

# STATE BOARD OF INVESTMENT

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**SBI  
POSITION  
PAPERS**

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**MINNESOTA STATE BOARD OF INVESTMENT  
POSITION PAPERS**

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**Paper:** Report of the Task Force on Fund Objectives

**Date:** January 1989

**Background:**

The Task Force reviewed the existing investment objectives and asset allocation strategies for the Basic and Post Funds. The existing policies had been adopted by the Board when they reviewed a series of position papers on the Basic and Post Funds (see Tabs B-F) during 1984-1987.

**Changes Since Publication:**

The Board adopted the recommendations that could be implemented within current statutory requirements. These recommendations essentially re-affirmed the existing policies and modified some reporting standards and formats. Note that the Board has not moved forward on the recommendation to add international securities to the Basic Funds. In addition, the Board approved a 1% allocation to cash rather than the 0% level shown in the report.

The Board did not adopt recommendations concerning restructuring the Post Fund. The Board directed Howard Bicker to discuss these recommendations with the retirement systems and report back. The Board stated it would not endorse any change to the Post Retirement Fund without support from the retirement systems, retiree groups and other interested parties.

**Prepared:** January 1990

# **REPORT OF THE TASK FORCE ON FUND OBJECTIVES**

## **Basic Retirement Funds Post Retirement Investment Fund**

**January, 1989**

### Members of the Task Force:

John Bohan, Pillsbury Company, Chair  
Harry Adams, Mpls. Teachers Retirement Fund  
Jim Eckmann, Dayton-Hudson  
Malcolm McDonald, Space Center Corporation  
Joe Rukavina, Public Representative  
Jan Yeomans, 3M Company

# REPORT ON THE TASK FORCE ON FUND OBJECTIVES

## BASIC RETIREMENT FUNDS POST RETIREMENT INVESTMENT FUND

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## **Report of the Task Force on Fund Objectives**

### **EXECUTIVE SUMMARY**

#### **MISSION:**

At its first meeting on December 15, 1988, the Task Force agreed that its mission was to:

- Review objectives of the Basic and Post Retirement Funds as to relevancy, clarity, measurability of results, and recognition of the Board's responsibilities to the Fund beneficiaries and contributors.
- Identify barriers to the development and execution of strategies to accomplish stated objectives.
- After review with the Investment Advisory Council, report findings to the Board, including where appropriate, recommendations for change.

#### **PROCESS:**

Participants included six members of the Investment Advisory Council (IAC). Extensive meetings were held on consecutive Wednesdays: December 15, December 28 and January 4. Members of the professional staff and representatives of members of the State Board of Investment were present at each meeting and contributed to the discussions.

A report draft of the Task Force report was forwarded to the Investment Advisory Council on January 23, 1989. Following discussion with the IAC on January 30, in which the Board's consultant participated, the draft was modified to incorporate certain clarifications.

#### **CONCLUSIONS AND RECOMMENDATIONS:**

Early on in its deliberations, the Task Force concluded that it would separate its recommendations into two parts:

- Recommendations that can be implemented within current statutory requirements (pages 3 to 10).
- Recommendations that require statutory changes to eliminate what the Task Force perceives as unreasonable and costly investment policy restrictions (pages 11 to 13).

## Executive Summary (con't)

### **Recommendations within current statutory requirements:**

- The Task Force developed, separately for the *Basic and Post Retirement Funds*, a mission statement, a statement of objectives and an asset allocation strategy designed to achieve the respective mission and objectives.

Further, the Task Force recommends that the combined funding status of the *Basic and Post Retirement Funds*, currently 72% of the present value of the future benefit obligations for actives and retirees, be included in the periodic reporting to the State Board of Investment. The current statute provides for the obligation to be fully funded by 2009. Adoption of the Task Force recommendations for a more aggressive investment policy in the *Basic Funds* may permit the acceleration of this schedule without affecting the current mechanism used to finance retirement benefit increases.

- The Task Force also recommends that a "score card" (page 10) be used in quarterly reporting of performance to the Board.

### **Recommendations that require statutory changes:**

- The Task Force recommends substituting an inflation-based benefit increase formula for the current formula that is keyed to excess "realized income" from the *Post Retirement Investment Fund*.
- The Task Force recommends that the separation of the pension assets of retirees and active employees be discontinued. This structure is believed to be unique among U.S. pension plans, with the known exception of one other public plan in Minnesota. This structure, along with the investment-driven benefit increase formula, leads to an asset allocation for the *Post Retirement Investment Fund* that generates current "realized income" from *fixed income securities*. Greater return could be secured from a portfolio more heavily weighted to equities, albeit with potentially more volatility in any given year.

The Task Force recommends that the Board, at its February 8, 1989 meeting, approve those recommendations that can be implemented within current statutory requirements.

With respect to statutory changes, the Task Force recommends that the Board, after consulting with the retirement systems and other state agencies, develop enabling legislation for consideration by the Legislature. The Investment Advisory Council stands ready to assist the Board in furthering these changes.

## **Report of the Task Force on Fund Objectives**

### **BASIC RETIREMENT FUNDS**

#### **Mission, Objectives, Asset Allocation Strategy**

##### **MISSION:**

To invest the pension contributions of employees/employers so that sufficient funds are available to finance promised benefits to over 200,000 public employees at retirement. All investments shall be governed by standards codified in Minnesota Statutes Chapter 11A, including the prudent person rule.

##### **OBJECTIVES:**

The Task Force recommends the following objectives:

- Total Return
- Liquidity

##### **1) Total Return (net of fees)**

##### **a) Real Return over 10 years**

The Basic Funds should generate total annualized returns that are 3-5 percentage points greater than the rate of inflation over moving 10 year periods.

**Rationale:** Historically, the capital markets have, over time, provided total returns exceeding inflation.

Since inflation and stock and bond returns will vary widely on a year to year basis, comparisons over short time periods are not meaningful. Given current trends in inflation, the Task Force believes an objective of 3-5% real return over a 10 year period is an appropriate and achievable objective for the Basic Funds. If inflationary trends change significantly, this objective should be re-evaluated.



## Basic Funds (con't)

### b) Relative Return over 5 years

Relative return measures should be compared to the Basic Funds' performance over moving 5 year periods. Return comparisons for shorter time periods (1 and 3 years) provide insights to relative performance but should not be used in judging the Funds' performance.

- **Exceed a composite of market indices ("Custom Index")**

The Basic Funds' total return should exceed a composite of market indices that is weighted in a manner that reflects the target asset allocation of the Funds.

Asset Class	Recommended Index/Target	Current Index/Target
Equities:		
Domestic Common Stock	Wilshire 5000	Wilshire 5000
Int'l Common Stock	EAFE *	None
Real Estate	**	None
Venture Capital	**	None
Resource Funds	**	None
Fixed Income:		
Domestic Bonds	Salomon BIG	Salomon BIG
Cash Equivalents	None	91 Day T-Bills

\* Morgan Stanley Capital International Index of Europe, Asia and the Far East.

\*\* To be recommended by the Alternative Investment Committee of the IAC.

**Rationale:** The Task Force recommends that the indices in the custom index correspond to the Board's asset class targets. If the Board changes these asset class targets, corresponding changes in the indices used in the composite should be made.

Implicit in the objective to "exceed" the Custom Index is the use of active management. Over time, active management is expected to add value, net of fees, to the return available from passively managed index funds.

## Basic Funds (cont)

- **Exceed the median fund in TUCS Universe ("Peer Index")**

The Basic Funds' total return should be above the median return from a representative cross section of other public and private pension funds.

The current peer index used is the Trust Universe Comparison Service (TUCS). Since many funds report only their stock, bond and cash returns to TUCS, the Task Force recommends that this measure be compared to the Basic Funds' return without alternative assets.

**Rationale:** TUCS is the largest and most comprehensive universe available to the SBI. It includes the returns of more than 800 public and private pension funds across the U.S.

The recommended asset allocation for the Basic Funds contains a larger percentage of stock than most funds reported to TUCS. As a result, the Basic Funds' return may be above the TUCS median return in years that the stock market performs well relative to the bond market, and below the TUCS median in years when the stock market performs poorly. The Task Force believes the Basic Funds' can be expected to exceed the TUCS median return over a moving 5 year period.

It should be noted that many funds report their returns before management fees are deducted. As a result, the Basic Funds are at a disadvantage when compared to other funds in the sample.

## 2) **Liquidity**

The Basic Funds should provide enough cash to meet the monthly transfer needs to the Post Retirement Fund.

**Rationale:** Historically, cash equivalents have provided lower rates of return than investments in stocks, bonds or alternative assets. Accordingly, the Task Force recommends that the Basic Funds minimize the amount of cash it holds at any point.

## Basic Funds (con't)

### ASSET ALLOCATION STRATEGY

The Task Force recommends the Basic Funds allocate 85% of its assets to equities (common stock and alternative assets). This is the maximum equity allocation allowed under current statute. The specific long term asset allocation recommended by the Task Force is:

	Recommended	Current
<b>Equities:</b>		
Domestic Common Stock	60.0%	60.0%
International Common Stock	10.0	0.0
Real Estate	10.0	10.0
Venture Capital	2.5	2.5
Resource Funds	<u>2.5</u>	<u>2.5</u>
<b>Sub-Total Equities</b>	<b>85.0%</b>	<b>75.0%</b>
<b>Fixed Income:</b>		
Domestic Bonds	15.0%	22.0%
Cash Equivalents	<u>0.0</u>	<u>3.0</u>
<b>Sub-Total Fixed Income</b>	<b>15.0%</b>	<b>25.0%</b>

**Rationale:** Historically, equities have provided higher returns than fixed income assets. Over the long term, the Basic Funds will achieve substantially higher total return than is possible from a lower equity position, although returns may fluctuate widely on a year to year basis. Given their long time horizon and low liquidity needs, the Basic Funds are ideally suited to take advantage of this return relationship.

The Task Force believes that the Basic Funds should increase its equity exposure by adding a 10% allocation to international common stocks and reducing allocations to bonds and cash equivalents. The Task Force recommends that staff develop an implementation plan for the international equity component for the Basic Funds. The plan should be reviewed by the IAC and approved by the Board prior to execution.

## Report of the Task Force on Fund Objectives

### POST RETIREMENT INVESTMENT FUND

#### Mission, Objectives, Asset Allocation Strategy

#### MISSION:

To insure that assets transferred to the Post Retirement Fund generate sufficient realized earnings to maintain promised benefits, and to generate additional realized earnings that will provide increases to more than 55,000 retired public employees. All investments shall be governed by standards codified in Minnesota Statutes Chapter 11A, including the *prudent person rule*.

#### OBJECTIVES:

The Task Force recommended the following objectives:

- Realized Earnings
- Liquidity

#### 1) Annual Realized Earnings

##### a) Generate 5% Realized Earnings to Maintain Current Benefits

The Post Fund must generate realized earnings of 5% each year to maintain current benefits.

##### b) Generate at least 3% Additional Realized Earnings to Provide Benefit Increases

After the 5% earnings goal is assured, the Post Fund should maximize additional realized earnings in a way that provides a relatively consistent level of benefit increases over time.

**Rationale:** The Post Fund's return objectives focus on realized earnings (interest, dividends plus net realized capital gains) because of its statutory provisions. By statute, the Post Fund must realize 5% earnings on the entire fund each year in order to provide current benefits.

## Post Fund (cont')

If the Fund generates more than 5% realized earnings in any year, statutes require that the additional earnings be distributed to retirees in the form of lifetime benefit increases. In order to provide benefit increases over time, the Fund should be invested to generate a relatively stable stream of additional earnings each year.

### 2) Liquidity

The Post Fund must generate sufficient cash each month to pay benefits to retirees.

#### ASSET ALLOCATION STRATEGY:

As cited previously, the Post Fund requires a large, stable stream of current income to pay monthly benefits to retirees. The Task Force believes the asset mix strategy currently in place fulfills this need. The current strategy is:

- Commit sufficient assets to a dedicated bond portfolio to meet the annual realized earnings objective of 5%.
- Commit additional assets to a dedicated bond portfolio to provide a floor benefit increase of 3% each year.
- Invest any remaining assets in common stock to provide realized gains that will *contribute to benefit increases*.

**Rationale:** A dedicated bond portfolio is a collection of various maturity, high quality bonds that generate cash flows from income and principal payments matching a specific stream of liabilities. The dedicated bond portfolio ensures that funds are available at the required times to meet promised benefit payments.

While the dedicated bond portfolio satisfies the Post Fund's statutory constraints, the Task Force believes there are other investment strategies that can generate a high level of current income and low volatility. The Task Force recommends that staff explore alternatives (e.g., dividend models used by endowment funds) and report on their potential applicability to the Post Fund.

## Report of the Task Force on Fund Objectives

### BASIC AND POST RETIREMENT FUNDS Funding Status

During its deliberations, the Task Force spent considerable time discussing the funding status of the statewide retirement systems. At the present time, the three largest statewide retirement plans have assets equal to approximately 72% of their combined actuarial liability. In dollar terms, this equals a shortfall of \$3.2 billion. Current law provides that this shortfall will be eliminated by 2009.

Two sources of financing could reduce the shortfall at a faster pace than anticipated by current State law:

- increased contributions by employees/employers
- *increased investment returns*

While the State Board of Investment has no control over the level of contributions coming into the retirement plans, it can assist in reducing the shortfall through superior investment performance.

Actuarial funding status is calculated on the assumption that the Basic Retirement Funds will provide an annual return of 8% over time and the Post Retirement Fund will provide 5% annual return.

The Task Force believes it is appropriate for the Basic Retirement Funds to employ an aggressive investment program that will, over time, have a high likelihood of exceeding the 8% assumed rate of return. This will assist the State in achieving full funding on or before the statutory target date of 2009. In addition, it could reduce the long term cost of public pension financing to the general taxpayer or allow benefit formulas to be enhanced.

**MINNESOTA STATE BOARD OF INVESTMENT  
QUARTERLY REPORT ON OBJECTIVES**

	<u>Status</u> <u>Month/Day/Year</u>
<b><u>BASIC RETIREMENT FUNDS</u></b>	<b>\$xx.x billion</b>
• Total Return (Annualized)	
- Real (10 Years)	xx.x%
3 to 5 percentage points over inflation	x.x percentage points over/under
- Relative (5 years)	xx.x%
Above median return	x.x percentage points above/below
Above composite index return	x.x percentage points above/below
• Liquidity	
- Minimal cash	\$xx million in cash, ___% of total fund
 <b><u>POST RETIREMENT INVESTMENT FUND</u></b>	 <b>\$xx.x billion</b>
• Realized earnings	\$xx.x million in FY 19__
- Above 8% per year	x.x percentage points above/below
• Liquidity	
- Cash equivalent to one month's benefits	\$xx.x million, ___% of previous month's
 <b><u>FUNDING (BASIC + POST RETIREMENT FUNDS)*</u></b>	 <b><u>Status</u> <u>June 30, 19</u></b>
• Achieve full funding by 2009	
- Projected benefit obligations (PBO)	\$xx.x billion
- Fair market value of assets (FMV)	\$xx.x billion
- Percent funded (PBO/FMV)	xx%
 * TRA, MSRS, PERA General Plans Only	

## **Report of the Task Force on Fund Objectives**

### **BASIC AND POST RETIREMENT FUNDS Recommendations for Statutory Changes**

The Task Force has reviewed the structure of the Basic and Post Retirement Funds within their current statutory requirements. The Task Force has identified three structural issues that unduly constrain the SBI's investment policies and asset management strategies. Addressing any of these issues would require changes the SBI's statutory authority.

- **Equity Exposure Limit**

By law, no more than 85% of any fund may be invested in equities or equity equivalents (common stock, real estate, venture capital, resource funds, high yield debt, international securities).

Since equities have provided the highest historical rates of return, limits on equity exposure may limit the SBI's ability to maximize returns over time.

- **Benefit Increase Formula**

By law, benefit increases in the Post Retirement Fund are granted whenever realized earnings exceed 5% in a year. This formula presents two problems:

- The formula requires the Post Fund to focus on generating current income (interest, dividends and net realized capital gains and losses) rather than total return (interest, dividends and realized and unrealized capital gains and losses). This limits the Post Fund's exposure to equities and therefore limits its potential for long term growth.
- The formula generates increases that may bear little relationship to inflation. Over time, it is likely that the formula will produce high increases during periods of low inflation and low (or no) increases during periods of high inflation. This is contrary to the implicit objective of providing benefit increases that parallel inflation and maintain the buying power of retirees.

- **Separation of the Basic and Post Funds**

By law, pension assets of currently working employees accumulate in the Basic Funds and pension assets attributable to retirees are transferred to the Post Fund for pay out during retirement. This structure is very rare among other public and private pension plans in Minnesota and across the U.S.



## Statutory Changes (con't)

The Task Force believes that separate fund management, combined with the current benefit increase formula, increases the long term costs of pension financing in Minnesota. Therefore, the Task Force believes this structure should be modified.

Over the long term, there is a potential increase in annual total return of 1.12% if the current statutory constraints were modified to permit a more aggressive investment policy. This translates to increases in value of more than \$100 million each year. (1)

### **RECOMMENDATION:**

The Task Force recommends that legislation be developed and implemented that:

- Replaces the present benefit increase formula that is totally dependent on "realized earnings" with one that relates in some manner to inflation.
- Eliminates the requirement for separate investment of the pension assets of active and retired employees.

**Rationale:** The Task Force believes that the pension income of public employees should be targeted at a proportion of their preretirement after-tax income that is competitive with the private sector for similar jobs.

Generally, public and private sector pensions are fixed as of the date of retirement. Some employers have subsequently elected, at their sole discretion, to provide ad hoc increases to mitigate the impact of inflation on retirees' after-tax income.

If it is the policy of the State of Minnesota to provide formula-driven benefit increases after retirement, the formula should relate to inflation rather than to excess "realized earnings" on a portion of retirement assets. Further, in establishing a new policy, due consideration should be given to competitive practices by other public and private employers.

## Statutory Changes (con't)

The Task Force believes that continuation of the present benefit increase formula and the accompanying statutory limitations on investment policy are not in the best interest of Minnesota taxpayers and do not effectively achieve the implicit objective of protecting retirees' income from the ravages of inflation. While any modifications should recognize the benefits promised to current retirees, such considerations should not preclude future action.

- (1) Assumes asset mix changes from 40% stock/60% bonds to 60% stock/40% bonds on a fund of \$10 billion.

Calculated using 9.9% annual total return for stocks and 4.3% annual total return for bonds. These total return values are taken from research by Ibbotson Associates and cover the period from 1926-1987.

If the Basic and Post Retirement Funds are considered together, their combined asset mix on 9/30/88 was 35% stocks/7% alternative assets/49% bonds/9% cash and their combined value was \$9.65 billion.

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**Background Materials  
on  
Fund Performance/Constraints**

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DATE: July 30, 1993

TO: Members, State Board of Investment  
Members, Investment Advisory Council

FROM: Howard Bicker  
Beth Lehman

**SUBJECT: Total Fund Performance/Constraints**

At the State Board of Investment (SBI) meeting on June 2, 1993, the Board tabled consideration of the Asset Allocation Committee's report concerning the adoption of total fund objectives for the Basic, Post and Combined Funds. Instead, the Board directed the Investment Advisory Council (IAC) and staff to bring the information described below to the September 1993 meetings.

*The Asset Allocation and Stock & Bond Manager Committees of the IAC are meeting on Aug. 12, 1993, from 8:30 a.m. to 12:00 noon in the SBI Conference room to discuss these issues. All members of the SBI and IAC have been notified of the meeting and are encouraged to participate in the discussion.*

**Summary of Discussion at the June 2, 1993 SBI Meeting**

State Auditor Dayton stated that he believed that the Investment Advisory Council and SBI staff should layout the reasons why the funds should not be expected to achieve more than median fund performance. He said he was not satisfied that this issue has been explicitly addressed by the Board, IAC or staff to date. He asked that the staff and IAC fully explain the following statement that appeared in the most recent report of the Asset Allocation Committee (see Tab F page of the June 1993 Board folder for the full report):

"At the March 1993 meetings, the Asset Allocation Committee discussed whether or not the goal of exceeding the median fund in the TUCS is an appropriate objective. In the past, Board members have suggested higher goals (e.g. performance in the top third of all pension funds) and have asked what changes would need to be made to reach such a goal. The Committee stated that it believes the current objective to exceed the performance of the median fund over moving 5 year periods is an aggressive goal for the Funds given their current constraints. Members believe that higher rankings against other pension funds are not realistic given the historical asset allocation targets approved by the Board."

Governor Carlson also asked that information be presented which compares the performance of corporate pension plans with the performance of the SBI's portfolios. He

said he was particularly interested in the performance of pension funds represented on the IAC and other companies from the Twin Cities area.

After discussion, the Board agreed that staff and the IAC should specify the constraints referenced in the Asset Allocation Committee report and discuss ramifications of sustaining, modifying or lifting those constraints. The goal is for the Board to review this information at its September 1993 meeting and to affirm its current positions or adopt new policies.

#### **Public vs. Corporate Pension Plan Performance**

As noted above, members of the Board asked for comparisons of public and corporate pension plan performance. While SBI staff does not have access to the performance of individual plans, aggregate information is available through the Trust Universe Comparison Service (TUCS).

As shown below, the performance of the Basic Funds is well above the median of all funds and of corporate funds over the last 3 and 5 year periods. *It should be noted that TUCS reports returns before fees.* If the SBI's returns were reported before fees, the performance of the Basic Funds would be approximately 30 basis points (0.3%) higher.

#### **Comparison of Total Fund Performance Periods Ending March 31, 1993**

	1 Yr.	3 Yrs.	5 Yrs.
<b>Basic Funds (after fees)</b>			
total fund	12.2%	12.6%	12.8%
without alt. assets	14.8	13.5	13.6
<b>TUCS Universe * (before fees)</b>			
all funds: median	13.2%	12.2%	12.2%
top quartile	14.5	13.4	13.1
public only: median	13.7%	12.1%	11.8%
top quartile	14.7	13.5	13.0
corporate only: median	13.1%	12.1%	12.2%
top quartile	14.2	13.3	13.2

- \* The Master Trust portion of the Trust Universe Comparison Service (TUCS) includes returns from approximately 270 corporate pension plans, public pension plans and endowment funds.

### **Concerns About Universe Comparisons**

While it is natural to want to know how the SBI's returns compare to other pension investors, universe data should be used with great care. There are several reasons why universe comparisons will provide an "apples to oranges" look at performance:

- **Differing Treatment of Fees.** As noted above, TUCS reports returns before fees while the SBI reports returns net of fees. This puts the SBI at considerable disadvantage in universe comparisons from the outset.
- **Differing Allocations.** Asset allocation will have a dominant effect on return. In March 1993, the allocation to stocks among the funds reported to TUCS ranged from 22% - 87%, a very wide range for meaningful comparison. In addition, it appears that many funds do not include alternative asset holdings in their reports to TUCS. This further distorts comparisons among funds.
- **Differing Goals/Liabilities.** Each pension fund structures its portfolio to meet its own liabilities and risk tolerance. This will result in different choices on asset mix. Since asset mix will largely determine investment results, a universe ranking is not relevant to a discussion of how well a plan sponsor is meeting its long term liabilities.

### **Types of Constraints**

Several types of constraints influence the performance of the funds managed by the SBI. The Board can control, or at least influence, the factors in each category shown below. The attachments to this memo provide background information on each category. Where appropriate, they also address performance expectations relative to actual results:

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### **Dates of Last Policy Review**

The information in the attachments covers a wide range of policies that have been adopted by the Board. For your reference, a listing of the SBI's major policies and the date of last review by the Board is shown below:



***Policy/Issue***

**Statutory authority**

***Last Review***

Reviewed annually before each legislative session. Last major change was removal of authority to purchase unrated debt and below investment grade debt in 1992.

**Investment objectives for Basic and Post**

Currently under discussion.  
Previous reviews in Sept. 1991 for Basic,  
Jan. 1989 for Basic and Post.

**Asset allocation for Basic Funds**

Sept. 1991

**Asset allocation for Post Fund**

June 1992

**Active/passive mix**

June 1990

**Use of benchmarks**

June 1990

**Use of tilted index fund to control style bias**

June 1990

**Return expectations by asset class**

June 1992

**Manager Continuation Policy**

Currently under discussion.  
Original policy adopted in March 1988.  
Revised in June 1990.

**Prohibition on liquor and tobacco stocks**

March 1993. Lifted as of 4/1/93.

**Prohibition on American Home Products**

October 1979

**Restrictions on South Africa-related stocks**

June 1993. Impact with respect to international stocks was discussed in the position paper that was adopted in Sept. 1992.

**Country guidelines for international stocks**

Dec. 1992

**ATTACHMENT A**  
**STATUTORY FRAMEWORK**

**Corporate Plans: ERISA and Prudent Expert Standard**

All corporate pension plans operate under the federal law contained in the Employee Retirement Income Security Act of 1974 (ERISA). ERISA states that all investments must be undertaken for the sole benefit of the beneficiaries of the plan and allows plan sponsors to undertake investments according to the "prudent expert" rule contained in section 404 (a)(1) of the act. ERISA requires the fiduciary to discharge his/her duties:

...with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent [person] acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims...

The focus of this standard is on the entire investment portfolio and total portfolio objectives. It does not specify any minimum or maximum percentage allocations to individual asset classes and does not address specific quality criteria regarding individual securities.

**Minnesota and Other Public Plans: Prudent Person Standard and Legal List**

Public funds do not operate under ERISA. Rather, most states have adopted statutes that allow their plans to operate under a "prudent person" standard. Minnesota has codified the following language in *Minnesota Statutes* section 356A.04. It states that a fiduciary:

... shall act in good faith and shall exercise that degree of judgment and care, under the circumstances then prevailing, that persons of prudence, discretion, and intelligence would exercise in the management of their own affairs, not for speculation, considering the probable safety of the plan capital as well as the probable investment return to be derived from the assets...

Many states, including Minnesota, further define the investment authority of public funds by enacting a "legal list" of authorized asset classes along with other constraints regarding the form of those investments. The SBI's legal list is contained in MS 11A.24 (Attached).

While Minnesota's legal list is quite broad, it does not allow the following investments that would be possible under either a prudent expert or prudent person standard:

- no more than 85% in equity (domestic common stocks plus alternative investments) in any one fund
- no more than 35% in alternative investments in any one fund. (Currently, real estate, venture capital, resource funds and international securities are defined as alternative investments in statute.)
- no authority to make direct investments in real estate, venture capital and resource funds (i.e., investments in these asset classes must be made through commingled funds or limited partnerships along with at least four other investors)
- no authority to invest in below investment grade debt (a.k.a., high yield debt or junk bonds)\*
- no authority to invest in unrated debt\*

\* *Prior to 1992, these were included as alternative investments and allowed, subject to the 35% limit. A bill proposed by the State Auditor and passed by the 1992 Legislature removed the SBI's authority to invest in these securities.*

Comments on each of the existing statutory constraints follow:

1. **85% limit on equities.** Staff does not believe that the 85% limit on equities needs to be modified at the present time. The current statutory limit imposes no real constraint since it is unlikely that the Board would endorse, or that the staff would recommend, investments beyond this limit. Given the nature of the funds under its control, it is appropriate that at least 15% of a pension fund be invested in fixed income securities. However, staff does recommend that the definitions of certain securities included under this limit be modified.
2. **35% limit on alternative investments.** Staff believes that the 35% limit on alternative investments, as currently defined, will limit the Board's future asset

allocation decisions. The Basic Funds have a 25% allocation in this area now (15% real assets and private equity, 10% international stocks). While these assets present greater risk, they also afford the potential for higher return and provide additional diversification. Staff believes that the Board should increase its allocations to private equity and international stock. In addition, the SBI should consider allocations to other types of securities that are, or have been, statutorily defined as "alternative investments." This would include international bonds, unrated debt, high yield debt, timber, land and other resource based assets. Therefore, it is likely that the Board will consider allocations at or above the 35% level within the next 2-4 years. Either the list of assets included in the 35% cap should be changed or the cap itself will need to be raised.

3. **Direct investment authority for real estate, venture capital and resource investments.** "Direct investment" means that a plan sponsor would be the primary owner or investor rather than a limited partner or a commingled fund participant. At the present time, staff does not believe that it is necessary to change the current statutory constraints on the form of these investments. If they were not imposed by statute, staff would be likely to ask the Board to maintain the same restrictions as a matter of policy or as part of its due diligence considerations. Staff believes it would be inappropriate for the SBI to assume the general liability that would be implicit in direct investing. Further, it is unlikely that the SBI could maintain the expertise necessary to make and monitor such investments on an on-going basis.
  
4. **Authority to purchase unrated debt.** "Unrated debt" is issued by companies that choose not to obtain a rating from a nationally recognized rating agency such as Standard & Poor's or Moody's. Data provided by J.P. Morgan shows that unrated debt comprises approximately 40% of the total domestic debt market in 1992. (Total domestic fixed income: \$7.8 billion. Unrated debt: \$3.0 trillion.) Historically, unrated debt has carried a higher coupon/interest rate than comparable rated debt (J.P. Morgan data estimates 0.4-0.6% higher). This means additional return for no additional risk. Absolute prohibitions on this type of security do not allow the SBI to take advantage of this potential for increased return. In addition, this prohibition makes it impossible for the SBI to participate in some yield oriented investments such as private placement commercial mortgages and business loan participations. It also impacts the SBI's ability to participate in some in-state investments since those

deals are often structured as unrated debt rather than as limited partnerships or other types of equity investments.

5. **Authority to purchase below investment grade debt.** Any debt security rated below the top four category ratings (AAA, AA, A, BAA) is referred to as "below investment grade," "high yield," or "junk." While these securities carry more risk than investment grade debt, returns have been very attractive. The SBI loses the opportunity to participate in these increased returns under current statute:

<b>Period Ending 3/31/93</b>	<b>1 yr.</b>	<b>3 yrs.</b>	<b>5 yrs.</b>
Salomon Broad Investment Grade Index	13.4%	12.6%	11.0%
Salomon High Yield Index	16.2	18.4	12.1

#### **Recommendations Regarding Statutory Constraints**

In order to achieve maximum flexibility in its asset allocation decisions, the Board would need to seek legislation that removes references to the "legal list" and allows the SBI to undertake investments solely under the "prudent person" standard. Since this would be a significant departure from current practice and would be likely to confront significant legislative opposition, staff believes the Board should consider less dramatic alternatives if it desires to increase its investment flexibility.

Staff recommends that the SBI seek the following statutory amendments to increase its investment flexibility. These authorities will allow the Board additional opportunities to diversify the portfolio and have the potential to enhance returns over time:

- **Remove international securities from the 35% cap placed on alternative assets and delete all references to "US and Canadian" securities. This would put international investments under the same guidelines as domestic securities.**
- **Re-establish authority to invest in unrated debt as an alternative investment subject to the 35% cap (or add unrated debt to the list of authorized debt securities).**

- **Re-establish authority to invest in below investment grade debt subject to the 35% cap (or add below investment grade debt to the list of authorized debt securities).**

## MINNESOTA STATUTES 11A.24

### "Legal List"

#### 11A.24 AUTHORIZED INVESTMENTS.

Subdivision 1. [SECURITIES GENERALLY.] The state board shall have the authority to purchase, sell, lend or exchange the following securities for funds or accounts specifically made subject to this section including puts and call options and future contracts traded on a contract market designated and regulated by a federal governmental agency or by a financial institution regulated by a governmental agency. These securities may be owned as units in commingled trusts that own the securities described in subdivisions 2 to 5.

Subd. 2. **Government obligations.** The state board may invest funds in governmental bonds, notes, bills, mortgages, and other evidences of indebtedness provided the issue is backed by the full faith and credit of the issuer or the issue is rated among the top four quality rating categories by a nationally recognized rating agency. The obligations in which the board may invest under this subdivision include guaranteed or insured issues of (a) the United States, its agencies, its instrumentalities, or organizations created and regulated by an act of Congress; (b) Canada and its provinces, provided the principal and interest is payable in United States dollars; (c) the states and their municipalities, political subdivisions, agencies or instrumentalities; (d) the International Bank for Reconstruction and Development, the Inter-American Development Bank, the Asian Development Bank, the African Development Bank, or any other United States Government sponsored organization of which the United States is a member, provided the principal and interest is payable in United States dollars.

Subd. 3. **Corporate obligations.** The state board may invest funds in bonds, notes, debentures, transportation equipment obligations, or any other longer term evidences of indebtedness issued or guaranteed by a corporation organized under the laws of the United States or any state thereof, or the Dominion of Canada or any province thereof if they conform to the following provisions:

(a) the principal and interest of obligations of corporations incorporated or organized under the laws of the Dominion of Canada or any province thereof shall be payable in United States dollars; and

(b) obligations shall be rated among the top four quality categories by a nationally recognized rating agency.

Subd. 4. [OTHER OBLIGATIONS.] (a) The state board may invest funds in bankers acceptances, certificates of deposit, deposit notes, commercial paper, mortgage participation certificates and pools, repurchase agreements and reverse repurchase agreements, guaranteed investment contracts, savings accounts, and guaranty fund certificates, surplus notes, or debentures of domestic mutual insurance companies if they conform to the following provisions:

(1) bankers acceptances and deposit notes of United States banks are limited to those issued by banks rated in the highest four quality categories by a nationally recognized rating agency;

(2) certificates of deposit are limited to those issued by (i) United States banks and savings institutions that are rated in the highest four quality categories by a nationally recognized rating agency, ~~that meet the collateral requirements established in section 9.0317~~ or whose certificates of deposit are fully insured by federal agencies; or (ii) credit unions in amounts up to the limit of insurance coverage provided by the National Credit Union Administration;

(3) commercial paper is limited to those issued by United States corporations or their Canadian subsidiaries and rated in the highest two quality categories by a nationally recognized rating agency;

(4) mortgage participation or pass through certificates evidencing interests in pools of first mortgages or trust deeds on improved real estate located in the United States where the loan to value ratio for each loan as calculated in accordance with section 61A.28, subdivision 3, does not exceed 80 percent for fully amortizable residential properties and in all other respects meets the requirements of section 61A.28, subdivision 3;

(5) collateral for repurchase agreements and reverse repurchase agreements is limited to letters of credit and securities authorized in this section;

(6) guaranteed investment contracts are limited to those issued by insurance companies or banks rated in the top four quality categories by a nationally recognized rating agency or to alternative guaranteed investment contracts where the underlying assets comply with the requirements of this section; and

(7) savings accounts are limited to those fully insured by federal agencies.

(b) Sections 16A.58 and 16B.06 do not apply to certificates of deposit and collateralization agreements executed by the state board under paragraph (a), clause (2).



(c) In addition to investments authorized by paragraph (a), clause (4), the state board may purchase from the Minnesota housing finance agency all or any part of a pool of residential mortgages, not in default, that has previously been financed by the issuance of bonds or notes of the agency. The state board may also enter into a commitment with the agency, at the time of any issue of bonds or notes, to purchase at a specified future date, not exceeding 12 years from the date of the issue, the amount of mortgage loans then outstanding and not in default that have been made or purchased from the proceeds of the bonds or notes. The state board may charge reasonable fees for any such commitment and may agree to purchase the mortgage loans at a price sufficient to produce a yield to the state board comparable, in its judgment, to the yield available on similar mortgage loans at the date of the bonds or notes. The state board may also enter into agreements with the agency for the investment of any portion of the funds of the agency. The agreement must cover the period of the investment, withdrawal privileges, and any guaranteed rate of return.

Subd. 5. **Corporate stocks.** The state board may invest funds in stocks or convertible issues of any corporation organized under the laws of the United States or the states thereof, the Dominion of Canada or its provinces, or any corporation listed on the New York Stock Exchange or the American Stock Exchange, if they conform to the following provisions:

(a) The aggregate value of corporate stock investments, as adjusted for realized profits and losses, shall not exceed 85 percent of the market or book value, whichever is less, of a fund, less the aggregate value of investments according to subdivision 6;

(b) Investments shall not exceed five percent of the total outstanding shares of any one corporation.

Subd. 6. **Other investments.** (a) In addition to the investments authorized in subdivisions 1 to 5, and subject to the provisions in paragraph (b), the state board may invest funds in:

(1) venture capital investment businesses through participation in limited partnerships and corporations;

(2) real estate ownership interests or loans secured by mortgages or deeds of trust through investment in limited partnerships, bank sponsored collective funds, trusts, and insurance company commingled accounts, including separate accounts;

(3) regional and mutual funds through bank sponsored collective funds and open-end investment companies registered under the Federal Investment Company Act of 1940;

(4) resource investments through limited partnerships, private placements and corporations; and

(5) international securities.

(b) The investments authorized in paragraph (a) must conform to the following provisions:

(1) the aggregate value of all investments made according to paragraph (a) may not exceed 35 percent of the market value of the fund for which the state board is investing;

(2) there must be at least four unrelated owners of the investment other than the state board for investments made under paragraph (a), clause (1), (2), (3), or (4);

(3) state board participation in an investment vehicle is limited to 20 percent thereof for investments made under paragraph (a), clause (1), (2), (3), or (4); and

(4) state board participation in a limited partnership does not include a general partnership interest or other interest involving general liability. The state board may not engage in any activity as a limited partner which creates general liability.

**Subd. 7. Appropriation.** There is annually appropriated to the state board, from the assets of the funds for which the state board invests pursuant to subdivision 6, clause (a), sums sufficient to pay the costs for the management of these funds by private management firms.

**History:** 1980 c 607 art 14 s 22; 1981 c 208 s 3-6,9; 1982 c 587 s 2; 1983 c 216 art 1 s 5; 1983 c 324 s 7-9; 1984 c 382 s 1; 1984 c 383 s 2,3; 1985 c 224 s 3-5; 1987 c 72 s 1; 1987 c 372 art 8 s 2-6; 1988 c 453 s 7,8; 1991 c 47 s 1; 1991 c 206 s 1; 1992 c 539 s 9; 1992 c 587 art 2 s 2; 1992 c 592 s 2



## ATTACHMENT B

### ASSET ALLOCATION POLICY

The Board determines the overall investment strategy for each fund through its long term asset allocation decision. This decision is the single largest determinant of a fund's return and overwhelms all other policy and implementation decisions. It also reflects the Board's tolerance for volatility/risk.

#### Current Asset Allocation Targets

The current long term asset allocation targets approved by the Board for the Basic and Post Funds are shown below. While the Board does not set specific targets for the Combined Funds, an aggregate target for the Combined Funds can be created using the market value of each fund. Because market values fluctuate, the "targets" for the Combined Funds will not be constant as they are for the Basic and the Post Funds.

	Basic Funds Long Term Target	Post Fund Long Term Target	Combined Funds Based on 3/31/93 Market Values
Domestic stocks	50%	50%	50.0%
International stocks	10%	--	5.6%
Alternative assets	15%	--	8.3%
Domestic bonds	24%	47%	34.2%
Cash	1%	3%	1.9%
Total	100%	100%	100.0%

The median allocation to stocks, bonds, cash and other asset classes of the Trust Universe Comparison Service (TUCS) universe on March 31, 1993 is shown below:

Median Allocation*	Stocks**	Bonds**	Cash
all funds	55.7%	32.4%	6.0%
public only	51.5	38.7	5.0
corporate only	58.4	30.5	6.1

\* Median allocation to each asset class. Will not add to 100%.

\*\* Includes both domestic and international.

This data suggest the following:

- The **Combined Funds** have an overall asset mix that is fairly close to the typical asset mix chosen for a pension plan. (*Stock allocation: Combined Funds 55.6%; median for all funds 55.7%. Bond allocation: Combined Funds 34.2%; median for all funds 32.4%*)
- The **Basic Funds** have a slightly higher allocation to stocks than is typical. (*Basics 60%; median for all funds 55.7%; median for corporate funds 58.4%*)
- The **Post Fund** has a lower allocation to stocks than is typical. (*Post 50%; median for all funds 55.7%; median for corporate funds 58.4%*)

#### **Impact of Asset Allocation Decisions**

The asset allocation chosen for a fund (the amount invested in stocks vs. bonds vs. other assets) will have a dominant effect on performance. Studies have shown that 90% or more of actual returns can be attributed solely to the asset mix of the portfolio. Asset management decisions (i.e. how much active vs. passive, which active managers, what rebalancing guidelines) will be overwhelmed by the fundamental asset allocation decision.

The actual experience of the Basic Funds confirms this relationship:

**Impact of Asset Allocation vs. Asset Management  
Basic Retirement Funds  
January 1, 1984-March 31, 1993  
(9.25 Years)**

	Millions	Annualized Return
<b>Beginning Market Value</b>		
<b>January 1, 1984</b>	\$3,129	
<b>Net Contributions</b>	279	
<b>Asset Allocation</b>	6,219	+12.7%
<b>Asset Management</b>	153	+ 0.2%
<b>Ending Market Value</b>		
<b>March 31, 1993</b>	\$9,780	12.9%

Source: Richards & Tierney

If the Basic Retirement Funds could have perfectly matched the index returns for stocks, bonds, etc., the SBI's asset allocation policy would have generated \$6.2 billion or 12.7% annualized over the last 9.25 years. Actual asset management generated an additional \$153 million and raised performance by 0.2%. The impact of various asset management decisions is shown below:

**Impact of Asset Management Decisions  
Basic Retirement Funds  
January 1, 1984- March 31, 1993  
(9.25 Years)**

	Millions	
<b>Misfit /Style Bias</b>	<b>\$-34</b>	
Domestic stocks	-93	mostly small stock bias before tilted index
All other assets	+59	mostly from alternative assets
 <b>Manager Contribution</b>	 <b>+50</b>	
Domestic stock passive	-35	tracking error, manager transition costs
Domestic stock active	+25	value added to benchmarks
Domestic bond managers	+23	value added to benchmarks
Alternative assets	+37	value added to established targets
 <b>Re balancing Activity</b>	 <b>+137</b>	
 <b>Total Asset Management</b>	 <b>\$153</b>	

Source: Richards & Tierney

**Future Asset Allocation Strategy**

With the change in the retirement benefit increase formula, both the Basic and Post Funds are oriented toward generating high long term total rates of return. However, the two funds remain separate by statute and continue to have somewhat different time horizons. Further, the ability of the Post Fund to generate and sustain benefit increases needs to be considered in the asset allocation decision. As a result, asset allocation targets need to be considered for each fund.

Staff believes that the Board's current asset allocation targets for the Basic Funds are appropriate given their funded status and liability structure. Nonetheless, staff would encourage the Board to consider a more slightly more aggressive asset allocation for the Basic Funds in order to enhance the potential for higher long term rates of return. Higher

returns would enhance the funded status of the Basic Funds and reduce the need for additional contributions to maintain currently promised benefits. The Basic Funds must generate at least 8.5% annual returns, overtime, to meet actuarial return assumptions.

Staff believes that the **Post Fund** should have a more aggressive asset allocation than current policy in order to increase the likelihood that the fund will be able to generate sufficient returns to maintain promised benefits and finance benefit increases. The Post Fund must generate 8.5% annual returns in order to cover its actuarial assumption of (5%) as well as the promised inflation-based adjustment (up to 3.5% per year). If the Post Fund expects to generate additional investment-based increases, annual returns must be greater than 8.5%, over time. As a result, it can be argued that the Post Fund should be positioned to be more aggressive than the Basic Funds. Currently, the Post Fund has a lower exposure to equities and, therefore, has a more conservative asset allocation policy.

Staff believes the following changes will increase returns in each fund without a dramatic increase in risk/volatility of returns. Because allocation changes take time to implement effectively, staff proposes that the Board consider making changes in stages:

*Increase allocation to international stocks*

- Basics: keep allocation at 10% for next 1-2 years, increase to 20% in 3-4 years.
- Post: add 10% allocation in next 1-2 years and increase to 20% in 3-4 years.

*Increase the allocation to alternative assets*

- Define alternative asset target as market value, rather than market value plus unfunded commitments.
- Basics: keep target at 15% and keep focus on equity vehicles.
- Post: add 5% allocation and focus on yield/debt oriented vehicles.

*Add global bonds and decrease the allocation to fixed income overall*

- Keep focus on domestic bonds over the next 1-2 years. Allocate one half to global bonds within 3-4 years.
- Basics: keep allocation at 24% for next 1-2 years, reduce allocation to 19% in 3-4 years.
- Post: reduce allocation to from 47% to 32% over next 1-2 years, reduce to 22% in next 3-4 years.

Staff suggests that the Board consider the specific allocation changes for the Basic and Post Funds that are displayed in the following table:

	Basics			Post		
	<i>Curr. Policy</i>	Next 1-2 Yrs.	Future Yrs.*	<i>Curr. Policy</i>	Next 1-2 Yrs.	Future Yrs.
<b>Stocks</b>	<b>60%</b>	<b>60%</b>	<b>65%</b>	<b>50%</b>	<b>60%</b>	<b>70%</b>
Domestic	50	50	45	50	50	50
International	10	10	20	--	10	20
<b>Alternative assets</b>	<b>15 (1)</b>	<b>15 (2)</b>	<b>15 (2)</b>	--	<b>5 (3)</b>	<b>5 (3)</b>
Real estate	7-8	7-8	7-8	--	--	--
Private equity	7-8	7-8	7-8	--	--	--
Yield oriented**	--	--	--	--	5	5
<b>Subtotal</b>	<b><u>75%</u></b>	<b><u>75%</u></b>	<b><u>80%</u></b>	<b><u>50%</u></b>	<b><u>65%</u></b>	<b><u>75%</u></b>
<b>Bonds</b>	<b>24</b>	<b>24</b>	<b>19</b>	<b>47</b>	<b>32</b>	<b>22</b>
Domestic	24	24	9-10	47	32	11
Global	--	--	9-10	--	--	11
<b>Cash</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>Total</b>	<b><u>100%</u></b>	<b><u>100%</u></b>	<b><u>100%</u></b>	<b><u>100%</u></b>	<b><u>100%</u></b>	<b><u>100%</u></b>

**Expected Return (4)**

High (5)	22.4%	22.48%	23.14%	20.34%	21.14%	23.13%
Median	10.29	10.32	10.54	9.44	9.69	10.24
Low (5)	-1.82	-1.84	-2.06	-1.46	-1.76	-2.65
<b>Standard Deviation</b>	<b>12.11</b>	<b>12.16</b>	<b>12.60</b>	<b>10.90</b>	<b>11.45</b>	<b>12.89</b>

- (1) at market value plus unfunded commitments, focused on equity oriented vehicles
- (2) at market value, focused on *equity* oriented vehicles (e.g. equity real estate, private equity)
- (3) at market value, focused on *yield* oriented vehicles (e.g. mortgage real estate, business loan participations, income producing real assets such as timber)
- (4) assumes 5.5% inflation
- (5) one standard deviation away from the median

\* Exceeds 35% cap on alternative investments.

\*\* May not be possible without authority for unrated debt.



### Assumptions Used to Calculate Expected Returns

The assumptions shown below are based primarily on the long term historical returns provided by the capital markets. Where historical returns are not available for a particular asset class, staff has extrapolated the assumptions based on those used by various consultants and money management firms.

Where possible, the same assumptions used in the analysis prepared for the September 1991 asset allocation review of the Basic Funds and the June 1992 asset allocation review of the Post Fund were used.

Asset Class	Nominal Return	Real Return**	Standard Deviation
Domestic stocks	11.0%	5.5%	18.0
International stocks	11.5	6.0	20.0
Domestic bonds	8.0	2.5	8.0
Global bonds	8.25	2.75	12.0
Real estate	8.5	3.0	9.0
Private equity	14.0	8.5	20.0
Yield oriented deals	9.5	4.0	12.0
Cash	6.0	0.5	3.0
Inflation	5.5	--	3.0

\*\* real return = nominal return - inflation

### Correlation Matrix

	US Stk.	Int'l Stk.	US Bnds.	Glob. Bnds.	Real Est.	Priv. Eqty.	Yld. Deals	Cash
US stocks	1.00							
Int'l stocks	0.60	1.00						
US bonds	0.35	0.20	1.00					
Global bonds	0.10	0.50	0.60	1.00				
Real estate	0.30	0.15	0.20	0.00	1.00			
Private eq.	0.50	0.15	0.15	0.00	0.20	1.00		
Yield deals	0.45	0.30	0.50	0.20	0.15	0.40	1.00	
Cash	-0.10	0.00	0.10	-0.10	0.20	0.00	0.20	1.00

## **Recommendations Concerning Asset Allocation**

Staff recommends that the SBI adopt the proposed allocations for the Basic and Post Funds shown on the previous pages if it wishes to enhance the potential for higher rates of return over the long term. In doing so, the Board must recognize the following:

- *The funds will be taking on a slightly higher level of risk. This means that returns may fluctuate somewhat more widely on a year to year basis than is likely under the current asset allocation. While the potential for higher long term returns justifies the additional risk, the funds will have "higher high's and lower low's" on a year to year basis.*
- *The asset allocation of the Basic, Post and Combined Funds will be more aggressive than the "typical" pension fund included in universe comparisons. Over longer periods (10 years or more), this should result in higher returns than the typical fund. Over shorter periods (1, 3 or 5 years), returns could just as likely be bottom quartile as top quartile in universe rankings.*



## ATTACHMENT C

### MANAGEMENT STRUCTURE (Active/Passive Mix)

For most pension funds, the manner in which assets are managed will account for less than 10% of their return. Within this area, the decision regarding active/passive mix will have the greatest impact on overall returns.

#### **Current Policy on Active/Passive Mix**

The SBI has utilized both active and passive management since the mid 1980's. The current policy with respect to each asset class is shown below:

- domestic stocks            at least half passive (indexed)
- domestic bonds            at least half semi-passive (enhanced indexed)
- international stocks       no more than half passive (indexed)
- alternative assets         all active

The Board's decision to use passive or semi-passive management for a portion of the stock and bond segments is influenced by several factors:

- **Diversification.** Passive management assures exposure to all sectors of the market.
- **Certainty of Returns.** Returns from passive and semi-passive management will track the target index with a low margin of variation/volatility.
- **Efficiency.** It is possible to deploy larger amounts of money passively than actively.
- **Cost.** The management fees and transaction costs are lower for passive management than for active management.

#### **Active/Passive Mix of Other Pension Funds**

Passive management/indexing is a relatively new investment approach and was not widely used until the mid 1980's. Today, many plan sponsors index at least a portion of their stock and bond assets. The data shown below comes from a survey conducted by Greenwich Associates in 1992:

**Percent of Sponsors that Use Passive Management  
for a Portion of their Funds**

Type of Plan/Fund	Domestic	Domestic	Int'l
	Stocks	Bonds	Stocks
Corporate Plans	40%	41%	15%
Public Plans	38	40	20
Corporate Plans > \$1 billion	74	78	35
Public Plans > \$1 billion	63	61	38

Source: Greenwich Associates

While many plans use passive management today, the amount of assets committed to passive management is considerably lower than that the amount managed actively. The information shown below is based on the aggregate asset mix of the plans included in the Greenwich Associates survey referenced above. It indicates that the SBI's relies on indexing to a much greater degree than other plan sponsors:

**Aggregate Active/Passive Mix  
All Plans over \$500 million**

	Corporate Plans	Public Plans
<b>Domestic Stocks</b>		
Active	71%	65%
Passive	29	35
<b>Domestic Bonds</b>		
Active	73%	87%
Passive	27	13
<b>International Stocks</b>		
Active	76%	77%
Passive	24	23

Source: Greenwich Associates

## Return Expectations for Stocks and Bonds

The goal of **passive management** is to track the benchmark/index closely. On a year to year basis, passive management returns will fluctuate above and below the target, usually by less than 50 b.p. on an annual basis. *Over time, passive management can be expected to under perform the target.* This is because all benchmark/index returns ignore the effect of transactions costs and management fees that are part of the actual portfolio management process.

The goal of **active management** is to add value to the agreed upon benchmark. Because active managers incur additional risk, returns can be expected to fluctuate above and below the benchmark by fairly wide margins, often by 500 basis points or more on an annual basis. *Over time, active managers are expected to add value to the benchmark net of all transactions costs and management fees. The amount of value added expected will vary by asset class.*

The Board has established the following return expectations for stocks and bonds given its existing active/passive mix policies:

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### Domestic Stocks

Asset Class Target: **Wilshire 5000\***

<i>Structure</i>	<i>Allocation</i>	<i>Return Expectation**</i>
Active	Maximum 50%	+50 to +100 b.p.
Passive	Minimum 50%	-10 b.p.
<b>Total Program</b>		<b>+20 to +45 b.p.</b>

\* adjusted for liquor and tobacco restrictions through 3/31/93

\*\* annualized, relative to benchmark, net of all fees

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### Domestic Bonds

Asset Class Target: **Salomon Broad Investment Grade Index**

<i>Structure</i>	<i>Allocation</i>	<i>Return Expectation*</i>
Active	Maximum 50%	+25 to +50 b.p.
Semi-Passive	Minimum 50%	+15 to +25 b.p.
<b>Total Program</b>		<b>+20 to +35 b.p.</b>

\* annualized, relative to benchmark, net of all fees

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**International Stocks**Asset Class Target: **EAFE\***

<i>Structure</i>	<i>Allocation</i>	<i>Return Expectation**</i>
Active	Minimum 50%	+75 to +150 b.p.
Passive	Maximum 50%	-25 to +10 b.p.
<b>Total Program</b>		<b>+25 to +75 b.p.</b>

\* adjusted for South Africa restrictions and re weighted, for fully active managers

\*\* annualized, relative to benchmark, net of all fees

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**SBI Performance Compared to Other Pension Plans**

The performance of the SBI's stock and bond managers compares favorably with the results experienced by other pension funds in the Trust Universe Comparison Service (TUCS). *It should be noted that TUCS reports returns before fees.* If the SBI's returns were reported before fees, the SBI's performance would be approximately 35-40 basis points (0.35% -0.40%) *higher* for stocks and approximately 15-20 basis points (0.15%-0.20%) *higher* for bonds:

**Domestic Stocks**  
**SBI Managers vs. Other Pension Funds**  
**Period Ending 3/31/93**  
**Annualized Return**

	<b>1 Yr.</b>	<b>3 Yrs.</b>	<b>5 Yrs.</b>
<b>SBI Stocks* (after fees)</b>	<b>14.8%</b>	<b>13.4%</b>	<b>14.5%</b>
<b>TUCS Equity Pools (before fees)</b>			
top quartile	16.0%	14.9%	15.4%
median	14.1	13.5	14.6
bottom quartile	12.2	12.1	13.2
<b>Wilshire 5000 Adjusted</b>	<b>15.1%</b>	<b>13.8%</b>	<b>14.7%</b>
<b>Wilshire 5000</b>	<b>15.1</b>	<b>14.0</b>	<b>15.1</b>

\* includes both active and passive managers

**Domestic Bonds**  
**SBI Managers vs. Other Pension Funds**  
**Period Ending 3/31/93**  
**Annualized Return**

	1 Yr.	3 Yrs.	5 Yrs.
<b>SBI Bonds* (after fees)</b>	<b>14.1%</b>	<b>13.1%</b>	<b>11.2%</b>
<b>TUCS Bond Pools (before fees)</b>			
top quartile	15.5%	13.8%	11.7%
median	14.0	13.0	11.2
bottom quartile	13.0	12.3	10.7
<b>Salomon BIG</b>	<b>13.4%</b>	<b>12.6%</b>	<b>11.0%</b>

\* includes both active and semi-passive managers

**Return Expectations for Alternative Assets**

Since indexing is not available for alternative assets at the present time, all alternative investments are actively managed. The return expectations established by the Board for alternative assets are shown below:

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**Private Equity (venture capital, buyout funds, re-structuring funds)**

<i>Asset Class Target:</i>	<b>SBI Aggregate</b>
<i>Structure:</i>	<b>Primarily limited partnerships and commingled funds</b>
<i>Return Expectation:</i>	<b>+300 basis points over historical public equity returns to compensate for lack of liquidity. Measured over the life of the investment. (This is approximately 13% in nominal terms.)</b>

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**Real Assets (real estate, resource investments)**

<i>Asset Class Target:</i>	SBI Aggregate, including Wilshire Real Estate Index
<i>Structure:</i>	Primarily limited partnerships and commingled funds
<i>Return Expectation:</i>	+300 to +500 basis points over inflation rate. Measured over the life of the investment. (This is approximately 6-8% in nominal terms at the present time.)

---

In recent years, the SBI's venture capital investments have exceeded the Board's return expectation:

	Period Ending March 31, 1993	
	3 yrs.	5 yrs.
SBI venture capital	19.1%	17.0%
Historical public equity returns	10.0	10.0
Difference	+9.1	+7.0

Over the last 3 years, the SBI's resource (oil and gas) investments have exceeded the Board's return expectation. Over the last 5 years, those investments have exceeded inflation but have fallen short of the +3% to +5% expected return:

	Period Ending March 31, 1993	
	3 yrs.	5 yrs.
SBI resource funds	12.3%	6.0%
Inflation	3.7	4.3
Difference	+8.6	+1.7

Due to the severe downturn in real estate values across the country, the SBI's real estate investments have not met the Board's long term return expectation, but have exceeded the returns of other real estate investors:

**Period Ending March 31, 1993**

	3 yrs.	5 yrs.
SBI real estate	-6.4%	-1.2%
Inflation	3.7	4.3
Wilshire Real Estate Index	-8.1	-2.9

**Recommendations Concerning Management Structure**

Staff does not recommend a change in the Board's mix of active and passive management at this time. The half passive/half active approach used for stock and bond investments represents a good balance between opposing risks and rewards of each approach:

- *Active management* provides the opportunity to add value. While the amount is relatively small compared to the returns that come from asset allocation, the dollar impact can still be significant for the total portfolio. However, active management increases the volatility of returns and the Board can never be certain that its active managers will in fact add value over time.
- *Passive management* provides greater certainty of returns. While these returns will be more consistent than active management, transactions costs and management fees virtually assure that the passively managed portfolios will under perform the target index over time.

The structure also reflects the administrative realities of managing large sums of money. The SBI has/will have the following assets committed to active management:

- domestic stocks:           \$4.5 billion   15 firms       \$200-600 million each
- domestic bonds:           \$3.3 billion   7 firms        \$250-800 million each
- international stocks:      \$0.5 billion   6 firms        \$ 75-150 million each

Staff believes that the universe of active managers capable of handling accounts of this magnitude is somewhat limited. In addition, there are limits on the number of managers that can be monitored and evaluated effectively by the staff/IAC. The half active/half passive structure addresses these constraints on a practical level.

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## ATTACHMENT D

### INVESTMENT RESTRICTIONS

Over time, the Board has chosen to implement certain policies regarding stock investments that affect the range of investment choices available to all or some of the SBI's stock managers. Those policies are/were:

- prohibition on holding stock of liquor or tobacco companies (initiated prior to 1970, lifted effective April 1, 1993)
- prohibition on holding the stock of American Home Products due to its infant formula marketing practices (initiated in the late 1970's)
- restrictions on purchasing the stock of companies with direct investment in South Africa (initiated in 1986)
- guidelines on purchasing the stock of companies domiciled outside the US due to concerns about the violation of human rights and worker rights (initiated in 1993)

#### **Liquor and Tobacco**

Effective April 1, 1993, the Board lifted its prohibition on liquor and tobacco stocks. The policy had been in place prior to 1970 and prohibited both active and passive managers from holding the stock of any company that obtained more than 50% of its revenue from the sale of liquor and tobacco.

Removing the affected stock reduced the returns available from the Wilshire 5000 stock index by nearly 0.3% annualized for the twelve year period from 1980-1992. This impact was seen directly in the SBI's Wilshire 5000 index fund. The impact on the actively managed portion of the stock portfolio is more difficult to determine since active stock managers may or may not have chosen to include some of the securities in their portfolios if they had not been prohibited.

#### **American Home Products**

The Board has prohibited all active and passive managers from holding the stock of American Home Products (AHP) since the late 1970's due to concerns about its infant

formula marketing practices in third world countries. The last time the Board discussed this issue was October 1979.

From 1980-1992, the return of AHP stock was 19.3% annualized. The return of the Wilshire 5000 during the same period was 13.9% annualized. While AHP performed better than the Wilshire 5000, the impact of that superior performance was quite small because AHP is a very small percentage of the index.

As with the liquor and tobacco policy, the prohibition has directly impacted the SBI's index fund. The impact on the actively managed portion of the stock portfolio is more difficult to determine since active stock managers may or may not have chosen to include AHP in their portfolios if it had not been prohibited.

### **South Africa**

The Board adopted its initial resolution concerning South Africa in October 1986. The policy has been implemented by "divestment through attrition" for actively managed stock portfolios since that time. Passively managed stock portfolios have not been affected by the policy. The last time the Board considered its resolution on South Africa was June 1993 when the resolution was amended to remove references to Namibia.

Unlike the policies referenced above, the South Africa resolution institutes investment restrictions rather than an explicit prohibition. Under the Board's resolution, active stock managers are directed to refrain from purchasing a restricted stock unless the manager believes it would be a breach of fiduciary responsibility not to do so.

The Board's policy impacts the range of investment opportunities available to active stock managers:

- Close to 90 companies domiciled in the US are on the restricted list at the present time. This represents about 10% percent of the market capitalization of the Russell 3000 (The Russell 3000 is a broad stock market index similar to the Wilshire 5000.) It should be noted the number of companies with direct investment in South Africa is beginning to increase after declining dramatically in the last half of the 1980's. As a result, the market capitalization affected by South Africa restrictions will likely increase in the future.

- More than 450 international companies (i.e. companies domiciled outside the US) are on the restricted list at the present time. This represents more than 30 percent of the market capitalization of the Morgan Stanley Capital International Index of Europe, Australia and the Far East (EAFE).

The performance impact of the Board's restriction policy is difficult to determine for several reasons. First, the Board has implemented its policy in phases and not all companies were affected during all stages. Second, an active manager may or may not have chosen to hold one or more of the securities if there had been no restrictions. Third, the policy is not an explicit prohibition since an active manager may choose to hold a restricted stock if it believes it would be a breach of fiduciary responsibility not to do so.

While they are not completely representative of the Board's policy, the performance of "South Africa Free" indices shows that explicit prohibitions on holding South Africa stocks would have produced lower returns over recent periods:

- The Russell 3000 returned 15.5% annualized for the five years ending 3/31/93. A "South Africa Free" Russell 3000 returned 15.3% annualized during the same period. (Difference: -0.2% annualized.)
- The EAFE index returned -0.8% annualized for the five years ending 3/31/93. A "South Africa Free" EAFE index returned -2.7% annualized during the same period. (Difference -1.9% annualized.)

#### **Country Guidelines for International Investments**

In December 1992, the Board adopted country guidelines recommended by the International Investing Guidelines Task Force in response to concerns about worker rights and human rights.

Like the South Africa policy, the international guidelines apply to the SBI's actively managed stock portfolios. The guidelines can be summarized as follows:

- **Group I.** Active stock managers are not restricted regarding the countries included in Group I since these countries have strong worker and human rights protections and there is little concern that economic and social disruptions may occur which would have an adverse effect on their financial markets.

- **Group II.** Active stock managers may invest in the Group II markets if the manager believes that it would be a breach of fiduciary responsibility not to do so. Since violations of worker and human rights continue to occur in these countries, there is some concern that economic and social disruptions may occur, having an adverse effect on the financial markets. If a manager chooses to invest in one or more of these markets, the manager must notify the SBI in writing.
- **Group III.** Active stock managers may invest in Group III markets if the manager believes that it would be a breach of fiduciary responsibility not to do so. Since these countries lack basic human and worker rights, the potential exists for economic, political and social unrest that could adversely affect the stability of those markets. If a manager chooses to invest in one or more of these markets, the manager must appear at a meeting of the SBI to present its reasons for the decision to do so.

The list of countries in each group is shown below:

<b>Group I</b>	<b>Group II</b>	<b>Group III</b>
Australia	Argentina	China
Austria	Brazil	Indonesia
Belgium	Chile	Kuwait
Canada	Colombia	Nigeria
Czechoslovakia	Egypt	Pakistan
Denmark	India	South Africa
Finland	Israel	USSR/former Soviet Union
France	Jamaica	Yugoslavia
Germany	Korea, Rep. of	
Greece	Malaysia	
Hong Kong	Mexico	
Italy	Philippines	
Ireland	Taiwan	
Japan	Thailand	
Luxembourg	Trinidad & Tobago	
Netherlands	Turkey	
New Zealand	Venezuela	
Norway		
Poland		
Portugal		
Singapore		
Spain		
Sweden		
Switzerland		
United Kingdom		
Uruguay		

### **Recommendations Concerning Investment Restrictions**

At the March 1993 meeting of the SBI, the Investment Advisory Council reported the following motion:

**Consistent with our fiduciary responsibility to plan beneficiaries, taxpayers and the State of Minnesota, the Investment Advisory [Council] recommends that the State Board of Investment act in a timely manner to remove all investment restrictions, except those resulting from objective risk/return considerations or required by statute, on the investment of employee benefit assets for which the Board has fiduciary responsibility. Further, the IAC recommends that no such new restrictions should be undertaken.**





## **ATTACHMENT E**

### **OPERATING POLICIES AND PROCEDURES**

The SBI's decision-making framework is considerably more complex than that employed by corporate pension plans. The diagrams on the following pages attempt to illustrate that point.

The public nature of the business conducted by the SBI necessitates involvement from a wider range of stakeholders and interested parties than would be considered at most corporate pension plans. No staff proposal is brought before the Board for action without the review and recommendation of at least one committee or task force. More often, multiple layers of review are involved.

Generally, this provides great benefit to the proposals brought before the Board since the final product represents the best thinking of all concerned. On the other hand, the multiple layers inevitably lead to a lengthier decision making process and true consensus is not always possible given the differing viewpoints of the parties involved.

#### **Staff Comment:**

Staff is not recommending that the SBI change its review processes since the current structure has evolved over time in response to the needs expressed by the Board or to the processes demanded by the public nature its business. However, all parties must recognize that the SBI's process and procedures will be slower and more time consuming than the operations of a typical corporate pension plan. While the impact of this structure is difficult to quantify in terms of return, it will always be a constraint on the management of the funds under the control of the SBI.

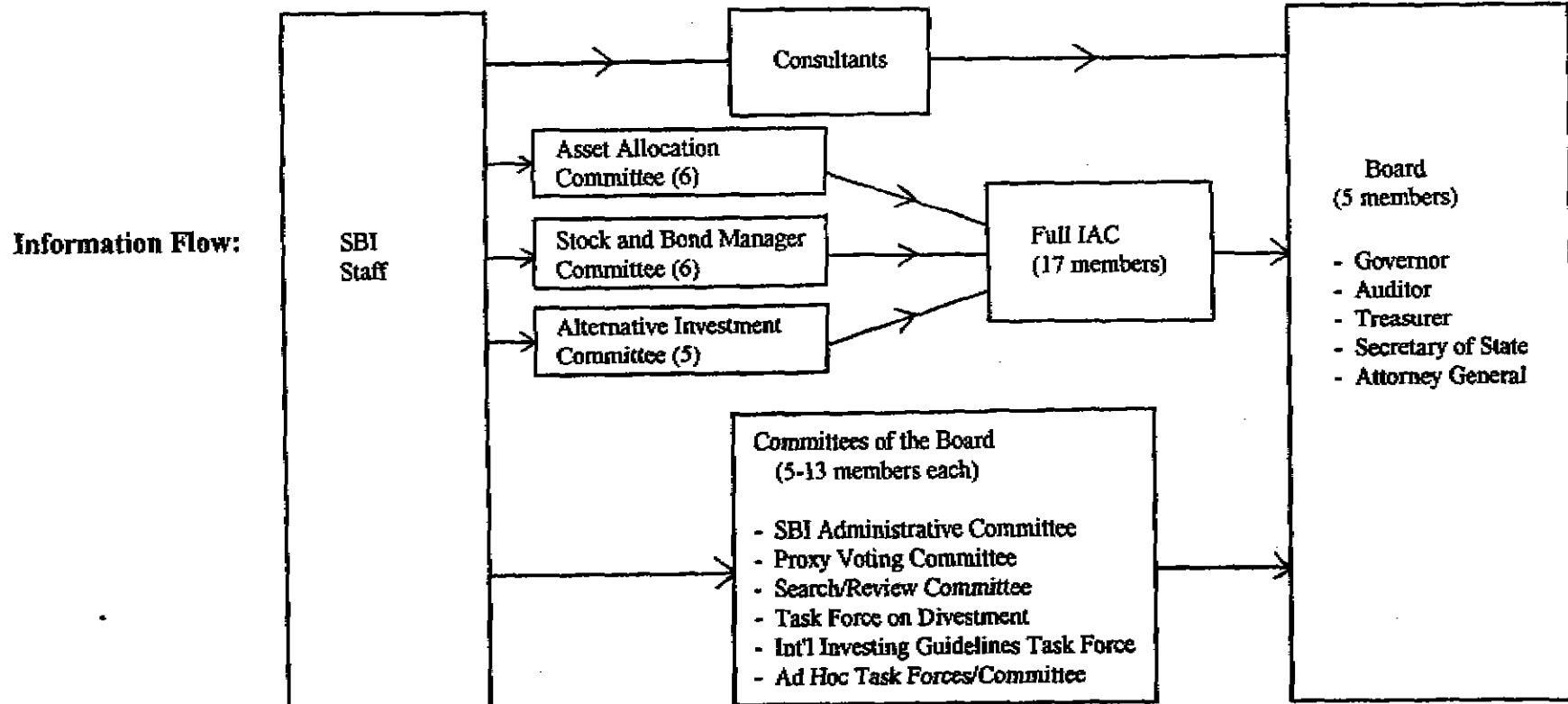
# STATE BOARD OF INVESTMENT

## Operating Environment

<b>Fiduciary Duty:</b>	Plan Beneficiaries	State of Minnesota	Taxpayers of the State
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<b>Accountability:</b>	General Electorate (Board)	Minnesota State Legislature (Board and Staff)
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<b>Oversight:</b>	Minnesota State Legislature	House and Senate Governmental Operations Committees Legislative Commission on Pensions and Retirement
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<b>Function:</b>	Propose Implement Monitor	Recommend Review	Approve Review
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# TYPICAL CORPORATE PENSION PLAN

## Operating Environment

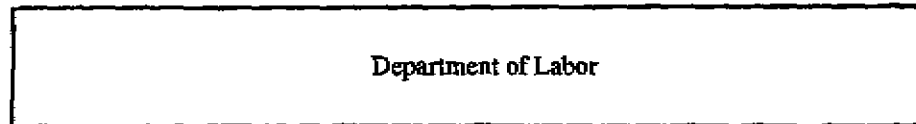
**Fiduciary Duty:**



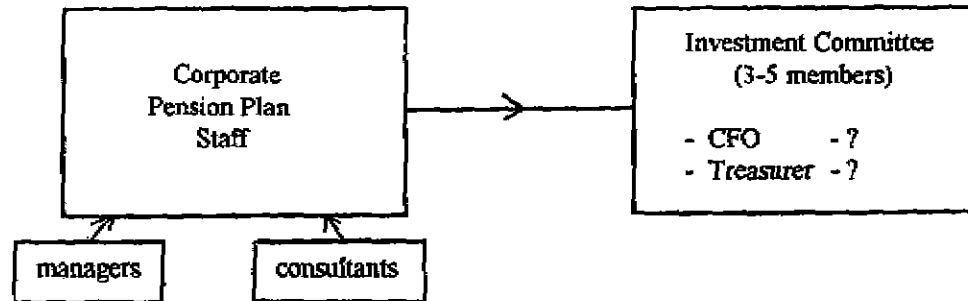
**Accountability:**



**Oversight:**



**Information Flow:**



**Function:**



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# **Asset Allocation Review**

**Basic Retirement Funds  
Post Retirement Fund  
Combined Funds**

**Minnesota State Board of Investment  
Staff Analysis and Proposal**

**July 1995**

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# ASSET ALLOCATION REVIEW

Basic Retirement Funds

Post Retirement Fund

Combined Funds

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## **ASSET ALLOCATION REVIEW**

### **Basic, Post and Combined Funds**

The State Board of Investment (SBI) determines overall strategy for each fund through its long term asset allocation policy. This decision is the single largest determinant of a fund's return and overwhelms all other policy and implementation decisions. It also reflects the Board's tolerance for volatility/risk.

The asset allocation targets of the Basic and Post Funds were last reviewed in 1993 as part of a larger study of constraints on fund performance (See *Review of Constraints on Fund Performance*, in the "Board Folder" for the September 1993 meeting). That study resulted in the addition of international stocks and yield oriented alternative investments to the Post Fund. The last major change in the Basic Funds allocation was in 1992 when international stocks were added.

This review is prompted by two issues that surfaced during the 1993 study:

- As part of its recommendations, staff suggested that the Board consider additional allocations to international assets for both the Basics and Post in approximately two to three years (i.e., 1995/96). *This review recommends that the SBI raise the target for international stocks from 10% to 15%. As part of this increase, exposure to emerging markets should be expanded.*
- At the urging of the Investment Advisory Council (IAC), the Board also approved a pilot program to introduce the use of non dollar bonds in the Funds. The pilot program allowed three of the SBI's current managers to allocate up to 10% of their individual portfolios to non dollar bonds on a tactical basis. Staff were directed to come back to the Board with a proposal to continue, expand or drop the non dollar bond initiative within two years (i.e., by the close of 1995). *This review recommends that the SBI use non dollar bonds tactically/opportunistically for up to 20% of the bond segment / up to 5% of the total fund.*

## Current Asset Allocation Targets

The current long term asset allocation targets for the Basic and Post Funds are shown below. While the Board does not set specific targets for the Combined Funds, they can be derived using the market values of the two underlying funds. (Because market values fluctuate, the "targets" for the Combined Funds will not be constant.)

	Basics	Post	Combined*
<b>Stocks</b>	<b>60%</b>	<b>60%</b>	<b>60.0%</b>
Domestic	50	50	50.0
International	10	10	10.0
<b>Alternative Assets</b>	<b>15</b>	<b>5</b>	<b>10.3</b>
<b>Bonds</b>	<b>24</b>	<b>32</b>	<b>27.7</b>
<b>Cash</b>	<b>1</b>	<b>3</b>	<b>2.0</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100.0%</b>

\* Based on 3/31/95 market values. Basics \$10.51 billion. Post \$9.46 billion.

## Comparison to Other Pension Plans

The median allocations to stocks, bonds, and cash in the master trust portion of the Trust Universe Comparison Service (TUCS) are shown below:

Median Allocation*	Stocks**	Bonds**	Cash
all funds	56.8%	31.2%	5.6%
public only	52.3%	38.6%	4.7%
corporate only	59.0%	29.3%	5.9%

\* Median allocation to each asset class as of 3/31/95. Will not add to 100%.

\*\* Includes both domestic and international.

The data indicate that the SBI has chosen an asset allocation strategy that is somewhat more aggressive (i.e., more stocks/less bonds) than many plans included in the comparison universe. Overall, the allocation of the Combined Funds appears to be more closely aligned with that of a corporate plan than a public plan.

## Considerations in Determining Asset Allocation Policy

Since the new retirement benefit increase formula was enacted, both the Basic and Post Funds have been oriented toward generating high long term total rates of return. However, the two funds remain separate by statute and continue to have somewhat different time horizons. Further, the ability of the Post Fund to generate and sustain benefit increases needs to be considered. As a result, asset allocation targets need to be established for each fund.

- **Basic Funds.** The Basic Funds must generate at least 8.5% annual returns, over time, to meet actuarial return assumptions. Staff believes that the current asset allocation targets for the Basic Funds are appropriate given their funded status and liability structure. Nonetheless, staff encourages the Board to look at other options that would improve the risk/return profile of the total fund. Higher returns would enhance the funded status of the Basic Funds and reduce the need for additional contributions to support promised benefits. Lower risk (with or without an increase in return) would benefit the Basics by reducing total fund volatility on a year-to-year basis.
- **Post Fund.** The Post Fund must generate 8.5% annual return, over time, in order to cover both its actuarial assumption of 5% as well as the promised inflation-based adjustment of up to 3.5% per year. (By statute, the inflation adjustment is capped at the difference between the return assumption for the Basics and the return assumption for the Post,  $8.5 - 5.0 = 3.5$ ) If the Post Fund is expected to generate investment-based increases in addition to the inflation adjustment, annual returns must be *greater* than 8.5%, over time. As a result, *it can be argued that the Post Fund should be positioned to be more aggressive than the Basic Funds.* Currently, the Post Fund holds less alternative investments and more bonds and, therefore, has a more conservative asset allocation policy. Staff encourages the Board to look at ways to increase the long term expected return of the Post Fund. The additional risk that would accompany a more aggressive policy is mitigated by the five year smoothing mechanism in the benefit increase formula.

Greater return is accompanied by greater risk. This means that in order to increase long term return, the Board must increase a fund's exposure to equities (international or domestic stocks) or equity-like alternatives (private equity or real assets). If increasing exposure to these assets provides incremental return that equals or exceeds the additional risk, the asset allocation change will be beneficial to the fund's risk/return profile.

Further diversification across world markets (both stocks and bonds) is likely to provide the best opportunity for the Board to improve the risk/return profile of the retirement funds. The rationale for increasing the SBI's exposure to international assets is well documented:

- potential to reduce total fund risk due to low correlation of returns between markets
- potential for enhanced returns through investments in faster growing economies

Historically, international investments have been attractive because they both increased return and reduced overall portfolio volatility/risk when used in combination with other assets. Even without the benefit of incremental return, their low correlation to the US market will continue to offer highly desirable diversification benefits for the total fund. (For further discussion, see position paper entitled *International Equity Investing in the Basic Retirement Funds*, dated August 1992.)

It should be noted that a small increase in total fund returns has large dollar impact over time. Ten basis points (10 b.p. or 0.1%) of additional return in the Combined Funds can be expected to generate approximately \$420 million over a ten year period:

**Value of Combined Funds after 10 Years\***

With return of 8.5% annualized	\$45.22 billion
With return of 8.6% annualized	45.64 billion
Dollar value of incremental return	\$0.42 billion

\* Assumes starting value of \$20 billion and no additional contributions or withdrawals.

## **Assumptions and Simulations**

With the above considerations in mind, staff ran several asset mix simulations for the Basic, Post and Combined Funds that utilize various combinations of assets.

The expected return, standard deviation and correlation assumptions that staff used in the simulations are in **Attachment A**. For the most part, the assumptions are based on the long term historical returns provided by the capital markets. Where historical returns are not available for a particular asset class, staff extrapolated the assumptions based on those used by various consultants and money management firms. These comparative data are in **Attachment B**. The assumptions used by the SBI for its 1993 review are also included for reference.

The results of the simulations for the Basics Funds, Post Fund and Combined Funds are shown in **Attachments C, D and E**.

## **Staff Proposal**

After reviewing the results of the simulations, staff suggests that the Board adopt the specific targets for the Basic and Post Funds that are displayed in **Attachment F**. The changes can be summarized as follows:

**1. *Increase the Combined Funds allocation to international stocks by 5.0%.***

Basics:            Increase the international segment from 10% to 15%.

Post:             Increase the international segment from 10% to 15%.

As part of the increase, expand the exposure to emerging markets. Target up to 15% of the international segment which translates to up to 2% of the total fund.

**2. *Decrease the Combined Funds allocation to domestic stocks by 2.5%.***

Basics:            Reduce target from 50% to 45%.

Post:             Keep target at 50%.

3. *Decrease the Combined Funds allocation to bonds by 2.5%.*

Basics: Keep target at 25%.

Post: Reduce target from 35% to 30%.

On a tactical basis, increase the use of non dollar bonds within the bond segment. Target up to 20% of the bond segment which translates to up to 5% of the total fund.

4. *Maintain targets for alternative investments in each fund.*

Basics: Keep target at 15%. Give private equity investments greater weight within the segment.

Post: Keep target at 5%. Continue to build commitments to yield oriented investments in order to reach the allocation target within next 3-5 years.

Staff believes that this proposal provides an appropriate risk/return trade-off for each fund at this time:

- **Basic Funds.** By increasing international/emerging markets exposure with a commensurate reduction in domestic stocks, the Basics can raise expected return and lower risk. (Long term expected return moves up by 14 b.p.; risk moves down by 26 b.p.)
- **Post Fund.** By increasing international/emerging markets exposure with a commensurate reduction in bonds, the Post will raise expected return. In this case, risk also increases, but at a lesser rate than return. (Long term expected return moves up by 22 b.p.; risk moves up by 18 b.p.)
- **Combined Funds.** When the proposed allocations for the Basic and Post are aggregated, expected return rises and risk decreases. (Long term expected return moves up by 18 b.p., risk moves down 4 b.p.)



The Post Fund could further improve its risk/return profile by including a higher proportion of alternative assets (refer to Attachment D, #4). However, raising the alternative asset target would be unrealistic at this time. Given the size of the Post Fund and nature of these investments, it is unlikely that the Post will reach its current target of 5% for 3-5 years. In the meantime, the Post Fund warrants a higher allocation to domestic stocks than the Basic Funds in order to increase long term expected returns.

### **Future Asset Allocation Strategy**

Both the Basic and Post Funds would benefit from exposure to international markets beyond the 15% level suggested in the staff proposal. Allocations to international stocks in the range of 20% or more will continue to provide diversification benefits.

The suggestion that the Combined Funds should have a higher allocation to international assets is supported by the results of an evaluation tool called "portfolio optimization." In portfolio optimization, a computer model determines optimal allocations based on the assumptions provided on return, risk and correlation. The model will seek the combination of assets that provides the highest level of expected return for a given level of risk.

**Attachment G** shows the results of the optimization for the Combined Funds. Targets for private equity, real assets, yield oriented investments and emerging markets were capped to reflect "real world" constraints (e.g. liquidity and availability) that are not captured in the assumptions. With these constraints in place, the optimizer chose the highest returning asset mix for portfolios with risk levels of approximately  $\pm 11.0$ ,  $\pm 11.25$  and  $\pm 11.5$ . (This range includes risk levels both above and below the standard deviation of the staff proposal for the Combined Funds.) As shown, the optimizer allocated more than 30% of the portfolio to international stocks in each case.

**Attachment H** shows how the asset allocation strategy of the Combined Funds has changed in recent years. It also displays how the proposal set forth in this review moves the Board toward the asset allocation targets that staff would suggest for the future. As shown, the SBI has made incremental steps toward international diversification of the Combined Funds, moving from 0% prior to 1993, to 5% during 1993 and to 10% during 1994. If the staff proposal is approved, exposure to international stock markets would increase to 15%. In the future, perhaps before the end of the decade, staff believes that it is appropriate for the Combined Funds to have a 20% exposure to international assets.

### Conclusion and Recommendation

Based on this review, staff recommends that the SBI adopt the allocations for the Basic and Post Funds shown **Attachment F** and summarized below:

	Basics Current	Basics Proposed	Post Current	Post Proposed
<b>Equities</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>65</b>
Domestic	50	45	50	50
International*	10	13	10	13
Emerging Markets	--	2	--	2
<b>Alternative Assets**</b>	<b>15</b>	<b>15</b>	<b>5</b>	<b>5</b>
Private Equity	7.5	9	--	--
Real Assets	7.5	6	--	--
Yield Oriented	--	--	5	5
<b>Fixed Income</b>	<b>25</b>	<b>25</b>	<b>35</b>	<b>30</b>
Domestic Bonds	24	19	32	22
Non Dollar Bonds***	--	5	--	5
Cash Equivalents	1	1	3	3
<b>Expected Return</b>	<b>10.33%</b>	<b>10.47%</b>	<b>9.85%</b>	<b>10.07%</b>
<b>Risk/Stand. Deviation</b>	<b>±11.64</b>	<b>±11.38</b>	<b>±11.13</b>	<b>±11.31</b>

\* Using unhedged policy target.

\*\* Market value. Market value plus unfunded commitments may be up to 5 percentage points higher.

\*\*\*To be used tactically, up to 20% of the entire bond pool.

The above allocation targets should not be considered final. Staff anticipates that the Board will continue to make incremental changes in its asset allocation strategy over the remainder of the 1990's. In the future, staff encourages the Board to consider higher allocations to international investments for both the Basic and Post Funds. Additional allocations to alternative assets are also likely to improve the risk/return profile of the Funds.

If the staff proposal is adopted, the asset allocation of the Combined Funds will continue to be more aggressive than the "typical" pension fund included in universe comparisons such as TUCS. Over longer periods (10 years or more), this should result in higher returns than the typical fund the peer group universe. Over shorter periods (1, 3, or 5 years), the Board should be cognizant that returns could just as likely be bottom quartile as top quartile in universe rankings.



## Attachment A

### Assumptions Used in Simulations

Asset Class	Return/Risk		
	Real* Return	Nominal** Return	Risk/ Stand. Dev.
<b>Equities</b>			
Domestic	6.50	11.00	17.00
International-unhedged	6.75	11.25	19.00
International-hedged	6.55	11.05***	17.00
Emerging markets	9.50	14.00	23.00
<b>Alternative Assets</b>			
Private equity	9.50	14.00	23.00
Real assets	4.50	9.00	12.00
Yield oriented	5.50	10.00	13.00
<b>Fixed Income</b>			
Domestic bonds	3.50	8.00	8.50
Non dollar bonds-unhedged	3.50	8.00	12.00
Non dollar bonds-hedged	3.30	7.80***	5.00
Cash equivalents	1.00	5.50	3.00
<b>Inflation</b>		4.50	

\* Real return = nominal return - inflation.

\*\* Nominal return is the long term (20+ years) expected return.

\*\*\* Unhedged return less assumed hedging cost of 20 b.p.

### Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11
1 US stocks	1.0										
2 Intl.-unhed.	.45	1.0									
3 Intl.-hed.	.60	.80	1.0								
4 Emerg. mkts.	.30	.30	.30	1.0							
5 Priv. equity	.50	.15	.25	.00	1.0						
6 Real assets	.30	.25	.25	.30	.30	1.0					
7 Yield oriented	.45	.30	.35	.00	.40	.15	1.0				
8 US bonds	.35	.20	.25	-.20	.15	.20	.60	1.0			
9 Non US-un.	.10	.60	.30	-.20	.00	.10	.00	.40	1.0		
10 Non US-hed.	.30	.20	.40	-.20	.05	.10	.30	.75	.25	1.0	
11 Cash equiv.	-.10	-.10	.00	-.10	-.10	.30	.20	.10	-.10	.60	1.0

**Attachment B**  
**Comparative Data -- Historical**  
**Annualized Returns through 3/31/95**

	Last 5 Yrs.	Last 15 Yrs.	Longest Avail.	Longest # Yrs.
<b>Equities</b>				
Domestic (1)	11.5 / 11.4	15.1 / 15.5	11.8 / 10.3	24 / 69
International-unhedged (2)	6.8	16.1	13.2	25
Emerging markets (3)	3.9	NA	16.6	10
<b>Alternative Assets</b>				
Private equity	NA	NA	NA	NA
Real estate (4)	1.2	11.8	13.1	17
Yield oriented	NA	NA	NA	NA
<b>Fixed Income</b>				
Domestic bonds (5)	8.9	11.9	9.8	19
Non dollar bonds-unhed. (6)	17.7	14.0	12.1	17
Cash equivalents (7)	4.8	7.3	3.7	69
<b>Inflation</b>	3.3	4.3	3.1	69

**Annual Standard Deviations through 3/31/95**

	Last 15 Yrs.	Longest Avail.	Longest # Yrs.
<b>Equities</b>			
Domestic (1)	15.1 / 14.9	15.8 / 19.8	24 / 69
International-unhedged (2)	18.3	17.4	25
Emerging markets (3)	NA	23.4	10
<b>Alternative Assets</b>			
Private equity	NA	NA	NA
Real estate (4)	14.4	17.2	17
Yield oriented	NA	NA	NA
<b>Fixed Income</b>			
Domestic bonds (5)	7.0	6.8	19
Non dollar bonds-unhedged (6)	12.5	12.7	17
Cash equivalents (7)	0.9	0.9	69

Source: Ibbotson Associates

- (1) Wilshire 5000 / S&P 500
- (2) Morgan Stanley Capital International EAFE
- (3) International Financial Corporation Composite
- (4) Wilshire Real Estate
- (5) Lehman Brothers Aggregate
- (6) Salomon Brothers Non US (wtd.)
- (7) 90 Day US Treasury Bills

**Attachment B (continued)**  
**Comparative Data -- Other Studies**

**Long Term Expected Returns (1)**

	<b>SBI-1993*</b>	<b>PCA</b>	<b>Brinson</b>	<b>JP Morgan</b>
<b>Equities</b>				
Domestic	11.0 / 5.5	10.5 / 6.5	9.7 / 6.2	9.4 / 5.7
International-unhedged	11.5 / 6.0	10.5 / 6.5	9.7 / 6.2	10.1 / 6.4
Emerging markets	NA	17.5 / 13.5	13.2 / 9.7	NA
<b>Alternative Assets</b>				
Private equity	14.0 / 8.5	14.3 / 10.3**	13.5 / 10.3	NA
Real assets	8.5 / 3.0	8.5 / 4.5***	8.8 / 5.2***	8.7 / 5.0***
Yield oriented	9.5 / 4.0	NA	NA	NA
<b>Fixed Income</b>				
Domestic bonds	8.0 / 2.5	7.5 / 3.5	6.9 / 3.4	7.0 / 3.3
Non dollar bonds-unhedged	8.25 / 2.75	7.5 / 3.5	6.7 / 3.2	7.5 / 3.8
Cash equivalents	6.0 / 0.5	5.0 / 1.0	5.5 / 2.0	5.7 / 2.0
<b>Inflation</b>	5.5	4.0	3.5	3.7

(1) Format of returns: nominal / real (real = nominal - inflation)

**Standard Deviations**

	<b>SBI-1993*</b>	<b>PCA</b>	<b>Brinson</b>	<b>JP Morgan</b>
<b>Equities</b>				
Domestic	18.0	15.0	17.0	16.4
International-unhedged	20.0	18.0	19.2	19.5
Emerging markets	NA	25.0	35.0	NA
<b>Alternative Assets</b>				
Private equity	20.0	25.0**	30.0	NA
Real assets	9.0	12.0***	14.0***	15.0***
Yield oriented	12.0	NA	NA	NA
<b>Fixed Income</b>				
Domestic bonds	8.0	7.5	7.0	7.5
Non dollar bonds-unhedged	12.0	12.0	11.9	12.5
Cash equivalents	3.0	2.5	NA	3.0

\* SBI-1993 reflects the data used in the last asset allocation study conducted in August 1993. PCA, Brinson, and JP Morgan numbers reflect those currently used by those organizations.

\*\* Venture capital only.

\*\*\* Real estate only.

## Attachment C

### Asset Mix Simulations - Basic Funds

	Current Targets	1	2 Proposed	3
<b>Equity</b>	<b>60</b>	<b>65</b>	<b>60</b>	<b>65</b>
Domestic	50	50	45	50
International Unhedged	10	15	13	13
Emerging Markets	--	--	2	2
<b>Alternative Assets</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
Private Equity	7.5	7.5	9	9
Real Assets	7.5	7.5	6	6
Yield Oriented	--	--	--	--
<b>Fixed Income</b>	<b>25</b>	<b>20</b>	<b>25</b>	<b>20</b>
Domestic Bonds	24	19	19	15
Non Dollar Bonds	--	--	5	4
Cash Equivalents	1	1	1	1
<b>Expected Return</b>	<b>10.33</b>	<b>10.49</b>	<b>10.47</b>	<b>10.62</b>
<b>Standard Deviation</b>	<b>±11.64</b>	<b>±12.00</b>	<b>±11.38</b>	<b>±12.00</b>
<b>Return:</b> change from current		+16	+14	+29
<b>Risk:</b> change from current		+36	-26	+36

- 1    -increase international stocks 5%  
      -decrease bonds 5%
  
- 2    -increase international stocks 5%, include emerging markets  
      -decrease domestic stocks 5%  
      -emphasize private equity, use non dollar bonds tactically
  
- 3    -increase international stocks 5%, include emerging markets  
      -decrease bonds 5%, use non dollar bonds tactically



## Attachment D

### Asset Mix Simulations - Post Fund

	Current Targets	1	2	3 Proposed	4
<b>Equity</b>	<b>60</b>	<b>65</b>	<b>60</b>	<b>65</b>	<b>60</b>
Domestic	50	50	45	50	45
International Unhedged	10	15	13	13	13
Emerging Markets	--	--	2	2	2
<b>Alternative Assets</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>10</b>
Private Equity	--	--	--	--	--
Real Assets	--	--	--	--	--
Yield Oriented	5	5	5	5	10
<b>Fixed Income</b>	<b>35</b>	<b>30</b>	<b>35</b>	<b>30</b>	<b>30</b>
Domestic Bonds	32	27	27	22	22
Non Dollar Bonds	--	--	5	5	5
Cash Equivalents	3	3	3	3	3
<b>Expected Return</b>	<b>9.85</b>	<b>10.01</b>	<b>9.92</b>	<b>10.07</b>	<b>10.02</b>
<b>Standard Deviation</b>	<b><u>+11.13</u></b>	<b><u>+11.47</u></b>	<b><u>+10.74</u></b>	<b><u>+11.31</u></b>	<b><u>+10.88</u></b>
<b>Return:</b> change from current		+.16	+.07	+.22	+.17
<b>Risk:</b> change from current		+.34	-.39	+.18	-.25

1    -*increase international stocks 5%*  
       -*decrease bonds 5%*

2    -*increase international stocks 5%, include emerging markets*  
       -*decrease domestic stocks 5%*  
       -*use non dollar bonds tactically*

3    -*increase international stocks 5%, include emerging markets*  
       -*decrease bonds 5%, use non dollar bonds tactically*

4    -*increase international stocks 5%; increase alternatives 5%*  
       -*decrease domestic stocks 5%; decrease bonds 5%*

## Attachment E

### Asset Mix Simulations - Combined Funds (assumes Basic and Post are equal in size)

	Current Targets	1	2 Proposed	3
<b>Equity</b>	<b>60</b>	<b>65</b>	<b>62.5</b>	<b>62.5</b>
Domestic	50	50	47.5	47.5
International Unhedged	10	15	13.0	--
International Hedged	--	--	--	13.0
Emerging Markets	--	--	2.0	2.0
<b>Alternative Assets</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
Private Equity	3.75	3.75	4.50	4.50
Real Assets	3.75	3.75	3.00	3.00
Yield Oriented	2.50	2.50	2.50	2.50
<b>Fixed Income</b>	<b>30</b>	<b>25</b>	<b>27.5</b>	<b>27.5</b>
Domestic Bonds	28	23	20.5	20.5
Non Dollar Bonds Unh.	--	--	5.0	--
Non Dollar Bonds Hed.	--	--	--	5.0
Cash Equivalents	2	2	2.0	2.0
<b>Expected Return</b>	<b>10.06</b>	<b>10.23</b>	<b>10.24</b>	<b>10.20</b>
<b>Standard Deviation</b>	<b>±11.33</b>	<b>±11.68</b>	<b>±11.29</b>	<b>±11.35</b>
<b>Return:</b> change from current		+17	+18	+14
<b>Risk:</b> change from current		+35	-04	+02

1 -combine #1 from Basic and #1 from Post

2 -combine #2 from Basics and #3 from Post

3 -same as Combined #2, but hedge all international stocks and non dollar bonds

## Attachment F

### Asset Allocation Targets -- Staff Proposal

	Basics Current	Basics Proposed	Post Current	Post Proposed	Combined Current	Combined Proposed
<b>Equity</b>	<b>60%</b>	<b>60%</b>	<b>60%</b>	<b>65%</b>	<b>60%</b>	<b>62.5%</b>
Domestic	50	45	50	50	50	47.5
International*	10	13	10	13	10	13.0
Emerging Markets**	--	2	--	2	--	2.0
<b>Altern. Assets***</b>	<b>15%</b>	<b>15%</b>	<b>5%</b>	<b>5%</b>	<b>10%</b>	<b>10.0%</b>
Private Equity	7.5	9	--	--	3.75	4.5
Real Assets	7.5	6	--	--	3.75	3.0
Yield Oriented	--	--	5	5	2.50	2.5
<b>Sub Total</b>	<b>75%</b>	<b>75%</b>	<b>65%</b>	<b>70%</b>	<b>70%</b>	<b>72.5%</b>
<b>Fixed Income</b>	<b>25%</b>	<b>25%</b>	<b>35%</b>	<b>30%</b>	<b>30%</b>	<b>27.5%</b>
Domestic Bonds	24	19	32	22	28	20.5
Non US Bonds****	--	5	--	5	--	5.0
Cash Equivalents	1	1	3	3	2	2.0
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100.0%</b>
<b>Annual Expected Return</b>	<b>10.33%</b>	<b>10.47%</b>	<b>9.85%</b>	<b>10.07%</b>	<b>10.06%</b>	<b>10.24%</b>
High*****	21.97	21.85	20.98	21.38	21.39	21.53
Low*****	-1.31	-0.91	-1.28	-1.24	-1.27	-1.05
<b>Annual Expected Risk/Stand. Dev.</b>	<b>+11.64</b>	<b>+11.38</b>	<b>+11.13</b>	<b>+11.31</b>	<b>+11.33</b>	<b>+11.29</b>

\* Using unhedged benchmark.

\*\* Would represent 13-15% of the entire international segment.

\*\*\* Market value. Unfunded commitments plus market value may be up to five percentage points higher, i.e. up to 20% for the Basics and up to 10% for the Post.

\*\*\*\* To be used tactically by existing managers/up to 20% of entire bond segment. Benchmark for entire bond segment would remain Lehman Aggregate.

\*\*\*\*\* Plus or minus one standard deviation.

## Attachment G

### Asset Mix Simulations Results of Constrained Optimizations\*

#### Combined Funds

	1	2	3
<b>Equity</b>	<b>65</b>	<b>68</b>	<b>71</b>
Domestic	29	30	32
International	34**	36**	37**
Emerging Markets	2*	2*	2*
<b>Alternative Assets</b>	<b>10*</b>	<b>10*</b>	<b>10*</b>
Private Equity	4.5*	4.5*	4.5*
Real Assets	3.0*	3.0*	3.0*
Yield Oriented	2.5*	2.5*	2.5*
<b>Fixed Income</b>	<b>25</b>	<b>22</b>	<b>19</b>
Domestic Bonds			
Non Dollar Bonds	25***	22***	19***
Cash Equivalents			
<b>Expected Return</b>	<b>10.34%</b>	<b>10.46%</b>	<b>10.54%</b>
<b>Standard Deviation</b>	<b>±11.00*</b>	<b>±11.25*</b>	<b>±11.50*</b>

\* Variable that was constrained for the optimization.

\*\* The optimizer chose a ratio of approximately two thirds unhedged/one third hedged for international stocks in each case.

\*\*\* The optimizer chose fully hedged bonds in each case.

## Attachment H

### Asset Allocation Strategy Over Time

#### Combined Funds

	1993*	Current	Proposed	Future Option	Future Option
<b>Equity</b>	<b>56</b>	<b>60</b>	<b>62.5</b>	<b>62.5</b>	<b>65.0</b>
Domestic	50	50	47.5	42.5	45.0
International	6	10	15.0**	20.0**	20.0**
<b>Alternative Assets</b>	<b>8</b>	<b>10</b>	<b>10.0</b>	<b>12.5</b>	<b>12.5</b>
<b>Sub Total</b>	<b>64</b>	<b>70</b>	<b>72.5</b>	<b>75.0</b>	<b>77.5</b>
<b>Fixed Income</b>	<b>36</b>	<b>30</b>	<b>27.5</b>	<b>25.0</b>	<b>22.5</b>
Domestic Bonds	34	28	20.5	18.0	15.5
Non Dollar Bonds			5.0***	5.0***	5.0***
Cash Equivalents	2	2	2.0	2.0	2.0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Expected Return</b>	<b>9.93</b>	<b>10.06%</b>	<b>10.24%</b>	<b>10.28%</b>	<b>10.36%</b>
<b>Risk/Stand. Dev.</b>	<b>+11.07</b>	<b>+11.33</b>	<b>+11.29</b>	<b>+11.19</b>	<b>+11.49</b>

\* Allocation targets for individual funds in 1993:

	Basics	Post
<b>Stocks</b>	<b>60</b>	<b>50</b>
Domestic	50	50
International	10	--
<b>Alternative Assets</b>	<b>15</b>	<b>--</b>
<b>Bonds</b>	<b>24</b>	<b>47</b>
<b>Cash</b>	<b>1</b>	<b>3</b>

\*\* Includes 2% allocation to emerging markets.

\*\*\* Non dollar bonds to be used tactically and capped at 5%.



## **Policy Decision on Strategic/Constant Hedging**

- What:*** Hedging a constant proportion of currency exposure at all times. Also referred to as a “passive hedge”.
- Why:*** To reduce risk/volatility associated with exposure to foreign currency.
- Context:*** Affects risk/return profile of total fund. Part of total fund asset allocation policy. Decision is reflected in policy target/benchmark.
- Finding:*** Doubtful benefit until international allocation is greater than 20% of the total fund.

### **Recommendations of the International Manager Committee:**

- Reject constant hedging as long as international allocation is less than 20% of the total fund.
- Continue to use EAFE unhedged as policy target.

## Strategic/Constant Hedging Impact on Combined Funds

	Total Fund with Unhedged Targets	Total Fund with Hedged Targets
<b>Expected Return</b>	10.24%	10.20%
<b>Expected Risk</b>	±11.29	±11.35

***Finding:*** Constant hedging does not benefit the risk/return profile of the proposal for the Combined Funds.

This supports the recommendation that the SBI's policy targets should remain unhedged at this time.

**Assumptions:**

	Return (1)	Risk (2)
Domestic Stocks	11.00	17.00
International Stocks-Unhedged	11.25	19.00
International Stocks- Hedged	11.05	17.00
Domestic Bonds	8.00	8.50
Non Dollar Bonds-Unhedged	8.00	12.00
Non Dollar Bonds-Hedged	7.80	5.00

(1) Returns:

Over time, returns are expected to be roughly equal among all developed markets. Hedged return is equal to unhedged return less 0.2%. (20 b.p. is a conservative estimate of the annual cost of maintaining a constant hedge.)

(2) Risk/standard deviation assumptions are based on historical relationships.



## Tactical/Active Hedging

**What:** A form of active management.

Manager makes decision to increase/decrease currency exposure at points in time.

<i>hedge</i>	\$US strong/appreciating
<i>do not hedge</i>	\$US weak/depreciating

**Why:** To enhance return over policy benchmark.

**Context:** Part of asset management decision.

**Status:** International Committee/Staff expect to finalize recommendations and position paper for the next SBI/IAC meetings.

Committee/Staff investigating capabilities of specific managers that use systematic/risk controlled approaches.



## Rationale for Emerging Markets

### More opportunity / faster growing economies

- Emerging markets comprise:  
85% of world population  
20% of world GNP
- Projection of future economic growth by the IMF:  
emerging markets           5.2% annual  
developed countries       2.5% annual
- Emerging markets are 13% of world market capitalization.  
Aggregate market value is \$1.9 trillion.

### Potential for higher returns, over time

	5 yrs.*	10.5 yrs.*	Long Term Assumption
Emerging Markets**	10.74%	17.27%	14.00%
EAFE	5.02	16.71	11.25
Wilshire 5000	12.32	15.07	11.00

\* Period ending June 30, 1995

\*\* IFC Composite

Source: Ibbotson Assoc.

### Low correlations to other assets

	Emerging**	EAFE	Wilshire 5000
Emerging**	1.00		
EAFE	0.28	1.00	
Wilshire 5000	0.33	0.48	1.00

## Emerging Markets (continued)

### Emerging markets returns are similar to venture capital returns

- Risk of an individual market (portfolio company) is high
- Risk of a emerging markets portfolio (venture fund) is much lower
- A few high returning markets are expected to offset low returns from other investments.
- Higher return is necessary to compensate for higher volatility and lower liquidity relative to other asset classes.

### Over time, higher risk is compensated by higher return

#### Return Per Unit of Risk\* Five Years 1989-1994

	Avg. Monthly Return	Monthly Stand. Dev.	Return Per Unit of Risk*
<b>World**</b>	0.40%	±4.21	0.10%
<b>EAFE**</b>	0.26%	±5.55	0.05%
<b>Emerging Markets***</b>	1.75%	±6.06	0.29%

\* monthly return divided by monthly standard deviation

\*\* Morgan Stanley Capital International (MSCI)

\*\*\* International Financial Corporation (IFC) Investable

Source: Genesis Investment Management

## **Emerging Markets (continued)**

### **Proposed allocation**

- approximately 15% of international segment
- approximately 2% of the total fund

### **Dollar values**

- Target allocation in staff proposal: \$400 million
- Expected exposure with existing managers: less than \$50 million
- Additional needed to reach proposed target: at least \$350 million

### **Implementation alternatives**

- change/add to mandates with existing managers
- retain emerging markets specialist(s)

### **Funding**

- increase exposure to emerging markets gradually / opportunistically
- target \$200 million additional over next year
- fill remaining allocation over following year



## Rationale for Tactical Use of Non Dollar Bonds

**Over the long term, returns from US vs. Non US bonds should be approximately equal.**

	Return Assumption
US Bonds	8.0%
Non US Bonds-Unhedged	8.0
Non US Bonds-Hedged	7.8

**A long term allocation to non dollar bonds does not appear to benefit return profile of the Combined Funds.**

### Impact on Combined Funds\*

	All Domestic	Half Domestic Half Non Dollar	All Non Dollar
<b>Expected Return</b>	10.24%	10.24%	10.24%
<b>Expected Risk</b>	±11.33	±11.29	±11.44

\* Using allocation targets from the proposal for the Combined Funds:

<b>Equities</b>	<b>62.5%</b>	
Domestic		47.5
International		15.0
<b>Alternative Assets</b>	<b>10.0%</b>	
<b>Fixed Income</b>	<b>27.5%</b>	
Bonds		25.5
Cash		2.0

## Non Dollar Bonds (continued)

**Over the short term, returns vary widely among world bond markets**

### Annual Returns 5-7 Year Government Bonds

Yr. Ending March	Unhedged Highest	Unhedged Lowest	Hedged Highest	Hedged Lowest
1987	13.2 Canada	-0.7 Denmark	11.9 Japan	0.8 Australia
1988	23.4 Australia	4.2 US	15.3 Australia	2.7 Canada
1989	16.5 Denmark	0.4 Nthlands	10.3 France	-2.1 Australia
1990	-6.7 Japan	-15.4 Australia	11.6 US	-6.5 UK
1991	25.9 Sweden	9.2 Japan	16.4 UK	7.9 Switz.
1992	21.1 Sweden	10.0 France	13.2 Australia	1.6 Switz.
1993	23.6 UK	9.3 Sweden	15.7 Australia	2.1 Denmark
1994	17.0 Sweden	2.0 US	8.1 Japan	2.7 US
1995	7.0 Japan	-8.7 Sweden	10.1 Japan	-0.7 France

Source: JP Morgan

**Conclusion: Tactical / opportunistic use of non dollar bonds could capitalize on these shorter term disparities.**



## **Non Dollar Bonds (continued)**

### **Proposal**

- use non dollar bonds on a tactical basis to add value
- target up to 20% of bond segment / up to 5% of the total fund
- policy benchmark would remain Lehman Aggregate, for the present

### **Structure**

- authority to be granted on a manager-by-manager basis
- individual active managers capped at 20-25%
- individual semi-passive managers capped at 5-10%

### **Implementation**

- review current managers' capabilities over next 6-12 months
- consider non dollar expertise in any future manager searches

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## **REBALANCING GUIDELINES**

### **Basic and Post Retirement Funds**

Invariably, both the Basic Retirement Funds and the Post Retirement Fund will experience changes in their respective asset mix due to a variety of factors. These factors include: contributions and withdrawals; interest and dividend income; asset liquidation proceeds; and market value increases or decreases. There will be occasions when the effect of these factors is sufficient to cause the actual asset mix to deviate materially from long term policy targets.

If no response were made to deviations from policy, performance results could differ significantly from expectations. If the policy asset mix is truly the desired long-run allocation among asset classes, it makes little sense to permit sizable deviations from this target. Therefore, staff recommends periodically rebalancing back to the policy targets.

Specifically, staff recommends the following rebalancing procedures:

#### **1. Frequency.**

The actual asset mix of the Basic and Post Funds will be reviewed monthly.

#### **2. General Guidelines.**

With the exceptions noted in #3 and #4, below, rebalancing will be required if any asset class deviates by more than 10% from its policy allocation. For deviations in the 5-10% range, staff will have discretion whether to rebalance.

For example, if an asset class had a target of 20%,  $\pm 5\%$  equates to  $\pm 1.0$  percentage point and  $\pm 10\%$  equates to  $\pm 2.0$  percentage points. Therefore:

- Rebalancing would be mandatory if the weighting dropped below 18.0% or rose above 22.0%.
- Rebalancing would be discretionary if the weighting was 18.0-19.0% on the downside or was 21.0-22.0% on the upside.
- No rebalancing would be done if the weighting was 19.0-21.0%.

#### **3. Specific Procedures Relating to Alternative Investments**

Alternative investments require special consideration for rebalancing purposes. These assets are treated differently than the more traditional asset classes (stocks, bonds and cash) in the rebalancing procedures because of the difficulty of raising cash from, and investing in, alternative investments. For alternative investments, the

transaction costs of an immediate rebalancing almost certainly outweigh the benefits. Because of the different treatment of alternative investments versus the traditional asset classes, it often may be impossible to move precisely back to policy targets during a rebalancing. Additionally, there must be recognition of the substitution of traditional assets for alternative investments when alternative investments are below policy targets.

Specific procedures are as follows:

- In the case of the **Basic Funds**, *domestic equities* and alternative investments will be viewed both as individual asset classes and as one combined asset class for rebalancing purposes. When alternative investments are *below* their policy target (as they are now and expected to be for the next 2-3 years), they will be combined with *domestic equities* and reviewed versus their combined target weights to determine the need for a rebalancing. When alternative investments *exceed* their policy asset mix weighting, alternative assets and domestic equities will be reviewed as two distinct asset classes and deviations from their respective weightings will be analyzed to determine whether or not a rebalancing needs to be done.
- In the case of the **Post Fund**, *bonds* and alternative investments will be viewed both as individual asset classes and as one combined asset class for rebalancing purposes. When alternative investments are *below* their policy target (as they are now and are expected to be for the next 2-3 years), they will be combined with *bonds* and reviewed versus their combined targets to determine the need for a rebalancing. When alternative investments *exceed* their policy target, alternative assets and bonds will be reviewed as two distinct asset classes and deviations from their respective weightings will be analyzed to determine whether or not a rebalancing needs to be done.
- At times when the alternative investment segment of a fund is above the policy target, new commitments to alternative investments will be suspended until the deviation is back in-line with the long term target.

#### 4. **Specific Procedures Relating to Cash**

Given the very small allocation to cash (1% in the Basics and 3% in Post), a deviation from the cash target will not trigger a mandatory rebalancing unless another asset class has also deviated from its policy target. If cash deviates from its weighting by more than  $\pm 10\%$ , staff will retain the discretion to rebalance back to the cash target. Staff will determine the immediate cash needs of the fund(s) involved and respond accordingly.

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# **Asset Allocation Review**

**Basic Retirement Funds  
Post Retirement Fund  
Combined Retirement Funds**

**Minnesota State Board of Investment**

**September 2003**

# ASSET ALLOCATION REVIEW

Basic Retirement Funds  
Post Retirement Fund  
Combined Retirement Funds

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## **ASSET ALLOCATION REVIEW**

### **Basic, Post and Combined Retirement Funds**

#### **Executive Summary**

Long-term asset allocation policy is the core focus of the State Board of Investment ("the Board" or "SBI") in the oversight of the assets under its charge. The asset allocation decision is the most significant determinant of an investment fund's return and risk.

The asset allocation policy of the Basic and Post Retirement Funds are reviewed periodically. The most recent formal review of the Funds' policy asset allocations occurred in 1995. The 1995 review resulted in the Board increasing its allocation to international equities from 10% to 15% in both the Basic and Post Funds. This was accomplished by reducing the domestic equity allocation in the Basic Funds from 50% to 45% and reducing the allocation to fixed income in the Post Fund from 35% to 30%.

The present review is prompted by the general discipline of a periodic review and the desire to determine the appropriateness of the SBI's existing asset allocation policies given current expectations for capital market returns and volatility. While the asset allocation is most appropriately treated as a long-term guideline to achieve desired performance levels, it is prudent to review its status and make refinements given changing economic environments and advances in the capital markets. Over time, much of the change in the asset allocation of the Retirement Funds has come from the availability of an increasingly diversifiable array of investment products. Domestic common stocks, once the only available source of equity returns, are now just one of a variety of investable equity vehicles for pension funds. As do many major pension plan sponsors, the SBI now utilizes international stocks, private equity and venture capital, real estate, and resource investments in combination with domestic equities. This is expected to achieve higher long-term rates of return while experiencing lower rates of volatility than can be achieved by using domestic stocks alone. The lower volatility is due to the diversification benefits of owning a variety of investment vehicles, which perform

differently over time. Fixed income products have also expanded, giving the plan sponsor a broader base of investment opportunities from which to choose.

The balancing of long-term returns with appropriate levels of risk is the goal of a proper asset allocation policy. The current review results in recommendations that continue to refine the return and risk relationship for the Basic and Post Funds.

- The review recommends that the SBI increase its allocation for alternative investments in the Basic Retirement Funds from 15% to 20%. The increase in this allocation to alternative investments would be funded by a corresponding decrease in the fixed income target, which would decline from 25% to 20%.
- The review recommends that the SBI increase its allocation for alternative investments in the Post Retirement Fund from 5% to 12%. The increase in this allocation to the Post Fund's alternative investments would be funded by a corresponding decrease in the domestic equity target from 50% to 45% and a decrease in the fixed income target from 27% to 25%.
- The review recommends that the allocation to alternative investments not exceed the current target of 15% in the Basic Retirement Funds until the proposed target allocation of 12% for alternative investments in the Post Retirement Fund is reached. At that time, staff will notify the Board of the status of the respective alternative investment allocations before the allocation target for Basic Retirement Funds alternative investments would be raised from the current 15% level to the proposed 20% allocation.
- The review recommends that the make up and risk exposure of the alternative investments portion of the portfolio for the Basic and Post Retirement Funds be identical. To accomplish this recommendation, the current yield-oriented portfolio in the Post and the equity-oriented portfolio in the Basics would be pooled. This accounting treatment would prospectively allow the Basic and Post

Funds to have the same risk and return exposure. New alternative investments would be purchased for the pool and would be funded on a prorated share from the Basic and Post Funds.

- The review recommends that the SBI change the reporting of returns and the long-term objectives for the Basic, Post and Combined Retirement Funds. The recommended changes would extend the time periods over which the Funds' return objectives are evaluated:

**Combined Retirement Funds:**

1. Achieve Real Return over a twenty-year period; currently, over ten years.
2. Match or exceed Composite Index over a ten-year period; currently, over five years.
3. Transfer the Trust Universe Comparison Service (TUCS) comparison of performance from the Long Term Objectives Section of the Board Report to the Investment Report Section for the Combined Funds.

**Basic Retirement Funds:**

1. Match or exceed Composite Index over a ten-year period; currently, over five years.

**Post Retirement Fund:**

1. Match or exceed Composite Index over a ten-year period; currently, over five years.

### **Current Asset Allocation Policy**

The current long-term asset allocation policy for the Basic and Post Funds are shown below. While the Board does not set a specific policy for the Combined Retirement Funds, the policy is derived using the market values of the two underlying funds. (Because market values fluctuate, the policy for the Combined Retirement Funds will not be constant.)

	Basics	Post	Combined*
<b>Stocks</b>	<b>60.0%</b>	<b>65.0%</b>	<b>62.5%</b>
Domestic	45.0	50.0	47.5
International	15.0	15.0	15.0
<b>Alternative Assets**</b>	<b><u>15.0</u></b>	<b><u>5.0</u></b>	<b><u>10.0</u></b>
<b>Total Equity</b>	<b>75.0</b>	<b>70.0</b>	<b>72.5</b>
<b>Bonds</b>	<b>24.0</b>	<b>27.0</b>	<b>25.5</b>
<b>Cash</b>	<b><u>1.0</u></b>	<b><u>3.0</u></b>	<b><u>2.0</u></b>
<b>Total Fund</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

\*Based on 12/31/02 market values. Basics \$15.6 billion; Post \$15.4 billion.  
\*\*Market value. Unfunded commitments plus market value may be up to 1.5 times market value.

### Comparison to Other Pension Plans

The median allocations to stocks, bonds, and cash in the master trust portion of the Trust Universe Comparison Service (TUCS) are as follows:

Median Allocation*	Stocks**	Bonds**	Cash
all funds	56.9%	32.4%	3.8%
public only	54.8%	35.2%	3.9%
corporate only	58.1%	32.4%	4.0%

\* Median allocation to each asset class as of 12/31/02. Will not add to 100%.  
\*\* Includes both domestic and international.

The data indicate that the asset allocation policy for the Basics and the Post have more stocks and less bonds than many plans included in the comparison universe.

### Considerations in Determining Strategic Asset Allocation Policy

There are a number of factors to consider when determining an appropriate strategic asset allocation policy for an investment portfolio. The review considered the following factors in determining the asset allocation mix for the Basic and Post Funds:

- Fund Objective
- Time Horizon
- Return Objective
- Liquidity Needs
- Risk Tolerance
- Accounting Considerations

## **BASIC RETIREMENT FUNDS**

- **Fund Objective:** The objective of the Basic Retirement Funds is to ensure that sufficient assets are available to pay promised benefits at the time of retirement.
- **Time Horizon:** The expected time horizon of the investment period is determined by the nature of the liabilities. Everything being equal, long-term liability streams afford the investor the opportunity to withstand short-term volatility in pursuit of higher returns. A shorter time horizon requires investors to take less equity risk. The Basic Retirement Funds consist of assets for active (working) employees. It has an investment horizon of 30 to 40 years.
- **Return Objective:** The stated return objective directly influences the asset allocation by focusing the decision on allocations to investment vehicles with sufficient expected return. The Basic Retirement Funds have a statutorily required rate of return of 8.5% which must be achieved over the long term in order to meet the Fund's investment and actuarial assumptions. The return objective has a significant influence on the plan's allocation to equity assets.
- **Liquidity Needs:** A plan's cash needs over the investment horizon must be considered in forming an effective asset allocation policy. Plans with higher liquidity needs should maintain a higher liquid cash balance than plans with

little need for cash. In addition, the liquidity impact due to allocations to non-marketable securities should be carefully considered. The Basic Funds have minimal liquidity needs, since transfers to fund retiree benefits from the Basic Funds to the Post Fund are accomplished with the transfer of assets via pool units, not cash.

- **Risk Tolerance:** Rather than a purely independent factor, risk tolerance is, in part, an outcome of the time horizon, return objective and liquidity decisions. For example, a 30-year time horizon combined with high return objectives and low liquidity needs allow for a high risk tolerance. This review recommends that the Basic Funds should have a high tolerance for risk. This decision is based upon the length of the investment horizon (30 to 40 years), low liquidity needs, and importantly, the aggressive return objective of 8.5% for the Funds. A higher risk tolerance suggests a greater emphasis on equity-type investments that offer higher absolute levels of return.
- **Accounting Considerations:** The retirement funds that make up the Basic Funds have statutorily required employer and employee contribution rates and assumed rates of return that will fully fund the plans by specific dates. (The dates range from 2020 to 2031.) Unlike corporate pension plans, the State has the ability to withstand short-term negative results without being required to make one-time cash contributions or make contribution rate changes. These factors further support the assertion that the Basic Funds have a high tolerance for investment risk, and therefore a high level of equity exposure is appropriate.

## **POST RETIREMENT FUND**

- **Fund Objective:** The Post Retirement Fund's objective is to earn sufficient returns to ensure that assets are available to pay initially promised benefits as well as any increases granted for all participants in the Fund.



- **Time Horizon:** The Post Fund has an investment horizon of 15 to 20 years, which represents the length of time a typical beneficiary is expected to draw a benefit.
- **Return Objective:** The Post Fund's return objective is the sum of the actuarial assumed rate of return (6%) used in the Post Fund's funding calculation plus a promised inflation-based benefit adjustment of up to 2.5% per year.
- **Liquidity Needs:** The Post Fund makes monthly benefit payments to retirees, and therefore has specific liquidity needs. Based on historical cash flows of monthly annuity payments and ongoing funding for new retirees, the Post Fund experiences net outflows of approximately \$500 million over a six-month period, or about 3% of the fund. The review recommends that the Post *continue to allocate 3% of its assets to cash and 25% to fixed income securities*, which in combination will be an appropriate source of liquidity for the Post Fund.
- **Risk Tolerance:** This review recommends the Post Fund, like the Basic Funds, should have a high tolerance for risk. This decision is based upon the length of the investment horizon, 15 to 20 years, moderate liquidity needs, and importantly, the aggressive return objective of 8.5% for the Fund. This objective suggests that a commensurate level of investment risk must be accepted in order to achieve the required return over the long term. To accomplish this goal the Post Fund should have a high level of equity exposure. In addition, the Post Fund should have a higher level of liquidity than the Basic Funds.
- **Accounting Considerations:** In the Post Fund, sufficient assets (discounted at the 6% return assumption) are transferred from the Basic Funds to the Post

Fund to support the initially promised benefit. An inflation increase of up to 2.5% is granted annually. If returns exceed the 6% return assumption and the inflation component, an investment based increase may be granted. If investment performance does not meet the return assumption and the inflation component, an unfunded liability occurs in the Post Fund. No investment component benefit increase will be granted until the unfunded liability is recovered. The need for the Post Fund to fund the initially promised benefits and to fund benefit increases support the assertion that the Post Fund has a high tolerance for investment risk. Therefore, a high level of equity exposure is appropriate.

### **Assumptions and Simulations**

With the above considerations in mind, several asset mix simulations were run for the Basic and Post Funds that utilize various combinations of assets.

The expected return, standard deviation and correlation assumptions used in the simulations are in **Attachment A**. The figures in Attachment A take into consideration long-term historical returns, data from consultants and long-term capital market assumptions from a number of investment management organizations (shown in **Attachment B**.) The assumptions used by the SBI in its 1995 asset allocation review are included for reference.

The results of the simulations for the Basic Funds, Post Fund and Combined Retirement Funds are shown in **Attachments C, D and E**.

## Recommended Proposal

After reviewing the results of the simulations, the review recommends that the Board adopt the specific policies for the Basic and Post Funds that follow:

### Asset Allocation Policy — Proposal

	Basics Current	Basics Proposed	Post Current	Post Proposed
<b>Equity</b>	<b>60.0%</b>	<b>60.0%</b>	<b>65.0%</b>	<b>60.0%</b>
Domestic	45.0	45.0	50.0	45.0
International-unhgd.	13.5	13.5	13.5	13.5
Emerging Markets	1.5	1.5	1.5	1.5
<b>Altern. Assets*</b>	<b>15.0%</b>	<b>20.0%</b>	<b>5.0%</b>	<b>12.0%</b>
Private Equity	10.0	10.0	—	6.0
Real Assets	5.0	5.0	—	3.0
Yield Oriented	—	5.0	5.0	3.0
<b>Total Equity</b>	<b>75.0%</b>	<b>80.0%</b>	<b>70.0%</b>	<b>72.0%</b>
<b>Fixed Income</b>	<b>25.0%</b>	<b>20.0%</b>	<b>30.0%</b>	<b>28.0%</b>
Domestic Bonds	24.0	19.0	27.0	25.0
Cash Equivalents	1.0	1.0	3.0	3.0
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>Annual Expected Return (Nominal)</b>	<b>8.88%</b>	<b>8.98%</b>	<b>8.35%</b>	<b>8.60%</b>
High Return**	33.22	33.74	31.33	31.74
Low Return**	-15.46	-15.78	-14.63	-14.54
<b>Annual Expected Risk/Stand. Dev.</b>	<b>±12.17</b>	<b>±12.38</b>	<b>±11.49</b>	<b>±11.57</b>

\* Market value. Unfunded commitments plus market value may be up to 1.5 times market value.

\*\* Annual range of expected returns within plus or minus one standard deviation. Approximately 95% of annual returns can be expected to fall within this range.

The proposed changes raise the expected return in the Basic Funds by an estimated 10 basis points (see Attachment C) and by an estimated 25 basis points in the Post Fund (see Attachment D), with a modest increase in risk.

## **Performance Reporting**

This review recommends that performance reporting for the Funds should more closely reflect the long-term nature of the Funds' investment objectives and time horizon. The current performance evaluation period for the Basic and Post Retirement Funds is five years, while the Combined Retirement Funds are evaluated over a ten-year period. The objectives of these funds is to meet the long-term needs of public employees and therefore, focusing on long-term results is more important than focusing on short-term results. In 1995, a major factor in recommending the five-year and ten-year reporting period was the relatively short period over which data was available. Performance data for the Basics dates back to 1980. However, the time series for the Basic Funds' composite index began in 1984. Data for the Post Fund, as it exists today, dates back to 1993. With the passage of time and the availability of more performance data, this review now recommends that the time periods be extended over which the Funds' return objectives are evaluated. The recommended changes detailed below are consistent with the Funds' long-term investment objectives and time horizon.

### Combined Retirement Funds:

1. Achieve Real Return over a twenty-year period; currently, over ten years.
2. Match or Exceed Composite Index over a ten-year period; currently, over five years.

### Basic Retirement Funds:

1. Match or Exceed Composite Index over a ten-year period; currently, over five years.

### Post Retirement Fund:

1. Match or Exceed Composite Index over a ten-year period; currently, over five years.

The review also recommends that the comparison of the Combined Retirement Funds to the Trust Universe Comparison Service (TUCS) be shifted from the long-term objectives section of the quarterly report to the investment reporting section. Any comparison of fund performance to a universe of other plans has inherent problems. Plans within the TUCS universe have varying levels of investment flexibility, different assumed rates of return, and different asset / liability issues which lead to different asset allocation policies. As a result, the Combined Retirement Funds' ranking in the universe will be based upon factors relating to the Funds' design and funded status, and not solely upon relative performance.

## Attachment A

### Assumptions Used in Simulations

Asset Class	Return/Risk		
	Real* Return	Nominal** Return	Risk/ Std. Dev.
<b>Equity</b>			
Domestic	6.25	9.25	17.00
International-unhedged	6.25	9.25	19.00
International-hedged	6.05	9.05***	17.00
Emerging markets	8.50	11.50	25.00
<b>Alternative Assets</b>			
Private equity	10.00	13.00	30.00
Real assets	5.00	8.00	12.00
Yield oriented	5.50	8.50	13.00
<b>Fixed Income</b>			
Domestic bonds	3.50	6.50	7.00
Non dollar bonds-unhedged	3.50	6.50	8.00
Non dollar bonds-hedged	3.30	6.30***	7.00
High Yield	4.50	7.50	10.00
Cash equivalents	1.00	4.00	2.00
<b>Inflation</b>		3.00	

\* Real return = nominal return - inflation.

\*\* Nominal return is the long-term (20+ years) expected return.

\*\*\* Unhedged return less assumed hedging cost of 20 b.p.

### Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12
1 US stocks	1.00											
2 Intl.-unhed.	.60	1.00										
3 Intl.-hed.	.70	.80	1.00									
4 Emerg. mkts.	.55	.50	.50	1.00								
5 Priv. equity	.50	.20	.40	.10	1.00							
6 Real assets	.40	.25	.30	.30	.30	1.00						
7 Yield oriented	.45	.30	.35	.00	.40	.15	1.00					
8 US bonds	.30	.20	.25	-.10	.15	.20	.50	1.00				
9 Non US-un.	.10	.40	.25	-.20	.00	.10	.05	.60	1.00			
10 Non US-hed.	.25	.20	.30	-.10	.10	.15	.15	.75	.50	1.00		
11 Cash equiv.	-.10	-.10	.00	.00	.00	.15	.10	.10	-.10	.10	1.00	
12 High yield	.50	.35	.40	.30	.30	.25	.60	.40	.00	.25	.00	1.00

**ATTACHMENT B  
COMPARATIVE DATA**

**Long Term Expected Real Returns**

	<b>SBI 2003 Study</b>	<b>SBI-1995*</b>	<b>PCA</b>	<b>UBS</b>	<b>JP Morgan</b>	<b>Wilshire</b>	<b>Goldman Sachs</b>	<b>Ibottson</b>
<b>Equities</b>								
Domestic	6.25	6.50	6.50	6.01	5.25	5.75	6.10	6.89
International-unhedged	6.25	6.75	6.50	N/A	5.25	5.75	5.80	6.79
Emerging Markets	8.50	9.50	N/A	10.05	6.00	5.75	6.80	-1.45
<b>Alternative Assets</b>								
Private Equity	10.00	9.50	10.50	10.31	6.95	8.75	8.90	N/A
Real Assets	5.00	4.50	5.00	5.60	4.45	4.50	3.50	8.92
Yield Oriented	5.50	5.50	N/A	N/A	N/A	N/A	N/A	N/A
<b>Fixed Income</b>								
Domestic Bonds	3.50	3.50	2.50	3.78	4.85	3.00	2.30	6.01
Non-dollar Bonds-unhedged	3.50	3.50	2.40	N/A	N/A	2.75	N/A	7.37
Cash Equivalents	1.00	1.00	1.50	2.45	2.00	1.00	N/A	0.68
<b>Inflation</b>		4.50	2.50	2.25	2.25	2.25	2.00	3.10

**Standard Deviations**

	<b>SBI 2003 Study</b>	<b>SBI-1995*</b>	<b>PCA</b>	<b>UBS</b>	<b>JP Morgan</b>	<b>Wilshire</b>	<b>Goldman Sachs</b>	<b>Ibottson</b>
<b>Equities</b>								
Domestic	17.00	17.00	20.00	15.00	15.40	17.00	15.90	21.91
International-unhedged	19.00	19.00	20.00	N/A	17.40	20.00	17.40	18.89
Emerging Markets	25.00	23.00	N/A	25.00	24.60	27.00	25.30	25.75
<b>Alternative Assets</b>								
Private Equity	30.00	23.00	35.00	32.60	30.00	32.00	29.00	N/A
Real Assets	12.00	12.00	14.00	10.60	7.60	14.00	9.30	16.89
Yield Oriented	13.00	13.00	N/A	N/A	N/A	N/A	N/A	N/A
<b>Fixed Income</b>								
Domestic Bonds	7.00	8.50	9.00	4.60	3.80	7.00	4.50	6.66
Non-dollar Bonds-unhedged	8.00	12.00	10.00	N/A	N/A	13.00	N/A	11.60
Cash Equivalents	2.00	3.00	1.50	0.50	0.30	3.00	N/A	0.90

\* SBI-1995 reflects the data used in the previous asset allocation study conducted in July 1995. PCS, UBS, JP Morgan, Wilshire and Goldman Sachs reflects the data currently used by those organizations. Ibottson reflects longest available observed historical data.

PCA = Pension Consulting Alliance. UBS = UBS PaineWebber Asset Management

## Attachment C

### Asset Mix Simulations - Basic Funds

	Current Policy	Option 1 Recommended	Option 2	Option 3
<b>Equity</b>	<b>60.0%</b>	<b>60.0%</b>	<b>55.0%</b>	<b>55.0%</b>
Domestic	45.0	45.0	40.0	40.0
International Unhedged	13.5	13.5	13.5	13.5
Emerging Markets	1.5	1.5	1.5	1.5
<b>Alternative Assets</b>	<b>15.0</b>	<b>20.0</b>	<b>20.0</b>	<b>25.0</b>
Private Equity	10.0	10.0	15.0	15.0
Real Assets	5.0	5.0	5.0	5.0
Yield Oriented	—	5.0	—	5.0
<b>Fixed Income</b>	<b>25.0</b>	<b>20.0</b>	<b>25.0</b>	<b>20.0</b>
Domestic Bonds	24.0	19.0	24.0	19.0
Cash Equivalents	1.0	1.0	1.0	1.0
<b>Expected Return*</b>	<b>8.88</b>	<b>8.98</b>	<b>9.07</b>	<b>9.17</b>
<b>Standard Deviation</b>	<b>±12.17</b>	<b>±12.38</b>	<b>±12.39</b>	<b>±12.60</b>
<b>Sharpe Ratio**</b>	<b>0.40</b>	<b>0.40</b>	<b>0.41</b>	<b>0.41</b>
<b>Return change from current</b>		+0.10	+0.19	+0.29
<b>Risk change from current</b>		+0.21	+0.22	+0.43

\* Nominal return (Real return + expected inflation of 3%)

\*\* Sharpe ratio, developed by William Sharpe, is a universal measure of reward per unit of risk, calculated as the return of an asset in excess of that of the risk-free asset divided by the standard deviation of the returns of the asset. Return of risk-free asset assumed to be 1%, consistent with the assumed real return for cash equivalents.

#### Changes from Current Policy

- Option 1     -increase yield oriented 5%  
              -decrease bonds 5%
  
- Option 2     -increase private equity 5%  
              -decrease domestic equity 5%
  
- Option 3     -increase private equity 5%; increase yield oriented 5%  
              -decrease domestic equity 5%; decrease bonds 5%



## Attachment D

### Asset Mix Simulations - Post Fund

	Current Policy	Option 1	Option 2	Option 3 Recommended
<b>Equity</b>	<b>65.0%</b>	<b>60.0%</b>	<b>65.0%</b>	<b>60.0%</b>
Domestic	50.0	45.0	50.0	45.0
International Unhedged	13.5	13.5	13.5	13.5
Emerging Markets	1.5	1.5	1.5	1.5
<b>Alternative Assets</b>	<b>5.0</b>	<b>10.0</b>	<b>10.0</b>	<b>12.0</b>
Private Equity	—	5.0	5.0	6.0
Real Assets	—	—	—	3.0
Yield Oriented	5.0	5.0	5.0	3.0
<b>Fixed Income</b>	<b>30.0</b>	<b>30.0</b>	<b>25.0</b>	<b>28.0</b>
Domestic Bonds	27.0	27.0	22.0	25.0
Cash Equivalents	3.0	3.0	3.0	3.0
<b>Expected Return*</b>	<b>8.35</b>	<b>8.53</b>	<b>8.67</b>	<b>8.60</b>
<b>Standard Deviation</b>	<b>±11.49</b>	<b>±11.45</b>	<b>±12.11</b>	<b>±11.57</b>
<b>Sharpe Ratio**</b>	<b>0.38</b>	<b>0.40</b>	<b>0.39</b>	<b>0.40</b>
<b>Return change from current</b>		+0.18	+0.32	+0.25
<b>Risk change from current</b>		-0.04	+0.62	+0.08

\* Nominal return (Real return + expected inflation of 3%)

\*\* Sharpe ratio, developed by William Sharpe, is a universal measure of reward per unit of risk, calculated as the return of an asset in excess of that of the risk-free asset divided by the standard deviation of the returns of the asset. Return of risk-free asset assumed to be 1%, consistent with the assumed real return for cash equivalents.

#### Changes from Current Policy

- Option 1    -increase private equity 5%  
              -decrease domestic equity 5%
  
- Option 2    -increase private equity 5%  
              -decrease bonds 5%
  
- Option 3    -increase private equity 5%; increase real assets 2%  
              -decrease domestic equity 5%; decrease bonds 2%

## Attachment E

### Asset Mix Simulations - Combined Retirement Funds

	<b>Current Policy</b>	<b>Proposed*</b>	<b>Median State Fund**</b>
<b>Equity</b>	<b>62.5%</b>	<b>60.0%</b>	<b>57.6%</b>
Domestic	47.5	45.0	44.9
International Unhedged	13.5	13.5	13.0
Emerging Markets	1.5	1.5	1.4
<b>Alternative Assets</b>	<b>10.0</b>	<b>16.0</b>	<b>5.8</b>
Private Equity	5.0	8.0	3.3
Real Assets	2.5	4.0	2.7
Yield Oriented	2.5	4.0	N/A
<b>Fixed Income</b>	<b>27.5</b>	<b>24.0</b>	<b>36.6</b>
Domestic Bonds	25.5	22.0	32.7
Cash Equivalents	2.0	2.0	2.0
<b>Expected Return (Nom.)</b>	<b>8.61</b>	<b>8.79</b>	<b>8.37</b>
<b>Standard Deviation</b>	<b>±11.76</b>	<b>±11.93</b>	<b>±11.04</b>
<b>Return change from current</b>		+0.18	-0.24
<b>Risk change from current</b>		+0.17	-0.72

Combined Retirement Funds Policy is calculated assuming the Basic and Post Funds are equal in size.

\* Combination of Basics Proposed (Option 1) and Post Proposed (Option 3).

\*\* Source: Greenwich Associates Market Dynamics Report. Median fund data normalized to total 100%. Assumed 2% cash allocation. Allocation to emerging market equities assumed as a pro-rata share of the international equity allocation based on the market capitalization weight of emerging markets.

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# **Asset Class Target & Asset Class Structure Review**

**Basic Retirement Funds  
Post Retirement Fund  
Combined Funds**

**Minnesota State Board of Investment**

**September 2003**

# ASSET CLASS TARGET & ASSET CLASS STRUCTURE REVIEW

## Basic Retirement Funds Post Retirement Fund Combined Funds

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# **ASSET CLASS TARGET & ASSET CLASS STRUCTURE REVIEW**

## **Basic, Post and Combined Retirement Funds**

### **EXECUTIVE SUMMARY**

The purpose of this paper is to review the asset class targets and management structures of the investment programs for the Basic and Post Retirement Funds (the Retirement Funds). The current review has been performed in conjunction with an asset allocation review. The Retirement Funds participate in the same investment programs on a proportionate basis. The investment programs in which the Retirement Funds invest are Domestic Equity, International Equity, Fixed Income and Alternative Investments. Each program has its own unique asset allocation target and structure. The Domestic Equity, International Equity, and Fixed Income Programs have each undergone significant reviews within the past five years. The intent of this paper is to focus on the major components of the structure of each program, including the asset class targets, manager benchmarks, risk control, and the allocation of assets to passive and active management.

The current review results in the following recommendations for the Basic and Post Retirement Funds:

- The review recommends that the Lehman Aggregate index continue to be used as the asset class target for the Fixed Income Program.
- The review recommends that for purposes of composite fund performance evaluation the Alternative Investments continue to be measured against themselves using actual portfolio returns in the composite fund benchmark calculations.

- The review recommends that the SBI continue to use Morgan Stanley Capital International (MSCI) as its asset class target provider for the International Equity Program, and that the International Equity Program asset class target be changed to the MSCI All Country World Index Free ex. U.S. net of taxes on dividends, thus adding Canada to the asset class target. It is further recommended that the asset class target remain unhedged.
- The review recommends that the SBI adopt the Russell 3000 as the asset class target for the Domestic Equity Program.
- The review recommends that the Fixed Income Program continue to use a 50% active and 50% semi-passive management allocation, that the Program continue to use a core approach whereby the asset class target is used as the benchmark for all managers. It is further recommended that the Program's current opportunistic approach to the Plus sectors be re-affirmed.
- The review recommends that the current structure of the Alternative Investment Program be continued.
- The review recommends that the developed markets managers in the International Equity Program be measured against the MSCI World ex U.S. (net) index, and that the emerging markets managers continue to manage against the MSCI Emerging Market Free (net) index. The review further recommends that up to 10% of the International Equity Program be allocated to semi-passive management and at least 25% be allocated to passive management. In aggregate, at least 33% of the Program would be allocated to passive and semi-passive management and at least 33% of the Program will be actively managed.



- The review recommends that the Domestic Equity Program use published Russell sub-indices to measure and monitor the active domestic equity managers, that the semi-passive managers be measured against the Russell 1000, that the passive index fund use the Russell 3000, that misfit risk or style bias be controlled by allocating assets across active managers and reducing the reliance on the DCF, that the DCF be in place when necessary to correct residual style bias, and that custom benchmarks continue to be built where appropriate as an additional analytical tool to evaluate managers. Further, the review recommends the use of ranges in stating the allocation among active, semi-passive, and passive management for the Domestic Equity Program. The proposed ranges are as follows:

Active	25-40%
Semi-Passive	25-40%
Passive	25-40%

## ASSET CLASS TARGETS

An asset class target is a diversified collection of investable securities within a particular asset class. It represents the set of feasible investment opportunities that best achieves the purposes for which the asset class is included in the policy asset mix. In general, an appropriate asset class target should fulfill the following objectives:

- It should represent a broad range of investment opportunities available in the marketplace to institutional investors, such as the SBI.
- It should reflect the constraints an institutional investor experiences in the market place.
- It should embody the plan's return objectives and risk tolerance for a particular asset class.
- It should provide a measurable performance standard with which to evaluate the results for that asset class.

### Fixed Income

Currently, the asset class target for the Fixed Income Program is the Lehman Aggregate Bond Index ("Lehman Aggregate"). The Lehman Aggregate is a broad market index comprised of bonds representing all major sectors of the public domestic investment grade fixed income market weighted by market capitalization of total eligible issuance. The Lehman Aggregate includes U.S. Treasury, agency, corporate, mortgage, asset-backed, commercial mortgage-backed and taxable municipal securities, as well as a limited amount of dollar-denominated debt of foreign entities.

The Lehman Aggregate is part of the Lehman Brothers family of fixed income indices and is widely used by market participants as a benchmark for domestic core fixed income management. Other index families available include Citigroup (formerly Salomon), Merrill Lynch and J.P. Morgan. While these index families have similar construction rules and sector compositions, they are less widely used by market participants. Therefore, staff concentrated its review on the Lehman Brothers family of indices. Staff reviewed a range of possible alternative benchmarks within the Lehman index family for use as the Program's asset class target:

- Government Index
- Government/Credit Index
- U.S. Universal Index
- Long Government/Credit Index

Each of the benchmarks staff reviewed has varying attributes, such as sector weightings, average maturity and overall interest rate and spread risks. Below is a sampling of information on the general characteristics of each of the Lehman benchmarks that were considered followed by their key statistics:

**General Benchmark Characteristics:**

**Lehman Aggregate** – a broad market index comprised of all major sectors of the domestic investment grade fixed income market weighted by market capitalization of total eligible issuance. Includes U.S. Treasuries and agencies, corporates, mortgages,

asset-backed and commercial mortgage-backed and a limited amount of dollar-denominated debt of foreign entities.

**Lehman Government/Credit Index** – a subset of the Lehman Aggregate index that includes only U.S. Treasuries and Agencies, investment grade corporates and some dollar-denominated debt of foreign entities.

**Lehman Government Index** – a further subset of the Lehman Aggregate index that contains only U.S. Treasuries and agencies.

**Lehman U.S. Universal Index** – a broad market index that includes all the sectors of the *Lehman Aggregate* plus a market-capitalization weighted representation of domestic high yield and dollar-denominated emerging market debt (EMD).

**Lehman Long Government/Credit Index** – a variation on the Government/Credit index that focuses on longer maturity securities within the U.S. Treasury, agency and credit sectors. This index represents the most viable choice for benchmarking a long duration strategy.

## Key Index Statistics

Selected Data as Of 2/28/03	Lehman Aggregate	Lehman Gov/Credit	Lehman Government	Lehman US Universal	Lehman Long Govt/Credit
Sector Weights (% \$MV):					
Treasury	21.7	35.4	62.6	19.2	48.1
Agency	12.9	21.1	37.4	11.4	10.2
Mortgage	34.9			30.9	
IG Credit	26.6	43.5		28.2	41.7
ABS/CMBS	3.9			3.8	
HY Credit				4.6	
EMD				1.9	
Duration	3.79	5.47	5.26	3.89	11.07
Convexity	-.11	.58	.55	-.06	1.83
OAS	57	71	10	107	77
10YR Return	7.28	7.35	7.26	7.26	8.72
10YR Std Deviation	3.69	4.19	4.20	3.60	7.41
10YR Sharpe Ratio	.73	.66	.64	.74	.55
Correlation w/R3000	.22	.21	.16	.26	.23

Staff assessed target quality based on the index ability to meet the following objectives:

- **Total Return** – has the benchmark achieved risk-efficient returns that are representative of the opportunity set available to managers
- **Equity Diversification** – how good is the benchmark at providing diversification in times when equities are performing poorly?
- **Deflation Hedge** – if the economy experiences a deflationary period, how will the benchmark perform?
- **Appropriate Risk Profile** – how appropriate is the relative risk of the benchmark?

Staff concluded that the Lehman Aggregate compares favorably to the alternatives for the following reasons:

- Sector diversification and spread sector exposure provide an opportunity to add alpha and a history of favorable risk-adjusted returns;
- Overall high credit quality provides good equity diversification characteristics;
- Absolute risk level of the index is within the range of expectations for a core fixed income strategy.

**The IAC and Staff recommend that the Lehman Aggregate index continue to be used as the asset class target for the Fixed Income Program.**

#### **Alternative Investments**

Alternative investments are included in the Retirement Funds' portfolios to provide high real returns relative to other asset classes. The SBI invests in a variety of alternative investment categories, which typically have been private equity, real estate, resources, and mezzanine debt.

Asset class targets that are currently available do not satisfy the basic criteria of investability and do not reflect the SBI's investment opportunities due to the illiquidity and non-publically priced nature of underlying investments. Despite significant research on the part of plan sponsors, third party consultants and financial institutions to develop asset class targets for alternative investments, no viable solutions have been found.

**Recognizing the nature of non-marketable investments included in the Alternative Investment Program, the IAC and Staff recommend for purposes of composite fund performance evaluation to continue to measure Alternative Investments “against themselves”. The actual portfolio returns will be used in composite fund benchmark return calculations.**

### **International Equity**

The asset class target for the International Equity Program is the Morgan Stanley Capital International (MSCI) EAFE Free + MSCI EMF net of taxes on dividends. EAFE stands for Europe, Australia, and the Far East, while EMF stands for Emerging Markets Free. The “Free” term indicates that the index does not include the stock of companies that foreign investors are restricted from owning. MSCI has made improvements by float adjusting constituent companies of its Standard indices (non-Free), such that there is no longer a difference between MSCI’s Free and Standard indices. Since the prior return history of these indices has been different over certain time periods, MSCI will continue to maintain both the Free and Standard indices.

The following review of the International Equity Program asset class target focuses on:

- The index provider.
- The addition of Canada to the asset class target.
- Whether the asset class target should remain un-hedged.

### **Alternative Index Providers**

The review focused primarily on a comparison between Citigroup Global Equity Indices (formerly Salomon Smith Barney) and MSCI. While Citigroup indices are generally thought by investment managers to have a solid construction methodology, the vast majority of plan sponsors use MSCI indices. Therefore, international equity investment managers establish their performance track records against MSCI indices.

Other international equity index providers do not currently offer significantly better alternatives to MSCI indices. Dow Jones Global (DJ Global) assesses stock inclusion by region, not by individual country. As a result, more stocks are included from the larger markets in each region than from the smaller markets. The Financial Times Stock Exchange (FTSE) indices use a sector classification system that is significantly different than the Global Industry Classification System (GICS), which is the norm of other index providers. Standard & Poors Global (S&P Global) limits the number of stocks for inclusion and only includes large capitalization companies.

Recently, MSCI made changes to their construction methodology in order to improve the investibility (float-weighting) and industry coverage of their indices. This has reduced many of the differences between MSCI and Citigroup indices. MSCI defines the free float of a security as the proportion of shares outstanding that are deemed to be available for purchase in the public equity markets by international investors. Whereas MSCI previously included a company in an index at its full market capitalization, the weight is now adjusted to reflect actual restrictions on foreign ownership, as well as the holdings of



strategic investors such as governments, corporations, controlling shareholders and management. MSCI also increased the coverage of each industry group within a country from 60% of total market capitalization to 85% of free float adjusted market capitalization. As a result, MSCI indices represent the constraints that an institutional investor experiences in the market place and also have broader representation of the range of non-U.S. equity investment opportunities available to an institutional investor.

While construction rules for MSCI indices are printed, constituent companies are still subjectively selected by Committee. In contrast, Citigroup indices have a purely objective and rules-based construction methodology. The strongest advantage of MSCI indices is their length of performance history and historical valuations data. MSCI has the longest history in P/E's, dividend yields, P/BV, P/Sales and P/CE, all at country, regional and sector levels. The developed market's history is from 1970, and the emerging markets history, from 1988. This amount of valuation data offers managers and plan sponsors advantages for portfolio analysis.

It should be noted that Citigroup currently has a highly regarded methodology for constructing value and growth style benchmarks. However, on May 31, 2003, MSCI began using an enhanced methodology to construct their style indices. Citigroup uses four variables to measure value, and three for growth. MSCI now uses three variables for value and five for growth. Currently the SBI does not use style benchmarks in the Program.

### **Add Canada to the asset class target?**

The SBI International Equity Program's asset class target, MSCI's EAFE Free+EMF (net) index, does not include Canada. Canadian equities are not represented in any equity benchmark in the SBI Combined Funds. The SBI's active developed markets managers and U.S. managers are permitted to buy Canadian equities. However, there is no policy exposure to Canada in the International Equity Program. While Canada is dominated by three sectors (*Financials, Energy, and Materials represent 68% of MSCI's Canada index, 37%, 17%, and 14% respectively*), Canada represents 6.0% of the investment opportunity set outside of the U.S. (*percentage of Canada in MSCI All Country World Index ex. U.S. as of 06/30/03*). The market capitalization of Canada is a significant part of the investment universe of developed markets outside of the United States.

Canada has a relatively high correlation with U.S. stocks. However, MSCI's World ex. U.S. index, which includes the countries in EAFE plus Canada, has only a slightly higher correlation with MSCI's U.S. index than does EAFE (*MSCI World ex U.S. to MSCI U.S., Correlation=0.672 vs. MSCI EAFE to MSCI U.S., Correlation=0.656, Time Period: 1991-2002*). The International Equity Program is already exposed to this slight reduction in diversification benefits (through increased correlation to U.S. equities) as a result of its current Canadian holdings.

The SBI's developed markets active managers have research coverage in Canada and most have Canadian holdings. These managers have said that they would not have to change the way they are managing the SBI's portfolio or change many holdings if their

benchmark moved to an index which included Canada. The estimated cost to add Canada to the developed markets passive portfolio is estimated at a one-time transaction cost of four basis points assuming roughly two weeks to transition the portfolio and a reasonable amount of available crossing opportunities. If Canada were to be added to the passive portfolio in conjunction with an asset rebalance, the cost would be minimized.

**Hedged or un-hedged asset class target?**

Currently, the International Equity Program's asset class target is 100% un-hedged, which means that none of the underlying currency exposure in the index is hedged back to the U.S. dollar. While this allows the Program to enjoy the full diversification benefits of investing in international equities over the long term, it may also contribute to greater return volatility due to fluctuating currency exchange rates in the short term.

An analysis was done comparing different levels of hedging for the SBI's International Equity Program. The asset allocation of the SBI's Combined Funds (as of 6/30/01) and 2002 capital market assumptions provided by J. P. Morgan were used for the asset class's volatility, correlation, and return assumptions. Eleven distinct portfolios ranging from 0% EAFE hedged to 100% EAFE hedged were evaluated. For each of these eleven portfolios, the current allocations for all other asset classes remained unchanged. The portfolio with the highest Sharpe Ratio allocated 100% of the total international equity allocation to an un-hedged EAFE benchmark. The Sharpe Ratio measures return per unit of risk, calculated as the return of an asset in excess of that of the riskless asset divided by the standard deviation of the returns of the asset.

**The IAC and Staff recommend that the SBI continue to use Morgan Stanley Capital International as its asset class target provider for the International Equity Program, and that the International Equity Program asset class target be changed to the MSCI All Country World Index Free ex. U. S. net of taxes on dividends, thus adding Canada to the asset class target. The IAC and Staff further recommend that the asset class target remain unhedged.**

### **Domestic Equity**

The current asset class target for the Domestic Equity Program is the Wilshire 5000 Investable. The SBI adopted the Wilshire 5000 Investable in June 2000. The move to the Wilshire 5000 Investable was an attempt to create an institutionally investable benchmark. The Wilshire 5000 is a published index, which is composed of all the publicly traded stocks in the United States. While the Wilshire 5000 is a broad-based index, it presents some difficulties for large institutional investors such as the SBI. The Wilshire 5000 Investable is constructed by adjusting the published Wilshire 5000 Index as follows:

- Removing stocks which have SBI-imposed restrictions (currently, tobacco stocks);
- Eliminating small illiquid companies (as represented by those stocks whose capitalization and trading volume would preclude investment consideration by institutions with assets as large as the SBI's).

- Eliminating American Depository Receipts, Real Estate Investment Trusts, Dual Class Stocks, Master Limited Partnerships, Closed-end Funds, Exchange Traded Funds, Unit Trusts and Preferred Stock.

These adjustments reduce the number of names in the index from approximately 6000 stocks to approximately 2600 stocks.

While the use of the Wilshire 5000 Investable resolved some issues for the SBI, it remains unique and the SBI is the only investor using the Wilshire 5000 Investable. Since it is a custom index, it is often cumbersome to analyze in a timely manner. Staff reviewed several alternatives for a target. The S&P 500 contains 500 of the largest companies but is not sufficiently broad to serve as a universe for a large institutional investor. The S&P 1500 is relatively new, having been created in 1995. Few plan sponsors use it, and it is also not sufficiently broad. The Dow Jones U.S. Total Market index is a broad index that can meet large plan sponsor needs. However, it is not well known or accepted by plan sponsors.

The Russell 3000 (R3000) is a domestic equity target used by a number of large institutional investors. It is composed of the largest 3000 companies in the U.S. The index is float weighted based on Russell's proprietary definition of float, and represents approximately 98% of the investable U.S. equity market.

The makeup of the Russell 3000 is similar to the Wilshire 5000 Investable in that it is comprised of a substantial number of the largest U. S. publicly traded stocks while excluding the smallest and least liquid names. Long-term return patterns and expectations as well as sector and risk characteristics of these two broad indices is very similar. Unlike the Wilshire 5000 Investable, the Russell 3000 is created and published by an independent third party. Whereas the SBI is the only plan measured against the Wilshire 5000 investable, the Russell 3000 is a common asset class target among large pension plans.

Russell data is transparent, readily available, and can be easily incorporated into the SBI's evaluation and monitoring tools, which can result in more efficient use of resources. This facilitates monitoring of the Program and individual managers for relative stock positions, industry weightings, risk level, and style exposure.

One of the attractive features of the R3000 is that Russell offers a family of style indices that can be structured to add up to the R3000. These style indices can be used as manager benchmarks thus allowing a plan sponsor to measure the performance of investment managers against components of the asset class target. A plan sponsor can also allocate assets to styles in the same proportion as they are represented in the target, thereby controlling misfit risk.

After review, the IAC and Staff believe that the R3000 accomplishes in a published index what the SBI has attempted to capture with the W5000 Investable custom index.

**Therefore, the IAC and Staff recommend that the SBI adopt the Russell 3000 as the asset class target for the Domestic Equity Program.**

## ASSET CLASS STRUCTURE

The IAC and Staff reviewed the major components of the management structure of each asset class. Specifically, the IAC and Staff reviewed manager benchmarks, the allocation between active and passive management, risk levels and control, and specific issues pertinent to the respective asset classes.

### Fixed Income

#### **Active and Passive Management**

The Fixed Income Program's active risk level is managed by setting an allocation among active- and passive-type management styles, and by controlling the degree of active risk to the managers' investment guidelines. The Fixed Income Program is currently allocated evenly to active management and semi-passive, or risk-controlled active management. Passive management is not currently employed in the program, although the product is widely available from a number of well-established fixed income managers. As part of its review of the Fixed Income Program, the IAC and Staff reviewed the effectiveness of the current allocation relative to a range of different allocation options. Staff also reviewed passive management as a possible alternative style.

Since July 1988, the Program has employed active and semi-passive management. The Program has added 20 basis points of excess return per year with 60 basis points of tracking error. The results of each style are presented in Figure 1.



*Figure 1. SBI bond program results through 12/31/02.*

Style (program inception)	Excess Return Objective	Maximum Tracking Error	Actual Excess Return	Actual Tracking Error
Active (7/84)	25 bps	250 bps	38 bps	118 bps
Semi-Passive (7/88)	10 bps	50 bps	14 bps	40 bps
Total Program (7/88)			25 bps	60 bps

There are structural inefficiencies within the bond market that can be exploited by active managers. These inefficiencies include the over-the-counter nature of trading, a diversity of investment objectives among market participants, and the sheer number of unique investment vehicles available to investors.

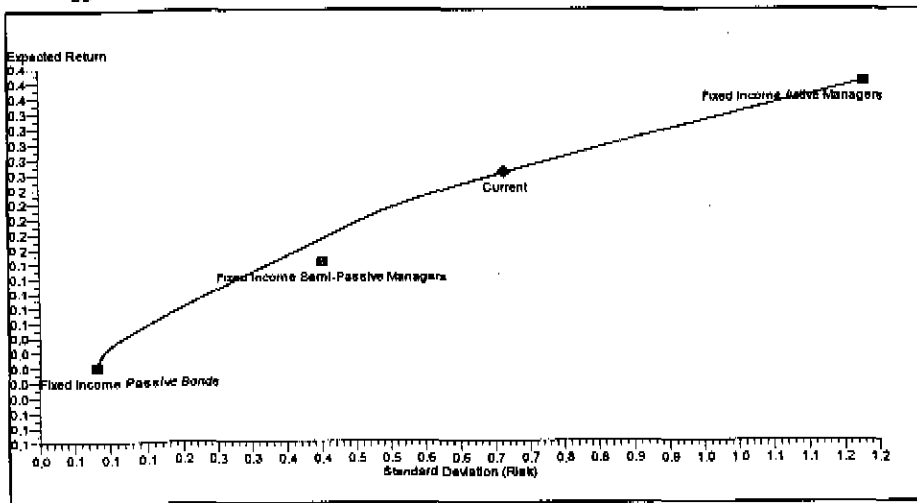
Staff reviewed the composite performance of passive core bond strategies from several investment managers to develop an accurate proxy for the return-risk profile available in modern passive management. Staff's analysis concluded that passive fixed income management could be expected to generate alpha to cover fees with very low incremental risk. However, given the success of risk-controlled styles in consistently adding value with low tracking error, Staff continues to favor these strategies over pure passive management. It is reasonable to expect that the bond market's structural inefficiencies will persist and provide opportunity for the continued relative outperformance of the semi-passive style compared to a pure passive approach.

To formally evaluate the current allocation against a range of alternatives, an efficient frontier of possible allocations among active, semi-passive and passive investment styles was developed based on actual program return data and staff's model of the risk-reward

profile of passive management. The range of possible allocations is represented graphically in Figure 3.

*Figure 3a-b. Analysis of possible allocations among investment styles*

**3a: Efficient Frontier**



**3b: Return, Risk and Correlation Inputs**

Style	Excess Return	Standard Deviation	Correlation w/ Active	Correlation w/ Semi-Passive	Correlation w/ Passive
Active	35 bps	120 bps	1.00	N/A	N/A
Semi-Passive	15 bps	40 bps	.20	1.00	N/A
Passive	0 bps	8 bps	.10	.15	1.00

The Program's current allocation lies along the efficient frontier of available allocation options, meaning the 50%-50% allocation is risk efficient. Program risk can be increased (decreased) by allocating more (less) to active management; however, any changes will come with an offsetting change in return. Staff believes the current allocation provides an efficient return profile with an appropriate risk level. **The IAC and Staff recommend that the allocation between active and passive management be maintained at 50% active and 50% semi-passive.**

## **Manager Benchmarks and Specialty Assignments**

Currently, all managers in the Fixed Income Program have the same benchmark, the Lehman Aggregate index. The Program has no “specialty” mandates, such as mortgage-only, or government/credit only. Investment managers in the Program have been selected for their capabilities as domestic core bond managers.

An alternative approach would be to incorporate a range of specialty assignments within the Fixed Income Program. Collectively, the individual specialty mandates would approximate the program’s asset class target. The main argument in favor of this approach is the idea that hiring the best managers in each sector could improve overall returns. Staff would not recommend the specialist approach in favor of the current core approach for three key reasons:

- The Sector Decision
- Industry Standard
- Risk Control

### The Sector Decision

Investment grade fixed income assets across sectors have fundamentally similar investment characteristics. Sector rotation, a strategy whereby investment decisions are based purely on the appraisal of sectors relative to one another, is a major source of excess returns for active bond managers. If specialty mandates were used, the SBI would, through the course of allocating assets among specialty managers, effectively assume responsibility for the sector decision. This would reduce or eliminate the

managers' ability to use sector rotation as a tool to generate excess returns. In contrast, the current approach insures that managers have the full ability to use sector rotation against a broad, multi-sector benchmark.

#### Industry Standard

Core and core-plus styles of active management are the preferred investment approach amongst plan sponsors, and the leading style of management offered by the investment management community. While there are managers who offer specialty products, the majority of fixed income investment managers are structured to offer competitive products in the core and core-plus categories that essentially bring together a team of specialist sector teams under one strategy.

#### Risk Control

Under the current structure, each manager's benchmark is, by definition, the same as the Asset Class Target. Therefore, there is no misfit risk from the combined manager benchmarks relative to the asset class target. Any risk is a function purely of each manager's active bets, i.e. active risk. In contrast, under a system of specialty mandates, misfit risk would need to be explicitly controlled through active monitoring and periodic rebalancing. The time and expense of such a system would be a material drawback to the specialty approach.

**The IAC and staff recommend the continued use of a core approach whereby the Program's asset class target is used as the benchmark for all managers.**

### **Use of the Plus Sectors of the Market**

In 2002, Staff conducted a review of the Plus sectors of the fixed income market (high yield, non-dollar, and emerging market debt), and re-affirmed a tactical approach to investing in certain sectors within the bond program. The IAC and the Board approved the proposal, which refers to an "opportunistic approach". The key findings of the review are listed below:

- U.S. High Yield, Non-dollar investment grade and Emerging Markets Debt (EMD) have sufficient size, liquidity and differentiation;
- U.S. High Yield and EMD have higher correlation with U.S. Equities, reducing the equity hedge benefit;
- EMD has equity-like volatility and has a relatively short track record (roughly 12 years);
- Non-dollar investment grade bonds offer some degree of diversification and uncorrelated return opportunities relative to the U.S. market, but no sustained return advantage is seen;
- Although volatile, the U.S. high yield market is increasingly differentiated in terms of risk;
- Attractive high yield investment opportunities do exist on an issue-by-issue basis and can represent an attractive opportunity for core managers with strong credit capabilities.

In 2002, the SBI approved the expansion of the then-existing tactical investment strategy for U.S. high yield and non-dollar sectors of the bond market. The approach expanded tactical limits for selected existing active and semi-passive managers, subject to review of each manager's capabilities in the extended sectors. Approved active managers are allowed to invest up to 15% in U.S. below investment grade bonds, and up to 15% in non-dollar fixed income, subject to a combined maximum of 20% of the manager's assets. Additionally, approved semi-passive managers are allowed to invest up to 5% in U.S. below investment grade and up to 5% in non-dollar fixed income. Currently, two active managers have the expanded authority. At this time no semi-passive managers have the expanded authority.

The use of U.S. Treasury Inflation Protected Securities (TIPS) was also reviewed during the asset allocation study. There is no recommendation for a specific allocation to TIPS in the program, although managers remain free to invest in the securities as an active bet.

**The IAC and Staff recommend that the Program's current opportunistic approach to the Plus sectors be re-affirmed.**

### **Alternative Investments**

The current structure of the Alternative Investments Program is derived from the SBI's statutory authority. *Minnesota Statutes* authorize investments through a range of commingled vehicles such as limited partnerships, collective funds and private placements. There must be at least four other participants in the commingled vehicle and

the SBI's participation may not exceed 20%. The SBI may not accept general liability. The SBI structures its program by selecting investment managers who make specific investment decisions as general partners of commingled vehicles.

The SBI alternative pool invests in a variety of alternative investment categories, including private equity (which includes leveraged buyouts and venture capital), mezzanine debt, real estate, and resources. At its June 2003 SBI meeting, the Board approved a recommendation to commingle the alternative investment portfolios of the Basic and Post Retirement Funds into a single pool. This accounting treatment prospectively allows the Basic and Post Funds to own units of the pool and to have the same risk and return exposure. This structure mirrors that of the Domestic Equity, International Equity, and Fixed Income pools. New alternative investments will be purchased for the commingled pool.

**The IAC and Staff recommend that the current structure of the Alternative Investment Program be continued.**

### **International Equity**

#### **Manager Benchmarks**

Currently, all but one of the developed markets managers in the International Equity Program are measured and evaluated against the MSCI EAFE Free (net) index. One active developed markets manager has a custom benchmark. The emerging markets

managers in the Program are measured against the MSCI Emerging Markets Free (net) index.

**The IAC and Staff recommend that developed markets managers (both active and passive) be measured against the MSCI World ex U.S. (net) index.** This index adds Canada to the MSCI EAFE Free (net) index. The one developed markets manager that is currently being measured against a custom benchmark would also be measured against the MSCI World ex U.S. (net) index. **The IAC and staff also recommend that the emerging markets managers continue to manage against the MSCI Emerging Markets Free (net) index.** The combination of the MSCI World ex U.S. index (net) and the MSCI Emerging Markets Free (net) index make up the MSCI All Country World ex U. S. (net) index that has been recommended as the asset class target for International Equity Program.

#### **Allocation to Active, Semi-Passive, and Passive**

Using historical risk and returns, an optimization study completed for the International Equity Program demonstrated that the addition of semi-passive management created the opportunity to yield incremental return while modestly lowering overall risk. Prior considerations of adding semi-passive management to the International Equity Program were forestalled primarily because there was an insufficient number of managers offering products with sufficient assets under management. Over the past five years a number of managers have entered the semi-passive market place. These managers now have track records with sufficient assets under management to make semi-passive management a



viable alternative for the SBI. The Board has been successful with semi-passive management in both its equity and bond programs.

The current risk allocation scheme for the International Equity Program requires that at least 33% of the Program be passively managed, and at least 33% of the Program be actively managed. There is no allocation to semi-passive management. **The IAC and Staff recommend that up to 10% of the International Equity Program be allocated to semi-passive management and at least 25% be allocated to passive management. In aggregate, at least 33% of the Program would be allocated to passive and semi-passive management at least 33% of the Program will be actively managed.**

### **Domestic Equity**

#### **Manager Benchmarks**

Currently, individual active domestic equity manager performance is measured relative to custom benchmarks designed to reflect a manager's area of expertise, research universe, and investment style. Benchmarks are used to measure the relative performance of active managers and to control any misfit or style bias risk in the program.

Custom benchmarks were put in place by the SBI in the late 1980's prior to the introduction of published style benchmarks. Custom benchmarks were intended to provide a better measure of the managers' performance than a broad market index such as the S&P 500 or W5000 index, and were a necessity to determine and control misfit. The

managers were given the option of building the custom benchmark themselves or having a consultant construct it for them.

Despite the advantages, the SBI has encountered practical problems with custom benchmarks including a lack of investment manager ownership, understanding, and acceptance. The entire program is based on the assumption that appropriate custom benchmarks are in place. Without the clear focus of managers to maintain appropriate custom benchmarks, the ability of a DCF benchmark to correct misfit risk is undermined, and the Domestic Equity Program's results may be adversely affected.

Regular monitoring of custom benchmarks is required to ensure that they remain an adequate reflection of a manager's style. Because of benchmark complexity, significant periods of time can pass before problems can be found and corrected. This can lead to inappropriate conclusions related to managers' performance.

Over the years published style indices have become more popular. A large majority of plan sponsors have adopted these style indices for the use in measuring and comparing active manager performance. The published style indices have become a common communication tool for potential and existing clients. Since the majority of active managers' business is tied to published benchmarks, managers have become familiar with the constituent companies and construction of published benchmarks. Managers communicate active bets, sector weights and other portfolio characteristics against published indices.

The IAC and Staff believe evaluating all its active managers against the published style indices that are currently available, such as the Russell U.S. Equity Indices, is appropriate. Using published indices will allow the SBI's monitoring and evaluation of managers, with published index data readily available to be linked into the SBI's portfolio monitoring systems.

If the R3000 Index were used as the asset class target for the Domestic Equity Program, as discussed in the previous section, subsets of the Russell 3000 Index would be used as active manager benchmarks. Russell divides the R3000 into sub-indices along market capitalization lines in three style categories: growth, value and core. The following chart shows some of the published sub-indices that are available for use as active manager benchmarks.

	<b>Value</b>	<b>Core</b>	<b>Growth</b>
<b>Large Cap</b>	R1000 Value	R1000 Core	R1000 Growth
<b>Largest 200</b>	RTop 200 Value	RTop 200 Core	RTop 200 Growth
<b>Next 800</b>	RMidcap Value	RMidcap Core	RMidcap Growth
<b>Small/Mid Cap</b>	R2500 Value	R2500 Core	R2500 Growth
<b>Small Cap</b>	R2000 Value	R2000 Core	R2000 Growth
<b>Broad Market</b>	R3000 Value	R3000 Core	R3000 Growth

The semi-passive managers' benchmark is currently the Dynamic Completeness Fund (DCF) benchmark. The IAC and Staff propose that the semi-passive managers be given the R1000 as a benchmark. However, in the process of controlling the overall program's misfit risk, one or more semi-passive manager may be assigned a DCF benchmark. It is the intention of Staff to recommend the hiring of active managers for the small cap portion of the market (R2000) leaving the DCF to be focused on the R1000. There will be transition periods, the first of which will be approximately six months, as the manager structure is altered and the DCF benchmark naturally adjusts toward the R1000 index. Future transitions will also occur as managers are hired and assets are reallocated among the managers.

The IAC and Staff recommend that the Domestic Equity Program use published R3000 sub-indices to measure and monitor the active domestic equity managers, that the semi-passive managers be measured against the R1000, that the DCF be in place when necessary to correct residual style bias, that the passive index fund use the R3000, and that custom benchmarks continue to be built where appropriate as an additional analytical tool to evaluate managers.

#### **Allocation to Active, Semi-Passive, and Passive**

The current allocation to active, semi-passive, and passive management is as follows:

<b><u>Current:</u></b>	
Active	33%
Semi-Passive	33%
Passive	33%

The current allocation provides an expected return of 18 to 40 basis points over the asset class target, and tracking error of 1.1 to 1.5% relative to the asset class target, which is similar to other large plan sponsors.

The establishment of a single number rather than a range for a subset of an asset class can be restrictive in that it may add cost when rebalancing the asset class or when managers are added or deleted from the program. The addition of some flexibility without significantly changing the expected return or tracking error of the asset class would aid staff in the daily operation of the plan.

**The IAC and Staff recommend the use of ranges in stating the allocation among active, semi-passive, and passive. The proposed ranges are as follows:**

<b>Active</b>	<b>25-40%</b>
<b>Semi-Passive</b>	<b>25-40%</b>
<b>Passive</b>	<b>25-40%</b>

The proposed ranges allow flexibility during rebalancing and manager hiring and termination. These ranges maintain similar risk return expectations over the asset class target at 16 to 46 basis points of expected return and 1.1 to 1.5% tracking error.

### **Misfit Risk Control**

The SBI currently uses a Dynamic Completeness Fund (DCF) to control misfit risk. This tool has been used by the SBI since October 1990. Its purpose is to reduce any style bias or misfit in the Domestic Equity Program relative to the asset class target so as to minimize any unintended size or style bets in the Program.

The DCF benchmark is constructed by comparing the weight of each stock in the combined custom benchmark of all active managers to the weight of that stock in the asset class target. The process is designed to neutralize over or under benchmark weighted stock exposures with an offsetting weight in the DCF benchmark. This DCF process has controlled the overall program's misfit risk.

The process was originally implemented passively from 1990 through 1994. With the introduction of semi-passive investment processes, the DCF benchmark assignment was

given to three semi-passive managers in January 1995. The semi-passive managers in aggregate have provided value-added results consistent with the stated objectives and have controlled the active risk level of their portfolios within stated limits.

The SBI's inability to legally short securities to offset "overweights" in the active manager benchmarks creates inaccuracy in the DCF benchmark. Problems with manager ownership, construction, and maintenance of appropriate custom benchmarks also cause problems in building the correct DCF benchmark. There is also a significant use of staff resources required to monitor and evaluate the Program that includes a DCF.

**The IAC and Staff recommend controlling misfit risk or style bias by allocating assets across active managers and reducing the reliance on the DCF.** This method minimizes misfit by allocating assets across the active managers so the policy (benchmark) weight reflect the size and style characteristics of the asset class target. To the extent that there is residual misfit risk remaining beyond an acceptable level, the DCF will be employed to reduce it. As was recommended previously, the semi-passive managers (DCF managers) will use only R1000 stocks to reduce misfit in the Domestic Equity Program.

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# **BASIC RETIREMENT FUNDS**

## **Tactical Asset Allocation**

**Minnesota State Board of Investment  
Staff Position Paper**

**March 1991**

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## Executive Summary

The stock market crash of 1987 caused an increased interest in asset allocation, especially tactical asset allocation (TAA). The increased interest in TAA strategies originates from the high returns that can be produced through a successful TAA strategy that avoids the worst performing asset classes.

TAA and other forms of market timing have not been used in the Basic Retirement Funds. This paper re-examines that policy decision and discusses the expected risks and returns associated with TAA.

### Current Rebalancing Strategy

The policy asset mix chosen for the Basic Funds incorporates a large commitment to common stocks in order to obtain higher rates of return over the long-term:

Common Stocks	60.0%
Bonds	24.0
Real Estate	10.0
Venture Capital	2.5
Resource Funds	2.5
Cash	1.0

The SBI's present asset allocation strategy uses a constant rebalancing approach. Currently, staff must rebalance the Basic Retirement Fund if an asset class deviates by more than 10% from its policy allocation (e.g. for stocks  $60\% \pm 6\%$ ). The policy gives staff discretion whether to rebalance for deviations in the 5-10% range.

Staff analysis indicates that this rebalancing strategy provides the highest risk-return ratio (i.e. the greatest additional return for the least additional risk) when compared to other deviation ranges. In effect, the SBI's current rebalancing guidelines impose a "buy low, sell high" discipline in the Basic Funds relative to its long-term asset mix policy.

**TAA  
Strategies**

TAA strategies try to generate excess return relative to a policy asset mix by increasing/reducing the exposure of an asset class depending on the expected future rate of return relative to the asset classes. Studies using both simulated and actual pension fund results show that a TAA strategy must achieve a significant degree of accuracy to generate any excess returns.

A study by Chua and Woodward indicates that both bull markets (upward movement in stock and bond prices) and bear markets (downward movements) must be correctly forecasted more than two-thirds of the time in order for TAA to produce any value added. Another study by Brinson, Beebower and Hood showed that the range of returns experienced by plan sponsors using explicit or implicit market timing are much more likely to be negative than positive. The study found that the "best case" reported added only 0.25% on an annualized basis over ten years and the average plan lost 0.66% annualized.

**TAA  
Implementation**

For a TAA strategy to have a significant impact on the Basic Funds' performance, at least 20% (currently \$1.4 billion) would need to be committed to one or more TAA managers. If the SBI could identify three equally skillful managers to provide some diversification among TAA strategies, each manager would manage significantly more assets than the SBI has been willing to commit to a single active management approach.

**Conclusion**

Staff recommends that the Board retain its current rebalancing policy and not implement a TAA strategy for the Basic Retirement Funds. The hurdles that must be overcome in terms of forecasting accuracy to generate a positive excess return are substantial. In addition, the SBI would assume considerable risk if a TAA strategy were to be implemented. These risks are:

- TAA strategies have greater potential downside loss than upside gain relative to the current rebalancing strategy for the Basic Funds.

- TAA strategies would have to improve their track record significantly in order to consistently outperform a constant rebalancing strategy on a risk/return basis.
- TAA would require a large commitment of the total assets to one, or relatively few, managers and TAA strategies.
- TAA would require a potentially longer evaluation time frame than for other investment strategies to determine whether the results were due to skill or chance.

Additional analyses supporting each of these conclusions are contained in the body of the paper.

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## **BASIC RETIREMENT FUNDS**

### **Tactical Asset Allocation**

The stock market crash of 1987 caused an increased interest in asset allocation, especially tactical asset allocation (TAA). The increased interest in TAA strategies originates from the high returns that can be produced through a successful TAA strategy that avoids the worst performing asset classes.

The first section of the paper describes the constant rebalancing strategy currently used by the Basic Retirement Funds. The second section of the paper provides a general description of TAA strategies and analyzes the risk and return that a plan sponsor must assume in implementing a TAA strategy. The last section discusses the appropriateness of implementing a TAA strategy for the Basic Retirement Funds.

### **Current Rebalancing Strategy**

#### **Asset Allocation Policy**

The importance of the asset allocation decision cannot be overemphasized. Studies suggest that asset allocation policy explains approximately 90% of the variation in total plan performance among large U.S. pension plans.<sup>(1)</sup> Therefore, the most important decision made by a pension fund will be the determination of its asset allocation policy.

All asset allocation strategies start by defining a policy asset mix. A policy asset mix represents the desired long run allocation of a pension fund's assets among various broad asset classes, which in turn reflects the pension fund's investment objectives and risk tolerance. The two primary determinants typically used to derive the policy allocation among the various asset classes are the long-run historical risk-return and the correlation of return relationships between the different asset classes.

By definition, transitory market movements do not cause the policy asset mix to be adjusted. Only when the plan's investment objectives or risk tolerance change, or when asset classes are added or deleted, should the policy asset mix be adjusted. In addition, the policy asset mix could be adjusted in the rare event that significant changes occurred in the capital markets, affecting the long-run historical risk-return or correlation of return relationships between the different asset classes.

Once a plan sponsor designates a policy asset mix, an asset allocation strategy can be implemented incorporating the policy asset mix as the baseline. A constant rebalancing asset allocation strategy allows the policy asset mix to deviate due to market movements up to a specified maximum or minimum level at which time it then must be rebalanced back to the policy asset mix. On the other hand, in implementing a TAA strategy, a plan sponsor intentionally makes short term deviations from its policy asset mix to take advantage of a perceived mispricing between various asset classes. The magnitude of the deviations depends on the level of aggressiveness the plan sponsor desires.

**Basic Funds  
Asset Mix**

The policy asset mix chosen for the Basic Retirement Funds incorporates the fund's objectives of obtaining a high total rate of return while maintaining enough liquidity to meet the monthly transfer needs to the Post Retirement Fund. The following shows the Basic Retirement Fund's policy asset mix among the various asset classes:

Common Stocks	60.0%
Bonds	24.0
Real Estate	10.0
Venture Capital	2.5
Resource Funds	2.5
Cash	1.0

## Basic Fund's Rebalancing Strategy

The SBI's present asset allocation strategy uses a constant rebalancing approach. Currently, staff must rebalance the Basic Retirement Fund if an asset class deviates by more than 10% from its policy allocation (e.g. for stocks 60%  $\pm$  6%). The policy gives staff discretion whether to rebalance for deviations in the 5-10% range.

The trade-off between transaction costs and tracking error determined the Board's rebalancing guidelines. Transaction costs increase as the policy guidelines become tighter thereby reducing the rate of return. Conversely, tracking error decreases as the guidelines become tighter. Tracking error represents the short term risk that the actual return will deviate from the policy asset mix rate of return. In implementing a constant rebalancing strategy a plan sponsor must choose a rebalancing guideline that provides an acceptable rate of return, given a stated policy asset mix, while keeping short term return deviations from policy (tracking error) at a level acceptable to the plan sponsor.

Figure 1 shows the annualized rate of return and standard deviation of return for a stock/bond policy asset mix that approximates the asset mix of the Basic Retirement Funds using various rebalancing guidelines for the time period January 1926 - March 1990. In addition, the third column of Figure 1 shows the tracking error for each rebalancing guideline relative to the constant stock/bond asset mix. The final column provides a risk-return comparison by dividing the potential excess return over a constant policy mix by the potential tracking error incurred by implementing that rebalancing guideline. The chart shows that the annualized rate of return, standard deviation of return, and tracking error all increase as the guidelines become less restrictive. The optimal rebalancing guideline allows the fund to deviate from its policy asset mix by 10%. Allowing the policy asset mix to deviate up to 10% provides the highest risk-return ratio (i.e. the highest additional return for the least additional risk) relative to the constant stock/bond asset mix as shown in the last column. This data supports the SBI's choice of a 10% rebalancing guideline.

**Figure 1.**

**Impact of Alternative  
Rebalancing Guidelines  
January 1926 - March 1990**

	<b>Annualized Rate of Return</b>	<b>Std. Dev. of Return</b>	<b>Tracking Error from Constant Policy</b>	<b>Risk/Return</b>
Constant Policy	8.56%	13.45%	0.0%	N.A.
5% Deviation	9.46	13.46	0.82	1.09
10% Deviation	9.59	13.53	0.94	1.10
15% Deviation	9.75	13.74	1.20	0.99
No Rebalancing	10.22	14.84	4.24	0.39

Constant Policy: 62.5% Stocks/37.5% Bonds

Data Source: Ibbotson Associates. Transaction costs were assumed to be 1% of the assets transferred.

**TAA Strategies**

TAA strategies try to generate excess return relative to a policy asset mix by increasing/reducing the exposure of an asset class depending on the expected future rate of return of the various asset classes.

**Study  
Results**

Several studies have been done that provide evidence that market timing can generate an absolute rate of return greater than that obtained by a balanced portfolio or an all stock portfolio. A study by Jeremy Evtine and Roy Henriksson shows that a real time TAA strategy has generated almost a 5% annualized rate of return greater than a market capitalization weighted stock/bond portfolio over a 13 year period.<sup>(2)</sup> Another study by Roger C. Clarke, Michael T. FitzGerald, Phillip Berent, and Meir Statman demonstrates that if a manager can develop an asset allocation strategy that provides a certain level of valid information in predicting the better performing asset class, the model will generate value added returns relative to the broad stock market.<sup>(3)</sup>

Staff concurs that a TAA strategy can potentially add absolute excess returns over the current policy asset mix for the Basic Retirement Funds. However, to determine the appropriate asset allocation strategy for the Basic Retirement Fund, one must not only look at excess returns, but also the risk assumed to generate those returns.

**Return  
Potential**

Any active investment strategy, including TAA strategies, generates excess return by the combination of the number of independent investment decisions made in a certain time period and the excess return that each independent decision generates. <sup>(4)</sup> For example, an investment strategy that can generate the same excess return for each investment decision can double the potential excess return if twice as many decisions can be made in the same time period. Also, if an investment strategy makes the same number of investment decisions but can increase the amount of excess return that each decision generates, the total excess return of the strategy will increase.

Because TAA decisions are based on major market moves rather than individual stock selections, TAA strategies tend to make relatively fewer investment decisions compared to other types of investment strategies. Therefore, TAA managers need to achieve a high degree of accuracy in their forecast so that their TAA strategy generates a higher level of excess return for each investment decision made relative to other investment strategies.

**Additional  
Study  
Results**

Studies using both simulated and actual pension fund results show that a TAA strategy must achieve a significant degree of accuracy to generate any excess returns. A study done by Jess Chua and Richard Woodward and summarized in Figures 2 and 3 provides a good picture of the accuracy needed in predicting bull and bear markets to add value using a TAA strategy. <sup>(5)</sup>

Figure 2 shows that a TAA strategy moving between stocks and cash needs at least a 90% accuracy in bear markets and a 60% accuracy in bull markets to generate positive returns of only 0.49% per year before transaction costs relative to common stock returns. Figure 2

also shows that a stock/cash TAA strategy needs to have at least an 80% accuracy in bull markets and 50% accuracy in bear markets to produce a positive return of 0.64% before transaction costs. If the stock/cash TAA strategy dropped from 80% to 70% accuracy for bull markets, it would produce a negative return of 0.79% per year.

Figure 3 shows that a TAA strategy moving between stocks and bonds that achieves a 100% accuracy in bear markets, needs at least a 60% accuracy in bull markets to produce a positive return of only 0.28% per year before transaction costs relative to common stock returns.

**Figure 2.**

**TAA Strategy Using Stocks and T-Bills  
Potential Value Added**

Bull Market Accuracy	Bear Market Accuracy					
	50%	60%	70%	80%	90%	100%
50%	Mean -3.41 S.D. 18.95	-2.69 19.65	-2.08 20.20	-1.42 20.79	-0.78 21.39	-0.01 24.01
60%	Mean -2.14 S.D. 17.90	-1.42 18.58	-0.80 19.12	-0.15 19.71	0.49 20.29	1.26 23.00
70%	Mean -0.79 S.D. 16.54	-0.07 17.23	0.54 17.76	1.20 18.34	1.83 18.92	2.61 21.75
80%	Mean 0.64 S.D. 14.89	1.36 15.59	1.98 16.12	2.63 16.70	3.27 17.28	4.04 20.29
90%	Mean 1.95 S.D. 13.07	2.67 13.78	3.29 14.32	3.94 14.92	4.58 15.51	5.35 18.75
100%	Mean 3.25 S.D. 10.68	3.98 11.46	4.59 12.04	5.24 12.68	5.88 13.31	6.65 16.91

S.D. = Standard Deviation

Source: J.H. Chua and R.S. Woodward, "Gains from Stock Market Timing," *Monograph Series in Finance and Economics*, Salomon Brothers, Monograph 1986-2.

Assumes no transaction costs.

**Figure 3.**

**TAA Strategy Using Stocks and Bonds  
Potential Value Added**

Bull Market Accuracy		Bear Market Accuracy					
		50%	60%	70%	80%	90%	100%
50%	Mean	-3.64	-3.02	-2.51	-1.97	-1.46	-0.94
	S.D.	16.49	17.04	17.44	17.83	18.18	18.52
60%	Mean	-2.41	-1.79	-1.28	-0.74	-0.23	0.28
	S.D.	15.41	15.94	16.34	16.71	17.05	17.38
70%	Mean	-1.17	-0.55	-0.04	0.50	1.01	1.52
	S.D.	14.07	14.60	14.99	15.35	15.68	16.00
80%	Mean	0.22	0.83	1.34	1.89	2.40	2.91
	S.D.	12.30	12.84	13.22	13.57	13.90	14.20
90%	Mean	1.48	2.09	2.60	3.15	3.66	4.17
	S.D.	10.21	10.78	11.17	11.53	11.86	12.16
100%	Mean	2.72	3.34	3.85	4.39	4.90	5.41
	S.D.	7.36	8.03	8.48	8.87	9.22	9.54

S.D. = Standard Deviation

Source: J.H. Chua and R.S. Woodward, "Gains from Stock Market Timing,"  
*Monograph Series in Finance and Economics*, Salomon Brothers,  
Monograph 1986-2.

Assumes no transaction costs.

A Brinson, Beebower, and Hood study looked at actual returns to analyze the explicit or implicit market timing results of 91 corporate pension funds. <sup>(6)</sup> The results of their study showed that over a ten year period the corporate pension funds lost, on average, 0.66% per year due to market timing relative to their average asset allocation. Over the ten year period the individual plan results ranged from a positive 0.25% to a negative 2.68% per year. This study shows that market timing by plan sponsors, whether intended or not, usually reduced performance. In addition, the study shows that the range of returns are much more likely to be negative than positive and the "best case" result was barely positive.

**Risk vs.  
Return**

In evaluating any investment strategy, a plan sponsor must not only look at the potential excess return that can be generated, but also the risk that must be taken to generate that potential excess return. The risk incurred in implementing a TAA strategy to achieve an excess return relative to a policy asset mix can be quite high. The Chua and Woodward study showed that, on average, the standard deviation of the excess return was about 10 times that of the excess return generated by the TAA strategy.<sup>(7)</sup>

**Information  
Ratio**

To put this into perspective relative to other investment strategies, an information ratio should be calculated. The information ratio takes the value added relative to a given benchmark and divides it by a measure of variability (e.g. standard deviation). The information ratio provides a good measurement of the risk/return relationship of an investment strategy or manager. In addition, the information ratio allows a plan sponsor to evaluate the risk/return relationship of various investment strategies relative to each other. By using the information ratio, a plan sponsor can evaluate which investment strategies will provide the highest value added relative to the risk the plan sponsor must take to generate that return. Since the Chua and Woodward study showed a standard deviation of about 10 times that of the corresponding value added return generated by a TAA strategy, the information ratio would be about 0.1 before management fees. In comparison, the SBI investment guidelines for its active equity managers strives to retain and hire new managers that can provide an information ratio of 0.5.

As discussed previously in this section, a TAA manager needs to achieve a high degree of accuracy in their forecast to generate a high level of excess return for each investment decision relative to other investment strategies that make more investment decisions in a given time frame. If a TAA strategy does not achieve a high degree of forecasting accuracy, the TAA strategy will generate a lower information ratio and require a substantially longer time frame to statistically prove within a certain confidence level that the TAA strategy can generate excess return. The following table shows the



number of years it would take to have a 90% confidence level that a manager can add value given a certain information ratio:

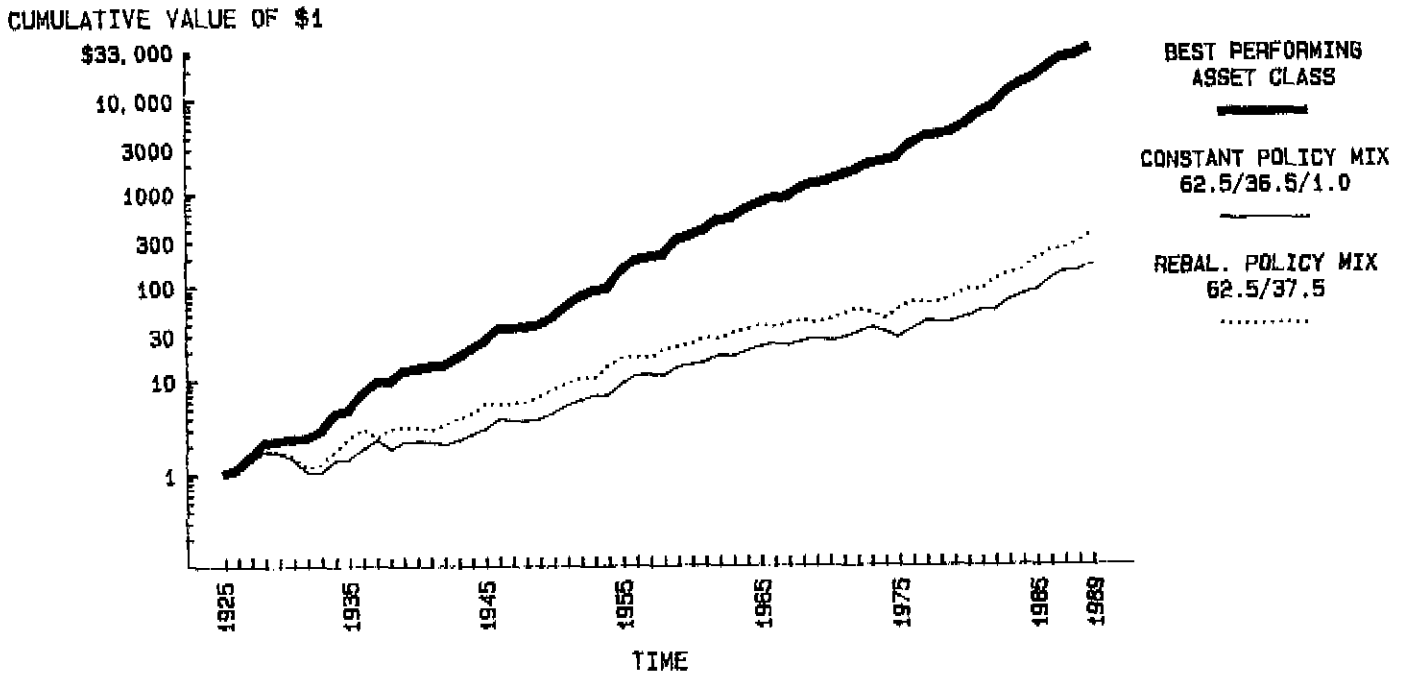
<b>Information Ratio</b>	<b>Years</b>
.10	164.0
.20	41.0
.30	18.2
.40	10.2
.50	6.6
.75	2.9
1.00	1.6

The Chua and Woodward study showed that TAA strategies on average have an information ratio of 0.1 before transaction costs. Therefore, a plan sponsor would have to implement a TAA strategy for a very long period of time before they could be reasonably confident that it can add value. (In comparison, the SBI's active managers' information ratios range from 0.2 to 1.2.) The long time frame required to confirm the accuracy of a TAA strategy constitutes an additional risk that a plan sponsor must assume in implementing a TAA strategy.

**Best and Worst Cases**

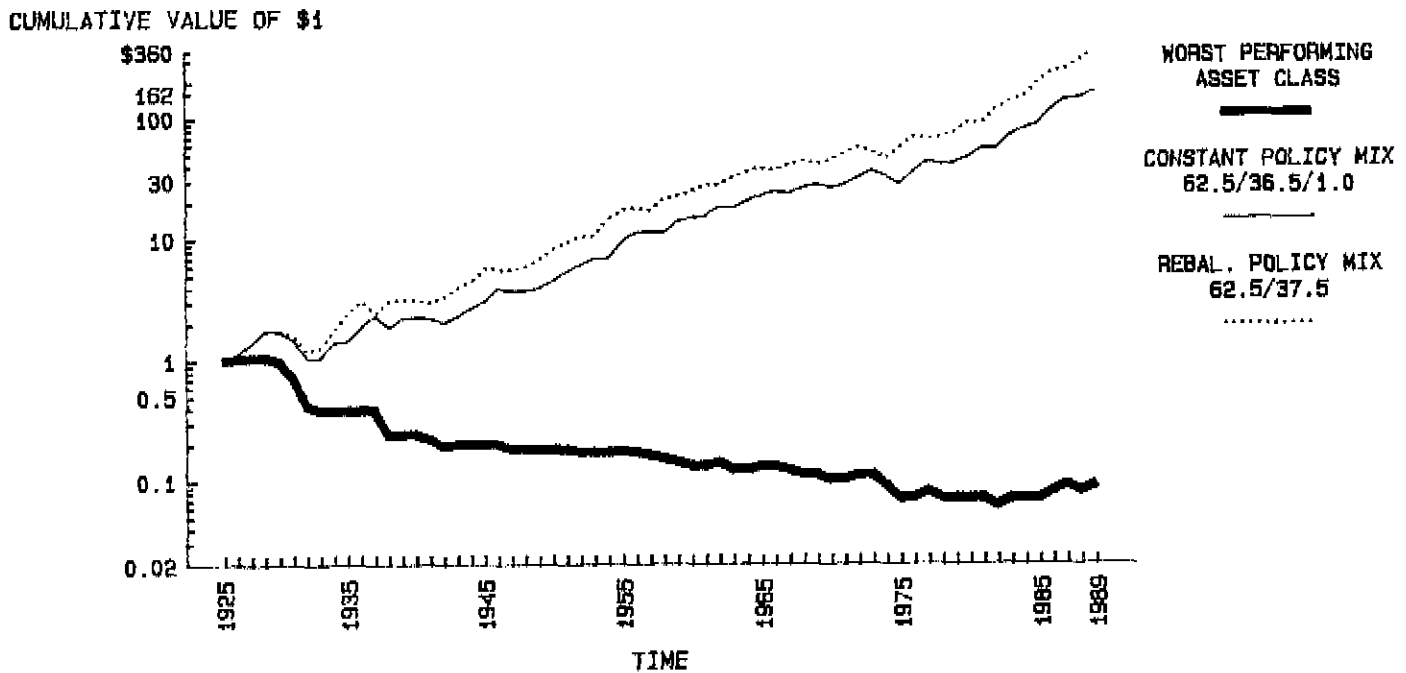
Staff has analyzed the risk of applying a TAA strategy relative to the current constant rebalancing policy. The study resembles a similar analysis presented in the Basic Retirement Funds Investment Policy, Part II, staff position paper dated February 1987. Figures 4 and 5 show the potential rate of return for successful and unsuccessful TAA strategies by plotting the cumulative values of an investment in the best and worst performing asset classes for each year since 1926. In addition, the figures show the cumulative value of an investment in an asset mix that approximates the Basic Funds policy weights and rebalanced under the SBI's current rebalancing guidelines.

**FIGURE 4**  
**POTENTIAL BENEFITS OF SUCCESSFUL MARKET TIMING**  
**BEST PERFORMING ASSET CLASS VS POLICY ASSET MIX**



SOURCE: IBBOTSON ASSOCIATES

**FIGURE 5**  
**POTENTIAL COSTS OF UNSUCCESSFUL MARKET TIMING**  
**WORST PERFORMING ASSET CLASS VS POLICY ASSET MIX**



SOURCE: IBBOTSON ASSOCIATES

One dollar initially invested in the best performing asset class grows to almost \$42,468 from 1926-89, or an 18.1% average annual compounded rate of return. One dollar initially invested in an asset mix similar to the Basic Funds and rebalanced under current guidelines grows to \$337, or a 9.6% average annual compounded rate of return over the same time period. This demonstrates that a successful TAA strategy can offer superior performance, outperforming the policy asset mix by 8.6 percentage points per year. However, one dollar initially invested in the worst performing asset class shrinks to \$0.10 during the 1926-89 time period, or a -3.6% average annual compounded rate of return. Thus the worst performing asset class strategy underperformed the rebalanced asset mix by 13.1 percentage points per year.

Compared to the baseline asset mix, two-thirds of the potential returns from a TAA strategy are less than the rate of return generated by the baseline asset mix using a constant rebalancing policy. This skewness towards negative returns also occurred in the Brinson, Beebower, and Hood study on corporate pension funds discussed earlier in this section.

Figures 4 and 5 represent unrealistic examples in that plan sponsors or investment managers do not possess perfect foresight. In addition, transaction costs are not included in the analysis. However, the analysis does show that a TAA strategy needs to achieve a fairly high degree of accuracy to outperform the Basic Retirement Funds policy asset mix.

### **TAA Implementation**

#### **Potential Impact on the Basic Funds**

For a TAA strategy to have a significant impact on the Basic Retirement Funds' performance, a substantial portion of the assets would need to be assigned to the TAA strategy. If a TAA strategy with perfect forecasting ability received 20% of the total Basic Retirement

Funds, it could expect to add 4.1% annually with a standard deviation of 2.6% relative to the constant rebalancing strategy before transactions costs. As noted earlier, however, assuming perfect forecasting ability is not realistic. The Chua and Woodward study showed that, on average, a TAA strategy achieves an information ratio of 0.1 before transaction costs. Using this information ratio, a TAA strategy would more likely add only 0.26% incremental return before transaction costs to the total fund return if 20% of the Basic Funds were committed to the strategy. A TAA strategy would need an information ratio of 0.4 to equal the 1.0% excess return generated by the current Basic Retirement Funds' rebalancing policy.

**TAA  
Management  
Structure**

Given that the Basic Funds' assets total \$7.1 billion, at least \$1.4 billion (20%) would need to be allocated to a TAA strategy in order to have a material influence on the Basic Retirement Funds' total rate of return. This would require a substantial commitment of assets to one TAA manager or strategy. It should be noted that a study by Roger Clarke, Michael FitzGerald, Philip Berent and Meir Statman shows that hiring more than one TAA manager can potentially reduce a plan sponsor's risk by diversifying among different TAA strategies. Below are two examples from that article. <sup>(8)</sup>

<b>Equal Ability</b>	<b>Expected Return</b>	<b>Std. Dev.</b>	<b>Risk/ Return</b>
Manager A	3.4%	17.8%	.191
Manager B	3.4%	17.8%	.191
50% A/50% B	3.4%	16.1%	.211
<b>Unequal Ability</b>			
Manager A	4.9%	17.3%	.283
Manager B	2.2%	18.2%	.120
50% A/50% B	3.4%	16.2%	.207

Depending on the expected returns, standard deviations, and the correlation of returns between the managers various TAA strategies, the study suggests that it may be advantageous to hire more than one TAA manager. The first example shows that a plan sponsor would gain by diversifying between the two managers of equal ability. The plan sponsor would receive the same expected return but have a lower total portfolio standard deviation. However, the second example shows that the plan sponsor might prefer to hire only manager A. Depending on the plan sponsors risk tolerance, the diversification gained by hiring manager B might not offset the lower expected return. Given the size of the Basic Funds, even if the SBI could find three equally good managers to provide TAA diversification, each manager would be managing significantly more assets than any of the SBI's current active managers.

## **Conclusion**

Staff recommends that the Board retain its current constant rebalancing policy and not implement a TAA strategy for the Basic Retirement Funds. The hurdles that must be overcome in terms of forecasting accuracy to generate a positive excess return are substantial. In addition, the SBI would assume considerable risk if a TAA strategy were to be implemented. These risks are:

- TAA strategies have greater potential downside loss than upside gain relative to the current constant rebalancing strategy for the Basic Funds.
- TAA strategies would have to improve their track record significantly in order to consistently outperform a constant rebalancing strategy on a risk/return basis.
- TAA would require a large commitment of the total assets to one, or relatively few, managers and TAA strategies.
- TAA would require a potentially longer evaluation time frame than for other investment strategies to determine whether the results were due to skill or chance.

## FOOTNOTES

- 1) G.P. Brinson, G. Beebower, and L.B. Hood, "The Determinants of Portfolio Volatility," *Financial Analyst Journal* (July/August, 1986), pp. 39-44.
- 2) Jeremy Eunine and Roy Henriksson, "Asset Allocation and Options" *The Journal of Portfolio Management* (Fall 1987), pp. 56-61.
- 3) Roger G. Clarke, Michael T. FitzGerald, Phillip Berent, and Heir Statman, "Market Timing with Imperfect Information," *Financial Analyst Journal* (Nov.-Dec., 1989), pp. 27-36.
- 4) R. C. Grinold, "The Fundamental Law of Active Management," *The Journal of Portfolio Management* (Spring 1989), pp. 30-37.
- 5) J.H. Chua and R.S. Woodward, "Gains from Stock Market Timing," *Monograph Series in Finance and Economics*, Salomon Brothers, Monograph 1986-2, p. 19.
- 6) Brinson, pp. 39-44.
- 7) Chua, p. 15.
- 8) Roger G. Clarke, Michael T. FitzGerald, Philip Berent, and Meir Statman, "Diversifying Among Asset Allocators," *The Journal of Portfolio Management* (Spring 1990), pp. 9-14.

TAB

8

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**Paper:** Basic Retirement Funds - Part I  
Investment Objectives and Risk Tolerance

**Date:** December 1986

**Background:**

The entire series of papers on the Basic Funds (see Tabs B-D) updated and expanded on the policies adopted and implemented by the Board from 1983-1986.

This series of papers replaced the following documents written and adopted in 1983:

- IAC Asset Mix Committee Report, August 1983
- IAC Asset Mix Committee Supplemental Report, December 1983

**Changes Since Publication:**

Concepts embodied in the "investment objectives" listed in this paper were incorporated in the "mission statement" developed by the Task Force on Fund Objectives (see Tab A). Risk tolerance was not addressed specifically by the Task Force.

**Prepared:** January 1990

**BASIC RETIREMENT FUNDS  
INVESTMENT POLICY**

**PART I  
INVESTMENT OBJECTIVES AND RISK TOLERANCE**

**Staff Position Paper  
December 1986**

## EXECUTIVE SUMMARY

The Basic Retirement Funds' investment program has been in place for over three years. In that time, both the capital markets and the Basic Funds have undergone changes. This position paper is designed to update and formally present the Board's investment policy for the Basic Funds.

The paper is divided into four parts:

- Part I discusses investment objectives and risk tolerance.
- Part II focuses on long-run asset mix.
- Part III deals with investment management structure.
- Part IV examines performance evaluation.

The first part of the position paper is contained in this report. Parts II, III, and IV will be presented to the Board in separate reports at its future meetings.

An important product of this position paper is a formal investment policy statement for the Basic Funds. An investment policy statement is a set of guidelines for the management of financial assets. It is an excellent means of communicating investment policy to interested parties. It can be especially useful in periods of adverse market conditions when the temptation to deviate from sound long-term investment policy is greatest.

Staff believes that three principal investment objectives apply to the management of the Basic Funds. Those objectives are:

- Secure promised benefits.
- Reduce employer/employee contributions and/or increase promised benefits.
- Avoid excessive short-run volatility in portfolio returns.

The first and third objectives are best achieved through a minimum risk policy. The second objective is best achieved through a maximum return policy. The appropriate

investment policy for the Basic Funds will depend on the relative emphasis that the Board places on each objective. Currently, the Basic Funds are managed under a policy which is oriented toward maximum return.

Current actuarial data indicates that, given existing contribution schedules, the fulfillment of the first objective requires taking on at least a moderate level of investment risk. But the assets of the Basic Funds are not likely to be sufficiently large under such a policy to meet the second objective. Only an aggressive investment policy can offer the chance to reduce contributions and/or increase benefits.

The Board's willingness to tolerate short-run portfolio return volatility will be an important factor in determining an appropriate investment policy. Historical capital markets data amply demonstrates the strong direct relationship between investment risk and return. Therefore, an aggressive policy will provide the highest expected long-run returns, but also produce the highest level of short-run risk. Short-run volatility can be reduced by limiting investments in high volatility, high return assets such as common stocks and replacing them with lower volatility, lower return assets such as high quality bonds.

Alternatively, short-run volatility can be reduced by diversifying among equity assets such as domestic common stocks, venture capital, real estate, and resource assets. Foreign equity investments also offer diversification potential. Combining these diverse equity assets can dampen volatility without necessarily inhibiting long-run returns.

## RECOMMENDED INVESTMENT POLICY STATEMENT: PART I

Three specific investment objectives are pursued by the Board in the management of the Basic Retirement Funds. In order of importance, those investment objectives are:

1. Secure promised benefits
2. Reduce employer/employee contributions and/or increase promised benefits.
3. Avoid excessive short-run volatility in portfolio returns.

The Board views the securitization of benefits promised public employees as the primary investment goal of the Basic Funds. Any investment program implemented by the Board must maintain the financial integrity of the Basic Funds with a high degree of confidence.

The Board also recognizes that it is desirable to assume additional investment risk with the goal of earning higher returns. The funded status of the Basic Funds currently is not sufficient to achieve objective #2 unless an aggressive investment program is pursued. Higher returns will produce additional assets in excess of liabilities that will permit reductions in employer/employee contributions and/or increases in promised benefits. However, this aggressive investment program must remain consistent with objective #1.

Finally, The Board wishes to avoid excessive short-run portfolio return volatility. The Board recognizes that the pension obligations of the Basic Funds are long-term in nature. Further, the Board acknowledges that the short-run volatility of returns of an aggressive policy is greater than that of a conservative policy. Nevertheless, the Board desires that the long-term investment program for the Basic Funds be tempered by a sensitivity to the consequences of large, negative, short-run performance results.

With these investment objectives in mind, the Board views its risk tolerance in the management of the Basic Retirement Funds as relatively high. Despite its concern over

excessive short-run declines in portfolio value, the Board is willing to accept a wide range of performance results in exchange for the likelihood of earning superior long-run returns. The Board recognizes that capital markets historical returns support the contention that assuming short-run investment risk is well-compensated over the long-run. Therefore, the Board has chosen to implement an investment policy for the Basic Funds that benefits from this trade-off.

## SECTION 1: OVERVIEW

### NEED TO REVIEW CURRENT POLICY

In August 1983, a staff report, prepared in collaboration with the Investment Advisory Council, examined the Basic Retirement Funds. That report recommended a long-term asset mix and investment management structure to the SBI. The paper's primary recommendations were adopted by the Board and have subsequently guided the investment of the Basic Funds' assets.

Over three years have passed since the issuance of that position paper. Considerable changes have occurred in that time. The Basic Funds have grown in size from \$3.0 billion to over \$4.5 billion. The Board has expanded the Basic Funds' equity commitments and moved into new investment vehicles such as venture capital. The Basic Funds' assets, which were formerly managed solely by internal staff, are now managed externally by a broad array of money managers.

Further, the investment environment confronting the Basic Funds has changed. Several developments are especially noteworthy. First, the management of pension assets is a dynamic, constantly evolving business. As a result, new investment techniques and vehicles continue to be developed at a rapid pace. Second, the stock and bond markets in recent years have produced unusually high returns. The investment performance of the Basic Funds has averaged 14.9% per year for the last three years. Third, legislative changes have impacted the Basic Funds. In particular, the "Rule of 85" suddenly and unexpectedly produced a drain on the Basic Funds' assets. Fourth, the Board and staff have gained considerable experience in the management of large complex pools of pension assets over the last three years.

Given these developments, staff believes that it is appropriate to review the investment program applied to the Basic Funds. In this position paper, staff makes specific recommendations regarding how that program should be refined so that the Basic

Funds remain responsive to their financial environment in the years ahead. An important product of this paper is a recommended formal investment policy statement for the Basic Retirement Funds.

### **SCOPE OF THE POSITION PAPER**

This position paper is divided into four parts:

- Part I discusses the investment objectives of the Basic Funds and the Board's risk tolerance.
- Part II considers an appropriate policy (long-run) asset mix for the Basic Funds. It presents investment targets for each asset class. It also examines the issue of market timing.
- Part III deals with the investment management structure for the Basic Funds. In particular, it focuses on the allocation of assets between passive and active management. It also recommends an arrangement of investment styles within the actively managed components of the Basic Funds.
- Part IV examines methods for feedback and control of the investment process. It reviews procedures for identifying value added (and subtracted) to the Basic Funds' performance, both on the individual manager and the plan sponsor levels.

The first part of the study, dealing with investment objectives and risk tolerance, is contained in this report. Parts II, III, and IV will be presented to the Board in separate reports at its future meetings. Each part of the position paper concludes with a recommended statement of the Board's investment policy regarding the specific issues under discussion. The aggregation of these statements represents staff's recommended investment policy statement for the Basic Funds.

This study will draw on information developed by a number of sources. These sources include the Board's staff, the Board's consultant, Richards & Tierney, members of the Investment Advisory Council, and the investment community at-large. It is not possible to develop unambiguous answers to most of the issues presented in this study. However, by giving these issues thorough consideration, the Board can be confident that it



is pursuing a well-designed and consistently-applied investment program appropriate for the Basic Funds.

## **DEFINING AN INVESTMENT POLICY STATEMENT**

An investment policy statement is a set of guidelines for the management of financial assets. An investment policy statement for the Basic Funds serves several functions:

- It delineates the plan's long-term investment objectives.
- It specifies the Board's risk tolerance.
- It establishes an appropriate long-term asset mix and investment management structure.
- It provides a framework for evaluating performance relative to expectations.
- It serves as an excellent form of communication between the Board, staff, investment managers, and plan participants.

Perhaps the most important function of an investment policy statement is as a "stabilizer" in periods of adverse market conditions. At those times, when market values have declined precipitously and the fear of future calamities is greatest, pension policymakers are most tempted to deviate from a sound long-term policy. These deviations are almost always to the detriment of the pension plan. A formal comprehensive investment policy statement, based on realistic long-term capital market expectations, can provide the rationale to resist ill-timed and ad hoc alterations in policy.

## **SECTION II: INVESTMENT OBJECTIVES AND RISK TOLERANCE**

### **WHAT ARE THE BASIC RETIREMENT FUNDS?**

The majority of Minnesota's public employees are covered by the statewide pension plans. Totaling six in number, each plan is administered by one of three separate retirement systems:

- Teachers Retirement Association (TRA)
- Public Employees Retirement Association (PERA)
- Minnesota State Retirement System (MSRS)

In terms of membership, the largest retirement system is PERA with 91,000 active members. PERA administers the Public Employees Retirement Fund and the Public Employees Police and Fire Fund. The second largest retirement system is TRA with 59,000 currently working members. TRA administers only one pension plan, the Teachers Retirement Fund. Finally, MSRS has 47,000 active members. MSRS administers the State Employees Retirement Fund, the Highway Patrol Retirement Fund, and the Judges Retirement Fund. In total, therefore, almost 200,000 currently working public employees are participants in the various statewide retirement plans.

Administration of the pension plans requires the retirement systems to perform a number of important functions. These functions include eligibility determination, participant recordkeeping, collection of contributions, and disbursement of benefits. The retirement systems, however, do not invest the pension assets of their participants. By law, the State Board of Investment is charged with that function.

As employer and employee contributions are received by the retirement systems, the money is turned over to the SBI for investment on behalf of the various retirement plans. The SBI invests these pension assets in a single fund named the Basic Retirement Funds. Thus, the Basic Funds are composed of the pension assets of currently employed

participants in the six statewide pension plans. As long as a participating public employee is working, his employer/employee contributions are invested in the Basic Funds. When the public employee retires, his retirement assets are transferred out of the Basic Funds to the Post Retirement Investment Fund.

The breakdown of the Basic Funds' assets by pension plan is shown in Table 1.

**TABLE 1**  
**Composition of the Basic Retirement Funds**  
**June 30, 1986**

<b>Pension Plans</b>	<b>Total Assets (Millions)</b>
Teachers Retirement Fund (TRA)	\$1,847
Public Employees Retirement Fund (PERA)	2,298
State Employees Retirement Fund (MSRS)	969
Public Employees Police and Fire Fund (PERA)	372
Highway Patrol Fund (MSRS)	72
Judges Retirement Fund (MSRS)	6
<b>TOTAL</b>	<u>\$4,564</u>

Although individual pension plan assets comprise the Basic Funds, these plan assets are commingled for investment purposes. Each plan shares, on a pro rata basis, in the investment returns of the Basic Funds as a whole. The commingling, therefore, treats each pension plan equally from an investment policy perspective.

#### **PENSION PLAN INVESTMENT OBJECTIVES AND INVESTMENT POLICY**

In developing an investment policy for any pension plan, the starting point should be an identification of the plan's objectives. Unfortunately, this simple advice is often overlooked. Phrases such as "earning the highest return without incurring undue risk"

frequently serve as the sole statement of a pension plan's goals. This is clearly inadequate. Pension plans, such as the Basic Funds, usually have several investment objectives. Frequently, those objectives are similar from plan to plan. It is the relative emphasis that the plans place on achieving those objectives that implicitly differentiates one plan from another.

A pension plan's primary goal is to secure the employer's promise to pay retirement benefits to employees. The assets of a pension plan represent the security backing the employer's promise. The employer (and sometimes, as in the case of the Basic Funds, the employees) make contributions to a pension plan so as to pre-fund the promised future benefits. [1]

If securing future promised benefits was the only objective of a pension plan, then determining the appropriate investment policy for the fund would be simple. That is, each year the plan sponsor would calculate the employees' accrued benefits. Contributions would be made to the plan based on very conservative investment, salary, and demographic assumptions. The contributions would be invested in a risk-free investment vehicle such as Treasury bills. As a result, there would be virtually zero risk that future benefits could not be paid in full. This policy of focusing solely on securing promised benefits will be referred to as the "minimum risk policy."

While securing promised benefits is the primary goal of most pension plans, it clearly is not the only goal. Two additional objectives commonly are targeted: Reducing employer/employee contributions and/or increasing benefits; and, reducing short-run investment return volatility.

Securing promised benefits through the minimum risk policy is very expensive relative to alternative policies. If the plan sponsor were to abandon the minimum risk policy of investing only in risk-free assets, the expected long-run return to the pension plan would be higher. Over the years, the capital markets have rewarded investors in risky assets in direct proportion to the short-run volatility of returns on those assets. With a

higher expected return on invested assets, the plan sponsor could chose to reduce contributions and/or increase benefits. In the extreme, the plan sponsor could place all of the plan's assets in the highest risk investible asset class (e.g., common stocks). The plan's expected long-run return would be the highest possible. Therefore, contributions to the pension fund could be reduced (or benefits increased) to the lowest (highest) level possible. This policy of focusing on achieving the highest expected returns for the pension plan will be referred to as the "maximum return policy."

*The maximum return policy's primary drawback is that it also entails the greatest amount of short-run volatility in investment returns. There will be periods of time when investment results under this policy are quite dismal. Policymakers may be uncomfortable with the large short-run fluctuations in the value of the pension plan, even if that value is maximized over the long-run.*

To summarize, the objectives pursued by a typical pension plan are not fully compatible. The plan's primary goal, securing promised benefits, and a secondary goal, reducing short-run return volatility, are best fulfilled by a minimum risk policy. The plan's other secondary goal, lowering expected costs and/or raising expected benefits, is best achieved through a maximum return policy.

It is the plan sponsor's responsibility to weigh these conflicting objectives. The resulting investment policy will reflect the relative emphasis placed by the plan sponsor on these objectives. Implicitly, it is these weighting decisions that produce the essential differences among the investment policies pursued by pension plans. In determining the appropriate investment policy for the Basic Funds, the SBI must consider the desires of those groups that have a direct interest in the investment performance of the Basic Funds. The preferences of public employees, legislators, retirement system administrators, taxpayers and Board members themselves must all be considered by the Board when weighing the Basic Funds' various objectives.

## CURRENT INVESTMENT POLICY

The 1983 staff report recommended an aggressive investment policy. The policy asset mix adopted by the Board in 1983 is skewed toward common stocks, a relatively high risk asset class. In fact, the allocation to equity assets is at the highest level permitted by statute. The Board's current policy asset mix for the Basic Retirement Funds is shown in Table 2.

**TABLE 2**  
**Basic Retirement Funds**  
**Current Policy Asset Mix**

<b>Equity Assets</b>		75.0%
Common Stocks	60.0	
Venture Capital	2.5	
Real Estate	10.0	
Resource Funds	2.5	
<b>Fixed Income Assets</b>		25.0
Bonds	22.0	
Cash Equivalents	3.0	
<b>TOTAL</b>		<u>100.0%</u>

While not at the extreme of the maximum return policy, the investment policy implicit in the Board's current asset allocation is oriented more toward maximum return than *minimum risk*. The fact that the Board has an investment policy geared toward producing returns above those of the minimum risk policy implies that the Board, and its constituents, are concerned with more than merely securing promised benefit increases. There must also be an interest in reducing pension costs and/or permitting benefits to be increased.

## **LINKING INVESTMENT POLICY AND BENEFIT POLICY**

How should the liabilities (i.e., promised future benefits) of the *Basic Funds* enter into the Board's decision regarding an appropriate investment policy? In an ideal situation, the development of benefit policy and investment policy would go hand-in-hand. Policymakers would determine a range of possible benefits to be promised employees. Utilizing realistic economic and demographic data, these benefit policies could then be translated into expected future liabilities. Jointly, a set of investment policies ranging from minimum risk to maximum return could be studied. The excess (or deficit) of expected pension plan assets over plan liabilities under different investment and benefit policies could be analyzed. Policymakers would be able to make well-informed decisions regarding the costs and risks associated with various benefit and investment policies.

This ideal pension policy decisionmaking process is difficult to implement in practice. As in most other states, and even in most corporations, Minnesota benefit policymakers (i.e., the Legislature, the retirement systems, and Finance Department) and investment policymakers (i.e., the SBI) do not jointly determine pension policy. Benefits generally are established independently of investment policy. An example of this dichotomous decisionmaking was the "Rule of 85." The early retirement legislation, passed in 1983, was enacted without consultation with the SBI. Yet the "Rule of 85" caused sizable withdrawals from the Basic Retirement Funds. At times these withdrawals forced the Board to hurriedly raise cash and alter asset allocations to various managers.

As estimated by the Legislative Commission on Pensions and Retirement's (LCRP) actuary, in aggregate, the assets of the Basic Funds are below projected liabilities. The ratio of actuarial-valued assets to liabilities (i.e., the funding ratio) is roughly 75%. This deficit, however, is being made up over time. Employers make contributions each paycheck to finance this unfunded liability. Under current plans, the unfunded liability should be erased by the year 2009. Therefore, from the Board's perspective, it is reasonable to view the Basic Funds as being fully funded, given the actuary's assumptions.

An inspection of the actuary's economic assumptions provides information relevant to a selection of an investment policy for the Basic Funds. The LCPR's actuary assumes that wages will grow a 6.5% per year while investment earnings will produce an average annual 8.0% return. This 1.5% differential is based on a 6% inflation assumption. Thus, the actuary assumes that the Board can earn a 2% (8% - 6%) inflation-adjusted rate of return on the Basic Funds' assets. Given historical capital markets return data, this assumption implies a moderate level of investment risk. Thus, the actuary implicitly assumes that the Board's investment policy is oriented slightly more toward a minimum risk policy than a maximum return policy.

Actuarial data indicates that a moderate-risk investment policy should be sufficient to just meet the Basic Funds' projected obligations. But the Board should recognize that this same actuarial data also implies that a moderate-risk investment policy cannot be expected to produce a surplus of plan assets over plan liabilities. Under such a policy, no cushion is expected to be available to permit reduced contribution or higher benefits in the future. Only a more aggressive investment policy can be expected to achieve these plan objectives.

#### **SHORT-TERM RISK TOLERANCE**

If the Basic Funds are to achieve the goals of permitting increased benefits and/or reduced contributions, an investment policy oriented toward maximum return will be necessary. But how aggressive that investment policy should be will depend to a large extent on the Board's (and other interested parties) willingness to tolerate volatility in portfolio returns over the short-run.

For a large pension plan, such as the Basic Funds, the most aggressive, feasible investment policy would entail a 100% commitment to common stocks. Historical experience indicates that this investment policy would produce the highest long-run returns possible. Yet over short intervals (e.g., a quarter, a year, or even two-to-three



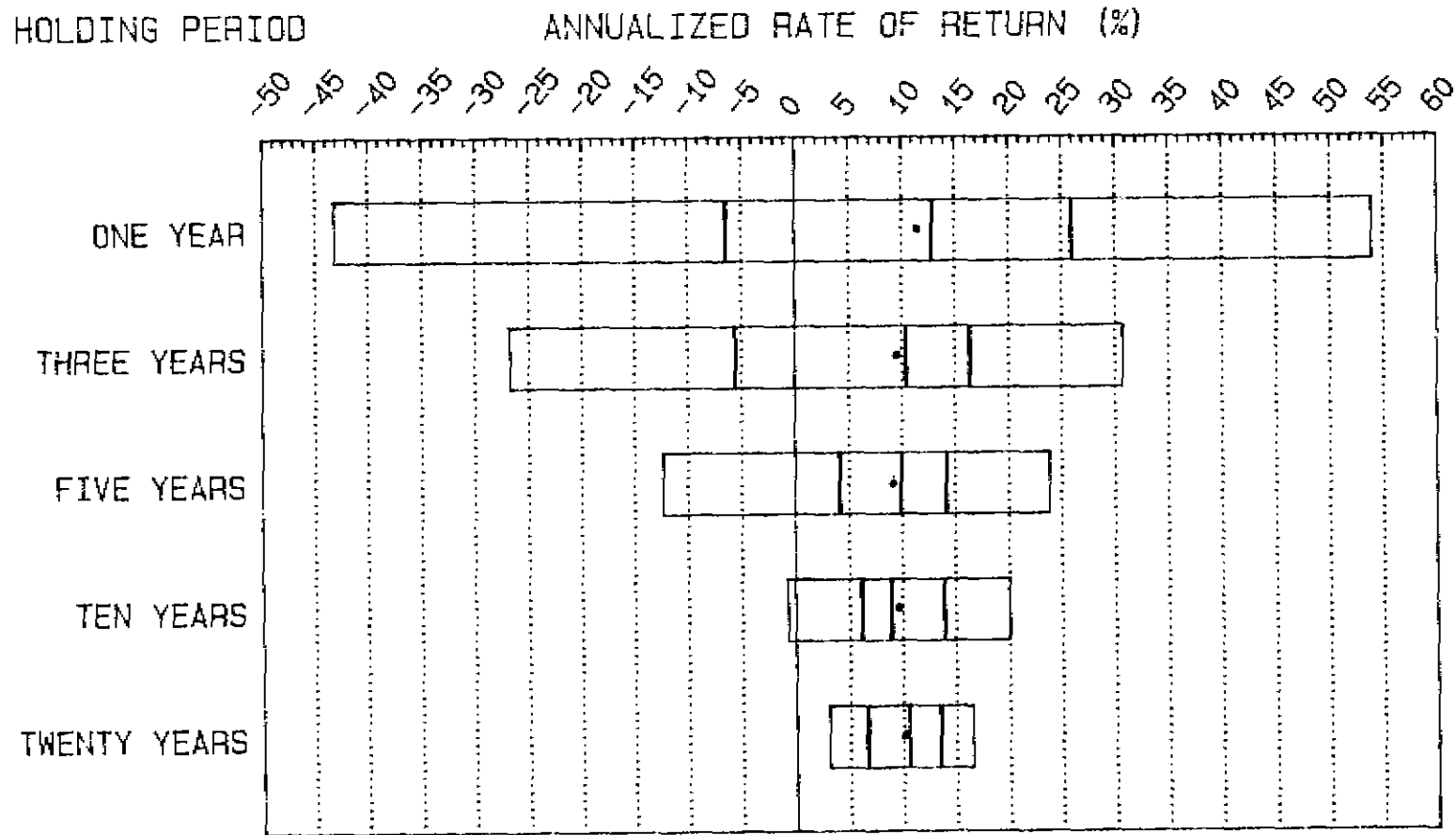
years), such an aggressive investment policy has the potential to yield extremely poor results. Would the Board be comfortable with a two-year cumulative performance result of -37.2%? This result would have happened with a 100% commitment to common stocks as recently as 1973-74. On the other hand, the Board should recognize that there has never been a 20-year period in which a 100% commitment to common stock would have generated a negative return. This data includes periods that encompass the Great Depression.

The range of annualized results from a 100% commitment to common stocks over 1,3,5,10 and 20 year periods is shown in Figure 1. Note that common stocks are very volatile in the short-run. The range of results for one-year holding periods is -43.3% to 54.0%. In contrast, as the holding period lengthens, the range of results narrows. For the 20-year holding period, annualized stock returns range from 2.9% to 16.6%. Yet despite the narrowing in the range of returns, the annualized average return, as the holding period increases, remains roughly the same, around 10%.

One means to limit short-run volatility is to adopt an investment policy less aggressive than the maximum return policy. This policy would entail holding a smaller percentage of common stocks and a higher percentage of fixed income assets, such as high quality bonds and cash equivalents. Figure 2 illustrates the annual returns generated by stocks, bonds, and cash equivalents over the period 1926-85. The less volatile nature of returns from bonds and cash equivalents relative to stocks is clearly evident. While a more conservative policy would produce less volatile short-term results, over the long-run, portfolio returns would be lower. Therefore, the ability to achieve the goals of benefit increases and/or contribution reductions would be diminished.

If the Board is to follow a less aggressive investment policy than the maximum return policy, it must determine the extent to which long-run returns are to be sacrificed in exchange for reduced short-run volatility. This is a difficult decision. Most pension plans, such as the Basic Funds, have liabilities that are very long-term in nature. Ideally, their

FIGURE 1  
COMMON STOCKS HISTORICAL RETURNS  
ALTERNATIVE HOLDING PERIODS



PERIOD OF ANALYSIS: 1926-85

SOURCE: IBBOTSON ASSOCIATES

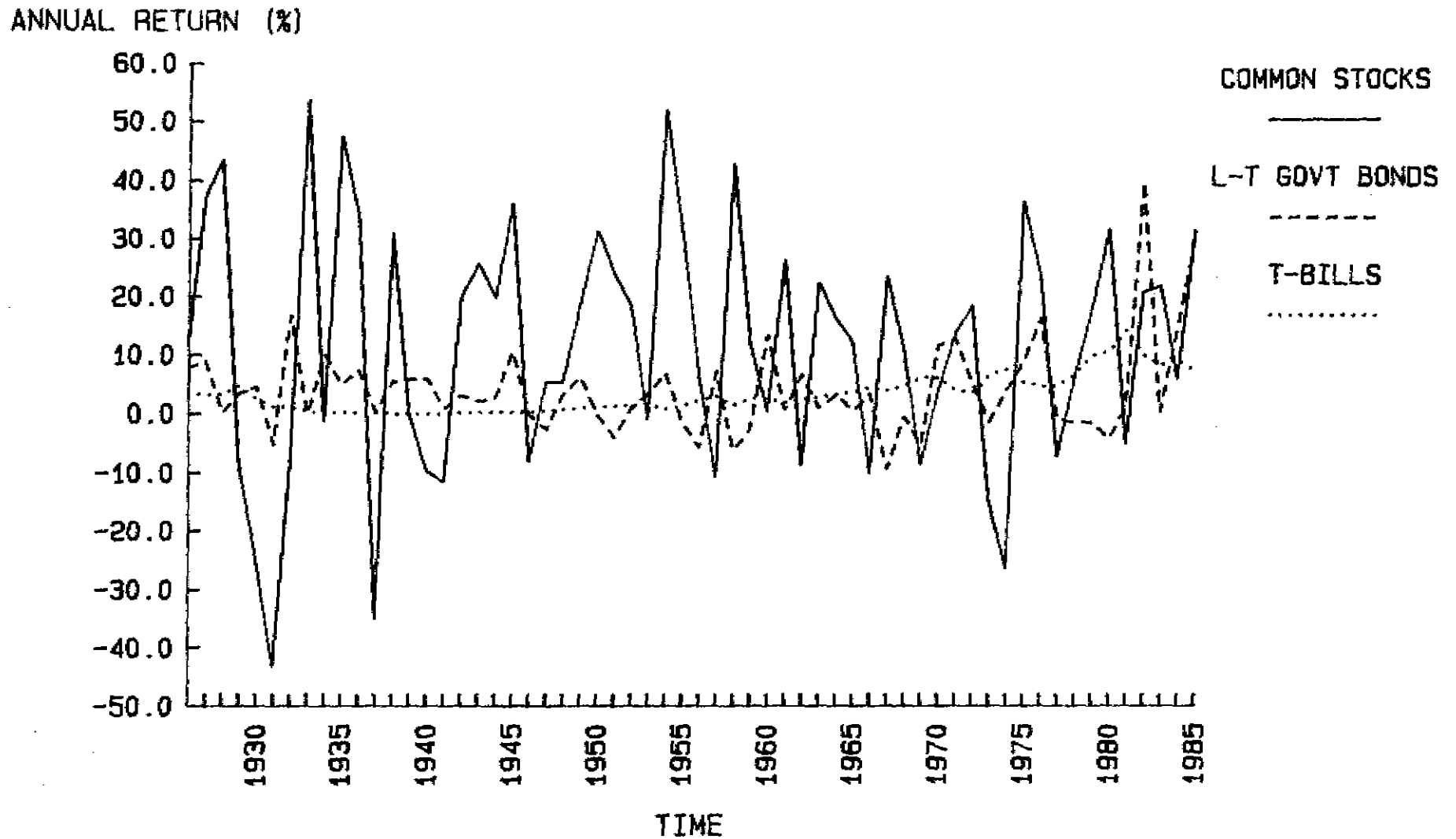
— QUARTILE BREAKS  
• AVERAGE VALUE

investment policies should be similarly long-term. But it is human nature to focus on the short-term. Board members and staff have effective time horizons considerably shorter than the 20-30 year horizon of the Basic Funds' liabilities. Decisions regarding the amount of acceptable short-run risk naturally will reflect these considerations.

An alternative to adopting a less aggressive investment policy is to control short-run volatility by diversifying within equity investments. The Board need not invest only in domestic common stocks. It already invests in alternative equity assets such as venture capital, real estate, and resource assets. Foreign equity investments are another attractive possibility (although legislation to permit such investments would be required). All of these equity assets exhibit relatively low correlations of returns. Combining them into a portfolio will dampen volatility, without necessarily inhibiting long-run returns. [2]

Staff recommends that both approaches to controlling short-run return volatility be followed. A 100% commitment to equity assets, even if diversified across a number of equity asset types, still would probably not dampen volatility to the Board's satisfaction. Conversely, the exposure to fixed income assets sufficient to adequately limit short-run volatility probably would result in too great a reduction in long-run returns. A blend of the two approaches is preferable. This issue of the appropriate asset mix for the Basic Funds, given the Board's risk tolerance, is a crucial one. It will be the subject of the second part of this staff position paper.

**FIGURE 2**  
**ASSET CLASS HISTORICAL RETURNS**  
**1926 - 1985**



SOURCE: IBBOTSON ASSOCIATES

## FOOTNOTES

1. It is debatable whether this primary goal involves securing retirement benefits for the employees in real (i.e., inflation-adjusted) terms. Is the employer responsible not only for seeing that the nominal benefits are secured, but also for ensuring that these benefits rise sufficiently to compensate for the purchasing power effect of inflation? Most corporate and public pension plans have not instituted a consistent policy of providing for such inflation adjustments.

With respect to the investment objectives of the basic Retirement Funds, this issue of inflation adjustments is largely moot. Because retirement benefits are based upon employees' "high five" average salaries, there is a de facto inflation adjustment built into the benefit calculation up until the employees' retirements. After they retire, their pension assets are transferred to the Post Retirement Investment Fund. It is this fund where the objective of securing inflation-adjusted benefits should be addressed.

2. A third alternative to dampening short-run volatility of returns is to utilize an investment strategy, such as portfolio insurance, that directly modifies the distribution of possible portfolio returns. Portfolio insurance is designed to protect a financial asset portfolio from declines in value below a specified level, without severely limiting the upside potential of the portfolio.

Staff has chosen not to incorporate portfolio insurance as part of its investment policy recommendations. The concept is relatively new and untried over a wide range of capital market environments. Further, there are many significant, unresolved issues regarding the cost and implementation of portfolio insurance. As these questions are answered in the future, the Board may wish to consider using portfolio insurance, or other strategies that modify the distribution of investments returns.

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TAB

9

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**Paper:** Basic Retirement Funds - Part II  
Policy Asset Mix, Asset Class Targets and Market Timing.

**Date:** February 1987

**Background:**

The entire series of papers on the Basic Funds (see Tab B-D) updated and expanded on the policies adopted and implemented by the Board from 1983-1986.

This series of papers replaced the following documents written and adopted in 1983.

- IAC Asset Mix Committee Report, August 1983
- IAC Asset Mix Committee Supplemental Report, December 1983

**Changes Since Publication:**

**Policy Asset Mix**

	<b>Paper</b>	<b>Current Policy</b>
Domestic Common Stocks	60.0%	60.0%
International Stocks	0.0	10.0
Domestic Bonds	22.0	24.0
Alternative Assets	0.0	15.0
Real Estate	10.0	0.0
Venture Capital	2.5	0.0
Resource Funds	2.5	0.0
Unallocated Cash	<u>3.0</u>	<u>1.0</u>
	100.0%	100.0%

**Asset Class Targets**

- Stocks - No change. The Wilshire 5000 is used.
- Bonds - The recommendation to use the Salomon Large Pension Fund Baseline Index was not implemented. The Board continued to use the Salomon Broad Investment Grade (BIG) Index as its asset class target for bonds through June 1994. In July 1994, the target was changed to the Lehman Aggregate.

- **Alternative Assets** - Staff and the IAC reviewed asset class targets for real estate, venture capital and resource funds in 1989. The Wilshire Real Estate Fund Index was adopted for real estate. No acceptable class targets have been identified for venture capital and oil and gas.

### **Market Timing**

No change.

The Board has not attempted to market time its investments in any asset class or investment management style. (See also Tab F, Tactical Asset Allocation)

### **Rebalancing Guidelines**

No substantial changes.

The need for rebalancing is reviewed monthly rather than quarterly as described in the paper. Underweightings in ill-liquid asset classes (real estate, venture capital, resource funds) are offset by additional allocations to bonds rather than cash as described in the paper. This change was needed after the Board adopted the recommendation to hold minimal unallocated cash when it reviewed the Report of the Task Force on Fund Objectives.

**Prepared: March 1991**

**Paper:** Basic Retirement Funds - Part II  
Policy Asset Mix, Asset Class Targets and Market Timing.

**Date:** February 1987

**Background:**

The entire series of papers on the Basic Funds (see Tab B-D) updated and expanded on the policies adopted and implemented by the Board from 1983-1986.

This series of papers replaced the following documents written and adopted in 1983.

- IAC Asset Mix Committee Report, August 1983
- IAC Asset Mix Committee Supplemental Report, December 1983

**Changes Since Publication:**

**Policy Asset Mix**

Small changes have been made in response to the report of the Task Force on Fund Objectives issued in early 1989 (see Tab A).

	<b>Paper</b>	<b>Current Policy</b>
Domestic Common Stocks	60.0%	60.0%
Domestic Bonds	22.0	24.0
Real Estate	10.0	10.0
Venture Capital	2.5	2.5
Resource Funds	2.5	2.5
Unallocated Cash	<u>3.0</u>	<u>1.0</u>
	100.0%	100.0%

The Board has approved (but not yet implemented) a 10% allocation to international stocks.

**Asset Class Targets**

- Stocks - No change. The Wilshire 5000 is used.
- Bonds - The recommendation to use the Salomon Large Pension Fund Baseline Index was not implemented. The Board continues to use the Salomon Broad Investment Grade (BIG) Index as its asset class target for bonds.

- **Alternative Assets** - Staff and the IAC reviewed asset class targets for real estate, venture capital and resource funds in 1989. The Wilshire Real Estate Fund Index was adopted for real estate. No acceptable class targets have been identified for venture capital and oil and gas.

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The need for rebalancing is reviewed monthly rather than quarterly as described in the paper. Underweightings in ill-liquid asset classes (real estate, venture capital, resource funds) are offset by additional allocations to bonds rather than cash as described in the paper. This change was needed after the Board adopted the recommendation to hold minimal unallocated cash when it reviewed the Report of the Task Force on Fund Objectives.

**Prepared: March 1991**

**BASIC RETIREMENT FUNDS  
INVESTMENT POLICY**

**PART II**

**POLICY ASSET MIX, ASSET CLASS TARGETS, AND MARKET  
TIMING**

**Staff Position Paper  
February 1987**

## **EXECUTIVE SUMMARY**

Part I of Basic Retirement Funds' investment policy paper addressed the issues of investment objectives and risk tolerance. The securitization of promised benefits is the primary investment goal of the Basic Funds. However, high returns, that will permit pension cost reductions and/or benefit increases, are also desired. The Board is willing to accept considerable short-run volatility in portfolio returns in exchange for the opportunity to earn high long-run returns.

Building upon the conclusions of Part I, Part II of the investment policy paper considers three specific subjects:

- Policy asset mix
- Asset class targets
- Market timing

A pension plan's policy asset mix is the desired long-run allocation of plan assets among various broad asset classes. It represents that combination of asset classes believed to be most consistent with the plan's investment objectives and risk tolerance.

The approach used to determine an appropriate policy asset mix for the Basic Funds is the "strategic planning" method. This method builds a logically consistent case for a particular policy asset mix based upon a pension plan's investment objectives, investment theory, and historical and expected capital markets returns and risks. Applied to the Basic Funds, the strategic planning method translates the Basic Funds' investment objectives into three asset mix requirements:

- To secure promised benefits, the policy asset mix must avoid financial catastrophes which might result from a severe economic depression or inflation.
- To reduce pension costs and/or increase benefits, the policy asset mix must seek maximum returns, within the constraints of the first and third objectives.

- To avoid excessive short-run volatility, the policy asset mix must achieve adequate diversification.

Based upon the strategic planning analysis, staff recommends that the Board's current policy asset mix for the Basic Funds be maintained. That policy asset mix is:

<b>Equity Assets</b>		75.0%
Common Stocks	60.0%	
Venture Capital	2.5	
Real Estate	10.0	
Resource Funds	2.5	
<b>Fixed Income Assets</b>		25.0
Bonds	22.0	
Cash Equivalents	3.0	
		<u>100.0%</u>

The Basic Funds' policy asset mix is aggressively positioned in common stocks and venture capital, which serve as total return maximizing vehicles. Real estate and resource funds act as inflation hedges, while bonds are a deflation hedge. In addition, the non-common stock asset classes also produce meaningful diversification benefits in the total portfolio which is dominated by common stocks.

An asset class target is a diversified collection of securities within a particular asset class. It represents the set of feasible investment opportunities that best achieves the purposes for which the asset class is included in the policy asset mix. The selection of an appropriate asset class target completes the connection between the pension plan's investment objectives and policy asset mix.

In many cases, the full range of investment opportunities available in the market place to institutional investors should represent the asset class target. However, there may be specific circumstances under which the target should be restricted to a certain subset of securities within an asset class.

The following market indices are recommended as targets for the asset classes included in the Basic Funds' policy asset mix:

**Asset Class**

- o Common Stocks
- o Bonds
  
- o Case Equivalents
- o Real Estate
  
- o Venture Capital
- o Resource Funds

**Asset Class Target**

- o Wilshire 5000
- o Salomon Brothers Large Pension Fund  
Baseline Bond Index
- o 90-day Treasury Bills
- o Prudential Real Estate Investment  
Separate Account
- o First Chicago Venture Capital Index
- o Portfolio of publicly held energy  
companies

Market timing is the short-run deviation from a policy asset mix in order to take advantage of perceived temporary over or underevaluations of particular asset classes. The potential gains from successful market timing are strikingly large. However, the potential losses from unsuccessful market timing are even greater.

Staff recommends against market timing on a policy level based upon the necessarily large commitment of assets, the highly uncertain outcome of the strategy, and the potentially sizable transactions costs for a large pension plan such as the Basic Funds.





## RECOMMENDED INVESTMENT POLICY STATEMENT: PART II

The Board desires to select a policy asset mix that is consistent with the investment objectives and risk tolerance established for the Basic Retirement Funds. Those investment objectives emphasize the securitization of the Basic Funds' pension obligations, while at the same time recognizing the cost reduction and/or benefit enhancement advantages of a high return policy. The Board views its tolerance for short-run return volatility in the Basic Funds' investment portfolio as being relatively high.

The Board has reviewed the available capital markets' risk-return historical data. The Board believes that a large common stock exposure in the policy asset mix is appropriate for the Basic Funds. However, the Board seeks to protect the Basic Funds from debilitating economic environments by holding deflation and inflation hedge assets. Additionally, the Board seeks to avoid excessive short-run return volatility by diversifying among equity and fixed income assets.

The policy asset mix established by the Board for the Basic Funds is:

<b>Equity Assets</b>		75.0%
Common Stocks	60.0	
Venture Capital	2.5	
Real Estate	10.0	
Resource Funds	2.5	
<b>Fixed Income Assets</b>		25.0
Bonds	22.0	
Cash Equivalents	3.0	
<b>TOTAL</b>		<u>100.0%</u>

The Board also desires to select asset class targets that best achieve the purposes for which each of the various asset classes are included in the policy asset mix. The asset class targets chosen by the Board for the Basic Funds are:

**Asset Class**

- o Common Stocks
- o Bonds
  
- o Cash Equivalents
- o Real Estate
  
- o Venture Capital
- o Resource Funds

**Asset Class Target**

- o Wilshire 5000
- o Salomon Brothers Large Pension Fund Baseline Index
- o 90-day Treasury Bills
- o Prudential Real Estate Investment Separate Account
- o First Chicago Venture Capital Index
- o Portfolio of publicly held energy companies

The Board does not view market timing as a viable option for the Basic Funds. The Board intends to alter the Basic Funds' asset mix only in the event of fundamental changes in: the Board's investment authority; the Basic Funds' investment objectives; or, the long-term risk-return opportunities available in the capital markets.

## SECTION 1: REVIEW OF PART I CONCLUSIONS

Part I of the Basic Retirement Funds' investment policy paper dealt with fund objectives and risk tolerance. Specifically, Part I identified three primary investment objectives for the Basic Funds. In order of importance, those investment objectives are:

- 1) Secure promised benefits.
- 2) Reduce employer/employee contributions and/or increase promised benefits.
- 3) Avoid excessive short-run volatility in portfolio returns.

Part I explained that the first and third objectives are best achieved through a "minimum risk" investment policy. But this policy also produces the lowest expected long-run returns. Conversely, the second objective is best achieved through a "maximum return" investment policy. However, this policy also results in the highest level of volatility in investment returns. Part I discussed these trade-offs between "minimum risk" and "maximum return" investment policies. The appropriate investment policy for the Basic Funds depends on the relative emphasis that the Board chooses to place on the three investment objectives.

The willingness of the Board to tolerate risk in the short-run figures prominently in its choice of an investment policy. Part I presented historical capital markets return data which demonstrated that asset class long-run returns are highly correlated with short-run risk. The implication is that the more volatility in short-run returns that the Board will accept, the higher will be the expected long-run pay-offs for the Basic Funds' investment portfolio.

The Board is unlikely to be satisfied with the significant short-run volatility inherent in an all-common stock portfolio, even though that portfolio probably would produce the greatest long-run returns. However, staff recommended in Part I that the Board continue to pursue an aggressive investment policy that incorporates a sizable equity exposure.

Excessive short-run volatility can be avoided by maintaining a modest fixed income component and by diversifying among classes of equity assets (e.g., domestic and foreign common stocks, real estate, venture capital, etc.). This investment policy may result in quarters or even years of disappointing returns. Nevertheless, the financial characteristics of an active lives pension fund, such as the Basic Funds, make it well-suited for an aggressive, long time horizon investment policy. If the Board is willing to view its tolerance for short-run risks as being relatively high, the long-run benefits are expected to be significant.

The goal of Part I was to formally present and prioritize the Board's investment objectives for the Basic Funds, as well as to establish the Board's attitude toward investment risk and reward. Part II's purpose is to follow-up on the concepts developed in Part I by presenting a specific set of asset mix recommendations. Part II will accomplish three tasks:

- Recommend a policy (long-run) asset mix for the Basic Retirement Funds.
- Specify a target for each asset class within the policy asset mix.
- Consider the issue of market timing.

## **SECTION 2: POLICY ASSET MIX RECOMMENDATIONS**

### **DEFINITION OF POLICY ASSET MIX**

A pension plan's policy asset mix is the desired long-run allocation of plan assets among various broad asset classes. It represents that combination of asset classes that the plan sponsor believes is most consistent with the plan's investment objectives and risk tolerance.

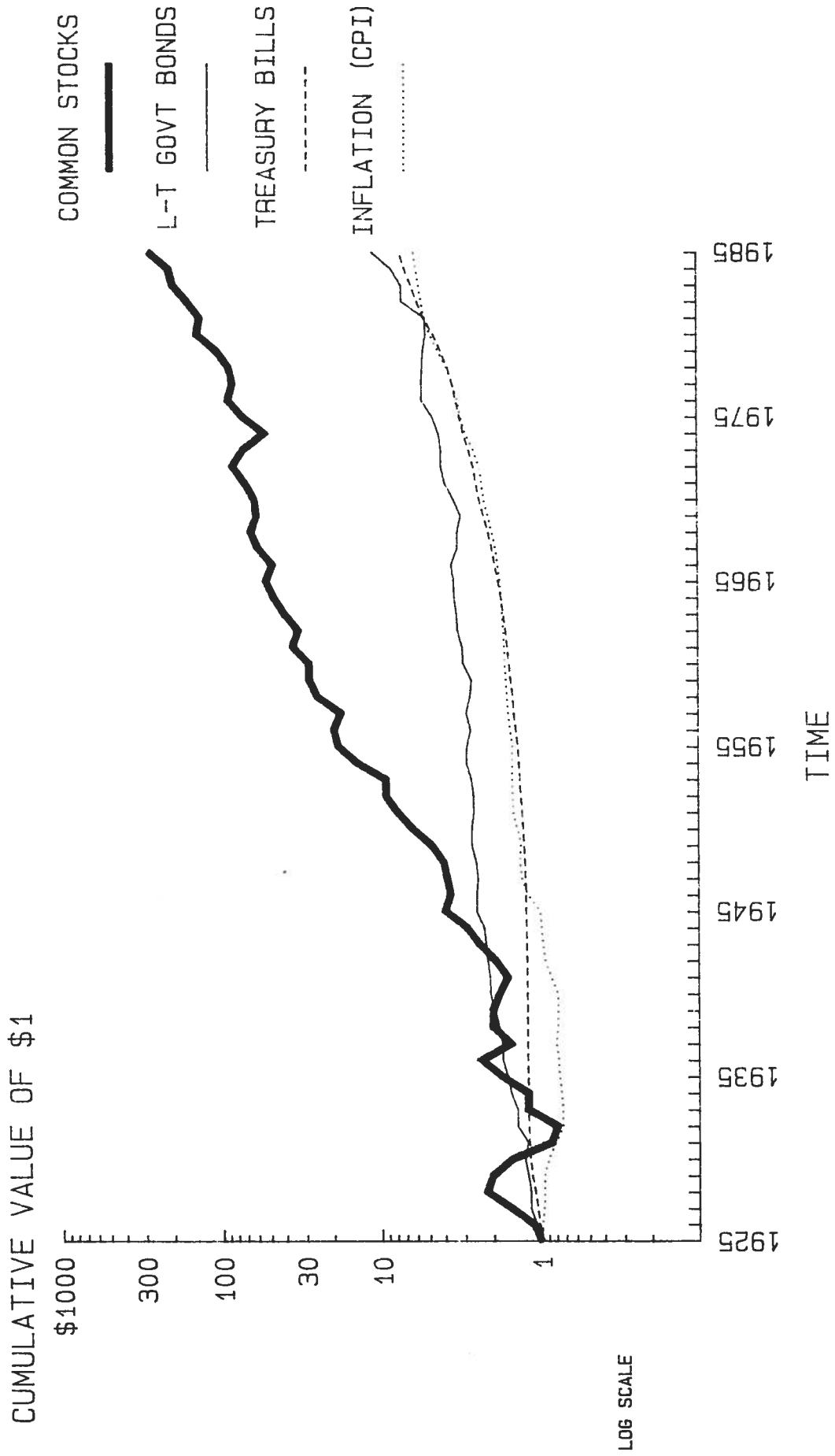
By definition, a plan's policy asset mix is not adjusted in response to transitory market movements. It is changed only when the plan's investment objectives or risk tolerance are altered, or in the rare event that significant changes in the capital markets occur which affect the long-run risk-return relationships between the different asset classes.

The choice of a policy asset mix is one of the most important investment decisions that a plan sponsor can make. The Board, like most plan sponsors, has focused considerable energy selecting and monitoring investment managers. But the impact of managers on the performance of the Basic Funds is dwarfed by the effects of the asset mix decision.

### **BRIEF HISTORICAL CAPITAL MARKETS REVIEW**

The starting point for any asset allocation study is a review of historical capital markets risks and returns. The future is unlikely to mirror the past exactly. Nevertheless, there are established long-run relationships between asset classes that can be expected to hold in the future. Table 1 presents the well-known Ibotson-Sinquefeld data summarizing historical returns and short-run return volatility for common stocks, bonds, cash equivalents, and inflation over the period 1926-85. [1] Figure 1 reinforces the information in Table 1 by showing the cumulative value of \$1 invested in these three asset classes over the same period.

**FIGURE 1**  
**HISTORICAL CAPITAL MARKETS RETURNS**  
**CUMULATIVE INVESTMENT VALUES**  
**1926-1985**



SOURCE: IBBOTSON ASSOCIATES

**TABLE 1**  
**Capital Markets Historical Performance**  
**1926-1985**

	<b>Annual Compound Return</b>	<b>Annual Standard Deviation</b>	<b>Cumulative Value of \$1 Investment</b>
Common Stocks	9.8%	21.2%	\$279.12
Long-term Govt. Bonds	4.1	8.2	11.03
U.S. Treasury Bills	3.4	3.4	7.47
Inflation	3.1	4.9	6.10

Source: Ibbotson Associates

Table 1 and Figure 1 stress concepts developed in Part I of this investment policy paper. Quite simply, common stocks have been by far the best performing asset class over the last 60 years. In fact, common stocks are the only asset class of the three analyzed that has provided a significant real (i.e., inflation-adjusted) return during the 1926-85 period. At the same time, common stocks have been the most volatile asset class, with a standard deviation of returns considerably above that of bonds or cash equivalents. [2] The implication of these historical risk-return data is that the patient investor is well-rewarded over the long-run for accepting short-run risk.

An analysis of the historical risk-return data also provides information regarding the correlation of returns among the three asset classes. Assets whose returns do not move in the same direction at the same time (i.e., exhibit low correlations) are useful in constructing portfolios that dampen return volatility. The process of combining assets whose returns are not highly correlated is referred to as diversification. Table 2 presents correlation coefficients among stocks, bonds, and cash equivalents over the 1926-85 period.



**TABLE 2**  
**Capital Markets Historical Return Correlations**  
**Inflation-Adjusted**  
**1926-1985**

	<b>Common Stocks</b>	<b>L-T Govt Bonds</b>	<b>U.S. T-Bills</b>
Common Stocks	1.00	0.20	0.09
L-T Govt Bonds	0.20	1.00	0.62
T-Bills	0.09	0.62	1.00

Source: Ibbotson Associates

Table 2 shows that the returns on bonds and cash equivalents exhibit historical correlations with common stock returns considerably less than the maximum possible value of 1.0. These relationships, along with the lower volatility of bond and cash equivalent returns, imply that combined in a portfolio with common stocks, bonds and cash equivalents can reduce the volatility of the total portfolio's returns.

Unfortunately, comprehensive historical risk-return information is available only for domestic common stocks, bonds, and cash equivalents. Risk-return information on other investable asset classes is of short history and generally unreliable quality. Data on foreign securities and real estate is gradually improving in quantity and quality. To date, that data indicates that foreign securities and real estate are at least as profitable and probably as volatile as domestic common stocks. Just as importantly, returns on these asset classes appear to have fairly low correlations with domestic common stocks.

#### **STRATEGIC PLANNING APPROACH TO POLICY ASSET MIX SELECTION**

A number of approaches are commonly used by pension plans to arrive at a policy asset mix. Appendix A discusses a representative group of these methods. Of the alternative asset allocation techniques, staff believes that the most effective approach is the "strategic planning" method. [3]

The strategic planning method, in essence, is an eclectic combination of both the qualitative and quantitative asset allocation techniques discussed in Appendix A. The strategic planning method uses the intuitive concepts derived from the qualitative techniques while avoiding much of these methods' arbitrariness. Further, it employs many of the valid conclusions of the quantitative techniques, while extending the analysis past the limits of the available risk-return data.

The strategic planning approach builds a logically consistent argument for a particular policy asset mix based upon a pension plan's investment objectives, conventional investment theory, and objective observations concerning historical and expected capital markets returns and risks.

Applying the strategic planning approach to the Basic Funds, the starting point is the Basic Funds' investment objectives. Translated into asset mix requirements, those objectives are interpreted as follows:

- To secure promised benefits, the policy asset mix must avoid financial catastrophes which might result from a severe economic depression or inflation.
- To reduce pension costs and/or increase benefits, the policy asset mix must seek maximum returns, within the constraints of the first and third objectives.
- To avoid excessive short-run return volatility, the policy asset mix must achieve adequate diversification.

Consider the first asset mix requirement: Avoid financial catastrophes. A significant extended decline in the value of the Basic Funds' assets would seriously impair their ability to pay promised benefits. There are two potential causes of such a decline. The first is a severe economic depression of the magnitude of the Great Depression. The second is a hyperinflation, with consumer prices rising at double or triple digit annual rates.

In the case of an economic depression, the prospects for corporate profits would deteriorate. Common stock prices, both domestic and foreign, would plummet. The

market values of real estate and resource assets would likewise decline drastically as deflation undercut the basis for their valuations.

In the case of a hyperinflation, the probable impacts on financial asset values are more complex. Bond prices would surely decline as interest rates rose. Common stock prices might increase in nominal terms, but on average would probably be unable to keep pace with inflation.

In order to meet the first asset mix requirement, the Basic Funds should hold certain assets that act as a hedge against extreme debilitating economic environments. In the case of an economic depression, high quality, long-term bonds not only will maintain their values but will appreciate in price as interest rates fall. In the case of a hyperinflation, hard assets such as real estate and resource investments can be expected to appreciate in value at a rate at least equal to the inflation rate.

Skipping ahead, consider the third asset mix requirement: Achieve adequate diversification. Excessive volatility in portfolio returns over the short-run can be discomfoting, even if long-run results are successful. Volatility can be reduced by establishing a policy asset mix that is diversified. As discussed above, diversification entails holding assets whose returns are not highly correlated. Bonds and inflation-hedge assets can serve the role of diversifiers to common stocks, in addition to acting as economic hedges. Cash equivalents are also effective diversifiers (and provide the Basic Funds with necessary liquidity), although they provide a lower expected return than bonds or inflation-hedge assets.

Finally, consider the second asset mix requirement: Seek maximum returns. With bonds, inflation-hedge assets, and cash equivalents satisfying the first and third requirements, the remainder of the policy asset mix can be devoted to earning the maximum available returns. Common stocks are the most effective total return vehicles available to a large pension plan seeking maximum returns. They have historically

provided superior returns. In addition, their risk characteristics are well-quantified. And finally, they offer a high degree of investment management flexibility. [4]

### **POLICY ASSET MIX RECOMMENDATION AND RATIONALE**

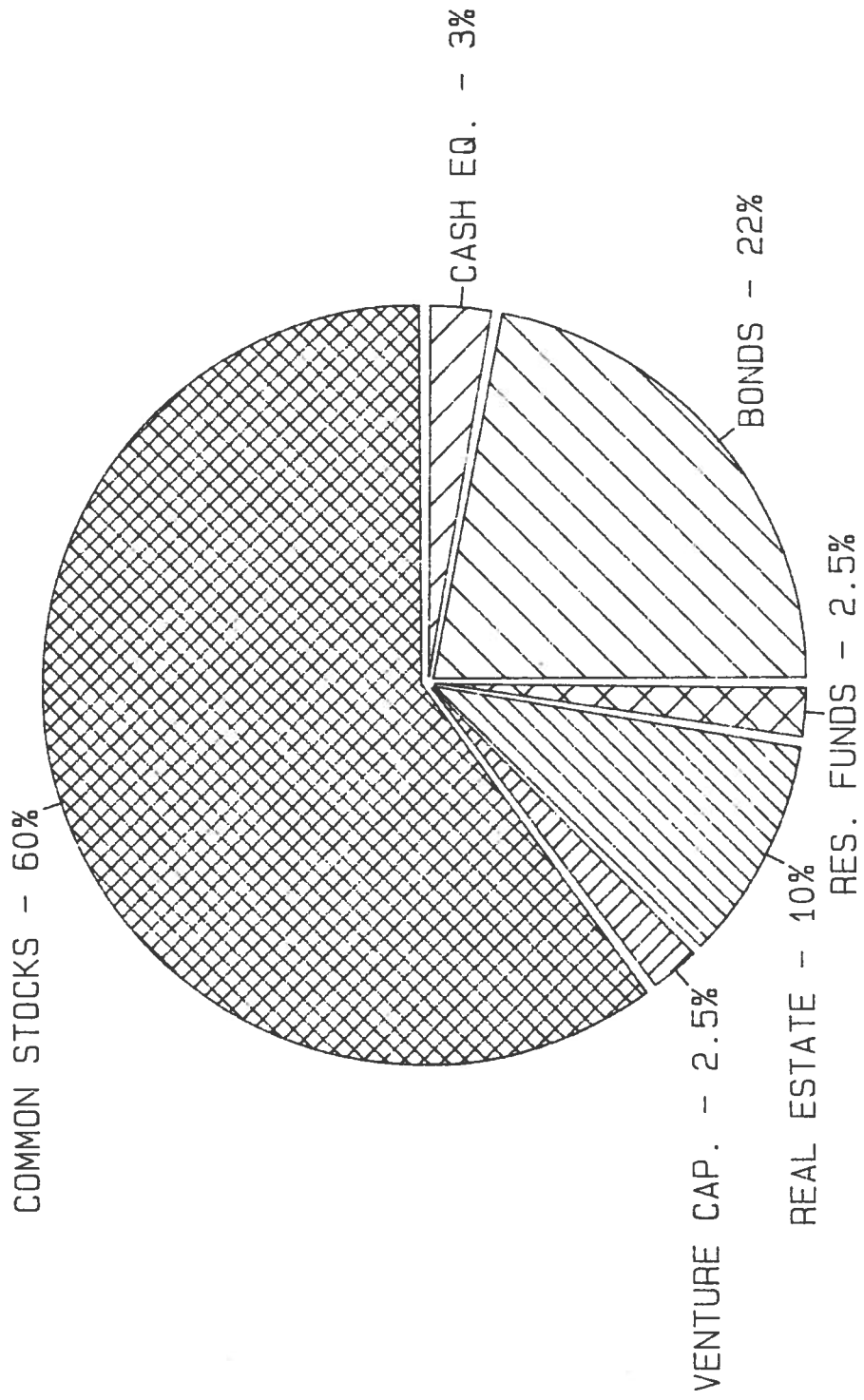
How should the policy asset mix be allocated among common stocks, bonds, inflation-hedge assets, and cash equivalents? The 1983 staff report on the Basic Retirement Funds recommended, and the Board subsequently adopted, the policy asset mix shown in Table 3 and Figure 2.

**TABLE 3**  
**Basic Retirement Funds**  
**Current Policy Asset Mix**

<b>Equity Assets</b>		75.0%
Common Stocks	60.0	
Venture Capital	2.5	
Real Estate	10.0	
Resource Funds	2.5	
<b>Fixed Income Assets</b>		25.0
Bonds	22.0	
Cash Equivalents	3.0	
<b>TOTAL</b>		<u>100.0%</u>

The strategic planning method supplies the rationale for these policy allocations. With respect to bonds, several considerations underlie the assigned 22% policy weight. First, in a severe deflation the bond component is expected to appreciate significantly in value. With a 22% weight in the total portfolio, such an increase would offset a sizable portion of the potentially large declines in equity asset values. Second, the bond allocation is expected to add meaningfully to the diversification of the total portfolio, helping to counter the short-run volatility of the large equity component. (Assuming normal asset class risk-return relationships and a 5-10 year time horizon, most quantitative asset allocation models generate approximately a 20-30% recommended weighting in fixed income assets.)

FIGURE 2  
CURRENT POLICY ASSET MIX  
BASIC RETIREMENT FUNDS



POLICY ASSET MIX

Because cash equivalents are the lowest expected return asset class, their allocation in the policy asset mix is held to a minimal 3%. This allocation is the smallest that can be maintained and still provide the Basic Funds with adequate liquidity.

Real estate and resource funds are assigned a combined 12.5% policy allocation. Given the uncertain response of equity financial asset values to an environment of high inflation, the inflation-hedge allocation in the policy asset mix is somewhat arbitrary. However, presuming that real estate and resource funds do appreciate in value along with inflation, their allocations are large enough to significantly offset losses on the other components of the total portfolio. Further, the inflation-hedge allocation is also sufficiently large to meaningfully contribute to total portfolio diversification.

With the economic hedge and diversification allocations established, the remainder of the portfolio is allocated to total return assets, specifically common stocks and venture capital. [5] The recommended policy asset mix is aggressive in the sense that it has a sizable common stock component. This large allocation is consistent with the Board's relatively high risk tolerance and desire to pursue a high return investment policy for the Basic Funds.

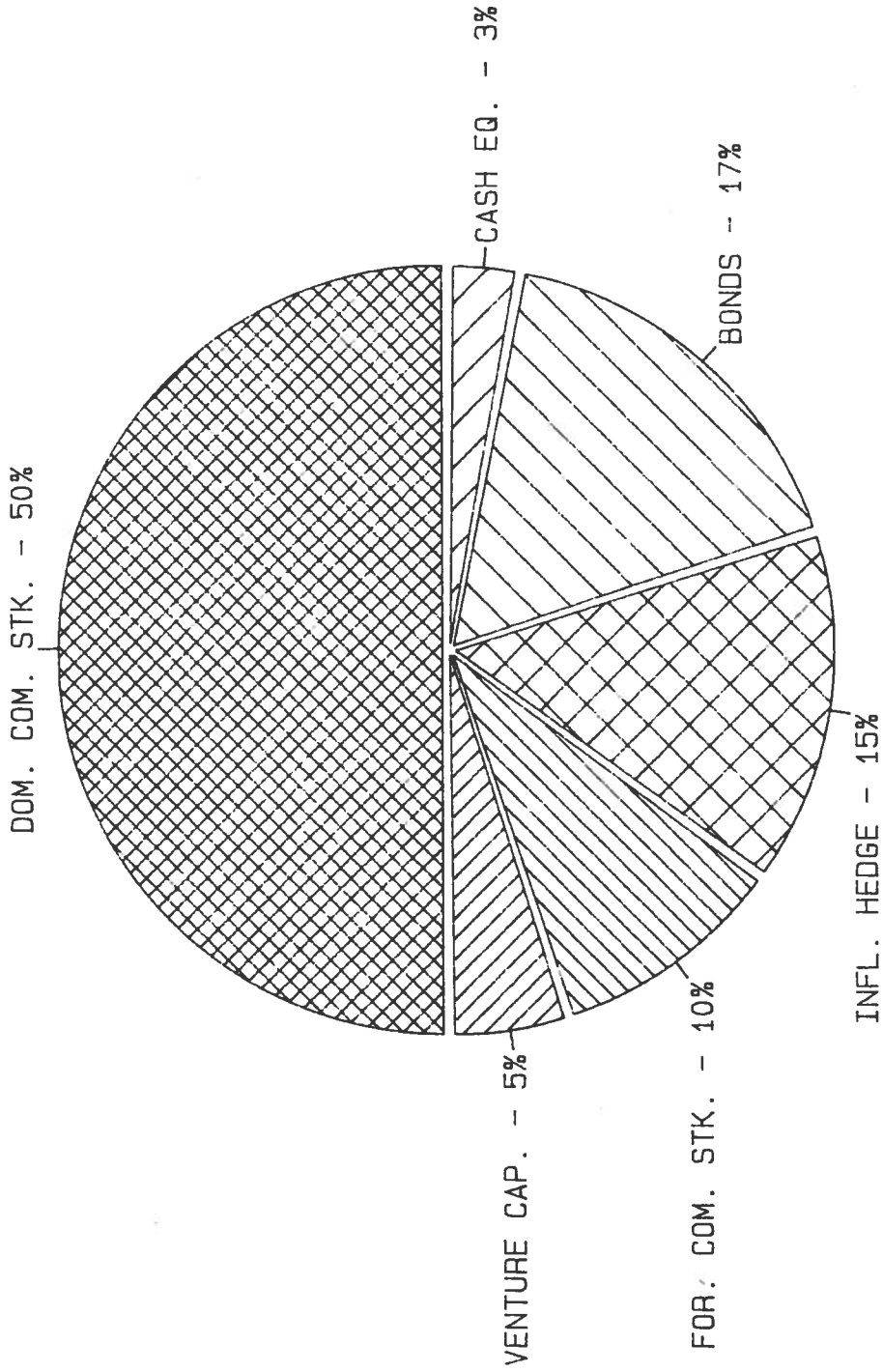
Given existing legislative investment authority, staff recommends that the Basic Funds' current policy asset mix, described above, not be altered. Staff believes that this policy asset mix has effectively satisfied, and will continue to satisfy, the Basic Funds' investment objectives. In the absence of important modifications of those objectives or fundamental changes in the capital markets, staff expects that this asset mix will prove viable for the foreseeable future.

#### **EFFECT OF POTENTIAL NEW LEGISLATIVE AUTHORITY**

During the 1987 legislative session, the Board proposed legislation to expand its investment authority. Most importantly, the proposed new authority permitted investments in foreign securities. It also raised the limit on investments in alternative

FIGURE 3

PROPOSED POLICY ASSET MIX  
CONTINGENT ON NEW INVESTMENT AUTHORITY  
BASIC RETIREMENT FUNDS



POLICY ASSET MIX

INFLATION HEDGE COMPOSED OF  
REAL ESTATE AND RESOURCE FUNDS

equity assets (defined in statute as real estate, venture capital, resource funds, and, prospectively, foreign securities) to 35% of the total portfolio from the current 20%. Further, it increased the upper limit on equity investments to 85% of the total portfolio.

The increased limits on both the Board's alternative equity and total equity investments were approved by the Legislature. However, the authority to invest in foreign securities was not granted. Staff is cautiously optimistic that the Board will be given that authority in 1988.

If the foreign investment authority should be approved by the Legislature, staff would modify its policy asset mix recommendations slightly. Specifically, staff would propose the policy asset mix shown in Table 4 and Figure 3. Until that authority is granted, staff recommends maintaining the current policy asset mix.

**TABLE 4**  
**Basic Retirement Funds**  
**Proposed Policy Asset Mix**  
**Contingent Upon Legislative Approval**

<b>Equity Assets</b>		80.0%
Domestic Common Stocks	50.0	
Foreign Common Stocks	10.0	
Venture Capital	5.0	
Real Estate, Resource Funds	15.0	
<b>Fixed Income Assets</b>		20.0%
Domestic Bonds	17.0	
Cash Equivalents	3.0	
<b>TOTAL</b>		100.0%

The opportunity to invest in foreign securities offers additional diversification opportunities to the Board. Staff recommends reducing the policy allocation to domestic common stocks to accommodate the foreign common stock component. Staff also recommends expanding the inflation-hedge and venture capital allocations modestly. As a net result, staff recommends a total equity asset policy weight five percentage points higher than currently targeted. This larger equity allocation will offer higher expected



long-run returns. But because of the added diversification characteristics of foreign common stocks, the short-run volatility of the total portfolio is not expected to be adversely affected.

### **REBALANCING BACK TO POLICY ASSET MIX**

Over time, the Basic Funds will experience changes in its actual asset mix due to a number of factors. These factors include: contributions and withdrawals; interest and dividend income; asset liquidation proceeds; and, market value increases or decreases. There will be occasions when the effect of these factors is sufficient to cause the actual asset mix to deviate materially from the policy asset mix.

If no response were made to deviations from policy, performance results could differ significantly from expectations. If the policy asset mix is truly the desired long-run allocation among asset classes, it makes little sense to permit sizeable deviations from this target. Therefore, staff recommends periodically rebalancing back to the policy asset mix.

Ideally, a rebalancing back to the policy asset mix should take place when the costs of foregoing the rebalancing are outweighed by the benefits. The rebalancing costs are transactions-related. The rebalancing benefits are reduced errors in tracking the performance of the policy asset mix. Unfortunately, with the possible exception of common stocks, the ability to estimate transactions costs is virtually non-existent. Therefore, staff recommends a more heuristic approach to the problem.

Specifically, staff recommends the following rebalancing procedures:

- The Basic Funds' actual asset mix (at market) will be reviewed quarterly.
- A rebalancing will be required if an asset class deviates by more than 10% from its policy allocation. For deviations in the 5-10% range, staff will have discretion whether to rebalance.
- If a liquid asset class (i.e., stocks, bonds, and cash equivalents) requires rebalancing, funds will be transferred between that asset class and those other

liquid asset classes which deviate from their policy allocations in an opposite direction.

- If an illiquid asset class (i.e., real estate, venture capital, and resource funds) requires rebalancing, allocation adjustments will depend on the direction of the difference between the actual and policy allocation:
  - In the case of overweightings, new cash flow will be withheld from the overweighted illiquid asset classes until the deviations are corrected.
  - In the case of underweightings, funds will be invested in the underweighted illiquid asset classes as opportunities arise. In the meantime, any unfunded allocation to venture capital will be invested in common stocks, while unfunded allocations to real estate and resource funds will be invested in cash. These asset class substitutes satisfy similar investment objectives (i.e., maximizing total return in the case of venture capital and common stocks, and inflation protection in the case of real estate, resource funds and cash equivalents).

Illiquid assets classes are treated differently than liquid assets classes in the rebalancing procedures because of the difficulty of raising cash from, and investing cash in, these asset classes. For illiquid asset classes, the transactions costs of an immediate rebalancing almost certainly outweigh the benefits. Because of the different treatment of the illiquid and liquid asset classes, it often may be impossible to move precisely back to the policy asset mix during a rebalancing. Nevertheless, the residual deviations are expected to be insignificant.

## **SECTION 3: ASSET CLASS TARGETS**

### **DEFINITION OF AN ASSET CLASS TARGET**

A plan sponsor should do more than simply specify a policy asset mix. If a selected policy asset mix is to be fully consistent with the pension plan's investment objectives and risk tolerance, appropriate asset class targets also must be established.

An asset class target is a diversified collection of securities within a particular asset class. It represents the set of feasible investment opportunities that the plan sponsor believes best achieve the purposes for which the asset class is included in the policy asset mix. The plan's investments in the asset class, in aggregate, should reflect the risk-return characteristics of the selected asset class target.

Ignoring the specific circumstances of a particular pension plan, the most appropriate asset class targets are broad market indices for those asset classes comprising the plan's policy asset mix (e.g., the Wilshire 5000 for domestic common stocks, the Salomon Broad Investment-Grade Bond Index for domestic bonds). These market indices represent the full range of investment opportunities within the asset classes available to institutional investors. However, there may be situations in which the plan sponsor should restrict the composition of an asset class target. There are four primary target-restricting cases:

- An asset class is included in the policy asset mix for purposes other than total return maximization.
- The financial nature of the plan sponsor's business makes it desirable to exclude certain types of securities within an asset class.
- Statutory or regulatory requirements prohibit ownership of certain securities within an asset class.
- The plan sponsor perceives certain significant long-run investment opportunities within an asset class.

In the first case, the plan sponsor includes certain asset classes in the policy asset mix for reasons other than producing the maximum expected return on total plan investments.

The plan sponsor should limit the securities held in such a special purpose asset class to those consistent with the desired purpose. For example, if bonds are included in the policy asset mix as a deflation hedge, it makes no sense to own low-rated bonds that have a high probability of default in the event of an economic depression, even if the low-rated bonds earn higher returns under normal economic conditions. [6]

In the second case, the plan sponsor wishes to avoid certain securities whose returns are highly correlated with the plan sponsor's economic prospects. For example, corporations should not own large positions of their own stock in their employees' pension plans. In periods when the corporation's profit outlook is poor, its stock will also perform poorly, detracting from pension plan performance at a financially inopportune time.

In the third case, a pension plan is prohibited outright from owning particular types of securities. For example, many public pension plans operate under legal lists which permit ownership of only certain specified securities. Securities not on these legal lists are ineligible for inclusion in the plans' investment portfolios.

In the fourth case, the plan sponsor believes that certain persistent investment opportunities exist within an asset class. In that case, the plan sponsor may wish to concentrate investments within the asset class in those opportunities. For example, it is well-documented that over the last 60 years small capitalization stocks have outperformed large capitalization stocks. A plan sponsor might wish to permanently emphasize small capitalization stocks in the plan's common stock component.

In each of these four situations, the decision to limit the types of securities held in a particular asset class should be reflected in the target for that asset class. By doing so, the plan's investment opportunities are reconciled with its policy asset mix.

## **BASIC FUNDS ASSET CLASS TARGET RECOMMENDATIONS**

Staff recommends the market indices listed in Table 5 be designated as asset class targets for the Basic Funds' policy asset mix. A description of the rationale behind each of these asset class target recommendations is provided in Appendix C.

**TABLE 5**  
**Basic Retirement Funds**  
**Policy Asset Mix**  
**Recommended Asset Class Targets**

<b>Asset Class</b>	<b>Asset Class Target</b>
o Domestic Common Stocks	o Wilshire 5000
o Bonds	o Salomon Brothers Large Pension Fund Baseline Bond Index
o Cash Equivalents	o 90-day Treasury Bills
o Real Estate	o Prudential Real Estate Investment Separate Account
o Venture Capital	o First Chicago Venture Capital Index
o Resource Funds	o Portfolio of publicly traded energy companies

## SECTION 4: MARKET TIMING

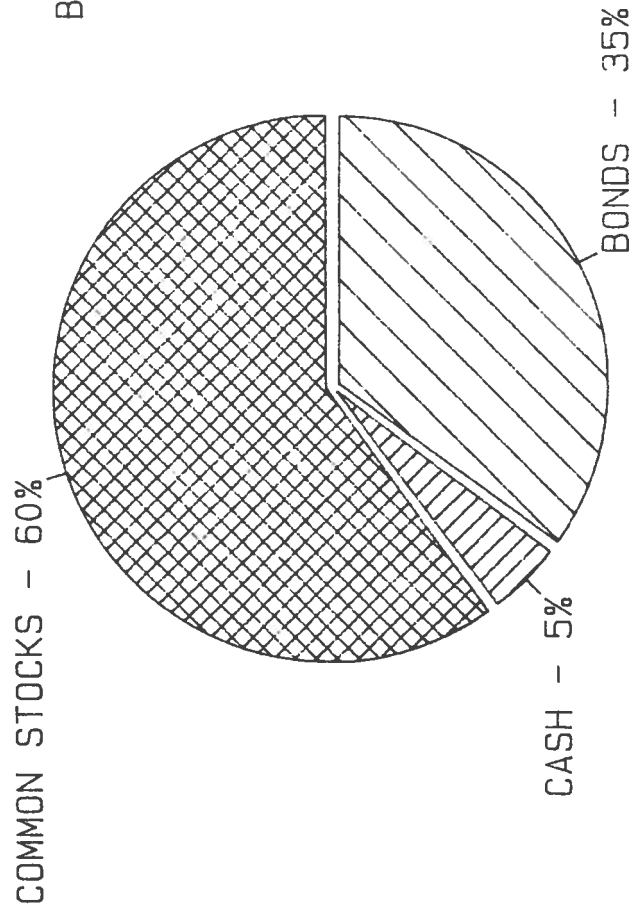
### POLICY ASSET MIX VERSUS TACTICAL ASSET MIX

It is important to distinguish between a pension plan's policy (long-run) asset mix and its potentially different tactical (short-run) asset mix. As defined in Section 2, a pension plan's policy asset mix represents that combination of asset classes best-suited to satisfy the plan's investment objectives and risk tolerance. The policy asset mix is a long-run equilibrium concept. It assumes that "normal " risk-return relationships between asset classes exist. The policy asset mix expresses no opinion as to whether current market prices are out-of-line relative to "fair" values.

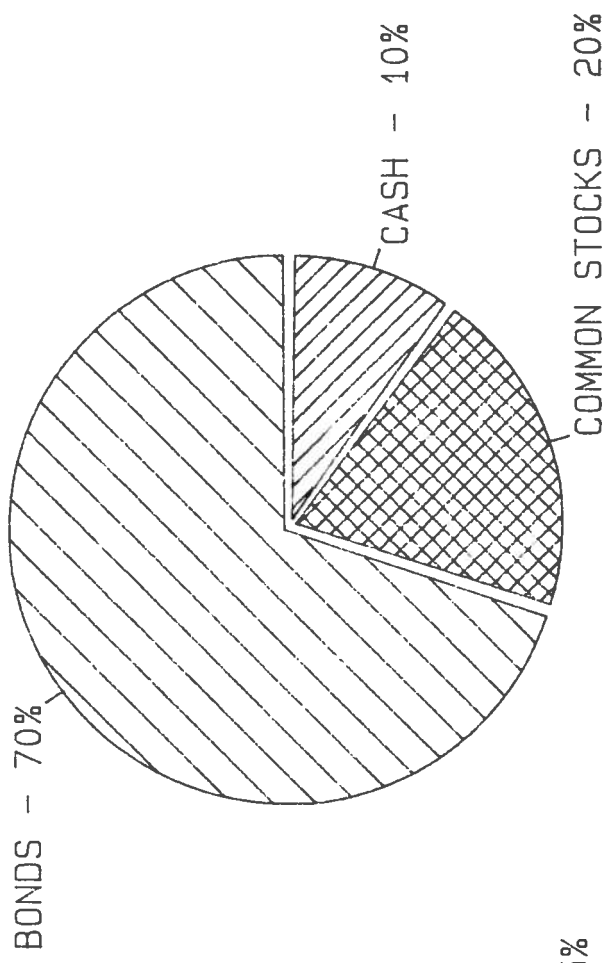
Conversely, a pension plan's tactical asset mix reflects the plan sponsor's (or investment managers') perceptions as to the current attractiveness of available asset classes. For example, consider a hypothetical pension plan's policy asset mix and its current tactical asset mix, as illustrated in Figure 4. The plan's policy is to invest 60% of its assets in stocks, 35% in bonds, and 5% in cash equivalents. This is the asset mix that the plan would hold if the plan sponsor believed that stocks, bonds, and cash equivalents were in-line with their normal relative values. However, the hypothetical plan sponsor currently believes stocks to be significantly overvalued relative to the other two asset classes. As a result, the plan's tactical asset mix is 20% stocks, 70% bonds, and 10% cash equivalents. If stock prices decline in the short-run as the plan sponsor expects, thereby removing the perceived overvaluation, the tactical asset mix will be adjusted back toward the policy asset mix.

Changes in tactical asset mix caused by perceived shifts in asset class relative values are referred to as market timing. Market timing decisions do not affect the pension plan's policy asset mix. Market timing is a short-run strategy that attempts to add value to the returns produced by the long-run strategy incorporated in the policy asset mix.

FIGURE 4  
HYPOTHETICAL PENSION PLAN  
POLICY VS. TACTICAL ASSET MIX



POLICY ASSET MIX



TACTICAL ASSET MIX

Most pension plans do not pursue market timing. There are a number of reasons for this stance and they are discussed at length below. If a pension plan does not utilize market timing, then by definition there is no difference between its policy and tactical asset mixes. In the past, the Board has not attempted market timing for the Basic Funds. Over the last five years, the Board has maintained an essentially constant allocation to stocks, bonds, cash equivalents, and alternative equity assets.

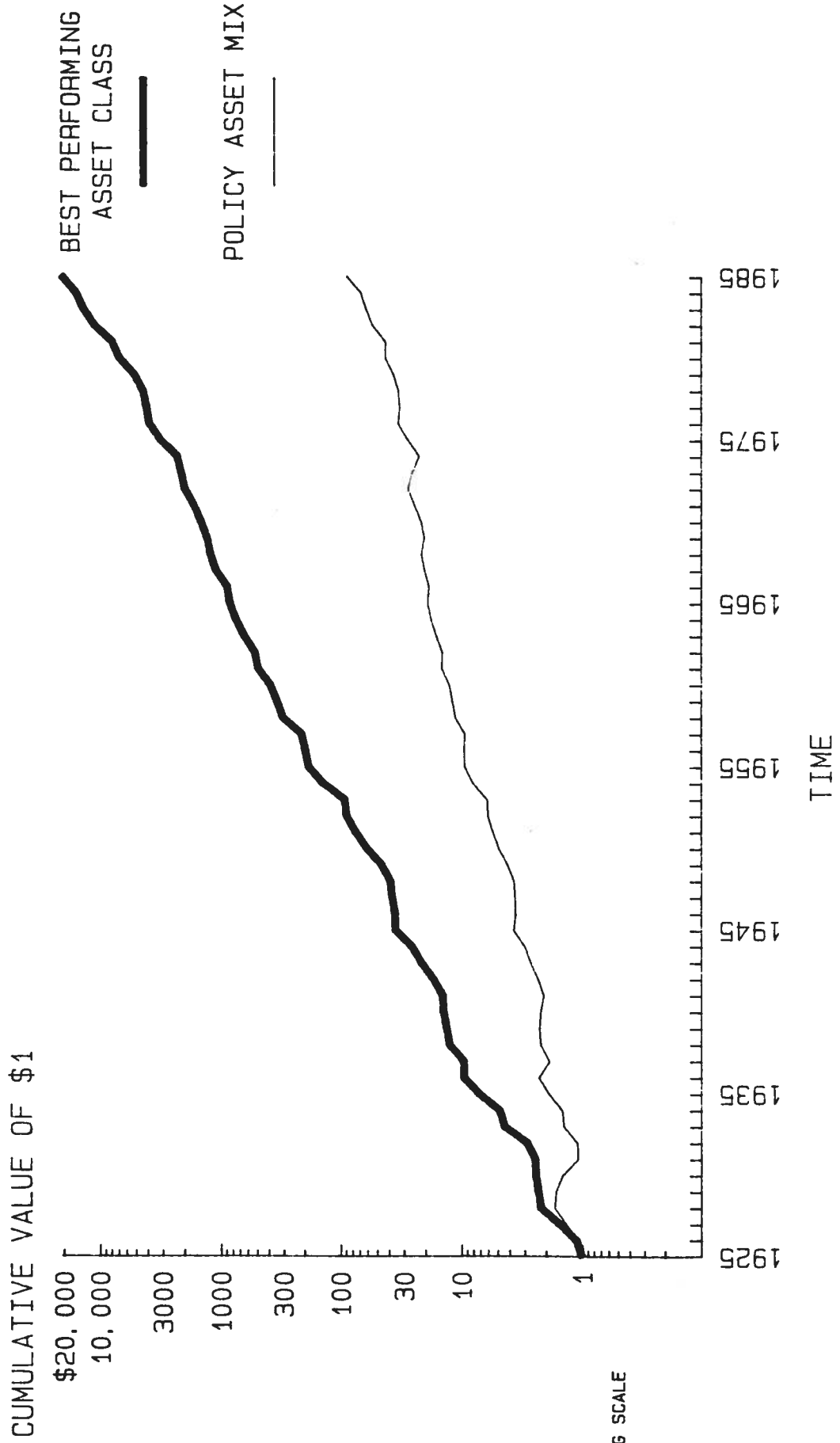
### **ATTRactions OF MARKET TIMING**

In hindsight, market timing is always a seductively attractive option. As discussed, the asset mix decision has an overwhelming impact on the performance of a pension plan. Therefore, successfully anticipating relative movements in the market values of the various asset classes could greatly enhance the returns that a pension plan could earn compared to merely following its constant policy asset mix. [7] Figure 5 illustrates the potential value-added from successful market timing. Figure 5 plots the cumulative value of an investment in the best performing asset class each year since 1926. It is assumed that annually the plan sponsor successfully anticipates which asset class will perform best that year and shifts all of the plan's investments into that asset class. Also shown is the cumulative value of an investment in a policy asset mix composed of 60% stocks, 35% bonds, and 5% cash equivalents. One dollar initially invested in the best performing asset class grows to over \$20,600 from 1926-85, or a 17.7% average annual compounded return. One dollar initially invested in the 60/35/5 policy asset mix grows over 60 years to \$101.98, or a 7.9% average annual compounded return. The superior performance of successful market timing is striking, outperforming the policy asset mix by almost 10 percentage points per year on average.

The example in Figure 5 is unrealistic in that omniscience is not an attribute possessed by any plan sponsor or investment manager. Further, no pension plan would ever risk shifting all of its investments back and forth among asset classes. In addition,



FIGURE 5  
 POTENTIAL BENEFITS OF SUCCESSFUL MARKET TIMING  
 BEST PERFORMING ASSET CLASS VS. POLICY ASSET MIX



SOURCE: IBBOTSON ASSOCIATES

transactions costs are not included in the analysis. Nevertheless, if a plan sponsor could forecast the best performing asset class with some level of skill, the potential for added returns is significant. This thought is especially appealing in today's investment environment when stock prices have reached record highs and the most logical path for stock prices would seem to be down.

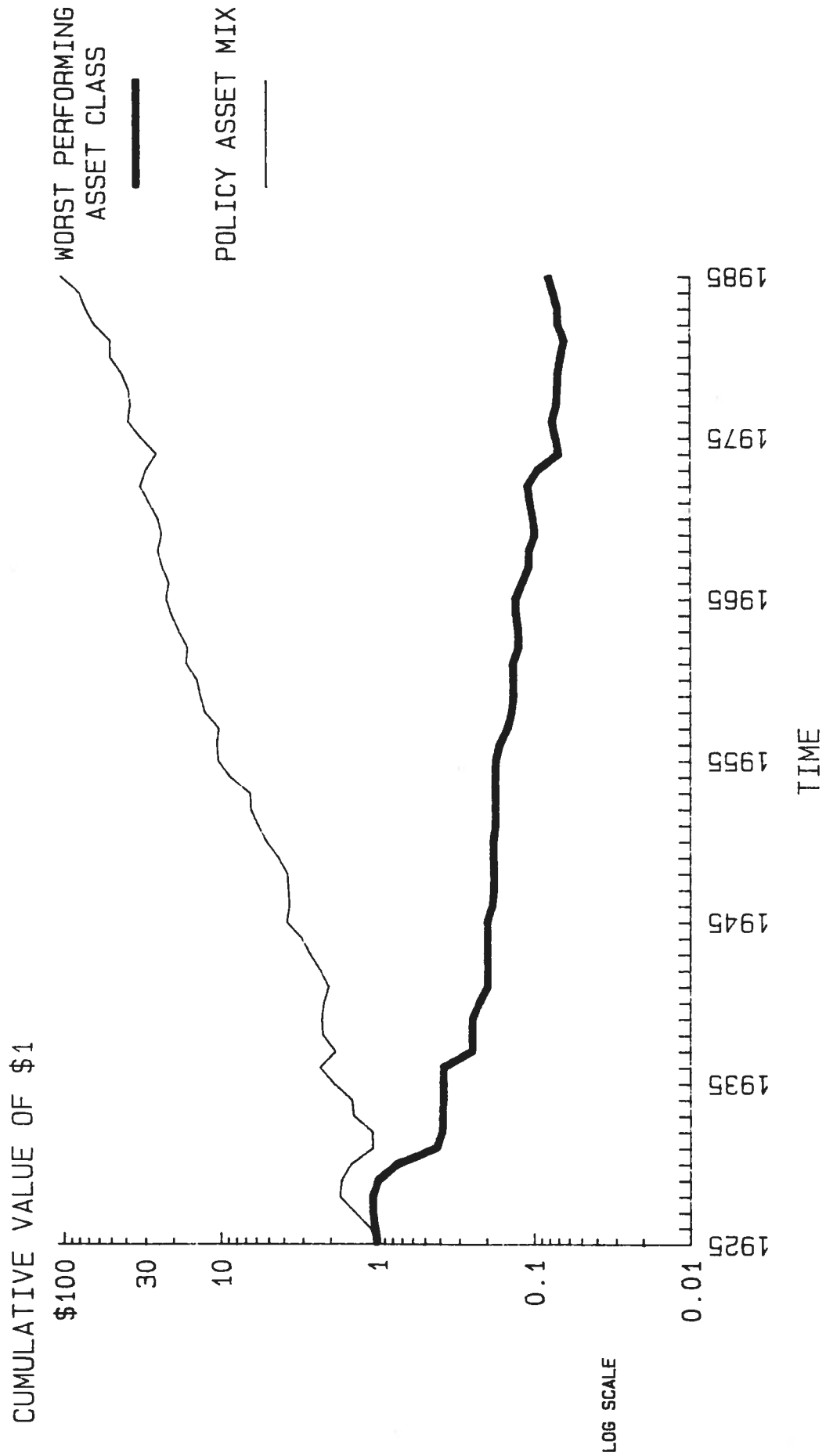
### **THE CASE AGAINST MARKET TIMING**

Despite the apparent attractiveness of market timing, the case against short-run shifts in asset mix is compelling. Figure 6 provides insights into the pitfalls of market timing. As opposed to Figure 5, Figure 6 graphs the cumulative performance of an investment in the worst (instead of the best) performing asset class over the 1926-85 period. Again, the assumption is made that the plan sponsor has perfect foresight, but now each year perversely shifts all of the plan's assets into the upcoming year's worst performing asset class.

One dollar initially invested in the worst performing asset class shrinks to \$.08 during the 1926-85 period, or a -4.1% average annual compounded return. Thus, the worst performing asset class strategy underperformed the 60/35/5 policy asset mix by 12 percentage points per year.

Using the policy asset mix strategy as a base for comparison, the ration of inferior returns under the worst-case strategy to superior returns under the best case strategy is 1.2 times. The implication of this simple analysis is that the maximum downside risk of market timing is greater than the maximum upside rewards. The risks to poor market timing are greater than the rewards because the policy asset mix used as a benchmark already emphasizes the highest return asset, common stocks. Not being invested at all in common stocks when they perform relatively well is expensive compared to merely increasing the exposure to common stocks in those same periods.

FIGURE 6  
POTENTIAL COSTS OF UNSUCCESSFUL MARKET TIMING  
WORST PERFORMING ASSET CLASS VS POLICY ASSET MIX



SOURCE: IBBOTSON ASSOCIATES

A second important argument against market timing is the observed tendency of the stock market to make abrupt and short-lived moves at important turning points. While common stocks have significantly outperformed bonds and cash equivalents over the last 60 years, the bulk of those superior returns can be found in a small number of fairly short time periods.

As a result, the odds are heavily stacked against the market timer. A plan sponsor missing just a few key quarters of strong market performance would have found the pension plan's performance quite disappointing over the last twenty years. In fact, a market timing plan sponsor who is right 50% of the time, over a long interval, will almost certainly produce returns inferior to those of a constant asset mix tilted toward common stocks. It has been estimated that a market timing strategy must be correct over 75% of the time in order to justify the cost of missed opportunities. [8] This is a record that few, if any, plan sponsors or investment managers can claim.

The last major argument against market timing is that short-run shifts in asset mix can be very expensive for a large pension plan, such as the Basic Funds. The logistics of the process are awesome. For a market timing strategy to have any significant impact on a pension plan's performance, it should effect at a minimum roughly 20% of the plan's assets. For large pension plans, this 20% figure translates into a very sizable amount of dollars being moved back and forth between asset classes.

The Basic Funds assets total almost \$5 billion in market value. Therefore, a market timing segment of the Basic Funds would have to be at least \$1 billion in order to have a material influence on portfolio returns. Presumably, the market timing role would be assigned to a single external investment manager. (Selecting more than one market timing manager would defeat the purpose of the strategy if the managers were to pursue divergent tactical asset mixes.) Therefore, the Board would be entrusting considerably more assets to a single active manager than it has chosen to do so up until now.

Further, the transactions costs of implementing a \$1 billion market timing strategy undoubtedly would be large. Turnover in market timing strategies usually exceeds 100% per year. If the market timing manager shifted between stocks, bonds, and cash equivalents directly, the ensuing trading costs might be prohibitive. The use of financial futures could significantly reduce transactions costs. Even then, however, the market impact of \$1 billion trades in financial futures would be material.

#### **STAFF MARKET TIMING RECOMMENDATIONS**

Staff recommends that the Board not implement a market timing strategy for the Basic Funds. Most importantly, staff believes that the sheer size of the Basic Funds makes market timing an expensive and impractical strategy. Further, staff believes that the odds of successful market timing are too small to justify such a strategy, given that the cost of ineffective market timing is significant.

## FOOTNOTES

1. See Reference [1] for more information.
2. These historical results clearly are not coincidental. Common stocks represent corporate ownership and, therefore, are much more sensitive to economic events than are bonds and cash equivalents which are high quality debt investments. Unless the United States' free market economy is severely disrupted, these historical risk-return relationships can be expected to hold into the future.
3. The term "strategic planning" was coined by Lewis Bailey Associates. See Reference [2] for further discussion.
4. See Appendix B for an analysis of the expected distribution of returns under various asset mixes.
5. Common stocks receive considerably more weight than venture capital due to the relative illiquidity and immaturity of the venture capital market.
6. Low-rated, or junk bonds, may be very desirable investments. But their financial characteristics are much more closely aligned to common stocks than investment grade bonds. Thus low-rated bonds should serve as equity substitutes rather than deflation-hedge instruments.
7. However, it must be noted that an investor with perfect foresight would earn considerably higher returns through stock selection than asset mix selection. The best performing stock each year by far exceeds the returns on the best performing asset class.
8. See reference [3] for more information.

## REFERENCES

1. Ibbotson Associates, Stocks, Bonds, Bills, and Inflation: 1986 Yearbook, 1986.
2. Lewis, Bailey Associates, Investment Planning Papers, 1983.
3. Jeffery, Robert H., "The Folly of Stock Market Timing," Harvard Business Review, July-August, 1984.

## **APPENDIX A**

### **ALTERNATIVE APPROACHES TO POLICY ASSET MIX SELECTION**

How might the Board go about determining an appropriate policy asset mix for the Basic Retirement Funds? There are a number of approaches commonly used by pension plans. They can be classified into three broad categories: Qualitative, quantitative, and eclectic. A representative list of methods within these three main categories is shown in Table A1.

**TABLE A1  
ALTERNATIVE ASSET MIX SELECTION METHODS**

- A. Qualitative Techniques
  - 1. Investor consensus
  - 2. Experiential
  - 3. Market capitalization
  
- B. Quantitative Techniques
  - 1. Minimum return target
  - 2. Liability simulation
  - 3. Efficient frontier
  - 4. Utility maximization
  
- C. Eclectic Techniques
  - 1. Strategic planning

Qualitative techniques require only a minimal knowledge of both the capital markets and the particular pension plan under consideration. These techniques basically operate on a rule-of-thumb basis. Their simplicity and ease of application are their chief positive attributes. Quantitative techniques are more complex. They require a formal specification of the risk-return relationships between various asset classes. This information is processed mathematically to arrive at the appropriate policy asset mix. Finally, eclectic techniques combine elements of both the qualitative and quantitative techniques, benefiting



from the insights produced by both approaches. A brief description of each technique listed in Table A1 follows.

### **INVESTOR CONSENSUS**

This approach is the rather unsophisticated process of merely "following the herd." It assumes that the asset allocation strategy of the average investor is an appropriate and reasonable one for the pension plan under consideration. The advantage of this approach lies in its simplicity as well as the comfort level that it provides. No analysis of plan investment objectives, forecasts of asset class risks and returns, or complicated quantitative methods are required. Further, plan sponsors often attain a certain sense of confidence by taking positions similar to those of other pension plans. Its drawbacks similarly are related to its simplicity. No consideration is given to the particular needs of the plan. Nor is any attempt made to improve decisionmaking by applying quantitative techniques. Further, valuable information relating to capital markets opportunities and risks facing the plan are likely to be ignored.

### **EXPERIENTIAL**

Utilizing the wisdom and intuitive insights of seasoned investors within or outside the pension plan is referred to as the experiential method. These individuals possess the accumulated investment experience of years of professional practice. Thus, they are assumed to be able to identify the proper asset mix based upon their knowledge of the capital markets and their understanding of the investment objectives of the fund. Ideally, the experienced investor should be able to qualitatively incorporate much of the quantitative techniques described below into his/her decision making. By adding his/her own intuitive "feel" for the markets the appropriate policy asset mix can be determined. Unfortunately, individuals possessing such vast knowledge are rare and their wisdom is unlikely to be made available directly to a pension fund. Paid consultants may provide

some of this experienced advice, but that advice is often very conventional and not particularly valuable.

### **MARKET CAPITALIZATION**

Another approach to policy asset mix selection is simply to hold the desired asset classes in the same proportion those asset classes represent of the capital markets' total value. For example, if common stocks make up 50% of the United States' institutionally-investable wealth, the plan sponsor would assign common stocks a 50% weighting in the policy asset mix. This method has some grounding in investment theory, which argues that investors should hold a portfolio composed of assets weighted in proportion to their market values. However, like the investor consensus method, the market capitalization method ignores both the investment objectives of the pension plan and opportunities and risks existing in the capital markets.

### **MINIMUM RETURN TARGET**

This method sets a desired rate of return objective. The mix of assets which minimizes the probability of failing to achieve this target return is calculated. This approach particularly is useful in situations where minimum real rate of return targets represent an integral part of the pension plan's objectives. The major difficulty associated with this approach is that often a wide range of asset mixes will minimize the probability of attaining a certain target return. The range may be so large as to be of little value in determining an appropriate policy asset mix.

### **LIABILITY SIMULATION**

It is possible to consider the interaction of alternative asset mixes and projected liabilities of the pension plan. In this way the liability simulation method integrates the investment process with the plan's responsibility to provide an adequate level of funding at the lowest possible cost. The liability simulation method usually is presented in terms of the probability of achieving a certain contribution-to-payroll or funded liability ratio. The advantage of this approach is that it deals not only with the asset side of pension policy

equation, but the liability side as well. It considers the complete financial well-being of the plan. A drawback to this method is that it adds an additional layer of estimated inputs in the form of actuarial data, thus further complicating the analysis.

#### **UTILITY MAXIMIZATION**

This approach attempts to quantitatively define the plan sponsor's risk-return preferences. Combined with a specification of the plan sponsor's rate of return objectives, it is possible to determine the policy asset mix which produces the greatest level of expected satisfaction or utility for the plan sponsor. The primary attribute of this approach is that it necessitates a formal analysis of the plan sponsor's willingness to bear risk. The major disadvantage is that it may be difficult to specify the risk-return preferences of a pension plan with a diverse group of trustees and constituencies.

#### **STRATEGIC PLANNING**

Described in Section 2.

## APPENDIX B

### SIMULATED RESULTS OF VARIOUS POLICY ASSET MIXES

The strategic planning method was utilized in Section 2 to develop a policy asset mix for the Basic Funds. The recommended policy asset mix is designed to produce maximum returns for the Basic Funds, given the constraints of protecting against debilitating economic environments and avoiding excessive short-run return volatility. Left unanswered has been the question: What range of portfolio returns can be expected from the recommended policy asset mix and alternative asset mixes? That question is best answered by a computer model that simulates portfolio returns given assumptions concerning asset classes' expected risks and returns. In its analysis, staff used an asset mix simulator supplied by Richards & Tierney (R&T), the Board's consultant. The R&T model requires the user to provide expectational values for a number of financial and economic variables. The assumptions used by staff are shown in Tables B1-B3.

**TABLE B1**  
**Expected Asset Class Returns and Standard Deviations**

<b>Asset Class</b>	<b>Expected Real Return</b>	<b>Expected Standard Deviation</b>
Common Stocks	6.0%	20.0%
Bonds	2.0	10.0
Real Estate	3.0	4.0

**TABLE B2**  
**Expected Asset Class Correlations**

	<b>Common Stocks</b>	<b>Bonds</b>	<b>Real Estate</b>	<b>Surprise Inflation</b>
Common Stocks	1.00	0.65	0.00	-0.20
Bonds	0.65	1.00	0.00	-0.40
Real Estate	0.00	0.00	1.00	0.20
Surprise Inflation	-0.20	-0.40	0.20	1.00

**TABLE 3**  
**Expected Value for Other Variables**

Current short term interest rate	= 6.0%
Cash or surprise inflation standard deviation	= 2.0%
Current inflation rate	= 5.0%
Long-term imbedded inflation rate	= 5.0%

The expectational values provided by staff are relatively conventional. The only serious questions arise regarding real estate expected returns and standard deviations. There are two possible approaches. In the first case, data from commingled real estate funds can be used. Due to the smoothing effect of real estate appraisals, this approach produces surprisingly low standard deviation of returns. The alternative is to use data from the few limited studies of actual real estate transactions that have been conducted. These studies indicate considerably higher standard deviation of returns. Staff chose the former approach largely due to the fact that all of the Board's real estate investments are in commingled funds.

Using the expectational values shown in Tables B1-B3, staff applied the R&T asset simulator to three different policy asset mixes:

- 1) 100% common stocks
- 2) 60% stocks, 35% bonds, 5% cash equivalents
- 3) 63% stocks, 22% bonds, 3% cash equivalents  
12% real estate

The three asset mixes were simulated over a ten year period. For each year 200 simulated outcomes were produced. The distribution of outcomes for each of the asset mixes for one year and ten years are shown in Table B4 and Figures B1 and B2.

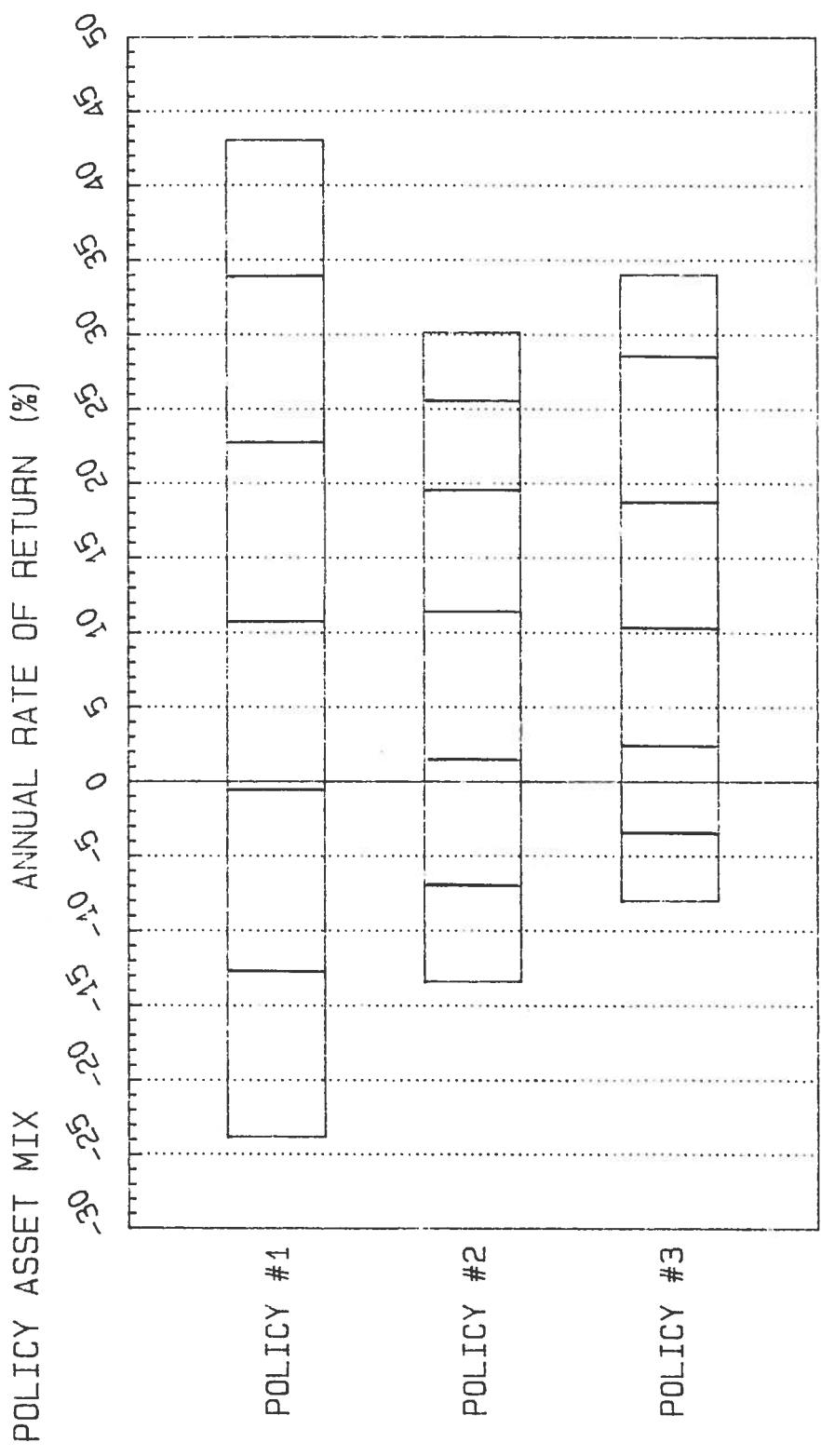
**TABLE B4**  
**Alternative Asset Mixes**  
**Simulated Portfolio Returns: One and Ten Years**

<b>ONE YEAR</b>					
<b>Percentile</b>	<b>100% Common Stocks</b>	<b>60% CS 35% BD 5% CE</b>	<b>63% CS 22% BD 3% CE 12% RE</b>		
Minimum	-39.3%	-35.5%	-28.8%		
5	-23.9	-13.5	-8.1		
10	-12.6	-7.2	-3.6		
25	-0.7	1.2	2.2		
50	10.6	11.1	10.1		
75	22.7	19.3	18.5		
90	33.9	26.3	28.5		
95	43.1	30.2	32.1		
Maximum	55.2	37.1	48.0		

<b>TEN YEARS (Annualized)</b>					
<b>Percentile</b>	<b>100% Common Stocks</b>	<b>60% CS 35% BD 5% CE</b>	<b>63% CS 22% BD 3% CE 12% RE</b>		
Minimum	-4.9%	-3.5%	-4.4%		
5	-1.2	-0.1	1.2		
10	1.8	2.8	3.0		
25	4.9	5.6	5.8		
50	8.5	8.4	8.7		
75	13.4	11.5	11.6		
90	16.8	15.1	14.9		
95	18.3	17.6	16.5		
Maximum	23.4	20.3	20.4		

This analysis produces a number of interesting observations. Beginning with the one year results, first, as expected the 100% common stock asset mix is quite volatile in the short-run relative to the other two asset mixes. For the one year period, the range of possible outcomes is much more dispersed under policy #1 than it is under the other policies. Second, the diversification benefits of adding bonds, cash equivalents, and real

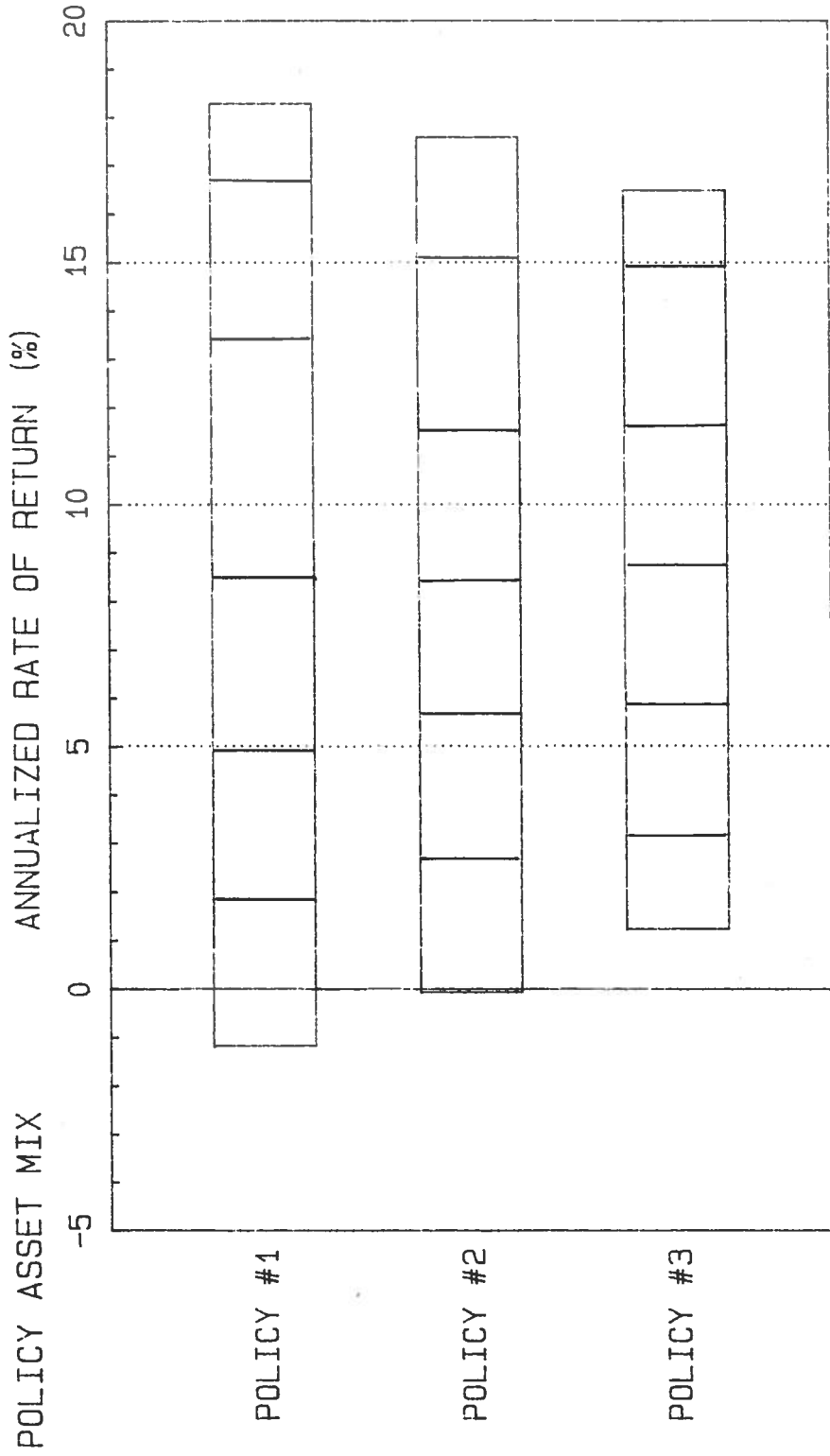
FIGURE B1  
 ALTERNATIVE ASSET MIXES: SIMULATED RETURNS  
 ONE YEAR HOLDING PERIOD



RANGE ENDPOINTS REPRESENT  
 5TH AND 95TH PERCENTILES

SOURCE: RICHARDS & TIERNEY

FIGURE B2  
 ALTERNATIVE ASSET MIXES: SIMULATED RETURNS  
 TEN YEAR HOLDING PERIOD



REBALANCED ANNUALLY

SOURCE: RICHARDS & TIERNEY

RANGE ENDPOINTS REPRESENT  
 5TH AND 95TH PERCENTILES



estate to the asset mix are clear. The one year dispersion of results declines moving from policy #1 to policy #2 as bonds and cash equivalents are added to the asset mix. The one year dispersion is further reduced by adding real estate to policy #3. Third, adding bonds, cash equivalents, and real estate to the asset mix does reduce the downside one year results to tolerable levels. Ignoring the minimum returns (which in these types of simulations are usually aberrations), the 5th percentile one year return under policy #1 is a dismal -23.9%. Under policies #2 and #3, the 5th percentile one year return is a disappointing, but much more acceptable -13.5% and -8.1%, respectively.

Moving to the ten year annualized results, first, the 100% common stock asset mix is not nearly as volatile relative to the other two asset mixes for the ten year period as it is for the one year period. The dispersion of ten year results for policy #1 is similar to that of policies #2 and #3. Second, the diversification benefits of bonds, cash equivalents, and real estate are much less significant over ten years than over one year. Nevertheless, the diversified policies #2 and #3 do produce slightly higher 5th percentile returns than does policy #1, thus indicating some protection against unacceptably poor performance.

## **APPENDIX C**

### **EXPLANATION OF ASSET CLASS TARGET RECOMMENDATIONS**

Section 3 presented staff's asset class target recommendations for each of the asset classes included in the Basic Funds' policy asset mix. The rationale behind each of these recommendations is discussed below.

#### **COMMON STOCKS**

None of the four target-restricting circumstances described in Section 3 currently applies to the domestic common stock component of the Basic Funds' policy asset mix. In the first case, the domestic common stock component is included in the policy asset mix to achieve maximum total returns. In the second case, for numerous reasons, it is impractical to avoid economic sectors of the stock market simply because they are highly correlated with Minnesota's tax revenue base. In the third case, there currently are no substantive legal restrictions on the Basic Funds common stock investments, although, as the later phases of the Board's South Africa resolution are implemented this situation will change. In the fourth case, there do exist certain documented sources of persistent above average returns in the stock market (e.g., low capitalization stocks, low price-to-book value stocks, low price-to-earnings stocks, etc.). Nevertheless, at this time staff is not prepared to recommend a specific strategy to exploit these market "anomalies." This may be a subject of future research by staff.

Given these considerations, staff believes there is no reason to limit the Basic Funds' investments in the domestic stock market. Therefore, staff recommends that the Wilshire 5000, which represents essentially the entire U.S. stock market, be used as the domestic common stock asset class target. [1]

#### **BONDS**

Of the four target-restricting cases, only the first applies to the bond component of the Basic Funds' policy asset mix. Bonds are included not to maximize total portfolio

returns, but to provide deflation hedge and diversification benefits. As a result, it is not appropriate simply to use a broad bond market index as the asset class target. Rather, the target should reflect the special role that bonds play in the policy asset mix.

A true deflation hedge would be composed of only high quality, very long-lived bonds. For example, 30-year zero coupon Treasuries provide maximum portfolio protection in the event of an economic depression. But long-lived bonds also produce highly volatile returns under normal economic conditions. Further, the correlation of their returns with common stock returns is higher than that of shorter-lived bonds. Thus, the diversification benefits of long-lived bonds are not as great as those of shorter-lived bonds. The bond asset class target must take into account both the deflation hedge and diversification needs of the Basic Funds' bond component. Staff believes that the Salomon Brothers Large Pension Fund (LPF) Baseline Bond Index effectively balances the trade-off between these two requirements, and thus should be used as the bond asset class target.

The LPF Baseline Bond Index differs from conventional bond market indices, such as the Salomon Broad Investment-Grade Bond Index, in several respects. Most importantly, it has a longer, but not excessively long, duration (i.e., average life). The longer is a bond portfolio's duration, the more it will appreciate in value in a deflationary, declining interest rate environment. The LPF Baseline Bond Index also has a higher representation of corporate bonds and mortgage securities, and a lower Treasury representation than do the broad bond market indices. Thus, the LPF Baseline Bond Index has a lower average quality rating. However, because the corporate bonds in the LPF Baseline Bond Index, on average, possesses a higher quality rating than do the corporate bonds in the broad bond market indices, the net diminution of quality is minimal. Overall, staff believes that the LPF Baseline Bond Index offers better deflation protection than do conventional bond market indices and essentially equivalent diversification benefits. (See Appendix D for a more detailed description of the LPF Baseline Bond Index.)

## **CASH EQUIVALENTS**

Even though cash equivalents do not play a return maximizing role in the policy asset mix, the first target-restricting case is immaterial. Cash equivalents provide liquidity and diversification benefits. But by definition, cash equivalents are highly liquid, high quality, short-maturity fixed income assets. Therefore, the special purpose of cash equivalents in the Basic Funds' policy asset mix is satisfied by the entire range of securities in the cash equivalents market.

However, the third target-restricting case is relevant. That is, the asset class target should take into account statutory restrictions that limit the SBI's cash equivalents investment authority. For example, the SBI may only invest in cash equivalents issued by U.S. and Canadian governments and corporations. There are also certain quality restrictions on SBI cash equivalents investments.

Identifying a cash equivalents market index that satisfactorily matches the SBI's investment authority is difficult. Given the relatively small size of the policy allocation, the current prohibition on foreign investments, and the statutory quality restrictions, staff recommends that 90-day Treasury bills be used as an asset class target for cash equivalents [2] While this choice admittedly is not ideal, the use of Treasury bills as an asset class target is conveniently implemented. Further, it is consistent with both the objectives underlying the inclusion of cash equivalents in the policy asset mix and the restrictions that affect the SBI's cash equivalents investments.

## **REAL ESTATE**

Real estate acts primarily as an inflation hedge and a diversifier in the policy asset mix, rather than a return maximizing investment. But staff does not believe that real estate's special role requires limiting the range of investment opportunities. There is no comprehensive evidence that one type of real estate is significantly more inflation sensitive

than another. Further, the more broad based is the real estate component the greater are the diversification benefits.

However, the real estate asset class target should reflect the limitations imposed by state statute on the SBI's investment authority. The Board is prohibited from entering into direct real estate investments in which it is the sole participant. The practical effect is that the Board participates in real estate almost entirely through commingled funds.

Staff recommends that one of the large, open-end insurance company commingled real estate funds be used as an asset class target for the Basic Funds' real estate component. These commingled funds reflect the types of real estate investments that the Board can make and are well-diversified across virtually the entire U.S. real estate market.

#### **VENTURE CAPITAL**

Venture capital is an off-shoot of common stocks in the policy asset mix. Venture capital represents equity participation in the formative stages of corporations who, if successful, will eventually have their securities traded in the public marketplace. For policy purposes, the Board also defines investments in leveraged buy-outs as a form of venture capital.

Venture capital, like common stocks, serves as a total return vehicle in the Basic Funds' policy asset mix. As a result, the venture capital asset class target should represent the entire range of investment opportunities. It should include investments in different stages of corporate development as well as a wide range of industries.

However, the third target-restricting case does apply to the venture capital component. State statutes restrict the types of venture capital investments that the Board can make. The effective result is that the Board's venture capital participation has been exclusively through limited partnerships. The asset class target should reflect the limiting effects of the SBI's investment authority.

Unfortunately, the venture capital market has not matured sufficiently such that widely-accepted market indices have been created. Of the few rudimentary indices that are available, the First Chicago Venture Capital Index is the most commonly referenced. Staff recommends that the First Chicago Index be used as the venture capital asset class target for the time being. However, staff also recommends that alternative indices be reviewed periodically as they become available. If a better indicator of the venture capital market is developed, the Board should consider changing its asset class target to that index.

## **RESOURCE FUNDS**

The resource funds asset class is the least clearly defined of the asset classes in the Basic Funds' policy asset mix. To date, the Board's resource investments have been concentrated solely in the oil and gas industry. [3] Until that strategy changes, the resource funds asset class target should be consistent with that limitation.

Like real estate, the resource funds component of the Basic Funds' policy asset mix is designed to act as an inflation hedge and provide portfolio diversification. Further, the Board's resource funds investments are constrained by the statutory investment authority. Both these target-restricting situations ideally should be reflected in the resource funds asset class target.

However, like venture capital, the oil and gas market for institutional investors has not matured sufficiently to generate the development of broad market indices. Given the poor performance of the oil and gas industry in recent years, the likelihood of such an index being developed soon is remote.

In the absence of established oil and gas market indices, only crude proxies are available as an asset class target. Staff recommends that a portfolio of publicly traded energy company stocks be used as the resource funds asset class target.

## **FOREIGN COMMON STOCKS**

Foreign common stocks would be included in the policy asset mix to maximize portfolio returns, just as domestic common stocks and venture capital are currently. Likewise, there are no overriding considerations that would recommend limiting the securities included in the foreign common stock asset class target. The target should be a broad representation of common stock investment opportunities available outside of the United States. The most widely-accepted foreign common stock index is the Morgan Stanley Capital International Europe, Asia and Far East index (EAFE). However, staff would recommend not adopting a specific index as an asset class target at this time. Staff will conduct considerably more research on the subject if the Board's legislation authorizing foreign securities investments becomes law.

## FOOTNOTES

1. It can be argued that the Wilshire 5000 includes a number of securities essentially unavailable to large institutional investors because of the stocks' small capitalizations. An alternative to the Wilshire 5000 as an asset class target might be the Russell 3000 which includes only the largest 3000 stocks in the publicly-traded market place. Staff does not view this issue as terribly important, but will continue to review the development of "extended market" stock indices.
2. A money market fund, or index of money market funds, for which return and holdings data is publicly available is a possible alternative to Treasury bills. Staff intends to investigate this matter further.
3. A number of additional inflation-hedge resource investments could be considered. These include gold, timberland, and farmland. Staff hopes to conduct additional research in this area in the future.



## **APPENDIX D**

### **SALOMON BROTHERS LARGE PENSION FUND BASELINE BOND INDEX**

The Salomon Brothers Large Pension Fund (LPF) Baseline Bond Index was conceived as an alternative to existing market capitalization bond indices. [1] In designing the LPF Baseline Bond Index, Salomon Brothers sought to create a bond benchmark more representative of the investment objectives of large pension funds with long-term liabilities. Staff believes that the LPF Baseline Bond Index better reflects the deflation hedge and diversification objectives for which bonds have been included in the Basic Funds' policy asset mix than do standard bond market indices.

The distinguishing characteristics of the LPF Baseline Bond Index relative to market capitalization bond indices are:

- Longer duration
- Reduced call risk
- Higher yield
- Larger corporate and mortgage sector exposures
- Lower Treasury sector exposure

To be eligible of inclusion in the Index, Treasury and corporate bonds must satisfy the following criteria:

- Minimum \$100 million outstanding
- Minimum quality: BAA
- Minimum five years to maturity
- Low call risk:
  - Security is not callable
  - or
  - Effective call date more than three years away
  - or
  - Current market price minimum two points below effective call price

Mortgages included must meet the following criteria:

- Minimum \$100 million outstanding
- Coupon rate does not exceed yield to maturity by more than 150 basis points

Salomon Brothers has assigned weights to the Treasury, corporate, and mortgage sectors within the Index of 30%, 40%, and 30%, respectively. Within each sector, the securities are capitalization weighted. The LPF Baseline Bond Index is rebalanced monthly.

A summary comparison of the LPF Baseline Bond Index with the Salomon Brothers Broad Investment-Grade Bond Index is in Table C1. The Broad Investment-Grade Bond Index is used for comparisons because it is the best available representation of a market capitalization bond index.

In terms of performance, as would be expected due to its longer duration, the LPF Baseline Bond Index has outperformed the Broad Investment-Grade Bond Index in periods of declining interest rates and underperformed in periods of rising rates. Further, for similar reasons, the LPF Baseline Bond Index is more volatile than the Broad Investment-Grade Bond Index.

**TABLE D1**  
**COMPARISON OF LARGE PENSION FUND BASELINE**  
**BOND INDEX WITH BROAD INVESTMENT GRADE BOND INDEX**

	Total		Treasuries		Corporates		Mortgages	
	Baseline	Broad	Baseline	Broad	Baseline	Broad	Baseline	Broad
Market Value	\$898.8	\$1,996	\$467	\$983	\$148	\$386	\$284	\$453
Weight	100	100	30	49.2	40.0	19.3	30.0	22.7
Quality	AAA	Agency	TSY	TSY	AA-	A+	Agency	Agency
Coupon	9.26%	9.68%	10.46%	9.99%	8.63%	9.31%	8.90%	9.91%
Maturity	14.51	9.08	15.37	8.20	19.48	15.20	7.04	5.62
Yield-to-Maturity	8.68%	7.88%	7.67%	7.01%	9.17%	9.30%	9.03%	8.84%
Duration	7.05	4.92	7.73	4.84	8.40	7.01	4.57	3.80

Source: Salomon Brother

11/30/86

## REFERENCES

1. Leibowitz, Martin, et. al., Introducing the Salomon Brothers Large Pension Fund Baseline Bond Index, 1987.

TAB

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**Paper:** Basic Retirement Funds - Part III  
Investment Management Structure

**Date:** May 1987

**Background:**

The entire series of papers on the Basic Funds (see Tabs B-D) updated and expanded on the policies adopted and implemented by the Board from 1983-1986.

This series of papers replaced the following documents written and adopted in 1983.

- IAC Asset Mix Committee Report, August 1983
- IAC Asset Mix Committee Supplemental Report, December 1983

**Changes Since Publication:**

No substantial change, except that the "completeness fund" concept outlined in the paper was not implemented.

The Board reviewed the style bias or "misfit" in the Basic Funds stock segment in 1990. At that time, Task Force on Manager Retention recommended that this issue be addressed by "tilting" the characteristics of the index fund to offset any style bias in the active manager group. This recommendation was adopted in June 1990.

Passive management (indexation) has been used for approximately two-thirds of the stock segment since early 1984. Semi-passive management (enhanced indexation) has been used for approximately one-half of the bond segment since mid-1988.

**Prepared:** March 1991

**BASIC RETIREMENT FUNDS  
INVESTMENT POLICY**

**PART III  
INVESTMENT MANAGEMENT STRUCTURE**

**Staff Position Paper  
May 1987**



## EXECUTIVE SUMMARY

The Basic Retirement Funds' investment policy paper presents staff's recommendations concerning the long-run management of the Basic Funds' assets. Part I addresses the topics of investment objectives and risk tolerance. Part II considers the issues of policy asset mix, asset class targets, and market timing.

Part III now examines the investment management structure of the Basic Funds. The focus is on the common stock and bond segments. Further, the discussion centers on the following issues:

- Rationale for passive and active management
- Mix of passive and active management
- Mix of management styles within the active component
- Multiple active manager portfolio
- Number of active managers

In the context of investing in a particular asset class, passive management is defined as buying and holding the securities which make up the asset class target. Active management is defined as buying or selling securities with the intention of outperforming the asset class target.

Active management is predicated on the assumption that skillful investors can consistently exploit various market inefficiencies. Passive management, conversely, assumes that those same skillful investors make the markets so efficient that few, if any, of them can consistently earn superior returns. The empirical evidence relating to the passive/active management question is inconclusive.

The appropriate policy passive/active mix is determined by two primary factors: the expected return from active management and the incremental volatility in returns that active management produces (i.e., active risk). The former factor is a function of several considerations including the plan sponsor's attitude toward the passive/active debate, the plan sponsor's ability to identify successful managers, and the size of pension plan. The

greater is the expected return from active management relative to active risk, the larger will be the plan sponsor's active allocation.

The policy passive/active allocation can be either fixed or flexible. A fixed allocation is changed only when a new investment policy is established. A flexible allocation is changed as the plan sponsor identifies superior managers or chooses to fire inferior managers. The passive allocation serves as a residual, determined by the active allocation.

An active manager's investment style consistently exposes his portfolio to different levels of risk and return than are incurred by the manager's asset class target. One means of representing a manager's investment style is through a normal portfolio. A normal portfolio is a collection of securities, appropriately weighted, from which the manager generally makes his investment selections.

Within each asset class, the plan sponsor is responsible for allocating funds to the various managers so that their combined investment styles, or aggregate normal portfolio, is consistent with the asset class target. To accomplish this task, three options are available to the plan sponsor:

- Actively manage the aggregate style bias emphasizing those styles expected to be favored by the market.
- Maintain a neutral aggregate style exposure by hiring active managers with a diverse range of styles.
- Maintain a neutral aggregate style exposure by constructing a portfolio which compensates for any bias present in the combined manager styles. This offsetting portfolio is called a completeness fund.

Most pension plans allocate their actively managed funds within an asset class across an array of specialized managers. These specialized managers pursue investment styles that are characterized by risk exposures different from those of the asset class target. The alternative to hiring multiple specialized managers is to retain one or more eclectic managers. Eclectic managers follow a broad investment style covering the entire asset class.

Hiring more than one manager produces diversification of judgment. Hiring managers representing different investment styles produces diversification of style. The multiple specialized manager approach provides both diversification of judgment and style.

There are a number of arguments both for and against multiple specialized managers. The primary points in favor of this approach are that specialized managers develop an expertise within their segments of the market that allows them to achieve superior returns and that the multiple specialized manager approach permits the plan sponsor to better control the risk exposure of the aggregate manager portfolio.

Arguments against the multiple specialized manager approach include diseconomies of scale, the possibility of hiring mediocre managers simply to cover a market segment, the problems of inducing managers to be sufficiently aggressive, and various administrative concerns.

The maximum number of active managers appropriate for a pension plan depends largely on two factors. The first is the availability of superior managers. The more efficient the plan sponsor believes the markets to be, generally the more difficult the plan sponsor will view the task of hiring superior managers. Hence, the fewer managers the plan sponsor likely will retain.

The second factor relates to administrative considerations. Because of the administrative costs of selecting and monitoring additional managers, a plan sponsor will be limited in the number of managers by the resources that can be devoted to these administrative functions.

A summary of the current status of the Basic funds' investment management structure with respect to the five issues discussed above, along with staff's recommended investment management structure, is presented in the following table.

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### RECOMMENDED INVESTMENT POLICY STATEMENT: PART III

The Board seeks to construct an investment management structure that effectively implements the policy asset mix of the Basic Retirement Funds and that is consistent with their investment objectives and risk tolerance. The Board recognizes that this investment management structure must be compatible with the special needs of a large public pension fund.

In developing the Basic Funds' investment management structure, the Board has considered five fundamental issues and has prepared specific policies related to each issue. The Board's analysis has focused on the common stock and bond segments of the Basic Funds, although the discussion can be generalized to a certain degree, to other asset classes as well.

The fundamental issues and associated Board policies are outlined below.

ISSUE	POLICY
o Passive vs. active management	o Utilize both passive and active management
o Policy passive/active mix	o Flexible passive/active mix with upper and lower limits on active management of 50% and 10%, respectively
o Aggregate active management investment style	o Aggregate active management style should equal asset class target through use of a completeness fund
o Specialized vs. eclectic managers	o Multiple managers specializing in various segments of the markets
o Number of active managers	o Maximum of 15-20 active stock and bond managers

## **SECTION 1: REVIEW OF PARTS I & II CONCLUSIONS**

### **INTRODUCTION**

A consistently applied investment policy is important to the ultimate success of any pension plan. The Basic Retirement Funds' investment policy paper presents, in a formal and unambiguous manner, staff's recommendations concerning the long-run management of the Basic Funds' assets. The first two parts of the paper address five major topics:

- Investment objectives (Part I)
- Risk tolerance (Part I)
- Policy asset mix (Part II)
- Asset class targets (Part II)
- Market timing (Part II)

### **PART I CONCLUSIONS**

Part I specifies three primary investment objectives of the Basic Funds. In order of importance, they are:

- 1) Secure promised benefits;
- 2) Reduce employer/employee contributions and/or increase promised benefits;
- 3) Avoid excessive short-run volatility in portfolio returns.

These objectives are not fully compatible. Part I discusses the risk-return policy trade-offs involved in achieving these conflicting objectives. Based on this discussion, Part I recommends an aggressive, high expected return investment policy that incorporates a sizable equity exposure. This policy is recommended with the understanding that it may result in quarters or even years of disappointing results. Nevertheless, given the extended investment time horizon of the Basic Funds, the long-run benefits of such a policy are expected to be significant.

## PART II CONCLUSIONS

Part II follows the Part I investment objectives and risk tolerance discussions with a formal policy (long-run) asset mix recommendation. Specifically:

<b>Equity Assets</b>		<b>75.0%</b>
Common Stocks	60.0	
Venture Capital	2.5	
Real Estate	10.0	
Resource Funds	2.5	
<b>Fixed Income Assets</b>		<b>25.0</b>
Bonds	22.0	
Cash Equivalents	3.0	
<b>TOTAL</b>		<b>100.0%</b>

This policy asset mix is designed to protect the Basic Funds from debilitating economic environments by incorporating deflation and inflation hedge asset classes. Further, the policy asset mix avoids excessive short-run return volatility by diversifying among equity and fixed income assets. Within these constraints, the policy asset mix seeks maximum returns through a large common stock exposure.

Part II also considers the subject of asset class target selection. An asset class target is a diversified collection of securities within a particular asset class. It represents the set of feasible investment opportunities that best achieves the purposes for which the asset class is included in the policy asset mix. Part II recommends the following market indices as asset class targets for the Basic Funds' policy asset mix:

<b>Asset Class</b>	<b>Asset Class Target</b>
o Common Stocks	o Wilshire 5000
o Bonds	o Salomon Brothers Large Pension Fund Baseline Bond Index
o Cash Equivalents	o 90-day Treasury Bills
o Real Estate	o Prudential Real Estate Investment Separate Account
o Venture Capital	o First Chicago Venture Capital Index
o Resource Funds	o Portfolio of publicly held energy companies

Finally, Part II discusses the issue of market timing. Market timing involves short-run deviations from the policy asset mix in order to take advantage of perceived temporary misvaluations between asset classes. Part II recommends against market timing on a policy level based upon the necessarily large commitment of assets, the highly uncertain outcome of the strategy, and the potentially sizable transactions costs for a large pension plan such as the Basic Funds.

### **PART III STRUCTURE**

This investment policy paper begins at the most basic level of decisions made by a plan sponsor. Step-by-step the paper progresses to more detailed levels of decisionmaking. Part III now considers the investment management structure of the Basic Funds. This is potentially an extremely broad topic. To narrow the focus of the discussion, Part III examines the investment management structure of only the common stock and bond segments of the Basic Funds' policy asset mix. Further, the discussion centers on the following issues:

- Rationale for passive and active management
- Mix of passive and active management
- Mix of management styles within the active component
- Multiple active manager portfolio
- Number of active managers

It must be stressed that there are no clear-cut answers to many of the issues raised in this analysis. The body of investment knowledge, particularly as it relates to the investment management structure of large pension plans, is far from complete. It currently is incapable of offering comprehensive solutions to many of the most fundamental problems confronting pension plans. As a result, the Board must develop a comfort level with a recommended investment management structure based primarily on the logical appeal of that structure. Various plan sponsors can justifiably arrive at quite different conclusions regarding the appropriate investment management structure for similar

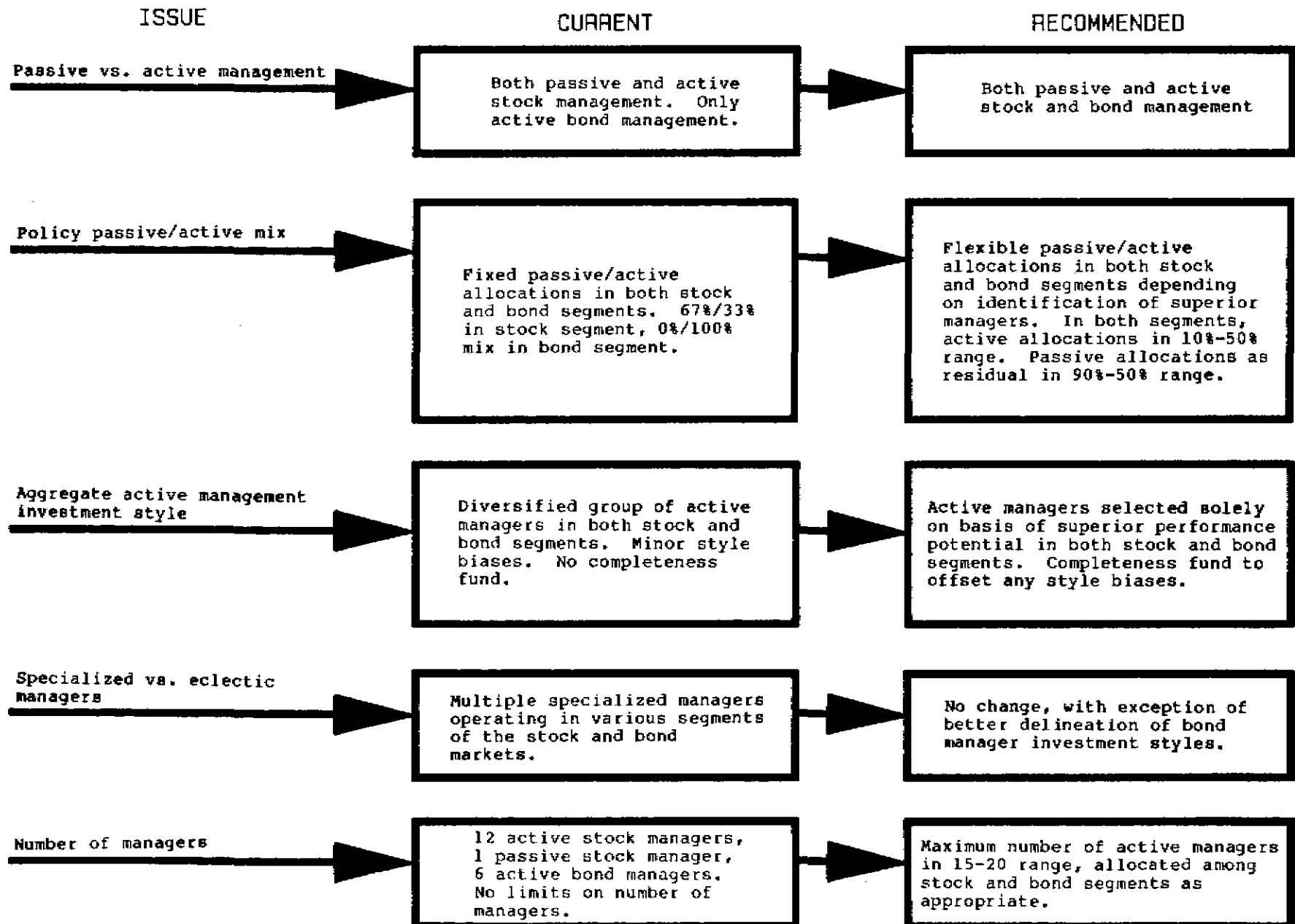


pension plans. Further, those conclusions are likely to change as new information and techniques are developed.

# BASIC RETIREMENT FUNDS

## INVESTMENT MANAGEMENT STRUCTURE

### SUMMARY OF CURRENT STATUS AND RECOMMENDATIONS



## SECTION 2: PASSIVE AND ACTIVE MANAGEMENT

### DEFINITION OF PASSIVE AND ACTIVE MANAGEMENT

Developing an appropriate investment management structure requires that a number of difficult decisions be made. The first issue that must be addressed is the choice between two forms of investment management: active and passive. Should one form be used to the complete exclusion of the other?

In the context of investing in a particular asset class, passive management is defined as buying and holding the securities which make up the asset class target. With the exception of investing income and new contributions, and occasional minor rebalancings, no transactions occur in a passively managed portfolio. Most importantly, no attempt is made to exploit misvalued securities within the asset class.

A passively managed asset class portfolio is referred to as an index fund. An index fund is designed to match the performance of its asset class target. Properly constructed, an index fund should not outperform its asset class target, but equivalently neither should it materially underperform the target. [1]

Active management within an asset class is defined as buying or selling securities with the intention of outperforming the asset class target. Active management can take many forms, but all involve identifying and trading securities that are perceived to be misvalued. Further, all forms of active management imply creating portfolios that intentionally differ in some manner from the composition of the asset class target. It is only by these deviations (referred to as active bets) that active management can add value to the asset class target's return.

Active management offers the possibility of outperforming the asset class target. Necessarily, however, it also creates the risk of underperforming the target.

A summary of comparative characteristics of passive and active management is presented in Table 1.

## **GROWTH OF PASSIVE MANAGEMENT**

Despite the simplicity of its approach, passive management is a relatively new investment concept. Prior to the late 1960's, it was the conventional wisdom that all investment portfolios should be actively managed. Any other policy was viewed as both unproductive and a violation of a manager's fiduciary responsibility. However, advances in performance measurement techniques, capital markets theory, and electronic data processing all helped to stimulate numerous academic studies that seriously questioned the effectiveness of active management. These studies, combined with the poor performance of active managers in the years 1969 and 1973-75, led many plan sponsors to turn to index funds.

Wells Fargo constructed the first common stock index fund for Samsonite Corporation in 1971. The trickle of assets into index funds became a flood by 1976. While that flow subsided in the late 1970's and early 1980's, when active managers fared relatively better, it surged again in the mid-1980's as active managers again performed poorly. Today it is estimated that over \$150 billion, or over 5% of the value of the stock market, is invested in common stock index funds. [2] Most of these investments belong to pension plans. Bond index funds have been a more recent development, but interest in them is growing rapidly as well.

Despite the growth in index fund investment, pension plans still manage the vast majority of their assets actively. The belief in the value of active management remains strong. Should the relative performance of active managers, which appears to run in cycles, improve once again, new cash flows to active managers can be expected to increase at the expense of index funds.

TABLE 1

COMPARATIVE CHARACTERISTICS OF  
ACTIVE AND PASSIVE MANAGEMENT

PASSIVE	GOAL	ACTIVE
Match performance of asset class target	GOAL	Exceed performance of asset class target
No opportunity to outperform asset class target. No risk of underperformance	PERFORMANCE	Opportunity to outperform asset class target. Risk of underperformance
Simple and limited in number	STRATEGIES	Vary widely in terms of complexity and type
Similar to asset class target in terms of issues held and associated weights	PORTFOLIO COMPOSITION	Differs from asset class target by excluding certain issues and varying weights in others
Requires minimal trading	TRADING/ TURNOVER	May, although not necessarily, involve considerable portfolio turnover
Very low fees	MANAGEMENT FEES	Moderate to expensive fees
Requires little monitoring by plan sponsor	MONITORING	Requires careful monitoring by plan sponsor to avoid unintended results

## CASE FOR PASSIVE AND ACTIVE MANAGEMENT

The debate between proponents of passive and active management has gone on for over twenty years. Yet the issues have remained surprisingly constant. Most market participants and other informed observers agree that the stock and bond markets are, on average, very efficient. That is, information relevant to securities prices is quickly and accurately incorporated into those prices. However, these individuals disagree on the implications of market efficiency as it concerns the choice between active and passive management.

The primary argument for active management is quite simple. In essence, it is that sufficient market inefficiencies exist that skillful and hardworking investors can consistently exploit them. Numerous examples of successful stock and bond managers and strategies are cited as evidence. An additional supporting argument is based on the logic of the work ethic. That is, hard work and innovation in the investment business, like any other business, should be expected to produce superior results. In the same vein, active management proponents generally are philosophically averse to the idea of accepting passive returns. They view it as imperative to strive for superior performance.

The arguments for passive management are more subtle. The primary contention is that the same skillful hardworking managers who strive to earn superior returns make the common stock and bond markets so efficient as to prevent any of the managers from consistently earning those superior returns. Many studies are available demonstrating the futility of active management. Further, it is argued that passive management does not imply settling for "mediocre" returns. Rather, because management fees and transactions costs are incurred by active managers, over the long-run a passively managed fund will always outperform the "average" manager. [3]

There is an overabundance of research supporting both sides of the passive versus active management issue. It is beyond the scope of this position paper to discuss those studies. However, it is fair to state that there exists no conclusive evidence on the issue

that would allow the Board, or any other plan sponsor, to arrive at a definitive policy. The choice ultimately involves a subjective decision based on incomplete information. This situation, unfortunately, is not likely to be satisfactorily resolved in the foreseeable future.

### **CURRENT BASIC FUNDS STRUCTURE**

The Basic Funds' common stock segment currently utilizes both passive and active management. The bond segment uses only active management.

### **RECOMMENDATIONS**

In light of the inconclusive evidence regarding the superiority of either passive or active management, staff recommends against employing one form of investment management to the complete exclusion of the other. In any situation that exhibits considerable uncertainty it is usually wise to avoid extreme policies. Thus, staff recommends that the Board adopt an investment management structure for the common stock and bond segments of the Basic Funds that employs both passive and active management. Implementation of this recommendation will involve no change in the management structure of the Basic Funds' common stock segment. However, it will require the retention of a bond index fund manager.

## SECTION 3: PASSIVE/ACTIVE MIX

### PRIMARY DETERMINATES OF THE POLICY PASSIVE/ACTIVE MIX

The decision to use both passive and active management must be followed by a second decision: In what proportions should the common stock and bond components be allocated to passive and active management? Two primary factors determine the appropriate policy passive/active mix.

The first factor is the degree of confidence that a plan sponsor has in active management. Many elements will influence this confidence level including:

- **Attitude concerning the passive/active debate discussed in Section 2.** The less the plan sponsor is convinced by arguments supporting active management, the smaller will be the plan's policy active allocation.
- **Ability to identify successful managers.** Beyond the plan sponsor's belief in the effectiveness of active management, the less the plan sponsor's confidence in its manager selection process, the smaller will be the plan's policy active allocation.
- **Dollar size of the plan's common stock and bond segments.** It is reasonable to assume that there are binding limits on the number of successful managers that the plan sponsor can identify as well as monitor. It is also reasonable to assume (with less conviction, however) that the performance of most managers declines as their assets under management rises above some critical threshold. Therefore, the larger are the plan's stock and bond components, the smaller will be the policy active allocation.

The second factor determining of the policy passive/active mix is the incremental volatility (either positive or negative) in portfolio returns caused by active management. This incremental volatility is referred to as active risk. Because plan sponsors dislike return volatility, then all other things remaining the same, the more positive is the active risk created by active management, the smaller will be the plan sponsor's policy allocation to active management.

Jointly considering these two primary factors, the smaller (larger) is the expected incremental return offered by active management compared to the incremental return



volatility that it produces, the more the plan sponsor will tilt the policy passive/active mix toward passive (active) management. This proportion of expected active return to active risk is referred to as the information ratio.

Assume that a plan sponsor has a strong belief that active management can generate returns for its plan well in excess of those of index funds. Further, assume that the plan sponsor believes that the incremental variability of these superior returns is small. In other words, the plan sponsor believes that the information ratio of its active management program is very high. In this case 100% of the plan's investments should be allocated to active management. To do otherwise would be to unjustifiably pass up low risk expected incremental returns.

Conversely, assume that the plan sponsor has no confidence in the ability of active management to add value to its plan's investment returns. Further, the plan sponsor believes that the incremental variability of active management returns is very high. That is, the plan sponsor views the information ratio of its active management program as very small. In this case all of the plan's investments should be passively managed. Any other course of action would unjustifiably increase risk and, at best, add nothing to expected returns.

Of course, examples of extreme active management information ratios such as these are rare. Most plan sponsors adopt a more balanced perspective toward the risk-return opportunities offered by active management. As a result, their investment management structures display a blend of active and passive management. Their particular policy passive/active mixes will depend on their beliefs regarding the active management information ratio and their unique risk-return preferences. [4]

## **VARYING THE LEVEL OF ACTIVE RISK**

Active management should not be viewed as a homogeneous investment approach. Despite the fact that all investment management strategies involve active bets relative to

an asset class target, the aggressiveness of those bets (i.e., or the active risk assumed) can vary considerably across strategies.

In fact, one way to categorize different active management strategies is to align them across a continuum of active risk. As shown in Figure 1, moving from left to right the active management strategies increase in terms of active risk. By definition an index fund, which engages in no active management at all, produces zero active risk. On the other extreme are active management strategies which involve a few concentrated holdings in securities exhibiting low correlations with the market.

Plan sponsors using higher active risk investment strategies presumably anticipate earning commensurately higher returns above the asset class target's return. If this were not the case, the information ratios and, hence, the attractiveness of the more aggressive active management strategies would be inferior to the more defensive strategies.

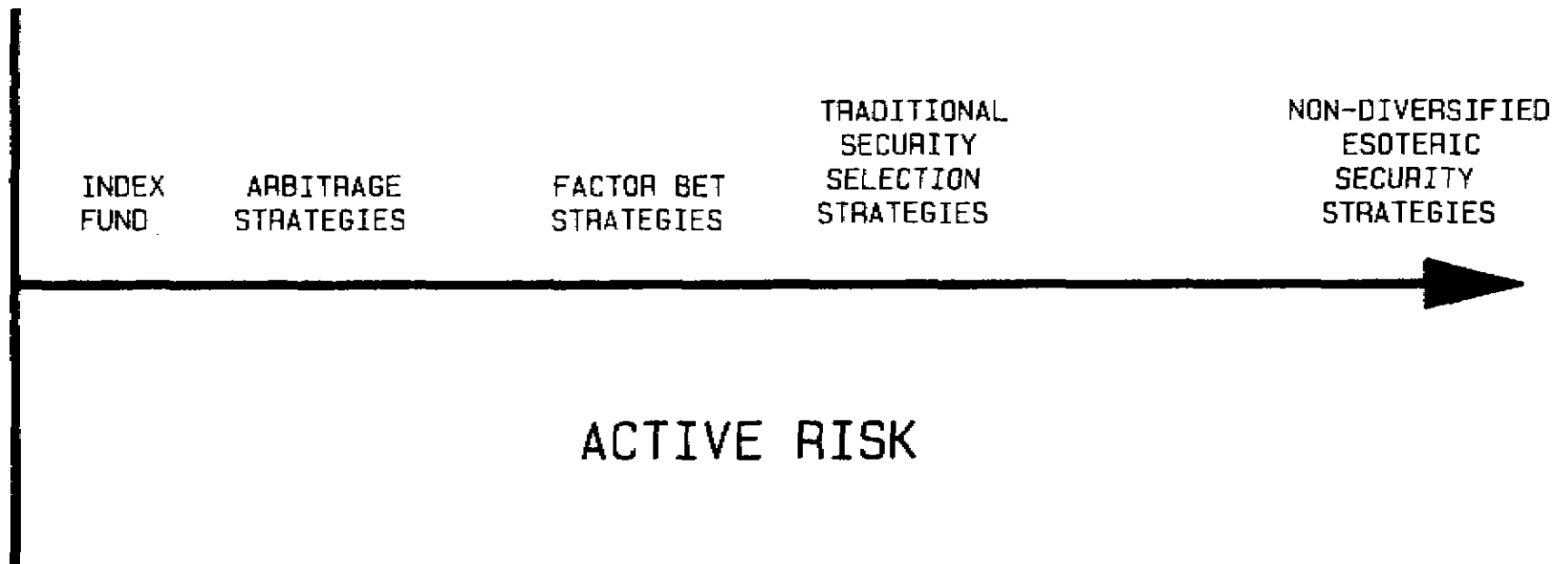
It is the plan sponsor's responsibility to control the level of active risk within the plan's various asset classes, particularly the common stock and bond segments. To do so, the plan sponsor must be aware of the active risk assumed by the individual managers within each asset class and how those managers together generate active risk for the asset class as a whole. As managers are changed or the policy passive/active mix is altered, the plan sponsor should act to ensure that active risk remains within reasonable bounds.

## **FIXED VERSUS FLEXIBLE ALLOCATION APPROACHES**

In adopting a policy passive/active mix for an asset class, the plan sponsor has essentially two options. First, a fixed allocation can be assigned to both passive and active management. This allocation would change only in the event that a new investment policy was established. Second, a flexible allocation to active management can be used. As the plan sponsor identifies superior managers (i.e., who demonstrate desirable information ratios), they can be allocated portions of the asset class funds. The passive allocation serves as a residual, determined by the allocation to active management. Upper or lower

FIGURE 1

# SPECTRUM OF ACTIVE RISK



policy limits on the active allocation can also be set by the plan sponsor under this approach.

The fixed allocation approach has the advantage of simplicity and clarity. Based on the plan sponsor's estimate of the active management information ratio, in conjunction with the plan sponsor's risk-return preferences, the policy passive/active mix is set. Changes in allocations to new and existing managers can easily be analyzed and implemented within the framework of the fixed allocation.

The flexible allocation approach has the advantage of being more responsive to changing opportunities facing the pension plan. Attractive managers can be retained or poorly performing managers can be dismissed more readily without having to satisfy a fixed passive/active allocation.

## **CURRENT BASIC FUNDS STRUCTURE**

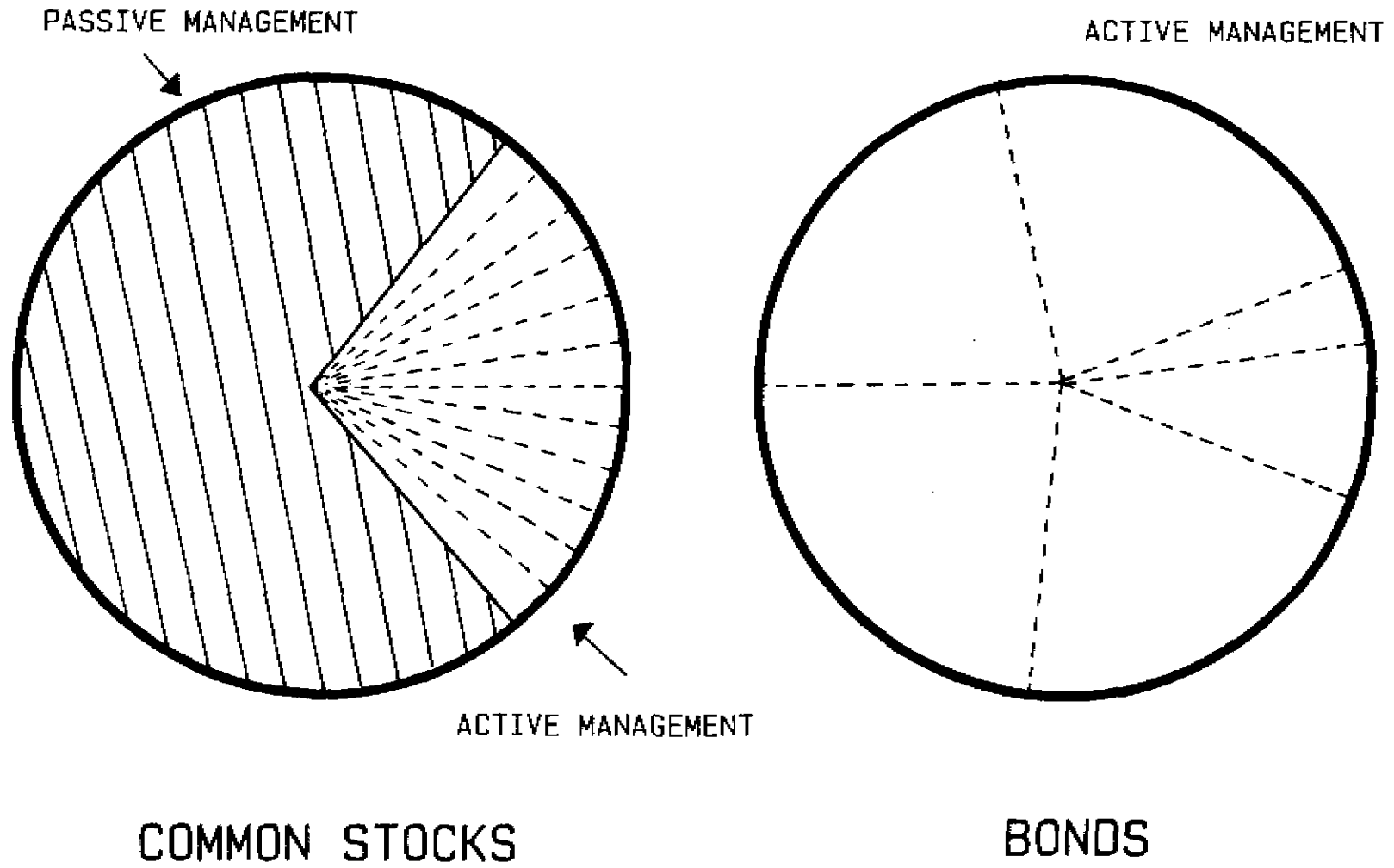
The Basic Funds common stock segment currently is allocated 67% to passive management and 33% to active management. These allocations are fixed. The bond segment is 100% actively managed. This allocation is also fixed. Figure 2 illustrates the current common stock and bond segments' policy passive/active mixes. The amount of active risk exhibited by the common stock and bond segments is modest.

## **RECOMMENDATIONS**

Staff recommends that the Basic Funds' policy passive/active mix maintain a meaningful active allocation. However, this mix should be tilted toward passive management. Staff bases this recommendation on its perception that the Board's active management information ratio is not particularly high. This view results from several considerations:

- First, even though as Section 2 discussed, the evidence regarding the superiority of passive or active management is inconclusive, it is still the case that the costs of active management (i.e., management fees and transactions costs, as well as Board

FIGURE 2  
CURRENT POLICY - PASSIVE/ACTIVE MIX



resources spent in the manager selection and monitoring process) are material. Thus, the burden of proof in this debate thus should rest more heavily on active management.

- Second, the Board's practical experience in implementing active management has not been highly successful thus far. Until the Board is more confident in its ability to hire superior active managers, active management should not be emphasized.
- Third, the size of the Basic Funds' common stock and bond segments produces practical constraints on the amount of funds that can be actively managed successfully.
- Fourth, active management, as applied in the Board's multiple manager approach, does add modestly to the variability of returns within the common stock and bond segments of the Basic Funds. Until the Board is more confident that this increased variability is compensated through higher returns from active management, passive management should dominate the passive/active mix.

Staff also recommends that the aggressiveness of the common stock and bond active management components be monitored as the passive/active mix changes or managers are replaced. If necessary, the Board can control the level of active risk by adjusting the allocations to managers in its common stock and bond segments.

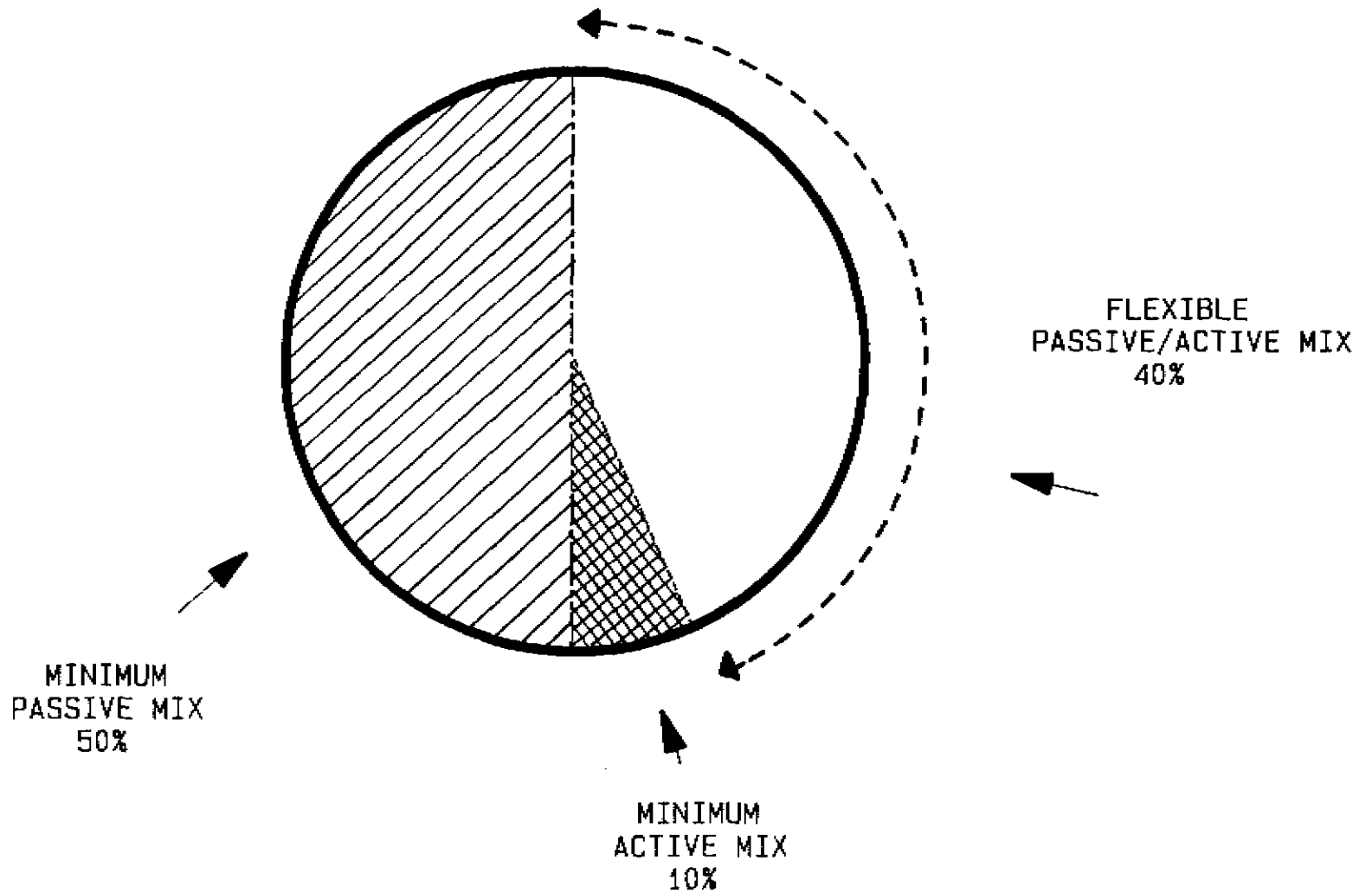
Finally, staff recommends that the Board adopt the flexible approach to setting the policy passive/active mix. The active management allocation should remain passively managed until the Board chooses to allocate funds to specific active managers. It is conceivable that at times very little of the common stock and bond asset classes will be actively managed. Conversely, it is also possible that the maximum active allocation might be filled.

This approach is designed to make the most efficacious use of active management. It will avoid the situation in which funds are forced into active management simply to meet a relatively arbitrary target. Instead, it will create a discipline of employing active management only in situations in which the Board is satisfied that proper risk-return expectations are in place and that the potential to add consistent value to passive management exists.

With respect to upper and lower limits on the flexible policy passive/active mix, staff recommends that the active management allocation be permitted to fluctuate in a 10-50% range, dependent on the availability of managers in whom the Board has confidence. Passive management, serving as the residual allocation, therefore would move in a 90-50% band. Figure 3 illustrates staff's proposed approach to the policy passive/active mix.

FIGURE 3

PROPOSED POLICY - PASSIVE/ACTIVE MIX  
COMMON STOCKS AND BONDS





## SECTION 4: AGGREGATE INVESTMENT STYLE

### DEFINITION OF INVESTMENT STYLE

It has become popular in recent years to speak of money manager investment "styles". For example, in the common stock asset class "Value" and "Growth" styles are now familiar terms. A manager's investment style is a set of fundamental investment principles and decision rules that the manager utilizes, on a consistent basis, to construct a portfolio. For example, an equity manager might concentrate his selections in those stocks which exhibit low price-to-earnings and low price-to-book value ratios. Similarly, a bond manager might invest primarily in mortgage-backed securities.

A manager pursuing a particular active investment style usually produces a pattern of portfolio returns that differs in a systematic fashion from the returns generated by the manager's asset class target. In other words, the manager's investment style consistently exposes his portfolio to different levels of investment risk than are incurred by the asset class target.

One means of representing a manager's investment style is through a normal portfolio. A normal portfolio is a collection of securities, appropriately weighted, from which the manager generally makes his investment selections. It exhibits the same prominent risk characteristics that the manager's portfolio assumes over time.

For a pension plan employing multiple managers within an asset class (discussed at length in Section 5), it is the aggregate investment style of the managers within the asset class that should command the plan sponsor's attention. Clearly, the plan sponsor should be concerned with the investment styles of each of its individual investment managers. Such information is important in allocating funds to the managers and in evaluating their performances. But the plan sponsor should recognize that each manager is but a single, small portion of a larger investment portfolio. It is the risk characteristics of the managers' combined portfolios that impacts performance within an asset class. These aggregate risk

characteristics can best be evaluated by combining the individual manager's normal portfolios into an aggregate normal portfolio.

### **ACTIVE AGGREGATE INVESTMENT STYLE**

The plan sponsor is responsible for implementing an approach to selecting money managers consistent with the plan's investment objectives. Within each asset class then, passive and/or active managers should be combined so that the combination of their investment styles, or aggregate normal portfolio, possesses risk characteristics similar to those of the asset class target. By definition, the passively managed portion of a plan's asset class investments (i.e., the index fund) reflects the asset class target's risk composition. Therefore, if the combination of passive and active portions of a plan's asset class investments are to exhibit risk characteristics similar to those of the asset class target, the active portion (in aggregate) must necessarily also exhibit those same risk characteristics.

Thus, in selecting active managers within an asset class, the plan sponsor has essentially three options with respect to the design of the active manager aggregate normal portfolio:

- Periodically adjust the bias of the active manager aggregate normal portfolio toward specific styles that are expected to be favored by the market. On average, however, maintain a neutral position relative to the asset class target.
- Ensure that the active manager aggregate normal portfolio's style exposure is always neutral by combining a diversified collection of management styles.
- Ensure that the active manager aggregate normal portfolio's style exposure is always neutral by constructing an additional portfolio designed to offset any style bias present in the active managers combined styles.

The first alternative is akin to market timing. Unquestionably, investment styles have a cyclical element to their performance over time. For example, managers emphasizing small capitalization, growth oriented stocks did very well in the late 1970's and early

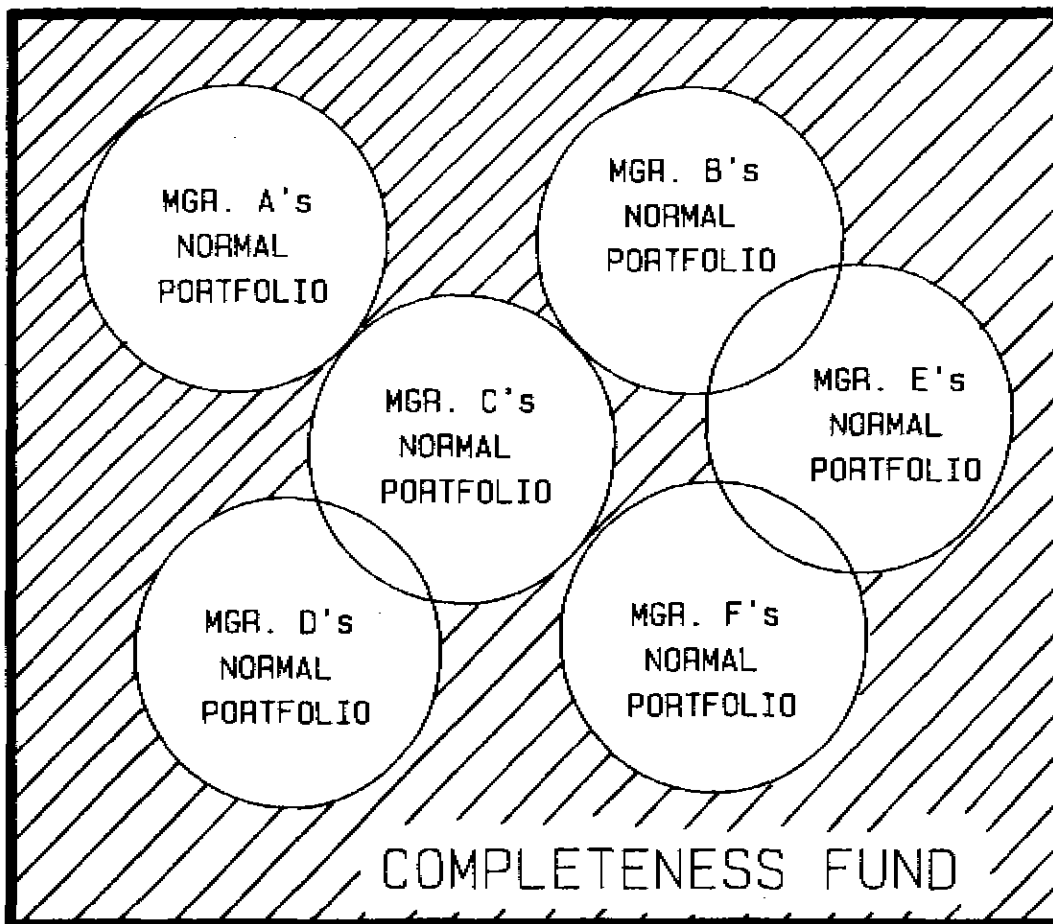
1980's. More recently, however, their performance has been generally poor. If a plan sponsor could anticipate how various investment styles would perform in the near future, the style emphasis of the active manager aggregate portfolio could be adjusted appropriately. Over time, however, it would be expected that the aggregate active portfolio's average style bias would be neutral relative to the asset class target.

The second alternative calls for maintaining an active aggregate investment style that always has risk exposures similar to those of the asset class target. This is accomplished by retaining a diverse group of managers with different investment styles. Funds must be allocated among the managers so that their various risk exposures relative to the asset class target offset one another. The objective of this structure is to incur the same risk as the asset class target. However, if the managers can add value to their individual investment styles, the active manager aggregate portfolio should outperform the asset class target.

The third alternative is similar to the second. But instead of specifically hiring a diverse group of managers, no restrictions are placed on the types of managers hired within an asset class. As a result, the active manager aggregate normal portfolio may possess different risk exposures than those of the asset class target. These exposures are offset by an additional portfolio referred to as a completeness fund.

A completeness fund is a passively managed portfolio solely designed to counteract unintended risk biases in the active manager aggregate normal portfolio. [5] A completeness fund accomplishes this objective by maintaining an over or under-exposure, in the opposite direction, to risk biases in the active manager aggregate normal portfolio. For example, many managers do not research or invest in utility stocks. This fact does not necessarily mean that utility stocks are poor relative performers. It is simply the case that the managers' investment styles consistently ignore these stocks. If such managers comprised a pension plan's active manager aggregate portfolio, the completeness fund

FIGURE 4  
DEPLOYMENT OF COMPLETENESS FUND  
AND MULTIPLE MANAGERS



ASSET CLASS TARGET

would, in part, hold a diversified collection of utility stocks to fill the gap in the aggregate active manager style.

Figure 4 presents a simplified conceptual view of a completeness fund combined with multiple managers. The large rectangle represents the securities (and their associated risk characteristics) that comprise the asset class target. The managers in Figure 4 pursue management styles that, in aggregate, do not cover the entire asset class target. The completeness fund compensates for this partial coverage by holding securities (and risk characteristics) that are not part of the managers' aggregate style (i.e., aggregate normal portfolio).

Because managers' normal portfolios, or investment styles, do not change materially in the short-run, a pension plan's completeness fund will likewise remain largely unchanged in the near-term. Only as managers are added or subtracted from the active manager aggregate portfolio would the completeness fund's composition be significantly altered.

The result of combining the completeness fund with the active managers' normal portfolios is no risk exposure relative to the asset class target. As in the second alternative, if the active managers can add value to their investment styles, the active manager aggregate portfolio (including the completeness fund) should outperform the asset class target.

## **CURRENT BASIC FUNDS STRUCTURE**

Both the common stock and bond segments of the Basic funds currently employ a diversified group of active managers in an approach similar to that of the second alternative above. Minor unintended investment style biases relative to the asset class targets exist. A completeness fund is not used to offset these biases.

Additionally, the Board currently does not adjust the investment style biases of its active manager groups in anticipation of near-term favorable or unfavorable performance of certain styles.

## RECOMMENDATIONS

Staff recommends that the Board adopt the third approach to constructing the active manager aggregate normal portfolio. That is, the Board should seek out the best available active managers and offset any unintended investment style biases with a completeness fund.

Staff recommends against the first approach due to the inherent difficulty of forecasting which investment styles will be in or out of favor. Many of the same arguments opposing and supporting market timing (see Part II, Section 4, of the investment policy paper) also apply to attempting to anticipate the success of various investment styles. Nevertheless, like the issue of market timing, the Board may wish to further explore the topic of investment style forecasting in the future.

Staff also recommends against the second approach. This approach may result in hiring managers for the wrong reasons. That is, managers may be hired primarily because they complement other managers in the Basic Funds active manager aggregate portfolio. It may also reduce flexibility in firing managers for the same reason.

Staff believes that the third approach to active manager aggregate normal portfolio construction is the most appropriate. It focuses on the ultimate reason for hiring active managers within an asset class. That is, to add value to the asset class target's return. The use of a completeness fund prevents unintended investment style biases in the active manager aggregate normal portfolio, while maintaining considerable flexibility to adjust the active manager group as deemed necessary.

## SECTION 5: MULTIPLE MANAGERS

### ECLECTIC AND SPECIALIZED MANAGERS

The implementation of a plan sponsor's desired active management aggregate investment style could be immensely simplified by selecting, within each asset class, a single manager. This manager would be charged with adding value to the asset class target's return by searching across the entire asset class for profitable investment opportunities. The manager's normal portfolio would be the asset class target itself. Such a manager will be referred to as an eclectic manager. Retaining a single eclectic manager within each asset class, by definition, will ensure that the plan's active management aggregate investment style is consistent with the asset class target.

Despite the obvious simplicity of this approach, few, if any, pension plans have chosen to retain a single common stock or bond eclectic manager. The primary reason is that plan sponsors do not feel comfortable entrusting all of their actively managed assets to one manager. They are concerned that the manager might make serious investment mistakes to which they would be fully exposed. By hiring more than one manager, plan sponsors can diversify the risk of an error in investment judgment. This action is called diversification of judgment. [6]

The rationale for hiring more than one active manager is simple enough. However, the design of an active manager aggregate portfolio could still remain fairly uncomplicated if several eclectic managers were retained within each asset class. This approach would offer adequate diversification of judgment. Further, because each eclectic manager's normal portfolio would be the asset class target, the active manager aggregate normal portfolio would still possess no biases relative to this target.

Most pension plans have not followed the multiple eclectic manager approach. Instead, within each asset class, the actively managed assets have been allocated across an array of specialized managers. These specialized managers pursue investment styles that

are characterized by risk exposures different (and in some cases significantly different) from those of the asset class target.

Pension plans implementing this multiple specialized manager approach typically categorize each asset class into various segments. This categorization scheme is usually very rudimentary and varies among pension plans. It may be based on market sectors (e.g., mortgage-backed securities), or financial characteristics (e.g., low price-to-earnings ratio), or nebulous style titles (e.g., value). Within some, or all, of these asset class segments the plan sponsor hires one or more managers whose investment styles are consistent with the assigned segments.

Plan sponsors hiring multiple specialized managers achieve not only diversification of judgment, but diversification of style as well. While the former is certainly beneficial to an actively managed pension plan, the case for the latter is less clear.

## **ARGUMENTS FOR MULTIPLE SPECIALIZED MANAGERS**

The primary argument in favor of specialized managers is that they can more readily recognize investment opportunities in their particular segments of the market than can eclectic managers. The presumption is that specialized managers develop an expertise in those segments that will permit them to more readily identify profitable investment opportunities and, hence, achieve superior returns.

By combining specialized managers across a number of market segments, many plan sponsors believe that they can not only outperform the asset class target, but eclectic managers as well. The key assumption is that the pension plans' specialized managers, in aggregate, will perform well enough within their market segments to overcome the ability of eclectic managers to forecast which segments will (and will not) perform well and shift their investments appropriately.

The second argument for the multiple specialized manager approach is that it better controls the risk exposure of the active manager aggregate normal portfolio. True eclectic



managers, who cover an entire asset class, are difficult to find. As a result certain segments of the market may not receive adequate coverage in a multiple eclectic manager portfolio. The use of specialized managers permits the plan sponsor to more effectively ensure that the active manager aggregate normal portfolio has risk exposures similar to those of the asset target.

Finally, the multiple specialized manager approach offers the advantage of considerably more hands-on control on the part of the plan sponsor. The plan sponsor is responsible for positioning the specialized managers within the asset classes. The plan sponsor thus can fine tune the process to its liking. Conversely, by using eclectic managers the plan sponsor abdicates responsibility for market coverage to the eclectic managers. The managers move among market segments as they deem appropriate, with the plan sponsor exercising no control over their decisions.

It may well be that this last point is the most important to plan sponsors. In recent years, pension plan administrators have shown increased interest in taking control of certain aspects of the actual management of plan assets. The multiple specialized manager approach offers plan sponsors the chance to exercise direct control over a significant element of the investment management structure.

#### **ARGUMENTS AGAINST MULTIPLE SPECIALIZED MANAGERS**

There are a number of serious objections to the multiple specialized manager approach. The first argument relates to several diseconomies of scale associated with hiring multiple managers. For example, most managers have sliding fee scales that reduce fees per dollar of assets managed as the amount of assets rises. By hiring more managers to invest the same dollars of plan assets, the plan sponsor may lose some of the benefits of these sliding fee scales. Further, multiple managers at times will generate offsetting securities transactions. That is, one of the plan's managers may sell the same asset that another is simultaneously buying. The net effect for the plan is actually negative (rather

than neutral) because of the trading costs involved. The more managers that are hired, the more offsetting transactions are likely to occur.

The second argument against the multiple specialized manager approach is that the plan sponsor may be forced to hire inferior active managers simply to cover a segment of the market. That is, within a particular market segment, the plan sponsor may not be able to identify an active manager that can add value. If the plan sponsor is unwilling (as many are) to utilize a completeness fund for this segment, then the resulting performance could be disappointing.

The third argument relates to controlling the level of specialized manager aggressiveness. Because the plan sponsor is hiring a number of managers, each assigned to take advantage of opportunities within a particular segment of the market, the plan sponsor will want each manager to be very aggressive within their segment. However, it is difficult to provide adequate incentives to force specialized managers to be very aggressive. They frequently are heavily concerned with the business risk of underperforming their market segment if their aggressive bets are incorrect. The plan sponsor, on the other hand, is not concerned about this possibility, because the plan is well-diversified across managers. Any one manager cannot seriously hinder performance. Instead, the plan sponsor wants each specialized manager to concentrate in their top selections. Because specialized managers may be reluctant to be sufficiently aggressive, the multiple specialized manager approach may result in too much (and too expensive) diversification for the pension plan.

The fourth argument against the multiple specialized manager approach concerns administrative overhead costs. The number of managers required to implement the specialized approach is much greater than is needed under the eclectic approach. Unfortunately, from the plan sponsors perspective, there are few economies of scale in constructing a multiple active manager portfolio. Thus, the time and expense of selecting, monitoring, coordinating, and evaluating managers basically is linearly related to the

number of managers that a pension plan retains. The last manager added to the multiple manager portfolio is roughly as administratively burdensome as the first.

### **CURRENT BASIS FUNDS STRUCTURE**

Both the common stock and bond segments of the Basic Funds use a multiple specialized manager approach. However, the investment styles of the Board's common stock managers are more specifically defined than are those of the bond managers.

### **RECOMMENDATIONS**

Despite the legitimate questions regarding the effectiveness of the multiple specialized manager approach, staff recommends that the Board maintain this approach over the alternatives of hiring either a single or multiple eclectic managers. Staff believes that the multiple specialized manager approach is the best available means of implementing active management in the Basic Funds' common stock and bond segments. Staff believes that the Board is better able to construct an aggregate manager portfolio that has desired investment characteristics by utilizing multiple specialized managers.

The difficulties of implementing a multiple specialized manager approach should not be lightly dismissed. In particular, no strong empirical evidence exists demonstrating the superiority of specialized managers over eclectic managers. Further, the administrative concerns and level of aggressiveness problems associated with specialized managers are troublesome. Nevertheless, staff believes that these problems are surmountable and that multiple specialized managers are preferred to eclectic managers.

## SECTION 6: OPTIMAL NUMBER OF MANAGERS

### MAXIMUM NUMBER OF MANAGERS

The final aspect of the Basic Funds' investment management structure to be considered is the desired number of active managers within the common stock and bond segments. With respect to a maximum number of managers, the decision is basically a function of two factors: the availability of successful managers and administrative considerations. Staff believes both factors point to retaining a relatively limited number of managers.

The availability of superior active managers is an important, but difficult to quantify, constraint on the investment management structure. Not all money managers are consistently superior investors. Institutional money managers control a large portion of the common stock and bond markets' active trading. As a result, their aggregate performance (relative to the markets) is a zero-sum game. Superior performance by some managers is attained at the expense of inferior performance by others.

Plan sponsors disagree on the seriousness of the superior manager availability issue. Plan sponsors who view the stock and bond markets as highly efficient will perceive superior managers to be a rare breed. Further, they are likely to question their own ability to select these superior managers from among the equally rare inferior managers and numerous mediocre managers. Conversely, plan sponsors who perceive the stock and bond markets to offer many exploitable inefficiencies will think that there exist many superior (and inferior) managers. They also are likely to be confident that their selection procedures can identify these managers. Figure 5 illustrates these contrasting views.

Plan sponsors who think the markets are highly efficient will set tight limits on the maximum number of active managers. Hiring numerous managers increases the chances of mediocre managers dominating their active management programs and thereby producing expensive passive management results. Conversely, plan sponsors who believe

the markets are inefficient will not be concerned with limiting the number of managers (except for administrative considerations). Increasing the number of managers will not materially dilute returns, but will provide reduced risk through diversification.

From the administrative perspective of the plan sponsor, active managers are costly. The conscientious plan sponsor has a wide range of responsibilities in a multiple specialized manager program. These responsibilities include:

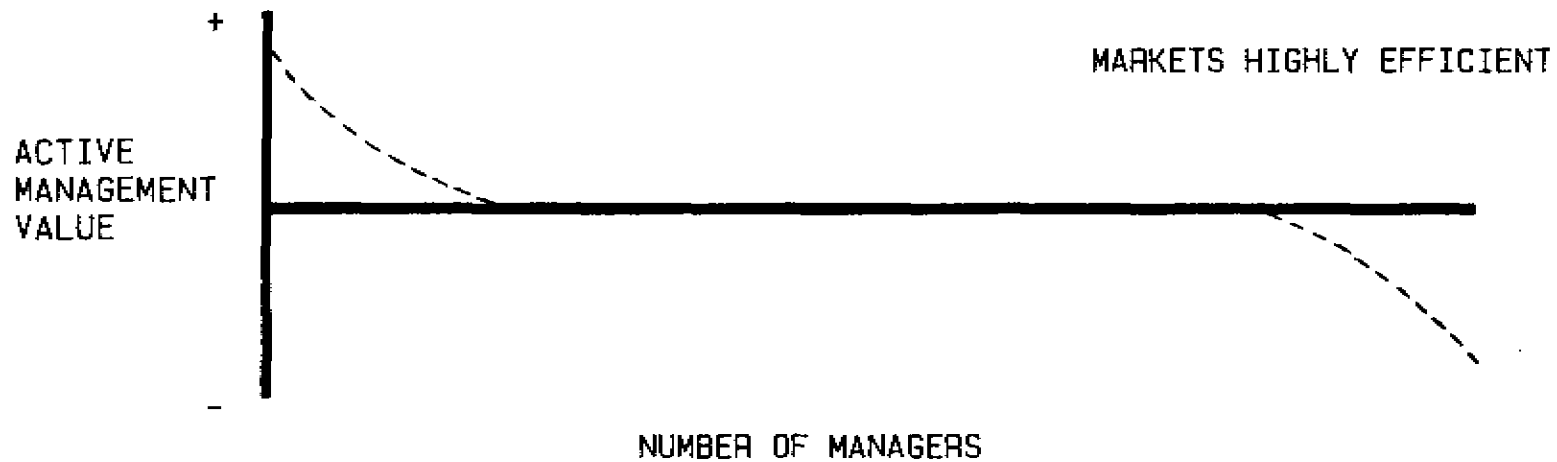
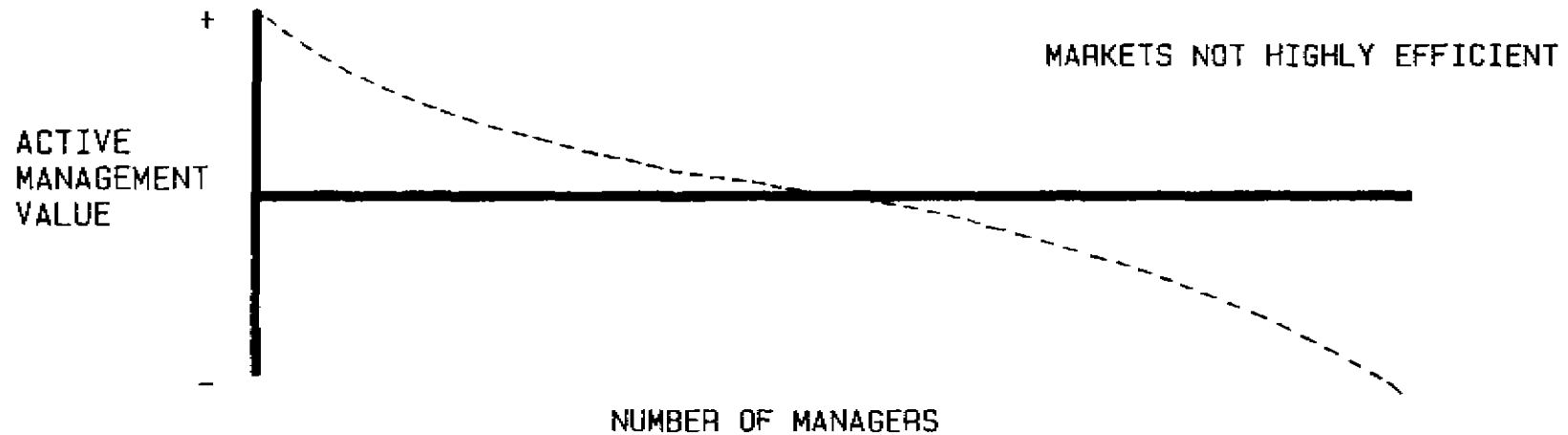
- Maintaining a knowledge of available managers
- Hiring new managers
- Maintaining normal portfolios
- Allocating funds among managers
- Meeting with managers
- Collecting risk-return data on managers
- Evaluating managers
- Reporting on manager performance to interested parties
- Replacing managers

In the case of virtually all of these functions, adding additional managers increases the administrative efforts required of the plan sponsor. As discussed in Section 5, there are few economies of scale (and several diseconomies) involved in adding active managers to a pension plan. Administratively, therefore, the maximum number of active managers that a plan sponsor can effectively control will depend upon the resources that the sponsor is willing to devote to the monitoring process.

#### **MINIMUM NUMBER OF MANAGERS**

The minimum number of active managers that a plan sponsor should hire will depend largely of two factors: plan assets under active management and the maximum dollars that each manager hired by the plan can manage. While a precise specification is not possible, there do appear to be practical account size limits that managers can handle. Most managers (and plan sponsors) become uncomfortable when one client becomes too large a percentage of manager's business. Further, some managers' investment styles are more amenable to large account sizes than are others. (For example, small capitalization

FIGURE 5  
AVAILABILITY OF SUPERIOR MANAGERS  
CONTRASTING VIEWS



technology managers can effectively invest considerably fewer total dollars than can large capitalization growth managers.) The investment management lore is full of anecdotes concerning managers who were initially successful with a small amount of dollars under management. As they grew, however, many of these managers found that they could not invest the larger amount of dollars with anywhere near their earlier superior results.

For any given dollar amount of actively managed assets, a plan sponsor who retains managers with less asset management capacity will be forced to hire more managers than a plan sponsor who hires larger asset management capacity managers.

### **CURRENT BASIC FUNDS STRUCTURE**

The Basic Funds' common stock segment now employs twelve active managers (down from a high of fifteen when the program was initiated in early 1983). The bond segment employs six active managers.

### **RECOMMENDATIONS**

Staff believes that the common stock and bond markets are very efficient. Therefore, staff believes truly superior managers are rare and difficult to identify. Staff recommends that the Board avoid indiscriminately hiring a large number of active managers. Staff believes that the results of such a policy would produce expensive and disappointing performance results.

Staff also believes that administrative considerations call for limiting the number of active managers. Given current staff resources, staff recommends fifteen to twenty common stock and bond managers represent the maximum number of active managers that the Board should hire and closely monitor.

## FOOTNOTES

1. Most index funds differ slightly in composition from the asset class target, both in terms of security names and associated investment weights. These differences are the result of the statistical sampling techniques designed to economically replicate the asset class target's return. Because of the slightly different portfolio compositions, index fund's returns may vary from those of their asset class targets. This difference is referred to as tracking error. Tracking error is generally insignificant and largely unbiased. That is, it can be either positive or negative, with an expected value of zero. However, index funds do incur certain expenses, such as minor trading costs, custodial expenses, and management fees, that create a small negative bias to tracking error.
2. See Wall Street Journal, March 23, 1987, pp. 1, 12.
3. An interesting, but more complicated, additional argument for passive management relates to the fact that the returns produced by most active managers have a high correlation with those of the market. Even for very aggressive common stock managers, frequently 60-80% of their portfolio returns are "explained" by the market. Given this fact, it makes sense to utilize passive management even in situations where the plan sponsor believes active management can be effective. This is because passive management is so much less expensive than active management. If the plan sponsor can induce its active managers to lower the correlation of their portfolios with the market (i.e., take more active bets), then an index fund can be combined with the now more aggressive active managers. This combination has the potential to produce the same superior returns as the 100% actively-managed portfolio, but at a lower cost.
4. It is theoretically possible to quantify the above discussion considerably. This analysis would require that specific assumptions be made concerning a plan sponsor's



risk-return preferences, as well as expected returns and risks of active management. The recommendations of such an analysis would have a very precise appearance to them. However, the heroic nature of the underlying assumptions makes any conclusions drawn from such a quantitative approach suspect. Recommendations based on more qualitative and heuristic processes are probably no less reliable, and certainly more comprehensible to the typical plan sponsor.

5. Within an asset class, the required size of the completeness fund will depend not only on the unintended risk exposure of the active manager aggregate normal portfolio, but the relative size of the index fund as well. It is the combined risk exposure of the active manager aggregate normal portfolio and the index fund which is of concern to the plan sponsor. Thus, the larger is the index fund, which by definition has no risk exposure, the smaller is the relative importance of any active manager aggregate normal risk exposure.
6. It is possible to structure the risk guidelines for a single eclectic manager such that disastrous performance results would be highly unlikely. For example, various diversification constraints could be established. Plan sponsors appear to have rejected this means of achieving adequate diversification of judgment through a single manager.

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**Paper:** Basic Retirement Funds - Part IV  
Performance Evaluation

**Date:** November 1987

**Background:**

The entire series of papers on the Basic Funds (see Tabs B-D) updated and expanded on the policies adopted and implemented by the Board from 1983-1986.

This series of papers replaced the following documents written and adopted in 1983.

- IAC Asset Mix Committee Report, August 1983
- IAC Asset Mix Committee Supplemental Report, December 1983

**Changes Since Publication:**

The evaluation framework described in the paper remains in place. (This means that actual performance is compared to policy benchmarks at the total fund, asset class and individual manager levels.)

The specific evaluation report described in the paper developed by Richards & Tierney (R&T), the Board's consultant, is prepared on a quarterly basis. Staff incorporates many elements of the R&T evaluation in the quarterly reports prepared for the Board and the Investment Advisory Council.

While the R&T performance evaluation report is very useful, the SBI has found other performance comparisons informative as well. At the total fund level, the SBI compares its performance relative to three standards or investment objectives. Two of these objectives are not embodied in the R&T analysis:

- **Exceed Inflation.** Over ten years, the Basic Funds are expected to exceed the rate of inflation by 3-5 percentage points annualized.
- **Exceed Market Returns.** Over five years, the Basic Funds are expected to exceed the return available from a composite of market indices weighted in a manner that reflects its long term asset allocation. (This is the same as the "investment policy" described in the paper.)
- **Exceed Other Pension Funds.** Over five years, stock, bonds and cash holdings in the Basic Funds are expected to exceed the median fund from a representative sample of other pension plans. The peer group universe used by

the SBI since 1983 is the Wilshire Associates Trust Universe Comparison Service (TUCS). TUCS contains the returns of more than 800 pension plans (both corporate and public plans).

**Prepared: January 1990**

**BASIC RETIREMENT FUNDS  
INVESTMENT POLICY**

**PART IV  
PERFORMANCE EVALUATION**

**Staff Position Paper  
November 1987**

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## EXECUTIVE SUMMARY

Performance evaluation is the process of understanding the investment results produced by a portfolio of financial assets. It is a short-term feedback and control process carried out within the context of investment policy. Properly conducted, performance evaluation assists in keeping a pension plan's investment program on track toward implementation of the plan's investment policy.

Meaningful performance evaluation is predicated on the comparison of investment results to expectations. Because expectations for pension plan performance are defined by the plan's investment policy, that policy should serve as the base against which to evaluate the effectiveness of the plan's investment performance.

A clear and concise framework for conducting performance evaluation greatly facilitates an understanding of the analysis. The Board's consultant, Richards & Tierney, has developed one of the most comprehensive and intelligible performance evaluation frameworks available. This paper provides a detailed example of the Richards & Tierney methodology.

Effective performance evaluation requires appropriate benchmarks and a sufficiently long time interval. Appropriate benchmarks are needed because they reflect the plan sponsors risk-return expectations for individual money managers, the aggregate of the *plan's managers within an asset class, or the plan's total portfolio.*

A sufficiently long evaluation time interval is necessary to overcome the "noise" resulting from the inherent random variability of investment results. In fact, performance evaluation carried out over short time intervals can actually be counterproductive. It can foster a pervasive focus on short-run results to the possible long-run detriment of the plan.

## **RECOMMENDED INVESTMENT POLICY STATEMENT: PART IV**

The Board believes that performance evaluation is an integral part of the investment policy established for the Basic Retirement Funds. The Board recognizes that performance evaluation is predicated on the comparison of investment results to expectations.

Expectations for the Basic Fund's performance are represented by benchmarks developed on total fund, asset class, and individual manager levels. Thus, the Board attaches great importance to the design of appropriate benchmarks.

The Board also recognizes that performance evaluation conducted over short time intervals has little meaning due to the inherent "noise" of investment results. Therefore, the Board intends to apply performance evaluation over intervals of at least three-to-five years.

## **ROLE OF PERFORMANCE EVALUATION**

Performance evaluation is the process of measuring and understanding the investment results produced by a portfolio of financial assets. Properly conducted, performance evaluation provides the plan sponsor with valuable information that can be used to more effectively implement and refine the pension plan's investment program.

Performance evaluation should address a number of issues, including:

- Rate of return and the sources of return earned by the plan's total portfolio and the components of its investment management structure.
- Risk incurred by the plan's total portfolio and the components of its investment management structure.
- Impact of the plan's investment policy on plan assets.
- Effectiveness of active and passive management within the plan's investment management structure.
- Contributions made by the plan sponsor and money managers to investment results.

Performance evaluation should be distinguished from the purely mechanical process of performance measurement. The latter is a part of performance evaluation. Performance measurement entails calculating the change in value of a portfolio over time, taking into account interim cash flows. [1] Performance evaluation, on the other hand, uses the information produced by performance measurement to develop an understanding of the sources of investment returns and the quality of those returns relative to expectations.

As a simple example of the performance evaluation process, consider a pension plan that employs a common stock index fund as part of its investment management structure. The objective of the index fund is to closely track the performance of the specified common stock asset class target. An evaluation of the index fund's performance first involves measuring the return earned on both the index fund and the common stock asset

class target. These returns are then compared to identify any "tracking error" on the part of the index fund. If tracking error exists, it must be determined whether that tracking error is significant and persistent enough to be of concern. Further, the causes of the tracking error should be identified. Finally, a judgment must be made whether the sources and the size of the tracking error merit a corrective action on the part of the plan sponsor and/or the index fund manager.

Performance evaluation is a short-term feedback and control process that is carried out within the context of investment policy. It is not meant to judge the appropriateness of investment policy. The appropriate investment policy is a long-term decision made by the plan sponsor. The question of whether a given policy is "correct" is one for which there is no definitive answer. [2] Performance evaluation is designed to keep the pension plan's investment program on track toward achieving the goals of the plan's investment policy, whatever that policy may be. Thus, it is reasonable to expect performance evaluation to answer a question such as, "Was XYZ bond manager's return last year acceptable?" Conversely, it is not reasonable to expect performance evaluation to answer the question, "Is our investment policy too aggressive?"

### **CONTRIBUTION OF THE PLAN SPONSOR**

Performance evaluation almost invariably is conducted by the plan sponsor. For obvious reasons the performance evaluation process frequently focuses entirely on the contributions made by the plan's money managers. The importance of the money managers in the production of total portfolio returns is clear. These organizations are directly responsible for investing the plan's assets. However, the plan sponsor often fails (either consciously or unconsciously) to recognize that how it allocates assets among the various asset classes and money managers also will materially impact the effectiveness of investment policy implementation.

For example, suppose that the plan sponsor permitted the plan's actual asset mix to differ significantly from the policy asset mix. The result could be actual total fund performance that deviates noticeably from the return that would have been earned had investment policy been precisely implemented. If the deviation from the policy asset mix was intentional, then the plan sponsor's market timing efforts should be explicitly recognized and graded. If the deviation was unintentional, then the plan sponsor should be criticized for introducing unproductive additional risk into the plan's total portfolio. In either case, effective performance evaluation should recognize the importance of the plan sponsor's actions on fund performance, just as it considers the contribution of the plan's money managers.

#### **POLICY AS THE BASE FOR PERFORMANCE EVALUATION**

Meaningful performance evaluation is predicated on the comparison of investment results to expectations. If results are in line with expectations (for the right reasons, of course) then the investment program has been successful. If results fail to meet expectations, then corrective measures are called for, particularly if these failures are persistent and significant.

Expectations for pension plan performance are defined by the plan's investment policy. The investment policy represents the configuration of asset classes, asset class targets, and individual money manager investment styles that the plan sponsor believes is most capable of achieving the plan's investment objectives. Therefore, investment policy should serve as the base against which to evaluate the effectiveness of the plan's investment performance.

The expression of investment policy through specific and appropriate investment benchmarks permits the performance evaluation process to be both measurable and objective. For example, individual manager investment styles are represented by benchmark portfolios, often referred to as normal portfolios. [3] A plan's investment

policy will allocate a certain percentage of the plan's assets to a particular investment style or normal portfolio. In evaluating the performance of the manager pursuing this style, the manager's investment results should be analyzed in relation to the manager's normal portfolio.

To carry the example further, investment policy establishes an asset class target for each asset class. It is the plan sponsor's obligation to ensure that funds are allocated among managers (both active and passive) within an asset class so that the combination of the managers' investment styles is consistent with the asset class target. In evaluating the performance of the plan sponsor, the aggregate investment results of the combined benchmarks of all managers within an asset class should be analyzed relative to the asset class target.

From the preceding discussion, it should be clear that performance evaluation is highly dependent on the construction of appropriate benchmarks. For this reason, SBI staff has devoted considerable attention to the benchmark building process. Unfortunately, the subject of benchmark building is relatively new and unrefined. As more efficient techniques are developed, performance evaluation will become more meaningful and useful.

## **FRAMEWORK FOR PERFORMANCE EVALUATION**

A clear and concise framework for conducting performance evaluation greatly facilitates an understanding of the analysis. In recent years SBI staff has reviewed a number of performance evaluation methodologies. Staff has concluded that one of the most comprehensive and intelligible frameworks available has been developed by Richards & Tierney, the Board's consultant.

Table 1 presents a condensed sample of an R&T performance evaluation report. The data presented are actual results for the Basic Retirement Funds during the first quarter of 1987. An explanation of this report provides useful insights into the way in

**TABLE 1****PERFORMANCE EVALUATION REPORT  
BASIC RETIREMENT FUNDS  
FIRST QUARTER, 1987**

<b>LINE</b>	<b>ITEM</b>	<b>INCREMENTAL CONTRIBUTION</b>	<b>ITEM</b>	<b>ENDING VALUE</b>
1	Beginning Market Value	A		\$4,474,053,231
2	Net Contributions	B	C	\$4,477,823,231
3	Risk-Free Asset	D	E	4,547,163,420
4	Investment Policy	F	G	5,032,400,183
5	Benchmark Misfit	H	I	5,047,412,787
6	Managers' Contribution	J	K	5,062,335,467
7	Allocation Tactics	L	M	5,075,059,029
8	Ending Market Value	N		<u>\$5,075,059,029</u>

Source: Richards & Tierney, Inc.

which investment policy and investment benchmarks are used to evaluate pension plan performance.

As a first step to understanding the R&T analysis, consider the information contained in lines 1 and 8. Item A lists the market value of the Basic Funds at the beginning of the quarter as \$4,474,053,231. Item N shows that the Basic Funds were worth \$5,075,059,029 at the end of the quarter. The difference, \$601,005,798, represents the results of the Basic Funds' investment management program for the quarter. The task of performance evaluation is to identify and explain the sources of those investment results.

Line 2 of the R&T analysis identifies the first source of change in the Basic Funds' assets. Net contributions of \$3,770,000 (Item B) were made during the quarter. As shown in Item C, if no further action were taken (i.e., the Basic Funds' assets were placed "under the mattress"), the net contributions would have produced total end-of-quarter assets of \$4,477,823,231.

But of course the Basic Funds' assets were invested. One investment option was to place all of the Basic Funds' assets in the lowest risk asset class available, namely Treasury bills. Line 3 calculates the effect of such a policy. Investing the beginning value plus the first quarter's net contributions in the risk-free asset would have added \$69,340,189 to the Basic Funds' total market value (Item D), producing a total end-of-quarter market value of \$4,547,163,420 (Item E).

The Basic Funds' investment policy entails more than simply investing in Treasury bills. In fact, the Basic Funds' investment policy calls for pursuing an aggressive, high expected return policy. (See Parts I and II of the investment policy paper.) This policy involves exposing the total portfolio to capital mark risk, including a large common stock component. Line 4 indicates the contribution of that policy to the Basic Funds' investment results. Item F shows that the policy asset mix added \$485,236,763 to the amount that would have been earned by investing the Basic Funds' beginning value plus net



contributions only in the risk-free asset. Item G shows that standing alone, the Basic Funds' policy asset mix would have led to a total portfolio market value of \$5,032,400,183 at the end of the first quarter.

Note that Item G is very similar to Item N. That is, the market value of the Basic Fund's total portfolio produced by the policy asset mix is very close to the portfolio's actual ending value. The remaining three sources of investment results (including active management) add relatively small amounts to the Basic Funds' total value. This observation serves to emphasize a point made at several times in the previous three parts of this investment policy paper. Namely, that the choice of an investment policy (embodied in the policy asset mix) represents the single most important decision that the plan sponsor can make. Particularly over an extended period of time, the policy asset mix decision will have the biggest impact on the plan's bottom line.

If all of the Basic Funds' assets were passively managed according to the policy asset mix, lines 5, 6, and (largely) 7 would be irrelevant. But active management is an element of the Basic Funds' investment management structure. Performance evaluation therefore should account for the contribution of active management decisions to investment results.

Line 5 indicates the contribution that money managers' investment styles, in aggregate, made to investment results. Within each asset class, the plan sponsor attempts to allocate funds among manager styles (as represented by their normal portfolios) so that in aggregate they match the asset class target. In practice, making a perfect match is difficult. Item 4 indicates that \$15,012,604 was added to Basic Funds' market value by the fact that the policy allocations to the managers' benchmarks, in aggregate, produced returns that did not match the returns on the asset class targets. Item I shows what the Basic Funds' would be worth \$5,047,412,787 if passive investments in the managers' benchmarks had been made according to policy allocations.

This incremental value produced by the managers' aggregate benchmark misfit is unintentional. Further, it can be negative just as often as it is positive. Therefore, the

benchmark misfit is a source of unproductive risk that should be minimized by the plan sponsor. [4]

Another source of investment results is the efforts of active managers to outperform their benchmarks. Item J on Line 6 shows that during the quarter active managers added \$14,927,680 to the Basic Funds by outperforming their benchmarks. The goal of active management, of course, is to consistently make this incremental contribution positive and large. Item K shows that the Basic Funds would have grown to \$5,062,335,467 if assets had been assigned to the managers based on policy allocations.

Line 7 contains the effect of not allocating assets precisely according to policy guidelines. For example, in the Basic Funds stocks may not always be at their targeted 60% policy weighting. Or a manager may be above or below his targeted allocation. These allocation effects may be due to conscious decisions on the part of the plan sponsor to temporarily deviate from policy. Or, in the case of the Basic Funds, the deviations are due to market movements that cause shifts in allocations too small to warrant rebalancing back to policy allocations. In any event, Item L indicates that \$12,723,562 was contributed to the Basic Funds' market value by these allocation deviations. Item M shows that this last source of investment results is the final reconciliation to the Basic Funds' ending value.

Table 2 of the R&T analysis takes the information presented in Table 1 and converts it from dollar to percentage terms. For example, an investment in the risk-free asset (Item A) generated a 1.46% return during the quarter. Similarly, the managers' benchmarks at their policy allocations, (Item B) produced, in aggregate, a 12.70% return for the quarter.

**TABLE 2**  
**PERFORMANCE EVALUATION REPORT**  
**BASIC RETIREMENT FUNDS**  
**FIRST QUARTER, 1987**

	INVESTMENT RETURNS	ITEM
RISK-FREE ASSETS	1.46%	A
INVESTMENT POLICY	12.35%	
POLICY BENCHMARKS	12.70%	B
MANAGERS AT POLICY	13.04%	
ACTUAL RATE OF RETURN	13.33%	

The R&T performance evaluation format can be applied on three distinct levels: the total fund; the various asset classes; and, individual money managers. Conducting the R&T analysis on these three levels allows those issues of primary importance to performance evaluation, presented at the beginning of this paper, to be dealt with directly.

Additional methods of performance evaluation can extend the analysis performed under the R&T format. For example, performance attribution techniques have been developed that attempt to categorize the sources of stock and bond portfolio returns. These performance attribution techniques are based on models of investment risk whereby returns on stocks or bonds are related to particular financial factors.

Performance attribution and other additional performance evaluation methods can provide interesting insights into the risk-return performance of individual managers or groups of managers. But generally those insights are ancillary to the basic and more important information derived from the R&T analysis.

## **TIME FRAME FOR ANALYSIS**

Indisputably, the longer the time period over which performance evaluation is conducted, the more meaningful are the resulting conclusions. Investment performance is inherently uncertain, exhibiting a large amount of random variability. Performance evaluation attempts to look through that variability in order to isolate the contributions that the plan sponsor and money managers make to a pension plan's investment results. Two primary elements make this analysis effective: appropriate benchmarks and a sufficiently long performance evaluation interval. The need for appropriate benchmarks was discussed earlier. To repeat, a properly constructed benchmark will reflect the risk-return expectations for an individual money manager, the aggregate of the plan's managers within an asset class, or the plan's total portfolio. As a result, appropriate benchmarks eliminate a portion of the "noise" surrounding investment performance by focusing on those factors truly relevant to the results of a manager's or plan's investment program.

The importance of the performance evaluation period's length is based on the statistical principal that outcomes due to random events will tend to cancel out over time. That is, the random component of investment performance has an expected value of zero. But in any given short time period, that variability can be very large relative to the returns generated by "true" investment skill. The longer is the evaluation period the more random variability will be removed and the more true investment skill will become apparent.

The difficulty that performance evaluators face is that the amount of time necessary to isolate investment skill with a high degree of confidence is quite long, on the order of decades. Naturally, that period is far too long for most interested parties to accept. As a result, the tendency among plan sponsors has been to evaluate performance over three-to-five year intervals. Evaluation periods of this length are certainly preferable to quarterly analysis. Nevertheless, three-to-five year performance evaluation analyses are still likely to be hampered by considerable random variability in results.

As a related and final comment, it should be noted that performance evaluation viewed over a short time frame (i.e., a quarter-to-quarter or even year-to-year) is of little use. In some circumstances it can serve to control extreme downside performance. But in general, performance evaluations conducted over short intervals are overwhelmed by the random variability of investment results, hence, providing little or no useful information.

In fact, performance evaluation carried out over short intervals can actually be counterproductive to a pension plan's goals. It can produce a pervasive attitude in the plan's management that focuses on short-term results. Decisions in response to short-term evaluations may be made to the long-run detriment of the plan. If there has been one primary theme of the four parts of this investment policy paper, it is that the investment policies of most pension plans (including the Basic Funds) are long-term in nature. Performance evaluation conducted under these policies would be similarly long-term.

## FOOTNOTES

1. The mathematics involved in performance measurement are straightforward. However, the difficulty of establishing a reliable and flexible system for collecting accurate transactions and holdings data should not be underestimated.
2. An investment policy is "correct" if it is consistent with the plan sponsor's risk-return expectations. That consistency is a highly subjective determination. Further, an investment policy is "correct" if it is internally consistent. That is, the various components of the investment policy (i.e., investment objectives, policy asset mix, investment management structure) are consistent.
3. See Part III, Section 4 of the investment policy paper for a more detailed discussion of normal portfolios.
4. See Part III, Section 4 for a discussion of reconciling aggregate manager investment styles with an asset class target.

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**POST RETIREMENT INVESTMENT FUND:  
New Benefit Increase Formula  
And Revised Asset Allocation Policy**

**Position Paper  
January, 1994**

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## **INTRODUCTION**

The Post Retirement Investment Fund (Post Fund) contains the pension assets of retirees in the statewide retirement plans from three (3) retirement systems: Teachers Retirement Association (TRA), Public Employees Retirement Association (PERA), Minnesota State Retirement System (MSRS). This paper reviews the history of the Post Fund, describes the past and present benefit increase formulas and discusses the rationale for the asset allocation strategy and management structure currently in place.

## **HISTORY**

Minnesota's statewide pension plans use a relatively unique investment structure. Most private and public pension plans commingle the retirement assets of all their participants, whether they are currently employed or retired. Minnesota, on the other hand, completely separates active and retired employee' pension assets. The Basic Retirement Funds (Basic Funds) invest the active employee' pension assets, while the Post Fund invests the retired employee's pension assets. [The Post Fund was established by the Legislature in 1979. This is the successor fund to the Minnesota Adjustable Fixed Benefit Fund (MFAB) which was established in 1969.]

Upon retirement, a fully vested public employee receives a life-time annuity with monthly benefits based on the employee' "high-five" average salaries and years of service. Upon the employee's retirement, the Basic Funds transfer a dollar amount to the Post Fund sufficient to fund the initially promised benefit for the employee's expected lifetime.

The transfers from the Basic Funds remain invested in the Post Fund while they are gradually paid out to the retiree. The initial transfer assumes that the Post Fund's invested assets will earn at least 5% per year. Therefore, the amount transferred from the Basic Funds equals the projected annuity payments to the retiree over his/her actuarially expected life span discounted at the 5% assumed rate of return. In addition, each year the actuary calculates a mortality adjustment based on revised expected life or mortality projections. Depending on whether the retiree's expected life has increased or decreased, a cash flow will take place between the Basic Funds and Post Fund to maintain the funding level of the Post Fund equal to present value of the projected annuity payments.

One particular aspect of the financing mechanism is that if Post Fund's investments earn the assumed 5% rate of return (a relatively conservative investment assumption), the Fund is, by definition, fully funded. Therefore, the initially promised benefits to retirees are at virtually no risk and no additional charges on employers likely will occur to support the initially promised benefits.

#### **OLD BENEFIT INCREASE FORMULA (1980 - 1993)**

When the Post Fund was established in 1979, the legislature enacted a post retirement benefit increase formula that was based on the realized earnings of the Fund. This formula was used for benefit increases granted on January 1, 1980 through January 1, 1993. During that period, state statutes defined "realized earnings" as interest, dividends and the net realized capital gains or losses on the assets of the Post Fund. If the Fund generated a realized return greater than 5% on its invested assets, the excess earnings were used to finance permanent lifetime benefit increases to eligible retirees.

Unrealized capital gains (or losses) had no direct impact on the additional benefits paid by the Post Fund under the previous benefit calculation. The purpose behind excluding

unrealized capital gains (or losses) from the earnings computation was to make the calculation, which was based on a one year time frame, largely insensitive to short run fluctuations in the capital markets.

The benefit increase calculation under this formula was fairly simple. An amount sufficient to satisfy the actuarially required 5% rate of return was subtracted from the fiscal year realized earnings. The remaining realized earnings were then stated as a percentage of the present value of the current liabilities to the retirees. This percentage represented the benefit increase that the Post Fund granted to eligible retirees. (See Exhibit A.)

#### **Asset Mix Under the Old Formula**

In order to assure that realized earnings were sufficient to support promised benefits under the old formula, a portion of the Post Fund was invested in a "cash matched dedicated bond portfolio." A dedicated bond portfolio is a collection of bonds whose principle and interest payments will match a specified stream of liabilities (in this case, the known benefit payments to retirees). By investing in high quality bonds, the exact principal and interest cash flow of the portfolio could be calculated with a high degree of certainty. Further, because the dates and amounts of the cash flows were known, the amount of assets necessary for the dedicated bond portfolio could be computed readily.

The objective of the Post's dedicated bond portfolio was to support the promised benefits (i.e., to assure 5% realized earnings) and to generate excess earnings for additional benefit increases. Accordingly, the dedicated bond portfolio was structured to produce realized income of 8% annually for the entire Fund. This income stream would cover the 5% assumed rate of return and provide sufficient excess earnings to fund a 3% annual benefit increase goal. Assets not needed to support the 8% earnings goal of the dedicated bond portfolio were invested in common stocks.

The domestic stock investment process divided the assets approximately 50/50 between a one year and a three year investment strategy which would stagger the realized capital gains from the portfolio. Because the investment process assured a substantial portion of the stock portfolio would be sold each year, the Post realized a material amount of the capital gains due to the strong stock market throughout the 1980's. These realized gains were included in the benefit increase and distributed to eligible retirees. Once granted, sums sufficient to support those benefit increases were included in the dedicated bond portfolio, thereby decreasing the stock segment of the Fund and increasing the bond segment.

#### **Results of Investment Strategy during 1980's**

Under the old formula, Post Fund benefit increases in the 1980's were generally above 6% per year, well in excess of inflation. These high benefit increases were possible due to a combination of several events:

- high interest rates at the start of the 1980's
- strong stock gains throughout the 1980's
- an early retirement incentive ("Rule of 85") which was implemented for a three year period in the mid 1980's
- growth in new retirees

**Interest rates** were at historic highs in the early 1980's. These high coupon rates were the major source of realized income for the Post Fund when the dedicated bond portfolio was first put into place. As interest rates declined during the mid to late 1980's, new cash flow had to be invested at less attractive yields. Over time, this would reduce the level of realized income available from the bond portfolio.



As interest rates fell, the **stock market** rose substantially (e.g., the Wilshire 5000 stock index from generated a 15.5% annualized rate of return from 1980-1992). Since dividends historically have accounted for about a 3% return each year, most of these gains were due to an increase in the price of the stock (i.e., capital gains). Eventually, a large portion of these stock market gains became realized capital gains because of the Post's domestic stock portfolio management process (see previous section of this paper for more information). Once realized, these capital gains were distributed to retirees in the form of benefit increases.

Also during the mid 1980's, the legislature enacted the "**Rule of 85.**" The Rule of 85 remained in place from the middle of 1984 through 1986 and allowed employees to take early retirement (before age 65) with full benefits if the combination of their age and years of service were equal to or greater than 85. (Previously, employees could take early retirement and receive full benefits only if they had 30 years of service and were at least 62 years old.) The Rule of 85 caused a significant increase in retirements resulting in disproportionately large transfers from the Basic Funds to the Post Fund for a period of time. These transfers resulted in large purchases of bonds that had relatively high interest rates. This surge of higher yielding bonds provided the Post Fund with a significant increase in realized earnings for a period of time.

After the implementation of the Rule of 85, retirements increased substantially (2,491 retirements in 1980 vs. 3,677 in 1985). This **growth in new retirees** also enhanced the benefit increases to existing retirees. Until 1989, an individual had to be retired for at least 12 months before a benefit increase was granted. Since they were ineligible to receive a *benefit increase during their first year of retirement*, the excess earnings on the assets of new retirees for that time period were distributed to other eligible retirees. In 1989, the Legislature changed the eligibility requirements. Since that time, retirees have received a

pro rata share of the benefit increase based upon the number of months they have been retired since the end of the previous fiscal year (e.g., a person who had been retired for six months would receive one-half of the benefit increase).

Over time, these events caused the stock segment to decrease and the bond allocation to increase. In 1980, only 54% of the total Post assets had to be allocated to the dedicated bond portfolio to accomplish the 8% earnings objective. By 1992, the bond allocation grew to 90%. This was due, in large part, to the lower levels of realized income from bonds due to falling interest rates. In addition, the need to fund the additional promised benefits made every year since 1980 and the compounding effect of these additional benefits drew more assets into the dedicated bond portfolio. For example, if a 3% benefit increase was distributed each year for ten years, the initial 3% benefit increase would have grown to 3.89% after ten years. Each year, additional funds had to be placed in the dedicated bond portfolio to cover the compounding portion related to previous years benefit increases.

#### **Benefit Increases Under the Previous Formula**

This asset mix strategy was very successful in producing a high level of realized earnings throughout the 1980's. This, in turn, provided substantial lifetime benefit increases to retirees during the same period:

<b>Fiscal Year</b>	<b>Total Realized Earnings*</b>	<b>Benefit Increases</b>	<b>Inflation</b>
1980	8.2%	3.2%	14.6%
1981	12.4	7.4	9.6
1982	11.9	6.9	7.1
1983	12.5	7.5	2.6
1984	11.9	6.9	4.2
1985	12.9	7.9	3.7
1986	14.8	9.8	1.7
1987	13.1	8.1	3.7
1988	11.9	6.9	3.9
1989	9.0	4.0	5.2
1990	9.7	4.7	4.7
1991	9.3	4.3	4.7
1992	9.6	4.6	3.1

\* Total realized earnings equal the benefit increase plus the 5% required rate of return

Despite the high benefit increases it generated, the old formula had two important disadvantages:

- **Inadequate Inflation Sensitivity.** The old formula was not tied to inflation. In fact, since the investments tend to perform well during periods of low inflation and, conversely, to perform poorly during periods of high inflation, the formula had an inverse relationship to inflation. While retirees benefited from this relationship in the 1980's it was not likely that this phenomenon would continue in the 1990's.
- **Inability to Maximize Earning Power.** With an ever increasing portion of its assets allocated to bonds, the Post Fund was unable to benefit from the higher total rates of return available from stock investments. This situation would persist as long as the

Fund focused on generating high levels of realized income as required under the old formula.

As interest rates continued to fall during the late 1980's and early 1990's, the ability of the Post Fund to generate high levels of realized earnings in the future was severely reduced. With the old formula and asset allocation strategy, benefit increases were projected to be 2.5%-4.0% by the mid 1990's.

#### **NEW BENEFIT INCREASE FORMULA (1993-present)**

During 1990-92 SBI staff worked with the staff of Minnesota State Retirement System, Teachers Retirement Association, Public Employees Retirement Association and retiree representatives to develop a new benefit increase formula that would address the above disadvantages and provide the opportunity for higher benefit increases. The formula described below was enacted by the 1992 Legislature and is effective beginning FY93 (more detail is in Exhibit B).

The new benefit increase formula has of three components:

- inflation component
- investment component
- transaction adjustment

#### **Inflation Component**

Each year, retirees will receive an inflation-based adjustment equal to the lesser of the *inflation rate for the fiscal year or the difference between the Basic Funds and Post Fund interest rate assumptions with a maximum capped at 3.5%*. Currently, the interest rate assumptions for the Basic Retirement Fund and the Post are 8.5% and 5.0% respectively,

producing a difference equal to 3.5%. Tying the maximum inflation adjustment to the spread between the interest assumptions of the two funds maintains the actuarial soundness of the plans. The discount rate represents the long term expected rate of return for that pool of pension assets. As a result, if legislative action causes the interest rate assumption spread between the Basic Funds and the Post Fund to increase beyond 3.5%, the maximum inflation adjustment would remain at 3.5%. If legislative action reduced the spread below 3.5%, the maximum inflation adjustment would be capped by the lower spread.

As noted above, the current spread between the interest rate assumptions of the Basic and Post Funds produces a maximum inflation adjustment of 3.5%. For example, if inflation is 3.0%, a 3.0% inflation adjustment would be given; if inflation is 4.0%, the maximum of 3.5% would be granted.

### **Investment Component**

Annually, in addition to the inflation adjustment, an investment-based adjustment will be paid to retirees depending upon the investment performance of the Post Fund. Investment performance will be measured by the increase/decrease in market value of all assets in the Post Fund and will therefore include all realized *and* unrealized capital gains or losses. (The previous formula included only realized gains and losses.)

On June 30 of each year, the market value of the Post Fund will be compared to the reserves required to pay existing benefits. The reserves will include the additional funds needed to support all inflation and investment adjustments already granted as well as the 5% assumed rate of return. If the result of this comparison is positive, one-fifth of the difference will be distributed to the retirees in the form of an investment adjustment for each of the next five years. If the result is negative, no investment-based adjustment will

be made. Any negative balance will be carried forward to ensuing years until the combination of past and current results becomes positive. However, under no circumstances will the inflation adjustment be reduced because of investment performance. The investment gains (or losses) will be spread over five years to smooth the market value fluctuations that will undoubtedly occur due to the volatility of the financial markets.

An illustration of the investment-based adjustment is shown below:

<b>Excess Market Value</b>	<b>\$100 Yr. 1</b>	<b>\$(50) Yr. 2</b>	<b>\$150 Yr. 3</b>	<b>\$75 Yr. 4</b>	<b>\$(50) Yr. 5</b>	<b>Total Available for Investment Based Increase</b>
Yr.1	\$20					\$20
2	20	\$(10)				10
3	20	(10)	\$30			40
4	20	(10)	30	\$15		55
5	20	(10)	30	15	\$(10)	45
6		(10)	30	15	(10)	*
7			30	15	(10)	*
8				15	(10)	*
9					(10)	*
	\$100	\$(50)	\$150	\$75	\$(50)	*

\* Total available would depend, in part, on excess market value in years 6-9

### **Transition Component**

Because the investment-based component of the new benefit formula will not be fully implemented for five years, a provision for a temporary transition adjustment was enacted. If the investment-based component provides a lower benefit increase than the stated transition amount for that year, the transition adjustment will be paid rather than the investment-based adjustment. The transition adjustment is 1.0% for FY93; 0.75% for FY94; 0.50% for FY95; and 0.25% for FY96.

The total annual benefit increase paid to retirees for the first four years will be the sum of: (1) the inflation component plus (2) the investment *or* transition component, whichever is greater. The inflation and transition components will be paid regardless of investment performance. Beginning in the fifth year (FY97), the increase will be the sum of (1) the inflation component and (2) the investment component. The investment based component will be paid *only* if there is excess market value after deducting the 5% actuarial requirement, the inflation adjustment, and any negative investment-based adjustment carry forward.

### **ADVANTAGES OF THE NEW FORMULA**

The new formula has three primary advantages:

- *increased sensitivity to inflation*
- *increased earning power*
- *lower volatility of benefit increase*

#### **Increased Sensitivity to Inflation**

The previous formula was not sensitive to inflation. In fact, as noted earlier, the previous benefit formula tended to provide large benefit increases during periods of low inflation and low or no benefit increases during periods of high inflation. The new formula mitigates the inflation lag by providing an inflation based adjustment each year.

By providing a direct relationship between inflation and benefit increases, the new benefit formula will help maintain a retiree's purchasing power to some degree. The previous formula did not have this feature and Table 1 shows that there were a number of years when no benefit increase was granted. This time frame during the mid to late 1970's was a

period where inflation rose to very high levels and returns from most financial assets were poor.

### **Higher Potential Rate of Return**

The new formula will allow the Post Fund to increase the earnings power of its assets. Since the previous formula focused on realized earnings, the asset allocation emphasized fixed income investments which provide a higher annual yield and de-emphasized stock investments provide which, over time, provide higher total rates of return through capital gains. The new formula allows the Post to adopt a more balanced asset mix of stocks and bonds to be consistent with the total rate of return orientation of the new benefit formula. A higher stock allocation will allow the Post to have a more diversified, higher expected return portfolio. This in turn offers the potential for higher benefit increases over the long run than the previous portfolio asset mix could provide.

Table 1 compares the actual benefit increases granted from 1971-1992 to those that would have been granted with the new benefit formula. As shown, the new benefit calculation outperformed the previous benefit formula and is more inflation sensitive. (The projected increases were calculated using the actual rates of return of the Basic Funds during the time periods shown. During the 1970's the Basic Funds had a stock exposure of 50% or less. In 1983, the stock allocation was increased to 60%.)



**Table 1**  
**Percent Benefit Adjustment Comparison**  
**FY 1971 - FY 1992**

<b>FY</b>	<b>CPI</b>	<b>Actual Increases</b>	<b>Projected Increases Under New Method</b>
1971*	4.5	2.5	4.5
1972*	2.9	4.5	3.6
1973*	5.9	0.0**	6.0
1974*	11.0	0.0	4.2
1975*	9.3	0.0	5.2
1976*	5.9	0.0	5.1
1977*	6.9	4.0***	3.5
1978*	7.4	0.0	3.5
1979*	10.7	0.0	3.5
1980	14.6	3.2	3.5
1981	9.6	7.4	3.5
1982	7.1	6.9	3.5
1983	2.6	7.5	2.6
1984	4.2	6.9	3.5
1985	3.7	7.9	3.5
1986	1.7	9.8	6.8
1987	3.7	8.1	11.3
1988	3.9	6.9	6.3
1989	5.2	4.0	8.6
1990	4.7	4.7	7.1
1991	4.7	4.3	4.4
1992	<u>3.1</u>	<u>4.6</u>	<u>5.5</u>
<b>Annualized Adjustment</b>	<u>6.0%</u>	<u>4.1%</u>	<u>4.9%</u>

\* Increases granted through the Minnesota Adjustable Fixed Benefit Fund.

\*\* Pre-FY73 retirees received a 25% increase to reflect the change from career average to high five average to calculate pension benefits of Post FY73 retirees.

\*\*\* Legislative increase, not performance based.

### **Lower Potential Volatility of Benefit Increases**

In addition to the higher potential benefit increases over the long run, the new benefit increase formula should be less volatile than the previous formula. Using the benefit increases calculated in Table 1 above, the annual standard deviation for the old and new benefit formulas are 3.2% and 2.1% respectively. Therefore, over a long time period, retirees have the opportunity to receive higher benefit increases and at the same time experience lower fluctuations in their benefit increases from year to year. The primary reason for the reduced volatility is the inflation adjustment that provides some benefit increase during any year with positive inflation.

### **REVISED ASSET ALLOCATION POLICY**

The total rate of return orientation of the new benefit formula makes the investment objectives of the Post Fund more similar to those of the Basic Funds. Therefore, the Post asset allocation policy should more closely resemble the Basic Funds' asset allocation policy as well. Both Funds should have large allocations to common stock to reflect the higher long term rates of return offered by the stock markets relative to other asset classes.

The Post Fund also needs to maintain enough cash/liquidity to finance the near term payment obligations to the retirees. An appropriate cash level needs to be maintained so that other investments do not need to be liquidated at potentially inappropriate times to meet the monthly payments to the retirees.

To accomplish the objectives of total return and short term liquidity, the Board adopted a new asset allocation strategy for the Post Fund. During FY93, the stock exposure of the Post Fund was increased from 10% to 50%. During FY94, the Board chose to further diversify the portfolio by adding a 10% allocation to international stocks and a 5%

allocation to yield oriented alternative investments. A comparison of past and present allocation targets is shown below:

	6/30/92	FY93	FY94*
Domestic Stocks	10%	50.0%	50.0%
International Stocks	--	--	10.0
Domestic Bonds	90	47.0	32.0
Alternative Yield Oriented	--	--	5.0
Cash	--	<u>3.0</u>	<u>3.0</u>
	100%	100.0%	100.0%

\* Represents the SBI's current long term asset allocation policy for the Post Fund

### **Stock Rationale**

Historically, common stocks have provided the highest long term rates of return. Therefore, the large allocation to stocks, both domestic and international, is appropriate for the total rate of return orientation of the new benefit formula. Investing a portion of the stock segment in international stocks provides increased diversification and potential for higher returns. Despite growing global integration, each stock market will be affected by the economic and political make-up of its own country. Also, international stocks provide the opportunity to invest in economies that may be growing faster than the U.S. economy on either a cyclical or secular basis. In summary, by investing across world markets the Post Fund can potentially enhance returns while reducing the volatility of the stock segment. (For more information, please refer to the position paper entitled "International Equity Investing for the Basic Retirement Funds," September 1992.)

### **Bond Rationale**

The bond allocation provides diversification and reduces the overall volatility of the total portfolio. Since bond returns do not move in perfect synchronization with returns of domestic and international stocks, the inclusion of bonds in the total asset mix will reduce

the year-to-year variability of the Post Fund's total return. The Post Fund's allocation to bonds (currently 32%) is somewhat higher than the bond allocation in the Basic Funds (currently 24%). The higher bond allocation reflects the Post Fund's lower tolerance for return volatility due to the benefit increase formula as well as its somewhat shorter time horizon.

#### **Yield Oriented Alternative Investment Rationale**

The allocation to yield oriented alternative investments (e.g. business loan participations, mortgage loan participations, private placements) provides an additional vehicle to obtain higher current yields and provide long term appreciation. These investments are typically structured like fixed income securities with an opportunity to participate in the appreciation of the underlying asset. Even though these investments may have an equity component to them, they display a return pattern more similar to a bond. Therefore, they also provide good diversification relative to domestic and international stocks, and to some degree, to domestic bonds. This will help to reduce the volatility of the total portfolio but at the same time will provide the opportunity to generate higher returns relative to domestic bonds.

#### **Cash Rationale**

Since cash equivalents have lower returns than longer term assets, the Post Fund's cash allocation should be sufficient only to cover short term liquidity needs. Insufficient cash would force the Post Fund to liquidate other investments at a potentially inappropriate time or over a very short time frame.

The analysis below shows that only a 0.5% probability exists that the maximum cash draw down for any time period would be greater than \$266 million. Even though the time period analyzed is relatively short from a statistical standpoint, a 3% cash allocation (\$255 million) incurs only a very small probability of not meeting the short term cash needs of the Post Fund.

**Post Retirement Fund  
Cash Flow Needed to Fund Monthly Annuity Payments  
June 87 - February 1992**

	<b>12 Month Rolling</b>	<b>6 Month Rolling</b>	<b>3 Month Rolling</b>	<b>Monthly</b>
Average	\$80,133,586	\$54,920,223	\$28,957,699	\$11,547,932
Maximum	409,262,067	446,358,144	529,657,871	371,675,652
Minimum	(125,739,857)	(106,156,127)	(83,299,727)	(32,534,868)
Std. Dev.	96,785,269	118,717,961	114,283,679	60,194,685
Max. Draw Down Level*	(169,572,241)	(251,372,116)	(265,894,192)	(143,754,355)

\* With 99.5% level of confidence

**QUANTITATIVE ANALYSIS OF ASSET ALLOCATION STRATEGY**

In order to assist the Board in selecting an appropriate asset mix for the Post Fund, staff prepared simulations of various asset allocation policies:

- current asset allocation policy (the asset allocation policy adopted in FY94)
- a more aggressive strategy (75% stocks/25% bonds)
- a more conservative strategy (10% stocks/90% bonds) similar to the asset mix employed under the old benefit increase formula

Tables 2 and 3 below show the assumptions used in the analysis.

**Table 2**  
**Return and Standard Deviation Assumption**

	<b>Real Return</b>	<b>Expected Return</b>	<b>Risk*</b>
<b>Domestic Stocks</b>	5.5%	11.0%	±18.0%
<b>International Stocks</b>	6.0	11.5	±20.0
<b>Domestic Bonds</b>	2.5	8.0	±8.0
<b>Alternative Yield Oriented</b>	4.0	9.5	±12.0
<b>Cash</b>	0.5	6.0	±3.0

\* one standard deviation

**Table 3**  
**Correlation Assumptions**

	<b>U.S Stocks</b>	<b>Non U.S. Stocks</b>	<b>U.S. Bonds</b>	<b>Alternative Yield Oriented</b>	<b>Cash</b>
<b>Domestic Stocks</b>	1.00				
<b>International Stocks</b>	0.60	1.00			
<b>Domestic Bonds</b>	0.35	0.20	1.00		
<b>Yield Oriented</b>	0.45	0.30	0.50	1.00	
<b>Cash</b>	-0.10	0.00	0.10	0.20	1.00

### Expected Return and Risk

Using the above assumptions, staff ran a computer simulation developed by Wilshire Associates. Table 4 below shows the results of that analysis.

**Table 4**  
**Expected Return and Risk**

	<b>More Aggressive 75/25 Stock/Bond</b>	<b>Current Asset Allocation Policy</b>	<b>More Conservative* 10/90 Stock/Bond</b>
<b>Mean Return</b>	10.25%	9.87%	8.30%
<b>Risk**</b>	±14.32	±11.78	±8.01

\* Similar to previous asset mix under old benefit increase formula

\*\* One standard deviation

The analysis shows that more risk (higher standard deviation) provides a higher mean return. In addition, the analysis shows the benefit of adopting a diversified asset allocation policy. Relative to the more conservative strategy, the current policy increases the expected rate of return by 1.57% with a corresponding increase in risk of 3.71. While the more aggressive portfolio provides an even higher increase expected rate of return, the increase in risk is unacceptably high as well.

### Sensitivity Analysis

Table 5 below provides the potential rates of returns for the three asset allocation alternatives assuming a 90% confidence interval.

**Table 5  
Range of Expected Returns**

	<b>More Aggressive 75/25 Stock/Bond</b>		<b>Current Asset Allocation Policy</b>		<b>More Conservative* 10/90 Stock/Bond</b>	
	<b>High</b>	<b>Low</b>	<b>High</b>	<b>Low</b>	<b>High</b>	<b>Low</b>
1 Yr.	35.78%	-11.10%	30.44%	-8.17%	21.79%	-4.52%
5 Yr.	20.53	-0.03	18.10	1.31	12.74	3.09
10 Yr.	17.19	2.81	15.36	3.70	10.67	5.01
15 Yr.	15.75	4.08	14.18	4.77	9.84	5.80
20 Yr.	14.90	4.84	13.49	5.40	9.39	6.24

\* Similar to previous asset mix of the Post Fund

Source: Wilshire Associates

Not surprisingly, the analysis shows that the current asset allocation policy and the more aggressive portfolio have a broader range of expected returns than the previous asset mix due to their higher volatility.

Another type of sensitivity analysis looks at the probability of not achieving a certain annual rate of return over a given time period. Since the Post requires a 5% rate of return to meet current promised benefit payments and the proposal provides for an inflation based adjustment capped at 3.5%, the analysis below used a 8.5% annual rate of return for the threshold level.



**Table 6**  
**Probability of Not Achieving 8.5% Return**

	<b>More Aggressive 75/25 Stock/Bond</b>	<b>Current Asset Allocation Policy</b>	<b>More Conservative* 10/90 Stock/Bond</b>
1 Yr.	46.45%	47.03%	53.49%
5 Yr.	42.01	43.23	59.40
10 Yr.	38.67	40.31	65.75
15 Yr.	36.14	38.06	71.55
20 Yr.	34.04	36.19	76.67

\* Similar to previous asset mix of the Post Fund

Source: Wilshire Associates

The analysis shows that both the adopted asset allocation policy and the more aggressive portfolio provide a much higher probability that they will exceed the 8.5% threshold level than the previous Post asset mix.

## **MANAGEMENT STRUCTURE**

### **Stocks and Bonds**

The domestic stock, international stock and bonds segments of the Post Fund will be invested in the same asset pools and will use the same management structure currently in place for the Basic Funds. The current investment pools can absorb the increase in assets and offer appropriate investment vehicles to accomplish the total rate of return objective of the Post Fund. Like the Basic Funds, the Post Fund will manage approximately 50% of its stock and bond assets passively or semi-passively. Due to the size of the Basic and Post Funds, allocating a portion of the assets to passive or semi-passive investment provides broad exposure in an efficient and cost effective manner. Conversely, allocating up to half of the assets to an actively managed program will offer the potential for value added.

### **Yield Oriented Alternative Investments**

The Post Fund assets that are allocated to high yield investments will be invested separately from the Basic Funds' alternative investments to assure returns attributable to these new investment vehicles are accounted for appropriately. These investments will be made through limited partnerships and private placements appropriate to the specific deal structure of the investments.

### **Cash Equivalents**

The Post's cash assets will be managed in the short term investment fund (STIF) currently managed by the SBI's custodial bank (State Street). This is the same investment vehicle used for the cash held in the Basic Funds.

## **SUMMARY AND CONCLUSION**

The new benefit increase formula provides retirees with annual adjustments that will be more sensitive to inflation. In addition, because the Post Fund will be oriented toward maximizing total return rather than current yield, the earning power of the Post Fund's assets can be enhanced. This, in turn, offers the potential for higher benefit increases, over time, than would be likely under the old formula.

The current allocation policy of the Post Fund provides a favorable trade off between risk and return and meets the requirements set by the new retirement benefit increase:

- The current asset allocation policy provides a 1.57% higher expected annualized rate of return than the previous asset mix.

- The adopted asset mix provides a higher probability of exceeding the 8.5% threshold return than the previous asset mix (i.e., 5% assumed rate of return plus the maximum inflation adjustment of 3.5%).
- The current asset allocation policy assures adequate short term liquidity to pay monthly benefits through its 3% allocation to cash.
- Given the five year time frame for calculation of the investment-based adjustment portion of the new benefit increase formula, the adopted asset allocation policy provides an appropriate balance between returns and risk/volatility.

# EXHIBIT A

## Old Benefit Increase Formula

FY1980 - 1992

In order to support currently promised benefits, the Post Retirement Investment Fund must generate 5% realized earnings on its invested assets each year. All realized earnings in excess of 5% are used to finance permanent lifetime benefit increases for current retirees. The benefit increase calculation is specified in *Minnesota Statutes* Chapter 11A.18, subdivision 9. A summary of the methodology is shown below:

$$\begin{array}{rcccl} \boxed{\text{Investment Earnings (1)}} & - & \boxed{\text{Required Return of 5\% (2)}} & = & \boxed{\text{Income Available for Benefit Increase}} \\ \\ \boxed{\text{Income Available for Benefit Increase}} & \div & \boxed{\text{Required Reserves(3)}} & = & \boxed{\text{Benefit Increase (4)}} \end{array}$$

- (1) Investment earnings are defined as dividends, interest, accruals and realized capital gains or losses applicable to the most recent fiscal year ending June 30.
- (2) Each cash flow in or out of the Post Fund is adjusted by 5% multiplied by the fraction of a year from the date of the cash flow to the end of the fiscal year on June 30.
- (3) Total required reserves are calculated by the State's actuary retained by the Legislative Commission on Pensions and Retirement.
- (4) A retiree who has been receiving an annuity or benefit for at least one year as of the end of the fiscal year will receive the full benefit increase. A retiree who has been receiving an annuity or benefit for less than one year will receive one twelfth of the full increase for each month the person was retired during the fiscal year. Full or partial increases are effective beginning January 1 of the following calendar year.

# EXHIBIT B

## New Benefit Increase FY93 - Present

### Calculation of January 1, 1994 Benefit Increase

Actuarially valued required reserves at Jan. 1, 1994	\$ 6,875,719,000
Less: Reserves not eligible for increase	<u>415,549,000</u>
Actuarially determined eligible reserves at Jan. 1, 1994	6,460,170,000
FY93 CPI inflation rate capped At 3.5%	2.800%
Dollar cost of inflationary increase	180,884,760
June 30, 1993 total required reserves	<u>7,049,322,000</u>
June 30, 1993 total required reserves adjusted for inflationary increase	7,230,206,760
Market value of Assets June 30, 1993	8,269,233,081
Less: Inflation adjusted required reserves	<u>7,230,206,760</u>
Current year excess market value	1,039,026,321
Negative balance carryforward	<u>0</u>
Excess market value available for investment based benefit increase	<u>1,039,026,321</u>
Divided by 5 year pay out period	5
Current year portion of excess market value	207,805,264
Second year portion	0
Third year portion	0
Fourth year portion	0
Fifth year portion	<u>0</u>
Total five year excess market value	207,805,264
Cost of transition adjustment	64,601,700
Greater of current year excess market value or cost of transition adjustment	<u>207,805,264</u>
Divided by eligible required reserves Jan. 1, 1994	\$ 6,460,170,000
Investment based increase for FY93	3.217%
<b>Summary:</b>	
Investment Based Benefit Increase	3.217%
Inflation Based Benefit Increase	<u>2.800%</u>
Total Benefit Increase	<u>6.017%</u>
Total Dollar Value of January 1, 1994 Benefit Increase	\$ 388,690,024

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**Paper:** Post Retirement Fund  
Benefit Increase Issues

**Date:** May 1986

**Background:**

This paper examined the old post retirement benefit increase formula in detail and reviewed some of the policy questions that arise from that increase mechanism.

**Changes Since Publication:**

Benefit increases under the old formula peaked at 9.8% for FY 1986 when the corresponding rate of inflation was 1.7%. For FY 1989, the increase was 4.0% with a corresponding rate of inflation of 5.2%. For FY 1990, the increase was 5.1% with a corresponding inflation rate of 4.7%. Future benefit increases were projected to stay within 2.5%-4.0% range during the 1990's if the benefit increase formula did not change.

A proposal to change the benefit increase formula was developed by the executive directors of MSRS, TRA, PERA and SBI with input from retiree groups and other interested parties. The boards of MSRS, TRA and PERA endorsed the proposal in late calendar 1990. Legislation was introduced in 1992 and the proposal was effective for FY1993. See "Post Retirement Fund: New Benefit Increase Formula and Revised Asset Allocation Policy, January 1994," for more information.

**Prepared:** June 1994

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A proposal to change the benefit increase formula has been developed by the executive directors of MSRS, TRA, PERA and SBI with input from retiree groups and other interested parties. The boards of MSRS, TRA and PERA endorsed the proposal in late calendar 1990. To date, no legislation has been introduced.

**Prepared:** March 1991

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**POST RETIREMENT INVESTMENT FUND**  
**BENEFIT INCREASE ISSUES**

**Staff Position Paper**  
**May, 1986**

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## EXECUTIVE SUMMARY

The assets of retired public employees, covered by the seven statewide retirement plans, are invested in the Post Retirement Investment Fund (PRIF). The retirees' contributed assets, plus the PRIF'S investment earnings, finance lifetime annuities for eligible retirees. If the PRIF's investments should earn more than the 5% actuarially required return, the excess earnings are used to finance permanent benefit increases.

Minnesota's statewide pension plans completely segregate the retirement assets of active and retired employees. This structure has the advantage of permitting a separate focus on the needs and objectives of these two employee groups. It has facilitated the maintenance of the PRIF's fully-funded financial condition. Under the PRIF's conservative structure, promised benefits to retirees are highly secure.

The PRIF's benefit increase formula has granted retirees sizable benefit increases in recent years, particularly when compared to the inflation rate. A number of factors have been responsible for these large increases including high interest rates, rising stock prices, low inflation, and rapid growth in PRIF membership.

It is unlikely that the large benefit increases relative to inflation can be sustained indefinitely. In fact, many of the factors that have led to these large increases could reverse themselves in the future, leading to benefit increases that fall well behind the inflation rate. This situation occurred in the late 1970's. The lagged relationship between benefit increases and inflation may be an inherent feature of the PRIF's benefit increase formula.

A number of major issues concerning the PRIF confront policymakers. These issues include benefit adequacy, the State's role in protecting benefits against inflation, realistic PRIF benefit increase expectations, the lagged relationship between benefit increases and inflation under the current formula, and, in general, the desirability of the existing benefit *increase mechanism*.

## **FUND DESCRIPTION**

The Post Retirement Investment Fund (PRIF) contains the pension assets of retired public employees covered by the seven statewide retirement plans. Fully vested public employees are entitled to life-time annuities, with monthly benefits based on the employees' "high-five" average salaries and years of service. Upon the employees' retirements, dollar amounts sufficient to fund their promised benefits (i.e., the present value of their annuities) are transferred from the Basic Retirement Funds to the PRIF.

These transferred sums remain invested in the PRIF while they are gradually paid out to the retirees. For purposes of funding the retirees' annuities, it is assumed that the PRIF's invested assets will earn at least 5% per year. Thus, the amounts transferred from the Basic Retirement Funds are less than the actual amounts expected to be paid in the future to retirees. If the PRIF's investment returns satisfy the 5% actuarial assumption, then the PRIF will maintain a value sufficient to finance promised benefits.

PRIF investment earnings counted toward meeting the 5% target return include interest and dividend income and realized capital gains (or losses). Unrealized capital gains (or losses) are not defined as part of the PRIF's earnings for benefit financing purposes. The effect of this provision is to make the financing of retiree benefits (and particularly benefit increases) largely insensitive to short-run fluctuations in the capital markets.

If the PRIF should generate more than a 5% return on its invested assets, the excess earnings are used to finance permanent benefit increases to eligible retirees. Essentially, the excess earnings are used to purchase additional monthly annuities for eligible retirees, on top of the benefits already promised those individuals. The calculation of benefit increases will be explained in greater detail in a later section.

## **SEGREGATION OF ACTIVE AND RETIRED EMPLOYEE ASSETS**

The structure of Minnesota's statewide pension plans is relatively unique. Most private and public pension plans commingle the retirement assets of all their participants, whether those people are currently employed or retired. Minnesota, on the other hand, completely separates active and retired employee assets. Active employee assets are invested in the Basic Retirement Funds, while retired employee assets are invested in the PRIF.

This segregated investment management structure is advantageous because it permits a separate focus on the needs and objectives of these two employee groups. The investment goals of retired employees differ considerably from those of active employees. Thus, their retirement assets should be managed under different policies.

The management of the active employees' assets follows a policy that is long-run in outlook and is willing to assume above-average risk. The vast majority of the active employees' assets are invested in common stocks and other equity securities. On the other hand, the management of the retired employees' assets follows an investment policy with a much shorter time horizon and with a very limited willingness to take on risk. Most of the PRIF is invested in high quality fixed income securities designed to ensure adequate funding of promised benefits.

The segregation of employee retirement assets also permits pension policymakers to clearly identify the important underlying assumptions and financial condition of both the active and retired employees' pools of retirement assets. Such aspects as demographics, capital markets and inflation expectations, wage growth, funding status, and benefit levels are better examined separately from the perspective of the active and retired employees' pension funds.



## **PRIF ALWAYS FULLY FUNDED**

One particular aspect of the PRIF's financial condition is made very clear by the segregation of employee retirement assets. That is, presuming only that the PRIF's investments earn the assumed 5% rate of return (a very conservative assumption), the Fund is by definition always fully funded.

As discussed earlier, when a public employee retires an amount sufficient to sustain his/her promised benefits is transferred to the PRIF. Because these benefits are based on predetermined factors (i.e., years of service and "high-five" salary), there is virtually no uncertainty as to the liabilities of the Fund. This situation is in contrast to the uncertainty surrounding expected active employee benefits. Wage rates and years of service are factors that can exhibit wide swings and can render actuarial assumptions meaningless in a matter of years.

Because the PRIF's liabilities are so certain and because of the low investment earnings assumption applied, one can confidently say that the PRIF is fully funded. This characteristic of the Fund separates it from the vast majority of other public pension funds, which in many cases exhibit very low funding ratios. Under the PRIF's current structure, promised benefits to retirees are at virtually no risk. No additional charges on employers are ever likely to be needed to support promised benefits.

## **CALCULATION OF BENEFIT INCREASES**

As discussed above, when the PRIF earns more than its actuarially required 5% return in any given fiscal year, excess earnings are used to finance permanent benefit increases for eligible retirees. Avoiding insignificant details, the calculation of benefit increases is fairly simple. From the PRIF's fiscal year earnings are subtracted an amount sufficient to satisfy the actuarially required 5% return. These residual earnings are then adjusted for several minor charges. After these adjustments, the PRIF's residual earnings are stated as a

percentage of the present value of the current eligible retiree liabilities. This percentage represents the benefit increase that the Fund must grant eligible retirees.

Retiree benefit increases are strictly a function of the PRIF's investment performance. Economic factors, particularly inflation, influence the level of benefit increases only as they affect the returns available to the PRIF. Retirees are totally dependent on the PRIF for benefit increases. In effect, once a public employee retires, the State sets aside a sum sufficient to finance promised benefits and then disclaims all further responsibility for the future purchasing power of those benefits.

### **HISTORY OF PRIF BENEFIT INCREASES**

The current mechanism for calculating retiree benefit increases was adopted by the Legislature in 1980. Since that time, benefit increases granted retirees have been substantial, particularly relative to the inflation rate. Table 1 lists the PRIF benefit increases on a year-by-year basis.

**TABLE 1**  
**Post Retirement Investment Fund**  
**Annual Benefit Increases**

	Calendar Year					
	1980	1981	1982	1983	1984	1985
<b>Benefit Increase</b>	3.2	7.4	6.9	7.5	6.9	7.9
<b>Inflation Rate</b>	12.4	8.9	3.9	3.8	4.0	4.0

Benefit increases over the last six years have averaged 6.6% on a compounded annual basis. This figure compares favorably to the 6.1% annual rate of change in the Consumer Price Index over that same period.

A number of factors have contributed to the large inflation-adjusted benefit increases over the last six years. Most importantly has been the high level of interest rates. Interest

rates surged in the late 1970's and early 1980's. These higher interest rates boosted the yields on the PRIF's bond portfolio and, hence, produced higher investment earnings.

The second factor was the SBI's decision to increase the proportion of the PRIF's portfolio invested in fixed income securities. This strategy was predicated on the historically high level of interest rates referred to above. The combination of higher interest rates and larger bond portfolio had a dramatic impact on the PRIF's earnings. In 1980, interest income represented 4.9% of the fund's liabilities. By 1985, that figure was 7.4%. This increased interest income was passed directly on to retirees in the form of benefit increases.

The third factor was the unusually strong performance of the stock market. The market produced returns averaging 17.1% a year over the last six years. A large portion of the stock price advance was translated into realized capital gains as part of the PRIF's normal common stock portfolio management process. Because realized equity capital gains are counted as part of investment earnings, they too served to increase benefits.

The fourth factor was the dramatic decline in the rate of inflation during the last six years. In 1980, inflation was running at a 12.4% annual rate. In calendar year 1985, consumer prices grew only 4.0%. Thus, while PRIF investment income was growing, the rate of inflation was declining. The result has been in recent years benefit increases more than double the rate of inflation.

Finally, the last factor contributing to the recent large benefit increases has been the rapid growth in the PRIF's membership. The number of new retirees each year has grown from 2491 in 1980 to 3677 in 1985, a 50% increase. In particular, during the last two years a considerable part of this growth has been due to early retirements under the "Rule of 85." Growth in new retirees enhances benefit increases due to the PRIF's eligibility requirements. Only those individuals who have been retired for at least 18 months are eligible to receive a benefit increase at the beginning of each calendar year. The excess earnings on the assets of ineligible retirees are credited to eligible retirees. In a sense,

eligible retirees benefit from the "float" on the excess earnings of ineligible retirees. When the number of new retirees is increasing, this procedure benefits current retirees by artificially raising benefit increases.

### **UNDERSTANDING RECENT BENEFIT INCREASES**

It is most unlikely that the confluence of favorable macroeconomic, asset mix, and demographic factors will occur again in the foreseeable future. Interest rates have fallen sharply over the last year. At current levels (8% long-term rates) over 90% of new contributions must be placed in the dedicated bond portfolio just to support current benefits and fund a modest 3% benefit increase. Further, while continued strong stock market gains are possible, historical evidence would argue against expecting similar returns in the future. With respect to inflation, economic analysts' projections are divided over its future course. Most forecasts discount the possibility of continued declines. Many economists contend that strong economic growth and high rates of money growth will result in much higher inflation before the end of the decade. Finally, the rapid influx of new retirees into the PRIF will soon level off, particularly given that the "Rule of 85" has not been extended.

In fact, it is quite conceivable that events could develop in such a way that benefit increases fall significantly behind the inflation rate. This situation occurred in the late 1970's when the PRIF earned no benefit increases from 1976 to 1979. This was a period when the inflation rate averaged 8.4% per year. Many persons erroneously believe that the primary cause of the zero earned benefit increases from 1976-79 was the formula used to calculate those increases. This formula was revised in 1980 and has been associated with the large benefit increases offered since then. The incorrectness of this view is shown in Table 2 which lists the benefit increases that would have been produced from 1976-79 under the current formula, if it had been in effect during that period.

**TABLE 2**

**Post Retirement Investment Fund  
Hypothetical Benefit Increases  
Assuming Current Formula Then In Effect**

	<b>Calendar Year</b>			
	<b>1976</b>	<b>1977</b>	<b>1978</b>	<b>1979</b>
<b>Benefit Increase</b>	1.2	1.6	0.9	1.9
<b>Inflation Rate</b>	4.8	6.8	9.0	12.7

Clearly, these hypothetical benefit increases are not substantially different than the zero growth in benefits that actually occurred.

Certain aspects of the old formula did inhibit benefit increases. The impact was not significant, however. The more important reasons for the inadequate inflation-adjusted benefit increases were the mediocre performance of the capital markets, the PRIF's asset mix, and the upsurge in inflation.

In the late 1970's interest rates and the inflation rate rose rapidly. But the PRIF's bond portfolio could not roll over immediately into higher yielding bonds without incurring substantial losses. As a result, the Fund's interest income remained near the levels earned in a lower interest rate environment. Further, the stock market over this period produced mediocre results. Combined with an investment philosophy that limited portfolio turnover, the result was that no significant realized equity capital gains were available to fund earnings. In addition, half of the PRIF's assets were invested in stocks. The Fund's earnings suffered not only because of the dearth of realized equity capital gains, but because dividend income produced by stocks is considerably less than interest income produced by an equivalent dollar investment in bonds. All of these factors together produced benefit increases quite inadequate to compensate for the high inflation of the late 1970's.

## **LAGGED RELATIONSHIP BETWEEN BENEFIT INCREASES AND INFLATION**

In fact, the experience of the late 1970's versus the 1980's highlights a serious flaw in the PRIF's benefit increase mechanism. That problem is the tendency of PRIF benefit increases to lag the inflation rate. As inflation rose in the late 1970's, benefit increases would not have immediately responded under the current formula. They did begin to catch up in the early 1980's. By that time inflation had peaked. As inflation declined PRIF benefit increases remained high. Most likely those benefit increase will decline, perhaps quite quickly, over the next several years. It is not inconceivable, however, that by then inflation rates will again be rising. The adequacy of the PRIF's benefit increases relative to inflation will once again be called into question.

The reasons for the lag between PRIF benefit increases and inflation is tied to the relationship between capital markets investment returns and inflation. Bond prices perform poorly during periods of rising inflation. Interest rates reflect an inflation premium. As inflation rates rise, so do interest rates (not necessarily in lockstep, but the correlation is still high). Rising interest rates drive down bond prices. Stock prices often respond negatively in such an environment as well, particularly if the inflation rise is rapid and unexpected. Higher interest rates on bonds provide "competition" to stocks in the eyes of investors, causing a decline in stock prices. Further, corporate earnings may not adjust quickly to inflation, making stocks less attractive. The opposite effects occur in a declining inflation rate environment.

PRIF benefit increases are tied to the Fund's investment earnings. If common stock prices decline because of a rise in inflation, PRIF earnings will suffer from an absence of realized capital gains. Further, as interest rates rise the bond portfolio cannot be quickly moved into higher yielding bonds without incurring immediate realized capital losses, which would further impair benefit increases. Hence, even though interest rates rise, the Fund's earnings will not be bolstered immediately by an increase in interest income.

Eventually, new cash flows into the Fund, invested in higher yielding bonds, will augment the PRIF's interest earnings and benefit increases will start to rise. But the pattern is for these benefit increases to lag the rise in inflation.

As inflation rates decline and interest rates fall, the PRIF's stock portfolio likely will rise in value, generating realized capital gains. The bond portfolio will still be invested in higher yielding bonds. The result is a high level of earnings which will permit continued large benefit increases. Eventually the investment of new cash flows in lower yielding bonds will drive down interest rates. But again the pattern of benefit increases to lag the move in inflation persists.

#### **PROMINENT ISSUES CONFRONTING POLICYMAKERS**

A number of major issues concerning the PRIF should be addressed by policymakers. The first issue is the subject of benefit adequacy. If current benefits promised retirees are sufficient from the State's view to support an adequate standard of living, the focus can be placed on maintaining the inflation-adjusted value of these benefits. On the other hand, if benefits are not considered to be adequate, then policymakers may desire to increase the level of benefits. Such an increase would require additional contributions to the PRIF if the Fund is to maintain its fully funded status.

The second issue is whether the State should guarantee the inflation-adjusted value of pension benefits paid to public employee retirees. As discussed, no guarantee of any kind currently exists. Retiree benefits increases are solely dependent on the earnings of the PRIF. Under certain economic conditions (which have occurred in the past), those earnings may fail to provide benefit increases that match inflation. Does the state have a responsibility to retirees to provide inflation protection, even in periods when PRIF earnings are inadequate to do so? If the answer is yes, how complete should this protection be? Conversely, in those periods when the PRIF produces benefit increases that outpace inflation, should benefit increases be capped?

The third issue, which is a derivative of the second, concerns realistic expectations for PRIF benefit increases. It can be shown that under a broad range of economic conditions, it is unreasonable to expect the PRIF to produce earnings that allow benefit increases to match inflation. Few U.S. pension plans, private or public, attempt to give benefit increases that even partially, let alone fully, *compensate for inflation on a consistent basis*. Policymakers may elect to establish a benefit increase target that is only a fraction of the inflation rate.

The fourth issue is the pattern of lagged benefit increases relative to inflation that the PRIF has produced over the last decade. Whether it is acceptable to grant benefit increases that fail to match inflation in periods when inflation is rising, while granting benefit increases that exceed inflation when inflation is falling, is debatable. Over a several year period, benefit increases may average out to be an acceptable fraction of the inflation rate. However, the arbitrariness of the lagged pattern can produce inequities among retirees, depending on their dates of retirement.

The final issue quite simply is whether it is desirable to provide benefit increases in the current manner. This broad subject encompasses the three previously discussed issues. Currently, the PRIF's actuarially assumed return of 5% is below the rate of return that the Fund can reasonably be expected to produce. The implied policy goal of this conservative assumption is to create surplus earnings that will be credited to retirees in the form of benefit increases. However, it is unclear whether this mechanism is the most efficient means of providing inflation protection to retiree benefits, presuming that some level of inflation protection is a State objective.

As has been discussed in this paper, the current mechanism for granting benefit increases has both positive and negative consequences. On the positive side is the fact that the PRIF has little likelihood of failing to fund its promised benefits. The conservative level of the assumed return on the PRIF's assets ensures this result. Further, the PRIF can be expected to produce excess earnings that permit benefits to be increased. On the



negative side, the PRIF may be unable to grant benefit increases that adequately compensate for inflation under some economic environments. Further, the PRIF's benefit increases have consistently lagged movements in the inflation rate over the past decade. Policymakers should consider whether, if inflation protection is a desirable goal, other direct benefit increase mechanisms might be more efficient means of accomplishing this objective.

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**SUPPLEMENTAL INVESTMENT FUND  
NEEDS AND OBJECTIVES**

**Staff Position Paper  
October 1985**

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## EXECUTIVE SUMMARY

The Minnesota Supplemental Investment Fund is a multi-purpose investment program that offers a range of investment options to state and local public employees. A diverse group of retirement groups participate in the Supplemental Investment Fund. These groups are: the *Deferred Compensation Plan*; local police and firefighter retirement plans; state university and community college teachers; *Unclassified state employees*; and, Hennepin County employees.

The nature of the retirement programs offered to these groups through the Supplemental Investment Fund varies from group to group. The Fund serves as a tax-sheltered savings program, similar to corporate 401(K) plans, for the *Deferred Compensation Plan*. For *Unclassified state employees*, the Fund represents their entire pension plan. For local police and firefighter retirement plans, the Fund serves as a money manager for part of the plans' assets. Finally, for state university/community college teachers and Hennepin County employees, the Fund is a pension supplement.

Because the Supplemental Investment Fund plays many roles for many retirement groups, it should be capable of offering a wide array of investment alternatives. The retirement groups should then be able to select those options that best meet the particular needs and objectives of their participants.

Currently, the Supplemental Investment Fund offers three alternatives. The first option is the Growth Share Account. It is an all-common stock fund which aggressively seeks superior returns through assuming above-average levels of investment risk. The second option is the Income Share Account. It is a balanced fund that holds a diversified portfolio of common stocks, bonds, and cash equivalents. It too seeks superior total returns, but without exposing itself to the volatility of the Growth Share Account. The final option is the Fixed Return Account (for individuals) and the Bond Account (for retirement organizations). These funds buy and hold high quality, short-to-intermediate

term debt securities. These funds offer interest bearing, low risk investments to participants.

SBI staff believes that the current set of investment options is neither broad nor well-defined. As such, they do not provide sufficient investment flexibility and diversity to meet the range of participants' investment needs.

Staff believes that a broader, better focused set of investment options will enhance the ability of the Supplemental Investment Fund to meet the participants' specific objectives. Staff proposes that the current set of options be revised. Specifically, staff proposes:

1. The Growth Share Account (all common stocks) and Income Share Account (balanced fund) be retained.
2. The Fixed Return Account be eliminated. It would be replaced by a money market account and a Guaranteed Investment Contract (GIC) account.
3. Two additional options be added: a common stock market index account and a bond market account.

Participating retirement groups would buy shares in investment pools representing the proposed options. Because all of these options, with the exception of the GIC account, currently are made available to the Basic Retirement Funds, administration of this expanded program will be administratively simple. The participating retirement groups could enter or leave the investment pools at their discretion.



## INTRODUCTION

The Minnesota Supplemental Investment Fund is a multi-purpose investment program that offers a range of investment options to state and local public employees. Approximately 14,000 individuals participate in the Fund, which had a market value on June 30, 1985 of \$287 million. Among the participants are police and firefighter retirement organizations, state university and community college teachers, state employees, and employees of various units of local government. A wide diversity of investment goals exists among the Fund's participants.

To meet these investment goals, most participants currently have a choice of investing in three types of accounts: the Income Share Account; the Growth Share Account; or one of two debt-related accounts, the Fixed Return Account for individuals, or the Bond Account for retirement plans. SBI staff believes that this set of investment options can be improved and expanded significantly. The investment pools utilized by the Basic Retirement Funds can be made available to the Supplemental Investment Fund. The increased investment flexibility, at no additional cost, can enhance the investment services offered to state and public employees.

This paper is divided into six sections. The first section describes the various public employee groups that participate in the Supplemental Investment Fund. The second section reviews the current set of investment options offered to Fund participants. The third section discusses corporate tax-deferred savings plans, which are similar to the Fund in terms of investment objectives and investment management structure. The fourth section presents recommended changes in the available options offered Fund participants. The fifth section considers several retirement group issues related to this proposal. Finally, the sixth section outlines sections of the Minnesota Statutes that would have to be modified for this proposal to be implemented.

## **FUND PARTICIPANTS**

### Deferred Compensation

The largest and fastest growing group of participants in the Supplemental Investment Fund are those public employees enrolled in the Deferred Compensation plan. As shown in Table 1, the program's assets make up 30.7% of the Fund's total market value. Like many similar programs sponsored by corporate employers, the Deferred Compensation plan permits eligible employees to invest a portion of their salaries in a tax-deferred savings program, ostensibly for retirement purposes. Participants have a choice of either investing in fixed or variable annuities sponsored by insurance companies; or of investing in the Supplemental Investment Fund. Participation is voluntary and is unrelated to employees' mandatory participation in the statewide retirement programs. Any public employee is eligible to place annually up to the lesser of either 25% of gross salary or \$7500 in the Deferred Compensation plan. Withdrawals are permitted only upon retirement, job termination, or financial hardship. Participants in the Supplemental Investment Fund have the choice of shifting annually new and past contributions among the three investment options.

Like many participants in corporate tax-deferred savings plans, participants in the Deferred Compensation plan tend to be risk averse. Among those individuals placing their contributions in the Supplemental Investment Fund, the large majority of their assets (63.8%) are invested in the debt-related option open to individuals, the Fixed Return Account. The remainder is split slightly in favor of the Income Share Account over the Growth Share Account.

### Police and Firefighter Retirement Plans

Various local police and firefighter (P&F) organizations make up the second largest group of participants in the Supplemental Investment Fund. Their combined assets represent 29.4% of the Fund, at market value.

Legislation enacted in 1979 closed the local P&F organizations to new membership. All new P&F employees hired after that time become members of the Public Employees Retirement Association. Their retirement assets are invested through the Basic Retirement Funds. However, the P&F employees in service prior to the law's enactment remain members of their respective local retirement organizations.

The local P&F retirement organizations have their own boards of trustees, and make their own investment decisions. Many local P&F organizations have chosen to retain external money managers to invest at least a portion of their retirement assets. State law permits these organizations to retain the State Board of Investment, through the Supplemental Investment Fund, as a money manager, at no direct expense to the P&F funds. Those organizations that use the Fund as a manager can also retain additional managers to invest their assets. In fact, the eight P&F organizations that currently invest in the Supplemental Investment Fund also employ additional external managers.

The financial condition of P&F retirement funds across the State varies from fund to fund. In general, however, local P&F funds have large unfunded liabilities. While many still have positive net contributions, because the funds are closed, almost all are maturing rapidly. Thus, many will soon start to experience net cash outflows. The individual financial circumstances of a particular P&F retirement plan can affect the investment needs and objectives of the plan.

Currently, 71.7% of the total participating P&F assets are invested in the Income Share Account, with the remainder split almost equally between the Growth Share Account and the two debt-related options.

### State Teachers

The third largest group of participants in the Supplemental Investment Fund are teachers employed by Minnesota state universities and community colleges (excluding the University of Minnesota). The teachers' assets comprise 23.6% of the Fund. The teachers

participate in a tax-deferred savings program similar to the Deferred Compensation program. However, the teachers' program is mandatory. The teachers contribute 5% of gross annual salary, up to a \$450 limit. These contributions are matched by their employer, the State of Minnesota. The teachers are only allowed to participate in the Income and Growth Share Accounts. Further, they are not permitted to shift past contributions among these two accounts, although future contributions can be redirected. The teachers' and the State's contributions to the Supplemental Investment Fund supplement the teachers' benefits received under their basic retirement program. The majority of the teachers' assets, 60.3%, are invested in the Income Share Account.

#### Unclassified State Employees

The fourth largest group of participants are the heads of state agencies, and employees of the legislature and selected state agencies. These individuals participate in a program referred to as the Unclassified Employees Retirement Program. The assets of this plan comprise 10.1% of the market value of the Supplemental Investment Fund. The Program is a defined contribution retirement plan invested entirely through the Supplemental Investment Fund.

The Unclassified Employee Retirement Program was created to offer retirement benefits to those state employees whose tenure is unlikely to be sufficient to qualify for full benefits under the basic retirement plan. Because the program is a defined contribution plan, participants' retirement benefits are immediately vested and completely portable. Within specific ranges, participants can direct their employer/employee contributions to either the Income, Growth or Fixed Return options. New contributions can be redirected, but past contributions cannot.

The Income Share Account has been the most popular option among Unclassified employees. It holds 59.0% of the Program's assets. The remainder is divided slightly in favor of the Growth Share Account over the Fixed Return Account.

### Hennepin County

The smallest group of participants is composed of Hennepin County employees. This group represents 6.2% of the Supplemental Investment Fund's total value. They formerly were eligible to participate in an employer matching tax-deferred savings program, similar to that offered to state university and community college teachers and Hennepin County employees. That program has since been discontinued, but its participants prior to the termination date are permitted to remain and make new contributions.

### **CURRENT INVESTMENT OPTIONS**

Participants in the Supplemental Investment Fund currently have the option to invest in a combination of three investment options: the Growth Share Account, the Income Share Account, and the Fixed Return Account (for individuals) or the Bond Account (for local P&F retirement funds). The range of options open to a particular participant depends upon the administrative policies of that participant's sponsoring organization. The three investment accounts available to Fund participants are described briefly below.

#### Growth Share Account

This alternative focuses on above-average capital appreciation primarily through investments in common stocks. Only as a secondary objective does it attempt to generate current income. As such, the Account frequently is exposed to considerably more investment risk than there are the other two options.

The Account is authorized to hold up to 100% of its market value in common stocks. At times, cash equivalents may make up a large portion of the total portfolio, depending on the market outlook of the Account's managers. The Account's policy portfolio calls for a 95%/5% common stocks/cash equivalents mix.

Management of the Account is split between the SBI internal staff and the Investment Board's external equity manager pool. Cash equivalents holdings are managed by State Street Bank in its Short Term Investment Fund (STIF).

#### Income Share Account

This option offers a balanced, diversified investment approach. The Account attempts to produce superior total returns without exposing itself to the volatility experienced by the Growth Share Account. It does so by holding a portfolio composed of common stocks, bonds, and cash equivalents. While the Account seeks returns through capital appreciation, it also attempts to hedge against disastrous financial environments and protect against excessively volatile long-term performance.

The Account's investment authority allows it to be invested at a maximum 75% in equity assets. The Account's policy portfolio calls for a 60%/35%/5% stock/bond/cash equivalents asset allocation.

Management of the Account on the equity side is split between SBI staff and external equity managers. SBI staff manages all of the Account's bond holdings. Cash equivalents are invested by State Street Bank in its STIF.

#### Fixed Return Account

This option provides an investment approach that focuses solely on current income. In the past this option was offered to both retirement organizations and individuals. More recently, it has been made available only to individuals. The Account attempts to generate high levels of current income by investing in high quality debt securities. It exposes participants to minimal investment risk by buying fixed income securities and holding them to maturity. Returns to participants come only from the interest income of the Account.

The Account represents a cross between a money market mutual fund and a bond market mutual fund. Investment decisions made in the mid-1970's created a long-maturity

bond portfolio that hampered the Account's flexibility as interest rates rose. Because there lower coupon bonds can only be sold at losses that would penalize current participants, they remain in the portfolio. In more recent years, new contributions have been used to purchase shorter maturity issues in order to decrease the Account's duration and make its yield more sensitive to the current interest rate environment.

The Account's bond portfolio is managed solely by the SBI staff. Cash equivalents are invested by State Street Bank.

### Bond Account

Like the Fixed Return Account, the Bond Account seeks to earn high levels of current income. This option is available only to retirement organizations. The Account is designed to offer participating organizations a minimum fixed rate of return for a specified period of time. The length of time that this guarantee is in effect depends on the average maturity of the Account's investments, usually in the range of six-to-eight years.

### Accounting Considerations

Investments by participants in the Supplemental Investment fund are accounted for a manner similar to mutual funds. In all of the accounts, shares are purchased with new contributions. The Income and Growth Share Accounts have variable share prices that are based upon the market values of the assets in their respective portfolios. Share values, as their assets are not marked to market.

The Income and Growth Share Accounts reinvest all interest, dividend and capital gains income. This income is not distributed in the form of new share purchases. Rather, the reinvestment increases the value of outstanding shares. The Fixed Return and Bond Accounts also reinvest all of their interest income. However, they use that income to purchase additional shares for participants at the accounts' fixed share values. New

contributions and withdrawals from the Supplemental Investment Fund are permitted once a month based upon the previous month-end share values.

## **CORPORATE TAX-DEFERRED SAVINGS PLANS**

Both in terms of its structure and its investment objectives, the Supplemental Investment fund bears a strong resemblance to tax-deferred savings programs offered by many U.S. corporations. Therefore, it is useful to review briefly these programs from the perspective of existing types, investment objectives, and investment options. This review will provide insights as to potential modifications in the Supplemental Investment Fund's structure.

Tax-deferred savings plans have become quite popular in recent years. Currently, roughly 75% of the largest U.S. companies, and an increasing number of smaller firms, are making these plans available to their employees. Quite simply, tax-deferred savings plans (commonly called 401(k) plans, after the section of the IRS code which authorized them) permit employees to set aside a portion of their salary for investment in vehicles offered by their employer. Taxes are deferred on the salary set aside. Up to 20% of annual pay, or a maximum of \$39,000, can be deferred. In many cases employers will match, in part, the employees' contributions.

Tax-deferred savings plans are similar to Individual Retirement Accounts (IRAs). However, they offer participants much greater savings capacity and withdrawal flexibility than do IRAs. The withdrawal flexibility has been a particularly important factor in the tax-deferred savings plans' popularity. While ostensibly for retirement purposes, contributions to 401(k) plans can be withdrawn by participants for one of four reasons: reach age 59 1/2; loss of job; become disabled; or, encounter financial hardship. Although future IRS regulations may tighten the withdrawal provisions, to date, many companies have allowed withdrawals to finance home purchases, college education's, and other sizable expenditures under the financial hardship exemption.



Corporations have a variety of investment objectives for their 401(k) plans. In an excellent article in Compensation Review (January 1985), John Appleton, of State Street Bank, reviewed the various plan types, objectives and investment options commonly observed among U.S. corporations 401(k) plans. Tables 2-4 are reproduced, in part, from his article.

Referring to the earlier discussion of the participants in the Supplemental Investment Fund, it is apparent that all of the plan types discussed in Tables 2-4 are applicable to at least one group of the Fund's participants. Specifically, the pension substitute plan type applies to the P&F organizations and Unclassified Employees. The pension supplement plan type applies to the state university and community college teachers. The thrift/savings incentive and maximum tax shelter plan types apply to the Deferred Compensation Plan.

Corporate plans usually focus on one plan type with specific, limited objectives. They do not need, nor do they desire, to offer a large number of investment options. On the other hand, the fact that the Supplemental Investment Fund must be capable of meeting several different investment objectives has an important bearing on its desired structure. The Fund should make available a wide range of investment options, even though each group of participants may choose to offer its members only a subset of the Fund's total options. That choice will depend on the needs and objectives of each group.

#### **PROPOSAL TO EXPAND INVESTMENT OPTIONS**

Among the participants in the Supplemental Investment Fund, the P&F retirement plans, the participants in tax-deferred savings programs, and the members of the Unclassified Employees Retirement Program, all have different financial needs and objectives. The current set of investment options available to these organizations and individuals is neither broad nor well-defined. It is not able to offer sufficient investment flexibility and diversity to meet all of the participants investment needs. With a more

diverse and better focused set of investment options, the participating groups will have an enhanced ability to meet the participants' specific objectives.

The Investment Board has the ability to offer a wide array of investment alternatives through the Supplemental Investment Fund. Most of these proposed alternatives, described below, already are seasoned components the Basic Retirement Funds' investment management structure. It would be administratively simple to permit the Supplemental Investment Fund's participant groups to invest in these existing alternatives. The Fund could leverage off the economies of scale created by the Basic Retirement Funds' use of these investment alternatives. Thus, the Supplemental Investment Fund could invest at the same low management and administrative fee schedules paid by the Basic Retirement Funds.

Staff proposes that the Supplemental Investment Fund offer the following seven options to its participants:

1. Money Market Fund - would be composed of short-term, high quality fixed income assets. The fund would offer safety of principal and competitive money market returns. It would be managed by State Street Bank as part of the Short Term Investment Fund (STIF) the SBI currently maintains there.
2. Guaranteed Investment Contract (GIC) - would offer a guaranteed fixed return for a specified period of time (e.g., three years). It would be underwritten by an insurance company selected through competitive bidding. The guaranteed return available will depend upon prevailing market yields at the time the GIC is bid, as well as the GIC's specific cash flow provisions. Each year, a new GIC would be offered. At maturity, investments would have to be rolled over into a new GIC (likely at a different interest rate) or placed in another investment option.
3. Bond Fund - would offer active bond management. The fund would be managed by the Basic Retirement Funds' external fixed income managers. These managers attempt to maximize total portfolio returns by moving fixed income assets among varying maturities, qualities, and sectors. This option possesses a degree of investment risk, unlike the previous two fixed income options, in the sense that the fund could suffer declines in principal value. However, it also offers the opportunity for earning considerably higher returns than the other two options can generate.
4. Aggressive Equity Fund - would offer investments in a group of non-diversified common stock portfolios managed by the Basic Retirement Funds' active equity

managers. It would be a high risk option with the potential for sharp short-run swings in principal value. However, given the investment risk assumed by the fund's managers, it also offers the possibility of significant long-run growth in principal. The fund would be similar in design to the current Growth Share Account.

5. Index Fund - would offer a second all-common stock investment option. The fund is designed to track the performance of the common stock market. It will produce returns that are less volatile than those of the Aggressive Equity Fund. Nevertheless, its long-run goal, likewise, is significant growth in principal. The fund would be invested by the Basic Retirement Funds' index fund manager, Wilshire Associates.
6. Balanced Fund - would be the same option currently offered under the Income Share Account. It would provide a diversified blend of stocks, bond and cash equivalents investments. It would avoid much, although not all, of the volatility produced by common stock-only options, yet be expected to produce long-run returns superior to the fixed income-only options.

These proposed options would replace the Supplemental Investment Fund's current three options. The Income Share Account would become the balanced fund mentioned above. The Fixed Return and Growth Share Accounts would be terminated. These Accounts' participants, depending on their investment objectives, could switch to either the money market fund or the GIC option. The Growth Share Account would also be ended. It would be replaced by the aggressive equity fund and/or the index fund options.

The only proposed investment option that does not already exist is the GIC option. However, GIC's are common components of corporate tax-deferred savings plans, and are simple in structure. The Board should have no difficulty in implementing this option.

## **INDIVIDUAL RETIREMENT GROUP ISSUES**

This position paper does not attempt to resolve a number of issues that are the domain of the retirement groups participating in the Supplemental Investment Fund. If the proposal described above is adopted by the SBI, the retirement groups will have to deal with these matters.

Most importantly, the retirement groups will have to decide which of the investment alternatives created by this proposal to offer to their members. As discussed above, this decision should be predicated upon the investment needs and objectives of the membership. SBI staff is willing to work with each retirement group in determining an appropriate mix of investment alternatives, if the retirement groups should so desire.

The retirement groups also will have to determine the frequency of shifts among investment options that their members will be permitted to make. The Board is capable of handling shifts as often as monthly in most of the proposed investment options, although it is unlikely that monthly shifts would be practical for the retirement groups. On the other hand, the current structure is very limited in that it permits, at most, annual shifts of past and future contributions. The retirement groups should consider whether a greater frequency of allowed shifts among investment options would be more attractive for their members, at the same time taking into account administrative factors.

Finally, the retirement groups will have to make decisions concerning their plan accounting capabilities. The wider the array of options and the greater the frequency of option shifts, the more sophisticated must be a retirement group's plan accounting system. Plan accounting systems can be operated either internally or externally. Currently, all the retirement groups use internally operated systems. Those systems may have to be enhanced or moved to external operation to accommodate this proposal.

## **LEGISLATIVE CONSIDERATIONS**

The implementation of this proposal will require several changes in Minnesota Statutes. Most importantly, section 11A.17, which creates and governs the Supplemental Investment Fund, will have to be revised. The available options will have to be changed to incorporate the additions, changes, and deletions proposed above. Further, the investment authorizations of the particular options will have to be defined.

The language permitting the various retirement groups to participate in the Supplemental Investment Fund also will have to be altered, pursuant to the wishes of the affected groups. The sections of the Minnesota statutes relating to those groups investments in the Fund are listed below:

<b>Group</b>	<b>Minn. Statutes Section</b>
Deferred Compensation	352.96
P&F Organizations	69.775
State Universities	136.81
Unclassified Employees	352D.04
Hennepin County	Laws of Minn., 1969 Chapter 450

Staff proposes that each affected group be consulted regarding their desired investment options within the Supplemental Investment Fund. Each group could request legislative permission to establish either broad or narrow investment authority. The requested authorization would be introduced along with the proposed changes in the Investment Board's statutes (Section 11A.17) at the next legislative session.

**TABLE 1**  
**SUPPLEMENTAL RETIREMENT FUND**  
**BREAKDOWN BY PERCENT OF TOTAL**  
**AT MARKET VALUE**  
**JUNE 30, 1985**

<b>ORGANIZATION</b>	<b>INCOME SHARE ACCOUNT</b>	<b>GROWTH SHARE ACCOUNT</b>	<b>FIXED RETURN ACCOUNT</b>	<b>BOND ACCOUNT</b>	<b>TOTAL</b>
Deferred Compensation	6.1	5.0	19.6	N.A.	30.7
Local P&F Organizations	21.1	4.2	2.3	1.8	29.4
State University Teachers	14.2	9.4	N.A.	N.A.	23.6
Unclassified Employees	5.9	2.3	1.9	N.A.	10.1
Hennepin County	<u>2.9</u>	<u>2.5</u>	<u>0.8</u>	<u>N.A.</u>	<u>6.2</u>
Total	50.2	23.4	24.6	1.8	100.0

**TABLE 2**

**Employee-Contribution Plan Types and Typical Objectives**

<b>Plan Type</b>	<b>Objectives</b>
Pension substitute	<ol style="list-style-type: none"><li>1. To limit company pension-plan liabilities and costs when the pension plan has been "frozen."</li><li>2. To provide a retirement program when there is no current pension plan but employees are pressuring for one.</li></ol>
Pension supplement	<ol style="list-style-type: none"><li>1. To preserve a current lower-cost "basic retirement plan" by offering employees the opportunity to obtain more competitive retirement benefits through their own contributions.</li><li>2. To provide employees with a way to "inflation proof" their current pensions and Social Security fixed-dollar promises.</li></ol>
Thrift/savings incentive	<ol style="list-style-type: none"><li>1. To give employees a tax-favored opportunity for longer-term savings needs.</li><li>2. To provide liberal or a better-than-competitive employment package to attract or retain quality staff.</li></ol>
Maximum tax shelter	<ol style="list-style-type: none"><li>1. To provide key employees with as much tax shelter for capital accumulation as is possible within plan regulatory limitations.</li><li>2. To offer 401(k) income tax reduction opportunities and capital-growth shelter to all employees.</li></ol>

**TABLE 3**

**Typical Investment Provisions Of Various Types  
Of Employee-Contribution Plans**

<b>Plan Type</b>	<b>Typical Investment Provisions</b>
<b>Pension substitute</b>	<ol style="list-style-type: none"><li>1. Employees have choice of types of investment funds (usually one or two).</li><li>2. Employees have limited transfer rights between investment funds (especially for any company contributions).</li><li>3. Withdrawals are not allowed and/or are penalized.</li><li>4. Loans are generally not offered.</li></ol>
<b>Pension supplement</b>	<ol style="list-style-type: none"><li>1. Employees have a somewhat wider choice of investment fund types than under pension substitutes, and these often include company stock.</li><li>2. Employees enjoy more liberal transfer rights between funds (commonly once per year).</li><li>3. Withdrawals and loans are generally permissible only for strict "hardship" reasons.</li></ol>
<b>Thrift/savings incentive</b>	<ol style="list-style-type: none"><li>1. Employees have greater choice and receive better communication about investment vehicles.</li><li>2. Employees enjoy transfer rights as often as quarterly.</li><li>3. Withdrawals on "employee money" are available on request.</li><li>4. Loans are generally available, with restrictions set only by government regulations.</li></ol>
<b>Maximum tax shelter</b>	<ol style="list-style-type: none"><li>1. Employees have a wide choice of investments, sometime including "aggressive" risk-type funds.</li><li>2. Transfer rights are liberal.</li><li>3. Withdrawals are often available.</li><li>4. Loans are perceived as a tax-shelter investment for personal financial leverage.</li></ol>



**TABLE 4**

**Generic Investments Offered by Employee Contribution Plans  
(classified by investment risk and type of plan)**

<b>Plan Type</b>	<b>U.S. Gov't</b>	<b>GIC</b>	<b>Money Market</b>	<b>Bonds</b>	<b>Balanced Fund</b>	<b>Conser- vative Equity</b>	<b>Aggres- sive Equity</b>
<b>Pension substitute</b>	---	Often	---	---	Some Times	Some Times	---
<b>Pension supplement</b>	---	Often	Some Times	Rarely	Some Times	Some Times	---
<b>Thrift/savings incentive</b>	Some Times	Often	More Often	Rarely	Rarely	Often	Some Times
<b>Maximum tax shelter</b>	---	Often	Some Times	Rarely	Rarely	Often	Often

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November 13, 1985

TO: Paul Groschen, Executive Director,  
Minnesota State Retirement System

FROM: Jeff Bailey, Assistant Executive Director

SUBJECT: Recommendations for Deferred Compensation and  
Unclassified plans investment options

Howard and I appreciated the opportunity to discuss our proposed changes for the Supplemental Investment Fund with you and your staff. To follow up, we thought that it appropriate to comment on our view of desirable investment options for the Deferred Compensation and Unclassified Plans. These plans are two distinct retirement programs, each with differing needs and objectives. As such, they should be treated differently and should not necessarily offer the same investment alternatives.

In brief, we suggest the following options be made available to plan participants:

Deferred Compensation

Money Market Account (replaces Fixed Return Account)  
Bond Market Account (new option)  
GIC Account (replaces Fixed Return Account)  
Aggressive Equity Account (Growth Share Account)

Unclassified Employees

Money Market Account (replaces Fixed Return Account)  
Bond Market Account (new option)  
Aggressive Equity Account (Growth Share Account)  
Balanced Account (Income Share Account)

The rationale for these recommendations is provided below.

## DEFERRED COMPENSATION

The Deferred Compensation Program (DCP) is designed to provide employees with a tax-sheltered savings program. Most participants in the program already have an adequate, vested pension. They are seeking to add to their wealth. Under the DCP's current options, the vast majority of the participants select the Fixed Return Account. This is consistent with information provided by Evaluation Associates that shows roughly 80% of 401(k) assets are invested in Guaranteed Investment Contracts (GIC's).

The evidence indicates that persons investing in tax-sheltered savings programs appear to be very risk averse. We suspect that participants in tax-sheltered savings plans view their investments from a short-run perspective, expecting to withdraw their contributions in the not too distant future. As a result, they do not want to take chances on a decline in the value of their investments. In addition, the high level of interest rates that has existed since the inception of the Fixed Return Account and 401(k) plans also seems to have been responsible for the widespread interest in guaranteed return investment options.

*Given the popularity of low risk, interest earning investment alternatives, we recommend that the GIC and money market options be offered DCP participants. These options, either alone, or in combination, would be logical replacements for the Fixed Return Account.*

EAI's information on 401(k) plans also indicates that roughly 20% of the investments in these plans are placed in a common stock alternative. Capital gains income generated by common stocks is less advantaged, relative to interest income, in a tax-sheltered plan. Nevertheless, a significant number of individuals seem to prefer a higher risk option. We believe that the aggressive equity (or index fund) option would offer these individuals an appropriate common stock investment choice.

In addition, we recommend that the bond fund be made available to DCP participants. This option, in conjunction with the aggressive equity and money market options, would permit participants to create a combination of choices that resembles the Income Share Account.

Finally, we believe that the balanced fund is inappropriate for the DCP. The diversification provided by a balanced fund is not a necessary feature of a savings supplement program. Further, DCP participants are likely to have specific investment preferences that can be implemented better by selecting among single options, rather than by choosing an alternative that offers a blend of options.

## **UNCLASSIFIED EMPLOYEES**

The Unclassified Employees Plan (UEP) serves as the sole retirement program for a number of individuals. Diversification concerns, which are not a significant factor for DCP participants, should be much more important to UEP participants. Many employees will have their own ideas about how various investment options should be combined to form a diversified portfolio that meets their own objectives. On the other hand, many others will not have the knowledge, or desire, to make these decisions. As a result, one of the options that should be offered to UEP participants is a balanced fund. The current Income Share Account provides such an alternative. We believe that it is essential that this option be retained for UEP participants.

For those participants who wish to construct their own combinations of options, a full range of tools should be made available: common stocks, bonds, and cash equivalents. This would entail offering the money market, GIC (and/or bond), and aggressive equity (or index fund) options. Without all of these options, it would be impossible for a UEP participant to construct a retirement portfolio that is diversified along the lines of the Basic Retirement Funds.

As far as limits on percentages invested in any particular option, we recommend that UEP participants have full discretion in selecting among the options. None of these options, standing alone, is so speculative that a participant's investment would ever be in serious jeopardy. Even a 100% investment in the common stock option could result in catastrophic losses to a participant only in the most disastrous of economic scenarios.

Subject to Board approval, in early December we plan to submit legislative language necessary to implement the proposed changes. It would greatly facilitate the entire process if you could have your own proposed statutory changes ready at that time. If we can provide you with any assistance, please contact Howard or me.

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**THE PERMANENT SCHOOL FUND  
NEEDS AND OBJECTIVES**

**Staff Position Paper  
May, 1985**





## EXECUTIVE SUMMARY

The Permanent School Fund is a trust fund created by the State Constitution. The Fund was created to serve as a long-term source of revenue for public schools. Income generated by the Fund currently is used to offset state school aid payments.

A recent Constitutional amendment liberalized the Permanent School Fund's investment authority. The amendment permits higher return assets to be held in the Fund's investment portfolio. However, certain restrictive constitutionally established accounting provisions still exist that hinder the investment management of the Fund.

The Permanent School Fund in many ways is similar in purpose to a typical endowment fund. Any endowment fund must trade-off immediate maximum income investment objectives versus long-run income growth investment objectives. The specific circumstances of the endowment fund will dictate the appropriate trade-off.

The Permanent School Fund's restrictive accounting provisions differentiate it from a typical endowment fund. The Permanent School Fund must reduce annual spendable income by an amount equal to amortized realized net capital losses. Further, it may not utilize any of its current or past capital gains to support spendable income. Thus, if the Fund is to avoid excessively large fluctuations in current spendable income, it should not pursue investment strategies that might generate sizable realized losses in any year. In other words, the Fund should maintain a short-run, conservative risk posture focused on maximizing current spendable income. This goal is best accomplished by holding a portfolio composed entirely of intermediate to long-term investment grade bonds.

This investment approach certainly will produce high levels of current spendable income. However, it will sharply limit long-run growth in spendable income. It is recommended that the Board support Constitutional changes that would remove the Fund's restrictive accounting provisions. Such a change will permit the Fund's portfolio to

be invested in a more aggressive, long-run oriented manner that will facilitate long-run growth in spendable income.

## **BACKGROUND**

The Permanent School Fund was created in 1858 under Article XI, Section 8 of the Minnesota State Constitution. The Fund was designed to serve as a long-term source of revenue for public schools. Technically, the Fund is composed of two parts. The first consists of lands granted to the State by the federal government that have been consolidated into the Fund. These lands generate income in the form of land sales, mining royalties, timber sales and lakeshore and other leases. The income from these sources is used to purchase financial securities which make up the second part of the Permanent School Fund. It is this second part of the Fund, the principal as represented by the Fund's financial investments, that is the focus of this paper.

The Fund had a market value of \$308 million (\$332 million at cost) as of December 31, 1984. For the calendar year 1984, the Fund transferred \$26 million to the general fund, which was used to offset state aid payments to Minnesota's public schools. During that same period the Fund received \$700,000 in revenues from its land holdings.

## **RECENT CONSTITUTIONAL AMENDMENT**

Prior to the recent passage of a Constitutional amendment, the investment authority for the Permanent School Fund, as specified by the Constitution, was extremely restrictive. Investments in stocks were limited to 20% (at cost) of the Fund. Further, all stocks purchased were required to have made five consecutive annual dividend payments. A maximum of 40% of the Fund could be invested in corporate bonds, but only the bonds of corporations whose earnings exceeded interest requirements on outstanding bonds by three times for five consecutive years. The remainder of the Fund was required to be invested in the securities of the U.S. Treasury, U.S. agencies, states, or Minnesota municipalities.

A 1984 constitutional amendment eliminated these restrictive investment statutes. The Permanent School Fund is now permitted to be invested under the same statutes that

govern the investment of all other funds under SBI management. Therefore, an opportunity now exists for restructuring the investment portfolio of the Fund. However, as is discussed below, the Fund still suffers from certain restrictive accounting requirements mandated by the Constitution. These requirements effectively limit the appropriate investment objectives that can be applied to the Fund.

### **INVESTMENT OBJECTIVES OF ENDOWMENT FUNDS**

In many respects, the basic goal of the Permanent School Fund is similar to that of a typical endowment fund. That is, the Fund, with its pool of investible assets, is expected to generate a stream of income that finances certain projects, specifically in this case to provide an offset to state school aid payments. Given this similarity of purpose between the Permanent School Fund and endowment funds, it is useful to analyze briefly the range of investment objectives facing typical endowment funds.

Any endowment fund encounters certain short-run versus long-run investment trade-offs. In the short-run, there is a demand for maximum current spendable income. This short-run objective can usually best be met by holding investments in lower risk, fixed income securities. Conversely, in the long-run, there is a demand for a growing stream of real (i.e., inflation adjusted) spendable income. This long-run objective can usually best be met by holding investments in higher risk equity securities. Unfortunately, the two investment objectives tend to be mutually incompatible. Maximum current spendable income achieved through fixed income investments will sharply limit long-run growth in a fund's principal and, hence, the real spendable income that the fund can generate. On the other hand, a growing stream of real spendable income achieved through equity investments usually results in a lower, and certainly a more volatile, stream of current spendable income.

An endowment fund sponsor's tolerance for risk largely is determined by how it trades off short-run versus long-run objectives. In turn, the emphasis on short-run versus

long-run objectives is primarily a function of the importance of the endowment fund's spendable income stream to the sponsor's total revenue. Where the spendable income stream is a relatively small percentage of total revenues, the risk tolerance of the sponsor will tend to be higher than in a situation where the fund's spendable income stream is a large percentage of the sponsor's total revenues. In the former case, the sponsor can afford to take a longer-term perspective. It can attempt to increase the fund's value through riskier investments so that at some point in the future the fund's spendable income can play a more substantial role in the sponsor's total revenue picture. In the latter case, the sponsor must be more cautious. A protracted period of poor investment results could have a serious impact on the various projects that the endowment fund is supposed to finance.

#### **INVESTMENT OBJECTIVES OF THE PERMANENT SCHOOL FUND**

Ideally, the Permanent School Fund should be managed as would an endowment fund. However, the Fund has certain constitutional accounting restrictions that differentiate it from a typical endowment fund. As prescribed by the State Constitution, the principal of the Fund must remain undiminished in perpetuity. The offset to school aids can be financed only out of the Fund's dividend and interest income. None of the Fund's principal may be reduced to finance the offset. Realized losses on fixed income securities are amortized over the remaining life of the securities sold. Realized losses on equity securities are amortized over a five year period. Any combined amortized realized losses on fixed income and equity securities are first subtracted from any realized gains on fixed income and equity securities. If the amortized realized losses are greater than realized gains, then the difference must be recovered from the Fund's interest and dividend income. On the other hand, any excess realized capital gains are added to the Fund's principal. These excess realized capital gains cannot be spent to offset school aids.

A typical endowment fund does not have to reduce spendable income if realized capital losses are taken. Moreover, a typical endowment fund can utilize all of its current or past capital gains to support spendable income. The Permanent School Fund does not have this latitude. Therefore, as a result of its restrictive accounting requirements, if the Fund is to avoid excessively large fluctuations in current spendable income, it should not pursue investment strategies that might generate significant realized losses in any given year, unless an offsetting increase in interest and dividend income is also produced. Implicitly, the Fund is forced to focus on short-run income maximization as its investment objective. This approach will cause long-run growth in the Fund's principal and real spendable income to be sacrificed in exchange for a higher and more stable level of current spendable income. As is discussed below, this approach would not be the ideal strategy if the Fund could be managed like the typical endowment fund. However, it would appear to be the only feasible strategy given present accounting constraints.

### **PROPOSED ASSET MIX**

Based on the Permanent School Fund's investment needs described above, staff recommends that its portfolio should be placed in investment grade, intermediate to long-term fixed income securities. Currently, the vast majority of the Fund's bond portfolio is invested in government issues. This is a remaining vestige of the recently removed restrictive investment authority. While at this time quality yield spreads are at very low levels, over the long term, spendable income to the Fund can be enhanced by increasing the holdings of lower quality bonds.

Staff also recommends that the Fund hold a minimal cash equivalents position. The Fund has no need for liquidity, beyond that necessary to facilitate investment management. (Given that the principal of the Fund must remain inviolate, no sales of securities for the purpose of generating cash flow are ever possible). The lower yields paid by cash equivalents make it an inferior investment to longer maturity fixed income assets.

Finally, staff recommends against owning common stocks in the Fund. As was discussed, holding common stocks would permit an increase the size of the Fund's principal and spendable income over the long-run. However, for several reasons, the inclusion of a significant equity component in the portfolio will adversely and unacceptably impact current spendable income. First, common stock dividend yields are considerably lower than bond yields. Second, equity prices are highly volatile and at times will generate capital losses that will reduce spendable income. Third, because the Fund's principal cannot be spent, and net capital gains become part of the Fund's principal, the effects of the volatility of equity prices on the Fund's spendable income cannot be smoothed out by spending past realized capital gains.

It seems more reasonable to rely on the revenues from the Fund's land holdings to generate growth in principal. The Fund's investment holdings should be used as a means of converting those revenues into a long-run steady stream of state school aids financing.

## **RECOMMENDED CONSTITUTIONAL CHANGES**

Staff believes that the long-run investment management of the Permanent School Fund could be enhanced considerably if the restrictive Constitutional accounting requirements applied to the Fund were relaxed. As noted, the Fund generates revenues equivalent to less than one percent of the State's general fund appropriations. Based on the earlier discussion of endowment fund investment objectives, it would seem desirable to attempt to increase the Fund's principal over the long-run by making sizable investments in equity securities. While this strategy might reduce current spendable income temporarily, given the limited relative importance of its spendable income to the State's revenues, the Fund can afford to be more future-oriented and focus on long-run growth in principal and real spendable income.

Despite the fact that this paper recommends that the Fund now be invested in fixed income assets, staff recognizes that the present structure of the Fund, and the derivative

need for an emphasis on current spendable income, is actually detrimental to the State's interests in the long-run. By effectively forcing the concentration of the majority of the Fund's assets into fixed income securities, the real value of the Fund's principal is gradually eroded by inflation. That is, the Fund has no means to grow in value, beyond the minor revenues from its land holdings. Thus, the spendable income that the Fund can produce as support for school aids will gradually decline in relative importance. But staff believes that current accounting provisions offer no practical alternative to this focus on short-run investment objectives.

The most effective means of resolving this dilemma would be to alter the Permanent School Fund's constitutionally established accounting provisions. They should be changed to eliminate the required offset of net capital losses against spendable income and to permit the inclusion of net capital gains in spendable income. If these changes were made, the Fund would have the same investment flexibility as a typical endowment fund. As a result, a longer-term investment outlook could be adopted, with a correspondingly positive impact on long-run spendable income available to the State.



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 296-3328

May 10, 1985

TO: Members, Asset Mix Committee  
 FROM: Jeff Bailey  
 SUBJECT: Effects of altering asset mix on the income generated  
 the Permanent School Fund

Assume:

- Bond portfolio yields 10% in interest income annually.
- Common stocks produce a 15% annual total return.
- Of the 15% total return, 5 percentage points is in the form of dividend income. The other 10 percentage points of return is in the form of capital gains.
- The fund annually is rebalanced to its target weighting.
- No new contributions take place.

Under these assumptions, and with a starting fund value of \$300 million, after ten years the Permanent School Fund would generate the following outcomes:

PERCENT EQUITY	EQUITY VALUE	BOND VALUE	TOTAL VALUE	EQUITY INCOME	BOND INCOME	TOTAL INCOME
0	0	300	300	0	300	300
10	33	298	331	17	282	299
20	73	292	365	36	262	298
30	120	282	403	56	240	297
40	177	266	444	79	216	295
50	244	244	488	103	188	292
60	322	214	537	130	158	288
70	413	177	590	159	124	283
80	518	129	647	191	86	278
90	639	71	710	225	45	271
100	778	0	778	262	0	262

Conclusion: Given existing Constitutional constraints, the goal of the Permanent School Fund must be to maximize current (i.e., interest and dividend) income. Clearly, the longer (shorter) is the Fund's investment time horizon, the more productive are asset mixes with high common stock (bond) allocations. However, what is unclear is precisely what time horizon is desirable from the State's viewpoint.

The assumptions underlying the analysis conducted above are favorably tilted toward common stocks. That is, projected common stock total returns are high relative to projected bond yields. Further, no variability in common stock total returns is assumed. Nevertheless, over a ten-year period, higher bond allocations are directly related to the production of higher levels of current income. It would take approximately thirteen years, under the above assumptions, for the 100% common stock asset mix to produce more income than the 100% bond asset mix. A 20%/80% common stock/bond asset mix has an eleven year break-even horizon.

It is true that over the very long run utilizing common stocks in the Fund's investment portfolio likely will generate more income than a 100% bond asset mix. However, the break-even horizon would appear to be too long to justify the inclusion of common stocks in the portfolio, even under the optimistic assumptions employed in the above analysis. Staff continues to recommend that all of the Fund's assets be invested in fixed income securities.

**PERMANENT SCHOOL FUND  
NEEDS AND OBJECTIVES - PART II**

**Staff Position Paper  
August 1985**

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## REVIEW OF RECENT DISCUSSIONS

As discussed in a recent staff paper, the Permanent School Fund was created by the State Constitution for the purpose of serving as a long-term source of revenue for public schools. Income generated by the Fund currently is used to offset state school aid payments. This offset is running at a rate of approximately \$26 million a year.

The needs and objectives of the Permanent School Fund are similar to those of typical endowment funds. Like the typical endowment fund, in achieving its goal of generating spendable income the Fund must trade-off immediate maximum income investment objectives versus long-run income growth investment objectives.

On the other hand, the Permanent School Fund's restrictive accounting provisions differentiate it from a typical endowment fund. The Fund's principal must remain inviolate. Further, any net realized equity and fixed income capital gains are added to the Fund's principal. Moreover, if the Fund should realize net capital losses, these losses must be offset against interest and dividend income before such income can be distributed. Finally, all interest and dividend income must be distributed in the year in which it is earned.

The investment management flexibility of the Permanent School Fund is sharply limited by these accounting provisions. The Fund has a strong incentive not to invest in equity assets. Equity holdings are not desirable for several reasons. First, common stock dividend yields are considerably lower than bond yields. Thus, common stocks generate less current income than bonds. Second, equity prices are highly volatile and at times may produce realized capital losses that will reduce spendable income. Finally, because the Fund's principal cannot be spent, and net capital gains become part of the Fund's principal, the effect of the volatility of equity prices on the Fund's spendable income cannot be smoothed out by spending past realized capital gains. As a result, in its position paper staff recommended, and the IAC and SBI concurred, that the Fund should be managed to

generate maximum current income. The Board approved the recommendation that all of the Fund's assets be placed in fixed income securities.

Staff also recommended, with the IAC's concurrence, that the SBI endorse a constitutional amendment that would liberalize the Fund's restrictive accounting provisions. Such a liberalization would permit the Permanent School Fund to be invested so as to balance current income needs against long-run income growth needs.

### **NEW INFORMATION AND RECOMMENDATIONS**

At the time of the position paper's preparation, staff believed that the Permanent School Fund's restrictive accounting provisions could only be liberalized through a constitutional amendment. Additional staff research into this matter, and a review by the Attorney General's office, has indicated that there may exist statutory remedies to the problem that would bypass the cumbersome procedure of obtaining a constitutional change.

Specifically, the Constitution states that "The principal of the Permanent School Fund shall be perpetual and inviolate forever. This does not prevent the sale of investments at less than the cost of the fund; however, all losses not offset by gains shall be repaid to the fund from the interest and dividends earned thereafter." These accounting provisions cannot be changed without a constitutional amendment.

However, precisely what constitutes the principal of the Permanent School Fund is defined both in the Constitution and in statute. The Constitution states that the proceeds from various land sales and leases are part of the Fund's principal. On the other hand, State statutes specify that "In any fiscal year in which gains on the sale of securities exceed the losses on the sales of securities, the excess shall be added to the principal of the fund."

It is this statutory accounting provision that is particularly binding on the Fund's investment management. This provision essentially eliminates any short-run benefits of common stock ownership, because net capital gains are added to principal and, thus,

cannot be distributed. If the provision were removed by legislative action, realized capital gains could be spent, in part, to sustain current expenditures as well as reinvested to support future growth in expenditures. The principal of the Fund would then be defined only as the proceeds from land sales and leases.

The constitutionally mandated offset of interest and dividend income against net capital losses does not pose a serious problem from an investment management perspective if this statutory change were enacted. Only in the situation where the value of the Fund's securities (at cost) fell below the value of the accumulated proceeds from land sales and leases (i.e., the Fund's principal) would income from interest and dividends have to be used to offset realized net capital losses. Since 1974, approximately \$35 million in capital gains have been realized. This amount could provide a initial buffer against possible future declines in the value (at cost) of the Fund's securities.

If this proposed statutory change were to become law, the Permanent School Fund's investment portfolio could be managed more in the manner of a typical endowment fund. Common stocks could make up a significant portion of the Fund's assets. Annual spending targets, as a percent of total portfolio assets, could be set. These spending targets would be financed by interest and dividend income, as well as realized capital gains. They would be established with the goal of producing a growing stream of inflation-adjusted expenditures. In periods when the Fund's total return is insufficient to maintain targeted spending, past realized capital gains can be spent. On the other hand, if earnings exceeded spending targets, the excess can be reinvested to increase the size of the Fund's invested assets. If realistic spending targets are established, the size of the Fund should grow over time and thus produce a rising stream of cash flows.

Several other less significant changes in the Permanent School Fund's investment accounting can also be made through statutory changes. The first would eliminate the provision that all of the Fund's interest and dividend income must be paid out in the year in which it is earned. Rather, the Fund's spending targets would govern the distribution of

income. The second change would delete the Fund's deferred yield adjustment, which amortizes losses on securities sales over a predefined period. Since the Fund would be managed on a total return basis, this provision is unnecessary and could result in a misallocation of investments. Instead, realized capital losses would be fully accounted for the period in which they were taken.





# Minnesota House of Representatives

January 10, 1984

TO: Education Committee Members

FROM: Bill Marx, Committee Administrator  
Permanent School Fund Advisory Committee

RE: PERMANENT SCHOOL FUND: History and Issues

The Permanent School Fund is made up of two parts: the lands granted to the state by the federal government that have been consolidated into PSF land; and cash and investments generated from land sales, mining royalties, timber sales and lakeshore and other leases. The Department of Natural Resources has responsibility for management of the land; the State Board of Investment is responsible for managing the principal.

## Lands

1. A total of 2,900,000 acres of school lands were granted to the state in the Enabling (Statehood) Act of 1857. This land consisted of sections 16 and 36 of most townships.
2. A total of 4,777,636 acres of swamp lands were granted to the state in 1860. Most of this acreage was sold or granted away but the remaining 1,560,000 acres were combined with the PSF lands by a 1962 constitutional amendment.
3. A total of 500,000 acres were granted to the state as internal improvement lands in 1866. All but 6,677 acres of this land were sold and a 1974 constitutional amendment transferred all remaining land, cash, and investments of the improvement lands to the PSF.

Of the lands granted to the state under the three programs, 2,520,303 acres remain in the fund. Most of these remaining lands are in the northern part of the state; 86 percent is located in Koochiching, St. Louis, Itasca, Lake, Cass, Aitkin and Cook Counties. Of the 2.5 million acres, 1.7 million acres are in DNR management units as follows:

State Forests	1,604,783	acres
Wildlife Management Areas	96,377	"
State Parks	9,717	"
Wild & Scenic Rivers	645	"
State Waysides	640	"
State Trails	238	"
Public Access	204	"

The remaining 808,000 acres are managed by DNR outside any established management area. These acres are primarily forestry lands but also include mineral, agricultural and lakeshore lands and other smaller categories. In addition to the 2.5 million acres of land, the PSF also includes the severed mineral rights only for another 989,462 acres.

### Principal

The principal of the permanent school fund must remain perpetual and inviolate forever (Minnesota Constitution Article XI, Section 8). The principal of the PSF is \$321,000,000 as of December 31, 1983. The principal is managed by the Department of Finance and invested by the State Board of Investment. The principal in the fund has been generated from the following sources:

1. Mining royalties. About 44 percent of the principal of the PSF has been generated by the royalties paid to remove minerals.
2. Occupation tax. Approximately 35 percent of the PSF principal has come from mineral exploration leases. These are leases to explore and occupy the land.
3. Timber sales. Approximately 12 percent of the PSF principal has come from timber sales on PSF land.
4. Land sales, other leases, etc. The remaining 9 percent of the PSF principal has come from the sale of PSF land, from lakeshore leases, wild rice leases, agricultural leases, utility leases and other commercial leases. Although about two-thirds of the PSF land has been sold, the sale of land has contributed less than 9 percent of the principal of the PSF.

The Legislative Audit Commission issued a report in June, 1981, that pointed out a number of areas where management of the PSF could be improved. In response to this, the 1982 School Aids Bill established the Permanent School Fund Advisory Committee. This committee, made up of the chairs of the House and Senate Education Committees, the chairs of the House Appropriations Committee and Senate Finance Committee, the Commissioner of Education and two school superintendents, has been meeting since the summer of 1982.

### Issues

1. Lease Rates. A major area of discussion for the PSF Advisory Committee has been the lease rates for several categories of PSF land.
  - A. Lakeshore leases. There are currently 1,785 lakeshore lots on 90 lakes in 11 counties that are leased by DNR. Most of these are in St. Louis, Itasca, Cass, Cook, Crow Wing and Hubbard Counties. The contracts for these leases were all issued in 1981 for 10 years with a readjustment in 1986. The average lease fee for a lakeshore lot is \$133. In addition to this, in 1982 leasees paid an average property tax of \$233 per lot. DNR's policy has been to lease these lots at 5 percent of the appraised value. DNR is reappraising the lots in preparation for the 1986 lease readjustments. If the lease rate is readjusted to the 5 percent of the new appraised value, many lease rates will be 6 to 7 times the present rates.

B. Taconite leases. Under 1941 legislation, taconite leases were granted for 15¢ per ton of concentrate in royalties. These were under 50-year leases and are being renegotiated effective for 1991. Renegotiation has already been accomplished for some of these leases for \$2.20 - \$2.40 per ton of concentrate. The new leases will also have escalators built in.

C. Wild rice leases. A small percentage of PSF land is leased for wild rice paddies. This is land near a water source that would otherwise probably not be raising any revenue. The leases are being raised from \$1.50 per acre to \$16 per acre. DNR is considering developing other areas into rice paddies and then auctioning off a developed wild rice paddy lease.

2. Management costs. DNR has incurred considerable costs in the management, administration and protection of PSF land. Over the past six years (7-1-75 - 6-30-81), these costs have averaged \$4,819,600 per year. The expenditures by area are as follows:

Minerals	\$ 465,800
Forestry - state forests	2,774,400
Forestry - outside state forests	1,579,400
	<u>\$4,819,600</u>

DNR may deduct up to \$500,000 from forestry proceeds on PSF land to pay for its management costs of these lands. Costs in excess of \$500,000 may also be deducted if approved by the legislature. Other management costs are absorbed by DNR.

3. PSF Land in state parks. PSF Land has been included in several areas where it has little or no potential for earning revenue for the PSF. The most obvious example of this is the 9,700 acres of PSF land in state parks. When some state parks were established, the PSF land was looked at as state land and included in the park with no reimbursement to the PSF. Since most parks are not money making operations (and even if they were, the additional revenue would go back into other parks, not the PSF), this land is not earning any revenue for the PSF. DNR estimates that it would cost about \$5 million to reimburse the PSF for the PSF land now in state parks. This would be a one-time cost and the additional \$5 million in the principal of the PSF would earn additional interest that would go to schools and offset state general fund appropriations.

A second option to address this problem would be a constitutional amendment to allow more flexibility in land exchanges. Presently, PSF Land can be exchanged only for federal or private land. A July, 1983 Legislative Audit Commission report recommended amending the constitution to allow PSF Land to be exchanged for other state and local government land in addition to federal and private land. Separate legislation dealing with this issue will be introduced soon.

4. Investment of PSF principal. The \$321 million principal of the PSF is invested by the State Board of Investment. The interest earned by the principal is paid to school districts. The present investment limitations are specified in the constitution and are very restrictive. HF1291/SF1240 proposes removing these limitations from the Constitution and placing them in statute. The limitation would then be the same as the limitation for retirement funds.



**PERMANENT SCHOOL FUND  
NEEDS AND OBJECTIVES  
PART II**

**Staff Position paper  
September 1985**

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## **REVIEW OF RECENT DISCUSSIONS**

As discussed in a recent staff paper, the Permanent School Fund was created by the State Constitution for the purpose of serving as a long-term source of revenue for public schools. Income generated by the Fund currently is used to offset state school aid payments. This offset is running at a rate of approximately \$26 million a year.

The needs and objectives of the Permanent School Fund are similar to those of typical endowment funds. Like the typical endowment fund, in achieving its goal of generating spendable income the Fund must trade-off immediate maximum income investment objectives versus long-run income growth investment objectives.

On the other hand, the Permanent School Fund's restrictive accounting provisions differentiate it from a typical endowment fund. The Fund's principal must remain inviolate. Further, any net realized equity and fixed income capital gains are added to the Fund's principal. Moreover, if the Fund should realize net capital losses, these losses must be offset against interest and dividend income before such income can be distributed. Finally, all interest and dividend income must be distributed in the year in which it is earned.

The investment management flexibility of the Permanent School Fund is sharply limited by these accounting provisions. The Fund has a strong incentive not to invest in equity assets. Equity holdings are not desirable for several reasons. First, common stock dividend yields are considerably lower than bond yields. Thus, common stocks generate less current income than bonds. Second, equity prices are highly volatile and at times may produce realized capital losses that will reduce spendable income. Finally, because the Fund's principal cannot be spent, and net capital gains become part of the Fund's principal, the effect of the volatility of equity prices on the Fund's spendable income cannot be smoothed out by spending past realized capital gains. As a result, in its position paper staff recommended, and the IAC and SBI concurred, that the Fund should be managed to

generate maximum current income. The Board approved the recommendation that all of the Fund's assets be placed in fixed income securities.

Staff also recommended, with the IAC's concurrence, that the SBI endorse a constitutional amendment that would liberalize the Fund's restrictive accounting provisions. Such a liberalization would permit the Permanent School Fund to be invested so as to balance current income needs against long-run income growth needs.

### **NEW INFORMATION AND RECOMMENDATIONS**

At the time of the position paper's preparation, staff believed that the Permanent School Fund's restrictive accounting provisions could only be liberalized through a constitutional amendment. Additional staff research into this matter, and a review by the Attorney General's office, has indicated that there may exist statutory remedies to the problem that would bypass the cumbersome procedure of obtaining a constitutional change.

Specifically, the Constitution states that "The principal of the Permanent School Fund shall be perpetual and inviolate forever. This does not prevent the sale of investments at less than the cost of the fund; however, all losses not offset by gains shall be repaid to the fund from the interest and dividends earned thereafter." These accounting provisions cannot be changed without a constitutional amendment.

However, precisely what constitutes the principal of the Permanent School Fund is defined both in the Constitution and in statute. The Constitution states that the proceeds from various land sales and leases are part of the Fund's principal. On the other hand, State statutes specify that "In any fiscal year in which gains on the sale of securities exceed the losses on the sales of securities, the excess shall be added to the principal of the fund."

It is this statutory accounting provision that is particularly binding on the Fund's investment management. This provision essentially eliminates any short-run benefits of common stock ownership, because net capital gains are added to principal and, thus,



cannot be distributed. If the provision were removed by legislative action, realized capital gains could be spent, in part, to sustain current expenditures as well as reinvested to support future growth in expenditures. The principal of the Fund would then be defined only as the proceeds from land sales and leases.

The constitutionally mandated offset of interest and dividend income against net capital losses does not pose a serious problem from an investment management perspective if this statutory change were enacted. Only in the situation where the value of the Fund's securities (at cost) fell below the value of the accumulated proceeds from land sales and leases (i.e., the Fund's principal) would income from interest and dividends have to be used to offset realized net capital losses. Since 1974, approximately \$35 million in capital gains have been realized. This amount could provide a initial buffer against possible future declines in the value (at cost) of the Fund's securities.

If this proposed statutory change were to become law, the Permanent School Fund's investment portfolio could be managed more in the manner of a typical endowment fund. Common stocks could make up a significant portion of the Fund's assets. Annual spending targets, as a percent of total portfolio assets, could be set. These spending targets would be financed by interest and dividend income, as well as realized capital gains. They would be established with the goal of producing a growing stream of inflation-adjusted expenditures. In periods when the Fund's total return is insufficient to maintain targeted spending, past realized capital gains can be spent. On the other hand, if earnings exceeded spending targets, the excess can be reinvested to increase the size of the Fund's invested assets. If realistic spending targets are established, the size of the Fund should grow over time and thus produce a rising stream of cash flows.

Several other less significant changes in the Permanent School Fund's investment accounting can also be made through statutory changes. The first would eliminate the provision that all of the Fund's interest and dividend income must be paid out in the year in which it is earned. Rather, the Fund's spending targets would govern the distribution of

income. The second change would delete the Fund's deferred yield adjustment, which amortizes losses on securities sales over a predefined period. Since the fund would be managed on a total return basis, this provision is unnecessary and could result in a misallocation of investments. Instead, realized capital losses would be fully accounted for the period in which they were taken.

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## **ASSIGNED RISK PLAN INVESTMENT POLICY STATEMENT**

### **BACKGROUND**

#### **General Description of the Plan**

The Assigned Risk Plan (ARP) provides workers' compensation and employers' liability coverage to Minnesota employers unable to obtain insurance through the private market. The ARP provides essentially the same coverage as private workers' compensation insurers. The establishment and administration of the ARP is codified in sections 79.251 and 79.252 of the Minnesota State Statutes

The obligations (liabilities) of the ARP result from its insurance underwriting activities. Liabilities arise when the plan's participants (policy holders) file claims and are awarded benefits. Minnesota provides seven differently types of benefits: medical, temporary total disability, temporary partial disability, permanent total disability, permanent partial disability, death and rehabilitation. Benefits are paid to claimants in both periodic and lump sum payments.

Most of the liabilities are short term (less than ten years). The liability stream is difficult to predict from year to year because the insured risks are unpredictable. However, the liabilities are easier to estimate over a 3-5 year period using actuarial methodology. The ARP is a young plan and the ability to estimate liabilities should improve with time. The liabilities are also difficult to estimate because some of the current and future obligations increase with inflation.

The ARP is operated as a nonprofit entity. State statutes require that the plan maintain a fully funded status. To the extent that the assets of the plan are inadequate to meet its obligations, all licensed insurers underwriting worker's compensation insurance are assessed an amount sufficient to fully fund the Plan's obligations. Each private

insurer's assessment is based on its pro rata share of total workers' compensation insurance written during the preceding calendar year.

The *Minnesota Commissioner of Commerce* sets the premium rates for the ARP annually. The premium rates must not be lower than those charges by private insurers. However, the private sector can price themselves out of certain lines of workers' compensation and the plan would then become the lowest cost provider. The ARP investment portfolio represents the source of payment for estimated current and expected future liabilities. Investment of the plan's assets is guided by Minnesota Statutes Chapter 11A. This investment authority is less restrictive than that established for insurance companies.

### **Business Risk**

Most Private companies underwriting workers compensation insurance in Minnesota are multi-line insurers. This gives them the opportunity to spread their business risk across a number of lines of insurance. Presumably, poor short term underwriting results in one or more lines will be offset by favorable results in others. Companies with a majority of their insurance underwriting in a single line still have the benefit of geographic and demographic diversification. The ARP can do little to diversity insurance risk since it is a single-line insurer that operates only in Minnesota.

### **Nature of Liabilities**

Insurance companies receive premiums to cover future claims. The premiums are invested in assets to cover the future liabilities. The timing and ultimate size of the claim depends on the type of risk being insured. For example, auto physical damage claims are paid quickly and the size of the claim is limited to the value of the automobile. On the other hand, medical malpractice claims could take years to develop and their final settlement values are often determined in court. (1)

Workers' compensation is considered a longer-tail liability. "Tail" refers to the length of time to the ultimate payment of a claim once the loss is incurred. The longer-tail

nature of workers compensation liabilities results from two factors: (1) many of the claims take years to develop, and (2) claims are often paid in the form of recurring medical payments and/or periodic disability income payments. (1)

#### **Financial Health of the Insurance Firm**

The financial health of an insurance firm is directly related to the value of its assets which in turn are used to determine the surplus. An insurance firm's ability to take on new business is restricted by its level of surplus. Regulators limit the total amount of a company's premium writing to no more than three times surplus. The industry average is currently closer to two times surplus. Surplus is the difference between current booked assets and current booked liabilities. All states require property and casualty companies to compute surplus on a statutory basis for regulatory purposes. Statutory accounting values bonds at their current amortized cost and common stocks at market prices. Therefore, assets are unaffected by changing interest rates and, in addition, liabilities are not discounted. (1)

Since bonds are not priced using market values and liabilities are not discounted, statutory accounting provides an incomplete picture of financial well-being with the emphasis on solvency. Two alternative measures are: (1) current value and (2) market value surplus. Both the current value and market value surplus measures value all assets at current market. Market value surplus also discounts liabilities at an appropriate discount rate. For the ARP, staff believes the market value is the more appropriate measure of surplus/deficit status.

#### **Unique Features of the ARP when Compared to the Property and Casualty Insurance Industry**

The above information shows that estimation and management of liability and premium cash flows are important to the health of an insurance company. The ARP has a

number of unique features that make it more difficult to determine what the cash flows, both negative and positive, will be.

### **Residual Market**

The ARP covers the residual market in Minnesota. These are the companies that have been rejected by private insurers and the cash flows in and out, particularly premium flow, for these companies is harder to predict than in the overall market for several reasons:

- Underwriting losses are greater in the workers' compensation residual market than the property and casualty industry. (2)
- There is less control over underwriting standards and premium flow. For instance, if a private firm does not want the business, it can increase premiums to a high enough level that firms will not buy insurance from the private market.
- The ARP must insure a company if it has been rejected by private insurers and does not owe the ARP premium payments from a previous ARP policy.
- The companies that private insurers do not want to cover are in the Assigned Risk Plan. Presumably, these companies are in the highest risk business lines.
- Residual market share means greater volatility because it is hard to predict what share of the market the ARP will have.
- For private insurers, as market share increases, losses are more likely as they insure more risky companies. For the ARP, as market share grows, the losses will probably be lower as less risky companies are accepted into the plan.

### **Status Within Minnesota**

Not only are cash flows harder to predict because the ARP is part of the residual market, but cash flows are also harder to predict because of its unique status within Minnesota:

- Most private insurers cover many lines of business while the ARP covers only workers' compensation. Further, private insurers that cover only one line of business can diversify across many states while the ARP is confined to Minnesota.
- ARP has assessments from the Special Compensation Fund. This fund was established to provide benefits when an employer has no insurance. The benefits are



paid by fining the employer and assessing other insurance companies in the state, including the ARP. Ultimately, the costs are passed on to other employers via higher insurance rates.

- ARP has the ability to assess private insurers for any deficit. This is important because if the ARP becomes underfunded, private insurers will be assessed to make up the deficit.
- The ARP is a young plan and this makes cash flows harder to predict.

## **INVESTMENT POLICY STATEMENT**

An appropriate investment policy statement for ARP includes the following considerations.

### **Objectives**

**Return Requirements:** *The main objective of this fund is management of the asset/liability relationship. The rate of return should be considered only when compared to an appropriate benchmark that is representative of the liability stream. The problems in predicting cash flows for the fund were discussed above. The difficulty in predicting liabilities makes meeting the objective even more difficult. Return enhancement is not as important as meeting the liability requirements.*

**Risk Tolerance:** *The fund has a very low risk tolerance. The biggest risk associated with the plan is not being able to meet liability payments. The volatility of the equity market makes a large percentage equities inappropriate for the fund.*

### **Portfolio Constraints**

*There are a number of constraints on this portfolio that affect the structure of the portfolio.*

**Liquidity:** *The portfolio must be very liquid. The Assigned Risk Plan portfolio must generate sufficient cash to pay both expected and unexpected obligations. Cash withdrawals from the portfolio occur frequently to meet obligations. While most claims and expenses can be anticipated, the nature of the casualty insurance business creates cash flow uncertainty and makes liquidity important.*

Unique Circumstances: Some unique characteristics of the fund are represented below. These factors make predicting cash flows difficult. To compensate for this unpredictability, the portfolio should be conservatively invested (i.e., predominately fixed income).

- The liabilities must be adjusted using "loss development factors" which allow for inflation and increased claims.
  - If there is unexpected inflation or deflation not included in calculating the loss development factors, the liability stream estimate will not be accurate. (1)
  - The loss development factors should also include an allowance for incurred but not reported liabilities. (1)
  - The loss development factor should properly "age" the loss. For example, a claimant's medical condition becomes known only with time, especially if the injuries were severe. (3)
- Escalating medical costs, broader definition of job related injuries, and spiraling litigation has made the worker's compensation system more difficult to manage. A system originally established to compensate workers for traumatic injuries, such as the loss of a limb, now faces administration of injuries that result in more subjective diagnoses. The subjectivity has made the system more confrontational and litigious. (4)
- Increasing market share shortens duration of the liabilities while decreasing share lengthens duration. (3) The ARP has been growing, causing the duration to shorten. (Duration is a measure of interest rate sensitivity. With a shorter duration, a portfolio is less sensitive to interest rate changes.)
- Legislation benefit changes may alter cash flows.
- Economic conditions affect cash flows. For example, during recessions, claims increase.
- If heavily invested in equities, the portfolio may begin to rely on premium cash flows to meet current obligations. This is risky because these premiums may decrease, depending on market conditions.
- Other factors unique to the ARP, such as covering only the residual market in Minnesota, make predicting cash flows even more difficult.

Although the above points show that the liabilities are difficult to predict, staff must assume that the liabilities calculated by the ARP's actuaries are estimated correctly. The actuarial valuation must serve as the basis for asset allocation decisions.

### **ASSET ALLOCATION**

The asset allocation should be tailored to the primary objective of the fund: to provide cash for the fund liabilities on the required date. As discussed above, it is difficult to accurately project these liabilities. As a result, staff recommends that the Board select a manager with special expertise in insurance related asset/liability matching. The manager should be charged with the responsibility to recommend an asset allocation. The manager should be familiar with liability streams produced by worker's compensation so its recommendation will take into account all the uncertainties discussed above.

Staff believes that because of the uncertainty of premium and liability cash flows, the portfolio should be invested very conservatively with a high fixed income content, 75 to 100 percent. The maximum amount of equities in the fund should be 25 percent. The fixed income portion should be managed to fund the shorter liabilities (less than ten years) and equities should be used to fund the long-term liabilities. This high fixed income allocation minimizes the chance of a future fund deficit while the equity exposure will provide higher expected returns and hedge some of the inflation risk associated with the liabilities.

### **FUND MANAGEMENT**

There should be only one manager to manage the fund as a business and the portfolio should be separate from the SBI's current portfolios. The portfolio manager should understand portfolio management as it relates to worker's compensation and should be able to recommend appropriate management styles. However, staff believes the following recommendations give appropriate guidelines for managing both the fixed income and equity portfolios.

#### **Fixed Income**

The duration of the portfolio should approximate the duration of the short-term liabilities. Matching the duration increases the possibility of meeting the stated objective of making liability payments.

Matching the duration of the liabilities does not ensure the liability payments will be met. This method assumes some of the liabilities will be met using asset cash flows and asset sales. This introduces market risk into the portfolio. Additionally, this method assumes a flat yield curve which introduces interest rate risk and is only appropriate for small changes in interest rates. Finally, as stated above, ARP liabilities are hard to predict and their duration is always changing making it hard to match duration.

Although the above risks are present, even greater risks would be incurred if the manager were allowed to deviate significantly from the duration of the liabilities. Any movement away from the liability duration increases the volatility of the fund and increases the likelihood that the liabilities will not be funded.

Matching duration limits how a manager can add value to the fund. As stated, total return is not the main objective of the fund. Matching duration helps to meet the main objective -- meeting liability payments. Incremental value can be added to the portfolio through sector, security and yield curve selection in the fixed income segment.

### **Equity**

The equity portfolio should provide broad market coverage. This reduces the possibility that the sole manager hired will be invested in an underperforming sector and therefore reduces the risk of increasing premiums. For instance, if a manager concentrates the portfolio in a certain area, the sector may underperform the market for an extended period of time and increase premiums over what they would have been if the investment had been in the entire market.

Exhibit One shows how the returns vary from sector to sector over various time periods. Hiring active managers who specialize in sectors is appropriate if more than one manager is being hired. Since only one manager is being used, a specialized approach is

not appropriate for the ARP. If the stock segment is actively managed, a broad based approach is more appropriate than an approach which concentrates in one area of the market. Staff believes that indexing or enhanced indexing also may be appropriate strategies for the equity portfolio.

## **BENCHMARKS**

### **Fixed Income**

The fixed income benchmark should, as much as possible, reflect the liability stream. Ideally, the benchmark should consist of securities that mimic the liabilities. However, this benchmark may be difficult to produce. Therefore, a benchmark consisting of published indices combined to reflect the duration of the liability stream and the long-term sector allocations of the fixed income manager would be appropriate. For example, if the duration of the liabilities is three years and the manager plans to only invest in Treasury and Corporate securities, an appropriate benchmark could have the following characteristics.

<b>Merrill Lynch Index</b>	<b>Percentage of Benchmark</b>	<b>Duration, 9/30/91 (years)</b>
1-10 Yr Treasury	50	3.06
1-3 Yr Corporate	25	1.51
5-10 Yr Corporate	25	4.18
Total	100	2.95

The above benchmark is only an example. A specific benchmark must be developed in conjunction with the manager for the ARP. Further, the benchmark will need to be adjusted whenever estimated liabilities for the ARP change. Staff anticipates that the benchmark will be reviewed at least annually.

**Equity**

As discussed above, the equity benchmark should reflect the desire for broad market coverage, e.g. the Wilshire 5000. However, if an active manager is selected, a customized benchmark that reflects the manager's investment style should be developed.

**Total Fund**

The total fund benchmark would be weighted in the same proportion as the recommended asset allocation for the ARP.

1. Peter D. Noris, C.F.A., Morgan Stanley, Asset/Liability Management Strategies for Property & Casualty Companies, May 1985
2. Best's Insurance Management Reports, 1989 Workers' Compensation, July 23, 1990
3. David F. Babbel, David R. Klock, Paul V. Polachek, Goldman Sachs, Insurance Perspectives, Assessing the Interest Rate Risk of Property and Casualty Companies, April 1988
4. Best's Insurance Management Reports, Workers' Compensation -- 1990, August 5, 1991

## Stock Market Performance

Periods Ending June 30, 1991

Wilshire 5000: Qtr. = -0.3%

Large Value 2.7%	Large Growth -0.9%
Small Value 7.0%	Small Growth -0.7%

Wilshire 5000: Year = 7.0%

Large Value 12.4%	Large Growth 10.2%
Small Value 13.5%	Small Growth 7.6%

Wilshire 5000: 3 Yr. = 13.0%

Large Value 12.6%	Large Growth 18.3%
Small Value 8.8%	Small Growth 8.8%

Wilshire 5000: 5 Yr. = 10.2%

Large Value 12.6%	Large Growth 12.5%
Small Value 8.0%	Small Growth 5.2%

Wilshire 5000: 10 Yr. = 14.1%

Large Value 17.8%	Large Growth 14.1%
Small Value 20.6%	Small Growth 9.8%



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**TOBACCO SETTLEMENT FUNDS**  
**ASSET ALLOCATION AND INVESTMENT STRUCTURE**

**Staff Position Paper**

**August, 1999**

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**TOBACCO SETTLEMENT FUNDS  
ASSET ALLOCATION AND INVESTMENT STRUCTURE**

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## **TOBACCO SETTLEMENT FUNDS**

### **ASSET ALLOCATION AND INVESTMENT STRUCTURE**

#### **INTRODUCTION**

In 1998, the State of Minnesota settled a lawsuit with a number of tobacco companies. The total settlement was \$6.1 billion with payments spread over a 20-year period. During the 1999 Legislative Session, two tobacco endowment funds were established using a portion of the proceeds already received and the future payments out to January 2001. This paper will address the following topics: 1) The purpose and funding of the endowment funds; 2) Rationale for the asset allocation and investment structure of the endowment funds; and 3) Description of the accounting procedures.

#### **PURPOSE AND FUNDING**

During the 1999 Legislative Session, two new endowment funds were created which will be funded from a portion of the State's tobacco settlement proceeds.

One endowment fund is the Medical Education Endowment Fund, which will receive 39 percent of the proceeds. The annual earnings, up to five (5) percent of the market value of the endowment fund, will be distributed to the University of Minnesota Board of Regents and to the Commissioner of Health. The allocations to the University will be used to help pay the costs of operating its medical school. The allocations to the Commissioner of Health will be used to fund other medical education expenses. By law, all earnings of the Medical Education Endowment Fund must be credited to the Fund,

and its principal must remain inviolate. (Inviolate means that no contributed principal may be used to meet the endowment fund's five (5) percent pay out goal.)

The second endowment fund is the Tobacco Use Prevention and Local Public Health Endowment Fund, which will receive 61 percent of the proceeds. The annual earnings, up to five (5) percent of the market value of the endowment fund, will be distributed to the Commissioner of Health and may be used to reduce tobacco use among the youth of the State and for other public health initiatives. All earnings of this endowment fund must be credited to the Fund, and its principal must remain inviolate.

Both the Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund will expire on June 30, 2015. Upon expiration, the principal, which has been defined as contributions to the endowment funds, and any remaining interest must be returned to the general fund.

The endowment funds are funded from the proceeds of the State's tobacco lawsuit according to the payment schedule stipulated in the settlement with the State. The funding comes from six (6) "one (1) time payments". The first two (2) payments were made on September 5, 1998 and January 4, 1999, totaling \$459,800,000, and will be the initial deposits to the Funds on July 1, 1999. Two (2) additional "one (1) time payments," \$242,500,000 on January 3, 2000 and \$242,500,000 on January 2, 2001, will also be deposited into the endowment funds. The final two (2) "one (1) time payments" scheduled for January of 2002 and 2003, have not yet been appropriated. A portion of the settlement in the form of annual payment of \$204 million in each of 20 years will not be used to fund the endowments.



## **ASSET ALLOCATION**

The Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund will be invested by the State Board of Investment. The funds possess the following three goals:

- 1) Each endowment fund is to earn a minimum of five (5) percent each fiscal year.
- 2) The principal of each endowment fund is to remain inviolate.
- 3) The entire principal contributed to each endowment fund is to be returned to the state general fund on June 30, 2015.

To accomplish the preceding goals, the endowment funds should be invested entirely in fixed income securities. Bonds are the only asset class that can offer a high probability of attaining each goal. The use of fixed income securities enables the endowment funds to achieve the desired earnings rate with some certainty, at the present time. In addition, the use of bonds increases the probability that the principal remaining inviolate and be available to be returned to the state's general fund at the pre-specified date, June 30, 2015.

Other asset classes, such as equities, offer the potential for higher overall rates of return, but also increase the risk of not achieving the desired earnings rate each year. They also subject the principal of the endowment funds to the potential of a loss that may not be recovered by the expiration date, June 30, 2015.

Currently, it is possible to invest in United States Treasury securities maturing in 2015 which yield more than six (6) percent annually. Investing in these securities assures annual earnings greater than the five (5) percent goal of the endowment funds. In contrast, domestic equities currently yield slightly more than two (2) percent annually and this yield is not assured. The stock market would have to appreciate at least three (3) percent in every year and also make up for any decline in yield below the current two (2) percent level to achieve the five (5) percent annual earnings goal. While the stock market has achieved returns significantly in excess of five (5) percent annually in the recent past, there is no guarantee that such levels can be sustained or that a five (5) percent return can be achieved each and every year. Historically, the stock market has experienced return volatility. The following chart illustrates the volatility of domestic equity returns. The data assumes an annual expected return of 11% with a standard deviation of 17%.

<u>Percentile</u>	<u>Annualized Return</u>
95 <sup>th</sup>	46.8%
75 <sup>th</sup>	24.5
50 <sup>th</sup>	11.0
25 <sup>th</sup>	-1.0
5 <sup>th</sup>	-16.1

The above chart indicates that there is a greater than 25 percent probability that the domestic equity market will generate a negative return in any given year. This demonstrates that an investment in equities could result in a significant shortfall to the five (5) percent annual earnings rate goal.

While fixed income securities provide the best opportunity to achieve the goal of a 5% income return in each year, bonds offer the best assurance that the principal of the funds will remain inviolate. Investing in fixed income securities gives the SBI the opportunity to structure a portfolio for which the risk of principal loss can be minimized or eliminated. While in any given year the market value of bonds can fluctuate due to changes in interest rates or other credit market conditions, over a predetermined time period, a bond portfolio can be structured to return all contributed principal at the stated date.

To achieve the three (3) goals of the endowment funds, the most appropriate strategy is to invest in fixed income securities.

### **INVESTMENT STRUCTURE**

Assuming fixed income securities provide the most appropriate investment vehicle for achieving the three (3) stated goals of the endowment funds, there are three (3) alternatives which could be used to develop an investment structure. The three (3) alternatives include:

- 1) Purchase all bonds with a maturity date that coincides with the expiration date of the endowment funds, June 30, 2015.
- 2) Purchase only short term fixed income securities for the endowment funds.
- 3) Develop a laddered bond investment structure with maturities that are spread out over the entire investment horizon of the endowment funds.

In developing an investment structure for the endowment funds, the primary concern is the interest rate sensitivity over the life of the endowment funds. The investment

structure resulting from each of the three (3) alternatives will react differently to interest rate changes.

The first alternative uses a strategy of purchasing securities with a maturity date that coincides with the expiration date of the endowment funds. This strategy would eliminate any reinvestment risk that might occur in the other two alternatives. The yield on the endowment funds would be locked in at the time of investment. Currently, interest rates exceed five (5) percent. By employing this investment strategy, the endowment funds would be assured of achieving their earnings target. A disadvantage associated with this approach is the potential for the market value of the endowment funds to fluctuate with changing interest rates. The five (5) percent spending limit is established annually based upon the market value of the endowment funds. Significant changes in the market value of the endowment funds would alter the annual amount of spending income available. Moreover, at the current time, there appears to be limited availability and liquidity of fixed income securities possessing the desired maturity date.

The second alternative which would use only short-term bonds would be very easy to establish. The short end of the bond market is very liquid with many securities available. The advantage of this approach is its ability to eliminate the Funds' market value fluctuations, thus ensuring that the principal of the endowment funds remains inviolate and would be available to be returned to the general fund on June 30, 2015. However, the investments would be very sensitive to changes in interest rates. As securities matured, the proceeds would have to be reinvested at the then prevailing rate. If interest rates were to fall below five (5) percent, the endowment funds would be unable to consistently achieve the earnings rate goal.

The third alternative would be to structure a laddered fixed income portfolio. The endowment funds would be structured by allocating a significant portion of the contributed principal to the maximum maturity. At current rates, this would lock in a significant portion of future earnings at a level above the targeted five (5) percent. The remaining amount would be invested in equal amounts to mature in each of the years leading to the maximum maturity.

### **RECOMMENDED INVESTMENT STRUCTURE**

As previously mentioned, investing the endowment funds solely in short term securities exposes them to an imprudent amount of reinvestment risk. Investing the endowment funds in fifteen year securities gives them relatively high market value volatility which could cause significant changes in the annual spending targets. In addition, there is limited liquidity and availability of securities to invest the entire contributed capital to the endowment funds' expiration date. Staff believes that a laddered approach provides the greatest flexibility and enables the endowment funds to achieve the three (3) stated goals. The proposed ladder structure has the advantage of locking in a portion of the endowment funds at an earnings rate greater than the targeted five (5) percent through the endowment funds' expiration date. The remainder of the endowment funds would be available to be reinvested in a rising interest rate environment and, therefore, would reduce annual market volatility.

Specifically, staff recommends that 50 percent of the principal contributions be invested in Treasury securities that have a maturity date which matches the endowment funds' expiration date, fiscal year end 2015. The remaining principal contributions would be

evenly distributed among securities with maturity dates up to 10 years coinciding with the end of fiscal years 2002 through 2009. There are scheduled principal contributions during fiscal year 2000 and 2001. When the additional principal is deposited in 2000 and 2001, the maturities will be evenly spread out coinciding with the end of the fiscal 2002 through the current 10 year government or agency issue. As these investments start to mature, the new 10 year government or agency issue would be purchased until 2005. After 2005, all maturities would be rolled into securities with maturities of 2015. Given current rates, the proposed structure minimizes the potential that the endowment funds will generate less than a five (5) percent earnings rate in any given year. Additionally, interest rates over the remaining life of the endowment funds would have to average less than 3.2 percent before the portfolio would be unable to provide the five (5) percent earnings goal.

## **ACCOUNTING**

The two (2) endowment funds' assets will be managed in one (1) commingled pool (The Tobacco Endowment Pool). The Tobacco Endowment Pool will be a unit-valued account that will be valued on a monthly basis. All unit value transactions will occur on the first business day of the month based on the unit value determined as of the end of the last business day of the preceding month.

Income earned by the assets in the pool will be distributed on a quarterly basis. Income is defined as dividends, interest on fixed income securities and interest earned on short term investments. Premiums and discounts on fixed income securities will be amortized on a monthly basis and will be included in income for the period.

If securities are sold generating a gain or a loss on the sale, the gain or loss will be amortized over the remaining life of the security sold or until June 30, 2015, whichever is first. The procedure followed will be to accumulate all gains and losses for a year and the net amount will be amortized over the average life of the securities sold. The amount of this annual amortization will reduce or increase income available to meet the five (5) percent goal.

If the income earned by the fund exceeds the five (5) percent spending limit in any one year, the excess will be placed in reserve to supplement insufficient income earned in a future year. If excess income remains at the expiration of the fund in 2015, then the balance will revert to the general fund with the principal.

Transfers of spendable income will occur on a quarterly basis for the Medical Education Endowment Fund and on an annual basis for the Tobacco Use Prevention and Local Public Health Endowment Fund. The spendable income is limited to five (5) percent of the market value of each endowment fund at the beginning of the fiscal year. On the transfer date the appropriate amount will be moved via wire transfer from the SBI's custodial bank to the State Treasury and deposited into the states general account. The Department of Finance will be notified of the amount of the transfers and will be responsible for the distribution of these funds.

#### **RECOMMENDATION**

Staff recommends that the Medical Education and Tobacco Use Prevention and Local Public Health Endowment Funds be invested in fixed income securities with a final maturity no greater than the expiration date of the endowment funds. Staff further

recommends that the endowment funds use a ladder investment structure. This approach will minimize the risk that the endowment funds will be unable to meet the five (5) percent earnings goal and allows them to participate in a rising interest rate environment. By limiting the bond investments to a final maturity no greater than the endowment funds' expiration date, finally, the principal of the Fund will remain inviolate.



**TOBACCO SETTLEMENT FUNDS**  
**ASSET ALLOCATION AND INVESTMENT STRUCTURE**

**Staff Position Paper**  
**Revised – February 2000**

**TOBACCO SETTLEMENT FUNDS  
ASSET ALLOCATION AND INVESTMENT STRUCTURE**

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## **TOBACCO SETTLEMENT FUNDS**

### **ASSET ALLOCATION AND INVESTMENT STRUCTURE**

#### **INTRODUCTION**

In 1998, the State of Minnesota settled a lawsuit with a number of tobacco companies. The total settlement was \$6.1 billion with payments spread over a 20-year period. During the 1999 Legislative Session, two tobacco endowment funds were established using a portion of the proceeds already received and the future payments out to January 2001. This paper will address the following topics: 1) The purpose and funding of the *endowment funds*; 2) Rationale for the asset allocation and investment structure of the endowment funds; and 3) Description of the accounting procedures.

#### **PURPOSE AND FUNDING**

During the 1999 Legislative Session, two new endowment funds were created which will be funded from a portion of the State's tobacco settlement proceeds.

One endowment fund is the Medical Education Endowment Fund, which will receive 39 percent of the proceeds. Up to five (5) percent of the market value of the endowment fund, will be distributed to the University of Minnesota Board of Regents and to the Commissioner of Health. The allocations to the University will be used to help pay the costs of operating its medical school. The allocations to the Commissioner of Health will be used to fund other medical education expenses. By law, all earnings of the Medical Education Endowment Fund must be credited to the Fund.

The second endowment fund is the Tobacco Use Prevention and Local Public Health Endowment Fund, which will receive 61 percent of the proceeds. Up to five (5) percent of the market value of the endowment fund, will be distributed to the Commissioner of Health and may be used to reduce tobacco use among the youth of the State and for other public health initiatives. All earnings of this endowment fund must be credited to the Fund.

Both the Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund will expire on June 30, 2015. Upon expiration, the remaining balance of the endowment funds must be returned to the general fund.

The endowment funds are funded from the proceeds of the State's tobacco lawsuit according to the payment schedule stipulated in the settlement with the State. The funding comes from six (6) "one (1) time payments". The first two (2) payments were made on September 5, 1998 and January 4, 1999, totaling \$459,800,000, and were the initial deposits to the Funds on July 1, 1999. Two (2) additional "one (1) time payments have been appropriated for deposit into the endowment funds. On January 3, 2000, \$221,785,000 was deposited and \$242,500,000 is scheduled to be deposited on January 2, 2001. The final two (2) "one (1) time payments" scheduled for January of 2002 and 2003, have not yet been appropriated. A portion of the settlement in the form of annual payments of \$204 million in each of 20 years will not be used to fund the endowments.

## **ASSET ALLOCATION**

The Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund will be invested by the State Board of Investment. The funds possess the following three goals:

- 1) To grow the principal of the fund in real terms over the long run.
- 2) To provide a rate of return consistent with the risk-return relationship of the fund.
- 3) To assure to the extent possible that the level of the annual distributions from this fund demonstrate low volatility.

To accomplish the preceding goals, the endowment funds should be invested in an asset allocation mix of 50 percent domestic equities and 50 percent domestic bonds. To achieve the first two goals, equities must be included in the asset mix to generate positive real returns. To accomplish the third goal, fixed income securities need to be included to maintain the overall portfolio volatility at a reasonable level.

Equities must be included in the asset mix so that the overall portfolio can generate a total return that will be greater than the rate of inflation after the 5% distribution is made. Since the long term absolute return of domestic equities has been about 11%, an asset allocation mix with a reasonable allocation to domestic equities will generate a portfolio return, after the 5% distribution, that has a reasonable probability of being greater than the long term rate of inflation.

The proper asset allocation and the level of overall risk that the fund can tolerate and still meet its goals must be determined. The higher the allocation to domestic equities the

greater the portfolio volatility will be. For example, an allocation of 100% to domestic equities would produce a superior return but with a correspondingly higher level of risk. Therefore at least one other asset class must be added to the portfolio. Historically, domestic fixed income has served as the best diversifier to domestic equities. The tables below show the volatility and a correlation matrix for domestic and international equities and fixed income.

**Volatility**

Domestic Equities	18%
International Equities	20
Domestic Bonds	8
International Bonds	12

**Correlations**

	Domestic Equities	International Equities	Domestic Bonds	International Bonds
Domestic Equities	1.00			
International Equities	0.60	1.00		
Domestic Bonds	0.35	0.20	1.00	
International Bonds	0.10	0.50	0.60	1.00

Relative to international equities, domestic bonds have a lower absolute volatility than international equities and a lower correlation to domestic equities. Compared to international bonds, the domestic bond market is more liquid and has a lower absolute volatility, mainly because there is no currency risk. In addition, the domestic bond

market has lower transaction costs which offsets the lower correlation that international bonds provide.

The question now becomes, what is the minimum allocation to domestic bonds that will allow the funds to accomplish the third objective of stable distributions and still generate a portfolio return that accomplishes the first two objectives. Shown below is a table with various asset allocation mixes and their associated returns and volatilities.

Asset Mix (Equities/Bonds)	30/70	50/50	70/30
Expected Return	8.16	8.96	9.76
Volatility	8.91	10.95	13.54

Currently, the Permanent School Fund has a 50/50 asset mix while the Environmental Trust Fund has a 70/30 asset mix. Since the Tobacco Trust Funds will end in 2015, they should be run somewhat more on the conservative side. This would favor either the 30/70 or 50/50 asset mix. However the 50/50 asset mix, which generates an additional 0.80% expected return, will provide a higher probability of accomplishing the real rate of return goals while maintaining the volatility at a reasonable level.

#### **INVESTMENT STRUCTURE**

The easiest and least expensive approach to invest in domestic equities would be to invest the 'Tobacco Endowment Funds' assets in the Internal S&P 500 Index Pool that is currently being used by the Permanent School and Environmental Trust Funds. This

investment vehicle offers the lowest cost in regard to fees and transaction costs while providing equity returns. Given the more conservative nature of the Tobacco Endowment Funds, a consistent market return would be preferable to risking a return that underperforms the market due to potentially poor active management decisions.

In developing the bond portfolio investment structure, the first decision is whether it should be run actively or more passively. Given the conservative nature of the portfolio, it would be best to manage the portfolio on a semi-passive basis. This would allow the portfolio to generate a more consistent market return based on an appropriate fixed income benchmark.

In selecting a fixed income benchmark, several risks must be considered. They are: 1) duration risk; 2) default risk; and 3) prepayment risk. Each of the three risk variables will impact the yield and total rate of return of a portfolio. Some fixed income indexes have a longer duration, which will provide a higher yield, but will also incur higher short-term volatility. Other fixed income indexes have lower quality bonds that generate a higher yield, but will also increase the default risk of the portfolio. Additional fixed income indexes have bonds whose principal maturities are uncertain. These bonds provide a higher initial yield because of the prepayment uncertainty, but if the bonds prepay differently from expectations, portfolio yield is increased or decreased.

The index chosen must balance the higher yield that can be provided versus additional risk that can be incurred. Given the more conservative nature of the portfolio and the



desire that it produce fairly consistent distributions, it would be best that the index have a duration close to the overall domestic fixed income market and a relatively low default risk. Keeping the duration close to the overall market would prevent the portfolio from becoming too volatile causing it to generate widely fluctuating annual distributions. Reducing the default risk will prevent the portfolio from any large loss of principal due to specific event risk. Prepayment risk is not as much of a factor since there is no loss of principal and it does not materially affect the volatility of the portfolio. As to the potential for a lower yield due to unexpected prepayments, that will be minimized if the portfolio is semi-passively managed relative to the benchmark.

The index that best meets the above requirements is the Lehman Aggregate Index. This index has a duration equal to the overall domestic fixed income market and has a very low default risk due to the index's AAA average quality rating.

Therefore, the most efficient way to acquire fixed income exposure for the Tobacco Endowment Funds' assets would be to invest the assets in the Internal Fixed Income Trust Pool, which uses the Lehman Aggregate as its benchmark and is managed on a semi-passive basis. Both the Permanent School and Environmental Trust Funds use this pool for their fixed income exposure. The pool provides exposure to the broad domestic investment grade bond market at a very low cost.

## **RECOMMENDED INVESTMENT STRUCTURE**

Staff recommends that one-half of the Tobacco Endowment Funds' assets be invested in the Internal S&P 500 Index Pool. This would provide an investment vehicle that would generate a consistent domestic equity market return at very little cost. For the balance of the portfolio, staff recommends that it be invested in the Internal Trust Fixed Income Pool that uses the Lchman Aggregate as its benchmark. A fixed income portfolio structured in this fashion would provide reasonably high yield with a market like volatility and low default risk.

## **ACCOUNTING**

The two (2) endowment funds' assets will be managed in two (2) commingled pools (The Internal S&P 500 Equity Pool and the Internal Fixed Income Trust Pool). The Internal S&P 500 Equity and the Fixed Income Trust Pools are unit valued accounts that are valued on a monthly basis. All unit value transactions occur on the first business day of the month based on the unit value determined as of the end of the last business day of the preceding month.

Transfers of the distributions will occur on an annual basis for the Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund. The distribution is limited to five (5) percent of the market value of each endowment fund at the beginning of the fiscal year. On the transfer date the appropriate amount will be moved via wire transfer from the SBI's custodial bank to the State Treasury and deposited into the state's general account. The Department of Finance will

be notified of the amount of the transfers and will be responsible for the distribution of these funds.

### **RECOMMENDATION**

Staff recommends that the Medical Education and Tobacco Use Prevention and Local Public Health Endowment Funds be invested in asset allocation structure of 50% domestic equities and 50% domestic fixed income. Staff further recommends that the endowment funds invest the domestic equity portion of the allocation in the Internal S&P 500 Index Pool and the domestic fixed income allocation be invested in the Internal Fixed Income Trust Pool. This approach will provide a reasonable probability that the Tobacco Endowment Funds will generate a long term rate of return that will: 1) grow the annual distribution in real terms over time; 2) provide a reasonable rate of return on contributed principal; and 3) generate reasonably consistent annual distributions.

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**STATE TRUST FUNDS  
INVESTMENT MANAGEMENT**

**Staff Position Paper**

**May 2001**

The State Board of Investment (SBI) is responsible for the investment management of several trust funds. These trust funds have differing accounting requirements and spending targets that derive from differing constitutional and statutory provisions. As a result of these differing legal bases, the trust funds have differing investment objectives and asset allocations. These trust funds are:

- Permanent School Fund (PSF)
- Environment and Natural Resources Trust Fund (Environmental Trust Fund or ETF)
- Medical Education Endowment Fund (Medical Education Fund)
- Tobacco Use Prevention and Local Public Health Endowment Fund (Tobacco Prevention Fund)
- Closed Landfill Investment Fund

Each of the trust funds is a nonretirement account that, by state law, must be invested separately from the retirement assets managed by the SBI.

This paper sets forth the constitutional and statutory basis for each trust fund, discusses the unique accounting requirements and spending targets for each and presents the investment objectives and rationale for the asset allocation for each.

#### **Endowment Fund Investment Objectives**

To the extent possible, the SBI treats these trust funds as endowment funds with the overriding need to balance a short-term need for income with the long term need for growth in principal. Any endowment fund encounters certain short-term versus long-term investment trade-offs. In the short-term, there is a demand for maximum current spendable income. This short-term objective can usually best be met by holding investments in lower risk, fixed income securities. Conversely, in the long-term, there is a demand for a growing stream of real, that is inflation adjusted, spendable income. This long-term objective can usually best be met by holdings investments in higher risk equity securities. Unfortunately, the two investment objectives tend to be mutually incompatible. Maximum current spendable income achieved through fixed income investments will sharply limit long-term growth in a fund's principal and, hence, the spendable income that the fund could generate in the future. On the other hand, a growing stream of real spendable income achieved through equity investment usually results in a lower and more volatile stream of current spendable income.

An endowment fund's tolerance for risk is determined largely by the trade off between short-term and long-term objectives. In turn, the emphasis on short-term or long-term objectives is primarily a function of the importance of the endowment fund's spendable income stream to the sponsor's total revenue. When the spendable income stream is a relatively small percentage of total revenues, the risk tolerance of the sponsor will tend to be higher than in a situation in which the fund's spendable income stream is a large percentage of the sponsor's total revenue. In the latter case, the sponsor is likely to be



more cautious since a protracted period of poor investment results could have a serious impact on the various projects that the endowment fund is expected to finance.

### **Permanent School Fund**

The Permanent School Fund (PSF) was created in 1858 under Article XI, Section 8 of the Minnesota State Constitution. The PSF was designed to serve as a long-term source of revenue for public schools. Technically, the PSF is composed of two parts:

- **Lands:** As part of the process of Minnesota becoming a state, the federal government granted to Minnesota two sections of each township for the support of schools. The most productive and valuable land was sold in the nineteenth and early part of the twentieth century and proceeds put into the Fund. Other lands were added to the remaining tracts which are primarily in the northern part of the state. The Department of Natural Resources (DNR) currently manages about 2.5 million acres of land and retains the mineral rights on another 1 million acres for the Fund. Most of the land is part of state forests, wildlife management areas, scientific and natural areas, state parks, riverways, and water access sites.
- **Principal:** The lands generate income in the form of land sales, mining royalties, timber sales and lakeshore and other leases. The income from these sources, net of DNR costs, is used to purchase financial securities, which make up the second part of the Permanent School Fund. It is this second part of the PSF, the principal as represented by the PSF's financial investments, that is managed by the SBI.

In conjunction with the PSF is the School Endowment Fund. Income generated by the financial investments in the PSF principal is transferred to the School Endowment Fund and is then available for educational spending. Funds are taken from this account twice a year to offset school aid payments. Because of the short-term nature of this account, the School Endowment Fund is invested in short-term cash equivalents.

### **Current Accounting Restrictions**

As prescribed by the State Constitution, the principal of the PSF must remain undiminished in perpetuity. The offset to school aids can be financed only out of the PSF's dividend and interest income. None of the PSF's principal may be reduced to finance the offset.

Any combined realized losses on fixed income and equity securities are first subtracted from any realized gains. Net realized gains or losses are then amortized over a ten year period in equal installments. Net gains are used to offset net losses over the ten year amortization period. If any portion of the gain is not needed to offset losses, it is added to the principal of the PSF. If the amortized realized losses are greater than realized gains, the difference must be recovered from the PSF's interest and dividend income in equal installments over the ten year amortization period.

## Investment Objective

As a result of these restrictive accounting requirements, the impact of investment strategies for the PSF on current spendable income is of primary concern. Investing in equities may generate significant realized losses in any given year, and equities typically generate a lower income stream than fixed income.

Accordingly, prior to fiscal year 1998, the PSF was invested entirely in fixed income securities for more than a decade. While this asset allocation maximized current income, it limited the long-term growth of the Fund and caused the income stream to lose value in inflation adjusted terms. A more appropriate investment objective for the Fund is to produce a growing level of spending income within the constraints of maintaining adequate portfolio quality and liquidity needed to make the periodic withdrawals to offset school aid payments.

To meet this objective, a proposal to introduce equities to the Fund's asset mix was discussed by staff with affected parties for a number of years. Since this modification would reduce short-term income and have budgetary implications for the State, the consent of the executive and legislative branches was necessary. After a number of unsuccessful attempts, the proposal was favorably received by the Legislature and the administration and incorporated into the K-12 education finance bill during the 1997 session. As a result, the Fund allocation was shifted to a 50% stock/48% fixed income/2% cash allocation during July 1997.

## Management Structure

The stock segment of the Fund is invested in the internally managed index fund designed to match the performance of the S&P 500. The bond segment is invested in the internally managed bond fund that is actively managed to add incremental value through sector, security and yield curve decision. The bond segment uses the Lehman Aggregate Index as its performance target. These investment vehicles offer low costs while providing market returns.

## Recommendation

There have been no legislative changes governing the Permanent School Fund since 1997. Therefore, staff recommends that the Fund continue to be invested in a 50% stock/48% bond/2% cash allocation through the internally managed stock and bond pools.

## Environmental Trust Fund

The Environmental Trust Fund was established by a constitutional amendment adopted in 1988 to provide a long-term, consistent, and stable source of funding for activities that protect and enhance the environment. In 1990, a constitutional amendment to Article XI, Section 14 was approved that mandates that 40 percent of the net proceeds from the state lottery be credited to the Fund until the year 2001. This mandate was extended through

the year 2025 following the approval of another constitutional amendment in 1998, which also eliminated certain restrictive accounting provisions. The Legislature may spend up to 5.5% of the Fund's total market value a year. By statute, the State Board of Investment invests the assets of the Fund.

### Investment Objective

The Environmental Trust Fund's investment objective is to produce a growing level of income, within the constraints of maintaining adequate portfolio quality and liquidity.

The Fund's initial investment objectives were influenced by the restrictive accounting provisions which governed the investment of the fund's assets. These provisions were:

- The Fund's principal must remain inviolate.
- Any net realized capital gains must be added to the principal.
- If the Fund realizes net capital losses, those losses must be offset against interest and dividend income before such income can be distributed.
- All interest and dividend income must be distributed in the year in which it is earned.

Effective July 1999, the 1998 constitutional amendment eliminated the accounting restrictions on capital gains and losses and established an endowment policy which sets annual spending up to 5.5% of the Fund's total market value.

### Asset Allocation

Before fiscal year 1994, the Fund was invested entirely in short-term instruments as part of the Invested Treasurer's Cash pool. By fiscal year 1995 the Fund had received sufficient contributions to warrant an investment policy that incorporated allocations to longer-term assets such as stocks and bonds.

For fiscal years 1995 through 1999, the SBI maintained a targeted allocation of 50% domestic common stocks and 50% fixed income.

After the 1998 constitutional amendment was adopted, SBI staff worked with the Legislative Commission on Minnesota Resources to establish an asset allocation policy that is consistent with the Commission's goals for spending and growth of the Fund.

The SBI approved a 70% stock and 30% fixed income asset allocation which was implemented July 1, 1999. The allocation positions the Fund for the best long-term growth potential while meeting the objective of the Fund to produce a growing level of spending.

## Management Structure

The stock segment of the Fund is invested in the internally managed index fund designed to match the performance of the S&P 500. The bond segment is invested in the internally managed bond fund that is actively managed to add incremental value through sector, security and yield curve decision. The bond segment uses the Lehman Aggregate Index as its performance target.

## Recommendation

There have been no changes in the Fund structure or spending needs to suggest a change in allocation targets or management of the Fund. Therefore, staff recommends that the Fund continue to be invested in a 70% stock/28% bond/2% cash allocation through the internally managed stock and bond pools.

## Tobacco Endowment Funds

The Medical Education Endowment Fund and Tobacco Use Prevention and Local Public Health Endowment Fund are discussed together as the Tobacco Endowment Funds. The two endowment funds were created by 1999 legislation. The endowment funds are funded from the proceeds of the State's tobacco lawsuit according to the payment schedule stipulated in the settlement with the State. The funding comes from the first four of six "one time-payments". These payments have been received and total about \$903 million.

The Medical Education Endowment Fund receives 39 percent of the proceeds. Up to five percent of the market value of the endowment fund is distributed annually to the University of Minnesota Board of Regents and to the Commissioner of Health. The allocations to the University are used to help pay the costs of operating its medical school. The allocations to the Commissioner of Health are used to fund other medical education expenses. By law, all earnings of the Medical Education Endowment Fund must be credited to the Fund.

The second endowment fund is the Tobacco Use Prevention and Local Public Health Endowment Fund, which receives 61 percent of the proceeds. Up to five percent of the market value of the endowment fund is distributed to the Commissioner of Health and may be used to reduce tobacco use among the youth of the State and for other public health initiatives. All earnings of this endowment fund must be credited to the Fund.

Both the Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund will expire on June 30, 2015. Upon expiration, the remaining balance of the endowment funds must be returned to the general fund.

## Investment Objectives

The Medical Education Endowment Fund and the Tobacco Use Prevention and Local Public Health Endowment Fund are invested by the SBI. The Funds have the following three goals:

- 1) To grow the principal of the fund in real terms over the long run.
- 2) To provide a rate of return consistent with the risk-return relationship of the fund.
- 3) To assure to the extent possible that the level of the annual distributions from the Funds have low volatility.

## Asset Allocation

To accomplish these goals, the endowment funds have been invested in an asset allocation mix of 50 percent domestic equities and 50 percent domestic bonds. To achieve the first two goals, equities must be included in the asset mix to generate positive real returns. To accomplish the third goal, fixed income securities are included to maintain the overall portfolio volatility at a reasonable level.

## Management Structure

The Tobacco Endowment Funds' assets are invested in the internally managed S&P 500 index and fixed income pools. These investment vehicles offer low costs while providing market returns.

## Recommendation

Staff recommends that the Medical Education Fund and Tobacco Use Prevention and Local Public Health Endowment Fund continue to be invested using an asset allocation of 50% domestic equities and 50% domestic fixed income in the internally managed stock and bond funds.

## **Closed Landfill Investment Fund**

The Closed Landfill Investment Fund is a trust fund created by the Legislature to invest moneys to pay for the long-term costs of maintaining the integrity of landfills in Minnesota once they are closed.

## Investment Objective

The investment objective of the Closed Landfill Investment Fund is to generate high returns from capital appreciation. The Fund will be used by the Commissioner of the Pollution Control Agency to pay for the long-term costs of maintaining the integrity of landfills in Minnesota once they are closed. By statute, the fund will receive an

appropriation of \$5.1 million at the beginning of fiscal years 2000, 2001, 2002 and 2003. However, by statute, the assets of the Fund are unavailable for expenditure until after fiscal year 2020.

#### Asset Allocation

Since July 1999, the Closed Landfill Investment Fund has been invested entirely in common stock. Given the long time horizon of this Fund and the lack of need for any short or mid-term withdrawals, this strategy will maximize the long-term gain of the Fund.

#### Investment Management

SBI staff manages all assets of the Fund in the internally managed index pool designed to match the performance of the S&P 500 index.

#### Recommendation

Until the Legislature makes a change in the purposes of the Fund, such as allowing withdrawals for expenditures, Staff recommends the Fund continue to be managed entirely in equities in the internally managed S&P 500 index pool.

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**INVESTED TREASURER'S  
CASH POOL**

**Staff Position Paper**

**May 2001**

## INVESTED TREASURER'S CASH POOL

In December 1996, the Board approved a staff position paper that recommended technical changes to the performance benchmark for the Invested Treasurer's Cash Pool (ITC), and recommended periodic reviews of the allocation of a fixed dollar amount of cash to a longer maturity portion of the Fund. This paper provides that review.

### **Background**

The State Board of Investment (SBI) manages a money market like short-term fund called the Invested Treasurer's Cash Pool. The fund is used as a pooled investment vehicle for about 525 state accounts, providing daily earnings and liquidity for each participant. Performance of the Fund is measured against a blended benchmark which consists of a fixed dollar amount measured against the Lehman Brother's 1 to 3 year U.S. Government Bond Index and the balance of the Fund against the iMoney Net Money Fund Index. The fixed dollar allocation has been periodically reviewed and changed as the fund balance and the economy have changed. Previous allocations were:

10/96 - \$600 million

1/98 - \$850 million

10/98 - \$1,500 million

### **Fund Analysis**

The ITC, as of March 2001, has a balance of \$6.2 billion (see Appendix I). For the purpose of determining the appropriate portion of the ITC that can be invested in longer

maturities, the fund should be divided into three components. The first component is the State General Fund, now at \$2.7 billion, which represents 44 percent of ITC; the second component is accounts other than the General Fund that have balances greater than \$10 million, currently composed of 31 accounts totaling \$3.4 billion or 55 percent of ITC; and the final component is the remaining accounts that total only \$.1 billion or 1 percent of ITC.

The General Fund component is the most volatile part of the ITC, having in the last four years fluctuated from under \$1 billion to over \$4 billion, and having experienced months with outflows greater than \$1.5 billion. Given its volatility, it is appropriate that the majority of this component continue to be invested in short-term, money market instruments, maturing in one year or less.

The second component of the ITC, the 31 funds with balances greater than \$10 million in the fund, appears to have more stable cash flows. The cash flow analyst of the Minnesota Department of Finance has identified 16 of these 31 funds (see Appendix II) that collectively have shown, over the last several years, a relatively stable balance of about \$1.5 billion. All of these funds are "expendable" funds, but tend to be engaged in longer-term projects, such as transportation or economic development, or provide a reserve for expenditures such as healthcare. These fund balances do not appear to be as quickly impacted significantly on an annual basis by changes in the economic environment or governmental policy.

Currently, one fund in this group, the Workers' Compensation Special Payment Fund, is experiencing a one-time "bulge" of \$300 million due to a payment from the Assigned Risk Plan. The expectation is that this cash will be used over the next two years.

### **Economic Considerations**

The February 2001 Forecast by the Minnesota Department of Finance anticipates an economic slowdown lasting until late summer 2001. This slowdown is "sufficient to cause state revenues to drop through the entire forecast horizon" (2001-2005). The expectation of a slow down, as opposed to a recession, does not justify at this time a change in the investment policy for the ITC. Staff will continue to monitor the market and economic conditions for their impact on ITC balances.

### **Recommendation**

Staff recommends that the SBI continue an allocation of \$1.5 billion of the ITC to 1 to 3 year maturity investments.

**LONGER MATURITY ALLOCATION FOR THE  
INVESTED TREASURER'S  
CASH POOL**

**Staff Position Paper**

**January 2007**



## **LONGER MATURITY ALLOCATION FOR THE INVESTED TREASURER'S CASH POOL**

In September 1996, the Board approved a staff position paper that recommended technical changes to the performance benchmark for the Invested Treasurer's Cash Pool (ITC), and recommended periodic reviews of the allocation of a fixed dollar amount of cash to a longer maturity portion of the Fund. This paper provides that ongoing review.

### **Background**

The State Board of Investment (SBI) manages a money market like short-term fund called the Invested Treasurer's Cash Pool. The fund is used as a pooled investment vehicle for about 525 state accounts, providing daily earnings and liquidity for each participant. The pool is invested in high quality, liquid, government, agency, or corporate debt obligations with a maturity of three years or less. The majority of the fund has, because of cash flow considerations, been invested in securities with a maturity of 1 year or less. The staff, after reviewing the fund's cash flow requirements and fund balance, should recommend to the Board, if appropriate, a fixed dollar amount of the ITC to be invested in long-term (1 – 3 years) investments with the expectation of increasing ITC's earnings.

### **Performance**

Performance of the Fund is measured against a blended benchmark which consists of a fixed dollar amount (currently \$0) measured against the Lehman Brother's 1 to 3 year

U.S. Government Bond Index and the balance of the Fund against the iMoney Net Money Fund Index. The fixed dollar allocation has been periodically reviewed and changed as the fund balance and the economy have changed. Previous allocations were:

10/96 - \$600 million

1/98 - \$850 million

10/98 - \$1,500 million

During fiscal year 2003, staff recommended that the fixed dollar allocation be brought to zero by selling or allowing the securities in the fixed dollar portion of the pool to mature, due to the economic downturn and pending \$4 billion State budget shortfall.

### **Fund Analysis**

The balance of ITC, as of January 31, 2007, was \$5.63 billion. The cash flow pattern in ITC has been consistent year over year. (See Appendix I for a comparison of ending daily balance of ITC for the Fiscal Years 2004, 2005, 2006 and through January 31, 2007). This consistency is due to both revenues and expenditures being received or paid at times or dates specified in statute.



The following shows the ending daily balance statistics for the last five fiscal years.

<u>Fiscal</u> <u>Year</u> (All figures in Billions)	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
2003	5.37	2.85	3.80
2004	5.23	3.28	3.84
2005	4.84	2.90	3.59
2006	5.53	3.05	4.10
2007 (to 1/31)	5.80	4.14	4.80

For the purpose of determining the appropriate portion of the ITC that can be invested in longer maturities, it is useful to view the fund in three components. The first component is the State General Fund, now at \$2.55 billion, which represents 44 percent of ITC; the second component is accounts other than the General Fund that have balances greater than \$10 million, currently composed of 31 accounts totaling approximately \$3.2 billion or 55 percent of ITC; and the final component is the remaining accounts that total only \$0.1 billion or 1 percent of ITC.

The General Fund component is the most volatile part of the ITC. Given its volatility, it is appropriate that the majority of this component continue to be invested in short-term, money market instruments, maturing in one year or less.

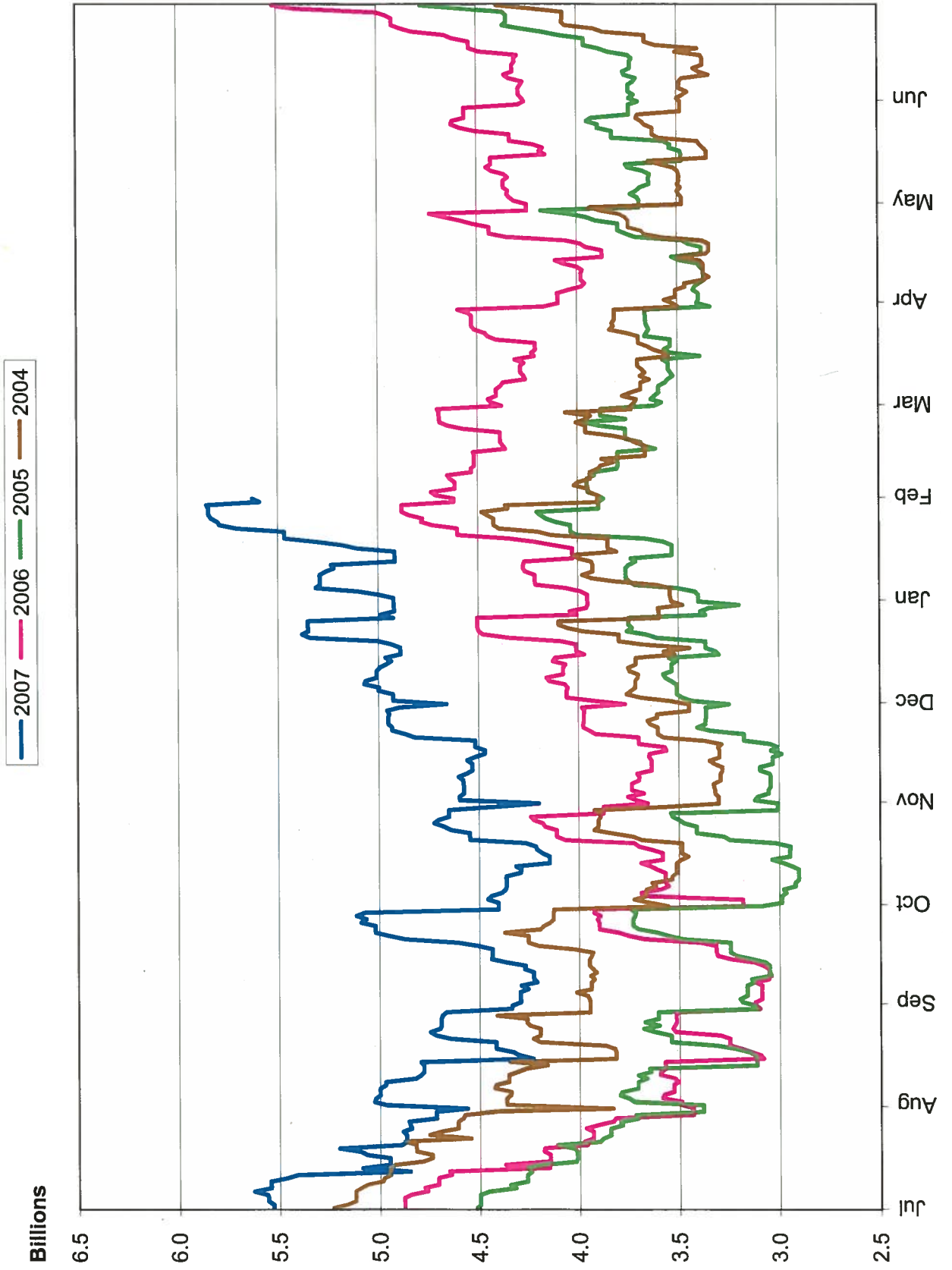
The second component of the ITC, the 31 funds with balances greater than \$10 million in the fund, appears to have more stable cash flows. The cash flow analyst of the Minnesota Department of Finance has identified 16 of these 31 funds that collectively have shown,

over the last several years, a relatively stable balance of about \$1.5 billion. All of these funds are “expendable” funds, but tend to be engaged in longer-term projects, such as transportation or economic development, or provide a reserve for expenditures such as healthcare. These fund balances do not appear to be as quickly impacted significantly on an annual basis by changes in the economic environment or governmental policy. The sustainability of these balances suggest that a portion could be invested in longer term securities.

### **Economic Considerations**

The economic forecast by the Minnesota Department of Finance anticipates a budget surplus of \$1 billion at the end of FY 2007 with another surplus of \$1 billion during FY 2008. It is still too early in the current legislative session to know how the legislature plans to use this surplus. Thus, until things become more definite, prudence dictates that these funds be invested in short term, money market securities. Staff will continue to monitor the market and economic conditions for their impact on ITC balances.

### ITC Ending Balance by FY



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**LIFETIME FISH AND WILDLIFE  
TRUST FUND**

**Staff Position Paper**

**August 2001**

**Investment Objective**

The Fund's investment objectives are influenced by the long term earnings assumption that the Legislature used to support the pricing of the licenses and the requirement to transfer annually from the Fund an amount equal to the amount that otherwise would have collected from annual licenses.

The earnings assumption supporting the pricing of the license is eight percent. The annual amounts to be transferred out of the Fund are currently unknown. Over time, DNR will be better able to estimate these amounts.

**Asset Allocation**

The Fund has a long term growth objective, subject to short term spending needs.

Staff supports a DNR recommendation to establish a 70 percent stock and 30 percent fixed income allocation similar to that of the Environmental Trust Fund to best meet the eight percent long term growth objective of the Fund and to produce earnings to support annual withdrawals.

**Management Structure**

It is proposed that the stock segment of the Fund be invested in the internally managed index fund designed to match the performance of the S&P 500 and the bond segment be invested in the internally managed bond fund that is actively managed to add incremental value through sector, security and yield curve decision. The bond segment uses the Lehman Aggregate Index as its performance target.

**Recommendation**

Staff recommends that the Fund be invested in a 70% stock / 28% bond / 2% cash allocation through the internally managed stock and bond pools.



# EXHIBIT I



## Minnesota Department of Natural Resources

### OFFICE OF THE COMMISSIONER

500 Lafayette Road  
St. Paul, Minnesota 55155-4037

August 17, 2001

Members of the State Board of Investment  
590 Park St., Suite 200  
St. Paul, MN 55103

Dear Board Members,

The 2000 Legislature passed a bill providing for the sale of lifetime licenses for certain hunting and fishing activities. The new lifetime licenses were available for sale to state residents beginning March 1, 2001 and will be available for sale to non-residents on March 1, 2002. Lifetime licenses can be purchased as a gift or for the purchaser. Proceeds from the sale of lifetime licenses are deposited to a new Lifetime Fish and Wildlife Trust Fund in the state treasury. Interest earnings are also credited to the trust fund.

M.S. Chapter 97A.4742, subdivision 2, states in part: "Money in the lifetime fish and wildlife trust fund shall be invested by the state investment board to secure the maximum return consistent with the maintenance of the perpetuity of the fund. The income received and accruing from investments of the fund shall be deposited in the lifetime fish and wildlife trust fund." In the six months following initial lifetime license sales, receipts deposited to the fund have earned interest as invested treasurer's cash (ITC) at an annual rate of slightly more than 4%. DNR staff has been in contact with staff from the State Board of Investment to initiate action as directed by statute for the investment and management of lifetime license funds.

On Thursday, August 9 the following people met to clarify legislative intent and to discuss approaches to managing the money in the Lifetime Fish and Wildlife Trust Fund.

Senator Pat Pariscau  
Tim Edman, Senate Research  
Kevin Voss, Senate Research  
Howard Bicker, State Board of Investment  
Jim Heidelberg, State Board of Investment  
Lyle Mueller, DNR Financial Analysis and Reporting

Senator Pariscau, as one of the primary Senate authors of the bill, stated her desire to follow a long-term investment strategy for the fund. An investment plan could be developed similar to the approach taken to investing for the Environmental and Natural Resources Trust Fund. The characteristics of the two funds are similar but not identical. The Environmental Trust Fund also has a long investment time horizon with an emphasis on long term growth verses immediate and known income earnings. Assets in the Environmental Trust Fund are allocated 70% to equities (stocks, mutual funds) and 30% to fixed income (bonds and bond funds).

An annual investment return of 8% was one of the key planning assumptions related to the lifetime license. This earnings rate, together with assumptions on life expectancy and frequency

DNR INFORMATION: 651-296-6157, 1-888-646-6367 (TTY: 651-296-5484, 1-800-657-3929) FAX: 651-296-4799



The State Board of Investment (SBI) is responsible for the investment management of the Lifetime Fish and Wildlife Trust Fund. The Fund is a nonretirement account that, by state law, must be invested separately from the retirement assets managed by the SBI.

This paper sets forth the statutory basis for the Fund and presents the investment objectives and rationale for an appropriate asset allocation. A letter from the Department of Natural Resources (DNR) discussing the legislative background and statutory requirements is attached as **Exhibit I**.

### **Purpose of the Fund**

The 2000 Legislature passed a bill providing for the sale of lifetime licenses for certain hunting and fishing activities. Each year DNR is to transfer from the Fund to the game and fish fund an amount equal to the amount that would otherwise have been collected from annual license fees. The SBI is to invest the funds "to secure the maximum return consistent with the maintenance of the perpetuity of the fund." In short, the Legislature created a new endowment fund with a long term return objective and a short term spending need.

### **Endowment Fund Investment Objectives**

Any endowment fund encounters certain short-term versus long-term investment trade-offs. In the short-term, there is a demand for maximum current spendable income. This short-term objective can usually best be met by holding investments in lower risk, fixed income securities. Conversely, in the long-term, there is a demand for a growing stream of real, that is inflation adjusted, spendable income. This long-term objective can usually best be met by holdings investments in higher risk equity securities. Unfortunately, the two investment objectives tend to be mutually incompatible. Maximum current spendable income achieved through fixed income investments will sharply limit long-term growth in a fund's principal and, hence, the spendable income that the fund could generate in the future. On the other hand, a growing stream of real spendable income achieved through equity investment usually results in a lower and more volatile stream of current spendable income.

An endowment fund's tolerance for risk is determined largely by the trade-off between short-term and long-term objectives. In turn, the emphasis on short-term or long-term objectives is primarily a function of the importance of the endowment fund's spendable income stream to the sponsor's total revenue. When the spendable income stream is a relatively small percentage of total revenues, the risk tolerance of the sponsor will tend to be higher than in a situation in which the fund's spendable income stream is a large percentage of the sponsor's total revenue. In the latter case, the sponsor is likely to be more cautious since a protracted period of poor investment results could have a serious impact on the various projects that the endowment fund is expected to finance.

of license use, was used to determine breakeven points and to establish the price of the lifetime license. The parties involved in the planning process knew achieving this level of return meant investing in the stock market. They also knew this approach carries an element of risk and uncertainty. The participants at the August 9th meeting also acknowledged that any investment in the current stock market would likely show a decrease in value. However, an investment strategy with a long-term view must be willing to risk downturns in the market if the objective is to seek greater interest returns than possible with fixed income investments.

Following consultation with the Senate bill author, Senate research staff and State Board of Investment staff, the Department of Natural Resources recommends the implementation of a specific investment plan for the Lifetime Fish and Wildlife Trust Fund. The plan will identify the amount of available funds and allocate them as 70% equity investments and 30% fixed income instruments.

Thank you for your willingness to add this to the agenda of your September meeting. My staff is available to assist you and your staff in taking the next steps to develop an investment plan for the Lifetime Fish and Wildlife Trust Fund. Feel free to contact Peggy Adelman, Administrator of the Office of Management and Budget Services at 651/296-8889 with your requests.

Sincerely,



Allen Garber  
Commissioner, Department of Natural Resources

Cc: Senator Roger Moe  
Senator Pat Parisseau  
Senator Jane Krentz  
Senator Leonard Price  
Senator Dennis Frederickson  
Representative Steve Sviggum  
Representative Mark Holsten  
Representative Larry Howes  
Representative Dennis Ozment  
Tim Edman, Senate Research  
Kevin Voss, Senate Research  
Howard Bicker, State Board of Investment  
Jim Heidelberg, State Board of Investment

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# **INTERNAL CASH MANAGEMENT**

**Staff Position Paper  
November 1992**

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# INTERNAL CASH MANAGEMENT

## INTRODUCTION

The State Board of Investment (SBI) manages the cash balances of more than 400 state agency accounts (Exhibit 1) along with the cash balances of internally managed accounts. The funds are managed with the objectives of preserving capital and liquidity, while providing competitive money market returns. To this end, the SBI invests these cash accounts in short-term, liquid, high quality debt securities.

SBI staff invest the majority of accounts through two pooled investment vehicles, the Treasurer's Cash Pool and the Trust Fund Pool. By far, the largest pool of money managed by Staff is the Treasurer's Cash Pool. Cash flow projections for this pool are provided by the Department of Finance. Using these projections, staff invests the fund in a wide range of money market instruments including U.S. Treasury and Agency issues, repurchase agreements, commercial paper, bankers acceptances and medium term notes. Strict quality guidelines are in place to insure the investment objectives are accomplished.

The State's economic climate decisions, administrative changes and other factors create differences between Department of Finance projections and the actual cash flows for the Treasurer's Cash Pool. The pool fluctuates from year to year, month to month and day to day. Because of the high volatility of cash flows, asset allocation among various instruments changes dramatically over time. Although a large degree of liquidity is needed to manage the pool due to the cash balance changes, maturity extension is usually possible for a portion of it.

In the past, performance of both the Treasurer's Cash Pool and the Trust Fund Pool has been measured against the 91 day Treasury bill. This is because a large percentage of assets are normally held in instruments that mature in less than 91 days and it is a readily available index. Because very little of either pool is actually invested in T-bills and a portion of the assets are usually invested in higher yielding, longer term maturities, the 91 day T-bill has been criticized as an inappropriate benchmark. Staff is proposing a new benchmark that blends the liquidity needs of the fund with the advantage that maturity extension provides for the portfolio.

## INVESTMENT OBJECTIVES

The primary investment objectives of the funds are to *preserve capital* and *maintain a high degree of liquidity* and within these objectives to *maximize returns*. Because of the liquidity needs and size of the Trust Fund pool, its average maturity is typically very short. However, the diversity of cash needs among participants in the Treasurers Cash Pool allows maturities to be extended without sacrificing liquidity.

## INVESTMENT ACCOUNTS

As of June 30, 1992, state funds invested by the SBI short term department staff totaled nearly \$2.7 billion. Table 1 shows that most of these funds are included in the Treasurer's Cash Pool. This pool and the Trust Fund Pool combine several smaller accounts and operate much like a money market mutual fund. Special legal restrictions on the other accounts listed in Table 1, however, do not allow them to be commingled, and so they are managed separately.

<u>Account</u>	<u>Amount (in millions)</u>
Treasurer's Cash Pool	\$2,239
Trust Fund Pool	105
Housing Finance Agency Accounts	186
State General Obligation Bond Related Accounts	35
Public Facilities Authority Accounts	131
Total	\$ 2,696

### *State Cash Accounts*

The Trust fund pool contains the cash balances of the Permanent School Fund and contributions from payroll deductions of the Public Employees Retirement Association (PERA), the Teachers Retirement Association (TRA), and the Minnesota State Retirement System (MSRS). These assets are invested in highly liquid, short term assets. On a monthly basis, a portion of the fund is certified for permanent investment and deployed into other asset classes.

Due to changes in the management and asset composition of the Post Fund in the beginning of fiscal year 1993, the size of the Trust Fund Pool has declined considerably. Staff is predicting that over the next fiscal year, the size of the fund will average about \$25 million, which is down from an average size of approximately \$200 million in past years.

Other investment accounts, such as the Housing Finance Agency Accounts, State General Obligation Bond Related Accounts and the Public Facilities Authority Accounts are managed separately. This is primarily due to restrictive bond indentures and/or arbitrage restrictions in place. Arbitrage restrictions make it illegal for an entity to issue tax-exempt bonds and invest the proceeds from the bond issuance at a profit.

Where possible, accounts are pooled to take advantage of differing cash timing needs and typically higher returns from diversification and extension of maturity. By far, the largest pool of money managed by the SBI is the Treasurer's Cash Pool. The balance of this paper will focus on the management of the Treasurer's Cash Pool.

### ***Treasurer's Cash Pool***

The Treasurer's Cash Pool is the largest component of assets managed by the SBI. This pool contains the cash balances from the State's Statutory General Fund and other accounts necessary for the operation of state agencies.

Among the larger accounts in the Treasurer's Cash pool during fiscal year 1992 were the State's General Fund, the Trunk Highway Fund, the County State Aid Highway Fund, the Municipal State Aid Street Fund, the Debt Service Account, the Environmental Trust Fund and the Northeast Minnesota Economic Protection Fund. This pool is widely diversified in several assets across a large maturity spectrum.

### **Cash Flow Projections for the Treasurer's Cash Pool**

The Treasurer's Cash Pool is invested using the information provided by the Department of Finance. Cash flow projections for the pool for the upcoming two years are given to the SBI by the Department of Finance at the beginning of each biennium. Revenue forecasts are prepared using information provided by Data Resources, Inc, an econometrics firm. Expenditure forecasts are prepared based on projections from the various state agencies in the pool. Formal revisions are made to the initial projections by the Department of Finance twice a year and these revisions are reviewed monthly.

Although the SBI receives projections out two years, staff relies most heavily on the outlook for the upcoming six to twelve months. Staff then gears its investment strategy towards these expectations. When revisions are made to the projections, adjustments to the portfolio are made.

### **Volatility of Cash Flows**

The cash flows of this pool change dramatically from year to year, over the course of a year and throughout the month. The attached chart shows the historical monthly high and low points of the fund since July 1989. The figures for October 1992 through June 1993 are the most recent Department of Finance projections.

As the chart shows, the pool changes in size from year to year, depending on the state's economic climate. For example, in fiscal 1990, the fund reached a high of nearly \$2.8 billion. For the upcoming fiscal year, it is projected to reach a high of only \$2.3 billion. This decline stems from the economic recession over the past two years and the subsequent decline in sales and income tax revenues.

In addition to these changes, the difference over a year's time between the highest and lowest point of the fund is large. For example, in fiscal 1992, the chart shows the difference between the high (in July) and the low (in December) was \$848 million. In past years, this difference has been as high as \$1 billion.

Also evident from the chart is the cash flow volatility that is present during the month. The spread between the monthly maximum balance and the monthly minimum balance can vary widely. On average, the minimum balance during a month is 86% of that month's maximum balance. However, in July 1992, the actual monthly low fell to 67% of the monthly high. To manage this volatility, a large percentage of the pool must be kept in very liquid, short term assets.

With these types of fluctuations, staff relies heavily on Department of Finance projections. These projections are subject to changes due to a variety of reasons. Frequently, legislative changes and adjustments to administrative policies cause payments to be increased or decreased and their timing to be accelerated or decelerated. Many times, information reflecting the impact of these changes on the Treasurer's Cash Pool reaches the SBI after investment decisions have been made.

To illustrate the impact of changes in projections on the investment of the fund, consider the following example: Prior to August 1992, staff was working with projections that showed the low in December 1992 at approximately 50% of the high for that month. Because of this large projected drop in the fund's balance by December, investments were made in commercial paper and other short instruments that matured prior to December. The legislature, by taking a sizeable payment that was to be made on one day in December, and spreading it over four days, caused the projected low as a percentage of the high for December to climb to 87%. New projections, reflecting these legislative changes, were given to staff at the end of August 1992. At this point, the fund's maturity was too short and an opportunity to profit from the decline in yields over the previous six months had been lost. Staff revised its funding targets and began investing the projected excess in longer maturity instruments to take advantage of the steepness in the yield curve.

Staff is also working with volatile daily cash projections. Each morning, staff discusses with the Treasurer's office what actual cash inflows and outflows will be for that day. Staff is given an "early" number about 8:10 a.m. and a "late" number about 11:30 a.m. The goal is to invest most of the excess cash for the day in the early round as this allows for the best choices of investments. At times, the Treasurer's daily projections have been revised after 12:00 p.m., leaving the SBI with large amounts of cash to invest late, or a short fall that must be covered. By this time of day, many traders' cash needs have been met, and prices may not be as favorable as they had been early in the day.

### **Maturity and Sector Breakdown of the Treasurer's Cash Pool**

Because of the wide fluctuations in the fund's balance over time, the asset breakdown and duration varies significantly. Duration is the weighted average term-to-maturity of the security's cash flows. Table 2 shows how the fund was invested as of June 30, 1992. In addition, it shows that depending on cash needs, the allocation to each asset class and the average maturity of the pool may change significantly over time.

**Table 2****Treasurer's Cash Pool Asset Composition**

	June 30, 1992	Range Over Time
Commercial Paper	51.4 %	0 to 70 %
Repurchase Agreements	16.8	0 to 60 %
U.S. Government Securities	10.2	0 to 70 %
U.S. Gov't Agency Securities	18.0	0 to 40 %
Medium Term Notes	0.0	0 to 10 %
Bankers' Acceptances	1.8	0 to 10 %
U.S. Govt Strips	1.8	0 to 5 %
Total	100.0 %	
Average Maturity	108 days	30 days - 1 yr

For example, on June 30, 1992, nearly half of the portfolio was invested in instruments that mature in less than two months. The majority of this was commercial paper and repurchase agreements. Despite holding instruments with maturities of up to three years, the weighted average duration of the entire fund was just under four months.

The decision to keep most of the fund invested in relatively short maturity instruments was based on projections provided by the Department of Finance for fiscal years 1992 and 1993. These forecasts showed a steep decline in revenues starting in July 1991 and well into 1993 due to the current recession.

A detailed description of how the assets listed in Table 2 are used in the portfolio is included in the Appendix.

#### **Asset Allocation Over Time**

Over time, changes in cash flows have a dramatic effect on the investment of the fund. Staff's internal guidelines are to manage the fund to have short term maturities sufficient to cover approximately three months of payments. Specific payment dates are targeted and most often funded with high quality commercial paper. The allocation to the commercial paper market can range from zero to seventy percent of the portfolio, depending on cash needs and spreads relative to other short term assets.

Bankers' acceptances are used as substitutes when commercial paper yields are relatively low or additional diversification is sought. The SBI currently has a very small portion of the pool invested in bankers' acceptances as the market has declined in size since the mid-80's and relative yields are currently unattractive. This will not preclude staff, however, from adding more bankers acceptances to the portfolio should spreads merit it. However, the total size of the bankers' acceptance portfolio is not likely to exceed ten percent of the assets managed in the Treasurer's Cash Pool.

Shorter needs, i.e., less than three weeks, are invested in the repo market. Normally ten to twenty percent of the portfolio is invested in this market as it provides high liquidity and good yields compared with other instruments. Depending on cash needs, however, up to sixty percent of the portfolio may be invested in short term repo.

After the known payments are funded, the remaining portion of the portfolio (if any) may be invested with discretion by staff. This portion of the portfolio is invested in medium term notes, U.S. Treasury debt and Agency securities with a maximum maturity of three years.

### Quality Guidelines

Because preservation of capital is extremely important in the management of the funds, strict quality guidelines are in place. Table 3 summarizes the quality guidelines for the assets the SBI purchases. The appendix discusses each of these instruments and their use in the portfolio.

<b>Table 3</b>		<b>Quality Guidelines</b>
<b>Investment</b>	<b>Statutory Limitations</b>	<b>Internal Limitations</b>
Commercial Paper	A-2/P-2 or higher	A-1/P-1
Asset Backed C.P.	A-2/P-2 or higher	A-1/P-1/D-1
Medium Term Notes	BAA or higher	A or higher
Bankers' Acceptances	BAA or higher	A or higher
Repurchase Agreements	Collateral Restrictions	Primary Dealers Only
U.S. Government Securities	None	None
U.S. Gov't Agency Securities	None	None

### SECURITIES LENDING PROGRAM

A way the short term department enhances the yield on the funds is by lending securities in the portfolio to primary U.S. Government security dealers. Dealers borrow securities for a variety of reasons. For example, they may need the securities to make delivery on a previous sale, use the securities to facilitate financing of their own portfolio, or may have an opinion that the supply of a particular issue will become tight. Lending of securities provides additional income, without sacrificing liquidity or increasing the risk of the underlying portfolio. Loan fees are negotiated between staff and the dealer and are calculated on the market value of the security.

Any U.S. Government or Agency security owned by the SBI that is wireable through the Federal Reserve System may be loaned. Staff avoids loaning securities that are being held for small accounts that do not have predictable cash needs. Staff also avoids loaning securities that are invested for restricted yield accounts or other accounts that legally cannot benefit from incremental yield due to arbitrage restrictions.

When a security is loaned, collateral equal to at least 102% of the security being loaned is held at the SBI's custodian bank. The market value of the combined loans for each dealer is checked twice a month by staff. If a dealer's total collateral has fallen below 100% of the total value of the securities loaned, the dealer may be asked to add or substitute collateral. If the value of the collateral exceeds 102% the borrower may request return of the excess.

The borrower is obligated to remit all interest payments or other distributions made on the borrowed securities. These payments must be made on the due date in immediately available funds. The SBI will pay to the dealer any of these types of payments on the collateral held. Payments to and from dealers on the underlying loan collateral are monitored by the SBI's custodian bank

The securities lending program has provided a good source of incremental income since its inception in April of 1977. The following table lists the loan income earned over the last five years.

**Table 4**  
**Securities Lending Income**

Fiscal Year	('000's)
1988	\$ 3,300
1989	3,100
1990	3,300
1991	3,000
1992	2,500

In the future, staff expects loan income to decline. The primary reasons for this are a smaller portfolio of loanable securities and lower loan fees stemming from increased competition. Although the SBI still has a portfolio of loanable bonds held in various state cash accounts, changes in the asset composition and management of the \$6.8 billion Post fund this year have dramatically decreased the supply of loanable bonds. In addition, loan fees have declined due to increased competition from other institutional investors that hold large bond portfolios.

#### PERFORMANCE MEASUREMENT

Currently, the SBI measures its performance against the 91 day Treasury bill. This was chosen as the benchmark because: 1) among pension funds nation wide, it is the most widely used short term benchmark 2) a large portion of the fund is normally invested in assets that mature in three months or less and 3) it meets several criteria for a quality benchmark. Below is a brief description of desirable benchmark characteristics:

- Investable:*** The option is available to forego active management and simply hold the benchmark portfolio
- Measurable:*** It is possible to calculate the benchmark's return on a monthly basis
- Specified in Advance:*** It is constructed prior to the start of an evaluation period
- Appropriate:*** It is consistent with the manager's investment style or biases

The April 1991 Legislative Auditor's report entitled "State Investment Performance", criticized the benchmark as being inappropriate because 1) most of the shorter maturity assets are invested in securities other than Treasuries and 2) after short term needs are funded, a portion of the fund may be invested in longer maturity instruments. In most environments, these factors create a yield advantage versus the three month T-bill.

An alternative benchmark, however, is difficult to develop for the short term department due to the high degree of volatility of the fund's cash flows and the subsequent changes in the fund's asset allocation and maturity structure.

In developing a new benchmark, staff has tried to blend the management of volatile cash needs with the fact that a yield advantage is usually available if a portion of the fund is invested in longer term instruments.

### ***Proposed Benchmark***

Staff recommends using a weighted benchmark in which 75% of the return is tied to a short term cash index and 25% is tied to a longer maturity index. The SBI custodian bank's Short Term Investment Fund (STIF) return would provide a good proxy for the short term portion of the benchmark and the Merrill Lynch 1 to 3 year Government index should be used to incorporate longer maturities in the portfolio. Staff expects added value of approximately 10 basis points to this benchmark on an annualized basis.

A large percentage of the pool should be tied to a cash index due to the high volatility of cash flows discussed earlier and the potentially large changes possible in projections from the Department of Finance. Because of these changes, a high degree of liquidity is necessary for the management of the fund.

The STIF is appropriate as a benchmark for the cash portion of the fund because it is managed using the same investment guidelines that are used by the short term department. The STIF is normally invested in repurchase agreements and high quality commercial paper, as is the short term portion of the Treasurer's Cash Pool.



The balance of the pool should be measured against a longer term index. Staff recommends the Merrill Lynch 1 to 3 year Government Index. This index is readily available. It currently includes 54 Treasury issues that range from 1 to 2.99 years in maturity. The securities that comprise the index will change as new 1 to 3 year issues are auctioned by the Treasury and as longer maturity issues eventually become 1 to 3 year securities. The index's modified duration is approximately 1.7 years. Exhibit 2 provides a summary of the characteristics of this index.

By measuring 25% of the portfolio's return against this longer term index, the benchmark will incorporate the yield advantage present by investing further along the yield curve, but also maintain adequate liquidity to manage extremely volatile cash flows.

## CONCLUSION

The SBI manages the majority of the State's cash accounts through the Treasurer's Cash Pool. In doing so, staff balances the competing objectives of preservation of capital, maximization of liquidity and maximization of returns. To this end, several money market instruments with maturities less than three years are used by staff. In many cases, more strict internal guidelines are imposed on the portfolio than are allowed by the statutes to accomplish the investment objectives.

Wide variation in pool sizes over time are likely due to legislative actions, administrative changes, and the State's overall economic climate. Variations occur yearly, monthly and daily. Although the Department of Finance projects the cash flows for the fund, they are subject to frequent and sometimes large changes. These factors make cash flows of the fund extremely volatile and require a high degree of liquidity in its management.

Staff first adequately funds the upcoming three months of payments. After these needs have been met, extension of maturity and yield enhancement are possible. Because maturity extension normally increases yield, staff recommends adjusting the benchmark to incorporate this yield advantage. By using a weighted benchmark in which 75% is tied to the custodian bank's Short Term Investment Fund and 25% is tied to the Merrill Lynch 1 to 3 year index, the benchmark will more appropriately measure this yield advantage, but also leave staff enough flexibility to manage volatile cash needs.

### *Future Considerations*

Staff is constantly seeking alternative instruments that provide appropriate liquidity, capital preservation, and compensation for incremental risk. For example, staff is considering the inclusion of futures and options strategies for cash enhancement purposes. This would add incremental value to the portfolio without a substantial increase in risk. New cash enhancement strategies are continually analyzed to determine how they can be used in the SBI's investment program.

## APPENDIX --- AUTHORIZED INVESTMENTS

Authorized investments are governed by Minnesota Statutes 11A.24. Briefly, these statutes state the following instruments may be purchased:

- I.
  - a) Debt instruments of the U.S. Government, its Agencies and sponsored organizations of the U.S. government
  - b) Debt instruments of the Canadian government, its Agencies and provinces provided the principal and interest is payable in U.S. dollars
  - c) The states and their municipalities, political subdivisions, agencies or instrumentalities
  - d) The International Bank for Reconstruction and Development, the Inter-American Development Bank, the Asian Development Bank, the African development Bank, or any other U.S. government sponsored organization of which the U.S. is a member. Principal and interest must be payable in U.S. dollars
- II. Corporate obligations of domestic firms or of Canadian firms if payable in U.S. dollars. All such obligations must have a rating among the top four quality ratings by a nationally recognized rating agency or meet other criteria as specified
- III. Bankers acceptances and certificates of deposit of U.S. banks rated in the top four quality categories by a nationally recognized credit rating agency
- IV. Commercial paper of U.S. corporations or their Canadian subsidiaries rated in the two highest quality categories by a nationally recognized credit rating agency
- V. Mortgage participation of pass through certificates
- VI. Repurchase agreements backed by authorized securities or letters of credit

Staff of the short-term department utilize several of these fixed income investment vehicles in daily operations, depending on the relative attractiveness of each vehicle within the investment objectives.

Below is a description of the most commonly used investment vehicles in the short term department and the limitations on the purchase of these securities. These statutory guidelines allow for a wide range of investments. In some cases, however, staff uses more strict internal guidelines to insure the accomplishment of the previously stated investment objectives.

## **U.S. GOVERNMENT SECURITIES: TREASURY BILLS, NOTES AND BONDS**

The U.S. Treasury is the largest single issuer of debt in the world. This large volume of total debt and large size of any single issue makes the U.S. Treasury market the most active and hence the most liquid market in the world. U.S. Treasury securities are backed by the full faith and credit of the U.S. government and thus are considered by market participants to have no credit risk and therefore to be AAA quality.

### **Statutory Limitations**

Because of the lack of credit risk with these securities there are no statutory limitations in purchasing U.S. Government debt.

### **Internal Investment Guidelines**

The SBI invests in these securities to extend duration by moving a portion of the fund further along the yield curve. Treasuries provide an excellent way to extend maturities and enhance yields, while protecting principal. Because of their high quality, there are no internal limits to the purchase of Treasury securities.

## **STRIPPED U.S. TREASURY SECURITIES**

U.S. Treasury securities are sold to the market with semi-annual coupons and principal to be paid at maturity. The Treasury allows all new Treasury bonds and notes with maturities of 10 years and longer to be eligible for stripping through the Separate Trading of Registered Interest and Principal of Securities (STRIPS) program. Government dealers may "strip" the coupon and principal payments from the bond and sell them individually in the marketplace. These individual pieces then become zero coupon bonds. Therefore, the Treasury does not directly issue zero coupon bonds, but the securities created under the STRIPS program are direct obligations of the U.S. government.

There is a slight difference in the credit guarantee between principal strips and coupon strips, however. In the highly unlikely event that the U.S. government were to default on its massive debt, it will default first on the coupons (the interest on the debt). Although the risk of default is remote, the coupon strip holders have a slightly greater, risk compared to the owners of principal strips. Investors are compensated for this risk by receiving a slightly higher yield on the coupon strips. Despite this, market participants consider strips to be AAA in quality.

### **Statutory Limitations**

As these securities are obligations of the U.S. government, there are no statutory limitations.

## **Internal Investment Guidelines**

Strips are also used in the portfolio to extend duration, with virtually no credit risk. The strip market, however, is less liquid than the U.S. Treasury bond market. The market compensates for this lack of liquidity by offering slightly higher yields on strips relative to U.S. Treasuries. There are no imitations on the purchase of U.S. government strips.

## **U.S. GOVERNMENT AGENCIES AND SPONSORED ORGANIZATIONS**

Federal government agencies and sponsored organizations offer credit to certain constituencies at a lower cost than would otherwise be available. The groups that benefit from this low cost financing in most cases are homeowners, farmers and students. Examples of federal agencies are the Government National Mortgage Association (GNMA) and the Commodity Credit Corporation (CCC). Primary examples of federally sponsored agencies are:

Federal National Mortgage Association (FNMA or Fannie Mae)  
Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac)  
Resolution Funding Corporation (Refcorp)  
Student Loan Marketing Association (SLMA or Sallie Mae)  
Federal Farm Credit Bank System (FFCBS)

These sponsored agencies are privately owned, publicly chartered entities that raise funds in the marketplace. Agencies issue securities in large blocks in the open market, and lend the proceeds to intermediaries who distribute the funds to targeted borrowers.

In contrast with Federal agencies, which are backed by the full faith and credit of the U.S. Government, there are no explicit federal guarantees of most of the securities issued by federally sponsored agencies. The general market perception, however, is that the federal government would cover any sponsored agency defaults. Agency debt is therefore considered extremely high in quality.

## **Statutory Limitations**

There are no limitations on the purchase of either U.S. Agency or sponsored organization securities in the portfolio.

## **Internal Investment Guidelines**

The SBI normally has a sizeable portion of the portfolio in agency securities because the credit risk is small and they offer an incremental yield advantage over Treasuries. There are no internal restrictions on their purchase.

## REPURCHASE AGREEMENTS

Repurchase agreements (repos) are entered into by market participants that have cash and want a short term, highly liquid investment and by market participants who have securities and want to borrow short term funds. From an economic standpoint, the transaction resembles a collateralized loan.

The dealer with securities who needs cash transfers the securities as collateral to the investor (the SBI) and in return receives cash. At a pre-specified later date, the collateral is transferred back to the dealer in return for the original cash plus interest. In essence, the dealer has borrowed short term funds for less than the cost of bank financing and the customer has locked up an attractive yield on a short-term secured transaction.

Two variations of the repo commonly used by the SBI in trading the short term cash accounts are the Tri-Party Repo and the Flex-Repo.

### o *Tri-Party Repo*

The collateral involved in the Tri-Party transaction is deposited in a mutually agreed upon third party bank. Funds are not released unless it is determined by the bank that the value of the collateral is 102 percent of the face value of the repo.

Using the Tri-party agreement reduces, but does not eliminate, the SBI's risk should the dealer default prior to maturity of the repo. The custodian bank is responsible for insuring that the underlying collateral for the repo is secured should a problem occur. In previous cases, the Tri-party agreement has allowed for an orderly liquidation of the obligation, and the SBI has not suffered losses.

### o *Flex Repo*

Another variation of the repo agreement used by the SBI is called a *flex repo*. The flex repo is an ongoing tri-party repurchase agreement that provides for principal drawdown prior to final maturity. These funds are available should cash be unexpectedly needed late in the day. 100% of the funds can be drawn on the repo prior to 10:00 a.m., 75% prior to 12:30 p.m. and 25% prior to 1:30 p.m., if necessary.

The flex repo is used as an "insurance policy". Without this alternative, distressed sales of securities may be necessary to cover unexpected cash needs. The SBI currently has one flex repo agreement for \$50 million, which is rolled over each day at the Fed funds opening rate. This rate has historically been about 1/8 of one percent less than the normal tri-party repo rate.

One alternative to maintaining a flex agreement is holding a large U.S. Treasury bill portfolio. The T-bill market is extremely liquid and it is possible to sell securities for same day settlement to cover cash needs. However, the spread between the Fed funds rate and

the T-bill has averaged 64 basis points over the last five years. This spread has narrowed recently, but since January of 1992 has still averaged 15 basis points. Therefore, by maintaining a flex agreement, the SBI gains cheaper liquidity than by holding a Treasury bill portfolio.

Another way to meet cash needs is through a reverse repurchase agreement. As the name suggests, this is the exact opposite of the repo transaction described above. Since the SBI holds a sizeable portfolio of securities, a portion of them could be used as collateral to obtain cash for unexpected outflows. Depending on the particular day and the size of the cash need, this alternative could be more or less advantageous than the flex agreement.

### **Statutory Limitations**

Collateral for repurchase agreements is limited to letters of credit and securities authorized in the statutes.

### **Internal Investment Guidelines**

Although tri-party repurchase agreements are considered very safe investments, the SBI limits its trades to those dealers recognized as primary government security dealers by the Federal Reserve Bank. The general market perception is that the Federal Reserve Bank will act as lender of last resort and assist in the orderly liquidation of a primary dealer should they fail. The reasoning behind this is a primary dealer's actions have far reaching ramifications for many entities in the economy and the result may be catastrophic if the bankruptcy is not handled correctly. Because the liquidation is orderly and there is a perception that the Fed will act as the lender of last resort, investors do not panic and add to the problem. In addition to dealing only with primary dealers, the SBI limits outstanding repo per dealer to the lesser of \$200 million or fifty percent of their regulatory capital.

Statutory guidelines allow a wide range of collateral to be accepted in repo agreements, however, the SBI currently accepts only U.S. Treasury and Agency securities as the incremental yield for accepting other instruments is not adequate.

Repos usually comprise approximately ten percent of the portfolio as they provide a highly liquid, low risk, short term investment.

### **COMMERCIAL PAPER**

Commercial paper is an unsecured promissory note most commonly issued by companies that need short term financing. The maturity of commercial paper is typically less than 270 days. Credit quality is a primary concern when purchasing commercial paper. Issuers generally roll commercial paper over and use the proceeds to pay off holders of the maturing paper. The risk that the investor faces is that the issuer will be unable to issue

new paper at maturity. In many cases, commercial paper is backed by unused bank credit lines.

Although commercial paper may be written for up to 270 days, the most liquid issues are for maturities of 6 months or less. Most commercial paper purchased by the SBI matures in one to three months. Depending on yield spreads relative to other instruments, the SBI will invest in commercial paper up to 270 days out.

In addition to the standard type of commercial paper described above, the SBI also purchases asset-backed paper and private-placement paper for the portfolio.

### ***Asset Backed Commercial Paper***

Asset-backed commercial paper is a term that describes an issuing entity which does not have a corporate purpose other than that of financing a specific asset or pool of assets with some common characteristics. The types of accounts receivable most commonly used as collateral are retail and trade receivables purchased from U.S. based investment grade corporations.

Because asset-backed paper is slightly less liquid than standard commercial paper, the market yield is usually higher on these issues versus other commercial paper issues.

### ***Private Placement Commercial Paper***

Private placement commercial paper has gained popularity over the last decade primarily because proceeds from its sale may be used for any purpose in contrast to standard commercial paper which must be used to finance "current" transactions.

SBI staff have recently added private placement paper issues to the portfolio as the credit risk, price and liquidity are on par with traditional commercial paper.

### **Statutory Limitations**

The SBI may only invest in commercial paper that is issued by U.S. corporations or their Canadian subsidiaries and is payable in U.S. dollars. In addition, the paper must be rated in the highest two quality categories by a nationally recognized statistical rating organization as defined by the Securities and Exchange Commission.

### **Internal Investment Guidelines**

Although lower quality commercial paper is legally allowed, the SBI has only invested in domestic issues that carry the rating of A-1 by Standard & Poors rating agency, and P-1 by Moody's Investor Service.

Currently, A-2/P-2 is not purchased for the portfolio. The amount of A-2/P-2 and lower rated issues has been shrinking as these companies are finding alternative means of short term borrowing. In addition, the yield spreads between A-1/P-1 and A-2/P-2 paper have narrowed making it unattractive to invest in these lower grade issues. If spreads widen in the future, A-2/P-2 paper will be considered for the portfolio.

The SBI limits its exposure to ten percent of any one issuer's average outstanding commercial paper issuance over a year's time. In addition, the amount of one issuer's commercial paper may not exceed five percent of the assets managed by the short term department. This allows for more prudent investing and a greater diversification of the portfolio.

Additional restrictions are placed on asset-backed commercial paper. The SBI normally purchases paper from companies that have issued commercial paper for at least one year. Also, the issuer must be a "special purpose corporation" and not a subsidiary of the asset seller. A special purpose corporation purchases receivables from a holder and finances these assets with commercial paper. Finally, any asset-backed paper the SBI purchases must have a Duff and Phelps of D-1 along with a Moodys rating of A-1 or an S&P rating of P-1. A Duff & Phelps rating is required because this firm provides excellent research in the asset-backed area.

Because many issuers write commercial paper to specific dates and it offers an attractive, low risk alternative to competing assets, it fits well into the SBI's investment program.

## **MEDIUM TERM NOTES**

Medium term notes are corporate debt instruments, initially created to provide a funding gap between short term instruments and long term bonds. The system used by recognized rating companies to rate medium term notes is the same as the rating of the long-term debt of the corporate issuer.

Maturities on most of these instruments range from 9 months to 7 years, however they can be written for over 7 years. Many programs are continuously available to investors. The yield quoted on the notes is a function of the maturity desired, the shape of the yield curve at that point, and credit-risk premium demanded by the market. As an example, if the SBI were obtaining a quote on a 5 year note from a specific issuer, the issuer will quote the 5 year Treasury yield + a specified number of basis points.

### **Statutory Limitations**

Corporate debt obligations purchased must be payable in U.S. dollars and rated in the top four quality categories by a nationally recognized statistical rating organization. These quality categories are AAA, AA, A, and BAA.



### **Internal Investment Guidelines**

The SBI limits its purchase of medium term notes to the top three categories by a nationally recognized rating agency. Medium term notes are used to enhance yields over comparable Treasuries, while taking only small incremental risk. Staff feels that given the objectives of this portfolio, spreads are too narrow to justify the incremental credit risk of a lower rated security.

A maximum of ten percent of the portfolio is invested in MTN's due to their liquidity limitations.

### **BANKERS' ACCEPTANCES**

A bankers' acceptance is a vehicle created to finance commercial trade transactions. Transactions that bring about the creation of a banker's acceptance include importing goods to and exporting goods from the United States and the storing and shipping of goods between two foreign (non-U.S.) countries. Once created, a bankers' acceptance may be traded in the secondary market to dealers or directly to investors.

Bankers' acceptances are considered to be very safe investments with the major risk being the bank's credit standing. Since the mid-80's, the development of alternative means of financing transactions have caused the banker's acceptance market to decline in size. The SBI rarely has more than one to two percent of its portfolio invested in these assets, as other instruments often provide more favorable yield differentials.

### **Statutory Limitations**

The issuing bank must rate in the highest four quality categories by a nationally recognized rating agency.

### **Internal Guidelines**

The SBI purchases bankers' acceptances from domestic issuing banks, and rated in the highest three categories by a nationally recognized statistical rating organization.

Exhibit 1 --- Treasurer's Cash Pool Accounts

2nd Begin Farm Rt	Adolescent Pregnancy	Challenge Grants-W Central
2nd Begin Farm Rt	Adventures In Achievement	Chem Dep Initiative - AN
89A Arbitrage	Aeronautics Fund	Chem Dep Initiative - FF
89A Costs of Issuance	Ag Chem Superfund Admin	Chem Dep Initiative - WI
89A Debt Service Reserve	Ag Chemical Response-Remb	Chem Dep Initiative -AGC
89A Loan	Ag Energy	Chem Dep Initiative -BR
89A Operating Reserve	Ag Energy Audit	Chem Dep Initiative - ML
89A Principal & Interest	Ag Util Research Inst	Chemical Dependency Initiative - SP
89A Redemption	Amoco II	Children's Trust Fund
89A Revenue	Amoco Overcharge Settle	Children's Trust Reserve
90-DNR Wolf Center	Amusement Fund Soc-Welfare	Citizens Council on Aging
90A Arbitrage	Anoka Bequest-Lundgren	Clare H Olcott Bequest
90A Costs of Issuance	Arbitrage Account 7-89	Client Security Board
90A Debt Service Reserve	Arbitrage Account 90A	Client Security Fund Gft
90A Loan	Arts Access Inc	Co Foundation Gifts
90A Operating Revenue	BE Escrow Fed Commission	Co State Grants
90A Principal & Interest	BE Escrow MDSE	Cobra Insurance Trust
90A Redemption	BE General Support	Communication-Impaired
90A Revenue	Begin Farm Loan Rt	Conference Center
90A State Match	Begin Farm Loan Rt	Contingency P & I
91A Arbitrage	Belridge Oil Company	Corporate Reserve Fund
91A Capitalized Interest	Bem Private Grants	Cost of Issuance 90A
91A Capitalized Interest	Benefits Administration	Cost Recovery System
91A Costs Of Issuance	Blue/Cross -Blue/Shield	County State Aid Highway
91A Debt Service Reserve	Bona Fide-7/21/87 Bond Sale	Cp Private Grants
91A Loan	Bona Fide-7/7/88 Bond Sale	Critical Hab Cash Gifts
91A Operating Reserve	Bona Fide-8/13/91 Bond Sale	Debt Service Loan 224 Sch X
91A Principal & Interest	Bona Fide-89 Bond Sale	Debt Service Reserve 7-89
91A Redemption	Bona Fide-90 Bond Sale	Debt Service Reserve 90A
91A Revenue	BSU Peat Grant-LCMR	Delta-Dental Trust
91A Revenue Account	Business Innovation Ctr	Designated Contributions
91A State Match	Canteen Accounts	Designated Contributions
91B Arbitrage Account	Canteen Accounts	Designated Contributions-LVRN
91B Capitalized Interest	Capital Loan	Designated Contributions-SB
91B Cost of Issuance	Carlton Co Loan Program	Developmental Programs
91B Debt Service Reserve	Carrier Accounts Trust	Diamond Shamrock Overcharge
91B Loan Account	Cellulose Rayon Pkg-Doa	Dislocated Wkrs Spec Reserve
91B Operating Reserve	Ceremonial House Gift	Edwin C Sponberg Trust
91B Principal & Interest	Chal Grants Southeast	Elmer Schoberg-Bequest
91B Redemption Account	Chal Grants-Central	Endow Invest Income Brai
91B Revenue Account	Chal Grants-Northeast	Endow Invest Income Deaf
Abatement Control	Chal Grants-Northwest	Energy & Conserv Account
Abatement Receipt Refund	Chal Grants-Southwest	Enterprise -Operations
Ace Crafffair	Chal-Grants-West Central	Environment Resp/Compensation
Activities Donations	Challenge Grants - S West	Environmental Proj Lottery Proc
Activities Donations	Challenge Grants - Central	Environmental Transfer
Activities Donations	Challenge Grants - N East	Environmental Trust
Addie L Beran Trust	Challenge Grants - N West	Environmental Trust Corpus
Admin Sprfund/Envir Fd	Challenge Grants - S East	Equipment Loan Fy92

Exhibit 1 --- Treasurer's Cash Pool Accounts

Escrow Account R	IRRRB Ne Mn 2nd Bond Res	Met Private Grants
Escrow Account Q	Japan Tuition Clearing	Metro Landfill Abate Acct
Escrow Club Contracts	Koochiching Co Loan Program	Metro Landfill Abatement
Executive Cert Program	Laboratory Services	Mhrd West Cent Mn Bic
Export Finance Auth Wkg	Lakeville Hershey Soc De	Minnetrista Escrow Acct
Exxon Farm Energy Audit	Limited Remedial Invtn	Miscellaneous Fees
Exxon Housing Finance	Lit Settle Hr Sports & HI	Mn Ag & Econ Dvlp
Exxon Overcharge	Lit Settlements Bidmon	Mn Ag & Econ Dvlp Account
Exxon Public Bldgs	Loan Account 7-89	Mn Mutual Insurance
Exxon U of M EES	Loan Account 90A	Mn Resources
Exxon U of M Secp	Loan Capital Fund	Mnsat
Family Farm Bonds	Loan Repayment-210	Moose Lake Soc Funded
Family Farm Bonds Interest	Local/Alexandria TC	MPCA Dedicated Recs
Family Farm Bonds-Amt to 91-20	Local/Duluth TC	Mrhd J Cupler Mem Sch
Family Farm Bonds-Interest	Local/Willmar TC	Mrhd Private Grants
Faribault Bequest-Barker	Local/Winona	Municipal Exxon Loans
Faribault Libr-Gen Bequest	Lottery Operations	Municipal State Aid Street
Fed Exxon Oil Overcharge	Lyndale Olympia Gym	MVVM Private Donations
Feed Inspection	MAMTC	MVVM Private Donations
Fertilizer Inspection	Man Private Grants	Natural Area Endowment Interest
FFRTC-Canteen-Amusement	Master Lease	Natural Area Endowment Princ
Fiscal Guardianship	Master Lease	Natural Res Inst
Fleet Management Acct	Master Lease 3 Repayments	NE Mn Environmental
Forest Mgmt Fd Nurseries	Master Lease Proceed & Exp	Nongame Wildlife Receipts
Fruit & Vegetables Insp	Master Lease Proceed & Exp	Nongame Wildlife X-Off
Gen Bequests Cambridge	Master Lease Repayments	NW Area Foundation
Gen Support Petrolenvir	Master Lease Reserve	Operating Reserve 7-89
General Bequests	MCC Student Assn	Operating Reserve 90A
General Fund	MCF-SCL Industry	Patient Volunteer Account
Gifts Grants Donations	MCF-SCL Social Welfare	PCA Admin Petro Tanks
Glen Lake-Begurst-Schobe	MCF-LL Industry	PEIP Administration
GMC Trust Account	MCF-LL Social Welfare	Pennzoil Company
GMC/SRI	MCF-OPH Industry	Petro TRC Reimbursement
Grant Programs	MCF-OPH Social Welfare	Pesticide Regulatory Acct
Greater Mn Corp	MCF-RW Social Welfare	Petro Board Funding
Grip Bad Debt Reserve	MCF-SCR Social Welfare	Petro Control
Guardianship Accounts	MCF-SHK Social Welfare	Petro Invest Corrt Atn
Harmful Substance Board	MCF-STW Industries	Petro Tank RI Cleanup
Haz Sub Control	MCF-STW Social Welfare	Petro TRC Earnings
Hazard Waste Recpt-Refund	MCF-WR/ML Social Welfare	Petro TRCPA
Higher Education Lottery Proceeds	MCF-SHK Industry	Petro-Release Cleanup
I/M Agency & Statewide	MCF-FRB Industry	Petroleum Violation Escrow
I/M Contractor Open	McKnight Family Preserve	Pine City Society Funded Dep
IBU Clearing Ins Trust	McKnight Funds	Prior Year Certified Enc
Income Contingent Loan	Medexpo	Privatization Study
Ind Retire Acct Plan	Medexpo Matching	Property Trans Law of 92
Indochinese Gift DPW	Medibus-Helpmobile	Public Insurance Trust
Insurance Trust 4 WK Grp	Medicaid Fraud Recovery	Real Estate Educ Res Rec
Investors Escrow Account	Membership	Red Lake Nh Rent Receipt
Iron Range Resources Rehab	Merla Control	Redwood Falls Soc Funded De

Exhibit 1 --- Treasurer's Cash Pool Accounts

Refunding 4/7/88	Sprfnd/Env Spic Project	Warner Overcharge Settle
Reg Support Envrn	SR Property Transfer	Watson-& Hughey 5 Yr Annual
Reg Support Petro	St Peter- Gluek Bequest	Wepza Intl Conv-91
Rem Land Exchange Escrow	St Res Sch Genl Beq-Brai	Win Private Grants
Reserve -7/21/87 Bond Sale	Standard Oil Company	WTC Operations
Reserve -8/13/91 Bond Sale	State History Ctr Escrow	Zoo Gift Stores
Reserve-7/7/88 Bond Sale	State History Ctr Nonstate	Zoo Monorail
Reserve-89 Bond Sale	State Payroll Clearing	Zoo Revenue Tropical Exh
Reserve-90 Bond Sale	State Res Sch Genl	
Resident Bank Cambridge	STC Private Grants	
Resident Personal Accounts	Stripper Overcharge	
Resident Personal Accts	Stripper Well Exempt Lit	
Revenue Account 7-89	Stud Org-PS Bpa	
Revenue Account 90A	Stud Org-PS Deca	
Revenue Bond Appl Deposits	Stud Org-PS Earth	
Revenue Refund Econ Dev	Stud Org-PS Vica	
Risk Management Fund	Stud Org-Sec Deca	
Rochester Soc Funded	Stud Org-Sec FFA	
RTC_CD Contingent Account	Stud Org-Sec FHA	
RTN DAM Repair Loans	Stud Org-Sec Heart	
RTN Dist Health Loans	Stud Org-Sec Hosa	
Rural Finance Loan Rtn	Stud Org-Sec Vica	
Rural Rehabilitation	Stud-Org FHA Regional	
Rural Rehabilitation	Student Loans	
School Dist Judgements	Supplemental Loan Prog	
School Store	Supplemental Revenue Account	
Security/Medical Deposit	Sustainable Agric Loans	
Seed Capital Fund	SW Private Grants	
Seed Inspection-Ded	Sweatshop /3000130050	
Seed Potato Insp Fund	TACIP Board-Comm Impair	
Self II Bad Debt Reserve	Taconite Area Environmental Project	
Seller Spon Rt	Telephone Assistance	
Silver Bay Resident Acct	Telephone Assistance Pin	
Snowmobile Trails	Temp Transfer Gen Fund	
Snowmobile Trails Receipt	Texaco Stripper Well	
Social Welfare Ah-Gwah-C	THC Social Welfare	
Social Welfare Anoka	Tracy Smith Holding	
Social Welfare Brainerd	Traffic Signal Retiming	
Social Welfare Cambridge	Tree/Shrub Plant-Energy	
Social Welfare Faribault	Tropical Coral Reef Exh	
Social Welfare Fergus Falls	Trunk Highway	
Social Welfare Glen Lake	Twin City Fitness Inc	
Social Welfare Moose Lake	US/Mexico Free Trade CNF	
Social Welfare St Peter	Vehicle Emission Inspection	
Social Welfare Willmar	Vehicle Emmissions	
Space Rent	Veteran Contributions	
Special Advance Royalty	Vets Home Luverne	
Special Projects	Vets Home-Luverne/Match	
Special Projects	Vickers Energy Corp	
Sprfnd/Env Fd Admin Costs	Vickers-Penzoil-Belridge	

Exhibit 2 — Merrill Lynch 1 - 3 yr U.S. Gov't Index Data

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Index T B I 9

MERRILL LYNCH BOND INDICES  
HISTORICAL CHARACTERISTICS

10/ 7/92

Data Available

Monthly: 12/31/75

Daily: 10/31/86

6102 GOVERNMENTS, U.S. TREASURY, SHORT-TERM  
(1-2.99 YEARS) ABOVE 4.25% COUPON

Quality Range: TSY - TSY  
Inception Date: 12/31/1975  
Market Value (MM) 568619.654  
% of GOAO index 27.51

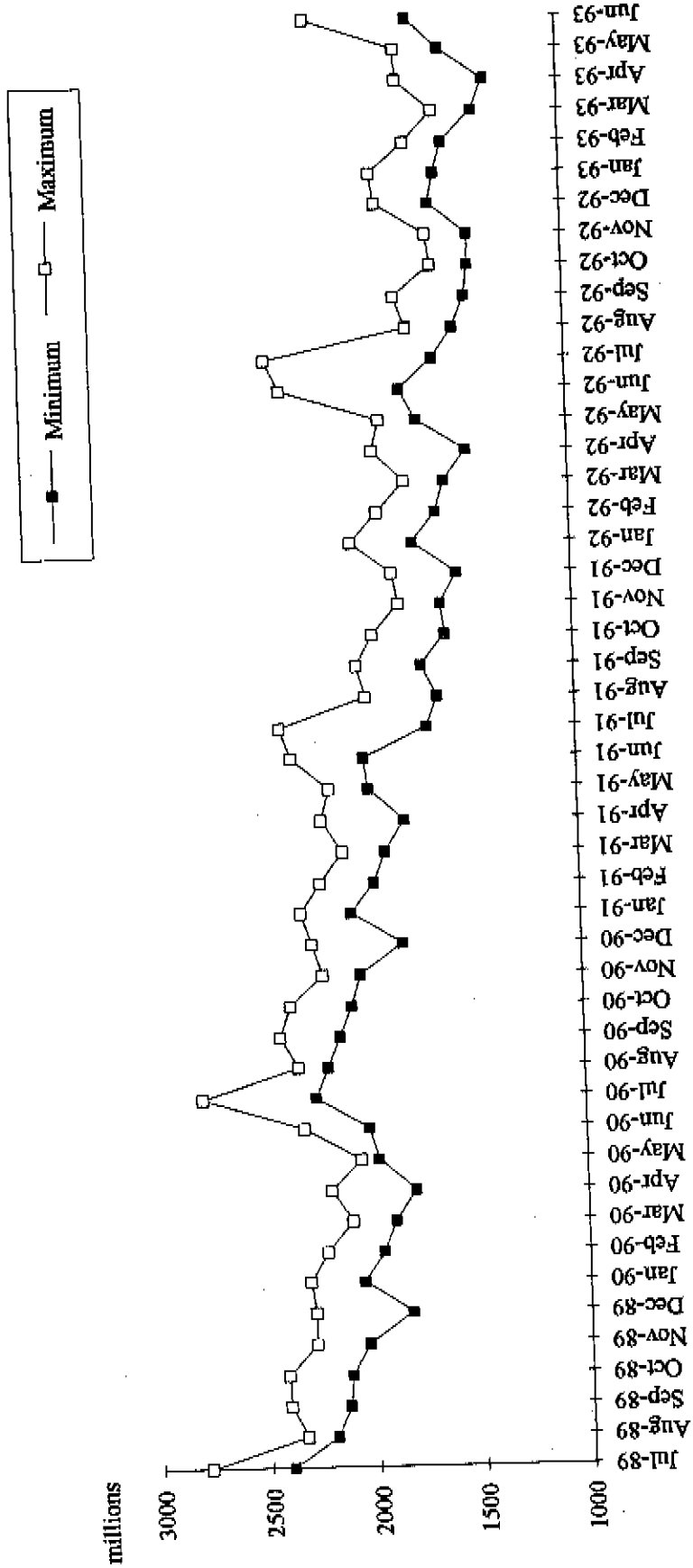
Number of Issues: 54  
Weighted Ave. Price: 105.774  
Par Value (MM) 537578.000  
% of GOAO index 28.79

WEIGHTED AVERAGE CHARACTERISTICS

	<u>MARKET</u>	<u>PAR</u>
Coupon	7.260	7.181
Yield to Mty	3.797	3.792
Bnd-Eq Yield	3.799	
Years to Mty	1.797	1.788
Quality	TSY	TSY
Duration	1.682	
Mod. Duration	1.650	

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Sydney:2-241-1133 Tokyo:3-3578-1625 Washington DC:202-393-1024 M056-124-1-0 08-Oct-92 11:32:33

Treasurer's Cash Pool Monthly Maximum and Minimum Balances



TAB

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# **MODIFICATIONS TO SHORT TERM GUIDELINES**

**Staff Position Paper  
June 1993**



## **PROPOSED MODIFICATIONS TO SHORT TERM GUIDELINES**

### **BACKGROUND**

In the last three years, slow economic growth, low levels of inflation and the Federal Reserve's easing of monetary policy have led to extremely low short term yields. The yield of the three month U.S. Treasury bill has fallen from 6.6% on 12/31/90 to less than 3% today. Current indications are that short term rates will remain at low levels for some time. For this reason, together with our desire to further diversify our portfolio, staff has been examining several alternatives to enhance the yield of the short term cash accounts, while working within the following investment objectives: 1) preservation of capital 2) maximization of liquidity and 3) maximization of returns.

### **YIELD ENHANCEMENT ALTERNATIVES**

#### **Maturity Extension**

Staff has been exploring alternatives that will enhance returns without incurring additional credit risk. One alternative is maturity extension. This involves investing a small portion of the portfolio in longer maturity securities that meet established credit guidelines. In an upward sloping yield curve environment, longer dated securities provide yield advantages without incorporating additional credit risk into the portfolio. Because of the size of the cash funds and the diversity of cash timing needs, extension of maturities will not sacrifice overall portfolio liquidity.

#### **International Securities**

Another alternative for enhancing yields while remaining within established credit guidelines is to invest in international securities. There are two main categories of international debt; U.S. dollar denominated and foreign currency denominated.

From the standpoint of the U.S. investor, foreign currency denominated international debt encompasses all issues denominated in currencies other than the U.S. dollar. Currency movements account for a large portion of the return from foreign currency bonds and tend to be the most volatile component of international debt returns. The decision of whether or not to hedge the currency exposure depends on how the investor views of the currency market.

The other category of international debt is payable in U.S. dollars. Because it is denominated in U.S. dollars, currency risk is not present. These debt securities trade at higher yields than comparable U.S. Treasury bonds primarily due to lower liquidity in these issues.

The primary markets for U.S. dollar denominated international debt are the **Eurodollar** market and the **Yankee** market.

- Eurodollar debt is denominated in U.S. dollars, issued and traded outside the jurisdiction of any single country, underwritten by an international syndicate, and issued in bearer form. Borrowers in this market include supranational agencies, such as the World Bank and the European Investment Bank, and sovereign and sovereign-backed entities.
- Yankee debt encompasses securities issued by foreign issuers who register with the SEC and borrow U.S. dollars via issuers underwritten by a U.S. syndicate for delivery in the United States. Supranational agencies (particularly the World Bank) and Canadian provinces are the most prominent Yankee issuers.

Foreign investors play a major role in both the Eurodollar and Yankee markets. The yield spread between U.S. dollar denominated international securities and U.S. domestic securities depends on the degree of interest from foreign buyers. However, the yields on dollar denominated securities are highly correlated with yields on comparable Treasuries.

Although these are the most common markets for U.S. dollar denominated debt, other instruments are available. Examples are bankers' acceptances issued by foreign banks and U.S. dollar denominated commercial paper. Another category of U.S. dollar denominated debt is **sovereign** or **sovereign-backed** debt. This is debt issued by other governments and is backed by the "full faith and credit" of the issuing government.

It is also possible for investors to use foreign securities that have been synthetically re-denominated into U.S. dollars. For example, a **synthetic dollar bond** is exposed to changes in foreign interest rates, but it is relatively insensitive to changes in domestic interest rates. Consequently, such a bond offers an attractive diversification outlet without exchange rate risk.

## **RECOMMENDATION**

Yield enhancement, without increasing liquidity or credit risk, is possible through the extension of maturities and through investment in international securities. Staff is recommending the following changes be made to the short term guidelines:

- 1) A maximum of 5% of an internal or external short term debt portfolio may be invested in securities with maturities between three and ten years.
- 2) A maximum of 20% of an internal or external short term debt portfolio may be invested in U.S. dollar-denominated international securities. This includes:

- Debt issued by foreign banks, including bankers' acceptances
- Commercial paper issued by foreign corporations
- Supra-national agency debt
- Sovereign and Sovereign-backed debt

Investment guidelines currently established for comparable domestic securities (credit quality, percentage of portfolio, etc.) will also apply to international short term securities.

This recommendation will allow diversification and create the possibility for enhanced returns, but will also avoid currency risk. Staff will continue to explore the advantages and disadvantages of using hedged and non-hedged international bonds in a portion of the portfolio.

In December 1992, the SBI adopted country guidelines recommended by the International Investing Guidelines Task Force. These guidelines were developed at the time the SBI began implementing its international equity program.

The recommendations were patterned after the SBI policy on South Africa that affects only active equity managers. The country guidelines in the Task Force report adopted by the Board explicitly apply to active managers, but are silent on which asset classes would be included. Consistent with the SBI's past action on investment restrictions, the country guidelines should apply to stock managers but not to other asset classes.

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**Benchmark For  
Internally Managed  
Short Term Cash Accounts**

**August 1996**

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## **BENCHMARK FOR INTERNALLY MANAGED SHORT TERM CASH POOLS**

In January 1993, the State Board of Investment (SBI) adopted a new performance benchmark for the internally managed cash pools. At the time, the Investment Advisory Council (IAC) recommended that this decision be reviewed after staff had gained some experience with the new benchmark. This paper provides that review and proposes modifications to the benchmark.

### **Background**

The State Board of Investment (SBI) manages the cash balances in more than 400 state agency accounts with the objectives of preserving capital and providing competitive money market returns. Staff invest the majority of these accounts through two pooled vehicles:

- **Invested Treasurer's Cash (ITC) Pool.** This pool contains cash balances from ITC and other accounts necessary for the operation of state agencies. Its average daily balance in FY96 was \$2.92 billion.
- **Trust Fund Pool.** This pool contains cash balances of trust fund and retirement related accounts that are managed internally. The Trust Fund Pool had an average daily balance of \$0.14 billion in FY96.

Historically, 91 Day Treasury Bills (T-bills) were used as the benchmark for all cash accounts. In 1991, the Program Evaluation Division of the Office of the Legislative Auditor criticized this benchmark and recommended that the SBI develop a customized benchmark for cash management that would better reflect the mix of securities actually being used.

After evaluating alternatives, staff recommended a benchmark for both pools that was weighted 75% cash equivalents / 25% 1-3 year debt. The State Street short term investment fund (STIF) return was recommended as the bogey for cash equivalents and the Merrill Lynch 1-3 Year Government Index was recommended as the bogey for the long portion of the benchmark.

The IAC endorsed this blended benchmark with reservations. Since the maturity structure of the pools fluctuates according to cash flow demands, it could be significantly different from the 75/25 split in the benchmark. Also, measuring the cash portion of the fund against State Street's actively managed STIF makes the benchmark a more difficult bogey than a passive index. As a result, the IAC felt the blended benchmark was very aggressive and recommended that it be reviewed within two years. They also recommended that 91 Day T-Bills continue to be reported as an alternative benchmark.

As a result of these recommendations, ITC and Trust Fund Pool performance have been reported against both 91 Day T-bills and the blended benchmark since January 1993. Results against both benchmarks are shown in **Appendix I**.

#### **Benchmark Weights for the Trust Fund Pool**

Since the blended benchmark was adopted, the cash flows and maturity structure of the Trust Fund Pool changed significantly. After the Post Fund moved to external management, the balance in the Trust Fund Pool dropped. It is now comprised of retirement fund contributions before they are invested in the Basic or the Post Funds and cashflows to the Permanent School Fund or Environmental Trust Fund before they are invested in stocks or bonds. Since these cash flows are held in the Pool for only a short time before they are allocated to long term investment vehicles, the maturity structure of the Trust Pool is now focused entirely on cash equivalents; maturities beyond 6 months are rarely used.

A blended benchmark is no longer representative of the maturity structure of the Trust Fund Pool. Therefore, staff recommend that the benchmark for the Trust Fund Pool drop the 1-3 year portion from its benchmark and be measured against a standard that is more representative of cash equivalents.

#### **Benchmark Weights for the ITC Pool**

Staff continue to believe that a blended benchmark is appropriate for the ITC Pool since its maturity structure will continue to include longer term securities. However, a benchmark based on set percentages has proved to be somewhat problematic.

The Invested Treasurer's Cash Pool continues to experience significant volatility in cash flows (see **Appendix II and Appendix III**). As a result, the dollar value attributable to 25% of the portfolio can vary significantly over very short periods of time as well. During the last three years, the amount has fluctuated by as much as \$245 million in a single month (see **Appendix IV**). This means the internal manager may be induced to buy or sell 5-10% of the entire ITC Pool in any month simply to match the benchmark weightings. Staff believe that this type of turnover is counterproductive and is incompatible with the objective of preserving capital.

Instead of a blended benchmark based on a **fixed percentage**, staff suggest that the benchmark be based on a **fixed dollar amount** for the 1-3 year portion of the benchmark. The fixed dollar amount selected would represent an amount that is never expected to be liquidated and should be determined in conjunction with the cashflow projections made by the Department of Finance. The balance of the portfolio, whatever its dollar value, would be measured against a cash equivalents measure.

Staff suggest that the fixed dollar portion of the benchmark be set at 20-25% of the projected minimum balance in the ITC for the coming year. For the twelve month period beginning October 1996, staff recommend a fixed dollar amount of \$600 million. The fixed dollar amount used in the benchmark would need to be updated at least annually to

reflect changing Minnesota economic conditions and changes in cash flow caused by legislative action.

### **Benchmark for Cash Equivalents**

As noted earlier, the State Street STIF was selected as the bogey for cash equivalents. This was based, in large part, on the fact that both State Street and internal staff are bound by the same statutory constraints and should therefore be selecting securities from the same investment universe. After further review, staff recommend using IBC All Taxable Money Fund Average Index rather than the State Street STIF.

Neither the State Street STIF nor the IBC Index (formerly known as IBC Donoghue) are ideal benchmarks since neither meet key components of an "investable" performance standard i.e., neither is a passive representation of an investment universe and the securities that make up the benchmark are not known before the start of the measurement period. The IBC Index is more representative, however, because it reflects the results achieved by a broader group of managers. All funds included in the IBC Index average follow SEC Rule 2(a)7 which is roughly comparable to the types of securities available to the internal manager (Treasury, Agency, Commercial Paper and Short Term Corporate Obligations).

### **Benchmark for 1-3 Year Securities**

Currently, the Merrill Lynch 1-3 Year Government Index is used to represent the long end of the maturities used in the benchmark. This index is updated daily as new issues are settled, old issues come within 3 years of maturity, or old issues become less than 1 year to maturity. In practice, this means the benchmark is changed on the last day of every month and on the 15th of every auction month (February, May, August, November). These frequent changes make managing against the benchmark more difficult.

As an alternative, staff recommend the Lehman 1 - 3 Year Government Index. This index is comprised of the same securities as the Merrill Lynch Index, however, it is updated only

on the first of the month to reflect the previous months maturity changes and new issuance.

### **Summary of Recommendations**

Staff recommend that the SBI discontinue measuring the performance of the ITC Pool and the Trust Fund Pool against the current 75/25 blended benchmark. The following benchmarks are recommended:

- **Trust Fund Pool.** The Trust Fund Pool should be measured against a cash equivalents benchmark rather than a blended benchmark. The IBC All Taxable Money Fund Index is recommended as the performance standard for this pool.
- **ITC Pool.** The ITC Pool should continue to use a blended benchmark but convert the long end of the benchmark from a fixed percentage to a fixed dollar amount. The fixed dollar portion of the benchmark should be measured against the Lehman Brother's 1 to 3 year Government Index. The remainder of the benchmark should use the IBC Index. For the 12 month period beginning October 1996, the fixed dollar portion of the benchmark should be \$600 million.
- **91 Day Treasury Bills.** 91 Day T-Bills should continue to be reported as an alternative measure for the internally managed cash pools as it continues to be a widely recognized performance standard for short term cash portfolios.

**APPENDIX I**

**Actual Returns vs. Benchmarks**

**ITC Pool**

	<b>ITC</b>	<b>Benchmark*</b>	<b>T-Bills**</b>	<b>ITC vs. Benchmark</b>	<b>ITC vs. T-Bills</b>
1Q93	1.1	1.1	0.8	0.0	0.3
2Q	1.1	0.9	0.7	0.2	0.4
3Q	1.0	1.0	0.8	0.0	0.2
4Q	0.7	0.8	0.8	-0.1	-0.1
<b>1993</b>	<b>4.0</b>	<b>3.9</b>	<b>3.1</b>	<b>0.1</b>	<b>0.8</b>
1Q94	0.5	0.5	0.8	0.0	-0.3
2Q	0.8	0.7	1.0	0.1	-0.2
3Q	1.1	1.1	1.1	0.0	0.0
4Q	1.1	1.0	1.3	0.1	-0.2
<b>1994</b>	<b>3.5</b>	<b>3.3</b>	<b>4.3</b>	<b>0.2</b>	<b>-0.7</b>
1Q95	1.8	2.0	1.4	-0.2	0.4
2Q	1.7	2.0	1.4	-0.3	0.3
3Q	1.5	1.5	1.4	0.0	0.1
4Q	1.6	1.8	1.4	-0.2	0.2
<b>1995</b>	<b>6.8</b>	<b>7.5</b>	<b>5.7</b>	<b>-0.7</b>	<b>1.0</b>
1Q96	1.2	1.1	1.3	0.1	-0.1
2Q	1.3	1.3	1.3	0.0	0.0
<b>1Q93-2Q96 Annualized</b>	<b>4.8</b>	<b>4.9</b>	<b>4.5</b>	<b>-0.1</b>	<b>0.3</b>

**Trust Fund Pool**

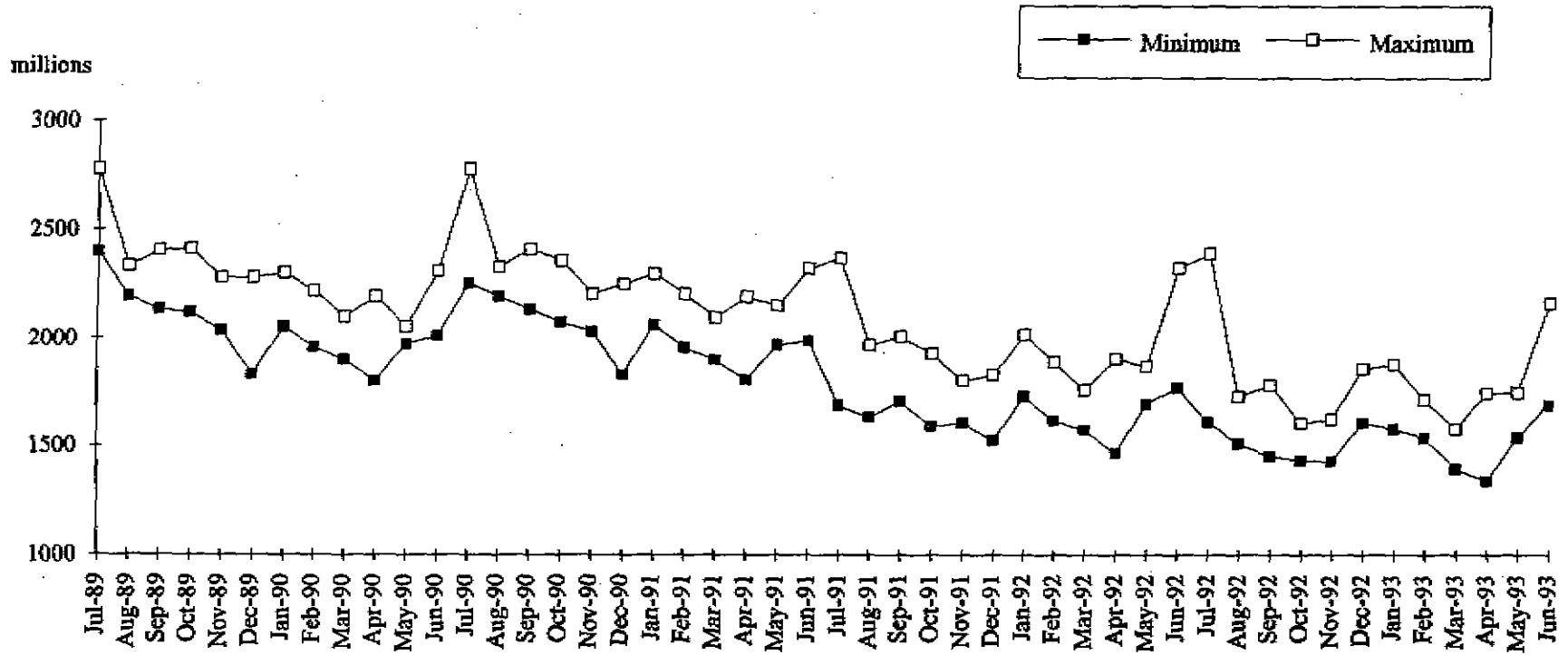
	<b>Trust Pool</b>	<b>Benchmark*</b>	<b>T-Bills**</b>	<b>Trust vs. Benchmark</b>	<b>Trust vs. T-Bills</b>
1Q93	1.4	1.1	0.8	0.3	0.6
2Q	0.9	0.9	0.7	0.0	0.2
3Q	0.8	1.0	0.8	-0.2	0.0
4Q	0.9	0.8	0.8	0.1	0.1
<b>1993</b>	<b>4.1</b>	<b>3.9</b>	<b>3.1</b>	<b>0.2</b>	<b>0.9</b>
1Q94	0.8	0.5	0.8	0.3	0.0
2Q	1.0	0.7	1.0	0.3	0.0
3Q	1.2	1.1	1.1	0.1	0.1
4Q	1.3	1.0	1.3	0.3	0.0
<b>1994</b>	<b>4.4</b>	<b>3.3</b>	<b>4.3</b>	<b>1.0</b>	<b>0.1</b>
1Q95	1.5	2.0	1.4	-0.5	0.1
2Q	1.5	2.0	1.4	-0.5	0.1
3Q	1.5	1.5	1.4	0.0	0.1
4Q	1.5	1.8	1.4	-0.3	0.1
<b>1995</b>	<b>6.1</b>	<b>7.5</b>	<b>5.7</b>	<b>-1.4</b>	<b>0.4</b>
1Q96	1.4	1.1	1.3	0.3	0.1
2Q	1.4	1.3	1.3	0.1	0.0
<b>1Q93-2Q96 Annualized</b>	<b>5.0</b>	<b>4.9</b>	<b>4.5</b>	<b>0.1</b>	<b>0.5</b>

\* Blended Benchmark Weighted 75%, State Street STIF/25%, Merrill Lynch 1-3 Year Government  
 \*\* 91 Day U.S. Treasury Bills



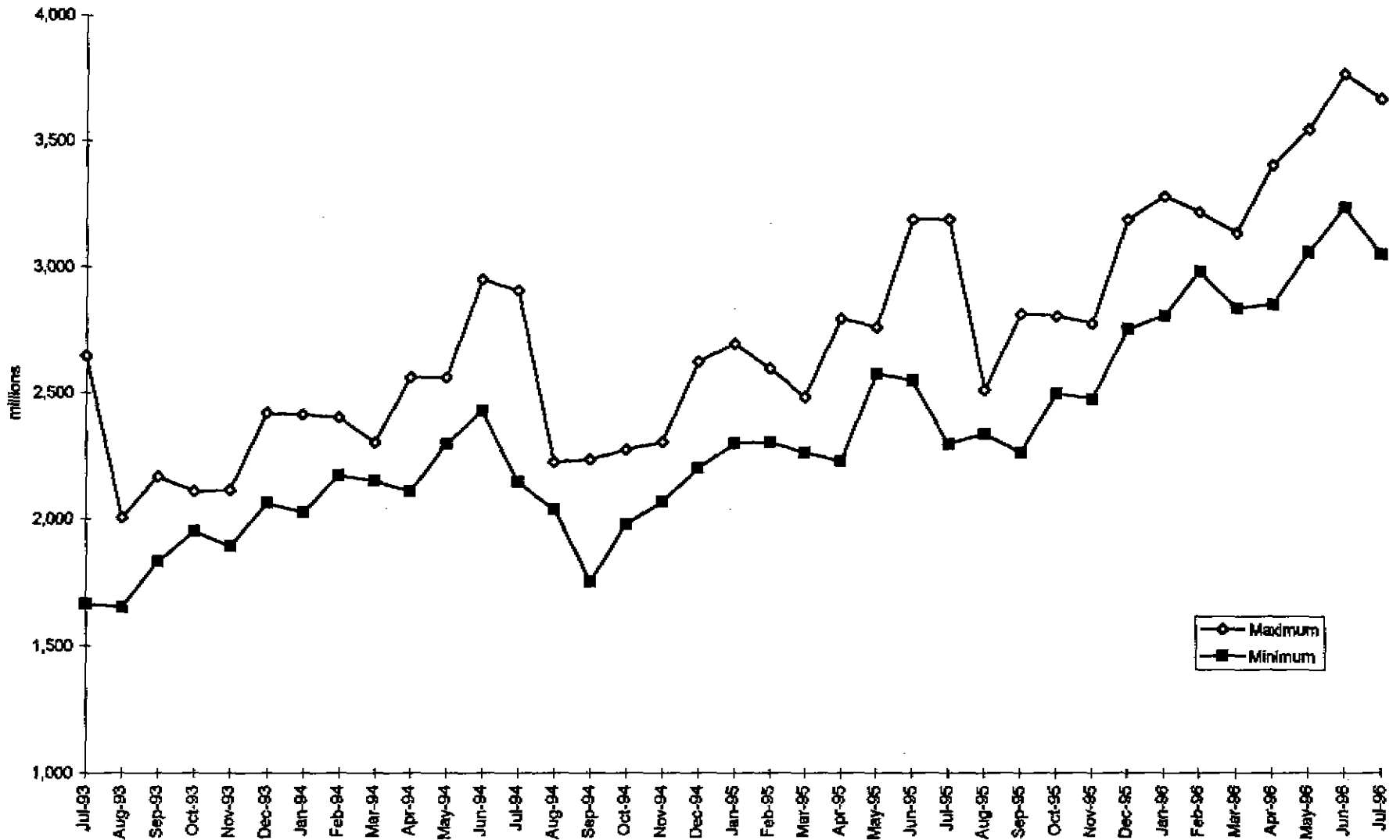
Treasurer's Cash Pool Monthly Maximum and Minimum Balances

JULY, 1989 - JUNE, 1993



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**Treasurer's Cash Pool Monthly Maximum and Minimum Balances  
July, 1993 - July, 1996**



**Appendix IV**  
**Volatility of Invested Treasurers Cash**  
**July 1993 - June 1996**

	Balance During the Month			Dollar Value of 1-3 Year Portion			\$500 million	\$750 million
	Max	Min	Diff.	25% Max	25% Min	Diff.	as a % of Min.	as a % of Min.
Jul-93	\$2,647	\$1,663	\$984	\$662	\$416	\$246	30%	45%
Aug-93	\$2,005	\$1,650	\$355	\$501	\$413	\$89	30%	45%
Sep-93	\$2,167	\$1,832	\$335	\$542	\$458	\$84	27%	41%
Oct-93	\$2,110	\$1,950	\$160	\$528	\$488	\$40	26%	38%
Nov-93	\$2,114	\$1,891	\$223	\$529	\$473	\$56	26%	40%
Dec-93	\$2,421	\$2,063	\$358	\$605	\$516	\$90	24%	36%
Jan-94	\$2,414	\$2,026	\$388	\$604	\$507	\$97	25%	37%
Feb-94	\$2,404	\$2,172	\$232	\$601	\$543	\$58	23%	35%
Mar-94	\$2,304	\$2,151	\$153	\$576	\$538	\$38	23%	35%
Apr-94	\$2,564	\$2,110	\$454	\$641	\$528	\$114	24%	36%
May-94	\$2,564	\$2,297	\$267	\$641	\$574	\$67	22%	33%
Jun-94	\$2,955	\$2,431	\$524	\$739	\$608	\$131	21%	31%
Jul-94	\$2,910	\$2,148	\$762	\$728	\$537	\$191	23%	35%
Aug-94	\$2,226	\$2,039	\$187	\$557	\$510	\$47	25%	37%
Sep-94	\$2,237	\$1,753	\$484	\$559	\$438	\$121	29%	43%
Oct-94	\$2,277	\$1,981	\$296	\$569	\$495	\$74	25%	38%
Nov-94	\$2,307	\$2,070	\$237	\$577	\$518	\$59	24%	36%
Dec-94	\$2,628	\$2,202	\$426	\$657	\$551	\$107	23%	34%
Jan-95	\$2,699	\$2,302	\$397	\$675	\$576	\$99	22%	33%
Feb-95	\$2,601	\$2,307	\$294	\$650	\$577	\$74	22%	33%
Mar-95	\$2,488	\$2,265	\$223	\$622	\$566	\$56	22%	33%
Apr-95	\$2,801	\$2,233	\$568	\$700	\$558	\$142	22%	34%
May-95	\$2,766	\$2,579	\$187	\$692	\$645	\$47	19%	29%
Jun-95	\$3,198	\$2,555	\$643	\$800	\$639	\$161	20%	29%
Jul-95	\$3,199	\$2,302	\$897	\$800	\$576	\$224	22%	33%
Aug-95	\$2,520	\$2,342	\$178	\$630	\$586	\$45	21%	32%
Sep-95	\$2,822	\$2,268	\$554	\$706	\$567	\$139	22%	33%
Oct-95	\$2,813	\$2,506	\$307	\$703	\$627	\$77	20%	30%
Nov-95	\$2,783	\$2,483	\$300	\$696	\$621	\$75	20%	30%
Dec-95	\$3,200	\$2,760	\$440	\$800	\$690	\$110	18%	27%
Jan-96	\$3,292	\$2,815	\$477	\$823	\$704	\$119	18%	27%
Feb-96	\$3,230	\$2,994	\$236	\$808	\$749	\$59	17%	25%
Mar-96	\$3,148	\$2,845	\$303	\$787	\$711	\$76	18%	26%
Apr-96	\$3,419	\$2,862	\$557	\$855	\$716	\$139	17%	26%
May-96	\$3,563	\$3,074	\$489	\$891	\$769	\$122	16%	24%
Jun-96	\$3,782	\$3,251	\$531	\$946	\$813	\$133	15%	23%
Jul-96	\$3,683	\$3,065	\$618	\$921	\$766	\$155	16%	24%

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# **MANAGER CONTINUATION POLICY**

**Position Paper**

**March 1988**

**June 1990 (Revised)**

**December 1993 (Revised)**

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# MANAGER CONTINUATION POLICY

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## EXECUTIVE SUMMARY

Evaluating the performance of a diverse group of money managers is an integral feature of the investment policies of the State Board of Investment (SBI). In order to make informed judgments regarding the current capabilities of the Board's managers, the SBI has developed a set of specific evaluation guidelines. These guidelines form a "manager continuation policy" that will assist the Board in its decisions concerning retention and termination of money managers.

The Manager Continuation Policy offers several benefits:

- It encourages a comprehensive and consistently applied analysis.
- It fosters a long-term attitude toward performance evaluation.
- It communicates investment objectives between the Board, its managers and its staff.

The guidelines include both qualitative and quantitative evaluation criteria. Since it is difficult to statistically confirm investment skill, absolute reliance on portfolio return numbers is not wise. Qualitative aspects of a manager's operation must be taken into consideration when the SBI evaluates a manager's ability to add value *in the future*.

### QUALITATIVE GUIDELINES

Qualitative performance evaluation relates to those aspects of a money manager's investment operation that cannot be expressed as numerical targets. Investors such as the SBI must attempt to deduce the skills of money managers by searching for the presence or absence of basic building blocks of sound investment management within a manager's firm:

#### **Elements of an Efficient Investment Organization**

- Experienced and talented staff
- Organizational stability
- Clear leadership
- Planned growth
- Adequate client support

#### **Elements of a Well-Defined Investment Approach**

- Clearly specified investment style
- Well-conceived decision-making process
- Adequate feed-back and control

*Figure 1* on page 16 of the paper provides a more specific list of criteria which may be used to evaluate a manager's investment organization and investment approach. Failure to meet one or more of these criteria should not be sufficient reason to terminate a manager. As a general rule, a qualitative evaluation should be applied in conjunction with a quantitative evaluation to determine whether a manager is meeting the Board's expectations. However, it is important to specify exceptions to this general rule. Certain changes in a manager's organization or investment approach will dictate immediate re-evaluation of the Board's relationship with the firm.

**The following events will automatically place a manager "on probation":**

- **A perceived change in the manager's investment style.**
- **An inability to create or maintain an appropriate benchmark portfolio.**
- **A change in the firm's ownership or important members of its management team.**
- **A significant gain or loss in accounts over the previous year.**

**A manager will remain on probation no longer than six months. If the issues of concern are not satisfactorily resolved, the manager should be terminated.**

#### **QUANTITATIVE GUIDELINES**

Quantitative performance evaluation relates to those aspects of a money manager's operation that can be analyzed relative to measurable targets. A manager's return relative to an appropriate benchmark represents "the bottom line" for a plan sponsor. However, the investment performance of superior and inferior managers exhibits a large amount of variability, even when returns are measured relative to a customized benchmark. Quantitative performance criteria must take this variability into account. A poorly designed measure could lead a plan sponsor to erroneously classify managers as inferior. This, in turn, could create costly and excessive manager turnover.

*Figure 2* on page 23 of the paper depicts a statistically valid method of assessing the variability of manager performance relative to an agreed upon benchmark. The horizontal line represents the return on the benchmark over moving five year periods. Performance exceeding (or conversely, falling below) the benchmark over the preceding five years will plot above (or conversely, below) the horizontal line. The area between the upper and

lower lines, or bands, represents a "confidence interval" based on the manager's actual return relative to its agreed upon benchmark. Returns within the confidence interval represent performance due either to skill or to chance. Returns falling outside the confidence interval represent superior or inferior performance significant enough that the odds of it being due to chance are low.

The SBI will use this confidence interval approach to highlight quantitative performance concerns by drawing a value of active management (VAM) graph for each active manager. The VAM graph will plot performance relative to the agreed upon benchmark, net of fees, and will include the performance history that led the SBI to retain the firm as well as the SBI's actual experience. Including a longer time period in the graph puts manager evaluation into a larger context and should assist the SBI in distinguishing unusual, deteriorating performance from recurring patterns in an active manager's returns. In addition, the confidence interval will be wider or narrower depending on the level of active risk that an individual manager takes. As a result, the confidence interval will tailor the analysis to the manager's own investment approach and will establish/define expectations regarding a manager's return volatility over time.

**The SBI believes that it is unwise to mandate termination for lagging performance at any specific point. Instead, the following guidelines will be used to trigger appropriate review:**

- **Review by the Stock and Bond Manager Committee of the Investment Advisory Council (IAC) if performance over rolling five year periods plots below the benchmark line for four consecutive quarters.** This review could result in a recommendation to watch performance closely over the next year, to meet with the manager to discuss the issue or to call for a formal re-interview of the manager.
- **Re-interview by special committee if performance over rolling five year periods plots below the lower band of the confidence interval for four consecutive quarters.** Performance that plots below the lower band of the confidence interval will be considered a signal of serious under performance. If performance continues to plot below the lower band for one year, the manager will be formally re-interviewed by a special committee of Board member designees and IAC members.

## REPORTING FORMATS

The SBI will use two reporting formats to communicate information about its managers on a quarterly basis:

- **Manager Commentaries.** Each quarter, each manager will prepare a brief analysis of its own performance over the last quarter and year. This will include a description of active bets, the philosophy underlying those bets and an explanation of what worked and did not work. The commentary will also include information on ownership and personnel changes at the firm along with information about accounts gained and lost. The report format is illustrated in *Figure 3* on page 26 of the paper.
- **Performance Reports.** The performance evaluation report format in *Figure 4* on page 28 of the paper summarizes the salient features of the qualitative and quantitative guidelines. Qualitative evaluations will be reported on an exception basis. Only in cases where there is cause for concern, or where the manager is exceptionally positive, will the issue be highlighted. Quantitative evaluations will be presented using the confidence interval/VAM graph approach outlined above.

Both of these reports will be reviewed by the IAC on a quarterly basis and presented to the Board.

## NEW MANAGERS

The Board is likely to add new managers in the future. Hiring new managers does not necessarily imply that the Board is dissatisfied with its existing managers. The Board may simply come to the conclusion that a particular new manager can do a better job than an existing manager. A flexible approach to manager retention that is cognizant of the costs of manager turnover can benefit the Board's investment program. The qualitative and quantitative performance evaluation criteria discussed in this paper will be used in the hiring of new managers.

The SBI has established a Manager Monitoring Program which will collect detailed information on up to ten firms in each asset class. Candidates for the program will be suggested by Board members, IAC members, consultants and staff. When the SBI seeks to add or replace managers, a Search Committee will be convened to interview Manager

Monitoring Program candidates and to recommend that the Board retain one or more of those firms.

## SECTION 1: OVERVIEW AND RETURN EXPECTATIONS

An important component of the Board's investment policy for the Basic and Post Retirement Funds is an investment management structure which utilizes a number of managers for its stock and bond programs. As part of this investment management structure, the Board allocates funds to both passive and active money managers. Further, by design, the Board's active managers pursue a variety of investment styles.

Evaluating the performance of this diverse group of money managers is an integral feature of the Board's investment policy. The Board expects its active managers to add value to their respective investment styles. Passive managers are expected to track the performance of their particular indices. In aggregate, the Board expects its managers to outperform their respective asset class targets. The Board has established the following return expectations for its domestic stock, domestic bond and international stock manager programs:

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<b>Domestic Stocks</b>	<b>Asset Class Target:</b>	<b>Wilshire 5000</b>
<i>Structure</i>	<i>Allocation</i>	<i>Return Expectation*</i>
Active	Maximum 50%	+50 to +100 b.p.
Passive	Minimum 50%	-10 b.p.
<b>Total Program</b>		<b>+20 to +45 b.p.</b>

\* annualized over time, relative to benchmark, net of all fees

---

<b>Domestic Bonds</b>	<b>Asset Class Target:</b>	<b>Salomon Broad Investment Grade (BIG)</b>
<i>Structure</i>	<i>Allocation</i>	<i>Return Expectation*</i>
Active	Maximum 50%	+25 to +50 b.p.
Semi-Passive	Minimum 50%	+15 to +25 b.p.
<b>Total Program</b>		<b>+20 to +35 b.p.</b>

\* annualized over time, relative to benchmark, net of all fees

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**International Stocks**

Asset Class Target: **MSCI index of Europe, Australia and the Far East (EAFE)**

<i>Structure</i>	<i>Allocation</i>	<i>Return Expectation*</i>
Active	Minimum 50%	+75 to +150 b.p.
Passive	Maximum 50%	-25 to +10 b.p.
<b>Total Program</b>		<b>+25 to +75 b.p.</b>

\* annualized over time, relative to benchmark, net of all fees

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The Board strives to hire managers who it believes can satisfy these performance expectations. However, the Board's perception of its managers' abilities may change over time. For example, changes in a manager's organization can adversely affect the manager's investment decision-making. Or, by gaining more experience with a manager, the Board may discover unsatisfactory aspects of a manager's investment process that previously had not been apparent. In any event, managers in whom the Board no longer has strong confidence should not be continued. The purpose of the Board's manager performance evaluations is to determine that level of confidence.

Performance evaluation is a complex and often frustrating process. Without sound procedures, this process can easily break down into a series of short-run, contradictory decisions that are counterproductive to a pension plan's long-run interests. In order to make informed judgments regarding the current capabilities of its managers, the Board requires a comprehensive and clearly specified evaluation procedure.

The SBI believes that the evaluation framework in this position paper, or "manager continuation policy," offers three primary benefits:

- It encourages a comprehensive and consistently applied analysis.
- It fosters a long-term attitude toward performance evaluation.
- It communicates investment objectives between the Board, its managers, and its staff.

While this position paper represents the SBI's attempt to present a comprehensive approach to manager performance evaluation, it should not be considered a static

document. As the SBI gains greater experience with external money managers and evaluation techniques, components of the framework will undoubtedly be modified and enhanced.

## **SECTION 2: AMBIGUITY OF SUPERIOR PERFORMANCE**

Investment management is similar to other businesses in that plan sponsors contract to receive products or services that presumably will make them better off. Specifically, plan sponsors hire money managers because they believe that the managers will make investment decisions that will enhance the plan sponsors' wealth. However, the investment management business is unusual in that the quality of its "product" appears so readily quantifiable and simple to evaluate. It may appear that a plan sponsor needs only to observe changes in the value of money managers' portfolios over time to make appropriate judgments concerning the managers' talents. Unfortunately, performance evaluation is not this straightforward. Two important issues complicate the analysis:

- Superior investment performance is a highly relative concept.
- Investment performance is inherently uncertain.

### **RELATIVE NATURE OF INVESTMENT PERFORMANCE**

The quality of investment performance is inextricably linked to investment objectives. Investment skill can be properly assessed only if the evaluation is conducted within the context of the investment objectives pursued by the investor.

In some cases this principle is obvious. For example, a bond manager's returns should not be compared to the performance of a stock market index since the bond manager's investment objectives are unrelated to the performance of common stocks. While this distinction is less clear within asset classes, it is still quite relevant. For example, a "growth stock" manager's returns generally should not be compared to the performance of the entire stock market. A growth stock manager's investment goal is to select the best performing stocks from a subset of the securities which comprise the stock market. Therefore, a growth stock manager's returns at times may deviate from the returns on the market for reasons totally unrelated to the manager's investment skill. A valid performance evaluation approach should explicitly take into account the investment objectives of the manager being evaluated.

## **INHERENT VARIABILITY OF INVESTMENT PERFORMANCE**

The investment results of even superior managers exhibit a large amount of random variability. This makes it difficult to identify investment skill. A "good" money manager may be right 51% of the time as opposed to a "poor" manager who is right 50% of the time. In the near-term, the "poor" manager's portfolio might outperform the superior manager's portfolio simply by random luck. Over the longer-term, the superior manager's skill will become apparent. But the time period required to make this distinction may be considerably longer than most clients are willing to accept.

## **NEED FOR APPROPRIATE BENCHMARKS**

One means of addressing these two issues is to construct unique benchmarks for each money manager. Properly designed, such benchmarks reflect a manager's investment style. Thus, a benchmark is the appropriate standard against which to evaluate the manager's investment performance. Further, because appropriate benchmarks should be tied to the manager's investment style, some (but by no means all) of the "noise" caused by the random variability of capital market returns is removed from the evaluation process.

Valid benchmarks will have the following characteristics: *(1)*

- **Unambiguous.** The names and weights of the securities comprising the benchmark are clearly delineated.
- **Investable.** The option is available to forego active management and simply hold the benchmark portfolio.
- **Measurable.** It is possible to readily calculate the benchmark's return on a monthly basis.
- **Reflective of current investment opinions.** The manager has current investment opinions (be they positive, negative or neutral) on the securities which makes up the benchmark.
- **Appropriate.** The benchmark is consistent with the manager's investment style or biases.
- **Specified in advance.** The benchmark must be available prior to the start of an evaluation period.

With these characteristics in mind, the SBI uses the following benchmarks for its stock and bond managers:

- **Domestic Bond Managers.** For the SBI's current domestic bond managers, a market index has been deemed to be an adequate representation of the manager's investment approach or security selection universe. Therefore, each bond manager uses the Salomon Broad Investment Grade (BIG) Index, or specific sub sectors of the index, as its benchmark.
- **Domestic Stock Managers.** Given the highly specialized approaches of the SBI's domestic stock managers, market indices are inappropriate performance standards. Instead, custom benchmarks or "normal portfolios" are used to reflect each firm's particular area of expertise. Stock managers are expected to add value to their individual benchmarks, over time, regardless of the performance of the broad market.
- **International Stock Managers.** At the present time, each of the SBI's international stock managers uses the Morgan Stanley Capital International index of Europe, Australia and the Far East (EAFE) as its benchmark. While the SBI would prefer to use customized benchmarks for these managers, benchmark building techniques are not as advanced for international managers as they are for domestic managers at the current time. In the future, the SBI intends to work with each of its international managers to develop a benchmark that is more representative of the manager's investment universe and portfolio construction process.

#### **PROBABILITY OF UNDER PERFORMING A BENCHMARK**

While the SBI believes that customized benchmarks have significant benefits and should be used wherever feasible, they are not a panacea for the difficulties of performance evaluation. Capturing a manager's investment style in a benchmark is an inexact process. Moreover, even given a precise benchmark, discerning superior and inferior performance in the near-term is very difficult because of the variability of investment returns.

An illustration may be useful to understand this point. Assume that the plan sponsor has retained a superior active stock manager. For purposes of this illustration, "superior" is defined as a manager whose value added compared to its benchmark, over time, is two percentage points (a high level of value added) with five percentage points of annual volatility (a reasonable assumption of volatility). (2) Even though this manager's performance is clearly superior in the long run, it is quite likely that its performance pattern will show marked periods of under performance relative to its benchmark:

**Probability that a *Superior* Manager  
Will Under perform a Benchmark \***

<b>Years</b>	<b>Probability</b>
0.5	39%
1.0	34
3.0	24
5.0	19
10.0	10

\* Assumes 2% value added and 5% volatility of value added, annualized

Source: Richards & Tierney, Inc.

As the above table shows, even a "superior" manager will have a 1-in-4 chance of under performing in any three year period and a 1-in-5 chance of under performing in any five year period. Other successful managers with somewhat lower levels of value added would have even *higher* probabilities of under performing.(3) This illustration points out that relying solely on past performance over a typical evaluation period of 3 to 5 years may easily lead to expensive, incorrect decisions.

As a result, a blind reliance on near-term relative performance comparisons, whether to market indices or to custom benchmarks, is not likely to lead to sound manager retention or continuation decisions. Other, less quantifiable factors have to be considered when assessing a manager's ability to add value *in the future*. Therefore, the SBI has integrated benchmarks into a decision-making framework which incorporates both qualitative and quantitative evaluation criteria. The following two sections describe that framework.

### SECTION 3: QUALITATIVE GUIDELINES

Qualitative performance evaluation relates to those aspects of a money manager's investment operations that cannot be expressed as measurable targets. By definition, these criteria cannot be incorporated into numerical decision rules. As a result, they may require significant judgments on the part of evaluators. Plan sponsors must attempt to deduce the skills of money managers by searching for the presence or absence of basic building blocks of sound investment management within the manager's firm.

Qualitative guidelines can be viewed as necessary, but not sufficient, conditions for consistent superior investment performance. To the extent that a manager substantially fails to satisfy these criteria, the plan sponsor will lack confidence that the manager has the necessary components of a successful investment operation. On the other hand, even if the manager fully satisfies these criteria, there is no guarantee that the manager will exhibit long-run superior results. Because superior investment abilities are so difficult to identify, plan sponsors are forced to rely heavily on qualitative inferences of managers' skills.

Qualitative performance evaluation guidelines may be categorized into two primary areas of a manager's operations:

- Organization
- Investment Approach

#### **ORGANIZATION**

An efficient organization is a necessary element of a successful investment program. Sub categories that the SBI believes characterize superior money management organizations are:

- **Experienced and talented staff.** Highly motivated and talented professionals lie at the heart of any successful investment organization. The evaluation criteria should judge the experience and quality of the professionals employed by a manager.
- **Organizational stability and clear leadership.** A superior money management organization not only offers incentives to retain talented professionals, but also

integrates these people into a cohesive structure. This requires effective leadership and organizational stability.

- **Planned growth.** A manager should have some type of business growth plan in place. *Uncontrolled growth can impede a manager's performance.* The growth path of a successful firm should be consistent with the organization's capabilities.
- **Adequate client support.** Large institutional clients, such as the Board, have a variety of administrative requests of a manager, including data collection, benchmark construction, strategy reports, etc. A manager's organization should be responsive to such needs.

### **INVESTMENT APPROACH**

Talented people blended into an efficient organization are not enough to produce superior investment results. A well-defined investment approach is needed to focus the resources of a manager's organization in a particular direction. Sub categories that the SBI believes characterize superior organizations are:

- **Clearly specified investment style.** The capital markets represent a diverse and constantly evolving system. A manager cannot hope to attain significant expertise in all segments of the marketplace. Therefore, without the discipline of a well-defined investment approach, a money manager may expend its resources on segments of the market where it has no comparative advantage over other investors. A manager's investment approach includes a specification of those segments of the market in which the manager chooses to focus its energies. This specification can be defined as the manager's investment style. A manager's investment style should reflect a thoughtful approach to identifying attractive segments of the market. Further, a manager should have consistently and successfully applied its investment style over a variety of market conditions.
- **Well-conceived decision-making process.** A manager's investment style is implemented through a decision-making process. This decision-making process should be clear and well-conceived. It should involve a set of logical portfolio construction procedures, consistent with the manager's investment style.



- **Adequate feedback and control mechanism.** The manager's investment approach should also entail a feedback and control system. The manager should understand its performance relative to an appropriate benchmark. The manager should constantly be gathering information that can be used to refine the investment approach and make it more effective.

## **DECISION GUIDELINES**

*Figure 1* provides a more detailed breakdown of the qualitative performance evaluation criteria described above. The various sub categories are divided into a specific list of criteria which can be used to evaluate the status of the Board's managers.

Failure to meet one or more of these criteria should not serve as grounds for the *immediate termination* of a manager. As a general rule, a qualitative evaluation should be conducted in conjunction with the quantitative evaluation to determine the Board's confidence in a manager. However, there are several important exceptions to this general rule. Certain changes in a manager's organization or investment approach should dictate immediate re-evaluation of the Board's relationship with the firm.

**The following events will automatically place a manager "on probation" and trigger an in-depth analysis of all aspects of a firm:**

- **A perceived change in the manager's investment style.**
- **An inability to create or maintain an appropriate benchmark portfolio.**
- **A change in the firm's ownership or important members of its management team.**
- **A significant gain or loss of accounts during the previous year.**

**In the event that a manager is placed on probation, the Stock and Bond Manager Committee of the IAC will meet with the manager as soon as possible to discuss the Board's concerns. A manager will remain on probation no longer than six months. In the interim, if the issues of concern are resolved to the Board's satisfaction, the manager should be removed from probation. However, if the issues are not satisfactorily resolved, the manager should be terminated no later than at the end of this six-month period.**

**FIGURE 1**

**MANAGER PERFORMANCE EVALUATION  
QUALITATIVE CRITERIA**

**I. ORGANIZATION/STAFF**

**A. Experience and Quality**

1. Professionals exhibit a high degree of competence and experience.
2. Professionals have managed money successfully under variety of market conditions.
3. Professionals are familiar with needs of large institutional clients.
4. Firm demonstrates its commitment to integrity and fiduciary responsibility.

**B. Stability**

1. Current group of professionals is responsible for firm's track record.
2. Turnover has not been extraordinary in terms of either numbers of people or reasons for their departures.
3. When turnover has taken place, prompt corrective measures have been taken.
4. Control or business emphasis of firm has not changed, or in those case where it has, the firm's investment process has remained intact.

**C. Leadership**

1. An individual is clearly accountable for directing and motivating the firm's professionals.
2. No serious dissension among professionals.

**D. Growth in Assets/Accounts**

1. Firm has growth policy in place, consistent with its investment approach.
2. Account load of portfolio managers is not excessive.
3. No extreme gain or loss of accounts has occurred in recent years.

### **E. Client Relations**

1. Support staff is adequate to provide satisfactory client servicing.
2. Firm demonstrates willingness to cooperate with clients to achieve client goals.

## **II. INVESTMENT APPROACH**

### **A. Investment Style**

1. Investment style is attractive in that it reflects a thoughtful consideration of reasonable risk-return opportunities.
2. Investment style has been consistently applied over a variety of market environments.
3. Investment style is represented by an appropriate benchmark.

### **B. Decision-Making Process**

1. Portfolio construction procedures are specified, efficient, and consistent with the investment style.
2. Investment research coverage is thorough.
3. Decision-making hierarchy among professionals is clearly specified.
4. Firm demonstrates a willingness to make short-term active bets relative to its benchmark.

### **C. Performance Review Process**

1. Comparisons of risk-return performance relative to a pre-determined benchmark are made.
2. Attempts are made to identify and rectify sources of performance problems.
3. Performance results, sources of returns, and investment strategy are clearly presented to clients.

## SECTION 4: QUANTITATIVE GUIDELINES

Quantitative performance evaluation relates to those aspects of a money manager's operation that can be analyzed relative to measurable targets. These criteria traditionally have been applied to the returns produced by managers. But they could also be extended to include the risk incurred by managers.

A manager's performance relative to an appropriate benchmark represents the bottom line *of the manager's business*. For good reason then, both managers and their clients concern themselves with relative rates of return when evaluating the managers' performance. However, as discussed in Section 2, the difficulty of statistically confirming investment skill makes a heavy reliance on portfolio return numbers inadvisable. Qualitative aspects of a manager's operation should also be considered. Furthermore, quantitative evaluation criteria should guard against two different types of decision making errors:

- **Type I Error.** Continue a manager who will not add value *in the future*.
- **Type II Error.** Terminate a manager who will add value *in the future*.

Both of these errors will prove costly to the plan sponsor. Effective decision guidelines will seek an appropriate balance between eliminating managers that are not likely to add value in the future (i.e., attempting to avoid Type I errors) and incurring unproductive manager turnover (i.e., attempting to avoid Type II errors).

### CONFIDENCE INTERVAL APPROACH

*Figure 2* presents a general illustration of an approach to quantitative performance evaluation that attempts to recognize these two potential pitfalls. It takes into account both a manager's performance relative to a specific benchmark and the variability of the manager's returns around that benchmark.

The horizontal line in *Figure 2* represents the return on a hypothetical manager's benchmark. The manager's actual return less the return on the benchmark is shown by the jagged line. Thus, when the manager has exceeded (or conversely, fallen below) the benchmark's return, its relative return line will plot above (or conversely, below) the

horizontal line. The graph is constructed using rolling five year periods, i.e. each point on the graph depicts the preceding 60 months of returns, annualized and *net of fees*.

Naturally, a plan sponsor would like its managers' returns always to lie above the horizontal line. But even the most skillful manager may under perform its benchmark for periods of time. How much under performance should a plan sponsor permit before becoming convinced that a manager is inferior? Conversely, by how much must the manager outperform its benchmark before a plan sponsor can feel comfortable that the manager is truly superior? Because the manager's performance relative to its benchmark has a large variable element to it, a precise answer to these two questions cannot be given. Rather, an analysis is required that reduces the probability of an incorrect answer to an acceptable level.

Avoiding a long discussion of statistical concepts (see Appendix A for additional information), the upper and lower bands in *Figure 2* represent a "confidence interval" surrounding the return on the manager's benchmark. In between the upper and lower confidence interval bands lies a range of performance relative to the benchmark for which it is difficult to distinguish skill from random chance. That is, in this range a manager's superior or inferior performance relative to the benchmark might be due to skill (or lack thereof), but there also is a high probability that the relative performance is due simply to chance. On the other hand, if a manager's relative return falls outside of the confidence interval, this result represents superior or inferior performance that is significant enough that the odds of it being due to chance alone are low. In such a case, a judgment concerning the manager's investment skill can be rendered with a reasonable degree of confidence.

Typical confidence ranges for active managers are shown below. The more volatile the manager's returns, the wider the range will be:

**Estimated Confidence Intervals for Active Managers  
Returns Above/Below Benchmark**

<b>Time Period</b>	<b>Domestic Stock</b>	<b>Domestic Bond</b>	<b>International Stock</b>
3 yr. annualized	±3.0-5.0%	±1.5-3.0%	±6.0-8.0%
5 yr. annualized	±2.0-4.0%	±1.0-2.5%	±5.0-7.0%

Source: Estimates based on SBI staff records of active manager returns.

## **DECISION GUIDELINES**

The SBI will use this confidence interval approach to highlight quantitative performance concerns about its money managers. Confidence intervals will be constructed for each manager using rolling five year time periods. The resulting value of active management (VAM) graph will plot performance relative to the agreed upon benchmark, *net of fees*. The confidence interval will be wider or narrower depending on the level of active risk that an individual manager takes. As a result, the confidence interval will tailor the analysis to the manager's own investment approach and will establish/define expectations regarding the manager's return volatility over time.

The graph will not be drawn until the SBI has two years of experience with the firm. When produced, the graph will display up to ten years of return history and will include the return data that led the SBI to retain the firm as well as the SBI's actual experience. Including a longer time period in the graph puts manager evaluation into a larger context and should assist the SBI to distinguish unusual, deteriorating performance from recurring patterns in an active manager's returns.

**It is important to underscore that the SBI believes that it is unwise to mandate termination for lagging performance at any specific point. Instead, the following process will trigger appropriate review:**

- **Review by the Stock and Bond Manager Committee if performance plots below the benchmark line for one year.**

Any manager whose rolling five year performance plots below the benchmark line for four consecutive quarters (one year) will be reviewed by the Stock and Bond Manager Committee of the IAC during the following quarter. In each case, the Committee will review the last 4-8 quarterly commentaries from the manager and decide if further action is warranted at that time. (See Section 5 for more information on the content of these commentaries.) The Committee may also request additional analysis by the SBI staff or consultant to assist in the review. The additional requests will be specified by the Committee so that the analysis can be tailored to the information needs of the Committee.

The review will result in a recommendation to watch performance closely over the next year, to meet with the manager to discuss the issue or to call for a formal re-

interview of the manager. The Committee will need to re-affirm its findings if performance continues to lag the benchmark.

All recommendations will be reported to the full IAC. It is anticipated that the IAC and the Board will endorse the recommendations of the Stock and Bond Manager Committee since the Committee will have studied the issue most closely. However, the full IAC may choose to recommend another course of action by majority vote. Likewise, the Board may accept, reject or modify any recommendation from the Committee or the IAC.

- **Re-interview if performance plots below the lower band of the confidence interval for one year.**

Rolling five year performance that plots below the lower band of the confidence interval will be considered a signal of serious under performance. If performance continues to plot below the lower band for four consecutive quarters (one year), the manager must be formally re-interviewed by a special committee.

- **Re-interview process.**

Any re-interview of a current manager, whether called for by staff, the Stock and Bond Manager Committee, IAC or Board, or required because performance falls below the lower band for one year, will be conducted by a special committee. The Chair of the Stock and Bond Manager Committee will serve as chair of the special committee. At least one other member of the Stock and Bond Manager Committee will serve on the committee along with at least three Board member designees. This will provide a committee of at least five members. The flexibility on membership is needed to assure that the re-interview can be conducted in a timely fashion.

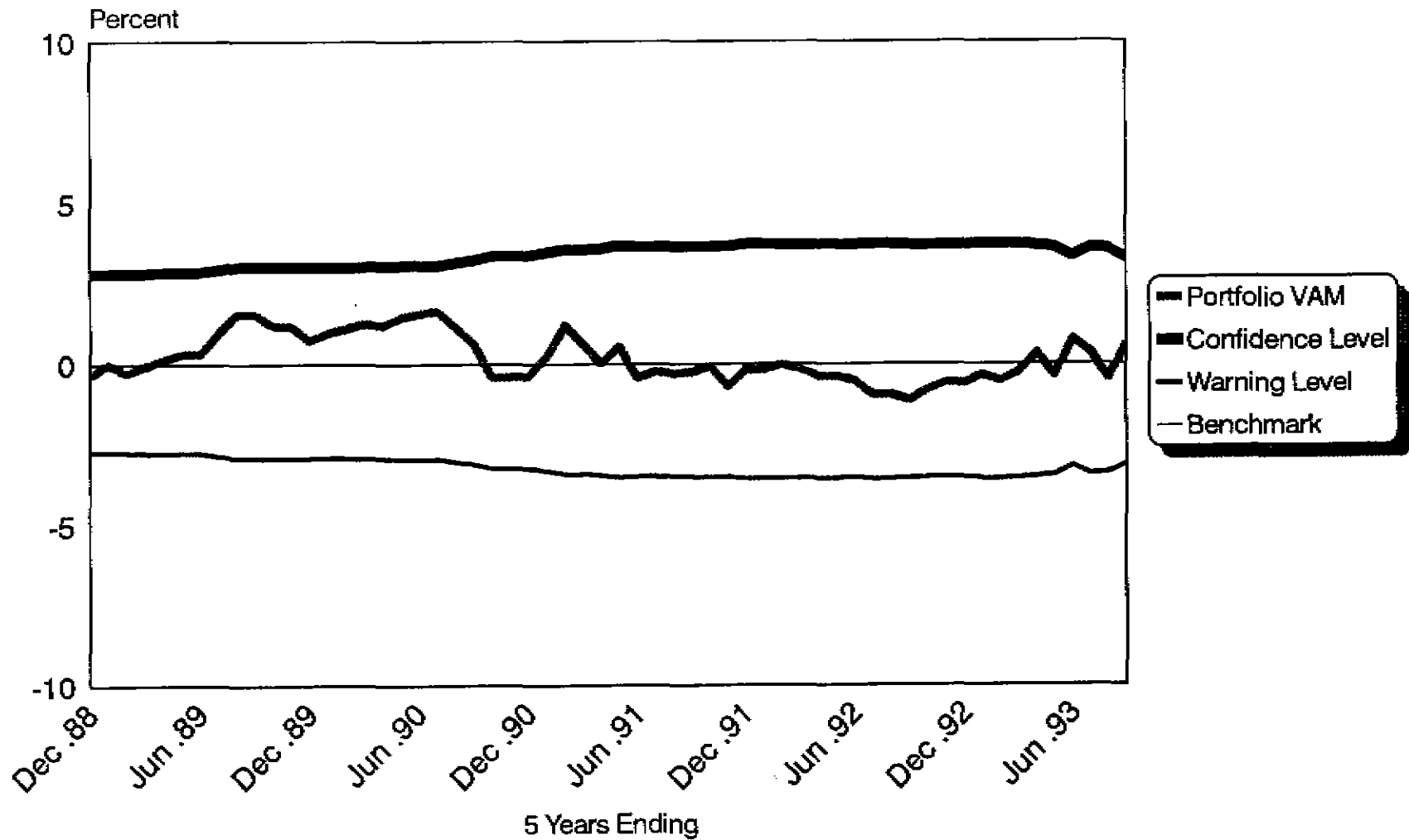
The special committee will use the same process that is applied to hiring new managers. The performance analysis should compare the SBI's actual experience with the manager to the performance of the firm's account composite for the discipline. The account composite should comply with the performance presentation standards of the Association for Investment Management and Research (AIMR). This is the return series that will be used by the manager in most marketing/search presentations. Any

significant differences in performance between the composite and the SBI's actual returns should be explained.

The special committee will recommend either to continue the manager (in effect a recommendation to "re-hire" the manager in question) or to terminate the SBI's relationship with the firm. The recommendation will be forwarded to the Board for action.



**FIGURE 2**  
**ILLUSTRATION OF CONFIDENCE INTERVAL**  
**ACTIVE DOMESTIC EQUITY MANAGER**  
 Rolling Five Year Time Periods



## SECTION 5: REPORTING

### QUARTERLY REPORTS

The SBI will use two reporting formats to communicate information about its managers on a quarterly basis:

- **Manager Commentaries.** Each quarter, each manager will prepare a brief analysis of its own performance over the last quarter and year. This will include a summary of active positions, the philosophy/outlook underlying those positions and explanation of what worked and did not work. In addition, the manager will highlight any significant ownership and personnel changes along with information about accounts gained and lost. Staff comments will be added which state whether the SBI staff/consultant attribution analysis confirms or disputes the manager's description of its active positions. Staff will also comment on the significance or insignificance of the organizational changes described by the manager. The purpose of the commentary is to convey information about, *and directly from*, each manager to the Board/IAC on a regular basis. It will summarize the analysis that staff conducts on an on-going basis for each firm. The format for the Manager Commentary is in *Figure 3*. These commentaries will be included in the materials prepared for the quarterly meetings of the Board/IAC.
- **Performance Reports.** The quarterly performance evaluation report format in *Figure 4* summarizes the salient features of the qualitative and quantitative evaluation guidelines. Qualitative evaluations will be reported on an exception basis. Only in cases where there is cause for concern, or where the manager is exceptionally positive, will the criteria be highlighted. Quantitative evaluations will be presented using the confidence interval/VAM graph approach outlined above. These reports will be reviewed by the IAC on a quarterly basis and presented to the Board. The reports will be shared with the Board's manager during the manager meetings conducted periodically by staff.

### ANNUAL REVIEW OF CUSTOMIZED BENCHMARKS

Staff will prepare an annual review of all domestic stock manager benchmarks. This written analysis will be presented to the Stock and Bond Manager Committee and will

focus on benchmark quality. Since benchmark quality is confirmed, in large part, by statistical tests, a statistical discussion will be included. Staff will incorporate that data in appendices where possible and focus on the conclusions drawn from the analysis in the cover memo/summary of the report. (A similar analysis for domestic bond managers and international stock managers is not necessary *at this time* since they use market indices rather than customized benchmarks for evaluation purposes.)

#### **REPORTS ON MANAGER/STAFF MEETINGS**

Staff will meet with each manager at least annually, either at SBI offices or at the manager's place of business. Any comments on the meetings will be incorporated into the "staff comment" section of the quarterly Manager Commentaries described above.

#### **IN-DEPTH REVIEWS**

Staff will prepare an in-depth written review of a manager if the firm is placed on probation for qualitative reasons or if a manager is to be re-interviewed. While the components of the review may be tailored for each manager, staff expects that such a review will include:

- **Organizational background.** Ownership, professional staff, account growth, staff turnover.
- **Investment approach.** Philosophy, prominent characteristics, perceived changes in approach over time.
- **Performance analysis.** Performance attribution relative to the benchmark, perceived trends in sources of value added/lost.

### FIGURE 3

#### Manager Commentary XYZ Manager

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<b>Period Ending:</b>	<b>x/x/xx</b>		<b>Qtr.</b>	<b>Year</b>
		<b>Actual</b>		
		<b>Benchmark</b>		

---

**1. Past Performance.** Summarize your performance over the last quarter and year. Specifically, what active bets did you make relative to your benchmark? Which of these bets worked/did not work and why?

**2. Future Strategy.** What active bets are in place at the present time relative to your benchmark? Summarize the rationale for making these active bets.

**Commentary (continued)**

**3. Organizational Issues.** Describe any significant ownership or personnel changes at the firm over the last quarter. List accounts gained and lost in this discipline over the same time period.

**4. Other Comments.** Highlight any other issues/events that are pertinent to the management of the SBI account at your firm.

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**Staff Comments**

**FIGURE 4**

**XYZ Manager  
Period Ending x/x/xx**

**Portfolio Manager: xxx**

**Assets Under Management: \$xxx**

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**Investment Philosophy  
(paragraph description)**

**Qualitative Evaluation  
(reported by exception)**

**Quantitative Evaluation  
(SBI actual, net of fees)**

**Recommendations**

**Actual    Benchmark**

Last Quarter  
Last 1 year  
Last 2 years  
Last 3 years  
Last 4 years  
Last 5 years  
Since Incept.

---

**Value of Active Management Graph  
Performance Relative to Benchmark**

VAM graph will be drawn after 2 years for domestic stock and bond managers

When produced, the graph will include up to 10 years of history to give longer term perspective on the pattern of a manager's returns. A shaded area will represent performance prior to retention by the SBI. Those returns will be reduced by the manager's base fee to approximate performance net of fees.

## **SECTION 6: NEW MANAGERS**

The Board is likely to add managers in the future. Many attractive active management approaches are available. Further, the investment management business is highly competitive and dynamic. New active management approaches may emerge and manager organizations change as professionals move from firm to firm. As a result, the Board can benefit by actively seeking new managers who may be able to deliver performance superior to its existing managers.

Hiring a new manager need not imply that the Board is seriously dissatisfied with its existing managers. The Board may simply come to the conclusion that a particular new manager can do a better job than an existing manager. Flexibility with respect to its manager group will present the Board with considerably more options than awaiting seriously poor performance.

However, a flexible approach to hiring new managers should avoid rapid and therefore costly turnover. The expense of terminating and replacing managers likely runs between 2-4% of the affected assets. The Board should be confident that the benefits of changing managers are worth the cost. Nevertheless, in those cases where the benefits appear to outweigh the costs, the Board should not hesitate to change managers.

### **MANAGER SELECTION**

The process of hiring new managers should be as comprehensive and consistently applied as the process of evaluating existing managers. The performance evaluation criteria cited in this paper will be used when searching for new managers, as well as when evaluating existing ones. As discussed previously, the qualitative criteria represent necessary conditions for successful investment management. Generally, no manager will be hired unless it is considered excellent with respect to those qualitative criteria.

With respect to the quantitative criteria, a manager is expected to demonstrate that it can fulfill the Board's long term performance expectations. In general, managers will not be considered if they do not possess appropriate benchmarks. Ideally, the manager should provide historical risk and return data on its benchmark and be able to demonstrate superior performance relative to it. However, this requirement will not always be

attainable. If a manager does not have an appropriate benchmark at the time the firm is retained, the manager will be required to develop one within a mutually agreed upon time period (normally six months or less).

### **MANAGER MONITORING PROGRAM**

The purpose of the Manager Monitoring Program is to maintain up-to-date, relevant information about firms which are likely to be serious candidates in future manager searches. Candidates may be suggested by Board members, IAC members, consultants or staff.

While candidates may be added or deleted at any time, staff will solicit suggestions from the above sources on at least an annual basis. Staff will review all suggested candidates with the Stock and Bond Manager Committee of the IAC. The Committee will then recommend which firms should be monitored on an on-going basis. Due to the quantity of data that is collected, no more than ten firms will be included from each asset class (i.e., domestic stocks, domestic bonds, international stocks).

Qualitative and quantitative data will be tracked for each firm. Quantitative data will include items such as historical returns and benchmark returns. The qualitative data will include information such as investment approach, organizational structure, client profiles and assets under management. Staff will communicate regularly with each firm in order to maintain and update the manager information on an on-going basis.

When the SBI seeks to add or replace one or more managers within an asset class, a Manager Search Committee will be convened. Normally, the Search Committee will include a designee of each Board member and at least two representatives of the IAC. The firms in the Manager Monitoring Program for the asset class in question will be interviewed by the Search Committee and one or more of the organizations will be recommended to the Board.



### Footnotes

1. These characteristics are taken from work published by Richards & Tierney, Inc. an investment management consulting firm which has served as the SBI's consultant. For further information, see Bailey, Richards and Tierney, "Benchmark Portfolios and the Manager/Plan Sponsor Relationship," *Current Topics in Investment Management*, 1990, Harper & Row.
  
2. The ratio of value added to the expected variability of that value added is called the information ratio (IR). It provides a statistical measure of a manager's ability to provide consistent returns relative to a benchmark. In more mathematical terms this can be expressed as follows:

$$\begin{aligned}
 IR &= \text{Value Added} / \text{Volatility of Value Added} \\
 &= (\text{Expected return vs benchmark}) / (\text{Expected volatility of return vs benchmark})
 \end{aligned}$$

Therefore, the "superior" manager in the illustration with 2% value added and volatility of 5% has an information ratio of 0.4 (2% / 5%=0.4).

3. Probabilities of outperforming a benchmark for different information ratios or varying levels of investment skill and varying time periods are shown below:

Years	Information Ratio					
	0.20	0.30	0.40	0.67	0.80	1.00
0.5	55.63%	58.40%	61.14%	68.13%	71.42%	76.02%
1.0	57.93	61.79	65.54	74.75	78.81	84.03
3.0	63.81	69.83	75.58	87.59	91.71	95.84
5.0	67.26	74.88	81.45	93.20	96.32	98.73
10.0	73.65	82.86	89.70	98.25	99.43	99.92
20.0	81.70	91.01	96.32	99.86	99.98	99.99

Source: Richards & Tierney, Inc.

## APPENDIX

### Further Discussion of Confidence Intervals

This appendix provides a non-technical description of the confidence intervals used in the Manager Continuation Policy. More detailed discussions can be found in standard statistics textbooks.

The construction of a manager's confidence interval begins with a very simple assumption: the manager has no investment skill. Referring to *Figure 2*, if this assumption were true, then the manager's relative return (i.e., the difference between the return on the manager's portfolio and the return on the manager's benchmark) would be expected to plot along the horizontal line representing the manager's benchmark returns. The manager would be expected to neither outperform nor under perform its benchmark over any given time period.

However, due to the inherent variability of investment returns, even a no-skill manager's returns will sometimes exceed those of its benchmark. At other times, this manager's returns may fall below the benchmark. These results will occur despite the fact that, over the long-run, the manager's performance will equal that of the benchmark.

Can a plan sponsor make some statements about the range over which the no-skill manager's returns are likely to fall around its benchmark's returns? A confidence interval provides a statistical description. Based on the manager's past variability of returns relative to its benchmark, a plan sponsor can calculate, with a specified probability of being correct, the range of performance within which we expect the no-skill manager's cumulative relative return to fall. This range is referred to as a "confidence interval."

The vertical width of the confidence interval is determined by the probability of the confidence interval encompassing the manager's relative returns over time. The higher (or conversely, the lower) the probability of capturing the manager's returns, the wider (or conversely, the narrower) the confidence interval will be. For example, assume that the confidence interval in *Figure 2* is constructed to encompass 80% of the possible relative returns that the no-skill manager might produce. That is, assuming that the manager's relative returns exhibit the same variability in the future that they have in the past, there is an 80% probability that the manager's relative return will fall somewhere between the

upper and lower confidence bands. This implies that there is a 20% probability that the manager's relative return will lie outside the confidence interval. Even more specifically, there is a 10% probability that the manager's relative return will fall above the upper confidence level and a 10% probability that it will fall below the lower confidence level.

The particular percentage of possible cumulative relative returns captured by the confidence interval will change depending on how it is constructed. There is no single "correct" percentage. Presumably, returns falling outside of the confidence interval should signal unusual events. The purpose of this signal is to make the SBI re-think its no-skill assumption. That is, if a manager's relative return exceeds the upper confidence level, then perhaps the manager's investment talents actually are superior. Conversely, if the manager's relative return falls below the lower confidence level, then perhaps the manager's talents actually are *inferior*.

The appropriate percentage to use in constructing manager confidence intervals depends on each plan sponsor's view of what is an unusual event. The SBI has chosen to use a confidence interval that captures 80% of the manager's possible relative returns. That means that 10% of the time, a no-skill manager's relative return will fall below the lower confidence level simply by chance, not because the manager is actually inferior.

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**REPORT OF THE TASK FORCE  
ON MANAGER RETENTION**

**JUNE 1990**

**Members of the Task Force:**

Judy Mares, Chair  
Jim Eckmann, Dayton-Hudson  
Jim Hacking, PERA  
Debbie Veverka, Honeywell  
Jan Yeomans, 3M

**Note:** This document combines the two reports presented to the Board by the Task Force at the January 10, 1990 and June 6, 1990 meetings of the SBI.

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## **INTRODUCTION**

At the Board's request, the Investment Advisory Council formed an ad hoc study group to examine a variety of issues relating to active managers. This report summarizes the findings and recommendations of the Task Force on Manager Retention. The Task Force as convened in November 1989 and presented its final recommendation to the State Board of Investment (SBI) in June 1990.

## **FINDINGS AND CONCLUSIONS**

### **Issue #1: Should the SBI utilize active managers?**

**Decision:** Yes. The Task Force believes that active management can add value over the long term. However, given the large size of the Basic Funds, the Task Force believes that the assets committed to active management should be constrained.

More information on this issue is contained in Attachment A. In addition, active/passive strategies were discussed in "Basic Retirement Funds Policy Papers-Part III" (May 1987).

### **Issue #2: Should the SBI use customized benchmarks?**

**Decision:** Yes. The Task Force believes that a customized benchmark is a better representation of a manager's specialized investment style/approach than a broad market index. Therefore, the Task Force endorses the current policy to use benchmarks as the standard against which individual managers are measured.

The construction and application of benchmarks has been discussed in the following staff position papers:

- Normal Portfolios Concepts and Applications (March 1985)
- Basic Retirement Funds Policy Papers-Part III (May 1987)
- Manager Continuation Policy (March 1988)

### **Issue #3: Should the SBI reduce the existing style bias or "misfit" in the stock segment of the Basic Funds?**

**Decision:** Yes. The Task Force is comfortable with the use of specialized active managers provided the manager group covers the entire market adequately (i.e., the aggregate benchmarks approximate the broad market). The Task Force observes that the SBI has not provided this coverage with its existing

active stock manager program. The active manager group has shown a persistent over-exposure to small, growth oriented stocks during a prolonged period when this segment of the market has underperformed significantly. This is the primary reason why the manager's benchmarks, individually and in aggregate, have underperformed the broad market.

The Task Force believes that unintended misfit is counterproductive and should be minimized as efficiently as possible. The Task Force believes the characteristics of the index fund should be modified or "tilted" to compensate for misfit.

More information on this issue is included in Attachment B.

**Issue #4: Should the SBI's Manager Continuation Policy be modified?**

**Decision:** Yes. The Task Force endorses the underlying structure of the qualitative/quantitative evaluation framework in the manager continuation policy. However, the Task Force believes that the focus on cumulative performance may allow recent deterioration to be overlooked. Therefore, the Task Force endorses a change to the Manager Continuation Policy that would trigger an in-depth analysis at various intervals.

## **RECOMMENDATIONS**

Based on the findings and conclusions noted above, the Task Force recommends that the SBI take the following actions:

- 1) The Task Force recommends that the SBI re-affirm its policy that up to 50% of the stock and bond segments in the Basic Funds be managed actively.
- 2) The Task Force recommends that the SBI re-affirm its policy that customized benchmarks are used as the standard against which individual active managers are measured.
- 3) The Task Force recommends that the SBI construct and maintain a custom tilted index fund which will offset the style bias or misfit in the stock segment of the Basic Retirement Funds.

Further, the Task Force recommends that the transition from the current index to the tilted index should be phased-in on a quarterly basis over the next two years or until the dollar impact of the historical misfit has been neutralized, whichever comes first.

- 4) The Task Force recommends that the SBI re-affirm the qualitative/quantitative approach to evaluation in the Manager Continuation Policy. Specifically:
  - The qualitative guidelines remain appropriate and should not be changed.
  - The quantitative guidelines should be modified somewhat. The current "probation line" should be eliminated. In order to highlight recent trends, an in-depth analysis should be conducted if a manager's performance lags its benchmark over the latest five year period. The analysis should result in a recommendation from the IAC to continue or terminate the manager. This action will constitute a vote of "confidence" or "no-confidence" in the manager's ability to add value in the future.
  - Each active manager should receive an in-depth review on both qualitative and quantitative factors once every three years regardless of its performance relative to its benchmark. The analysis should be reviewed by the IAC.



## ATTACHMENT A

### USE OF ACTIVE AND PASSIVE MANAGEMENT IN THE BASIC RETIREMENT FUNDS

Currently, Board policy calls for at least one-half of the stock and bond assets in the Basic Retirement Funds to be managed passively (i.e., indexed).

- Stocks

Passive management was first introduced in 1983. At that time, two-thirds (2/3) of the stock segment was indexed and one-third (1/3) was placed with active managers. This 2/3 passive, 1/3 active split has remained fairly constant since 1983.

- Bonds

Semi-passive management was introduced at the start of fiscal year 1989. At that time, one-half (1/2) of the bond segment was moved from active managers to *enhanced index managers*. The 1/2 passive, 1/2 active division has remained quite stable since semi-passive management was added.

The Task Force endorses the Board's existing policy on active/passive mix. The Task Force bases its endorsement on two conclusions:

- The Task Force believes that active management can add value over the long term. As a result, the Task Force believes it is appropriate for the SBI to utilize active stock and bond managers in its management of the Basic Funds.

The Task Force urges the SBI to look at more than very recent experience when making long-term decisions on the use of active management. In the 1970's and early 1980's, most active managers, regardless of their style orientation, had little difficulty "beating the market." In the mid 1980's, just at the time the SBI first retained external active stock managers, this pattern reversed itself and most active managers began underperforming relative to the market. The pattern could easily reverse itself again during the 1990's and active managers could once again consistently beat the market.

- Given the large size of the Basic Funds, the Task Force believes that assets committed to active management must be constrained. A 1/2 active, 1/2 passive policy guideline means the SBI would maintain more than \$3 billion under active management over the next few years. This translates to at least 15-20 stock and bond managers with portfolios of \$150-200 million each. The Task Force believes that the universe of active managers capable of handling accounts of this size is

## ATTACHMENT A (con't)

somewhat limited. In addition, there are practical constraints on the number of managers that can be monitored and evaluated effectively by SBI staff. The 1/2 active, 1/2 passive guideline addresses these constraints on a practical level.

The Task Force recommends that the Board reaffirm its current policy guideline that up to one half of the stock and bond segments in the Basic Funds be actively managed. This recommendation is made based on the belief that active management can add value over the long term.



## **ATTACHMENT B**

### **MISFIT CONTROL USING A CUSTOM TILTED INDEX FUND**

#### **WHAT IS MISFIT?**

"Misfit" is the difference between the aggregate benchmarks of the active managers and the asset class target, i.e., the Wilshire 5000.

The SBI's active stock manager group has shown a significant misfit versus the market in three major areas:

- persistent over-exposure to small capitalization stocks
- persistent over-exposure to growth oriented stocks
- persistent under-exposure to yield oriented stocks

The active manager group has held the bias toward small, growth oriented stocks during a prolonged period when this segment has underperformed significantly. This is the primary reason why the manager's benchmarks, individually and in aggregate, have underperformed the broad market (see Figures 1, 2, 3 and 4).

In the future, the aggregate benchmarks of the current active manager group can be expected to vary up to 3.2 percentage points above or below the Wilshire 5000 on an annual basis. This variance can easily overwhelm any value added through active management.

#### **WHAT COURSES OF ACTION ARE AVAILABLE?**

The Task Force believes that the Board can take one of three basic courses of action with respect to the existing misfit:

- It can make an explicit choice to leave the misfit in place indefinitely. This amounts to a decision, or "bet", that small growth stocks will outperform the market in the future.
- It can take action to reduce the misfit using one or more of the following strategies: reallocating assets among existing managers, adding new managers, establishing a completeness fund, or modifying the characteristics of the current fund.

## ATTACHMENT B (con't)

- It can leave the current bias toward small growth stocks in place for the time being and then take action to reduce the misfit at some point in the future.

The Task Force believes that unintended misfit is counter-productive over the long term and may mask the value added by active management. Therefore, the Task Force recommends that the SBI reduce its exposure to misfit risk in a cost efficient manner.

### HOW SHOULD THE MISFIT BE CONTROLLED?

The Task Force examined several alternatives to control misfit risk:

- **Reallocating Assets Among Existing Managers**

In varying degrees, all of the SBI active managers have a bias toward the small-growth area of the market. As a result, reallocating assets among the existing managers will do little to offset the existing bias (See Figure 2).

- **Adding New Active Managers**

The universe of available active managers is oriented toward the small-growth area of the market (see Figure 5). Efforts to offset the existing bias by adding new active managers will be relatively ineffective. In 1989, the SBI attempted to reduce its growth bias by adding four managers with a value orientation (Concord, Franklin, Rosenberg, Sasco). While the new managers did impact the characteristics of stock segment, they did not reduce the overall misfit significantly.

- **Adding a Large-Value Index Portfolio**

The SBI could attempt to counter balance the existing misfit by adding a passive portfolio that is indexed to large-value stocks. However, since the existing misfit is not solely a small-growth bias, this strategy would not reduce misfit dramatically. Further, the performance of this portfolio would vary widely on a year-to-year basis relative to the Wilshire 5000. (See Figures 6 and 7.)

- **Establishing a Completeness Fund**

A completeness fund is a portfolio specifically designed to compensate for misfit. It "completes" the active manager group by investing in those areas of the market that are not covered by the aggregate benchmarks of the active managers. A completeness fund could be managed passively or actively but is constrained by the amount of assets devoted to it. A \$200-250 million completeness fund would reduce misfit somewhat. However, like the Large-Value Index, the performance of a completeness fund of this size would vary widely on a year-to-year basis. (See Figures 6 and 7. For a more complete discussion, see the staff position paper entitled "Completeness Fund," February 1988).

## ATTACHMENT B (con't)

- **Tilting the Characteristics of the Index Fund**

The index fund represents approximately 60% of the entire common stock segment of the Basic Funds. Because of its large size, the index fund can be a powerful lever in managing the characteristics of the entire stock segment. With relatively minor changes in its holdings, the index fund could be modified or "tilted" to compensate for the existing misfit in the active manager group (see Figure 8). These changes would reduce the misfit of the Basic Funds stock segment by more than one-half (see Figure 7).

Due to the changes in its composition, the returns of the tilted index will not track the Wilshire 5000 as closely as the current index fund. However, the combination of active manager benchmarks and the titled index fund should vary no more than 60 basis points above or below the Wilshire 5000 on an annualized basis. This is very close to the tracking error expectation for the current index fund (see Figure 9).

The Task Force believes that the SBI should utilize a tilted index fund to control misfit in the stock segment of the Basic Funds. It is clearly the most efficient method among the alternatives available to the SBI at this time.

### **WHEN SHOULD THE TRANSITION OCCUR?**

The Task Force acknowledges that misfit has reduced investment returns in the Basic Funds. From January 1984-December 1989, the cumulative dollar impact of misfit in the stock segment was -\$65 million. Strong relative performance in the small growth area of the market in the future could reverse this impact. However, the Task Force does not believe it is prudent to delay implementation of misfit control indefinitely.

Therefore, the Task Force recommends that the transition to a tilted index fund be phased-in on a quarterly basis over a period not exceeding two years. If the cumulative impact of the misfit is neutralized (reduced to approximately \$0) prior to the end of the two year period, the Task Force recommends that any remaining portion of the "tilt" to the index be made immediately.

# SMALL CAPITALIZATION STOCKS

## Periods of Under and Over Performance 1926 - 1989

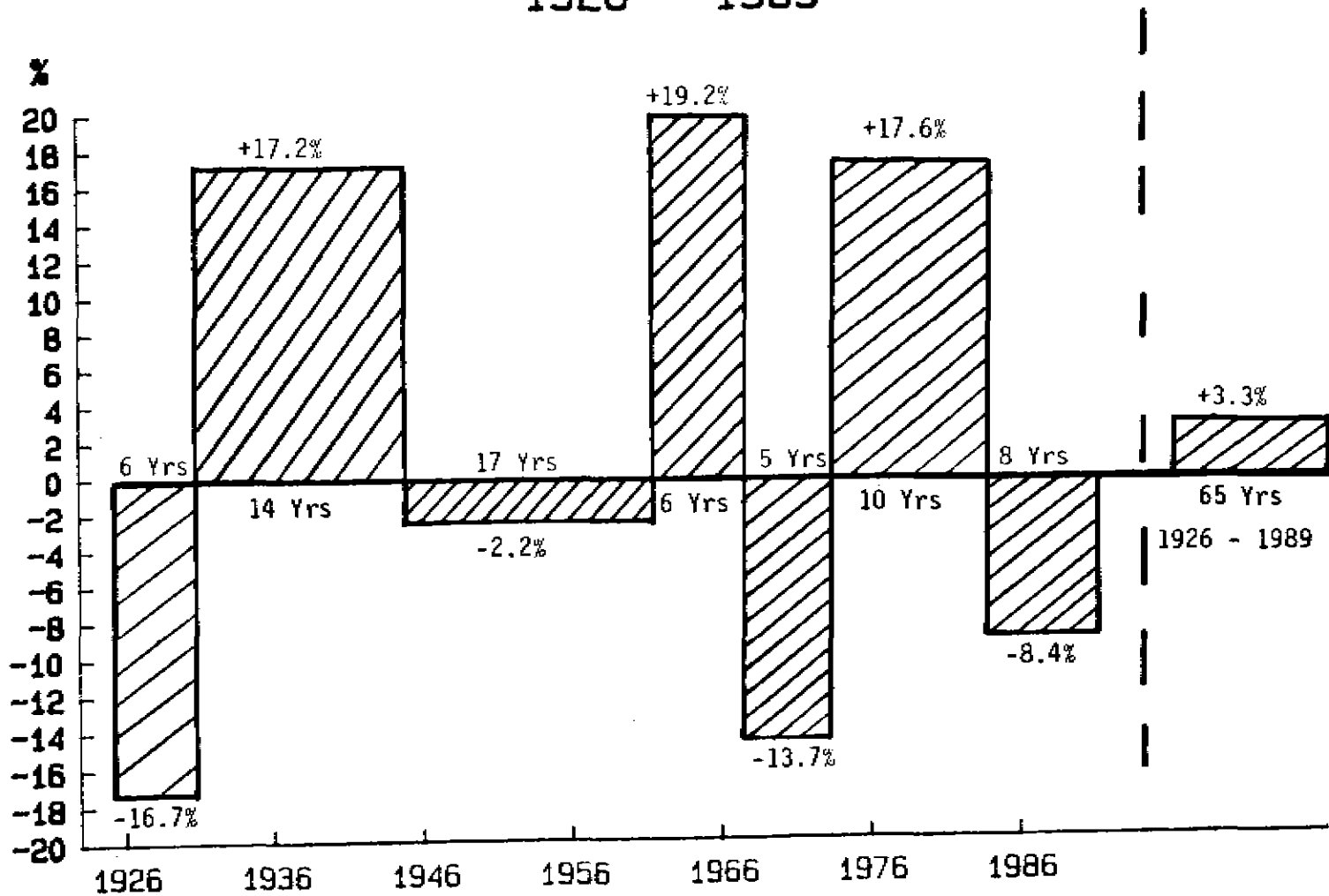


FIGURE 1

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Source: Ibbotson Associates

FIGURE 2

# SBI ACTIVE MANAGERS VS. MARKET

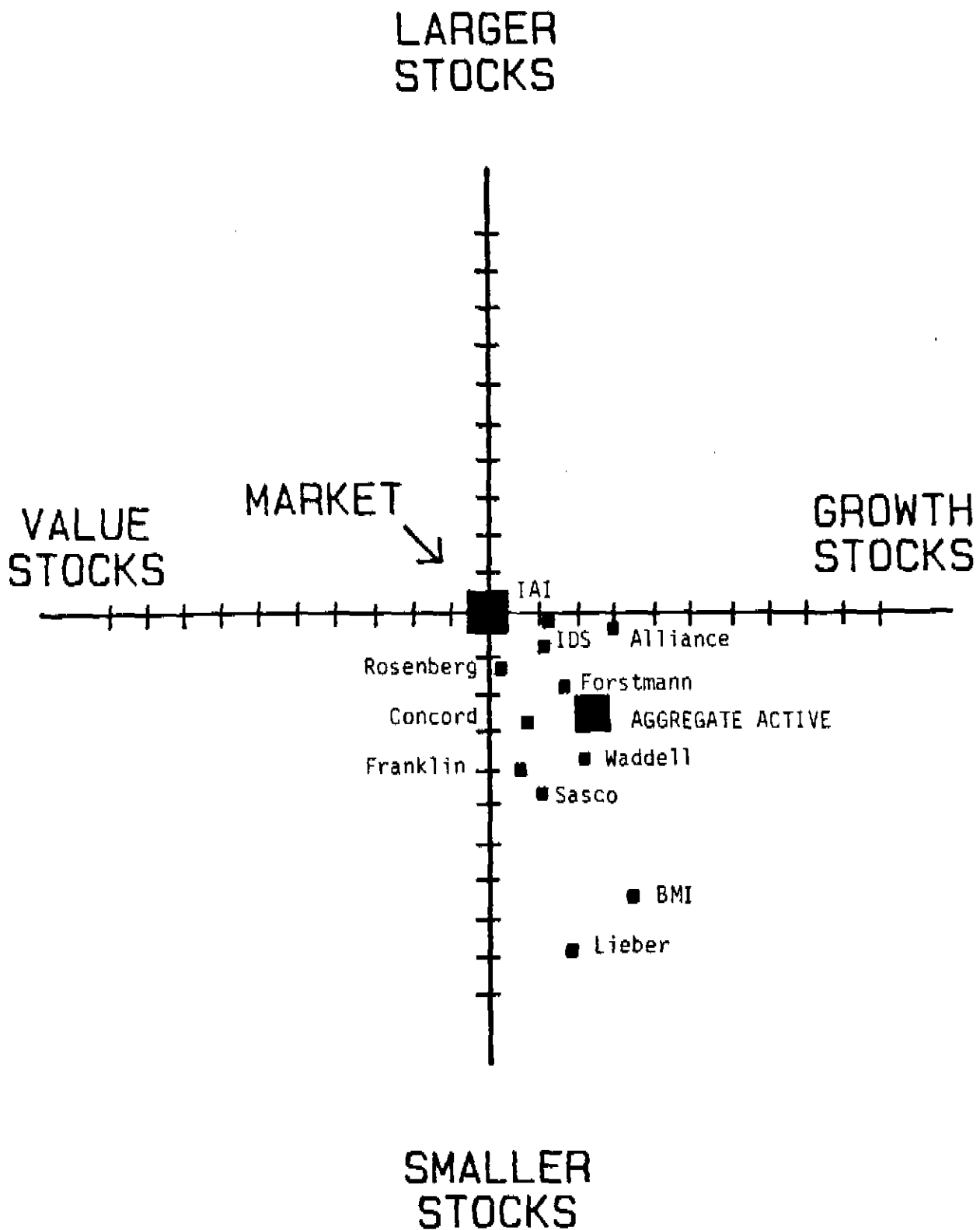


FIGURE 3

STOCK MARKET RETURNS  
BEFORE MANAGERS WERE HIRED

1977 - 1983

Wilshire 5000: 17.2%

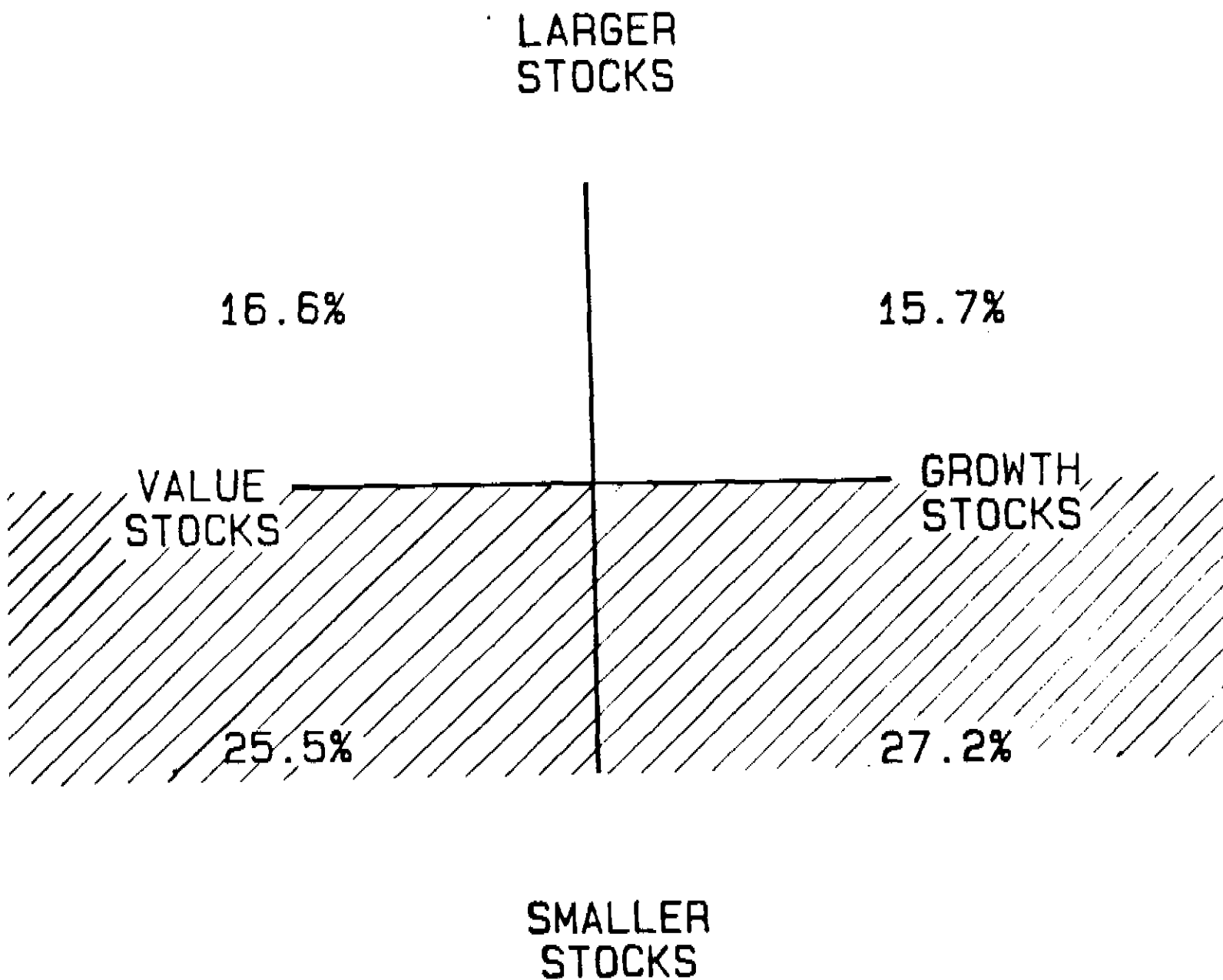
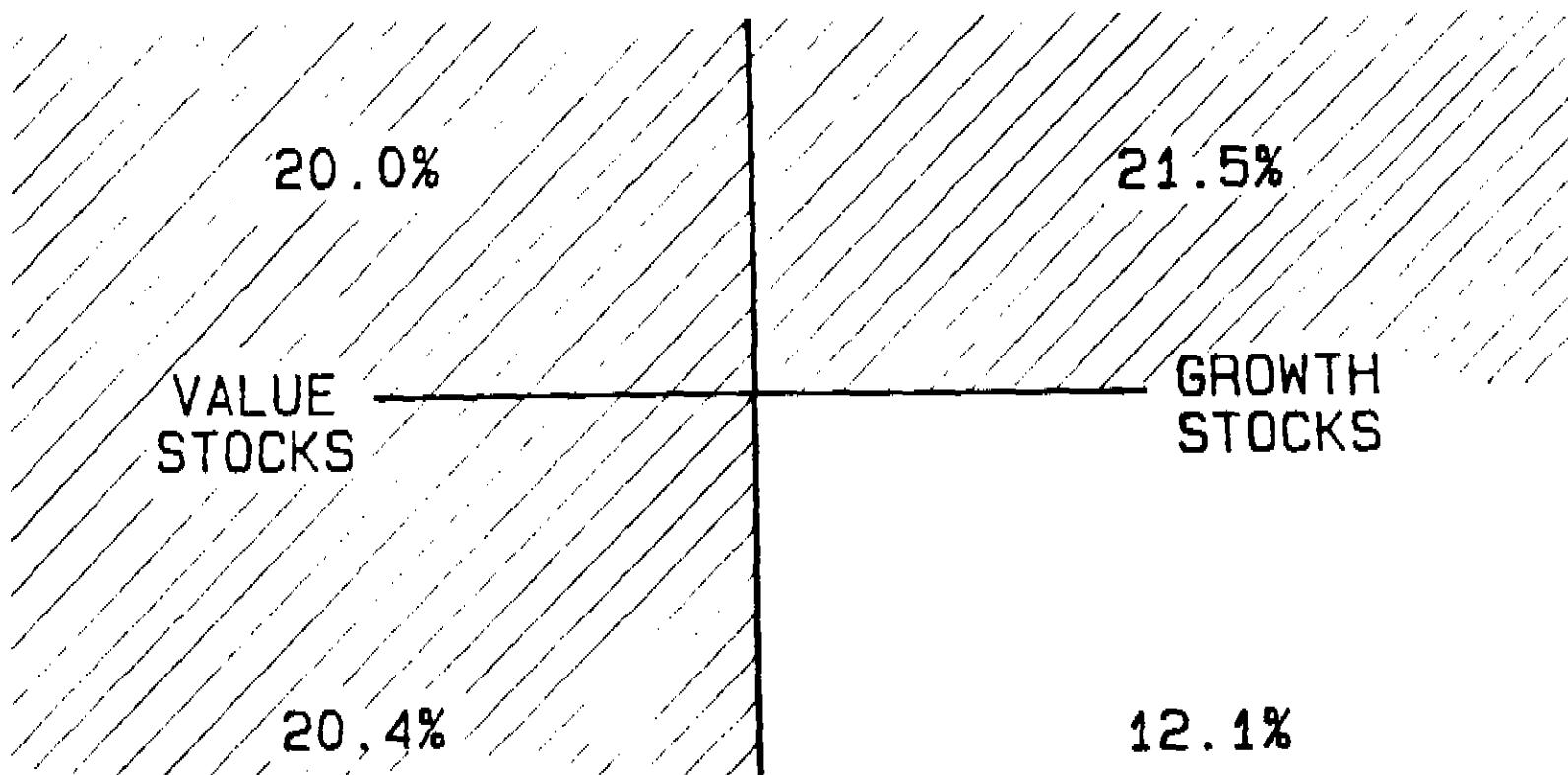


FIGURE 4

STOCK MARKET RETURNS  
AFTER MANAGERS WERE HIRED  
1985 - 1989

Wilshire 5000: 19.1%

LARGER  
STOCKS

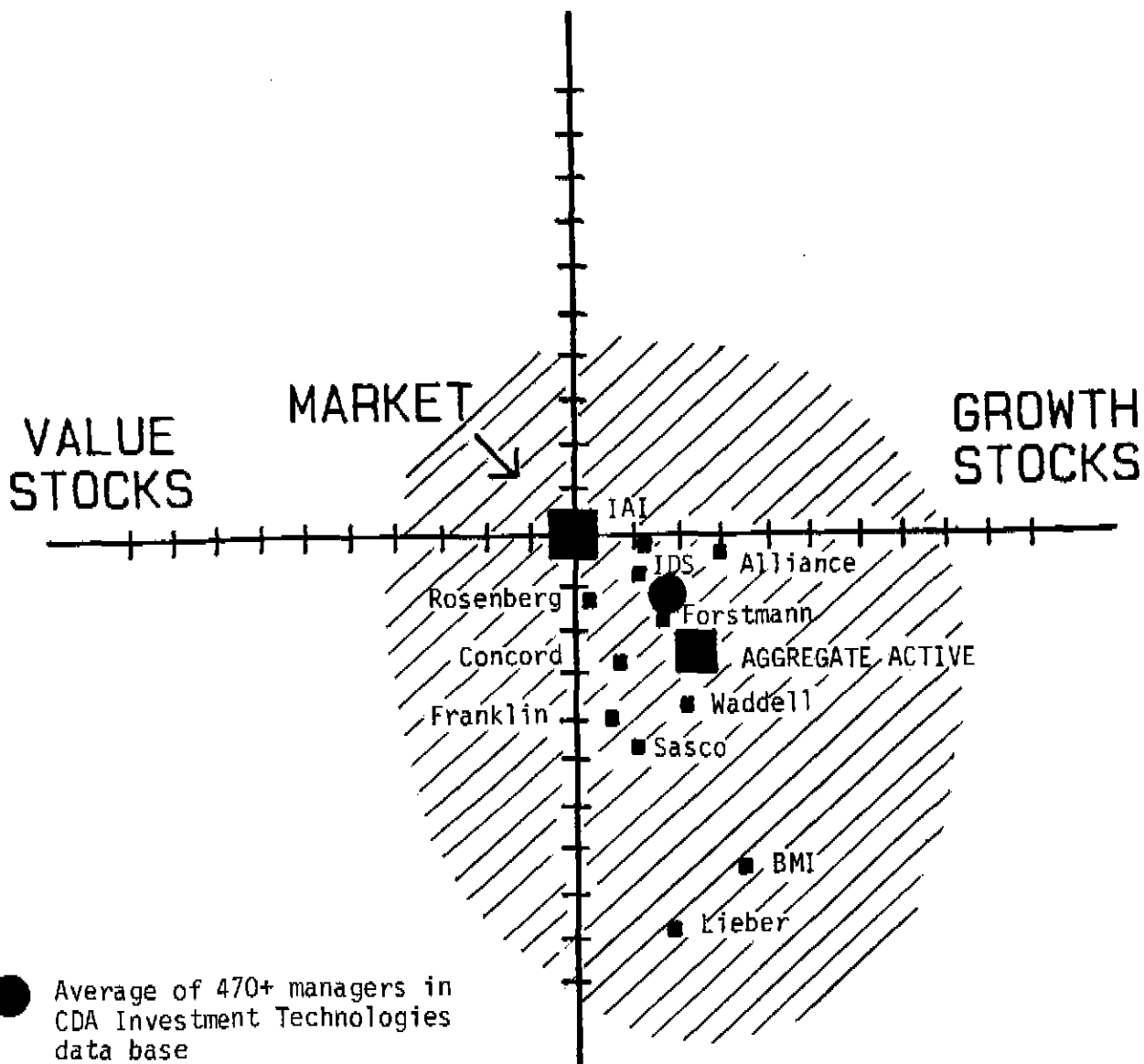


SMALLER  
STOCKS

FIGURE 5

# ACTIVE MANAGER UNIVERSE VS. MARKET

LARGER  
STOCKS



SMALLER  
STOCKS



## Expected Variability of Returns Relative to Wilshire 5000

	<b>Annualized</b>
<b>Current Active Managers Benchmarks</b>	<b><math>\pm 3.20\%</math></b>
<b>Large Value Style Index</b>	<b><math>\pm 6.35\%</math></b>
<b>Active Manager Completeness Fund</b>	<b><math>\pm 5.62\%</math></b>

Data Source: BARRA

## Relative Efficiency of Misfit Control Strategies

<b>Current Active Managers Combined with</b>	<b>Resulting Misfit</b>	<b>Net Change</b>
<b>Current Index</b>	<b><math>\pm 1.43</math></b>	<b>---</b>
<b>Large Value Style Index</b>		
<b>@ \$300 million</b>	<b><math>\pm 1.33</math></b>	<b>-0.10</b>
<b>@ \$500 million</b>	<b><math>\pm 1.35</math></b>	<b>-0.08</b>
<b>@ \$700 million</b>	<b><math>\pm 1.45</math></b>	<b>+ 0.02</b>
<b>Active Manager Completeness Fund @ \$238 million</b>	<b><math>\pm 1.14</math></b>	<b>-0.29</b>
<b>Tilted Index</b>	<b><math>\pm 0.59</math></b>	<b>-0.84</b>

Note: All figures are annualized percentage points.

Source: BARRA

## Transition from Current Index to Custom Tilt Index

<b># ISSUES:</b>	<b>Current</b> <b>1607</b>	<b>Tilted</b> <b>1369</b>
------------------	-------------------------------	------------------------------

**TURNOVER:**                      less than 15%

### MARKET CAPITALIZATION STRUCTURE WILL CHANGE

	<b>Current</b>	<b>Tilted</b>
<b>\$10 Billion and Above</b>	<b>32.78%</b>	<b>48.16%</b>
<b>Average</b>	<b>\$1.8 Billion</b>	<b>\$2.0 Billion</b>

### MARKET RISK (BETA) WILL CHANGE

	<b>Current</b>	<b>Tilted</b>
<b>Beta &lt; 1</b>	<b>42.6%</b>	<b>51.8%</b>
<b>Average</b>	<b>1.0085</b>	<b>0.9619</b>

### SECTOR EXPOSURES WILL CHANGE

	<b>Current</b>	<b>Tilted</b>	
<b>Basic Materials</b>	<b>11.26%</b>	<b>8.95%</b>	<b>(2.31)</b>
<b>Energy</b>	<b>9.39</b>	<b>13.73</b>	<b>+4.34</b>
<b>Technology</b>	<b>8.13</b>	<b>4.37</b>	<b>(3.76)</b>
<b>Utilities</b>	<b>16.11</b>	<b>19.86</b>	<b>+3.75</b>

## Expected Variability of Returns Relative to Wilshire 5000

### Basic Funds Stock Segment With Current Index

Current Active Managers Benchmarks	$\pm 3.20\%$
Current Index Fund	$\pm 0.53\%$
Combined	$\pm 1.43\%$

### Basic Funds Stock Segment With Tilted Index

Current Active Manager Benchmarks	$\pm 3.20\%$
Tilted Index Fund	$\pm 1.40\%$
Combined	$\pm 0.59\%$

## History of Style Bias/Misfit

- 1982 - 83**      **Board Selected Original Active Managers**
- Emphasized past performance vs. the market
  - Resulted in unintended bias toward small growth
- 1985**            **Board Reallocated Within Active Group**
- Terminated several managers
  - Provided better balance between growth and value
  - Still over emphasized small cap
- 1985 - 86**      **Board Approved Use of Benchmarks**
- Provided tool to specify/quantify existing bias
- 1986 - 87**      **Board Adopted Basic Funds Policy Paper**
- Opposed style-timing
  - Identified need to offset existing unintended bias
  - Introduced completeness fund concept
- 1987 - 88**      **Board Terminated Additional Managers**
- Added to small-growth bias
- 1988**            **Staff Proposed Completeness Fund Plan**
- Proposal was not recommended by IAC
  - Staff began research on alternatives
- 1988**            **IAC Re-affirmed Need to Address Style Bias**
- Urged Board to reduce small-growth bias through the addition of new managers or other means
- 1988 - 89**      **Board Considered/Approved New Managers**
- Reduced (but did not eliminate) small-growth bias

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## **MANAGER MONITORING PROGRAM**

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### **Description**

The purpose of the Manager Monitoring Program is to maintain up-to-date, relevant information about investment firms which the Board, IAC, Consultant or Staff feels are likely to be serious candidates in future equity manager searches.

The program will track quantitative and qualitative information regarding the firms. Quantitative data will include items such as historical returns and benchmark returns. The qualitative data will include information such as investment approach, organizational structure and client profiles.

### **Managers to be Monitored**

As determined by the Equity Search Committee during the recent manager search process, the following firms initially are to be included in the Manager Monitoring Program:

Brandywine Asset Management  
Fayez Sarofim  
Fisher Investments  
IAI Small Cap Regional  
Mitchell Hutchins (UnCommon Value)

Additional candidates may be suggested by Board members, IAC members, Staff or the Consultant. Staff will review all suggested candidates with the IAC Stock and Bond Manager Committee. Due to the quantity of data collected, the number of managers in the system at one time should be limited to 15.

### **Components of the System**

The monitoring program will consist of the following components:

1. **Basic Manager Information**

This information is to be gathered when coverage of a manager is initiated. For the current group of managers, this information will be gathered from the questionnaire used in the last equity manager search. See the attached Exhibit 1 for the questionnaire to be sent to future managers added to the program.

2. **Quarterly Updates**

On a quarterly basis, the managers will be sent a brief questionnaire (Exhibit 2). This questionnaire is intended to inform staff of any changes in the organization or its investment process. The manager will also submit quarterly performance data for actual and benchmark results.

3. Annual Updates

On an annual basis, the manager will be sent a more detailed questionnaire (Exhibit 3). This includes all topics covered in the quarterly questionnaire as well as providing details of the manager's client and asset relationships.

4. Manager Meetings

Staff will conduct annual meetings with the managers in order to gain further insight into the managers' performance and organizational status.

**Applications of the Monitoring System**

The information gathered from the above sources will be input into a database. Periodic reviews of the data will be provided to the IAC Stock and Bond Manager Committee.

A Search Committee would be reconvened as necessary to formally consider candidates and recommend that one or more firms from the Manager Monitoring Program be retained by the Board.

**MINNESOTA STATE BOARD OF INVESTMENT  
EQUITY INVESTMENT MANAGER INFORMATION**

**I. Background Data**

1. Name of Firm: \_\_\_\_\_
2. Discipline/Style: \_\_\_\_\_
3. Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Telephone: \_\_\_\_\_
5. Fax: \_\_\_\_\_
6. Contact: \_\_\_\_\_
7. Date Business Commenced: \_\_\_\_\_
8. Affiliation with other firms (i.e., parent management companies, insurance companies, brokerage firms, investment banking firms, or other entities):
9. Ownership:
10. Is the firm registered as an investment advisor under the Investment Advisors Act of 1940; a bank, as defined in the act; an insurance company qualified to act in such capacity under the laws of Minnesota and one other state?

**II. Organization/Staff**

**A. Professional Staff**

1. Number of Investment Department Personnel: \_\_\_\_\_
2. Number of Portfolio Managers:
3. Number of Full-time Security Analysts: \_\_\_\_\_
4. Number of Economists: \_\_\_\_\_

5. Number of In-house Traders: \_\_\_\_\_
6. Number of portfolio managers and investment analysts added in the past three years: \_\_\_\_\_
7. Number of portfolio managers and investment analysts who have left in the past three years: \_\_\_\_\_
8. Elaboration on answers to questions #6 and #7.

9. Experience of Investment Personnel

		<u>Number of Years</u>		
		<u>Average</u>	<u>Low</u>	<u>High</u>
	Portfolio Managers	_____	_____	_____
	Investment Analysts	_____	_____	_____

10.	Dollars under management per portfolio manager:	<u>Average</u>	<u>Low</u>	<u>High</u>
		_____	_____	_____

11.	Number of accounts per portfolio manager:	<u>Average</u>	<u>Low</u>	<u>High</u>
		_____	_____	_____

12. Limit on number of accounts per portfolio manager: \_\_\_\_\_

13. Please provide biographical data on key investment personnel, including education and work experience.

B. Assets/Client Relationships

1. For all assets under management as of the end of last quarter, provide the following information:

<u>Accounts</u>	<u>Number</u>	<u>Assets ( \$ in millions )</u>				<u>Percent of Assets Fully Discretionary</u>
		<u>Total</u>	<u>Stocks</u>	<u>Bonds</u>	<u>Other</u>	
Total						
Tax Exempt						

2. Account Breakdown for the stated discipline/style:

	<u>Number of Tax-exempt accounts</u>				
	<u>Last qtr</u>	<u>12/31/91</u>	<u>12/31/90</u>	<u>12/31/89</u>	<u>12/31/88</u>
Under \$10 million					
\$10 - \$25 million					
\$25 - \$50 million					
\$50 - \$100 million					
Over \$100 million					
Total #					
Total (in \$)					
Largest Account (in \$)					
Smallest Account (in \$)					

3. Describe any limitations the firm currently imposes or plans to impose for the stated discipline/style regarding:

- (a) Number of Client Relationships
- (b) Total Assets Under Management
- (c) Maximum Account Size
- (d) Minimum Account Size

4. List the names and the dollar amount of the firm's five largest equity tax-exempt accounts for the stated discipline/style.

5. Provide the names and sizes of all tax exempt accounts gained during the last five years for the stated discipline/style.

6. Provide the names and sizes of all tax exempt accounts lost during the last five years for the stated discipline/style.

7. Does the firm utilize performance-based fees for any of its current clients? If no, would the firm consider a performance-based fee arrangement with the SBI?

C. Financial Viability and Ethics

- 1. Describe any censure by the SEC or any litigation pending against the firm.
- 2. Is the firm aware of any potential conflicts of interest in managing the SBI's assets.

3. Does the firm maintain written policies and guidelines to assure compliance with governing securities laws and regulations? Briefly describe your monitoring process.

### III. Investment Approach

#### A. Investment Philosophy

1. Describe the firm's overall investment philosophy regarding equities.
2. Does the firm utilize any customized benchmarks (normal portfolios) that differ in some way from the broad market indices? If yes, please provide a description of the benchmark construction process. If no, would you be willing to construct one?

#### B. Investment Management Process

1. Describe the firm's portfolio construction process.
2. Describe the allocation to cash during the past five years.
3. Describe the firm's stock selection process.
4. Describe the firm's trading operations and techniques.
5. What is the average annual level of portfolio turnover experienced during the past five years?
6. The SBI's Investment Guidelines (i.e., restrictions concerning allowable investments and target risk-return parameters) are enclosed. How would these guidelines affect the firm's investment approach.

#### C. Miscellaneous

1. Will the SBI's account be managed on a separate basis? If not, explain.
2. What does the firm perceive its weakness(es) to be, if any, in its organization and/or investment approach?

#### **IV. Return History and Asset Listings**

- A. Detailed performance history requirements are specified in Attachment A accompanying this questionnaire. Please complete the data sheet for actual and benchmark portfolios according to those requirements. Please specify which benchmark you are using. If you are using a market index, you do not need to submit benchmark return data.
  
- B. Please submit actual and benchmark asset listings as described in Attachment B. If you are using a market index, you do not need to submit benchmark asset listings.

**Attachment A**  
**Actual and Benchmark Returns**

1. Please note that return data should be provided for a minimum of two (2) years. More than five (5) years is highly desirable and we prefer as long a time period as possible. We will not accept any backtested data or any results generated by individuals prior to their association with your firm.
2. Please list the name of the benchmark against which your performance is most appropriately compared. Please state the cash position that was incorporated into the benchmark, if any, to calculate benchmark returns.
3. Please report all historical returns before fee payments are deducted and out to at least two decimal places. To the extent possible, you should follow the reporting standards set forth by AIMR in "Report of the FAF Committee for Performance Presentation Standards."
4. Composite returns are preferred over individual account returns. The composite should include all accounts that existed during each time period to eliminate survivor bias. Please calculate the composite on a portfolio market value weighted basis rather than an equal weighted basis. If you can not provide us with a market weighted composite, please describe how the composite was calculated.
5. If a composite is not available, please provide data from a representative account that is as similar as possible to the MSBI's typical account size (\$100 million or more) and investment restrictions. Identify the client account provided. You must provide returns for this same account in the future.
6. Monthly returns are preferred. If monthly data is not available, please substitute quarterly returns.
7. Please complete the attached form for all time periods. If you use a custom benchmark/normal portfolio, complete separate forms for those returns. It is not necessary to complete a form for benchmark returns if your benchmark is a published market index.



**Attachment B**  
**Portfolio and Benchmark Asset Listings**

1. Please note that return data and asset listings should be provided for a minimum of two (2) years. More than five (5) years is highly desirable and we prefer as long a time period as possible.
2. Composite asset listings are preferred over an individual account. However, if a composite is not available, please provide data from a representative account that is as similar as possible to the MSBI's typical account size (\$100 million or more) and investment restrictions. Identify the client account provided. You must provide asset listings for this same account in the future.
3. Monthly returns are preferred. If monthly data is not available, please substitute quarterly returns.
4. We prefer a market value weighted return composite over an individual account. If a composite return can be calculated, but a corresponding composite asset listing is not available, please submit the composite return data and substitute asset listings from a representative account. See #2 above.
5. If you utilized a custom benchmark (normal portfolio), we request historical benchmark portfolio asset listings. If a third party produces a custom benchmark for you, we ask that you direct that organization to make the asset listings available to us. The asset listings must be provided on a diskette.
6. Asset listings on computer diskette for actual portfolios are highly desirable. If not available, submit hard copy.
7. Requirements for machine readable data in #4 and #5 are:
  - a. The files should be sequential ASCII ("flat") files (for example, .PRN files generated by Lotus 1-2-3) on computer diskette compatible with IBM PC hardware.
  - b. Each security's record should be placed on a separate line in the file.
  - c. Unique identifiers, either CUSIPs or IDC (not exchange) tickers, should be provided for each security.
  - d. The name of each security should be contained in the file or provided in an accompanying hard copy version of the file.
  - e. The amount held of each security should be provided in the file.
  - f. Security data fields should be placed in consistent locations for every record in the file.

g. Please follow the following format:

1) Four header lines describing the file (e.g., manager, date of the portfolio), with each line no more than 26 columns wide.

2) One line per security with each record containing:

Columns 1 - 8	CUSIP
Columns 9 - 12	IDC ticker, left justified (leave blank if not available)
Columns 13 - 22	Amount of the security held, including a decimal point
Columns 23-27	Leave blank
Columns 28 - 35	Security price, right-justified (carried out to three decimal places)
Columns 36 -	Security name

8. Any data provided on diskette must also be provided in hard copy.

**MINNESOTA STATE BOARD OF INVESTMENT  
EQUITY INVESTMENT MANAGER QUARTERLY UPDATE**

**Organization/Staff**

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1. Describe any ownership changes during the past quarter.
2. Describe any turnover in your investment staff in the past quarter.
3. Provide the names and sizes of all tax exempt accounts gained during the last quarter for the appropriate discipline/style and also for the firm as a whole.
4. Provide the names and sizes of all tax exempt accounts lost during the last quarter for the appropriate discipline/style and also for the firm as a whole.
5. What is the amount of client relationships and total dollars under management as of the end of last quarter? Please provide for both the appropriate discipline/style and for the firm as a whole.

**Investment Approach**

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1. Were there any changes to the firm's investment management process, equity research process or trading operations during the last quarter? If so, please describe.
2. Were there any changes to the benchmark construction process? If so, please describe.

**Return History**

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1. Please provide quarterly return data below. Actual returns should be calculated before fee payments are deducted. Please see Attachment A for details on performance history requirements.

	<u>Actual</u>	<u>Benchmark</u>
Month 1	_____	_____
Month 2	_____	_____
Month 3	_____	_____
Quarter	_____	_____
Year	_____	_____

2. Please provide actual and benchmark asset listings for the last quarter on diskette. Submit asset listings for customized benchmarks only. If the benchmark is a market index, please specify which index you are using. Please see Attachment B for format requirements.

#### **Miscellaneous**

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1. Describe any censure by the SEC or any litigation pending against the firm.
2. Describe any recent event or issue not included above that you believe is pertinent in evaluating your firm.

**MINNESOTA STATE BOARD OF INVESTMENT  
EQUITY INVESTMENT MANAGER ANNUAL UPDATE**

**I. Background Data**

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Please note any changes in the firm's address, phone number, contact individual, or ownership status.

**II. Organization/Staff**

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**A. Professional Staff.**

1. Number of Investment Department Personnel: \_\_\_\_\_
2. Number of Portfolio Managers: \_\_\_\_\_
3. Number of Full-time Security Analysts: \_\_\_\_\_
4. Number of Economists: \_\_\_\_\_
5. Number of In-house Traders: \_\_\_\_\_
6. Number of portfolio managers and investment analysts added in the past quarter: \_\_\_\_\_
7. Number of portfolio managers and investment analysts who have left in the past quarter: \_\_\_\_\_
8. Elaboration on answers to questions #6 and #7.
9. Experience of Investment Personnel

		<u>Number of Years</u>		
		<u>Average</u>	<u>Low</u>	<u>High</u>
	Portfolio Managers	-	_____	_____
	Investment Analysts	_____	_____	_____
10.	Dollars under management per portfolio manager:	<u>Average</u>	<u>Low</u>	<u>High</u>
		_____	_____	_____
11.	Number of accounts per portfolio manager:	<u>Average</u>	<u>Low</u>	<u>High</u>
		_____	_____	_____

12. Limit on number of accounts per portfolio manager: \_\_\_\_\_

**B. Assets/Client Relationships**

1. For all assets under management as of 12/31/19XX, provide the following information:

<u>Accounts</u>	<u>Number</u>	<u>Assets ( \$ in millions )</u>				<u>Percent of Assets Fully Discretionary</u>
		<u>Total</u>	<u>Stocks</u>	<u>Bonds</u>	<u>Other</u>	
Total						
Tax Exempt						

2. Account Breakdown for the stated discipline/style as of 12/31/19xx:

	<u>Number of Tax-exempt accounts</u>
Under \$10 million	
\$10 - \$25 million	
\$25 - \$50 million	
\$50 - \$100 million	
Over \$100 million	
Total #	
Total (in \$)	

Largest Account (in \$) as of 12/31/19xx

Smallest Account (in \$) as of 12/31/19xx

3. Describe any limitations the firm currently imposes or intends to impose regarding:
- Number of client relationships
  - Total assets under management
  - Maximum account size
  - Minimum account size
4. List the names and the dollar amount of the firm's five largest equity tax-exempt accounts for the stated discipline/style.
5. Provide the names and sizes of all tax-exempt accounts gained during the last quarter.
6. Provide the names and sizes of all tax-exempt accounts lost during the last quarter.

**C. Other**

Describe any censure by the SEC or any litigation pending against the firm.

### III. Investment Approach

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- A. Describe any changes made to the firm's investment management process during the past quarter.
- B. Describe any changes made in the firm's equity research process during the past quarter.
- C. Describe any changes to the firm's trading operations which occurred during the past quarter.
- D. Describe any changes to the benchmark during the past quarter.

### IV. Return History

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- A. Please provide quarterly return data below. Actual returns should be calculated before fee payments are deducted. Please see Attachment A for details on performance history requirements.

	<u>Actual</u>	<u>Benchmark</u>
Month 1	_____	_____
Month 2	_____	_____
Month 3	_____	_____
Quarter	_____	_____
Year	_____	_____

- B. Please provide actual and benchmark asset listings for the last quarter on diskette. Submit asset listings for customized benchmarks only. If the benchmark is a market index, please specify which index you are using. Please see Attachment B for format requirements.

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**NORMAL PORTFOLIOS  
CONCEPTS AND APPLICATIONS**

**Staff Position Paper  
September 1985**

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## EXECUTIVE SUMMARY

The widespread use of multiple specialty investment managers by pension plans has created a need for more sophisticated selection and monitoring procedures. Normal portfolios can aid the plan sponsor both in designing a multiple manager configuration and evaluating its effectiveness.

A normal portfolio is a passive representation of the investment style of a specific money manager (or aggregation of money managers). It reflects the prominent risk characteristics that a manager's portfolio would exhibit if the manager were making no active investment judgments. In a sense, it represents the average risk-return posture that the manager would assume over a sufficiently long period of time.

Normal portfolios can be utilized on two levels by a pension plan sponsor. On the total fund level, a normal portfolio reflects the plan's long-run risk-return objectives, as represented by the normal portfolio's asset mix. Active strategies that cause the plan to temporarily deviate from its long-run investment policy can be evaluated using the normal portfolio as a benchmark.

Normal portfolios can also be used on the individual manager level. A manager's normal portfolio characterizes its investment style. Thus, normal portfolios can be used by a plan sponsor when searching for managers of a particular style. In addition, the normal portfolios of the managers of a pension plan can be aggregated to provide with a measure of the total portfolio's long-run risk exposure. Finally, normal portfolios provide a useful benchmark against which to compare the value that a manager adds to (or subtracts from) its investment style.

The construction of a normal portfolio for an investment manager entails five basic steps: First, a qualitative understanding of the manager's investment decision-making process must be gained; second, the manager's past portfolio holdings should be analyzed

to identify prominent financial characteristics; third, a list of securities that will comprise the normal portfolio must be developed; fourth, these securities must be appropriately weighted and a normal cash position assigned; fifth, and finally, the normal portfolio should be backtested and compared against the manager's past performance. Actual examples for three *Minnesota State Investment Board* managers are described below.

Normal portfolios are not without significant drawbacks. Most importantly, their construction is more of an art than a science. Quantitatively identifying a manager's investment style is difficult, given the subjectivity and volatility associated with investment management. A lack of precision is an inherent problem of normal portfolios. Further, normal portfolios are costly to produce, in terms of both human and computer time. Despite these problems, normal portfolios have much to offer the plan sponsor seeking to design and monitor an effective multiple manager pension plan.

## **INTRODUCTION**

Pension management has evolved considerably over the last twenty years. Previously, a pension plan's investment portfolio often was managed by a single balanced manager. Now, numerous specialized managers perform specific, predetermined functions, coordinated to varying degrees, within the typical pension plan's total portfolio.

The process of monitoring a pension plan's total investment program, as well as the plan's individual money managers, has also changed significantly. The advent of more powerful and cheaper computers, along with the concomitant expansion of computerized databases, has increased the ability of a plan sponsor to frequently analyze the risk-return characteristics of its total portfolio and individual investment managers. These increased capabilities have provided a plan sponsor with the means to take a more active role in determining an appropriate asset mix for the plan and in positioning individual managers within a total portfolio context. Further, a plan sponsor is now more capable of providing a dispassionate and thorough analysis of the value that it and its managers bring to the investment of the plan's assets.

Many plan sponsors, however, still retain and evaluate their multiple managers by overly simplistic means. These plan sponsors fail to view their investment managers' portfolios as individual components within a larger pool of financial assets. One valuable tool for alleviating these deficiencies are "normal portfolios." The purpose of this paper is to define the concept of normal portfolios, to discuss their applications, to give real life examples of their construction, and finally to present the potential drawbacks of their use.

## **MANAGER INVESTMENT STYLES**

Typical institutional money managers today pursue consistent and distinct investment styles. A manager's investment style is a set of fundamental investment principals and decision rules that the manager utilizes, on a consistent basis, to construct a

portfolio. These principals and rules run the gamut from asset class choice to individual security selection.

Manager firms develop investment styles out of organizational necessity. The ability to marshal and coordinate the individuals within the firm, as well as to market the firm's resources to plan sponsors, requires the adoption of certain fundamental policies and methods of operation. To the extent that the organization is successful and become well-recognized, its investment style will become more firmly established and more impervious to the substitution of individuals in and out of the organization.

Obvious examples of investment styles are equity managers who concentrate in very narrowly defined segments of the stock market, such as *emerging growth stock managers*. Other manager may utilize more broadly defined investment approaches. Nevertheless, it is the rare manager firm indeed which cannot verbalize its own particular investment style. Investment styles usually can be quantitatively evaluated by identifying the consistently prominent financial characteristics of the managers' current and past portfolios.

Managers following particular investment styles usually will construct portfolios that differ significantly in composition from the market portfolio. (Obvious exceptions include index fund managers and managers using other highly diversified investment approaches.) The multiple manager plan sponsor should attempt to identify these different investment styles and combine managers of the appropriate styles into a total portfolio so as to best fulfill the plan's long-run objectives. Normal portfolios can play an important role in *effectively constructing and controlling a multiple manager pension plan*.

#### **DEFINITION OF A NORMAL PORTFOLIO**

A normal portfolio is a passive representation of the investment style of a money manager (or an aggregation of money managers). That is, a normal portfolio reflects the prominent risk characteristics that a manager's portfolio would exhibit if the manager were making no active investment judgments.



Of course, at any particular time the risk attributes (and returns) of a manager's actual portfolio are likely to differ from those of its normal portfolio. However, if the normal portfolio is properly conceived, the differences should represent active decisions to deviate from the passive investment style in order to capture specific returns that the manager believes are temporarily available in the marketplace.

In a sense, a manager's normal portfolio represents the average risk-return posture that the manager would assume over a sufficiently long period of time. Prominent risk characteristics that persist should be captured by the normal portfolio. Active management decisions, which cause the actual portfolio to deviate from the normal portfolio, should tend to "wash out" over an extended time interval, revealing the manager's true investment style.

For example, consider the emerging growth stock manager referred to earlier. Assume that one could pose to the manager the hypothetical situation in which the manager had no strong beliefs concerning the future course of the economy and stock market, or the relative value of specific individual securities. Under this scenario, a plan sponsor would *not expect this manager to hold a broadly diversified portfolio of securities resembling the market portfolio*. Rather, the manager would more likely to select a portfolio of common stocks concentrated in those immature companies that exhibit significant growth potential. Within this distinct group of stocks the portfolio would be diversified, with no significantly different weighting of any one issue, except for possible liquidity considerations. Further, the manager would likely hold some cash that would represent its normal risk aversion to the emerging growth sector, as well as "frictional" cash that occurs as a result of trading, income flows, etc.

The collection of stocks and cash described above would comprise that particular manager's normal portfolio. It would represent the true essence of the manager's investment style. As noted, the manager frequently may hold a portfolio that differs in terms of risk composition and ex post returns. Active bets stimulated by specific

perceived market opportunities will result in these deviations. Nevertheless, the ability to conceptualize and measure the normal portfolio can greatly facilitate the manager monitoring process.

The normal portfolio concept can be traced back a number of years. Barr Rosenberg is commonly associated with the term "normal portfolio." He described a normal portfolio in the following manner.

It is extremely useful... to consider what would be the optimal portfolio for the client if management were completely passive. Passive management would make no use of special information but, instead, would consider only the relatively permanent aspects of the capital market-those aspects which characterize equilibrium. The client's equilibrium portfolio is shaded toward those assets that are relatively favorable for him, in comparison with the average investor... The equilibrium portfolio reflects the unique circumstances of the investor but not the special information that is generated in the competitive research progress of active managers.  
[3]

Martin Leibowitz also has long advocated the use of normal portfolios. He has concentrated on applying normal (or "baseline") portfolios to bond management.

Since the Baseline Portfolio structure should be determined primarily by long-range considerations, it should be relatively independent of the manager's day-to-day market judgments. Thus, the Baseline Portfolio could be defined as the most balanced possible fulfillment of all the fund's complex objectives and goals in the absence of an active market-related management activity. [2]

Water Good also has expounded the benefits of utilizing normal portfolios from a plan sponsor's perspective.

...we define the manager's normal portfolio as the universe of securities in which he prefers to operate... The fundamental characteristics of a particular universe, such as lower price-earnings ratios or high growth rates, are very likely to continue over extended periods... [1]

## **APPLICATIONS OF NORMAL PORTFOLIOS TO ASSET MIX DECISIONS**

The widespread use of multiple managers by pension plans has left the asset mix decision largely in the hands of the plan sponsor. Previously, a single balanced manager usually made the choice of a specific allocation to stocks, bonds and cash equivalents. Under a multiple manager system the plan sponsor must choose an optimal long-run mix between these asset classes and perhaps others as well (e.g., real estate, venture capital). The plan sponsor must also decide if, and when, to deviate from its long-run asset mix.

A pension plan's long-run asset mix represents that combination of financial assets that the plan sponsor believes best meets the plan's long-run objectives. This asset mix can be viewed as reflecting the plan sponsor's investment philosophy. Appropriately then, a normal portfolio can be created that formally represents this optimal asset mix and, hence, the plan's investment style. A normal portfolio is a convenient format for describing the plan's investment policy to trustees, employees, and other interested groups. Further, temporary deviations from the normal portfolio resulting from the sponsor's specific investment strategies likewise can be described relative to the normal portfolio.

A normal portfolio also provides a benchmark for measuring the success of short-run deviations from a pension plan's long-run investment policy. By using readily available indexes of broad asset classes (e.g., Wilshire 5000 as a proxy for the stock market), the performance of the normal portfolio, or long-run investment policy, can be measured. The returns generated by each particular asset class index are multiplied by the corresponding asset class weights in the normal portfolio. This normal portfolio return can then be compared with the return calculated by multiplying the actual weights assigned to each asset class in the plan's total portfolio times the returns on each corresponding asset class index. If the plan sponsor's asset mix strategies are successful, the difference between returns on the actual asset mix portfolio and the normal portfolio should be consistently positive.

The use of a normal portfolio in measuring the effectiveness of a plan sponsor's asset mix strategies is relatively simple and is applied by many pension plans. As such, examples are not presented here. (See Good [1] for additional insights into this subject.)

### **APPLICATIONS OF NORMAL PORTFOLIOS TO MANAGER MONITORING**

From the plan sponsor's perspective, manager monitoring is composed of three primary functions. First, the plan sponsor must select individual investment managers. Second, these manager must be positioned within the sponsor's total portfolio to fulfill, ex ante, certain risk-return objectives. Finally, managers' performances must be evaluated. This evaluation must consider not only whether the manager has produced acceptable rates of return, but whether the manager has met predetermined risk objectives as well. *Normal portfolios can facilitate the execution of all three monitoring functions.*

With respect to the manager selection function, a clear understanding of manager investment styles is crucial in a multiple manager plan. The plan sponsor presumably is searching for managers that will fill certain niches within the total portfolio. Those niches correspond to investment management styles. As discussed, normal portfolios provide a quantitative representation of manager investment styles. Thus, armed with a list of managers, their normal portfolios, and a knowledge of the particular investment styles desired, a plan sponsor can readily whittle down the initial list of candidates to a small group of managers who meet the sponsor's immediate needs. The plan sponsor can focus its attention on this group in terms of the entire regimen of interviews and questionnaires. Further, the past performance of these managers can be evaluated relative to their normal portfolios as will be discussed below.

In addition, once a manager has been hired, the existence of an agreed upon normal portfolio should facilitate a smoother relationship between the plan sponsor and manager. The normal portfolio clearly defines the manager's role in the plan sponsor's total

portfolio. Thus, there is less likelihood of disagreements developing over the manager's actual strategies and results versus the plan sponsor's expectations.

With respect to the second function, that of positioning managers within the total portfolio, a plan sponsor's individual manager normal portfolios, within a particular asset class, can be aggregated. The risk characteristics of the aggregate normal portfolio provides a plan sponsor with a measure of the total portfolio's long-run risk factor exposure in that asset class. To the extent that the aggregate of the normal portfolios is over or under-exposed to a particular source of risk, the allocation of assets to the various managers can be rearranged or other actions taken to offset the unwanted biases. The goal of such changes would be to shift the total portfolio to a risk posture consistent with long-run plan objectives.

Finally, normal portfolios can be used to evaluate the value that managers add to (or subtract from) their specific investment styles. Just as is the case in an evaluation of a plan sponsor's asset mix decisions, an individual manager's normal portfolio can serve as an appropriate benchmark against which to judge its active management decisions.

Managers are frequently evaluated by plan sponsors who compare the managers' rates of return to that of some broad market index (e.g., the S&P 500 in the case of equity managers). A naive direct comparison ignores the differences in risk between the manager's portfolio and the benchmark. On the other hand, serious questions have been raised regarding risk-adjusted performance evaluation procedures using the Capital Asset Pricing Model. No satisfactory model of the relationship between systematic sources of risk and return currently exists.

Normal portfolios, however, can deal with the differences in market and extra-market risk among managers. As discussed previously, a normal portfolio represents the prominent risk characteristics that a manager tends to assume consistently. A plan sponsor expects the manager to hold a portfolio that exhibits the particular risk posture exhibited by the manager's normal portfolio. Further, the plan sponsor is (or at least

should be) willing to accept the returns associated with that investment style at a given point in the market cycle. To the extent that the manager deviates from the normal portfolio for strategy purposes, the plan sponsor is justified in expecting a positive incremental return. If the manager fails to produce such a return, then it has not performed up to expectations and should be graded poorly.

## **NORMAL PORTFOLIO CONSTRUCTION**

There exist no widely-accepted set of procedures that can guide a plan sponsor or manager in constructing a normal portfolio. However, we have constructed a number of normal portfolios for managers retained by the Minnesota State Board of Investment. Based on our experience there do appear to be a number of steps that, if followed, will greatly facilitate the consistency and quality of the normal portfolios produced.

The first step in the construction of a normal portfolio can be stated simply as "know thy manager." The more the designer is familiar with the manager's decision-making process, the more accurately the designer is able to model that process. In-person, give-and-take interviews with the manager are the best means of developing an understanding of the manager's decision-making process. The manager should be asked to describe that process in detail. The manager should provide examples of how that process is implemented. Consultants and other pension plan sponsors who have experience with the manager also may provide useful input.

The second step of the normal portfolio construction process entails examining the manager's past portfolio holdings. Portfolio data going back as far as practically possible should be obtained. Of course, the cost of collecting, loading, and verifying data must be weighed against the benefits of a larger sample size. If possible, however, at least five years of quarterly data is desirable. Using any of a number of commercially available computerized data bases, the portfolio holdings data should be analyzed in terms of factors that characterize the manager's investment style. With respect to common stock

portfolios, these factors include the portfolio's R-squared (diversification), equity allocation, equity beta, price-to-book, price-to-earnings ratio, market capitalization, yield, earnings growth, leverage, etc. Access to a fundamental factor model (such as offered by Wilshire Associates or BARRA) also can be useful in categorizing a manager's distinguishing portfolio risk characteristics.

This portfolio data should be examined closely for significant levels, trends, and shifts. It is this data that provides the designer with a quantitative window on to the manager's investment style. The data should be reviewed with the manager. It should be consistent with the designer's understanding of the manager's investment style. To the extent that the data is not consistent with that understanding, the manager should be requested to provide a satisfactory explanation.

The third step in the normal portfolio construction process is to develop a list of stocks that will comprise the normal portfolio. A limited number of selection criteria should be used to screen a broad list of available securities. Capitalization is a simple but effective screening tool. Most managers have practical minimum (and sometimes maximum) market capitalization levels for stocks held in their portfolios. While these limits may be occasionally violated, stocks outside these limits rarely represent a significant proportion of their portfolios.

Removing certain industry sectors also is a useful screening criteria. Managers may consistently avoid particular industries. Stocks in these industries can be removed from consideration.

Finally, certain financial data items may be useful in screening potential candidates for inclusion in the normal portfolio. We have found such items as yield and price-to-book to be quite useful. The particular constraints placed on these financial data items will depend on the manager's investment style (e.g., value managers should tend to own higher yielding, lower price-to-book stocks).

Using the above mentioned criteria, the initial broad list of stocks can be narrowed to a group that is reflective of the type of securities that the manager will frequently hold. The manager is unlikely to hold all of these securities. Further, the manager at time may own other securities not included in the normal portfolio. Rather, the securities included in the normal portfolio, in aggregate, should characterize the manager's investment style. Concentrated holdings in particular normal portfolio securities or the ownership of issues outside of the normal portfolio represent active management decisions.

The fourth step in the normal portfolio construction process is to appropriately weight the securities included in the normal portfolio and assign a normal equity allocation position. The weighting scheme employed will vary among managers. Often though, we have found that a technique we call capitalization tiering works well. This technique is a cross between equal and capitalization weighting. It reflects the fact that while managers frequently will hold equal-weighted positions in their portfolios, they also will frequently skew their portfolios toward securities in particular capitalization ranges. Capitalization tiering is described in greater detail in the examples below.

The list of selected securities, appropriately weighted, composes the non-cash segment of the manager's normal portfolio. Its aggregate financial characteristics should resemble those of the manager's historical portfolio averages if the manager's style has been accurately modeled. At this point a normal cash allocation must be assigned. Most managers do not remain fully invested at all times. Some may hold, on average, substantial cash positions. This fact should be represented by allocating a specific cash level to the normal portfolio.

The fifth, and final, normal portfolio construction step is to backtest the normal portfolio's performance. This performance should be compared with the manager's actual portfolio returns and versus some broad benchmark, such as the market portfolio. One should not necessarily expect the normal portfolio's returns to closely track those of actual manager's portfolio. The manager may have been making significant active bets that could



cause large deviations. However, there should be recognizable correlations between the two sets of returns. Further, the normal portfolio's performance relative to the market should reflect the known performance of the manager's investment style. For example, in a period when growth stocks have done well one should expect that a growth manager's normal portfolio will outperform the stock market.

### **NORMAL PORTFOLIO CONSTRUCTION EXAMPLES**

To illustrate the normal portfolio construction process, three examples are provided below. The normal portfolios designed in these examples represent actual applications developed for common stock managers retained by the Minnesota State Board of Investment. The managers used in these examples are representative of three broad common stock investment styles usually identified by institutional investors as Value, Growth and Rotational. Each broad style category offers a unique set of investment characteristics that must be modeled, in addition to the individual idiosyncracies of the specific managers considered.

**Value Manager.** The investment style of Manager A is to search for companies whose stock prices are low in comparison to estimated tangible book value or companies whose P/E's are low in relation to earnings quality and expected earnings growth. The manager is contrarian and defensive by nature. The manager's portfolio returns exhibit much lower volatility than do the returns of managers pursuing more aggressive investment styles. Manager A is not an active market timer and rarely raises cash above minimal levels.

Quarterly portfolio data was available only since third quarter 1982. This distribution of portfolio financial data through year-end 1984 is:

	R2	EQ. ALLOC.	EQ. BETA	EAR. VAR.	P/B	5 YR. EAR.	MKT SIZE CAP	SIZE RISK	YIELD	GROW RISK	FINL RISK
MEAN	.80	91	1.08	3.04	1.44	-0.3	4,949	73	4.50	48	54
MINIMUM	.71	72	1.01	1.62	1.18	-7.7	3,428	65	3.67	36	48
MAXIMUM	.86	99	1.14	4.41	1.62	14.9	6,687	79	6.29	57	58
STD DEV.	.04	9	.04	0.91	0.13	7.2	1,006	4	0.79	7	3
S&P 500	N.M.	N.M.	N.M.	2.12	1.76	7.1	11,237	40	4.67	46	48

Prominent average financial statistics include a high equity allocation, average equity portfolio beta and below average price-to-book ratio. On average the portfolios generally maintain a high exposure to companies with variable earnings, below average market capitalization and significant financial leverage. The manager's portfolios have a low exposure to growth-oriented companies.

To develop a list of stocks for Manager A's normal portfolio, the Wilshire 5000 first was screened for stocks with a minimum capitalization of \$200 million. From this \$200 million-plus capitalization list were removed stocks in industries in which Manager A cannot invest (due to SBI policies) or is unlikely to invest. These industries are Liquor, Tobacco, Utilities, Real Property, and Gold. Finally the remaining stocks were searched for those with either dividend yields greater than or equal to 5.0% or a price-to-book ratio less than or equal to 1.20. (Stocks with both data items unavailable were not eligible for inclusion in the normal portfolio.)

The weighting scheme applied to Manager A's normal portfolio was the capitalization tiering method. Based on the manager's historical portfolio data, various market capitalization ranges (or tiers) are assigned specific weights within the normal portfolio. Within each tier, all stocks included in that tier are equal-weighted. The distribution of weights and stocks among the tiers is as follows:

CAPITALIZATION (\$ MILLION)	WEIGHT (PERCENT)	NUMBER OF STOCKS			
		12/83	6/84	12/84	6/85
200-499	25.0	151	194	166	126
500-999	20.0	88	107	86	73
1000-1999	30.0	67	65	69	44
2000-3999	15.0	29	41	35	35
4000 and above	<u>10.0</u>	<u>31</u>	<u>31</u>	<u>33</u>	<u>31</u>
	100.0	366	438	389	309

Because Manager A does little in the way of market timing, a small normal cash position of 5% is assigned.

The normal portfolios generated using the procedures described above resembled Manager A's historical data in terms of portfolio financial characteristics. This similarity can be observed by comparing the normal portfolio financial statistics shown below to Manager A's historical averages presented above. The price-to-book ratio and the market capitalization of the normal portfolios are below those of the average historical data.

	EQ. ALLOC.	EQ. BETA	EAR. VAR.	P/B	5 YR. EAR.	MKT CAP	SIZE RISK	YIELD	GROW RISK	FINL RISK
12/31/83	95	1.09	2.76	1.02	1.2	1,956	74	4.53	46	58
6/30/84	95	1.18	2.81	0.98	-3.2	1,972	73	4.98	43	56
12/31/84	95	1.19	2.89	1.01	-3.8	2,010	74	4.66	43	54
6/30/85	95	1.13	3.00	1.04	-5.1	2,050	73	4.28	41	54

From the perspective of portfolio performance, the normal portfolio's superior performance relative to the Wilshire 5000 points out the generally favorable environment for low price-to-book, defensive issues during the measurement period. However, the normal portfolio did not outperform the market by as much as might be expected, due largely to its poor second quarter 1984 performance. Manager A significantly outperformed its normal portfolio, indicating that it had added considerable value to its investment style through active management. Buy-hold normal portfolio returns, semi-

annually rebalanced, are shown below, along with manager A's actual returns and the Wilshire 5000's returns. The manager's returns include the impact of management fees.

QUARTER	NORMAL PORTFOLIO		MANAGER A ACTUAL	WILSHIRE 5000
	EQUITY ONLY	INC. CASH		
1Q 1984	-1.3	-1.1	-0.6	-4.2
2Q	-6.5	-6.0	-2.8	-2.8
3Q	10.3	9.9	9.3	9.2
4Q	3.2	3.2	4.9	1.3
1Q 1985	10.3	9.9	10.7	10.3
2Q	7.3	7.0	7.5	7.5
Cumulative	24.3	24.0	31.8	22.1

**Growth Manager.** Manager B pursues an investment style that emphasizes the search for companies that it expects to experience above consensus earnings gains. These earnings gains may be either cyclical or secular in nature. As we found to be the case with a number of growth managers, Manager B focuses on two types of growth companies: First, companies whose products are expected to produce high consistent unit volume growth rates; and, second, companies undergoing a positive life cycle change (e.g., new management, financial restructuring, new uses for products, etc.). The proportion of Manager B's portfolio represented by these types of companies varies over time. However, on average, the high unit growth companies tend to dominate the portfolio. Manager B is not an active market timer and will usually maintain a fully invested position.

Quarterly portfolio data analyzed covered the period from year-end 1978 through year-end 1984. (However, interim quarterly 1979 and 1980 data were not available.) The distribution of portfolio financial data through year-end 1984 is:

	R2	EQ. ALLOC.	EQ. BETA	EAR. VAR.	P/B	5 YR. EAR.	MKT CAP	SIZE RISK	YIELD	GROW RISK	FINL RISK
MEAN	.79	94	1.34	2.71	2.67	9.8	4,078	68	2.12	66	49
MINIMUM	.66	85	1.18	1.84	1.59	-1.3	854	46	1.16	52	45
MAXIMUM	.89	99	1.61	3.64	3.69	19.3	9,020	89	2.75	80	55
STD DEV.	.07	3	0.12	0.50	0.47	5.6	2,365	11	0.49	7	3
S&P 500	N.M.	N.M.	N.M.	2.05	1.69	10.1	10,085	39	5.02	47	49

Prominent average financial statistics include a consistently high equity allocation, and a high equity portfolio beta and price-to-book ratio. Further, on average the portfolios appear to maintain significant exposures to companies with variable earnings and growth orientation. The portfolios also appear to have above average exposure to small capitalization companies.

Because Manager B will invest in two quite different types to growth companies we decided to create a normal portfolio dividend into two segments individually representing each type. The high unit growth segment was created by first screening the Wilshire 5000 for companies possessing three characteristics: a capitalization of \$50 million or greater; a price-to-book ratio of 2.0 or greater; and, a dividend yield of 3.0% or less. From this list of companies stocks in industries in which Manager B cannot invest (due to SBI policies) or is unlikely to invest as part of its high unit growth strategy were removed. The number of excluded industries was large. Those industries remaining were Media, Drugs & Medicine, Soaps & Cosmetics, Business Machines, Electronics, Optical Photographic Equipment, Non-durables & Entertainment, Business Services, and Travel & Recreation. To reflect liquidity considerations the high unit growth segment was capitalization-weighted.

The life cycle change segment of the normal portfolio was created by screening the Wilshire 5000 for companies with the following three features: a market capitalization above \$300 million; a price-to-book ratio 2.0 or less; and, a yield of 1.5% or greater. From this list were eliminated stocks in industries in which Manager B cannot invest (due

to SBI policies) or is unlikely to invest as part of its life cycle change strategy. The excluded industries were Liquor, Tobacco, Drugs and Medicines, Electronics, Optical Photographic Equipment, Utilities, Rent Property, Business Services, Travel and Recreation, and Gold. The capitalization tiering method was used to weight the life cycle change segment. Because of the difficulty of identifying past weighting patterns within the life cycle change segment, a somewhat arbitrary capitalization tiering scheme used. (More information is currently being collected from Manager B regarding its weighting tendencies in the two segments.) The distribution of weights and stocks among the life cycle tiers was as follows:

CAPITALIZATION (\$ MILLION)	WEIGHT (PERCENT)	NUMBER OF STOCKS			
		12/83	6/84	12/84	6/85
300-499	20.0	98	116	111	97
500-999	20.0	113	128	114	111
1000-1999	20.0	85	76	92	81
2000-3999	20.0	44	56	54	58
4000 and above	<u>20.0</u>	<u>41</u>	<u>35</u>	<u>38</u>	<u>43</u>
	100.0	381	411	411	390

The high unit growth segment is assigned 60% of the normal portfolio's weight. The life cycle change segment is given the remaining 40% weight. Because Manager B generally maintains a fully invested equity position, a small 5% normal cash allocation is used.

The normal portfolios produced using the methods described above compared adequately to Manager B's historical financial data. The major deviations were lower normal portfolio market-related risk, market capitalization, financial risk, and a higher normal portfolio yield. The normal portfolio financial data is shown below.

	EQ. ALLOC.	EQ. BETA	EAR. VAR.	P/B	5 YR. EAR.	MKT CAP	SIZE RISK	YIELD	GROW RISK	FINL RISK
12/31/83	95	1.19	2.10	2.96	8.8	2,619	70	2.48	63	46
6/30/84	95	1.25	2.08	2.50	5.5	2,409	71	2.66	64	45
12/31/84	95	1.26	2.06	2.55	5.9	2,454	72	2.63	61	44
6/30/85	95	1.17	1.97	2.66	6.3	3,093	65	2.61	58	42

Manager B's normal portfolio's performance over the last six quarters has been mixed relative to that of the manager's actual portfolio. However, on a cumulative basis, Manager B has outperformed the normal portfolio over this period, thus adding value to its investment style. The poor market for growth stocks over this period is illustrated by the normal portfolio's poor performance relative to the Wilshire 5000. Buy-hold normal portfolio returns, semi-annually rebalanced, are shown below along with Manager B's and the Wilshire 5000's actual returns. The manager's actual return include the impact of management fees.

QUARTER	NORMAL PORTFOLIO		MANAGER C ACTUAL	WILSHIRE 5000
	EQUITY ONLY	INC. CASH		
1Q 1984	-8.1	-7.6	-7.0	-4.2
2Q	-2.4	-2.2	-3.5	-2.8
3Q	6.7	6.5	8.0	9.2
4Q	-0.8	-0.6	0.2	1.3
1Q 1985	10.2	9.8	7.2	10.3
2Q	6.5	6.3	9.1	7.5
Cumulative	11.4	11.6	13.6	22.1

**Rotational Manager.** Manager C employs an investment style that entails shifting among industry sectors based upon its outlook for the economy and the financial markets. Over a market cycle, Manager C will invest in a wide range of industries. Like most rotational

managers, Manager C emphasizes liquid, medium to large capitalization stocks. However, also like many rotational managers, despite its willingness to shift from sector to sector Manager C appears to have a long-run bias toward high beta, growth oriented stocks. Manager C is an active market timer, willing to make significant shifts in and out of cash over a market cycle.

Quarterly portfolio data was available over the period year-end 1979 through year-end 1984. The distribution of portfolio financial data over this period is:

	R2	EQ. ALLOC.	EQ. BETA	EAR. VAR.	P/B	5 YR. EAR.	MKT CAP	SIZE RISK	YIELD	GROW RISK	FINL RISK
MEAN	.80	79	1.15	1.91	2.27	13.3	5,194	65	2.92	62	48
MINIMUM	.70	55	1.04	1.17	1.63	6.2	954	42	1.90	44	38
MAXIMUM	.92	96	1.30	2.42	3.06	20.4	11,416	80	3.75	70	54
STD DEV.	.05	9	0.07	0.31	0.44	4.6	3,415	10	0.55	7	4
S&P 500	N.M.	N.M.	N.M.	2.05	1.67	10.9	9,777	39	5.10	48	48

Manager C's most prominent characteristic is the varying level of almost all of its portfolio financial data over time. This variation is consistent with the manager's rotational style. Average equity allocation is relatively low. Average equity portfolio beta is above that of the market as is the price-to-book ratio and the portfolio growth orientation. Further, market capitalization is below that of the market, on average.

In constructing a rotational manager's normal portfolio, the designer must take care to reflect that the manager's style requires it to invest in a broad range of stocks. Excluding whole classes of stocks, such as in the case of Value and Growth managers, is not permissible. On the other hand, rotational managers generally do not hold portfolios that closely resemble the market, on average. The designer must therefore build a normal portfolio that reflects the manager's long-run biases, without overly constraining the portfolio.



Manager C's normal portfolio was designed by first screening the Wilshire 5000 for stocks with a minimum market capitalization of \$200 million. From this \$200 million-plus capitalization list were removed stocks in which the manager cannot (due to SBI policies) or is unlikely to invest. These excluded industries are limited to Liquor, Tobacco, Real Property and Gold.

Based on historical portfolio data the large list of eligible stocks was capitalization tiered. The distribution of weights and stocks among tiers is as follows:

CAPITALIZATION (\$ MILLION)	WEIGHT (PERCENT)	NUMBER OF STOCKS			
		12/83	6/84	12/84	6/85
200-999	30.0	868	811	797	861
1000-1999	25.0	202	163	194	184
2000-3999	20.0	86	101	103	134
4000-9999	10.0	62	42	53	67
10000 and above	<u>15.0</u>	<u>17</u>	<u>15</u>	<u>15</u>	<u>16</u>
	100.0	1,235	1,132	1,162	1,262

In order to increase the growth orientation of the normal portfolio, without excluding whole segments of the equity market, a segment composed of growth-oriented stocks is blended into the diversified segment designed above. These growth stocks include all stocks from the diversified segment that possess a price-to-book ratio of 2.0 or greater and a yield of 3.0% or less. The effect of including these stocks twice in the normal portfolio is to increase their relative importance. The growth segment is capitalization-weighted to reflect liquidity considerations.

Based on an examination of the historical portfolio risk, the growth segment is assigned a 25% weight in the normal portfolio. The diversified portfolio is given an 75% weight. Further, the normal portfolio was assigned a 20% cash position to reflect Manager C's moderate market timing strategies.

Given the difficulty of attempting to model Manager C's broad rotational style without overly constraining the portfolio, the resulting normal portfolios bear a surprising close resemblance to the manager's historical portfolio data. The only major difference is that the normal portfolio has a slightly lower growth orientation.

	EQ. ALLOC.	EQ. BETA	EAR. VAR.	P/B	5 YR. EAR.	MKT CAP	SIZE RISK	GROW YIELD	FINL RISK	RISK
12/31/83	80	1.14	2.27	2.40	9.0	4,414	64	3.37	57	49
6/30/84	80	1.17	2.26	2.08	5.8	4,074	64	3.79	56	49
12/31/84	80	1.18	2.26	2.16	5.7	4,053	65	3.59	54	48
6/30/85	80	1.14	2.18	2.29	5.6	4,412	62	3.24	53	47

Over the last six quarters, Manager C's normal portfolio has underperformed the market, primarily due to its small capitalization growth bias. Over this period Manager C has cumulatively outperformed the normal portfolio, although quarterly results varied widely. Thus, the manager added value to its investment style over the period of analysis. Buy-hold normal portfolio returns, rebalanced semi-annually, are shown below along with Manager C's and the Wilshire 5000's actual returns. The manager's actual returns include the impact of management fees.

QUARTER	NORMAL PORTFOLIO		MANAGER C ACTUAL	WILSHIRE 5000
	EQUITY ONLY	INC. CASH		
1Q 1984	-5.9	-4.2	-4.9	-4.2
2Q	-2.3	-1.3	-2.8	-2.8
3Q	8.3	7.2	10.7	9.2
4Q	0.4	0.8	5.7	1.3
1Q 1985	10.6	8.9	6.4	10.3
2Q	7.9	6.7	6.4	7.5
Cumulative	19.3	18.7	22.4	22.1

## **NORMAL PORTFOLIO CAVEATS**

Normal portfolios have much to offer to the plan sponsor administering today's complex pension plans. However, the practical problems of normal portfolio construction are not trivial. Most of the problems result from the ad hoc design of normal portfolios. Unfortunately, their construction currently represents more of an art form than a science. Two individuals designing a normal portfolio for the same manager are likely to arrive at two (perhaps considerably) different results.

There are two reasons for this problem. First is the fact that it is difficult to specify, particularly in quantitative terms, a manager's investment style. The investment decision rules that a manager utilizes usually will possess a high degree of subjectivity. This subjectivity is difficult to model. Persons attempting to construct a normal portfolio may differ in terms of how they interpret quantitatively the manager's decision rules.

The second reason is that a manager's investment style may not be highly stable over time. Investment management is a dynamic process. Pinning it down to a relatively static set of quantitative decisions rules is like hitting a moving target. The less stable is a manager's investment style, the less useful is the manager's past portfolio data in discerning prominent risk exposures. Uncertainty as to manager's investment style will introduce noise into the modeling process. This will lead persons designing a normal portfolio to develop different conclusions.

Beyond these design problems is the difficulty associated with permitting the normal portfolio concept to "overintellectualize" the manager monitoring process. Normal portfolios certainly are not a panacea from the perspective of the plan sponsor. It is too easy to imbue the concept with a sense of precision that is unrealistic. The field of portfolio management is constantly evolving. Normal portfolios simply represent part of that evolution. They should be viewed as another tool available to plan sponsor, along side existing analytical techniques and plain common sense.

Finally, normal portfolios are costly to produce. Despite the widespread availability of computerized databases, screening through thousands of securities and their associated financial data can be very expensive. Further, the time required to construct individual manager normal portfolios is considerable and adds a large human cost factor as well. In addition, the periodic rebalancing of normal portfolios, while by no means as costly as the initial construction, is nevertheless a recurring expense.

A manager can more efficiently produce a normal portfolio and distribute it to a number of plan sponsors, than can plan sponsors separately construct normal portfolios for their many managers. Unfortunately, few managers have yet been willing to design normal portfolios for themselves, leaving the task in the hands of plan sponsors and consultants.

TAB

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**WILSHIRE 5000**  
**AS AN**  
**EQUITY ASSET CLASS TARGET**

**Staff Position Paper**

**November 1988**

**Revised February 2, 1989**

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## EXECUTIVE SUMMARY

In 1983, the State Board of Investment (SBI) selected the Wilshire 5000 as its asset class target for domestic common stocks. The purpose of this paper is to review the rationale for that decision.

Generally, the most appropriate asset class target is a broad market index which represents the full range of investment opportunities within an asset class. The asset class target should embody the plan's return objectives and risk tolerance for a particular asset class. It also provides a measurable performance standard with which to evaluate investment results.

Most plan sponsors have chosen either the Standard and Poor's 500 (S&P 500) or the Wilshire 5000 as their domestic equity asset class target. In recent years, many plans have moved away from the S&P 500 in order to gain greater exposure to the smaller capitalization area of the market. Since the Wilshire 5000 includes many small capitalization stocks, it is a logical alternative to the S&P 500.

Historically, the Wilshire 5000 has produced returns that are somewhat greater and slightly more volatile than those of the S&P 500. Over shorter periods of time (one to five years), performance may differ significantly. Over longer periods of time (ten to fifteen years), the performance difference between the two indices is minimal.

There are two primary advantages to the Wilshire 5000 as an asset class target:

- o The Wilshire 5000 represents virtually all publicly traded domestic common stocks. It is the most direct means of gaining exposure to the entire stock market and includes both small and large capitalization stocks.
- o The Wilshire 5000 is more representative of the universe of stocks held by the Board's managers. The SBI's active stock managers, in aggregate, are oriented toward smaller capitalization stocks.

Staff believes that the use of an extended broad market index is consistent with the Board's investment objectives and risk tolerance. Staff recommends that the Board continue to use the Wilshire 5000 as its asset class target for domestic equities.

## INTRODUCTION

In 1983, the State Board of Investment (SBI) selected the Wilshire 5000 as its asset class target for the domestic common stocks. The purpose of this paper is to review the rationale for that decision. The discussion has been organized in a question and answer format:

	<u>PAGE</u>
1. What is an asset class target?	1
2. What is the purpose of an asset class target?	2
3. What market indexes are typically chosen as asset class targets?	2
4. Are there situations where a market index is not appropriate?	3
5. Do any of these considerations apply to the SBI?	4
6. How does the performance of the two most common asset class targets compare (S&P 500 vs. Wilshire 5000)?	4
7. Is relative performance a sound basis for choosing an asset class target?	5
8. What are the advantages of the Wilshire 5000 as an asset class target?	6
9. What would be the impact of changing the SBI's asset class target?	7

The paper concludes with a staff recommendation that the Board continue to use the Wilshire 5000 as its asset class target for domestic common stock.

### 1. What is an asset class target?

An asset class target is a diversified collection of securities within a particular asset class. It represents the set of feasible investment opportunities that the plan sponsor believes best achieve the purposes for which the asset class is included in the policy asset

mix. The plan's investments in the asset class, in aggregate, should reflect the risk-return characteristics of the selected asset class target.

Generally, the most appropriate asset class target is a broad market index which represents the full range of investment opportunities within the asset class. Currently, the SBI uses the Wilshire 5000 Index as its asset class target for domestic equities and the Salomon Broad Investment Grade Bond Index as its class target for domestic fixed income.

2. What is the purpose of an asset class target?

There are two primary purposes for establishing an asset class target:

- o The asset class target should embody the plan's return objectives and risk tolerance for a particular asset class. The establishment of an appropriate asset class target, by defining the range of available investments, assures that implementation is consistent with stated policy.
- o The asset class target should provide a measurable performance standard with which to evaluate the results of the plan's investment program.

3. What market indices are typically chosen as asset class targets?

The majority of plan sponsors utilize the Standard & Poor's 500 (S&P 500) as their asset class target. The popularity of the S&P 500 is due primarily to its widespread use in the financial press. (See Appendix A for a description of the S&P 500).

In recent years, many plan sponsors have moved to non-S&P 500 targets. The desire on the part of some plan sponsors to extend the range of investment opportunities in the smaller capitalization area of the market has been the primary motivation. The Wilshire 5000 is a widely used "extended" index. (See Appendix A for a description of the Wilshire 5000).

4. Are there situations where a market index is not appropriate?

Yes. A plan sponsor may choose to restrict the composition of its asset class target if:

- o Statutory, regulatory or policy requirements prohibit ownership of certain securities within an asset class.
- o The nature of the plan sponsor's business makes it desirable to exclude certain types of securities within an asset class.
- o The plan sponsor perceives certain significant long-run investment opportunities within an asset class.

In the first case, a pension plan may be prohibited from owning particular types of securities. For example, many public pension plans operate under legal lists which permit ownership of only certain specified securities. Securities not on these legal lists are ineligible for inclusion in the plans' investment portfolios.

In the second case, the plan sponsor may wish to avoid certain securities whose returns are highly correlated with the plan sponsor's economic prospects. For example, corporations ordinarily do not own large positions of their own stock in their employees' pension plans. In periods when the corporation's profit outlook is poor, its stock will also perform poorly, detracting from pension plan performance at a financially inopportune time.

In the third case, the plan sponsor may believe that certain persistent investment opportunities exist within an asset class. As a result, the plan sponsor may wish to concentrate investments within the asset class in those opportunities. For example, it is well-documented that over the last 60 years small capitalization stocks have outperformed large capitalization stocks. A plan sponsor could permanently emphasize small capitalization stocks in the plan's common stock component by selecting an asset class target that is heavily weighted in small cap stocks.

In each of these situations, the plan sponsor's decision to limit the types of securities held in a particular asset class should be reflected in the target for that asset class. By doing so, the plan's investment opportunities are reconciled with its policy asset mix.

5. Do any of these considerations apply to the SBI?

Not at the present time. Since none of these target-restricting circumstances described in Question #4 currently applies to the Board's common stock investments, the broadest possible market index is most appropriate choice for the SBI domestic stock target. Specifically:

- o There are no statutory restrictions on the Basic Funds common stock investments. It should be noted, however, that the Board policy concerning South Africa, liquor and tobacco have some impact on security selection.
- o Given Minnesota's broad economy, it is impractical to avoid economic sectors of the stock market that are highly correlated with Minnesota's tax revenue base.
- o Certain sources of persistent above average returns in the stock market do exist (e.g., small capitalization stocks, low price-to-book value stocks, low price-to-earnings stocks, etc.). However, given the difficulty in accurately predicting the cyclical nature of these opportunities, it is not feasible to select an asset class target designed to exploit market anomalies.

Given these considerations, there has been no reason to limit the Board's investments in the domestic stock market at the present time. Therefore, a broad market index is appropriate for the SBI's equity asset class target.

6. How does the performance of the two most common asset class targets compare (Wilshire 5000 vs. S&P 500)?

Historically, the Wilshire 5000 has produced returns that are somewhat greater and slightly more volatile than those of the S&P 500. As is illustrated in Table I, the standard deviation of returns on the Wilshire 5000 over the last 213 months is 17.0% per annum

versus 16.3% per annum for the S&P 500. Over this same time period, the Wilshire 5000 has returned 11.3% per annum versus 10.9% for the S&P 500. Over long periods of time the performance difference between the two indices is minimal. Exhibit I shows the value of \$1 invested on January 1, 1971 in the Wilshire 5000 and S&P 500.

**TABLE I**  
**TOTAL RETURN AND STANDARD DEVIATION**  
**OF THE WILSHIRE 5000 AND THE S&P 500**

	<b>For The Period Jan. 1971 - Sept. 1988</b>	
	<b>Wilshire 5000</b>	<b>S&amp;P 500</b>
Annualized Total Return	11.3%	10.9%
Annualized Standard Deviation	17.0%	16.3%

7. Is relative performance a sound basis for choosing an asset class target?

No. Using performance as a criterion can be very misleading. This can be illustrated by comparing the performance of the Wilshire 5000 and S&P 500 over two different five-year periods.

Exhibit II encompasses the five year period ending June, 1981. During this period the Wilshire 5000 outperformed the S&P 500 by 4.1% per annum (Wilshire 14.1% vs. S&P 10.0%). The S&P 500 underweighting in the "small cap" sectors is the primary cause of the differences in the rates of return produced by the two market indicators. Over this period, small capitalization stocks significantly outperformed large capitalization stocks, just as they have done over the last 60 years. This was not captured by the S&P 500.

By contrast, the five year period ending June 30, 1988 produces a much different result. As shown in Exhibit III, the S&P 500 provided superior results relative to the Wilshire 5000. Over this period the S&P 500 outperformed the Wilshire 5000 by an annualized rate of 1.7% (S&P 14.6% vs. Wilshire 12.9%).

Many explanations have been offered for the S&P 500's recent exceptional performance, e.g. liquidity, financial futures, portfolio insurance, indexing. Whether these phenomena will continue into the future is unknown.

8. What are the advantages of the Wilshire 5000 as an asset class target?

Staff believes there are several advantages to the Wilshire 5000:

- (1) Using the Wilshire 5000 as a target index is the most direct means of gaining exposure to the entire common stock market. The Wilshire 5000 represents virtually all publicly traded domestic common stocks. The S&P 500, on the other hand, has a capitalization only 70% of that of the Wilshire 5000. It is significantly underweighted in the "small cap" sectors of the market. Thus, it provides a much less adequate representation of the overall stock market.
- (2) The SBI's active managers, in aggregate, are oriented toward smaller capitalization stocks. Thus, using the Wilshire 5000 is more representative of the universe of stocks held by the Board's managers.
- (3) Market indices that focus predominately on large capitalization stocks, like the S&P 500, are becoming less representative of the entire stock market. As indicated in Table II, the percent of the equity market represented by large capitalization stocks has declined over the last fifteen years.



**TABLE II**  
**CAPITALIZATION OF STOCKS**

			<b>Percent of Wilshire 5000</b>	
<u>Capitalization</u>			<u>As of 12/31/72</u>	<u>As of 9/30/88</u>
Largest	250	issues	67.6%	61.9%
	500	issues	81.3	77.0
	1000	issues	93.9	88.9

It is hypothesized that as the U.S. economy continues to evolve from an industrial, centralized structure to an information-oriented, decentralized form, total capitalization within the stock market will become even more diffuse.

- (4) The Wilshire 5000 is not a "managed" index. Although changes occur fairly infrequently, the composition of the S&P 500 occasionally is altered. This fact, combined with the somewhat arbitrary rationale by which stocks are included in the index, give the S&P 500 a certain "managed" style. The particular stocks which comprise the S&P 500 are selected by the "500 Committee." The Committee bases its choices not only on capitalization and industry representation, but investor interest as well. The Wilshire 5000, on the other hand, is a completely unmanaged market indicator. No judgments regarding whether a particular stock should be included in the indicator are required since all publicly traded stocks are represented.

9. What would be the impact of changing the SBI's asset class target?

Changing the SBI's domestic equity asset class target from the Wilshire 5000 to the S&P 500 would impact the fund in two ways.

First, more than two-thirds of the common stock assets in the Basic Funds are passively managed in a Wilshire 5000 index fund. A Wilshire 5000 index fund measured against an S&P 500 target is totally incompatible. The expense of moving the Wilshire 5000 index fund portfolio to a compatible S&P 500 portfolio must be outweighed by the expectation of better relative performance from the S&P 500. As discussed in Questions #6 and #7, staff does not believe such an expectation is warranted over the long term.

Second, a move to the S&P 500 would be an implicit "bet" on larger capitalization stocks. That is, it would indicate the Board perceives a significant long-run investment opportunity in large capitalization companies. This is contrary to the evidence that smaller stocks have outperformed larger stocks over the past 60 years.

### **CONCLUSION**

Staff believes that the use of an extended broad market index as the asset class target for domestic common stocks is consistent with the Board's investment objectives and risk tolerance.

Staff recommends that the Board continue to use the Wilshire 5000 as the asset class target for domestic common stocks. The Wilshire 5000, which represents essentially the entire U.S. stock market, is the least restrictive index currently available.

## APPENDIX A

### Description Of Wilshire 5000

The Wilshire 5000 is a broad based domestic equity market indicator, composed of all common stocks publicly traded in the U.S. market for which daily prices are obtainable. The actual number of issues contained in the market indicator varies over time as publicly held companies come into and go out of existence. As of September 30, 1988, the Wilshire 5000 included 5,825 common stock issues.

The Wilshire 5000 is a capitalization-weighted market measure. In calculating its value, the weight assigned to a particular issue is based upon the market value of the total shares outstanding of that issue. Unlike the S&P 500, the current market value of the Wilshire 5000 is not stated relative to a base period market value. Rather, the Wilshire 5000 is measured in billion dollar units. On September 30, 1988, the unit value of the Wilshire 5000 was reported to be 2,706.669 indicating that the aggregate market value of the stocks in the market indicator was roughly \$2.7 trillion.

Historical data is available on the Wilshire 5000 extends back to 1971.

### Description Of The Standard & Poor's 500

Like the Wilshire 5000, the S&P 500 is designed to provide a broad representation of the entire domestic common stock market. However, instead of including all issues for which daily pricing is obtainable, the S&P 500 attempts to represent the stock market by utilizing a limited subset of the available stocks. More specifically, as of September 30, 1988, the S&P 500 included 400 industrial, 40 transportation, 20 utility, and 40 financial issues. The particular stocks which make up the index are selected by Standard & Poor's "500 Committee." The Committee bases its choices not only on capitalization size and industry representation, but investor interest as well. Major changes in the composition of

the index are rare. However, since the number of stocks in the index is a constant 500, mergers or acquisitions of companies, whose stock is part of the index, require for replacements. Further, the "500 Committee" may determine that certain stocks are no longer "appropriate" for inclusion in the index and it may choose to replace those stocks.

Like the Wilshire 5000, the S&P 500 is a capitalization-weighted market indicator. Unlike the Wilshire 5000, however the current value of the S&P 500 represents a ratio of the current total market value of the stocks in the index relative to the total market value of the stocks in the index as of the period 1941-43. This ratio then is scaled to produce a base year value of 10. On September 30, 1988, the value of the S&P 500 index was 271.91, indicating that the total market value of all stocks in the index is currently 27.19 times greater than it was in the base period 1941-43.

Historical information is available on the S&P 500 extending back to 1941.

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**PERFORMANCE BASED FEES**

**Staff Position Paper  
March 1993**

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## PERFORMANCE BASED FEES

Currently the Minnesota State Board of Investment uses performance based fees for its external domestic active stock managers. The existing formula, while adequate, has some deficiencies that concern staff. The following paper describes the rationale for having performance based fees, the current formula, and a proposal that resolves staffs concerns.

### HISTORY

#### Performance Based Fee Rationale

In March 1986, the Board adopted a performance based fee policy for its active domestic equity managers. The rationale for implementing a performance based fee over the traditional flat fee structure centers around three principal arguments.

- 1) **Risk sharing.** Performance based fees provide for a more equitable relationship between a client and an external investment manager. Despite the best efforts of money managers, investment results are inherently uncertain. With flat fees, the client bears virtually all the risk of poor performance. With performance based fees, the external investment manager shares the risk of poor results with the client. Consequently, the client pays lower fees for inferior performance. Conversely, the external investment money manager receives additional fees for successful results.
- 2) **Focus.** Performance based fees provide a more focused relationship between a client and an external investment manager. The SBI uses a customized benchmark to represent the manager's particular investment style. With flat fees, the manager has less incentive to carefully consider the benchmark when constructing the client's portfolio. Performance based fees help to eliminate this problem by tying the manager's compensation to performance relative to the manager's benchmark. Therefore, performance based fees increase the manager's incentive to implement its stated investment process.
- 3) **Incentive.** Performance based fees offer more incentive to the external money manager to manage the client's portfolio as efficiently as possible. Under a flat fee system the manager will receive approximately the same management fee regardless of performance. Under performance based fees, a manager has a monetary incentive to focus on all aspects of the investment business that impact a client's portfolio. If the manager can eliminate even small inefficiencies in their investment process, the client will earn a higher rate of return, net of fees, and the manager will receive a larger management fee.

## **CURRENT PERFORMANCE BASED FEE STRUCTURE**

### **General Description**

The current policy uses a "symmetrical fulcrum" performance based fee. A symmetrical fulcrum establishes a base compensation for an external investment manager and a performance target against which additional compensation (positive or negative) will be determined. If the manager's return exceeds the target, an additional compensation above the base fee will be paid to the manager. If performance falls short of the target, the base fee will be reduced. As the name implies, the symmetrical fulcrum calculation causes the manager's total compensation to fluctuate symmetrically around an established target. Therefore, superior performance of a certain amount relative to the target produces additional payments to the manager equivalent to the amount withheld from the manager for the same deviation in performance below the target.

### **Current Formula**

The current performance based fee calculation consists of two parts.

- 1) Base fee.
- 2) Performance fee.

The base fee portion uses the fee schedule negotiated in each external investment manager's contract. The base fee is paid in arrears at the end of each quarter based on the market value of the SBI assets allocated to that manager.

The performance fee is calculated and paid annually in arrears. The calculation is based on the manager's excess return (total actual return, net of fees, less the manager's benchmark return) and the average assets under management. The calculation converts the manager's share of the excess return into dollars by multiplying it by the manager's average portfolio value over the appropriate time frame.

The current performance fee structure combines two separate calculations. The calculation using the one year performance receives a 25% weight while the calculation based on the manager's three year performance receives a 75% weight. The manager will earn its base fee if it outperforms its benchmark, net of fees, by 1.5% over a one and three year time frame. The manager's maximum positive performance fee will double its base fee. The maximum negative performance will eliminate the base fee entirely. With the 1.5% "hurdle rate" the calculations equalize the manager fees so that they all achieve the maximum positive performance fee when they outperform the benchmark by 9.0% and the maximum negative fee occurs when they under perform the benchmark by 6.0% over both a one and three year time frame.

The current formula is described in more detail in Exhibit A.

#### **WHY CHANGE**

The type of performance base fee structure described above has the advantage of being the most widely accepted approach to performance fees within the financial community. However, there are some disadvantages in using the current structure.

- 1) Using one and three year rolling annualized returns ignores what the manager accomplished prior to that time period. Therefore, the relationship between what the manager earns in fees relative to its performance since the inception of the account can be distorted.
- 2) The return based performance fee structure can cause distortions when cash flows do not occur at the beginning of the measurement period. For example, if a manager generates all of its excess return in the first half of the measurement period but receives a contribution in the second half, the manager will earn a performance fee on that contribution as well.
- 3) The calculation is not very intuitive. It is difficult to explain how the combination of the manager's excess rate of returns and assets under management generated the performance based fee paid to the manager.
- 4) There is a fair amount of resistance among external investment managers to the idea that performance based fees could reduce their annual management fee significantly. In the case of the current formula, the manager's total compensation

could go to zero. Some external investment managers are willing to accept performance based fees but feel that the current formula creates too much business risk. They feel that the potential wide variations in fee payments make it difficult to run their business because of the uncertainty of what their revenue will be each year.

## **DOLLAR MEASURE PERFORMANCE BASE FEES**

### **General Description**

Staff proposes that the SBI continue to use a symmetrical fulcrum structure but change its performance based fee calculation from one based on rates of return to a "dollar measure" approach. The dollar measure approach calculates the manager's ability to add value in terms of dollars rather than rates of return. To calculate the value added, the dollar measure approach compares the manager's actual portfolio value to the dollar value of the manager's benchmark portfolio. If the manager's actual portfolio generates a larger dollar amount than the benchmark portfolio, the manager will receive a portion of the value added in addition to their base fee. If the manager under performs, the manager's share will be subtracted from its base fee payment.

### **Proposed Dollar Measure Calculation**

Staff's proposed dollar measure performance base fee calculation basically follows the general concept described above. Staff proposes that the dollar difference between the actual and benchmark portfolio be allocated in the following manner:

- 1) The evaluation period will be one year. After each evaluation period the dollar value of the benchmark portfolio will be reset to equal the dollar value of the actual portfolio.
- 2) The manager will earn its base fee when it outperforms the benchmark portfolio by the equivalent of its base fee plus a 1.0% hurdle rate.
- 3) The dollar difference left after deducting the base fee and the 1% hurdle rate will be paid out over a five year period (i.e. One fifth in each of the next five years.)
- 4) The client and the manager will share the net positive or negative value added on a 1 to 15 share ratio (e.g. If a net positive \$150,000 value added was generated, the client would keep \$140,000 and the manager would receive \$10,000.)

- 5) The manager may choose from four options on how much of their base fee they can earn/lose in any given year. The manager's performance based fee can be 100%, 75%, 50%, or 25% of their base fee for the year.
- 6) If the manager's potential performance fee (positive or negative) exceeds the maximum or minimum payment limits, the remaining amount will be carried over into the next year.

Once the manager has chosen one of the four options in #5 above, that option would remain in effect for as long as the SBI maintains an account with the manager. The base fee for each manager will use the fee schedule included in each manager's contract and will be paid quarterly, in arrears, based on the market value of the SBI assets allocated to the manager at the end of each quarter. The performance fee calculation will occur annually and will be paid in arrears.

To illustrate the proposed dollar measure calculation, Exhibit B shows an example covering the first five years. The example assumes that the manager chose the option where the performance fee can equal 50% of its base fee.

To start the new formula, a transition process needs to be developed to convert the existing investment managers from the current performance based fee procedure to the dollar measure approach. Under the current performance based fee calculation, the manager has an implied positive or negative carryover due to the rolling three year average. If the current calculation remained in place, the previous two years would have some impact on the performance fee for the next two years. That implied carryover should be calculated and reflected in the starting amounts for the dollar measure calculation. The carryover can be calculated by assuming that the next two years actual and benchmark returns are the same and the current portfolio value remains constant. Therefore, the actual and benchmark starting values will be different reflecting the implied carryover of the current performance base fee calculation.

## CONCLUSION

Staff recommends that the SBI performance based fee calculation be changed from a rate of return methodology to a dollar measure methodology. The dollar measure approach has several advantages over the current performance base fee calculation. First, the dollar measure approach resolves the problem of how to handle cash flows that occur during the measurement period. Since the calculation compares the dollar value of the actual portfolio to the dollar value of the benchmark, the problem can be solved by adjusting both accounts by the dollar value of the cash flow when it occurs.

Second, the proposed methodology incorporates the manager's total performance since inception rather than the rolling time periods used in the current formula. Using a performance fee calculation based on results since inception of the account provides the best correlation between the manager's value added performance and the performance fee that is paid. Any system that uses rolling time periods creates distortions because at a certain point, past years are eliminated.

Third, the dollar measure methodology is easier to understand because the calculation is based on the dollar growth of the actual portfolio compared to the dollar growth of the benchmark portfolio. The current calculation is more difficult to understand and communicate because the manager's performance fee is based on several excess rates of return and average assets under management.

Fourth, providing various options on how much of the managers base fee is at risk in any given year addresses the investment manager's concerns about business risk. The manager will obtain a lower performance fee if it chooses to guarantee receipt of a certain portion of its base fee.

## EXHIBIT A

### CURRENT PERFORMANCE BASE FEE FORMULA

The annual fee will be composed of two parts:

- A) The base fee
- B) The performance fee

#### A. BASE FEE

- The base fee will be paid quarterly, in arrears.
- The base fee will be calculated as a percentage of the market value of total SBI assets managed by the manager at the end of quarter.
- The annual base fee rate is the fee included in the contract between the manager and SBI.

#### B. PERFORMANCE FEE

- The performance fee will be paid annually, in arrears.
- The performance fee will be based upon the manager's total fund return relative to the manager's normal portfolio return.
- The performance fee rate will be computed according to the following formula (in basis points):

$$PF = [(RM - RN - 150) X (BF/50)]/15$$

where:

*PF* = performance fee rate

*RM* = return on manager's portfolio, net of base fee payments

*RN* = return on normal portfolio

*BF* = base fee rate in the manager's contract x 100

## EXHIBIT A (con't)

- Performance measurement period shall be one full twelve-month period.
- The maximum performance fee will be no more than the base fee paid in the most recent performance measurement period. The minimum performance fee will be no less than minus the base fee paid in the most recent performance measurement period.
- Performance fees will be calculated by assigning a one-quarter weight to the most recent period's relative returns and a three-quarters weight to trailing three-period annualized relative returns.
- In the first performance measurement period, 100% weight will be assigned to the most recent period's relative returns. The maximum performance fee will be no more than one-third the base fee paid in the most recent performance measurement period. The minimum performance fee will be no less than minus one-third the base fee paid in the most recent performance measurement period.
- In the second performance measurement period, one-third weight will be assigned to the most recent period's relative returns and two-thirds weight to trailing two-period annualized relative returns. The maximum performance fee will be no more than two-thirds the base fee paid in the most recent performance measurement period. The minimum performance fee will be no less than minus two-thirds the base fee paid in the most recent performance measurement period.
- The performance fee will be calculated against average quarterly asset values (at market) over the appropriate performance measurement periods.
- The performance fee, if positive, will be added to the final quarterly base fee paid at the end of the most recent performance measurement period.
- The performance fee, if negative, will be offset against the final quarterly base fee paid at the end of the most recent performance measurement period and any outstanding performance fee balances must be paid in full within 60 days after said date.



## **EXHIBIT A (con't)**

### **C. MISCELLANEOUS**

- Manager portfolio and normal portfolio returns will be computed by organization(s) designated by the SBI.
- If this contract should be terminated prior to the end of a full performance measurement period, no performance fee will be paid or debited for that year.
- Further, in the event of such a termination, any and all outstanding performance fee balances must be paid in full within 60 days of the termination date.

**PERFORMANCE BASE FEE  
PROPOSED DOLLAR MEASURE  
EXAMPLE**

	Total Dollar Value Added*	Manager Share	Year 1	Year 2	Year 3	Year 4	Year 5
Period 1	\$7,500,000	\$500,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Period 2	-11,250,000	-750,000	-0-	-150,000	-150,000	-150,000	-150,000
Period 3	30,000,000	2,000,000	-0-	-0-	400,000	400,000	400,000
Period 4	15,000,000	1,000,000	-0-	-0-	-0-	200,000	200,000
Period 5	-18,750,000	-1,250,000	-0-	-0-	-0-	-0-	-250,000
<i>Total</i>			<u>\$100,000</u>	<u>-\$50,000</u>	<u>\$350,000</u>	<u>\$550,000</u>	<u>\$300,000</u>
<i>Pervious Year Carryover</i>			-0-	-0-	-0-	-0-	\$100,000
<i>Total Available</i>			<u>\$100,000</u>	<u>-\$50,000</u>	<u>\$350,000</u>	<u>\$550,000</u>	<u>\$400,000</u>
<i>Base Fee</i>			\$800,000	\$750,000	\$850,000	\$900,000	\$850,000
<i>Option Limit</i>			50%	50%	50%	50%	50%
<i>Potential Performance Fee</i>			<u>\$400,000</u>	<u>\$375,000</u>	<u>\$425,000</u>	<u>\$450,000</u>	<u>\$425,000</u>
<i>Actual Performance Fee</i>			\$100,000	-\$50,000	\$350,000	\$450,000	\$400,000
<i>Total Fee</i>			<u>\$900,000</u>	<u>\$700,000</u>	<u>\$1,200,000</u>	<u>\$1,350,000</u>	<u>\$1,250,000</u>
<i>New Carryover</i>			-0-	-0-	-0-	\$100,000	-0-

\* After deducting the dollar value of the 1% hurdle rate, and the manager's base fee paid.

**PERFORMANCE-BASED FEES**

**Staff Position Paper  
January 1986**

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## EXECUTIVE SUMMARY

Until recently, registered investment advisers were prohibited from entering into advisory agreements with pension plans if the advisers' compensations were based directly on performance. Instead compensation had to be made on a "flat fee" basis, whereby managers' fees were calculated as a specific percentage of the market value of assets under management.

In November 1985, the Securities and Exchange Commission lifted the prohibition on performance-based fees for most institutional investors. A wide range of fee structures is now permitted.

There are three principal rationales for performance-based fees. First, such fees are inherently fairer in that the client shares the risk of poor or good performance with the manager. Second, performance-based fees give a manager an incentive to carefully consider a client's risk-return preferences in constructing the client's portfolio. Finally, performance-based fees provide the manager with an inducement to pursue all avenues of maximizing client portfolio returns.

The appropriate benchmark against which to calculate manager performance-based compensation is a normal portfolio. A normal portfolio is a customized index that reflects a manager's particular investment style. At times a manager may perform well (or poorly) simply because his investment style is "in favor" (or "out of favor"). Normal portfolios compensate for this factor and can be used to more effectively evaluate the true value added to the investment process by a manager.

Staff considered three performance-based fee structures. Each was designed to pay a manager fees roughly equal to those now earned under the flat fee system, if the manager can outperform his normal portfolio by two percentage points annually. The three fee structures, symmetrical fulcrum, maintenance, and asymmetrical fulcrum differ

technically in terms of base fee levels and the rates at which excess performance (positive and negative) is shared with a manager. More importantly, the fee structures differ as to the risk-taking incentives they will offer managers.

Staff recommends that the symmetrical fulcrum fee, as proposed, be adopted by the Board to compensate its active equity managers. This fee structure is the simplest and most conservative. Particularly in the initial stages of performance-based fee implementation, simplicity and conservatism are desirable attributes. As the Board and the investment community become more experienced with performance-based fees, the proposed fee structure likely will be altered.

## **INTRODUCTION**

Since the initiation of the SBI's external investment program, the Board has compensated its managers based solely on assets under management. That is, each manager's fee is calculated as a specific percentage of the market value of the assets that the manager is investing. These fees, referred to as flat fees, are paid regardless of the manager's absolute or relative performance.

Performance-related compensation under a flat fee system is provided for only in an indirect fashion. If the manager performs as well (poorly) assets under management will rise (fall) in value and, hence, dollar income will rise (fall). Further, if the manager performs well, presumably the firm will be allowed to continue managing the account. If the manager performs poorly, presumably the firm eventually will lose the account. Beyond these considerations, compensation is unaffected by the manager's investment performance.

Until recently, registered investment advisers were prohibited from entering into advisory agreements with pension plans if the advisers' compensation were based directly on performance. However, the Securities and Exchange Commission has now lifted this total prohibition. Registered investment advisers now may negotiate, subject to certain constraints, performance-based compensation arrangements with clients of substantial size. Given the SEC's recent decision, the purpose of this staff position paper is to propose a performance fee structure that the SBI could implement for its active external equity managers

## RECENT SEC RULING

The Investment Advisers Act of 1940, administered by the SEC, regulates the activities of most firms offering investment advisory services. Portions of the Act restrict the form of compensation paid to investment managers. The Investment Advisers Act prohibits the use of performance fees except under very specific conditions. Section 205, paragraph 1, states that no investment adviser may enter into a contract that "provides for compensation to the investment adviser on the basis of a share of capital gains upon or capital appreciation of the funds or any portion of the funds of the client."

In 1970, Congress gave the SEC wide latitude to grant exemptions to this prohibition. Since that time the SEC has permitted relatively few individual exemptions. In 1983, the SEC considered a rule that would have provided a general exemption for clients of substantial size. This proposed ruling was withdrawn after a comment period. The reasons for the withdrawal were never clearly explained. Nevertheless, in March 1985, the SEC again proposed a rule almost identical to the 1983 version. In the case of both the 1983 and 1985 proposed rules, the SEC was prompted by the concern that "the general ban on performance fees was unnecessary for certain clients." During the SEC's comment period on the 1985 proposal a number of responses were received, the vast majority favorable to the proposal. The SBI was one of the favorable respondents. Based on these responses and its staff's analysis, on November 14, 1985, the SEC adopted the proposed general exemption.

For qualifying clients the SEC's general exemption allows investment managers almost unlimited authority to negotiate performance-based fee contracts. A registered investment adviser may now receive performance-based compensation from a client if:

- 1) The client has at least \$500,000 under the management of the adviser or the adviser reasonably believes that the client has a net worth of at least \$1,000,000.



- 2) The adviser's performance fee is based on unrealized, as well as realized, capital gains and losses.
- 3) The performance measurement period is at least one year.
- 4) The adviser discloses certain information to the client.
- 5) The adviser reasonably believes that the advisory contract is an arms-length transaction and that the client understands the performance fee contract and its risks.

The funds managed for the Board by external managers easily meet the SEC's size requirement. Further, the three performance-fee structures discussed in this paper fully satisfy the other SEC conditions.

### **RATIONALE FOR PERFORMANCE-BASED FEES**

There are three principal arguments supporting the use performance-based fees over flat fees. First, performance-based fees provide for a more equitable relationship between a client and a manager. Despite the best efforts of money managers, investment results are inherently uncertain. With flat fees, the client bears all risk of unsatisfactory performance. Under performance-based fees, the client shares the risk of poor results with the money manager. The client is not required to pay high fees for inferior performance. Conversely, the manager will be well paid for successful results.

Second, performance-based fees produce a more efficient relationship between a client and a manager. With flat fees, the manager has no strong incentive to carefully consider a client's risk-return preferences when constructing the client's portfolio. Terminating a manager for insufficient attention to client preferences usually is not a realistic option. Performance-based fees, on the other hand, tie a manager's compensation to performance relative to a specific target. This target represents the risk-return preferences of the client. Because of this tie, the manager is forced to consider the performance implications of active management decisions relative to the client's desired target.

Third, performance-based fees offer a more comprehensive relationship between a client and a manager. Flat fees give the manager no inducement to pursue all avenues of maximizing total portfolio returns, subject to the client's risk-return preferences. But under performance-based fees, a manager has a monetary incentive to focus on all aspects of the investment business that impact on client's portfolio. These aspects include such often overlooked details as commission costs, market impact of trades, dividend reinvestment programs, etc.

### **POSSIBLE TYPES OF PERFORMANCE COMPENSATION**

The SEC's recent ruling permits a wide range of performance fee structures. Nevertheless, staff believes that the actual number of viable performance fee structures is limited. This paper examines three of the most feasible forms from the plan sponsor's standpoint. This section briefly describes each of the three forms. Recommended specific terms of these fee structures are presented later.

The first type of performance fee structure is a symmetrical fulcrum fee. A symmetrical fulcrum fee establishes a base compensation for a manager and a performance target against which additional compensation (positive and negative) will be determined. If the manager's return matches that of the target no additional compensation is paid. The manager simply receives the base fee. If performance exceeds the target, an additional predetermined fee will be paid to the manager. If performance falls short of the target, the base fee will be reduced by a predetermined amount. As the name implies, the symmetrical fulcrum fee makes performance compensation fluctuate symmetrically around the base compensation. That is, superior performance of a certain amount relative to the target produces additional payments to a manager equivalent to the amount withheld from the manager for the same deviation in performance below the target.

Under a symmetrical fulcrum fee, the base compensation would be set at a rate similar to fees presently paid under a flat fee system. (Flat fees currently paid by

institutional investors to active equity managers average approximately .50% of assets under management.) Performance above (or below) the target is shared with the manager as described above. The symmetrical fulcrum fee is designed so that the manager will have to perform exceptionally well (poorly) relative to the target to receive the maximum (minimum) performance compensation.

The second form of performance fee structure is a maintenance fee. A maintenance fee, like the symmetrical fulcrum fee, sets a base compensation and performance target for a manager. However, unlike the symmetrical fulcrum fee, the maintenance fee establishes a very low base compensation, only a fraction of the current flat fees paid most active equity managers. Further, the low base compensation is the minimum amount the manager will receive. Even if the manager underperforms the target, significantly, the base compensation will still be paid.

The security of a positive minimum total fee is offset by a more volatile fee structure than under the symmetrical fulcrum fee. Excess returns (positive and negative) are shared with the manager at a higher rate. Hence, the total fee paid the manager will go to the maximum or the minimum more quickly than under the symmetrical fulcrum fee. From the manager's perspective this feature makes the maintenance fee more risky than the symmetrical fulcrum fee.

Finally, the third type of performance fee is an asymmetrical fulcrum fee. Like the symmetrical fulcrum fee, this fee structure sets a base compensation roughly equal to that paid under current flat fees. However, unlike the symmetrical fulcrum fee, performance above target is shared at a lower rate than is performance below target. Hence, the name asymmetrical fulcrum fee. This structure is designed to reflect the plan sponsor's risk aversion. That is, superior performance gives the plan sponsor less "satisfaction" than does inferior performance of an equal absolute magnitude cause plan sponsor "dissatisfaction."

## **APPROPRIATE PERFORMANCE TARGETS**

Performance-based fees are vacuous if they do not tie a manager's compensation to an appropriate performance target. If the target is not consistent with the manager's investment style, then the manager's results relative to that target will be essentially random. In such cases, performance-based fees may fail to reward (penalize) a manager for positive (negative) results within his control or may reward (penalize) a manager for results out of his control. Either situation is inimical to a sound long-term investment program.

The appropriate performance targets for the Board's equity managers are customized indices (i.e., normal portfolios) that reflect the manager's specific investment styles. Normal portfolios are predicated on the concept that investment managers follow distinct approaches in designing portfolios. These approaches will vary from manager to manager. For example, "Growth" managers will hold different portfolios and may produce radically different investment results than managers pursuing a "Value" style. The performance targets assigned to these and other types of managers should reflect the fundamental differences in investment style. Normal portfolios as performance targets are clearly consonant with SEC directives which state that "in determining whether an index is appropriate for a particular investment company, directors should consider factors such as the volatility, diversification of holdings, types of securities owned and objectives of the investment company." (For additional information on normal portfolios, see the staff position paper on the subject contained in the Board's second quarter 1985 report.)

## **PERFORMANCE FEE DESIGN**

The preceding sections have provided a general introduction to three performance-based fee structures and discussed the use of normal portfolios as performance targets. The discussion now turns to staff's opinions regarding desirable specific terms and conditions of the three performance-based fee structures.

In a number of respects, the proposed designs of the performance-based fees are similar. The following standard terms are proposed for incorporation in each fee structure.

- One base fee and one performance fee schedule will apply to all SBI active external equity managers.
- The base fee will be paid quarterly calculated as a percentage of total assets managed at quarter-end.
- The performance fees will be based on the managers' total fund returns relative to their individual normal portfolios, gross of base fee. It will be calculated as a percentage of the managers' average quarterly assets over the performance measurement period.
- The performance measurement period will be one full fiscal year ending June 30.
- Performance fees will be calculated assigning a one-third weight to the most recent year's relative results and a two-thirds weight to trailing three-year relative results.
- Both the managers' total fund performances and the returns on the managers' normal portfolios will be computed by independent consultant(s) designated by the SBI.
- If a manager-SBI contract is terminated, any outstanding performance fee balances must be paid in full.

As described in detail in the next three sections, the primary technical differences among the three proposed performance fee structures are the base fee levels and the rates at which excess performance (positive and negative) is shared with a manager.

Despite these differences, each fee structure is designed to pay a manager total compensation roughly equal to that now paid under flat fees, if the manager can add

"adequate" value to his investment style. That is, the SBI always has the option to passively replicate, at a low cost, any manager's investment style by simply holding the manager's normal portfolio. An active manager should be expected to make investment decisions that produce results superior to the returns earned by a passive investment in the manager's particular style. Staff believes that an active manager should be able to outperform his normal portfolio by at least two percentage points annually (before fees). Thus, the proposed fee structures are designed to offer compensation higher than amounts paid under flat fees only if a manager outperforms his normal portfolio by more than this expected increment. Further, if a manager fails to outperform his normal portfolio by the expected two percentage points, he will earn compensation below the amount now paid under flat fees.

It should also be noted that the calculation of performance fees based on both one-year and three-year relative results is designed to provide immediate and long-term incentives to a manager. The inclusion of one-year relative results prevents a manager's compensation from being excessively influenced over an extended period by one very successful or unsuccessful year. On the other hand, the incorporation of trailing three-year relative results gives a manager an incentive to adopt a long-term investment approach.

#### **SYMMETRICAL FULCRUM FEE DESIGN**

In addition to the standard performance fee terms outlined in the previous section, staff proposes that a symmetrical fulcrum incorporate the following features:

- The standard base fee will average .50% on all amounts under management.
- The performance fee schedule will be:

Manager's Return less Return on Normal Portfolio	Performance Fee
---	-----------------

+200 bp	0
+201 bp on up	One basis point in additional fee for every fifteen basis points in positive excess returns, up to a total performance fee of 50 basis points
+199 bp on down	One basis point in decreased base fee for every fifteen basis points in negative excess returns, down to a total performance fee of -50 basis points

The performance fee is symmetrical, adding to and subtracting from a manager's base fee in equivalent amounts for equal levels of over and underperformance. The fee structure is constructed so that a manager's total fee can range from 1.00% to 0% of assets under management. The performance fee structure is conservatively designed so that the manager must significantly outperform (underperform) his target to receive the maximum (minimum) total fee. Excess returns (positive and negative) are shared with the manager on a one-for-fifteen basis. Staff believes that this conservative approach is appropriate particularly in the early phases of performance fee use. As the Board gains more experience the performance fee schedule may be altered.

#### **MAINTENANCE FEE DESIGN**

In addition to the standard terms, staff proposes that a maintenance fee incorporate the following features:

- The standard base fee will be .10% on all amounts under management.
- The performance fee schedule will be:

Manager's Return less Return on Normal Portfolio	Performance Fee
-80 bp on down	0

-79 bp on up

One basis point in additional fee for every seven basis points in positive excess returns up to a total performance fee of 90 basis points

The maintenance fee establishes a ten basis point base which serves as a floor level of compensation. A manager can earn no less than this fee, regardless of how poorly he might perform. While this base fee is considerably below that earned under a flat fee system, it does give a manager with a certain amount of cash flow security. This certainty is not provided under the symmetrical fulcrum fee.

On the other hand, the maintenance fee shares excess returns (positive and negative) with a manager at a more aggressive rate than under the symmetrical fulcrum fee. This reward sharing ratio is one-for-seven instead of one-for-fifteen. As a result, the manager approaches the maximum 1.00% total fee, as well as the minimum .10% total fee, much more quickly than under the symmetrical fulcrum fee. This feature makes the manager's cash flow more risky under the maintenance fee.

#### **ASYMMETRICAL FULCRUM FEE DESIGN**

In addition to the standard terms, staff proposes that an asymmetrical fulcrum fee incorporate the following features:

- The standard base fee will be .50% on all amounts under management.
- The performance fee schedule will be:

<b>Manager's Return less Return on Normal Portfolio</b>	<b>Performance Fee</b>
+200 bp	0
+201 bp on up	One basis point in additional fee for every twelve basis points in positive excess returns up to a total performance fee of 50 basis points



+199 bp on down

One basis point in decreased fee for every ten basis points in negative excess returns, down to a total performance fee of -50 basis points.

The asymmetrical fulcrum fee allows total fees to move both above and below the base fee with an upper limit of 1.00% and a lower limit of 0%, the same as the symmetrical fulcrum fee. But a manager is rewarded more generously for performance above the target than he is penalized for equivalent performance below the target. Specifically, performance above the target will be split one-for-twelve with a manager. Performance below the target will be split one-for-ten. Again, as with the symmetrical fulcrum fee, these reward sharing ratios are fairly conservative. As a Board's experience with performance-based fees increases, these reward sharing ratios could be altered.

#### **PERFORMANCE FEE EXAMPLES**

To aid in understanding the mechanics of the three fee structures, several hypothetical examples are presented in Table 1. The examples are designed to demonstrate the compensation that would be paid under each fee structure, assuming various performance results by a given manager. These results range from significantly below the manager's normal portfolio return to significantly above the normal portfolio return.

At the point where a manager outperforms his normal portfolio by 200 basis points, all three fee structures yield the same total compensation (50 basis points). Moving away from that point, the fee structures offer a manager varying compensation risks and opportunities.

For returns below target, a manager receives the lowest compensation from the maintenance fee for a fairly wide range. Within this range, the symmetrical and asymmetrical fulcrum fees both offer compensation above the maintenance fee, although the asymmetrical fulcrum fee penalizes the manager more than the symmetrical fulcrum

PERFORMANCE-BASED FEE EXAMPLE RESULTS  
(Fees in Basis Points)

	Manager's Return Less Return on Normal Portfolio (In Basis Points)	Symmetrical Fulcrum			Base Fee	Maintenance Performance Fee	Total Fee	Asymmetrical Fulcrum		
		Base Fee	Performance Fee	Total Fee				Base Fee	Performance Fee	Total Fee
Scenario A	- 800	50.0	-50.0	0.0	10.0	0.0	10.0	20.0	- 20.0	0.0
Scenario B	- 700	50.0	-50.0	0.0	10.0	0.0	10.0	20.0	- 20.0	0.0
Scenario C	- 600	50.0	-50.0	0.0	10.0	0.0	10.0	20.0	- 20.0	0.0
Scenario D	- 500	50.0	-46.7	3.3	10.0	0.0	10.0	20.0	- 20.0	0.0
Scenario E	- 400	50.0	-40.0	10.0	10.0	0.0	10.0	20.0	- 20.0	0.0
Scenario F	- 300	50.0	-33.3	16.7	10.0	0.0	10.0	20.0	- 20.0	0.0
Scenario G	- 200	50.0	-26.7	23.3	10.0	0.0	10.0	20.0	- 10.0	10.0
Scenario H	- 100	50.0	-20.0	30.0	10.0	0.0	10.0	20.0	0.0	20.0
Scenario I	0	50.0	-13.3	36.7	10.0	11.4	21.4	20.0	10.0	30.0
Scenario J	100	50.0	- 6.7	43.3	10.0	25.7	35.7	20.0	20.0	40.0
Scenario K	200	50.0	0.0	50.0	10.0	40.0	50.0	20.0	30.0	50.0
Scenario L	300	50.0	6.7	56.7	10.0	54.3	64.3	20.0	38.3	58.3
Scenario M	400	50.0	13.3	63.3	10.0	68.6	78.6	20.0	46.7	66.7
Scenario N	500	50.0	20.0	70.0	10.0	82.9	92.9	20.0	55.0	75.0
Scenario O	600	50.0	26.7	76.7	10.0	90.0	100.0	20.0	63.3	83.3
Scenario P	700	50.0	33.3	83.3	10.0	90.0	100.0	20.0	71.7	91.7
Scenario Q	800	50.0	40.0	90.0	10.0	90.0	100.0	20.0	80.0	100.0
Scenario R	900	50.0	46.7	96.7	10.0	90.0	100.0	20.0	80.0	100.0
Scenario S	1000	50.0	50.0	100.0	10.0	90.0	100.0	20.0	80.0	100.0
Scenario T	1100	50.0	50.0	100.0	10.0	90.0	100.0	20.0	80.0	100.0
Scenario U	1200	50.0	50.0	100.0	10.0	90.0	100.0	20.0	80.0	100.0

fee. However, for performance well below the normal portfolio, both the symmetrical and asymmetrical fulcrum fees go to zero, while the maintenance fee offers a minimum 10 basis points.

For performance above the normal portfolio by more than expected results, the maintenance fee is consistently more generous than the other two fee structures. Further, the asymmetrical fulcrum fee is relatively more rewarding than the symmetrical fulcrum fee.

### **DIFFERENCES IN RISK-TAKING INCENTIVES**

The three fee structures described above incorporate a number of different features. However, in terms of their impact on manager-client relationships, they are basically similar. Each fee structure possesses the three advantages of performance-based fees over flat fees discussed earlier. That is, each creates a more equitable, efficient and comprehensive relationship between a money manager and client.

However, the three fee structures have at least one substantial difference. They differ in how they potentially will affect a manager's attitude toward risk-taking. Risk-taking, in this context, is defined as holding a portfolio that differs from the normal portfolio and, hence, has the potential to add value to (or detract value from) the normal portfolio. The SBI's managers, like any others, can be expected to react to performance fees in a way that maximizes their self-interest. The task is to design a fee structure that causes that action to be in the best interest of the SBI as well.

The symmetrical and asymmetrical fulcrum fees are likely to induce a manager to take less risk than will the maintenance fee. Passive management relative to the normal portfolio will produce a reasonably comfortable level of fee income. That is, if a manager holds a portfolio that resembles the normal portfolio, thereby producing returns which equal those of the normal portfolio, he can still earn a reasonably high fee under these two

structures. Deviating from the normal portfolio increases opportunities to earn more than the passive fee, but also runs the risk of earning less, particularly a zero fee at a minimum.

The maintenance fee may induce a manager to take on more risk than the other two fee structures. In a sense the manager holds an option on the SBI. If his performance is below the normal portfolio he will receive the minimum 10 basis points base fee. While this base compensation low relative to flat fees, the manager can only do better. Thus, he has an incentive to make significant active bets. The concern would be whether those bets might be excessive relative to the client's objectives. Certainly, active managers should be encouraged to take risks. The only way they can add value to their investment style is to deviate from their normal portfolios. Yet those active bets should be tempered by the understanding that performance fee penalties will be assessed if the active bets should prove to be grossly incorrect.

Which of these three fee structures will result in an optimal level of risk-taking on the part of the managers is difficult to anticipate. Various managers may react differently to any one of the structures.

## **DISADVANTAGES OF PERFORMANCE FEES**

A number of objections to performance-based fees have been raised. Some of these arguments have merit and should not be dismissed lightly. However, staff believes that these objections can be adequately addressed and that on balance performance-based fees will enhance client-manager relationships.

It has been argued that performance-based fees may cause a manager to adopt a short-run outlook, detrimental to the client's long-run interests. Staff believes quite the contrary. The prevailing plan sponsor focus on short-run performance, and the resulting rapid termination of poorly performing managers, has fixated most managers on short-run results. Staff believes that a client will be less likely to fire a manager performing poorly quickly if the manager is penalized through performance-based fees. Therefore, by

lowering the chances of hasty terminations, performance-based fees are likely to cause a manager to adopt a long-run investment perspective. Further, because a manager's compensation is tied to his long-run performance, he has an incentive to avoid short-run decisions that might detract from longer-term results.

Another objection to the use of performance-based fees is that they will cause a manager to take excessive risks. Staff has discussed that issue earlier in this paper. If the appropriate performance fee structure is used, the incentive for a manager to take undue risks can be controlled. Further, with an adequate manager monitoring program in place, any excessive risk positions by a manager can be quickly identified and corrected.

The concern also has been raised that the techniques used to distinguish successful performance are too crude and that manager compensation should not be based on an inadequate methodology. It is true that the measurement of active management ability is imprecise. The use of normal portfolios, which reflect managers' distinct investment styles, is one means of confronting this problem. Nevertheless, a manager's results, relative to his normal portfolio, will still reflect a considerable degree of chance. That problem is inherent to the investment process. If a manager's normal portfolio is properly specified, however, then over time that portion of the manager's returns attributable to chance should wash out, leaving the results due to management skills.

Finally, it has been argued that performance-based fees may cause a manager to pay less attention to a poorly performing account. The manager may believe that the account's results are so poor that even strong future performance is unlikely to salvage results and produce adequate compensation. Staff believes that this potential problem is handled best by the inclusion of one-year performance results in the fee calculation. If the performance fees were based solely on results over several years, it might be possible for a manager to fall far enough behind his normal portfolio that chances of a catch-up would be remote. Under the proposed structure, such a scenario is unlikely.

## **RECOMMENDATION**

Staff strongly supports the use of performance-based fees to compensate active equity managers. Staff believes that the advantages of properly designed performance-based fees far outweigh the potential disadvantages. Each of the three performance-based fees structures discussed in this paper offers the prospect of increased equitability, efficiency and comprehensiveness in client-manager relationships.

Among the three fee structures staff believes that the symmetrical performance fee is the superior design. It is the simplest and most conservative of the three fee structures. Particularly in the initial stages of performance-based fee implementation, simplicity and conservation are probably desirable attributes.

As discussed previously, the maintenance fee may encourage a manager to assume excessive risk. It is true that the manager's risk position can be monitored by the client and corrective action initiated if necessary. Nevertheless, reducing the incentive to take excessive risk seems more reasonable.

The asymmetrical fulcrum fee may also be a very workable structure. However, with its two reward sharing ratios depending upon whether a manager produces superior or inferior performance, it does not have the simplicity of the symmetrical fulcrum fee.

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**COMPLETENESS FUND**

**Staff Position Paper  
February 1988**

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## EXECUTIVE SUMMARY

The Basic Retirement Funds are managed in a similar fashion to many other large pension funds in that the common stock and bond components use both active and passive management. Further, the Basic Funds employ a number of specialized active managers pursuing a variety investment styles within each asset class. These active managers are hired for their anticipated ability to produce superior performance within their specific areas of expertise.

Active management offers the potential for the Basic Funds' common stock component to exceed the returns of its asset class target, the Wilshire 5000. However, the pursuit of superior performance through active management carries with it the risk of underperforming the Wilshire 5000.

This underperformance results from two sources:

- The active managers perform poorly relative to their benchmarks. This source of underperformance is the most familiar to performance evaluators.
- The active managers individually perform well within their areas of expertise. However, the active managers' investment styles, in aggregate, over or underemphasize certain segments of the Wilshire 5000. The underemphasized segments perform relatively well while the overemphasized segments perform poorly.

The active managers' over or underemphases of segments within the Wilshire 5000, and the possibility that this may result in the Basic Funds' common stock portfolio underperforming the Wilshire 5000, is called misfit risk. Misfit risk is unintentional. Further, it is unproductive in that there is no expectation of enhanced returns associated with assuming misfit risk. Therefore, the Board should seek to minimize misfit risk.

The role of a completeness fund is to control misfit risk. A completeness fund accomplishes this objective by adjusting the Basic Funds' common stock portfolio to offset

the misfit present in the aggregate investment style of the Board's common stock managers. The completeness fund offers two primary benefits:

- Improves the ability of the Basic Funds' common stock program to consistently outperform the Wilshire 5000. The completeness fund reduces the risk that the value added by the active managers is offset by the negative impact of misfit.
- Adjusts for changing risk characteristics in the common stock portfolio due to changes in the active manager line-up. This allows the Board to focus on hiring active managers for their ability to add value rather than for the coverage provided by their specialized area.

Constructing a common stock completeness fund for the Basic Funds involves eight basic steps.

- **Step 1.** Select a common stock asset class target. The Board already has selected the Wilshire 5000 as the common stock asset class target.
- **Step 2.** Express the Wilshire 5000 as an investable list of securities. Ineligible stocks, such as liquor and tobacco stocks, are removed.
- **Step 3.** Build appropriate benchmark portfolios for each of the Board's common stock managers. These benchmarks reflect the managers' investment styles.
- **Step 4.** Combine the managers' benchmark portfolios into an aggregate benchmark portfolio.
- **Step 5.** Compare the aggregate benchmark portfolio to the Wilshire 5000 and identify the differences. These differences represent misfit.
- **Step 6.** Specify a list of completeness fund securities to reduce the misfit to acceptable levels.
- **Step 7.** Periodically rebalance the completeness fund.
- **Step 8.** Monitor the performance of the completeness fund manager.

Staff has conducted research into the amount of misfit risk present in the Basic Funds' common stock component. Currently, that misfit risk is approximately 0.9% per

annum. That is, in any given year the Basic Funds' are likely to outperform or underperform the Wilshire 5000 by almost 1% due solely to misfit.

Staff does not view this current level of misfit as cause for significant concern. The diversity of investment styles among the Board's active managers, combined with the sizable allocation to the index fund, results in broad coverage of the Wilshire 5000. Nevertheless, the current level of misfit is not trivial. Further, if the current group of managers were altered, the misfit could increase. Therefore, staff proposes that a completeness fund be implemented as an adjunct to the active manager program.

Staff recommends that 5% of the Basic Funds' common stock component, or approximately \$150 million, be allocated to a completeness fund. This allocation is expected to reduce misfit risk by approximately 22%. Staff further recommends that the assets now managed for the Basic Funds by the internal manager be redirected from active management to the completeness fund.

Staff also recommends that responsibility for maintaining the completeness fund be divided between an outside vendor and internal staff. The outside vendor would supply the sophisticated computer software and databases required to construct the list of completeness fund securities. Staff recommends that, at least initially, the Board's consultant provide the necessary technical support. Internal staff would provide for the daily management of the completeness fund and, in particular, carry out the necessary security trading. A similar arrangement has proven successful and cost-effective in the management of the Post Retirement Fund's dedicated bond portfolio.

For the present, the Board's consultant can provide the necessary technical support under its current contract. As a result, the completeness fund can be constructed initially without incurring additional management costs to the Basic Funds.

If the completeness fund is approved, staff will continue to search for these technical support services during the next quarter. Staff intends to provide recommendations to the Board concerning on-going compensation to any vendor at the June 1988 Board meeting.

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## I. INTRODUCTION

### RISK MANAGEMENT

Investors are willing to incur risk because they expect to be compensated with enhanced returns. One of the primary responsibilities of pension plan sponsors is to manage this risk-return trade-off. For large pension plans, the risk management process can be a complex undertaking.

A pension plan's risk management begins with the identification of the plan's investment objectives. These objectives are then translated into a policy asset mix. A policy asset mix specifies the long-run allocation of the plan's assets among a number of broad asset classes (e.g., stocks and bonds).

Given a policy asset mix, the risk management process proceeds with the establishment of an investment management structure for each asset class in the policy asset mix. An investment management structure describes the alignment of investment approaches designed to achieve the desired risk-return objectives for a particular asset class.

The policy asset mix and common stock and bond investment management structures of the Basic Retirement Funds are delineated in a comprehensive investment policy statement adopted by the Board in 1987. (For further information, see Parts II and III of the Basic Funds' investment policy paper.)

### PASSIVE AND ACTIVE MANAGEMENT

In establishing an investment management structure, two basic investment approaches are available to a plan sponsor. These two approaches entail different sets of performance expectations.

- **Passive Management.** Buying and holding a diversified portfolio of securities within the asset class. Performance is expected to match that of the asset class.
- **Active Management.** Buying and selling securities with the expectation of exceeding the returns on the passive alternative.

Because it offers the potential to exceed the returns from passive management, active management also exposes a pension plan to the possibility of underperforming passive results. The risk of active management underperforming passive management is referred to as active risk. As part of the risk management process, a plan sponsor must determine how much active risk it is willing to accept in each asset class.

Among institutional investors, the most common approach to active management consists of retaining a group of specialized money managers. As specialists, each manager pursues an investment style which focuses on specific segments of a particular asset class. (For example, among specialized common stock managers, some managers focus on small capitalization stocks. Others concentrate on stocks with low price-earnings ratios.) Specialized managers are hired with the expectation that they will produce returns that exceed a *passive investment in their particular areas of expertise*.

Similar to many other large pension plans, the Basic Funds' common stock and bond investment management structures use both active and passive management. Further, the Basic Funds employ a number of specialized active managers pursuing various investment styles within each asset class. (The rationale for the allocation to passive and active management, as well as the use of specialized active managers, is discussed in Part III of the Basic Funds' investment policy paper.)

## **MISFIT RISK**

Clearly, a pension plan that uses both active and passive management can produce superior performance only if the active managers, as a whole, perform better than the passive alternative. But is it possible for all of the specialized active managers to produce



superior returns within their individual areas of expertise, and yet, as a whole, underperform the passive alternative? The answer is "Yes," if the combined investment styles of the active managers overlook certain segments of the asset class (e.g., particular industries) or concentrate too heavily in others.

For example, the pension plan's specialized common stock managers may all follow investment styles that ignore utility stocks. If utility stocks produce exceptionally strong returns, the plan's common stock performance will suffer compared to the broad stock market. Yet each specialized manager may have performed well within its area of expertise.

These over or underemphases of segments within an asset class, and the possibility that they may result in underperforming the passive alternative, is called misfit risk. Misfit risk is unintentional. Further, it is unproductive in that there is no expectation of enhanced returns associated with incurring misfit risk. Therefore, the risk management process should seek to minimize misfit risk.

The purpose of this position paper is to describe how misfit risk can be controlled through the use of a completeness fund. Specifically, this paper:

- Develops various basic completeness fund concepts.
- Outlines the completeness fund construction process.
- Describes the evaluation of the completeness manager's performance.
- Analyzes the misfit risk present in the Basic Funds' common stock component.
- Makes recommendations for implementing a common stock completeness fund in the Basic Funds.

## II. BASIC COMPLETENESS FUND CONCEPTS

To better understand the nature of the problem that a completeness fund is intended to solve, a discussion of several basic concepts is helpful.

### ASSET CLASS TARGET

An asset class target is a diversified collection of securities within a particular asset class. It represents the set of feasible investment opportunities that the plan sponsor believes best achieve the purposes for which the asset class is included in the policy asset mix.

The asset class target chosen for the Basic Funds' common stock component is the Wilshire 5000. The Wilshire 5000 is a broad stock market index representing, with few exceptions, the full range of available domestic common stock investments.

As the common stock asset class target, the Wilshire 5000 is the standard by which the results of the Basic Funds' common stock component are judged. The returns on the Wilshire 5000 can be thought of as a threshold performance expectation. Through active management, the Board desires to exceed this performance target.

For purposes of designing a completeness fund, the specification of the asset class target involves:

- A specific list of stocks. This list must satisfy any eligibility requirements established by the plan sponsor, such as minimum market capitalization or prohibited securities (e.g., stocks in the liquor and tobacco industries).
- A method of assigning weights to the stocks in the list. In the case of the Wilshire 5000, a capitalization weighting system is used.
- A normal cash position. This cash component recognizes that, in practice, managers' portfolios are rarely fully invested. This occurs because of the continuous receipt of dividends and the need to maintain a cash balance to complete transactions.

## **PASSIVE AND ACTIVE COMPONENTS**

A passively managed asset class portfolio is referred to as an index fund. An index fund is designed to match the performance of its asset class target. Properly constructed, an index fund should not outperform its asset class target, but equivalently, neither should it materially underperform the target. The Basic Funds' common stock index fund is designed to track the performance of the Wilshire 5000.

Active management can take many forms, but all involve identifying and trading securities that are perceived to be misvalued in an attempt to outperform the asset class target. Further, all forms of active management imply creating portfolios that intentionally differ in some manner from the composition of the asset class target. Only by these deviations (referred to as active bets) can active management add value to the asset class target's return.

As discussed earlier, the Board's active common stock component is a multiple manager configuration. The Board currently employs ten active managers, each with specialized skills. These managers were hired for their anticipated ability to produce superior results within their specific segments of the stock market. In other words, the managers are expected to add value to their investment styles.

## **BENCHMARK PORTFOLIOS**

A benchmark portfolio represents a manager's area of expertise, or investment style. Specialized managers have distinct preferences for certain types of securities. A benchmark portfolio represents these preferences. It is a collection of securities, appropriately weighted, from which the manager generally makes portfolio selections. As in the case of an asset class target, a manager's benchmark is defined by a specific list of stocks, weights assigned to each stock, and a normal cash position.

A manager's benchmark portfolio serves two important roles in the completeness fund process. First, it represents the standard against which to evaluate the manager's investment skill. Secondly, the benchmark portfolio reflects those segments of the asset class target covered by the manager.

Staff has worked jointly with the Board's common stock managers and the Board's consultant, Richards & Tierney, to construct appropriate manager benchmarks.

### **MANAGER ALLOCATION POLICY**

In a multiple specialized manager program, an important responsibility of the plan sponsor is to allocate funds among the managers. The policy allocation for a manager is the percentage of the plan's assets assigned to that manager.

A specific policy allocation for each manager is a necessary ingredient in the construction of a completeness fund. Recall that a manager's benchmark defines the particular segments of the asset class target covered by the manager. As a result, the manager's policy allocation determines the plan's coverage within these segments covered by the manager.

The subject of how best to allocate funds among managers is discussed in Part III of the Basic Funds' investment policy paper. For purposes of designing the completeness fund, however, it is assumed that manager policy allocations have been established.

### **AGGREGATE BENCHMARK PORTFOLIO**

A plan sponsor's allocation of funds among its active and passive managers (including a completeness fund) should be consistent with the plan's investment objectives. Within each asset class, achieving this consistency requires that the managers, in aggregate, do not over or underemphasize segments of the asset class target. Measuring

the level of segment coverage provided by managers is accomplished by creating an aggregate benchmark portfolio.

An aggregate benchmark portfolio is constructed by adding together all of the managers' benchmarks within an asset class. That is:

$$\begin{array}{rcccl} \text{Aggregate} & & \text{Mgr. \#1} & & \text{Mgr. \#2} & & \text{Mgr. \#N} \\ \text{Benchmark} & = & \text{Benchmark} & + & \text{Benchmark} & + \dots + & \text{Benchmark} \\ \text{Portfolio} & & \text{Portfolio} & & \text{Portfolio} & & \text{Portfolio} \end{array}$$

In the aggregation process, the benchmarks are weighted by the managers' policy allocations. Because the managers' benchmarks are composed of lists of securities, security weights, and a normal cash positions, the aggregate benchmark portfolio likewise will have the same structure.

### **COMPLETENESS BENCHMARK PORTFOLIO**

Comparing the aggregate benchmark portfolio to the asset class target measures the extent of misfit, or by how much the managers, in aggregate, over or underemphasize segments of the asset class target. Formally, subtracting the aggregate benchmark portfolio from the asset class target produces a completeness benchmark portfolio. That is:

$$\begin{array}{rcccl} \text{Completeness} & & \text{Asset} & & \text{Aggregate} \\ \text{Benchmark} & = & \text{Class} & - & \text{Benchmark} \\ \text{Portfolio} & & \text{Target} & & \text{Portfolio} \end{array}$$

With respect to the common stock asset class, underemphasized segments appear in the completeness benchmark portfolio as positive holdings of certain stocks. Conversely, overemphasized segments appear as negative positions in other stocks. The positive holdings represent investments that must be added to bring the aggregate benchmark portfolio in line with the asset class target. On the other hand, negative holdings represent

investments that must be deleted to reconcile the aggregate benchmark portfolio with the asset class target.

## **COMPLETENESS FUND**

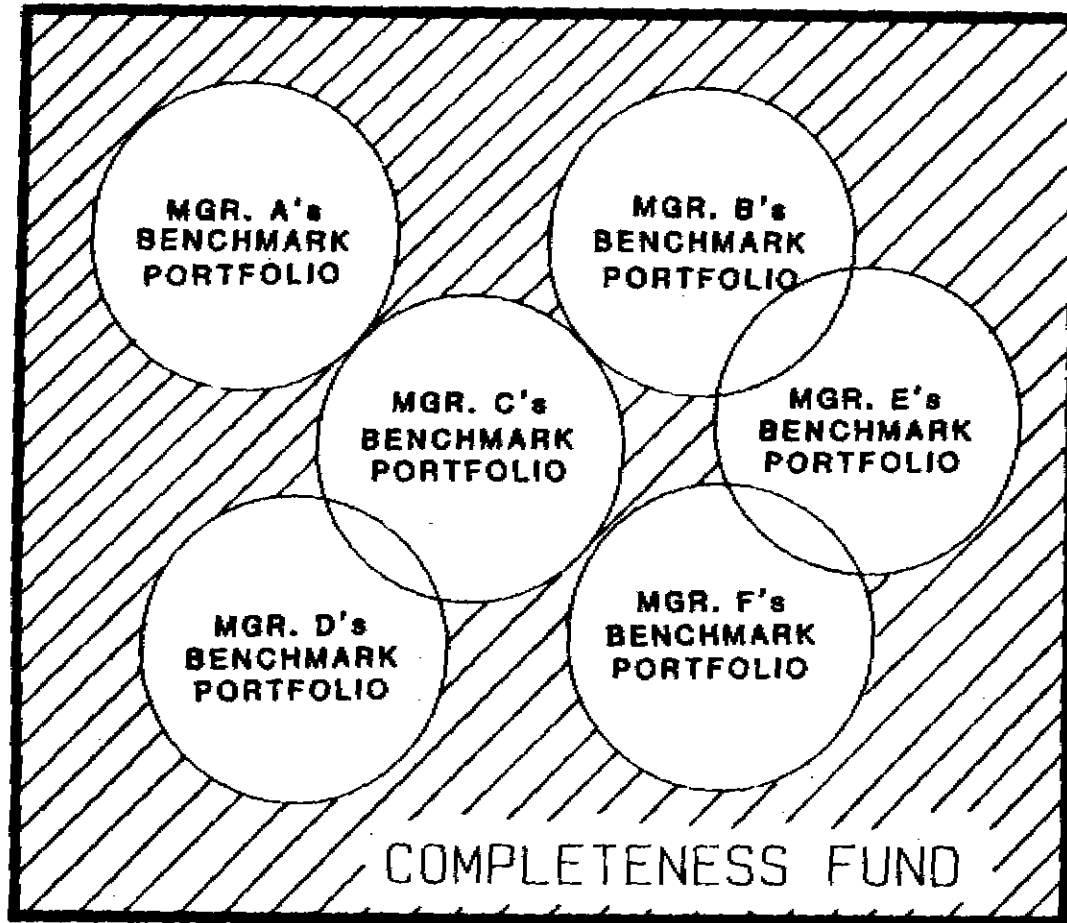
These basic concepts lead to the focus of this paper: the completeness fund. A completeness fund is a portfolio of securities designed to eliminate the misfit between the asset class target and the aggregate benchmark portfolio.

Figure 1 presents a simplified conceptual view of a completeness fund combined with multiple managers. The large rectangle represents the securities (and their associated risk characteristics) that comprise the asset class target. The managers in Figure 1 pursue investment styles that, in aggregate, do not cover the entire asset class target. The completeness fund compensates for this partial coverage by holding securities that are not part of the managers' aggregate investment style (i.e., aggregate benchmark portfolio).

Ideally, the composition of the completeness fund mirrors that of the completeness benchmark portfolio. However, holding all of the positions specified by the completeness benchmark portfolio generally is not practical. In particular, the negative holdings of the completeness benchmark portfolio require stocks to be sold "short," a strategy most institutional investors do not pursue.

In constructing a completeness fund, the objective is to match the performance of the completeness benchmark portfolio as closely as possible, while avoiding the impractical holdings of the benchmark. This objective can be accomplished through various portfolio construction techniques employed by passive managers, such as optimization or stratified sampling. While a discussion of these techniques is beyond the scope of this paper, suffice it to say that they have allowed passive managers to efficiently track the investment performance of various targets.

FIGURE 1  
DEPLOYMENT OF COMPLETENESS FUND  
AND MULTIPLE MANAGERS



ASSET CLASS TARGET

### **III. COMPLETENESS FUND CONSTRUCTION**

With an understanding of the basic completeness concepts covered in the previous section, the steps involved in constructing a completeness fund are straightforward. Specifically, this construction process involves eight steps.

#### **STEP 1 - ASSET CLASS TARGET SELECTION**

The choice of an asset class target is determined. As discussed in Section II, the Board has selected the Wilshire 5000 as the asset class target for the Basic Funds' common stock component.

#### **STEP 2 - ASSET CLASS TARGET SPECIFICATION**

The asset class target selected in Step 1 is expressed as an investable list of securities. Ineligible stocks, such as liquor and tobacco stocks in the case of the Basic Funds, are removed. Any other desired modifications of the asset class target securities also take place in this step.

#### **STEP 3 - IDENTIFY THE MANAGERS' BENCHMARKS**

Appropriate benchmarks are developed for each manager. Like the asset class target, these benchmarks are expressed as investable lists of securities, modified to reflect any restrictions under which the managers may operate.

#### **STEP 4 - BUILD THE AGGREGATE BENCHMARK PORTFOLIO**

The benchmarks of all managers, both passive and active, are combined to produce an aggregate benchmark portfolio.



#### **STEP 5 - COMPUTE THE COMPLETENESS BENCHMARK**

A comparison of the aggregate benchmark portfolio to the asset class target identifies those segments of the asset class where misfit exists. The difference between the aggregate benchmark portfolio and the asset class target, the completeness benchmark portfolio, is expressed as a group of positive and negative holdings in various securities.

#### **STEP 6 - CONSTRUCT THE COMPLETENESS FUND**

Given the completeness benchmark portfolio from Step 5, the completeness manager builds a portfolio designed to closely track the performance of this benchmark.

#### **STEP 7 - COMPLETENESS FUND MAINTENANCE**

On an on-going basis, minor modifications in the completeness fund's composition are required. These small rebalancings are necessitated primarily by mergers and acquisitions and movements in the market prices of securities in the aggregate benchmark portfolio which, in turn, affect the composition of the completeness benchmark portfolio. Major rebalancings of the completeness fund are needed if managers are added or removed.

#### **STEP 8 - PERFORMANCE EVALUATION**

On a periodic basis, the performance of the completeness fund manager is evaluated. The proficiency of the manager in tracking the completeness benchmark portfolio is measured and sources of tracking error are identified.

#### IV. PERFORMANCE EVALUATION

The success of the completeness fund manager is objectively determined through a performance evaluation process. Evaluating the completeness fund manager requires much the same data collection and analysis techniques as those used to evaluate the Board's active managers. However, while the objective of an active manager is to add value relative to an appropriate benchmark, the goal of the completeness fund manager is to track the performance of the completeness benchmark portfolio within specific tolerances. Thus, the evaluation process reflects these differences in performance expectations.

The completeness fund is expected to track its benchmark closely. However, in any given quarter, the return on the completeness fund may not precisely match that of its benchmark. These quarter-to-quarter deviations in performance are referred to as tracking error.

Tracking error is introduced into the completeness fund management process through three primary sources:

- Differences between the composition of the completeness fund and the completeness benchmark portfolio.
- Costs of trading securities during rebalancings.
- Management fees.

Each of these sources of tracking error is relatively immaterial. Therefore, the tracking error of the completeness fund will be small. Further, it will be largely unbiased. That is, in any given quarter, the tracking error is almost as likely to be positive as negative, producing a self-cancelling effect over time. The completeness fund should experience a tracking error in the range of plus or minus .75 percentage points per year.

The completeness fund manager will be evaluated by its ability to meet this tracking error target.

In reviewing the completeness fund's performance, an important note of caution should be observed. The completeness fund's returns should not be viewed in isolation from the active managers and the index fund. The completeness fund manager's returns should be compared to those of the completeness benchmark portfolio, and should be judged in the context of improving the results of the entire fund relative to the performance of the asset class target.

The completeness fund holds securities not followed by the active managers. As a result, the completeness fund's performance is likely to vary significantly from that of the other managers and that of asset class target. The completeness fund may at times outperform the active managers and at other times it may underperform them. Regardless, this variance is to be expected. It is part of the process by which the completeness fund offsets the misfit of the combined investment styles of the active managers.

## **V. THE BASIC RETIREMENT FUNDS' COMMON STOCK MISFIT**

### **MISFIT RISK MEASUREMENT**

As previously defined, misfit risk represents the potential for returns on investments in an asset class to deviate from the returns on the asset class target. Misfit risk is present when the aggregate benchmark portfolio differs significantly from the asset class target. How much misfit risk is present in the Basic Funds' common stock component? The answer to this question requires a model of investment risk.

The current state-of-the-art in common stock portfolio risk measurement is a multi-factor risk model. Such a model attributes investment risk to the complex interaction of a number of factors determined to be "common" to security returns.

In the context of a multi-factor risk model, misfit risk is the likely variance (either positive or negative) of returns between the aggregate benchmark portfolio and the asset class target. With respect to the Basic Funds' common stock component, misfit risk is the likely difference between the return on the Wilshire 5000 and the Basic Funds' common stock investments. This misfit risk results from the managers' benchmarks, in aggregate, being different from the Wilshire 5000.

### **CURRENT MISFIT**

Staff has conducted research into the amount of misfit risk present in the Basic Funds' common stock component. Currently, that misfit risk is approximately 0.9% per annum. That is, in any given year, the Basic Funds' common stock investments are likely to outperform or underperform the Wilshire 5000 by almost 1% due to misfit. (E.g., if the Wilshire 5000 produces a 10% return, the Basic Funds' common stock investments are likely to return 9-11%.)

Staff does not view this current level of misfit as a significant source of concern. The diversity of investment styles among the Board's active common stock, combined with the sizable allocation to the index fund, results in broad coverage of the common stock asset class target.

Nevertheless, the Basic Funds' current common stock misfit is not trivial. Further, if the current group of active common stock managers were altered, the misfit could increase. Therefore, staff believes that the common stock misfit should not be ignored, but rather should be dealt with explicitly through a completeness fund.

Staff believes that a completeness fund offers two primary benefits:

- Enhances the current Basic Funds' common stock program by improving the potential for the aggregate portfolio to more consistently outperform the Wilshire 5000.
- Adjusts for changing risk characteristics in the aggregate portfolio due to changes in the manager line-up. This allows the Board to focus on hiring managers on the basis of their ability to add value relative to an appropriate benchmark, and not for the coverage they provide relative to the asset class target.

## **SOURCES OF MISFIT**

An analysis of the current misfit provides a look at the potential sources of misfit risk. The analysis shows that a majority of the misfit risk is caused by the aggregate benchmark portfolio's underemphasis of certain industries relative to the Wilshire 5000.

As shown in Table 1, the largest sources of misfit are the aggregate benchmark portfolio's underweightings in five major industry groups: Oils, Business Machines, Drugs, Telephone and Electric Utilities.

The results of the analysis also isolate the sources of misfit attributable to differences among broadly defined market factors. Relative to the Wilshire 5000, the aggregate benchmark portfolio emphasizes growth stocks and stocks that are more volatile than the overall market. Also, relative to the Wilshire 5000, the aggregate benchmark, on average,

contains lower dividend paying stocks and a preponderance of smaller capitalization stocks. The differences in the common factor exposures are also provided in Table 1.

**TABLE 1**  
**BASIC RETIREMENT FUND EQUITIES**  
**SUMMARY OF LARGEST MISFIT EXPOSURES**  
**AS OF SEPTEMBER 30, 1987**

<b>INDUSTRIES</b>	<b>AGGREGATE BENCHMARK</b>	<b>TARGET</b>	<b>DIFFERENCE</b>
International Oil	2.08%	3.17%	-1.09%
Drugs, Medicine	3.56	4.58	-1.02
Telephone, Telegraph	4.42	5.59	-1.17
Electric Utilities	4.20	5.11	-0.91
Business Machines	6.22	6.78	-0.56

<b>COMMON RISK FACTORS*</b>	<b>AGGREGATE BENCHMARK</b>	<b>TARGET</b>	<b>DIFFERENCE</b>
Growth	0.12	0.05	0.07
Variability in Markets	0.10	0.04	0.06
Size	-0.39	-0.28	-0.11
Yield	-0.13	-0.03	-0.10

\* Exposures measured in standard deviation units.

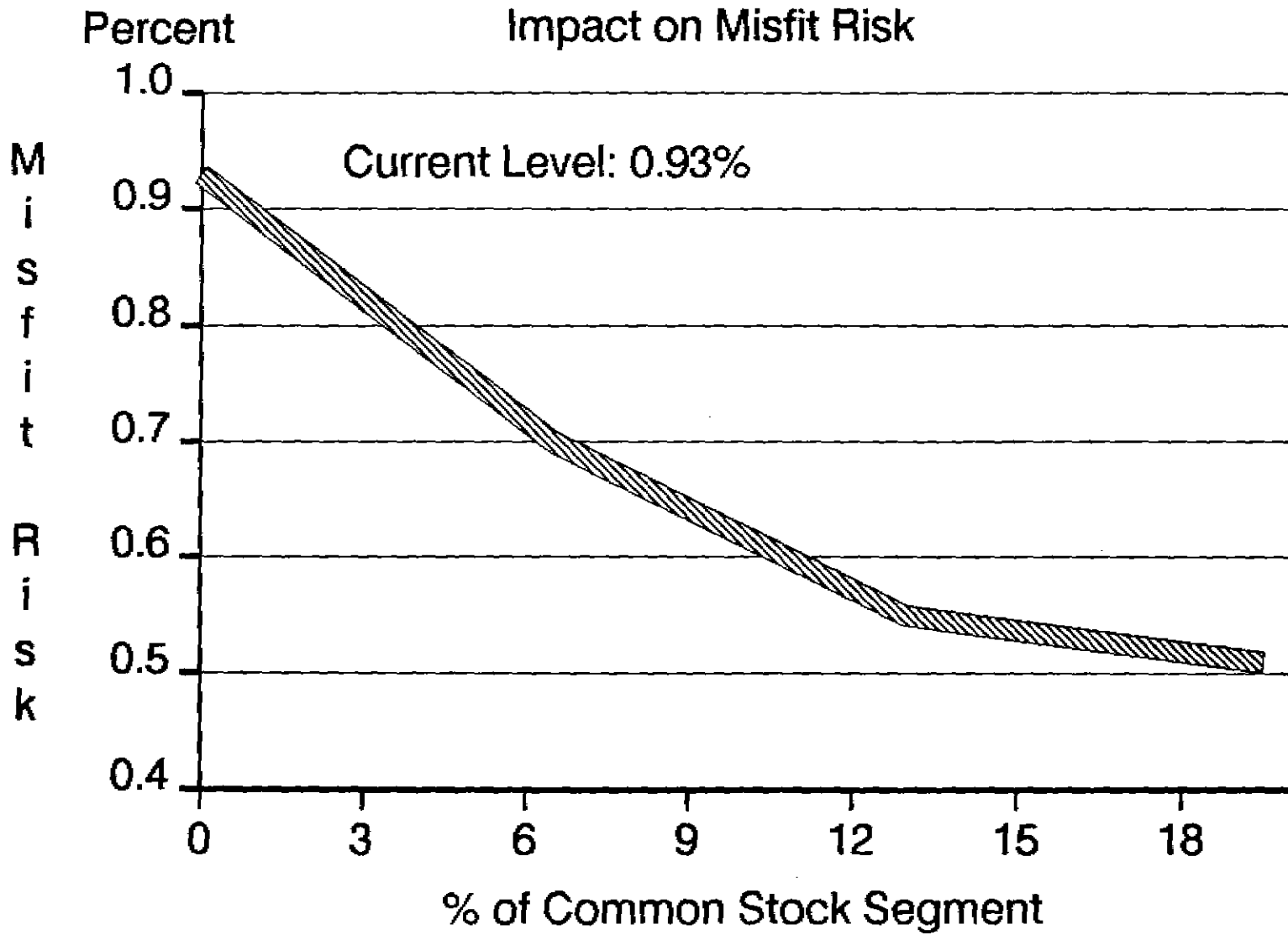
### **COMPLETENESS ALLOCATION**

How much of a pension plan's investment in an asset class should be allocated to a completeness fund? The answer depends on the amount of misfit risk reduction desired. Reduction in misfit risk increases with the size of the completeness fund. Staff's analysis of the Basic Funds' current misfit risk indicates that substantial misfit reduction is possible as the allocation of the common stock component to the completeness fund increases from

0 to 13 percent. This relationship is illustrated in Figure 2. Beyond a 13 percent allocation, very little reduction in misfit risk is possible.

FIGURE 2

# Completeness Fund Allocation





## **VI. RECOMMENDATIONS**

Staff recommends that the Board approve the implementation of a common stock completeness fund. The completeness fund will provide the Board with added control and flexibility in the management of risk within the Basic Funds' common stock component. As an adjunct to the active manager program, the completeness fund will permit the managers' investment skills to more consistently benefit the performance of the common stock component.

### **COMPLETENESS FUND POLICY ALLOCATION**

Initially, staff recommends that five percent (5%) of the Basic Funds' common stock component be allocated to the completeness fund. This level of commitment is estimated to reduce misfit from 0.93% to 0.70% per year under the existing manager configuration. This represents a 22% reduction from the current level of misfit. This policy allocation will need to be reviewed each time an active manager is added to or deleted from the Basic Funds' common stock component.

### **ASSETS COMMITTED TO THE COMPLETENESS FUND**

The 5% allocation recommended above represents a completeness fund of approximately \$150 million. Staff recommends that the assets now managed for the Basic Funds by the internal manager be re-directed from active management to the completeness fund.

### **MANAGEMENT OF THE COMPLETENESS FUND**

Implementation of a completeness fund can be divided into two distinct sets of responsibilities:

- Maintain software and databases required to construct the list of completeness fund securities. Because of the highly technical and specialized nature of these services, staff recommends that they be obtained from an outside vendor. At least initially, staff recommends that the Board's consultant provide the necessary technical support.
- Provide for the daily management of the completeness fund, in particular, the security trading required to maintain the fund. Staff recommends that these responsibilities be assigned to the internal manager.

This division of responsibilities is similar to the procedures now used to maintain the dedicated bond portfolio in the Post Retirement Fund. The software and databases necessary to operate the dedicated bond portfolio are provided by an outside vendor (currently Bankers Trust). Internal staff uses the analysis provided by the vendor to execute the required trades in the portfolio.

With respect to the completeness fund, the outside vendor would have several responsibilities:

- Construct an aggregate benchmark portfolio for the Board's common stock managers.
- Compare this aggregate benchmark portfolio to the Basic Fund's common stock asset class target.
- Provide the internal manager with a list of securities to make up the completeness fund.
- Repeat the above process periodically so that the internal manager can maintain the completeness fund.
- Evaluate and monitor the ability of the completeness fund manager to track its benchmark.

This division of responsibilities represents the most cost effective and timely approach to managing a completeness fund. The internal staff is fully capable of

implementing a passive investment approach and the Board's consultant is able to provide the technical support necessary to construct and rebalance the completeness fund.

### **COMPLETENESS FUND COST**

For the present, the Board's consultant can provide the necessary technical support under its current contract. As a result, the completeness fund can be constructed initially without incurring additional management costs to the Basic Funds.

If the completeness fund is approved, staff will continue to search for these technical support services during the next quarter. Staff intends to provide recommendations to the Board concerning on-going compensation to any vendor at the June 1988 Board meeting.

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## **DOMESTIC EXTERNAL EQUITY PROGRAM ALLOCATION TARGETS AND REBALANCING GUIDELINES**

### **Overview**

The Minnesota State Board of Investment instituted its external domestic equity manager program in March 1983 and its external domestic equity index program in November 1983. In 1987 the Board approved a policy position paper specifying the active/passive allocation guidelines for the Basic Retirement Funds. Specifically, the Board implemented a flexible approach to setting the active/passive policy mix. The policy stipulates that the passively managed domestic equity assets must be at least 50% of the total domestic equity assets. The active equity manager program may be no more than 50% of the total domestic equity assets.

This paper will recommend guidelines to determine the target allocation weights for each individual manager within the active domestic equity program. In addition, this paper will recommend a rebalancing policy to control deviations from the target weights over time.

### **Policy Benefits**

Establishing allocation guidelines to determine target weights for the active managers provides several benefits:

- 1) It provides a structure to control the amount of active risk that can be taken within the external domestic equity program.
- 2) It provides a systematic process to determine the most appropriate manager mix within the active manager group.
- 3) It provides a baseline to calculate attribution analysis within the domestic equity program.
- 4) It provides a systematic process to control deviations from the target weights to maintain the desired risk return ratio.

Active risk can be measured by calculating the volatility of the excess return for the total active domestic equity manager program. By calculating the potential active risk and excess return or value added generated by various allocation mixes allowed by the policy guidelines, the target weights that provide a favorable risk\return trade-off can be determined.

Setting target weights also provides a baseline to calculate an attribution analysis. An attribution analysis will delineate the effect of the various allocation decisions and help to

evaluate the effects of past decisions so that improvements can be made going forward. It will show the impact due to deviations from the target weights as well as the value added by each manager.

### **Guidelines for Target Weights**

Staff will recommend target weights for the individual active managers within the domestic equity program using the boundaries and criteria shown below. The IAC Stock and Bond Manager Committee will review the target weights and any subsequent changes.

Both quantitative and qualitative criteria be used to determine the targets. The difficulty of statistically confirming investment skill makes an absolute reliance on return numbers inadvisable. Qualitative aspects of a manager's operation should also be considered.

### **Upper and Lower Boundaries**

- 1) An active manager will not have more than 10% of the total domestic equity assets or 20% of the active domestic equity manager assets. This implies that the SBI will have a minimum of 5 active managers.
- 2) An active manager will have at least 2% of the total domestic equity assets or 4% of the active domestic equity manager assets.
- 3) Assets remaining after allocation to the active equity managers will go to the domestic equity index manager. However, the allocation to the index manager will not be less than 50% of the total domestic equity assets.

These boundaries limit the amount of assets a particular external equity manager will have. By making sure that no one or two active managers become responsible for a large proportion of the external domestic equity assets, the active risk for the program can be maintained at a prudent level.

### **Allocation Criteria**

Staff will recommend target weights for each individual active domestic equity manager using the quantitative and qualitative criteria listed below.

- 1) The maximum individual account size that the manager can effectively manage.
- 2) The manager's ability to accept new contributions
- 3) The level of excess returns that the manager can consistently generate.
- 4) The volatility of the manager's excess returns.



- 5) The manager's ability to maintain sufficient, high quality resources to implement its investment process efficiently and effectively.
- o Has turnover been extraordinary in terms of either numbers of people or reasons for their departure?
  - o Has there been a noticeable gain or loss of accounts in recent years?
  - o Does the firm have strong support staff and systems to provide client servicing?
  - o Has there been any change in the business emphasis by the manager?
  - o Is the account load reasonable for the firm's portfolio manager?

These above criteria outline the information that will be used to determine the target weight for each active manager within the entire domestic equity segment of the Basic Funds. The first two consider the manager's limitations as to how large an individual account and total assets they can manage effectively (e.g., a small capitalization manager cannot manage as large an asset base as a large capitalization manager due to liquidity and other constraints inherent in the part of the equity market they invest). The next two guidelines provide the quantitative data needed to determine the optimal trade-off between maximizing the value added and the volatility of that value added for each manager. The last guideline incorporates various qualitative aspects of a manager's investment operation that can not be expressed as measurable targets but are also important in determining a manager's target weight.

#### **Guidelines for Rebalancing to Target Weights**

After target weights have been set, a rebalancing policy should be implemented to prevent the external active equity managers from deviating too far from their target weights. The target weights are established to provide an optimal trade-off between potential excess return and the active risk incurred to obtain that return. Excessive deviations could produce lower long term value added or expose the program to more active risk.

Staff recommends that the Board adopt a constant rebalancing approach for the external domestic equity program similar to the rebalancing guidelines used for the total Basic Funds. That is, the allocations among the active external equity managers will be rebalanced when they deviate more than 10% from their policy weights. For example, an equity manager with a 5% target weight would have to be rebalanced if its actual weight was 5.5% or 4.5%. Staff would have discretion to rebalance a manager when they have deviated within a range of 5-10%. A manager would not be rebalanced when their deviations from policy are less than 5%.

In determining the appropriate rebalancing range a trade-off exists between controlling deviations from the target weights and the cost due to the actual rebalancing. If rebalancing is done too often, the cost incurred will be greater than the benefit derived in controlling the deviations from the target weights. The following table shows the effects of implementing a rebalancing program with different upper limits over a eight year period using actual SBI equity manager return data.

**TABLE 1**

<u>1984 - 1991</u>	5% Upper Limit	10% Upper Limit
Average # of Rebalancings Per Manager	6.5	1.3
Average \$ Amount Rebalanced	\$7,581,282	\$13,694,413

The table shows that using the proposed 10% upper limit greatly reduces the number of rebalancings. It should be noted that only an eight year time frame was available to run the simulation. From a statistical perspective, this time frame does not provide enough data to produce a high level of confidence in the results generated. However, the results do reflect the direction that is expected from an intuitive standpoint.

**Conclusion**

Staff recommends that the Board adopt the above allocation guidelines and rebalancing proposal for domestic equity program in the Basic Funds. Application of these guidelines will assist the SBI in maintaining appropriate allocations among its active managers.

Staff further recommends that the rebalancing guidelines be reviewed periodically to ensure that transaction costs and asset transfers remain prudent.

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**ACTIVE, PASSIVE AND SEMI-PASSIVE MANAGEMENT IN  
THE DOMESTIC STOCK PROGRAM**

**Position Paper  
July 1994**

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# **ACTIVE, PASSIVE AND SEMI-PASSIVE MANAGEMENT IN THE DOMESTIC STOCK PROGRAM**

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## **INTRODUCTION**

This paper presents a discussion of active, passive and semi-passive equity management structures. Currently, approximately 50% of the SBI's domestic stock program is actively managed and 50% is passively managed. Based on the potential for enhanced returns, staff recommends that the SBI introduce semi-passive management for a portion of its domestic stock program.

## **DEFINITIONS AND BACKGROUND**

Since 1984, the SBI's domestic stock management structure has had two components: passive management and active management.

**Passive management** involves buying and holding securities that will closely follow the returns of a specified benchmark. A passive approach does not try to add value relative to its assigned benchmark. In theory, a passive strategy should neither outperform nor underperform its specified benchmark, over time. Typically, however, passive management will slightly under perform over the long term due to management fees and transaction costs. Since the passive benchmark is a hypothetical portfolio, any trading and transactions costs to maintain the index (e.g., dividend reinvestment, additions or deletions of stocks) are ignored. On the otherhand, an actual portfolio will incur transaction costs to buy and sell the securities that are needed to properly track the selected index. In addition, someone must be paid for their management services. These costs will act as a permanent "drag" to the actual return that the plan sponsor will obtain relative to the benchmark rate of return. These permanent cost range from 2-3 basis points for a S&P 500 index to 10-12 basis points for an extended index (e.g. Wilshire 5000 or Russell 3000).

**Active management** entails buying and selling securities in a asset class with the intention of outperforming a specified benchmark. To outperform the benchmark, the securities held in an active portfolio will differ substantially from the composition of its benchmark. The differences occur because active managers generally try to invest in stocks that they perceive to be undervalued and to avoid overvalued stocks. Active management offers the potential to outperform the specified benchmark but the plan sponsor also assumes the risk that an active manager may under perform the benchmark. This risk of underperformance is considerably greater for active portfolios than passive portfolios.

Traditionally, active management was the only investment management structure typically used by plan sponsors. Passive management was not widely employed until the early to mid 1980's. Today, with the advent of more sophisticated risk control methodologies, semi-passive management is gaining greater consideration as a feasible management option for plan sponsors.

**Semi-passive management** is a hybrid approach that incorporates characteristics from both the passive and active strategies. A semi-passive approach will make active bets relative to a specified benchmark but will constrain those bets so that the risk assumed by the plan sponsor is considerably less than under an active strategy. A semi-passive approach provides some potential to outperform the benchmark, but also incorporates procedures that constrain the level of risk, or volatility of returns, relative to the benchmark.

To implement a semi-passive investment strategy, the investment manager needs to have two investment capabilities in place.

**A valuation process that can add value to a portfolio over a specified benchmark.** This valuation process evaluates the stocks in the manager universe and then ranks them. The valuation process implemented by a manager can use one or a combination of different investment strategies. For example, it could be a value or growth strategy based on fundamental and/or quantitative research. The type of strategy used by the manager from a risk standpoint is not as important in semi-passive application. Some strategies have higher return volatility than others, but the semi-passive approach will restrain the assumed risk relative to an active implementation. However, the manager must be able to demonstrate that they can implement it effectively in a semi-passive environment and produce value added returns over time.

**A risk control model that allows them to manage the portfolio risk at the level desired by the plan sponsor.** To accomplish the objectives of a semi-passive program, the investment manager needs a risk control model that will maximize the potential value added from the manager's valuation process while meeting the plan sponsor's risk tolerance. Like the valuation process, the risk model can take many different forms and can vary significantly depending upon the criteria that the manager believes are the primary determinants to effectively control portfolio risk relative to the

## HISTORICAL PERFORMANCE

A summary of the value added by SBI's domestic equity program is shown below:

<u>Value Added to Benchmarks</u>	<u>9.75 Years</u> <u>1/1/84*-12/31/93</u>	<u>3.0 Years</u> <u>10/1/90**-12/31/93</u>
Active managers	+\$12,134,458	-\$9,650,046
Passive manager	<u>-60,223,123</u>	<u>-45,450,348</u>
Total	-\$48,088,665	-\$55,100,394

\* Start of external manager program

\*\* Start of the tilted index fund

These data highlight the following conclusions:

- The active manager program has provided positive dollar value added since the inception of the program relative to the aggregate benchmark of the active managers. While this is one measure of success for the active manager program, the SBI continually seeks to improve program results. As part of this effort, the Manager Continuation Policy, a set of qualitative and quantitative evaluation guidelines, has been developed and is reviewed on a regular basis. These guidelines are designed to enhance the results generated by the active manager program.
- The passive manager has generated negative dollar value added since inception and throughout the implementation of the tilted index fund. Some loss should be expected since a passive account will always slightly under perform its benchmark due to management fees and transaction costs. However, the extent of the underperformance by the SBI's current passive manager should bear careful scrutiny. Staff is particularly concerned that negative tracking error has increased since the tilted index fund was implemented. Over the last few years new trading techniques and portfolio management strategies have been developed and should be investigated to evaluate whether they can improve the implementation of the SBI's passive strategy.

## **ALLOCATION TO ACTIVE MANAGEMENT**

A plan sponsor's allocation to active management will depend on several factors:

- **Confidence that value added returns are attainable.** The more confidence a plan sponsor has that active management can provide excess returns, the larger the allocation to active management should be.
- **Ability to identify successful active managers.** The more confidence a plan sponsor has in its manager selection and retention policies, the larger the allocation to active management should be.
- **Tolerance for volatility of returns.** Active management will produce wider variation in returns, both positive and negative, relative to the asset class target than passive management. The greater the plan sponsor's tolerance for this volatility, the larger the active management allocation should be.
- **Size of assets under management.** There are practical limitations on how many successful managers the plan sponsor can identify and the amount of assets that can be allocated to each. In general, the larger the total assets, the greater the allocation to passive management. For example, a 1992 survey by Greenwich Associates shows that 70% of the corporate funds over a billion dollars had some portion of their domestic stocks passively managed. On the other hand, no more than 35% of the corporate funds below \$250 million had a portion of their domestic stocks passively managed.

As noted earlier, it is the SBI's policy to allocate no more than 50% of the domestic stock program to active management. Given the above factors, staff believes that this policy represents a reasonable balance between the potential rewards of active management, the risk inherent in the volatility of active manager returns and the size of the SBI's domestic stock program.

## **ALLOCATIONS TO PASSIVE AND SEMI-PASSIVE MANAGEMENT**

In order to increase the domestic equity program's potential value added, staff believes it is appropriate to consider adding a semi-passive management component with a commensurate reduction in passive management. Specifically, staff recommends an

allocation of up to 50% active management, up to 25% semi-passive management and the balance (at least 25%) in passive management.

The return expectations for the current and proposed management structure are shown below.

**Expectations with Current Structure**

<i>Structure</i>	<i>Allocation</i>	<i>Long Term Return Expectation*</i>	<i>Year-to-Year Likely Range of Returns**</i>
Active	Maximum 50%	+0.50 to +1.00%	± 3.0%
Passive	Minimum 50%	-0.10%	± 0.5%
Total Program		+0.20 to +0.45%	± 1.1%

\* annualized over time, relative to benchmark, net of fees

\*\* for all managers in aggregate relative to the aggregate benchmark

**Expectations with Proposed Structure**

<i>Structure</i>	<i>Allocation</i>	<i>Long Term Return Expectation*</i>	<i>Year-to-Year Likely Range of Returns**</i>
Active	Maximum 50%	+0.50 to +1.00%	± 3.0%
Semi-passive	Maximum 25%	+0.15 to +0.30%	± 1.3%
Passive	Minimum 25%	-0.10%	± 0.5%
Total Program		+0.25 to +0.55%	± 1.3%

\* annualized over time, relative to benchmark, net of fees

\*\* for all managers in aggregate relative to the aggregate benchmark

The likely range of returns of 3.0% and 1.3% for the active and semi-passive domestic equity managers represent the annualized standard deviation of the total active or semi-passive management structure and will be less than the individual managers due to diversification between the individual manager's excess returns. For the active managers, most of them generally range from 4.0% to 6.0%. About 80% of the SBI active managers fall within this range with a couple of them having annualized standard deviation above

6.0%. For the semi-passive managers, staff recommends that they be restricted to an annualized standard deviation between 1.25% to 1.5%.

As referenced above, the primary reason for initiating a semi-passive strategy is that the expected return generated by the entire domestic stock program will increase. The potential for increased expected returns is created by reducing the passive strategy (which is expected to slightly under perform its benchmark, over time) with a semi-passive strategy (which is expected to provide modest value added, over time).

In order to achieve this increase in expected returns, the SBI must recognize that it would assume a higher level of risk. "Higher risk" means greater volatility of returns on a year-to-year basis. With the current 50% active/50% passive mix, returns can be expected to fluctuate above and below the asset class target by 1.1 percentage points or more on a year-to-year basis. With a 50% active/25% semi-passive/25% passive mix, the range widens to  $\pm 1.3$  percentage points or more on a year-to-year basis.

All of the above "likely ranges" are expressed in terms of annual standard deviation. The probability of an actual return occurring within one standard deviation is 67%. To encompass 95% of all possible outcomes the "likely ranges" discussed above would need to be doubled. For example, 95% of the possible excess returns for the total domestic equity program will be within a range of  $\pm 2.6\%$ .

#### **RECOMMENDED STRUCTURE FOR SEMI-PASSIVE MANAGEMENT**

Staff recommends that the SBI retain 2-4 semi-passive managers with initial allocations of 5-6% of the total domestic equity program (approximately \$500 - 600 million each) to each manager. This would represent approximately 15-25% of the stock program. As the SBI gains more experience with the capabilities of semi-passive managers, staff believes the individual manager allocations could be increased up to 10% of the total domestic equity program (approximately \$1 billion per manager).

Staff recommends that each semi-passive manager use the same benchmark employed by the passive manager for the tilted index fund. A semi-passive manager should be expected to add 0.15-0.30% annualized to its benchmark, net of fees, over time. On a year-to-year basis, returns should be expected to range from  $\pm 2.50$  to 3.0% around the benchmark

95% of the time. Currently, our active managers returns are  $\pm 8.0\%$  or greater around their benchmark 95% of the time.

If this proposal is adopted by the Board, staff would expect to conduct a formal semi-passive manager search as part of the FY95 (7/94 - 6/95) work plan.

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**CONSIDERATION OF ALTERNATIVE ASSET CLASS TARGETS  
FOR THE DOMESTIC EQUITY PROGRAM**

**Position Paper  
January 1994**

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**CONSIDERATION OF ALTERNATIVE ASSET CLASS TARGETS  
FOR THE DOMESTIC EQUITY PROGRAM**

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## **INTRODUCTION**

In 1983, the State Board of Investment (SBI) selected the Wilshire 5000 as its asset class target for domestic common stocks. The purpose of this paper is to review the current policy and determine whether the Wilshire 5000 or another stock market index represents the most appropriate asset class target for the SBI's domestic equity program.

## **BACKGROUND**

### **Objectives**

An asset class target is a diversified collection of securities within a particular asset class.

An appropriate asset class target should fulfill the following two objectives:

- It should embody the plan's return objectives and risk tolerance for a particular asset class. By defining the range of available investments, the selection of an appropriate asset class target assures that implementation is consistent with the stated policy.
- It should provide a measurable performance standard with which to evaluate the results of the plan's total investment program for that asset class.

### **SBI Requirements**

When selecting an asset class target, any unique requirements or restrictions imposed by the plan sponsor must be considered. As such, the asset class target needs to address three separate issues: limitations introduced by total asset size, restrictions imposed by law or regulation, and considerations due to the nature of the plan sponsor's business activity.

- **Total asset size.** The current SBI domestic stock program has an asset value of over \$9 billion. To maximize the total return on this large pool of assets, the investment opportunities of the entire stock market need to be considered.

However, it becomes impractical for the SBI to invest in some stocks because of the small dollar value of their outstanding shares and relative illiquidity of those issues. If it is to be representative of the SBI's investable universe, the SBI's asset class target should exclude these issues.

- **Legal restrictions.** By statute, the SBI may not hold more than 5% of the total outstanding shares of any one corporation. Because the SBI's active domestic equity program uses multiple managers with different investment styles, the probability of a group of managers in aggregate holding more than 5% of a company's outstanding shares is remote. (In fact, since the inception of the SBI's external equity manager program in 1984, this limitation has impacted only one stock that was held both by an active manager and the passive manager. The passive holding was liquidated at the SBI's direction when the situation arose.) As a result, there are no significant statutory restrictions that need to be considered in the SBI's selection of an asset class target.
- **Plan sponsor's business activity.** A plan sponsor may wish to avoid certain securities that produce returns that are highly correlated with the plan sponsor's economic prospects. For example, corporations typically do not own large positions of their own stock for their employees' pension plans. In periods where the corporation incurs poor profit performance, its stock will also perform poorly, detracting from pension performance at a financially inopportune time. Given Minnesota's broad economy, there is no one sector of the stock market that dominates Minnesota's tax revenue base. Therefore, this is not an important consideration for the SBI's investment program.

### **Extended Versus Narrow Indices**

A market index can be broadly categorized as either "extended" or "narrow." Extended indices (e.g., Wilshire 5000 or Russell 3000) provide broad coverage of the domestic stock market. Conversely, narrow indices (e.g., Dow Jones or S&P 500) represent a smaller sub-set of the market.



Extended and narrow indices will differ in the amount coverage they provide relative to the stock investments held by a plan sponsor's active domestic equity managers. For example, the Wilshire 5000 and Russell 3000, both extended indices, contain at least 96% of all the investments made by the SBI's domestic active equity managers. By comparison, the S&P 500 covers approximately 64% and the Dow Jones only about 8%. By choosing a narrow index as its asset class target, a plan sponsor implicitly or explicitly targets investments in a certain part of the available market. On the other hand, if a plan sponsor wishes to target a broader set of investment opportunities it should designate an extended index as its target.

The SBI's domestic equity asset class target should be a market index that represents the broadest and most feasible set of investment opportunities that are available. As a result, staff recommends that the SBI continue to use an extended stock market index as its asset class target for the domestic stock program.

### **EXTENDED INDEX ALTERNATIVES**

The Wilshire 5000 and the Russell 3000 are the two most widely accepted and published extended market indices for domestic stocks. Descriptive data on the two indices are provided below to highlight their small differences.

#### **Wilshire 5000**

The Wilshire 5000 is constructed by Wilshire Associates and includes the common stock of all U.S.-domiciled companies that are publicly traded and for which daily prices are obtainable. This definition now includes real estate investment trusts (REIT's) and master limited partnerships (MLP's). The actual number of issues contained in the Wilshire 5000 varies over time, depending on how many publicly held companies come into and go out

of existence. Companies are added and deleted by Wilshire Associates on a continual basis. Currently, the Wilshire 5000 contains approximately 6200 issues.

The Wilshire 5000 is a capitalization weighted index. ("Capitalization weighted" means that an issue receives a weight based upon the capitalization, or market value, of its total shares outstanding.) No adjustments are made to reflect non-public ownership of large blocks of shares. The total rate of return calculation for the index includes both the change in total market value of the index and dividends. Historical return data goes back to 1971.

### **Russell 3000**

The Russell 3000 is constructed by The Frank Russell Company and is a composite of the stocks of the largest 3000 U.S.-domiciled companies that are publicly traded. This index also includes REIT's and MLP's. The Russell Company determines the issues included in the index once a year on July 1. During the year, the index potentially can lose issues due to bankruptcies, mergers, or acquisitions. When eliminations of this sort occur, the weightings are distributed across the remaining issues in the index.

Like the Wilshire 5000, the Russell 3000 is a capitalization weighted stock index. However, in assigning a weight to a particular issue based on its market value, total shares outstanding are adjusted downward to reflect non-public ownership due to large holdings by corporate owners or affiliated companies. This adjustment is intended to produce an index that is more representative of the stock issues available to the institutional investor. The total rate of return calculation for the index includes both the change in total market value of the index and dividends. Historical return data for the Russell 3000 goes back to 1979.

**Statistical Data as of June 1993**

	<b>Wilshire 5000</b>	<b>Russell 3000</b>
<b>Largest Company</b>	AT&T	AT&T
Market Value	\$84 billion	\$84 billion
Index Weight	1.86%	2.10%
<b>Smallest Company</b>	Electronic Tech. Grp.	Cycare
Market Value	\$890 thousand	\$38.9 million
Index Weight	0.00001%	0.01%

	<b>Wilshire 5000</b>	<b>Russell 3000</b>
<b>Sector Weights</b>		
Basic Materials	6.78%	6.62%
Energy	7.64	7.74
Consumer Staples	8.74	8.90
Capital Goods	7.05	7.09
Consumer Cyclicals	4.21	4.14
Technology	12.16	11.64
Consumer Growth Staples	19.82	19.23
Transportation	1.89	1.85
Utilities	14.19	15.68
Credit Cyclicals	0.65	0.61
Financial	16.35	16.17
Miscellaneous	0.52	0.33

	<b>Wilshire 5000</b>	<b>Russell 3000</b>
<b>BARRA Risk Factors</b>		
Variability in Markets	0.08	0.04
Success	0.03	0.03
Size	-0.30	-0.17
Trading Activity	0.04	0.05
Growth	0.11	0.04
Earnings/Price	-0.02	0.00
Books/Price	0.01	0.01
Earnings Variation	0.07	0.04
Financial Leverage	0.00	0.01
Foreign Income	-0.13	-0.10
Labor Intensity	0.07	0.01
Yield	-0.10	-0.03

Source: Merrill Lynch & Co.

<b>Annualized Returns</b>	<b>1YR</b>	<b>3YR</b>	<b>5YR</b>	<b>10YR</b>
Wilshire 5000	16.15%	12.30%	13.79%	13.32%
Russell 3000	16.04	12.60	14.17	13.52

Source: Richards & Tierney

The above data show that only minor differences exist between the Wilshire 5000 and the Russell 3000. By excluding very small stocks, the Russell 3000 has a somewhat larger capitalization relative to the Wilshire 5000 as indicated by a higher size risk factor (-0.17 vs. -0.30) and a slightly lower growth orientation as indicated by the growth (0.04 vs. 0.11) and yield (-0.03 vs. -0.10) risk factors. Another indication of the slightly larger capitalization orientation of the Russell 3000 is that the smallest company in the Russell 3000 has a market capitalization of \$38.9 million where as the smallest company in the Wilshire 5000 has a market capitalization of less than \$1 million.

A comparison of returns shows that, even over shorter periods of time, the two indices do not deviate significantly from each other. This should be expected since the Russell 3000 includes approximately 97% of the market value of the issues in the Wilshire 5000. The additional stocks (currently 3200+ names) in the Wilshire 5000 comprise only 3% of total capitalization of the index.

#### **PROS AND CONS OF THE RUSSELL 3000**

The Russell 3000 has several advantages and disadvantages as a potential asset class target for the SBI:

- The Russell 3000 more accurately reflects the universe of stocks in which the SBI can invest considering the \$9 billion asset value of the domestic stock program. Assuming that the SBI invested the maximum allowed by state statute (5% of total outstanding shares), the SBI could invest approximately \$2 million in the smallest stock in the Russell 3000 vs. \$45,000 in the smallest issue in the Wilshire 5000. Given the very small capitalization and illiquidity of the stocks outside the Russell 3000 and the total dollar size of the SBI domestic equity portfolio, it becomes impractical for the SBI to invest in stocks with market capitalization below the Russell 3000. (As a point of reference, as of June 30, 1993, the SBI's active and

passive managers in aggregate held only 40 issues with total market capitalizations below that of the smallest stock in the Russell 3000.)

- The slightly larger capitalization orientation of the Russell 3000 should lower transaction costs in the on-going operation of the SBI's passive portfolio since it would reduce the number of stocks held and traded in the very small capitalization, illiquid portion of the market.
- The main disadvantage of switching to the Russell 3000 is that one-time transaction costs would be incurred to convert the passively managed portfolio to reflect a new asset class target. Staff projects that the turnover due to the conversion would be approximately 5 to 10%. However, the long term benefit of changing to an asset class target that more accurately reflects the SBI's investable universe and that eliminates more illiquid issues should outweigh the one-time cost to convert to the Russell 3000.

#### **PASSIVE MANAGEMENT OPTIONS**

Another important factor that needs to be addressed in choosing an asset class target is the day-to-day management of the SBI's passive portfolio. Consideration must be given to an asset class target that can be implemented efficiently and effectively by available passive managers. As a result, staff recommends that the selection of a passive manager be considered in conjunction with selection of the SBI's asset class target.

#### **SUMMARY AND CONCLUSION**

Staff believes that either the Wilshire 5000 or the Russell 3000 can function adequately as the SBI's asset class target for domestic equities. Both indices are consistent with the objectives for an asset class target stated earlier in the paper:

- Both the Wilshire 5000 and Russell 3000 provide the type of broad market coverage that is consistent with the SBI's return objectives and risk tolerance for the domestic stock program.

- Both indices provide a measurable standard for the SBI's domestic stock program in aggregate.

After considering their characteristics in greater detail, staff has a slight preference for the Russell 3000 at this time. With the growth in assets in the domestic stock program from \$5 billion to \$9 billion, staff believes that the Russell 3000 more accurately reflects the universe of domestic stocks in which SBI invests. Also, the additional names in the Wilshire 5000 comprise a relatively illiquid portion of the market and will therefore be more costly for a passive manager to track.

Staff recommends that the SBI consider which combination of passive manager and asset class target can be implemented most efficiently and effectively. This is best accomplished by considering the capabilities of available passive managers through a manager search process that explores the abilities of various candidates to manage portfolios against benchmarks based on either the Wilshire 5000 or Russell 3000. Staff recommends that the Board direct the Manager Search Committee to complete the search process prior to the June 1994 meeting of the SBI.

**DOMESTIC EQUITY  
ASSET CLASS TARGET**

**Minnesota State Board of Investment**

**Staff Position Paper**

**May 2000**

# DOMESTIC EQUITY ASSET CLASS TARGET

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## INTRODUCTION

In 1983, the State Board of Investment (SBI) selected the Wilshire 5000 (W5000) as its asset class target for the Domestic Equity Program. The purpose of this paper is to review the current options and to determine which index represents the most appropriate asset class target for the SBI's Domestic Equity Program at this time.

## BACKGROUND

An asset class target is a diversified collection of securities within a particular asset class. It represents the set of feasible investment opportunities that best achieves the purposes for which the asset class is included in the policy asset mix. In general, an appropriate asset class target should fulfill the following objectives:

- It should represent the broad range of investment opportunities available in the market place to institutional investors.
- It should reflect the constraints an institutional investor experiences in the market place.
- It should embody the plan's return objectives and risk tolerance for a particular asset class. By defining the range of available investments, the selection of an appropriate asset class target assures that implementation is consistent with the stated policy.
- It should provide a measurable performance standard with which to evaluate the results of the plan's total investment program for that asset class.

A market index can be categorized in general terms as either "broad" or "narrow." Broad indices (e.g., Wilshire 5000 or Russell 3000) provide broad coverage of the domestic stock market. Conversely, narrow indices (e.g. Dow Jones Industrial or S&P 500) represent a smaller sub-set of the market. Broad and narrow indices will differ in the

amount of coverage they provide relative to the stock investments held by a plan sponsor's active domestic equity managers. For example, the W5000 and Russell 3000 (R3000), both broad indices, contain at least 93% of the market value of all the investments made by the SBI's active domestic equity managers. By comparison, the S&P 500 covers approximately 77%. By choosing a narrow index as its asset class target, a plan sponsor implicitly or explicitly targets investment in a certain part of the available market. On the other hand, if a plan sponsor wishes to target a wider set of investment opportunities, it should designate a broad index as its target.

In 1983, the SBI selected the W5000 as its asset class target for the Domestic Equity Program. At that time, the published indices available for use as a target included the W5000 and the S&P 500. Given the SBI's desire to have broad exposure to publicly traded domestic equities, the W5000 was the appropriate choice.

In June 1994, Staff again reviewed the asset class target with the Stock and Bond Manager Committee of the IAC and found the R3000 attractive. However, the advantages of the R3000 did not appear to outweigh the one-time transaction cost of moving from the W5000 to the R3000, so the W5000 continued as the SBI's Domestic Equity asset class target.

Historically, the SBI has believed that a broad market index is the most appropriate asset class target for the Domestic Equity Program. Broad market indices represent the return behavior of the U.S. common stock market and reflect the belief that one segment of the market will not produce better long-term performance than another. At times, the SBI has instituted investment restrictions such as prohibiting tobacco and alcohol stocks from being included in equity portfolios. During these times, the asset class target has been appropriately adjusted to reflect these restrictions.

**INVESTABILITY ISSUES WITH THE WILSHIRE 5000  
AS AN ASSET CLASS TARGET**

Recently, several issues surfaced to cause Staff to revisit the Domestic Equity asset class target. These issues have always existed and have caused minor tracking in the performance evaluation of the Domestic Equity Program relative to its asset class target. However, in 1999, these issues resulted in unacceptable tracking error for the Domestic Equity Program. Because the Domestic Equity Program is a significant part of the Basic and Post Retirement Plans, the total return of both Plans also suffered tracking error relative to their composite indices.

The issues that Staff has identified with the published W5000 include the following:

**Mismatch Between Planning and Reporting.** The SBI manages the Domestic Equity Program on a quarterly planning cycle. Each quarter, the SBI's consultant works with the SBI's active managers to construct and modify their individual custom benchmarks. The consultant then analyzes the active managers' benchmarks to construct the Dynamic Completeness Fund benchmark for the ensuing quarter. This benchmark is then delivered to the SBI's semi-passive managers five days in advance of the quarter-end to allow the managers to prepare a modification to their portfolio. To operationally accomplish these steps, data based on the prior month-end must be used.

The SBI has used this quarterly buy/hold methodology to plan benchmarks since 1990, while the program's performance has been reported against a published index, the W5000, which changes daily. (The S&P 500 and the R3000 are also buy/hold indices.) Historically, the mismatch between planning and reporting has caused a variance of approximately 19 basis points. However, this mismatch between planning and reporting periods

caused a tracking error of 79.3 basis points during the year ended December 1999. This very significant tracking error had not been experienced in the past, but due to the extremes in the market place during 1999, such as narrow market advances (technology), significant initial public offerings, and high merger and acquisition activity, it had a very large impact on the Domestic Equity Program's performance.

**Timing of Index Changes.** Wilshire reconstitutes the W5000 (determines which companies belong in the index) daily, based on whether the stock traded or did not trade on that day. Wilshire rebalances (adjusts the weights of stocks in the index for changes in the number of shares outstanding) monthly, and incorporates changes to its index due to corporate actions (i.e. mergers, stock splits, etc.) during the month. Companies with initial public offerings (IPO's) are included in the W5000 at the end of the month in which they are brought to market. The SBI's custom benchmarks and Dynamic Completeness Fund benchmark are reconstituted at the start of each quarter based on the previous month-end data (for example, the first quarter of the year is based on November month-end data) and held constant until the next quarterly reconstitution. This difference in the timing of changes in the benchmarks may result in significant tracking error between the Domestic Equity Program's aggregate benchmarks and the published W5000 Index.

For example, a company that goes public during December would be included in the W5000 on January 1, but would not be incorporated into the custom benchmarks until April 1 (the January 1 custom benchmark reconstitution is based on November 30 data). The company's stock price could markedly change during this three-month period. This change results in misfit or tracking error between the SBI Aggregate Domestic Equity benchmark and the published W5000. During periods such as 1999, this can have a significant impact on tracking error. IPO's caused a

45 basis point impact to the W5000 in 1999, because of the significant number of IPOs and because so many had very good performance. Thus, the Wilshire index construction methodology is inconsistent with the SBI's benchmark construction process and may at times put the SBI's portfolio at significant variance relative to its ability to track the current asset class target.

**Significant Number of Illiquid Stocks.** The SBI is unable to invest in a significant portion (number of names not market capitalization) of the W5000 due to the illiquid nature of many small capitalization names. The all-inclusive nature of the W5000 adds some measure of difficulty for passive managers to track the performance of the index, because it includes more than 3000 small companies below \$100 million in market capitalization. Included in these are 1300 micro-cap companies with market capitalization of less than \$25 million. The stocks of these very small companies are illiquid and expensive to trade, so the SBI's passive portfolio owns few of them. Therefore, an asset class target that does not include small cap names (less than 1% of the published W5000 market capitalization) would be an improvement over the published W5000.

**Lack of Float Adjustment.** Wilshire's index construction methodology includes all companies in the index at their full market capitalization weighting (number of shares times price per share). Wilshire does not adjust the weight of a security in the index for float, that is, for the shares owned by company insiders or venture capitalists that are not available for trade in the open market. This lack of float adjustment inflates the level at which some companies are included in the W5000, and makes it difficult for a passive manager to get the proper exposure to a name relative to its weighting in the benchmark.

A passive manager can incur high negative tracking error when they are unable to get sufficient exposure to stocks that perform well and are included in the W5000 at a full market cap weighting. For example, companies with IPOs often have significant insider and/or venture capitalist ownership. In recent periods, many IPO companies significantly outperformed broad index measures, and the inability of the passive manager to obtain a market weight, due to lack of float, exposed the passive portfolio to tracking problems relative to the benchmark. During the quarter ending December 1999, the SBI's passive index account underperformed by 50 basis points due to insufficient exposure to eleven IPO companies.

An appropriate asset class target should allow for passive implementation and the ability to transact in and out of an index position quickly and with little market impact or direct cost. Therefore, float adjustment should be given consideration in the selection of an asset class target.

These issues with the W5000 as an asset class target were exaggerated due to the stock market environment in late 1999. This paper will address these issues.

## CURRENT OPTIONS FOR THE ASSET CLASS TARGET

The SBI has several options for an asset class target including various published indices and modified indices. Included in this section and in **Attachment 1** is information on the construction methodology and characteristics of the following indices:

**Published Indices:** Wilshire 5000  
Russell 3000  
Standard & Poors 1500  
Standard & Poors 500  
Dow Jones Total Market Index

**Modified Indices:** BGI US Equity  
Modified Published Indices

### PUBLISHED INDICES

The published indices offer the plan sponsor the ability to follow their performance in various published sources. All are priced on a daily basis.

The **W5000** is the broadest of all U.S. equity indices currently containing over 7000 capitalization-weighted securities. The **W5000** is constructed by Wilshire Associates and includes the common stock of all U.S.-domiciled companies that are publicly traded in the U.S. and for which daily prices are obtainable. This definition includes, in part, real estate investment trusts (REIT's) and master limited partnerships (MLP's). The index does not include American Depository Receipts (ADRs). The actual number of issues contained in the **W5000** varies over time, depending on how many publicly held companies come into and go out of existence. Companies are added and deleted by Wilshire Associates on a continual basis.

The **R3000** is constructed by the Russell / Mellon Analytical Services. It measures the performance of the 3000 largest U.S. companies by market capitalization that meet their inclusion rules. The securities must be domiciled (incorporated) in the U.S. or its territories. All companies listed on a U.S. exchange or the NASDAQ are considered for inclusion in the index. The index is reconstituted annually based on data available on May 31 of each year. The weighting of securities may be adjusted for float, that is, for factors that limit the available shares such as cross-holdings and private ownership based on a set of specific rules. As of June 1999, the R3000 represented approximately 90% of the investable U.S. equity market. The R3000 is also divided into numerous sub-indices that represent the small, mid, and large capitalization universes as well as value and growth measures.

The **S&P 1500** has been compiled since 1995 by Standard and Poor's. It measures the performance of the 1500 securities in the S&P 500, the S&P MidCap 400, and the S&P SmallCap 600 indices. Index reconstitution is a continuous process that is based on the judgment of a committee and not on clear published rules. The S&P indices include companies for their market size, liquidity, and industry group representation. The S&P 1500 is not widely used by institutional investors.

The **S&P 500** consists of 500 stocks that represent the major industries in the U.S. market. It is the most widely followed index in the U.S., and is used as a large capitalization benchmark. While it covers approximately 74% of the U.S. equity market capitalization, the S&P 500 is not considered a broad capitalization index. As with the S&P 1500, index reconstitution is continuous and based on committee judgment.

The **Dow Jones Total Market Index** is a new family of benchmark indices launched in February 2000. This new index covers a constant 95%



of the U.S. equity market's capitalization, so it offers more consistent coverage, particularly during periods of rapid market expansion, than indices with a fixed number of constituents. The Total Market Index is made up of three sub-indices: Large-Cap, Mid-Cap, and Small-Cap. The index includes all NYSE, Amex, and NASDAQ stocks, but excludes those with less than six months trading history, foreign issues, non-common equity issues, illiquid stocks, and stocks owned significantly by insiders or other organizations. Stocks that constitute the top 70% of the universe's market value become the Large-Cap Index; those in the next 20% become the Mid-Cap Universe; those in the bottom 10% become the Small-Cap Universe.

The Dow Jones Total Market Index is a new index without historical experience, and therefore Staff is not recommending it at this time. However, over time, the Dow Jones Total Market Index Series may be more widely used by institutional investors, because its construction is designed to be more institutionally investable and to cover 95% of the market while preserving index liquidity.

Most of these published indices are well known and used by many plan sponsors as asset class targets. It should be noted, however, that many of the problems the SBI recently experienced with the W5000 would not be resolved by using these published Indices as the asset class target. For example, only the Dow Jones Total Market Index is reconstituted on a quarterly basis. The W5000, R3000, and S&P indices would not resolve the mismatch between planning and reporting time periods. In addition, the W5000 and the S&P indices are not float adjusted. Timing of index changes is problematic in the W5000, because it occurs daily compared to the SBI's quarterly benchmark reconstitution. In the S&P indices, index changes are not predictable, as they are a result of committee judgment. The R3000 is reconstituted once a year, so index changes cause significant turnover during July.

## **MODIFIED INDICES**

Many consultants and others have the capability to construct asset class targets that meet the needs of large plan sponsors. These indices are constructed to represent the client's investable universe, and can be monitored and measured by various entities. An example of a modified index is the BGI U.S. Equity Index. It is a broad market index that captures the performance of about 5000 securities. The following is a brief description of this index:

The **BGI U.S. Equity Index** is constructed by Barclays Global Investors (BGI), and is used by more than 90 BGI clients with \$43 billion invested in an index fund designed to track it. The BGI U.S. Equity Index is a composite of the S&P 500 and the BGI Extended Market Index. The BGI Extended consists of more than 4500 securities that represent the broad market beyond the S&P 500. It does not include about 1500 securities that fail liquidity and market capitalization cutoff screens. While the BGI Extended is float adjusted, the S&P 500 portion of the BGI U.S. Equity is not. BGI also includes ADRs and other non-U.S. stocks that are part of the S&P 500. The non-U.S. stocks include 13 companies that total about 4% of the S&P 500 market capitalization. They are companies generally headquartered in Canada or Bermuda and trading on U.S. exchanges. Approximately 80% of the BGI U.S. Equity total capitalization is in the S&P 500 component. Reconstitution is monthly.

Modified indices represent improvements for institutional investors, as they more closely reflect an institutional investor's domestic equity universe. Specific modified indices resolve most but not all of the issues the SBI has identified with the asset class target. If the SBI were to consider a modified index as an asset class target, the SBI should seek (if not immediately, then in the future) adjustments that address all of the known investability concerns identified in this paper.

## REQUIREMENTS FOR AN ASSET CLASS TARGET

The SBI's Domestic Equity Program uses active management, and inherent to active manager programs is style misfit relative to a broad market index. To control style misfit, the SBI uses a Completeness Fund investment structure. This structure necessitates some unique requirements for an asset class target. The completeness fund approach involves assigning every stock in the target to either an active or semi-passive manager's benchmark in order to actively manage all parts of the equity market and minimize the misfit or tracking error between the aggregated benchmarks and the asset class target. For this reason, it is very important that the asset class target be completely investable.

Second, in order to remove the mismatch between the benchmark planning process and reporting, the asset class target should also be reconstituted on a quarterly basis. Since inception in 1990, the SBI's Completeness Fund investment structure has been based on quarterly reconstitution of the benchmarks. Quarterly reconstitution generates the majority of the refinements that a monthly reconstitution would, but does not generate the high level of one-time turnover that annual reconstitution would.

Finally, the SBI has, at times, had specific investment restrictions in place. Currently, all active domestic equity managers are restricted from owning stocks in companies that generate more than 15% of revenue from tobacco proceeds. The asset class target should be adjusted to remove the tobacco stocks that the SBI chooses not to invest in to more accurately measure the Domestic Equity Program's performance.

In order to satisfy these requirements and address the issues identified in this paper, the SBI should consider using a modified W5000 as an asset class target. The asset class target should start with the published W5000 but include adjustments to reflect the SBI's Domestic Equity Program structure and constraints. The adjustments should also make the new target more institutionally investable, so the SBI's passive manager can better replicate the target with tracking error coming only from transaction costs.

If the Board adopts the recommendations in this paper, the SBI would use a specific set of rules and procedures to create the asset class target. The SBI's consultant would build a custom asset class target for the SBI called the **W5000 Investable** according to SBI's requirements as follows:

- The asset class target would be constructed each calendar quarter or at a time consistent with a planned and significant change to the program's structure.
- The starting point for each reconstitution will be the prior month-end published W5000 holdings (i.e. the first quarter target would be based on November month-end W5000 holdings). Then the following adjustments would be made:
  - Remove stocks that are part of the SBI's directed restrictions (currently, restricted tobacco company list).
  - Eliminate low volume stocks. Stocks must trade 50% or more of the time.
  - Eliminate low capitalization stocks, which are defined as the 10th decile of the New York Stock Exchange. This determines the market capitalization cut-off point applied to all stocks in the published W5000. (As of March 31, 2000, this would eliminate companies below \$91.7 million in market capitalization).
  - Eliminate ADR's, REIT's, Dual Class Stocks, MLPs, Closed-end and Exchange Traded Funds, Unit Trusts, Preferred Stock (non common stock).
- With regard to float, the **W5000 Investable** will use the published W5000 shares outstanding as reported until a process to adjust for float is determined by Staff.
- The asset class target's list of stocks and number of shares would remain constant until the next reconstitution.
- The weights of the stocks in the asset class target would float with price movement until the next reconstitution.
- Any adjustment for corporate actions would be made to the asset class target as necessary in a manner consistent with the custom benchmarks and the Dynamic Completeness Fund benchmark.

The characteristics of the **W5000 Investable** index are included in **Attachment 1**. The index contains approximately 3700 securities as of March 31, 2000. It is similar to the R3000 in terms of median and average market capitalization, and it excludes those securities not considered to be part of the SBI's investment universe, such as tobacco, ADR's, REITs, MLPs, etc.

Back tests of the **W5000 Investable** index modified for the SBI demonstrates that there is little difference in the total rate of return over time versus both the published W5000 and the R3000 (see **Attachment 2**). The benefit offered by the **W5000 Investable** is the ability of the SBI to reduce short-term volatility around the new asset class target and better evaluate the performance of the Domestic Equity Program. A better performance measurement target will improve short-term decision-making.

If the Board approves the **W5000 Investable** as the asset class target for the Domestic Equity Program, it should also consider using it as the target during the volatile markets experienced during fiscal year 2000. By restating the returns of the asset class target from the published W5000 to the **W5000 Investable** for quarters ending *September 1999, December 1999, March 2000, and June 2000*, the SBI can more accurately evaluate the Program's performance during that unusual period of market activity. Restating the asset class target returns would not impact the active, semi-passive, or aggregate benchmark returns, but would simply reflect an asset class target more similar to the aggregate of all managers' benchmarks.

Using the **W5000 Investable** as the asset class target for the SBI's Domestic Equity Program will immediately address three of the four issues identified in this paper. Those issues are

- A mismatch between planning and reporting,
- The timing of index changes, and
- A significant number of illiquid stocks.

Staff and SBI's consultant will research the fourth issue, which is float adjustment, and identify a satisfactory source of holdings information. Once a source and process for incorporating it have been determined, float adjustments will be incorporated into the **W5000 Investable** asset class target.

If the SBI approves the implementation of this **W5000 Investable** as the asset class target, the construction rules and methodology described within this paper should be reviewed regularly to ensure that it continues to reflect the market environment, the practices of the investment industry, and the needs of the SBI. The asset class target should be viewed as an evolving index, modified to incorporate realities of institutional investing and appropriately evaluate the Domestic Equity Program.

#### **RECOMMENDATION**

**The Investment Advisory Council recommends that the SBI adopt this position paper establishing the W5000 Investable as the new asset class target for the Domestic Equity Program.**

**The Council also recommends that the SBI authorize Staff to negotiate all necessary changes in our contractual relationship with the Board's passive manager to facilitate the implementation of this new asset class target.**

## INDEX CHARACTERISTICS

Index	Wilshire 5000	Wilshire 5000 Investable	Russell 3000	BGI U.S. Equity
Data as of	March 2000	March 2000	April 1999	April 1999
Number of Stocks	6,987	3748	2822	5378
Market Coverage	97.0%	93.9%	86.1%	99.6%
Median Mkt. Cap.	\$153 M	\$431 M	\$554 M	\$217 M
Avg. (Mean) Mkt. Cap.	\$2.4 B	\$4.3 B	\$4.3 B	\$2.6 B
Reconstitution	Daily	Quarterly with one month lag	Annual	Monthly
Inclusion	-Common stock of all U.S. domiciled companies (for which prices are available)	-Common stock of all U.S. domiciled companies less specific exclusions listed below.	-3000 largest cap. U.S. domiciled companies -REIT's, -MLP's	-All stocks in the S&P 500 and approx. 4500 stocks in BGI Extended Mkt. Index (smaller-cap. stocks) -ADR's in S&P 500 -REIT's -Large non-U.S. companies in S&P 500
Exclusion	-ADR's, -Large non-U.S. companies (except Slumberger)	-Board mandated exclusions -ADR's, -Large non-U.S. co.'s (except Slumberger) -REIT's -MLP's -Dual class stocks -Small, illiquid issues -Closed-end funds	-ADR's, -Dual class stocks -Large non U.S. companies -Low priced stock (\$1 per share) -Illiquid stocks -Stocks owned significantly by insiders or other organizations	-MLP's -Dual class stocks -Approx. 1,500 small, illiquid issues
Float Adjusted	No	No, not at this time	Yes	Yes (for non-S&P 500 component)

Sources: Barclays Global Investors  
Dow Jones  
Richards & Tierney

## INDEX CHARACTERISTICS

Index	S&P 1500	S&P 500	Dow Jones Total Market Index
Data as of:	April 1999	April 1999	April 2000
Number of Stocks	1500	500	2016
Market Coverage	87.0%	78.3%	95.0%
Median Mkt. Cap.	\$1.4 B	\$8.4 B	\$1.3 B
Avg. (Mean) Mkt. Cap.	\$8.1 B	\$21.9 B	\$7.3 B
Reconstitution	Continuous	Continuous	Quarterly
Inclusion	-1500 securities in the S&P 500, S&P Mid Cap 600, and the S&P Small Cap 400 -Large non U.S. companies	-500 U.S. traded stocks included for their market size, liquidity and industry representation -Large non-U.S. companies	-All NYSE, Amex & NASDAQ stocks
Exclusion	-At S&P Committee's discretion	-At S&P Committee's discretion	-Stocks with less than six months trading history -Foreign issues -Non-common equity -Illiquid stocks -Stocks owned significantly by insiders or other organizations
Float Adjusted	No	No	Yes

Sources: Barclays Global Investors  
Dow Jones



**ATTACHMENT 2**

**PERFORMANCE COMPARISONS**

**Annualized Returns  
As of December 31, 1999**

	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>7 Year</u>
W5000 Investable	22.3	26.3	27.3	20.6
W5000	23.6	26.0	27.1	20.5
R3000	20.9	25.5	26.9	20.4

**Quarterly Returns  
As of Quarter Ending**

	<u>Mar-00</u>	<u>Dec-99</u>	<u>Sep-99</u>	<u>Jun-99</u>
W5000 Investable	4.2	17.2	-6.8	8.2
W5000	3.8	18.3	-6.6	7.8
R3000	4.6	16.2	-6.6	7.7

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# **CONSTRUCTION OF THE SBI'S DEDICATED BOND PORTFOLIO**

**Staff Position Paper  
May 1985**

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## **RATIONALE FOR A DEDICATED BOND PORTFOLIO**

The Post Retirement Investment Fund contains the assets of retired Minnesota public employees covered by seven statewide retirement plans. Participants in the Fund are promised lifetime annuities, the size of which are based upon the employees' "high five" average salaries and years of service. Upon the employees' retirement, sums of money sufficient to finance fixed monthly annuities for the retirees are transferred to the Post Retirement Investment Fund.

In order to support these promised benefits, the Fund must "earn" at least 5% on its invested assets. Earnings are defined as interest and dividend income plus realized capital gains. If the Fund earns more than 5%, the excess earnings are used to finance permanent benefit increases for eligible employees.

The Post Retirement Investment Fund has two objectives:

- 1) To produce earnings sufficient to finance benefits currently promised retirees.
- 2) To produce additional earnings that permit benefits to be increased at a rate which compensates, to some degree, for inflation.

In the third quarter of 1984, staff developed a series of position papers that discussed the investment needs, objectives and investment management structure of the Post Retirement Investment Fund. To meet the first objective cited above, staff recommended that a portion of the Fund's assets be placed in a dedicated bond portfolio. This portfolio would be composed of high quality bonds blended so as to produce cash flows, from interest and principal payments, that would match the stream of benefits promised current retirees. It was also recommended that the dedicated portfolio be utilized to achieve, in part, the second objective as well. That is, the dedicated portfolio would be made large enough to produce not only cash flows sufficient to fund promised benefits, but also to generate a three percent benefit increase annually. This benefit

increase would serve as a stable, minimum increase, which could be added to based upon the performance of the remainder of the Fund's investment portfolio.

Staff proposals were reviewed by the Investment Advisory Council's Asset Allocation Committee and the full Investment Advisory Council (IAC). The IAC recommended that the Board approve the staff proposals, which the Board did at its December, 1984 meeting.

### **ADVISER SELECTION PROCESS**

Also at its December, 1984 meeting, the Board requested that the IAC's Fixed Income Manager Committee work with staff to select an adviser who would assist in implementing the dedicated bond portfolio. The role of the adviser would be to provide the computer software and technical expertise necessary both to design the dedicated bond portfolio as well as to carry out the specified securities trading.

The adviser would not be retained to act in the role of a money manager. Staff would continue to manage the Fund's assets. Rather, the adviser would utilize liability data submitted by the retirement funds and asset data submitted by staff, to construct a list of bonds to be purchased and sold that would meet the estimated cash needs of the Fund's current beneficiaries over the next thirty years. This list would be monitored and, if necessary, altered by the adviser as staff carried out the implementation of the dedicated bond portfolio.

In consultation with Evaluation Associates, the Committee and staff chose to interview three firms for the adviser's job: Bankers Trust, J.P. Morgan, and Ward & Wissner. Interviews were held with each firm at the Investment Board's offices.

*A representative list of the issues discussed with each firm included:*

- The universe of bonds from which the firm would select securities for the dedicated portfolio



- Bond pricing procedures
- Bond dedication software
- Procedures for selecting alternative bonds if originally suggested issues are not available
- Constraints placed on sectors, qualities, and individual issues
- Call protection
- Details of the firm's proposed trading strategy
- Hedging during portfolio construction
- Use of bond swaps in the dedicated portfolio
- Bond dedication experience
- Fees

#### **SELECTION OF BANKERS TRUST**

From among the three candidates considered, Bankers Trust was selected by the Fixed Income Manager Committee to provide assistance in the dedicated bond portfolio's construction. While all three candidates offered excellent credentials, the Committee and staff believed that Bankers Trust offered the best combination of experience, personnel, software, trading strategies, and cost. The Committee recommended that Bankers Trust be hired and in early-January the firm signed a one-year contract with the Investment Board.

Soon after Bankers Trust was hired, representatives of the firm came to Minnesota for a meeting with staff and the Fixed Income Manager Committee. Prior to the meeting, the firm was supplied with a copy of the Post Retirement Investment Fund's existing bond holdings and estimated liabilities. Based on this information and its previous meeting with staff and the Fixed Income Manager Committee, the firm constructed a suggested dedicated bond portfolio. Bankers Trust proposed that the portfolio be composed largely

of Treasury and Agency bonds, due to the prevailing historically low yield spreads between corporates and government issues. The firm recommended retaining all corporate bonds that were then held in the portfolio. Where necessary, existing Treasury and Agency bonds would be sold to buy other Treasury and Agency bonds which, when combined with the existing corporate bonds, would produce the cash flows required to meet promised benefit payments.

This proposal was advantageous in a number of ways. First, transacting only in Treasury and Agency issues significantly reduced the difficulty and cost of constructing the dedicated portfolio. Government issues trade much more easily than do most corporates. Yet due to the low level of yield spreads, very little in terms of portfolio income was given up. Second, in the future if, and when, yield spreads widen, the government holdings can be swapped for corporate bonds at a pace dictated only by the availability of attractive trades. Third, the ability to simultaneously sell and buy Treasury and Agency bonds allowed the Investment Board to avoid significant interest rate risk exposure. The Board was never required to significantly alter the duration of its portfolio because it did not have to move into and out of cash as sells and buys took place.

#### **DEDICATED PORTFOLIO CONSTRUCTION**

The process of constructing a dedicated bond portfolio for the Post Retirement Investment Fund was greatly facilitated by the Fund's pre-dedication asset mix structure. As a result of investment decisions made as far back as 1980, the Fund's bond portfolio represented an ad hoc dedicated portfolio. That is, based on the Fund's perceived investment needs, and the prevailing high level of interest rates, a large portion of the Fund had been invested in long-term, high quality bonds. While no formal study had been conducted regarding the Fund's specific cash flow needs, the size and make-up of the Fund's existing bond portfolio closely approximated that of the desired dedicated

portfolio. Thus, construction of the dedicated portfolio was more a matter of refining the existing bond portfolio than creating an entirely new portfolio.

Since the middle of 1984, the Post Retirement Investment Fund had been experiencing large cash inflows. These inflows were caused by early retirements under the "Rule of 85." Staff had been investing these cash inflows in a manner designed to fill gaps in the Fund's bond maturity structure. Thus, it is hard to pinpoint a date at which time trading for the dedicated bond portfolio actually commenced. However, December 31, 1984 would seem to be a reasonable, although somewhat arbitrary, starting date for purposes of this report.

The original bond portfolio contained 271 securities with a total year-end 1984 market value of \$1.30 billion. The breakdown of the original portfolio by financial characteristics is presented in Table 1.

The desired dedicated bond portfolio contained 187 securities and had a February month-end market value of \$1.46 billion. Its financial characteristics are shown in Table 2. As can be seen, the two portfolios were quite similar. The dedicated portfolio had a slightly higher yield-to-maturity and duration than did the original portfolio. On a quality basis, the two were essentially the same. In terms of sector weighting, the dedicated portfolio had a higher percentage of government holdings and contained no mortgages.

Construction of the dedicated bond portfolio entailed transactions in a large number and dollar amount of securities. The bonds that the original portfolio held generally were not precisely those that the dedicated portfolio would require. However, as noted, the original portfolio was quite similar in composition to the desired dedicated portfolio. As a result, most of the required transactions involved swapping very similar bonds. These trades had the advantage of being done with very liquid, similar securities which greatly reduced transactions costs and the risk of adverse interest rate moves.

The primary deficiency of the original portfolio's composition compared to that of the desired dedicated portfolio lay in bonds with maturities in the ten to twenty-five year

TABLE 1

POST RETIREMENT INVESTMENT FUND  
 BOND PORTFOLIO CHARACTERISTICS  
 PRIOR TO DEDICATION  
 DECEMBER 31, 1984

MARKET VALUE (Millions)	PAR VALUE (Millions)	# OF ISSUES	COUPON	YIELD TO MATURITY	DURATION	TERM TO MATURITY
\$1,306	\$1,334	271	11.69%	11.65%	5.1 yrs	9.9 yrs

QUALITY DISTRIBUTION  
 (Percent of Portfolio Market Value)

SECTOR DISTRIBUTION  
 (Percent of Portfolio Market Value)

AAA	AA	A	BAA	BA	NR	GOVT	AGCY	ZERO	IND	UTIL	FIN	TRAN	MTGS	MISC
62.1	21.7	11.9	3.8	0.6	0.0	34.5	18.2	0.0	13.4	12.3	7.6	1.9	9.1	2.9

TABLE 2

POST RETIREMENT INVESTMENT FUND  
 BOND PORTFOLIO CHARACTERISTICS  
 AFTER DEDICATION  
 FEBRUARY 28, 1985

MARKET VALUE (Millions)	PAR VALUE (Millions)	# OF ISSUES	COUPON	YIELD TO MATURITY	DURATION	TERM TO MATURITY
\$1,458	\$1,614	187	10.78%	12.04%	6.3 yrs	14.4 yrs

QUALITY DISTRIBUTION  
 (Percent of Portfolio Market Value)

SECTOR DISTRIBUTION  
 (Percent of Portfolio Market Value)

AAA	AA	A	BAA	BA	NR	GOVT	AGCY	ZERO	IND	UTIL	FIN	TRAN	MTGS	MISC
65.0	19.6	11.5	3.4	0.5	0.0	55.2	6.9	0.0	13.4	11.0	9.2	1.7	0.0	2.5

range. The original portfolio had a shortage of these bonds and an excess of short to intermediate term issues. Most of the new cash added to the portfolio was concentrated in correcting this imbalance.

In all approximately \$1.8 billion (at market) in total trading took place over the first two months of 1985. By the end of February, trading for the dedicated portfolio was complete. The list of issues traded and the par amounts transacted in are shown in Table 3. The actual trading went quite smoothly. It is not possible to quantify the total costs of the trades. However, the liquidity of the government bond market permitted the dedicated bond portfolio's transactions to be absorbed with no apparent significant market impact.

#### **INVESTMENT OF NEW CASH FLOW**

One dedicated bond portfolio topic that remains not fully resolved relates to the investment of new cash flows. The dedicated portfolio will be rebalanced at the end of each calendar year based on fiscal year-end actuarial data supplied by the retirement funds. In the interim, annuities for retirees will continue to be purchased. This new cash inflow must be invested. In order to minimize interest rate exposure until the annual rebalancing is conducted, staff has recommended that the portion of the new cash flow necessary to fund promised benefits be invested in fixed income securities with durations, in aggregate, approximately equal to those of the newly created liabilities. In order to implement this process, it will be necessary for the State's actuary to supply estimates of the new liabilities.

#### **ON-GOING MONITORING**

The dedicated bond portfolio represents a passive investment strategy. Moreover, the portfolio is designed to generate a specific stream of income. Total returns on the bond investments are irrelevant to the objectives of the portfolio. Thus, appropriate

TABLE 3

DEDICATED BOND PORTFOLIO  
COMPLETED TRANSACTIONS  
DECEMBER 31, 1984 THROUGH FEBRUARY 28, 1985

## U.S. TREASURY

SALES			PURCHASES				
COUPON	MATURITY DATE	AMOUNT (000'S)	COUPON	MATURITY DATE	AMOUNT (000'S)		
TREAS	9.500%	04-30-85	\$ 20000	TREAS	10.625%	07-31-85	\$ 4910
TREAS	9.875	05-31-85	15000	TREAS	15.875	09-30-85	7060
TREAS	12.625	07-31-86	12500	TREAS	14.000	03-31-86	8694
TREAS	12.375%	08-15-87	20000	TREAS	14.875	06-30-86	5945
TREAS	13.250	04-15-88	9965	TREAS	12.625	07-31-86	6430
TREAS	15.375	10-15-88	9735	TREAS	12.250	09-30-86	2225
TREAS	14.625	01-15-89	42600	TREAS	10.000	12-31-86	420
TREAS	14.500	07-15-89	11600	TREAS	10.250	03-31-87	10140
TREAS	11.875	10-15-89	26000	TREAS	10.500	06-30-87	6680
TREAS	10.750	11-15-89	2000	TREAS	12.375	01-15-88	11800
TREAS	14.875	08-15-91	20000	TREAS	10.125	02-15-88	5584
TREAS	14.250	11-15-91	25000	TREAS	14.000	07-15-88	4795
TREAS	14.625	02-15-92	36000	TREAS	10.625	12-31-88	330
TREAS	13.750	05-15-92	10000	TREAS	14.375	04-15-89	6290
TREAS	10.500	11-15-92	23000	TREAS	10.500	01-15-90	13750
TREAS	10.125	05-15-93	13000	TREAS	9.000	02-15-94	40000
TREAS	11.625	11-15-94	70000	TREAS	11.625	11-15-94	60000
TREAS	11.625	11-15-04	54871	TREAS	10.500	02-15-95	40000
				TREAS	10.375	05-15-95	60000
				TREAS	12.625	05-15-95	40000
				TREAS	11.500	11-15-95	60000
				TREAS	8.500	05-15-99	37100
				TREAS	7.875	02-15-00	40000
				TREAS	8.375	08-15-00	8795
				TREAS	11.750	02-15-01	23800
				TREAS	8.000	08-15-01	40000
				TREAS	11.625	11-15-02	43000
				TREAS	11.625	11-15-04	50000
				TREAS	10.750	02-15-03	40000
				TREAS	8.250	05-15-05	38050
				TREAS	7.625	02-15-07	29475
				TREAS	8.375	08-15-08	12200
				TREAS	10.375	11-15-09	14900
				TREAS	9.125	05-15-09	9000
				TREAS	11.750	02-15-10	60000
				TREAS	12.750	11-15-10	40000
				TREAS	12.000	08-15-13	28326
				TREAS	13.250	05-15-14	18375

FEDERAL NATIONAL MORTGAGE

SALES			
	COUPON	MATURITY DATE	AMOUNT (000'S)
FNMA	7.750%	03-10-87	\$ 250
FNMA	12.550	10-13-87	5270
FNMA	10.500	06-10-88	4000
FNMA	10.300	05-10-90	14000
FNMA	10.900	11-12-90	3000

PURCHASES		
COUPON	MATURITY DATE	AMOUNT (000'S)
NO PURCHASES		

FEDERAL HOME LOAN

SALES			
	COUPON	MATURITY DATE	AMOUNT (000'S)
FHLB	11.500%	02-25-85	\$ 25000
FHLB	11.950	08-26-85	25000
FHLB	12.750	01-27-86	19550
FHLB	12.625	08-25-87	20590
FHLB	12.500	09-25-89	5000
FHLB	12.500	09-25-90	10000
FHLB	11.850	08-30-91	28000
FHLB	11.100	11-25-92	5000
FHLB	12.150	12-27-93	10000
FHLMC	12.500	01-01-10	1626
FHLMC	14.750	03-01-10	8137
FHLMC	10.750	07-01-10	2439

PURCHASES			
COUPON	MATURITY DATE	AMOUNT (000'S)	
FHLB	11.700%	07-26-93	\$ 20000

FEDERAL FARM CREDITS

SALES			
	COUPON	MATURITY DATE	AMOUNT (000'S)
PFCB	13.250%	04-22-85	\$ 2280
PFCB	10.750	10-20-86	750
PFCB	10.000	12-01-86	1300
PFCB	12.875	09-01-88	7500
PFCB	12.450	10-23-89	12000
PFCB	10.600	10-22-90	6000
PFCB	14.700	07-22-91	28000
PFCB	13.750	07-20-92	600
PFCB	11.800	10-20-93	8000

PURCHASES			
COUPON	MATURITY DATE	AMOUNT (000'S)	
PFCB	11.900%	10-20-97	\$ 37000

## CORPORATES

SALES		
COUPON	MATURITY DATE	AMOUNT (000'S)
NO SALES		

PURCHASES		
COUPON	MATURITY DATE	AMOUNT (000'S)
GMAC	8.875%	06-01-99 \$ 8500
SEARS	6.000	05-01-00 13000
CIT FIN	8.375	04-01-01 7790
BENEFIC	7.500	07-15-02 15000
PAC TEL	6.500	07-01-03 5000
HOUSEHLD	8.375	10-01-03 7320
BANKAMER	7.875	12-01-03 10000
CHEVRON	8.750	07-01-05 18140
JC PENNY	6.000	05-01-06 2930

## GNMA

SALES		
COUPON	POOL NUMBER	AMOUNT (000'S)
GNMA	8.000%	03818 \$ 916
GNMA	8.000	04086 630
GNMA	8.000	09678 708
GNMA	8.000	10182 676
GNMA	8.000	10278 494
GNMA	8.000	10697 55
GNMA	8.000	10805 257
GNMA	8.000	10810 682
GNMA	8.000	10904 1168
GNMA	8.000	10910 585
GNMA	8.000	10960 555
GNMA	8.000	10961 651
GNMA	8.000	10975 711
GNMA	8.000	11057 1176
GNMA	8.000	11304 564
GNMA	8.000	11312 424
GNMA	8.000	11639 710
GNMA	8.000	11780 544
GNMA	8.000	12312 1132
GNMA	8.000	12527 328
GNMA	8.000	13003 303
GNMA	8.000	13338 610
GNMA	8.000	13439 590
GNMA	8.000	13548 701
GNMA	8.000	13653 794
GNMA	8.000	13844 459
GNMA	8.000	14575 728
GNMA	8.000	16214 748
GNMA	8.000	16805 667
GNMA	8.000	17398 755
GNMA	8.000	17424 830
GNMA	8.000	17467 728
GNMA	8.000	17784 629
GNMA	8.000	17891 603

PURCHASES		
COUPON	POOL NUMBER	AMOUNT (000'S)
NO PURCHASES		



	COUPON	POOL NUMBER	AMOUNT (000's)
GNMA	8.000%	18077	\$ 658
GNMA	8.000	18516	209
GNMA	8.000	19672	1666
GNMA	8.000	20041	764
GNMA	8.000	20413	754
GNMA	8.000	20746	786
GNMA	8.000	20952	751
GNMA	8.000	21467	766
GNMA	8.000	21480	739
GNMA	8.000	21652	798
GNMA	8.000	21878	1788
GNMA	8.000	21982	816
GNMA	8.000	22676	777
GNMA	8.000	23016	855
GNMA	8.000	23098	670
GNMA	8.000	23139	4236
GNMA	8.000	24837	815
GNMA	8.000	24978	813
GNMA	8.250	04714	422
GNMA	8.250	08803	1231
GNMA	8.250	08961	615
GNMA	8.250	09105	1093
GNMA	8.250	09760	1124
GNMA	8.500	04054	70
GNMA	8.500	04149	685
GNMA	8.500	04225	36
GNMA	8.500	08073	232
GNMA	8.500	08296	439
GNMA	8.500	08437	228
GNMA	8.500	09204	1113
GNMA	9.000	04137	1587
GNMA	9.000	04168	500
GNMA	9.000	04471	493
GNMA	9.000	04507	473
GNMA	9.000	26980	4333
GNMA	9.500	33172	4674
GNMA	9.500	34007	3700
GNMA	9.500	34126	2852
GNMA	9.500	36068	2866
GNMA	11.000	42691	4527
GNMA	11.500	44539	3578
GNMA	12.500	43600	5935
GNMA	13.500	38180	650
GNMA	13.500	45933	742
GNMA	13.500	46868	810
GNMA	13.500	47924	770
GNMA	13.500	50250	933
GNMA	16.000	49656	348
GNMA	16.000	49993	433
GNMA	16.000	50733	244
GNMA	16.000	51252	145
GNMA	16.000	51524	155
GNMA	16.000	51624	69
GNMA	16.000	52431	328
GNMA	16.000	52437	205

COUPON	POOL NUMBER	AMOUNT (000's)
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monitoring procedures are substantially different than those applied, for example, to the total return portfolios invested by the Board's active external bond managers.

As discussed, the objective of the dedicated portfolio is to generate a stream of income sufficient to match the benefit payments promised current retirees. In terms of meeting this objective there are two major sources of potential underperformance. One is that the actuarial benefit forecasts supplied by the retirement funds might be inaccurate. The SBI has not control over these estimates. However, staff will periodically compare actual benefits versus estimates to evaluate the effectiveness of the estimation procedure. Second, the dedicated portfolio might be improperly constructed and insufficient income produced. Given the certainty of income flows from high quality bonds, this type of error is highly unlikely. Moreover, income from reinvested cash flows represents less than 2% of total estimated liabilities. The reinvestment rate used in the dedicated portfolio's construction is a conservative 5%. Again, staff will periodically report on the actual amount of income and timing of income generated by the dedicated portfolio relative to expected amounts and timing.

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**BASIC RETIREMENT FUNDS  
PASSIVE BOND COMPONENT**

**Staff Position Paper  
Prepared by: Daralyn Peifer**

**November 1987**

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## **EXECUTIVE SUMMARY**

At its June, 1987, meeting, the Minnesota State Board of Investment approved a proposal by staff to modify the investment management structure of the Basic Retirement Funds. The proposal for the structure was included in Part III of a four-part series of staff position papers regarding the long-run management of the Basic Funds' assets.

Under the proposed investment management structure, the Board will utilize both passive and active management for the common stock and bond segments of the Basic Funds. The policy allocation to passive/active management will be flexible rather than fixed.

The common stock segment of the Basic Funds already includes both passive and active components. However, at the present time the fixed income segment of the Basic Funds uses only active management. The adoption of the revised investment structure will require that a passive component be added to the fixed income segment of the Basic Funds.

This paper examines the issues involved in adding the passive bond component to the Basic Funds' fixed income program. In particular, the focus of the paper is on the implementation issues:

- Bond asset class target
- Bond indexation strategy
- Bond index fund construction

The selection of an appropriate bond asset class target is the most important of the implementation issues. The asset class target will be used as the performance benchmark for the entire Basic Funds' fixed income program. In addition, it will serve as the base index for the bond index fund.

Bonds are included in the Basic Funds' long-term policy asset mix to provide deflation hedge and diversification benefits rather than for total return maximization. The asset class target selected for the Basic Funds' bond segment should reflect these two investment objectives.

The Board may select either a standard, published broad market index or a custom-designed bond index as the Basic Funds' bond asset class target. Staff recommends that the Board adopt a custom bond index for the target. Staff believes that, properly designed, a custom bond index will be superior to conventional bond market indices in terms of reflecting the Basic Funds' bond objectives.

A custom bond target must specify four primary characteristics:

- Duration
- Duration Strategy
- Sector Composition
- Quality

Duration measures the average life of a bond. As the primary indication of a bond index's sensitivity to changes in interest rates, duration is the key risk characteristics of any bond target. Longer duration targets provide greater deflation benefits but also reduce diversification potential.

There are two possible duration strategies for a bond target. In a floating duration strategy, the duration of the custom bond target is allowed to fluctuate with interest rate changes. As interest rates change, the target's duration moves in the opposite direction. In contrast, in a constant duration strategy, the duration of the bond asset class target is maintained at a level consistent with long-term investment policy. To implement a constant duration strategy, the actual composition of the custom target is altered slightly over time as needed to maintain the specified duration.

The sector composition of the target and the overall quality rating are the subject of the remaining target recommendations. In aggregate, the duration, duration strategy, and



sector/quality recommendations produce a custom bond target that provides greater deflation hedge capacity than conventional broad bond market indices and approximately the same diversification benefits. The resulting custom target deviates from broad market characteristics in relatively small but significant ways. Specific recommendations for each of the characteristics are contained in Table 1.

The second implementation issue is the selection of a bond indexation strategy. The index strategies can be grouped into three major categories:

- Passive
- Enhanced - Semi-passive
- Enhanced - Semi-active

Passive and semi-passive strategies are conservative approaches. A semi-active strategy, conversely, is much closer on the investment management continuum to pure active management. Staff recommends that the Board adopt a semi-passive strategy for the Basic Funds' bond index fund. The semi-passive approach, although slightly less conservative than the passive approach, is still a relatively low-cost, low-risk strategy. Within fairly tight risk constraints, the semi-passive index manager attempts to exceed the performance of the asset class target by exploiting mispricing opportunities as they appear in the market over time.

The final implementation issue addressed in this paper is the bond index fund construction technique. Since it is not feasible for a bond index fund manager to purchase each of the 4,000 to 5,000 bonds in the broad bond market indices, the manager must use a sampling technique to select a limited number of bonds for the index fund. Most bond index managers use some form of a stratified sampling strategy. Staff recommends this approach.

The table on the following page summarizes staff's recommendations on all of these implementation issues. This paper is organized as follows:

- Section 1-Investment Policy Review
- Section 2-Implementation Issues
- Section 3-Bond Asset Class Target
- Section 4-Basic Funds' Custom Bond Target
- Section 5-Indexation Strategy
- Section 6-Index Construction
- Appendix -Duration
  - Embedded Options

**TABLE 1**  
**BASIC RETIREMENT FUNDS**  
**Implementation of Passive Bond Component**

ISSUE	RECOMMENDED
<b>I. ASSET CLASS TARGET</b>	<b>Custom Asset Target</b>
A. Duration	At long end of historical Market range (5.0+0.25 yr.)
B. Duration Strategy	Constant option-adjusted duration
C. Sector Composition:	<div style="border: 1px solid black; padding: 5px;"> <p>Market weighting (20%) (with additional call protection)</p> <p>Less than market weighting (20%) (with additional prepayment protection)</p> <p>Greater than market weighting (60%)</p> </div>
■ Corporates	
■ Mortgages	
■ Treasury/Agency	
D. Quality	Match or exceed market (AAA in aggregate)
<b>II. INDEXATION STRATEGY</b>	<b>Enhanced (Semi-passive)</b>
<b>III. INDEX CONSTRUCTION</b>	<b>Stratified Sampling/Linear Program</b>

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## SECTION 1: INVESTMENT POLICY REVIEW

Before the issues involved in the implementation of the passive bond component are presented, it is helpful to review the investment policy established for the Basic Funds as it relates to the long-run management of the Basic Funds' bond segment, particularly with respect to the passive bond component.

The two key concepts presented in the policy position papers from this perspective are:

- the specified role of bonds in the Basic Funds' long-run policy asset mix;
- the definition of a bond asset class target.

The long-term policy asset mix for the Basic Funds was detailed in Part II of the recent investment policy position papers. The policy asset mix represents the allocation to broad asset classes that best achieves the investment objectives established for the Basic Funds and is consistent with the Board's attitudes toward risk and return.

Each asset class represented in the policy asset mix plays a clearly defined role in the Basic Funds' total portfolio. The most important point in the policy papers from the perspective of the passive bond component is that the investment objectives established for the Basic Funds' bonds are different from those set for common stocks. The objective of the common stock component is to maximize returns. Bonds, on the other hand, are included in the Basic Funds' total portfolio for distinctly different purposes. Specifically, bonds act as a hedge against a severe economic depression. In the event of a significant decline in interest rates, high-quality, long-term bonds can be expected to appreciate in value. This appreciation would cushion the market value decline likely to be experienced by the remaining Basic Funds' assets. Bonds are also expected to provide portfolio diversification. Because bonds do not move in perfect synchronization with common

stocks, the addition of bonds to a stock portfolio has the effect of reducing the year-to-year variability of portfolio returns.

The concept of an asset class target was also introduced in the Part II position paper. The purpose of establishing an appropriate asset class target for each asset class in the Basic Funds' policy asset mix is to ensure that the defined investment role established by the Board for each asset class will be met.

An asset class target is a diversified collection of securities within a particular asset class. It represents the set of investment opportunities that best achieve the purposes for which the asset class is included in the policy asset mix. Over time, the risk-return characteristics of a specified asset class target should be matched by that of the Basic Funds' aggregate investments in the asset class.

In the absence of unique or special circumstances, the most suitable selections for asset class targets are broad market indices. A broad market index represents the full range of investment opportunities available within a particular asset class. However, if an asset class is included in the policy asset mix for reasons other than total return maximization, it may not be appropriate simply to use a market index as the target. A plan sponsor may need to deviate from the market index in some way to reflect the defined role of the asset class in the policy mix.

For the Basic Funds' bond component, the target should reflect the deflation hedge and diversification objectives set for the asset class. It is at this point, with the special role of the Basic Funds' bonds in mind, that the consideration of the implementation of the passive component of the bond segment should begin.

## **SECTION 2: IMPLEMENTATION ISSUES**

The implementation of the passive component of the Basic Funds' bond segment represents a direct application of the long-term investment policies established by the Board. In the context of the policy statements presented in the series of position papers, staff has identified five primary issues involved in the passive component implementation. The issues are indicated by the following hierarchy of questions:

- What is the appropriate asset class target for the Basic Funds' bond segment?
- What indexation strategy should be adopted by the Board for the Basic Funds' bond index fund?
- What index fund construction technique should be used for creating the bond index fund?
- Which investment manager should be selected by the Board to construct and manage the bond index fund?
- How should funds be reallocated within the Basic Funds' bond segment from the current six active managers to the bond index fund manager?

The first three of the implementation issues and staff's recommendations regarding them are presented in Sections 3 through 6 of this paper. Recommendations concerning the remaining two issues will be presented to the Board at its March, 1988, meeting.

### SECTION 3: BOND ASSET CLASS TARGET

The specification of the appropriate asset class target for the Basic Funds' bond segment is the most important of the five implementation considerations. The asset class target selected for the bond segment will serve two on-going functions in the Basic Funds' investment program. First, it will be used as a performance benchmark for the bond asset class as a whole. The effectiveness of the entire Basic Funds' bond program will be measure by comparing the performance of the program with that of the asset class target. (The use of asset class targets in the Board's performance evaluation system is addressed in Part IV of the staff investment policy paper.) Second, the bond asset class target will serve as a base for the passive component of the Basic Funds' bond program. The Basic Funds' bond index fund will be designed to track the performance of the bond asset class target.

Broad market indices are the appropriate selections for asset class targets, unless a target-restricting case applies. For the Basic Funds' bond asset class target, the important target-restricting consideration is the role bonds are expected to play in the Basic Funds' total portfolio. Because bonds are included in the Basic Funds' portfolio for deflation hedge and diversification purposes rather than for total return maximization, the selected target should deviate from broad bond market indices to the extent necessary to reflect these objectives.

Recently, plan sponsors have shown increasing interest in creating performance benchmarks and index funds that deviate from conventional broad bond market indices in order to reflect special investment considerations. In response to this interest, Salomon Brothers, Shearson Lehman and other prominent bond index publishers have begun working with investment managers and plan sponsors to construct custom bond indices tailored to their individual needs. The availability of this customization service gives the



Board the opportunity to create a bond asset class target that is superior to conventional broad bond indices in terms of meeting the two Basic Funds' bond objectives.

## **GENERAL CUSTOMIZATION PROCESS**

The general process utilized by a plan sponsor in constructing a custom bond asset class target is as follows:

1. The plan sponsor defines the investment objectives to be reflected by the custom asset class target.
2. The sponsor selects a broad bond market index to serve as a base universe of bonds from which the custom asset class target will be built. For example, the sponsor might select as a base index the Salomon Broad Investment-Grade Index (Salomon BIG). The Salomon BIG is a universe of nearly 4000 bond issues, weighted in proportion to their market value relative to the value of the entire index.
3. The plan sponsor then translates the investment objectives into specifications for the desired *financial characteristics* (i.e., coupon, sector, maturity) of the asset class target. That is, the sponsor specifies how the custom target should deviate in composition and characteristics from the underlying broad market index to reflect the defined investment objectives.
4. The sponsor communicates the specification of desired financial characteristics of the asset class target either directly to the publisher of the underlying broad index (i.e., Salomon Brothers, Shearson Lehman, etc.) or indirectly through an investment manager.
5. The index publisher divides the broad index by financial characteristics into a large number of cells. Each cell represents all of the bonds in the index with a particular combination of characteristics. The publisher then screens through the total broad bond universe. The publisher builds the custom target by combining various market cells until a target with the desired characteristics is created. The custom target may contain anywhere from several hundred to several thousand individual bond issues, depending upon the sponsor's specifications.
6. The index publisher monitors the asset class target, making alterations as needed to reflect changes in the broad bond market or changes in sponsor objectives. The publisher provides the sponsor with a listing of all of the bond issues in the target and calculates its performance on a monthly basis. The custom asset class target is then ready to be used as a performance benchmark for a fixed income program or as a base for a custom index fund.

## **CUSTOM TARGET VS. CONVENTIONAL TARGET COSTS**

All bond index funds, whether conventional or custom, must be rebalanced on an ongoing basis to reflect changes in the overall bond market. Custom bond index funds can be designed specifically to keep monthly rebalancing costs in line with those of conventional index funds. The "cash throw off" of a bond index fund facilitates the rebalancing effort. A bond index manager receives coupon and principal payments each month that must be reinvested. The parameters of bond index funds can be set such that monthly rebalancing is accomplished efficiently with the cash inflows from portfolio income and maturities rather than through security sales.

Moreover, it should be noted that the costs associated with passive bond management in general are much lower than those associated with active bond management. The Board will experience a significant reduction in overall bond management costs in either case as the funds are shifted from active to passive bond management within the Basic Funds' bond segment.

## **SECTION 4: BASIC FUNDS' CUSTOM BOND TARGET**

To create an organized framework for designing a custom bond asset class target, staff evaluated a broad bond market index along several dimensions or characteristics and considered how the broad index should be altered along those dimensions to meet the established objectives for Basic Funds' bonds. The Salomon Broad Investment-Grade Bond Index, (Salomon BIG) was used as the base index in the analysis. Staff believes that the Salomon BIG is the best representation of the overall bond market. However, the Shearson Lehman Aggregate Index or the Merrill Lynch Master Index could have been substituted as the base index with similar results.

The recommendations for a custom asset class target for Basic Funds' bonds necessarily involve trade-offs between the two bond objectives. For example, the change required along one dimension of the initial broad market index to meet the deflation hedge objective may be counter to that required for the diversification objective. In addition, the recommendations must be internally consistent. The recommendation for each dimension must be attainable given the recommendations along the remaining dimensions.

A listing of the bond market dimensions considered in the customization process and staff's recommendations for the Basic Funds' bond asset class target for each of the dimensions are presented in the table below. A discussion of the rationale for the recommendations follows.

## **BASIC FUNDS' BOND ASSET CLASS TARGET RECOMMENDATIONS**

**TABLE 2**  
**BASIC RETIREMENT FUNDS**  
**Recommended Bond Asset Class Target**

<b>Market Characteristic</b>	<b>Recommendation</b>
1. Duration	Long end of historical market range (5.0 yrs. + 0.25 yrs.)
2. Duration strategy	Constant option-adjusted duration
3. Sector Composition:	
Corporates	Market weighting (20%) (with additional call protection)
Mortgages	Less than market weighting (20%) (with additional prepayment protection)
Treasury/Agency	Greater than market weighting (60%)
4. Quality	Match or exceed market (AAA)

### **DURATION**

Duration is a measure of the average life of a bond. It is defined as the weighted average term-to-maturity of a bond's cashflows. The time period each cash flow is received is weighted by the present value of the cash flow. Duration is a more useful measure of the life of a bond than term-to-maturity because it considers not only the time until the bond's principal payment is received but also the timing and amounts of the coupon cashflows.

Duration is the primary measure of the sensitivity of the market value of a bond to changes in interest rates. All other things remaining the same, the longer a bond's duration

the more sensitive will be the market value of the bond to a given change in interest rates. Since the performance of a diversified portfolio of high-quality bonds is determined primarily by its responsiveness to interest rate changes, the overriding risk characteristic of a bond portfolio is the duration. As such, the specification of the duration of a bond asset class target is clearly the most important of the target decisions. This decision will "swamp" the remaining decisions in terms of its impact on the future performance of the target.

Ideally, to fulfill the deflation hedge requirement for bonds in the Basic Funds' portfolio, the Board should create a very long duration asset class target. For example, 30-year zero coupon Treasuries would provide substantial protection in the event of a severe decline in interest rates. These securities would experience greater price appreciation in the event of a severe decline in rates than shorter-duration securities. However, longer-duration bonds produce returns that are more volatile than intermediate- and shorter-duration bonds. Further, the returns of longer-duration bonds are more highly correlated with common stock returns. Thus, although longer-duration bonds are expected to behave differently than common stocks under severe deflationary conditions, the diversification potential provided by longer-duration bonds under normal market conditions is less than that of shorter-lived securities.

The recommendation for the duration of the custom asset class target represents a subjective balancing of the two objectives. The duration of the Salomon BIG ranged from approximately 3.5 years to 5.0 years over the last interest rate cycle. Staff recommends that the duration of the custom target be set at the long end of this historical range. A custom bond asset class target with a duration of approximately 5.0 years would provide some deflation protection for the Basic Funds without a significant loss of diversification benefits.

This duration recommendation is consistent with the long-term investment time horizon of the total Basic Funds. There is a growing awareness on the part of plan

sponsors that the duration of a plan's assets should relate in some purposeful way over the long-term to the duration of the plan's liabilities. Just as a plan's assets can be considered as a distribution of expected cash inflows, a plan's liability stream can be thought of as a distribution of expected cash outflows. The determination of the amounts and timing of the liability cashflows involves a number of actuarial assumptions and is impacted by a number of factors. At the present, there is considerable research being undertaken regarding the nature and behavior of plan liability streams relative to the behavior of asset cashflow streams.

In the future, as the Board gains a better understanding of the behavior of the Basic Funds' liability stream, it will be able to specify more closely a desired duration for the aggregate Basic Funds' bond portfolio. For the present, staff believes that the recommended duration for the bond asset class at the longer end of the historical market range appropriately relates to the duration of an active lives pension fund liability stream. Although a longer-than-market duration target ultimately may be desirable, staff is concerned about the additional return volatility a longer duration target would generate. Until the characteristics of pension plan liability streams are better understood, the recommended target duration of 5.0 years represents a reasonable trade-off between the deflation hedge and diversification objectives and is consistent with the financial characteristics of the Basic Funds. (For additional discussion of duration issues, see the Appendix.)

## **DURATION STRATEGY**

"Duration slippage" refers to the natural movement of the duration of a bond market index with changes in interest rates. As interest rates decline, the duration of a bond market index increases. Conversely, as interest rates rise, the duration of a broad market index decreases. Over the course of an interest rate cycle, the duration of a broad bond market index such as the Salomon BIG may vary by more than a full year. There are two

possible duration strategies a plan sponsor can take with regard to this "duration slippage":

- Floating duration strategy
- Constant duration strategy

To implement a floating duration strategy, a plan sponsor specifies the composition of the custom target and allows the duration of the index to "float" freely with interest rate changes, as described above. To implement a constant duration strategy, the duration of the asset class target is kept fixed at the point specified by the sponsor. The precise composition of the asset class target is allowed to change as needed to maintain the fixed duration. One way of implementing a constant duration strategy is for a plan sponsor to specify a fixed core percentage of corporate and mortgage securities. As the duration of the core corporate/mortgage position moves with both the passage of time and changes in interest rates, the composition of the Treasury sector is altered to maintain the target duration. The Treasury sector, the most liquid of the sectors, is used as the duration "swing" sector to minimize transactions costs.

### **Constant vs. Floating Duration**

The natural movement of a floating duration target is a problem for plan sponsors who wish to fix the duration of a custom asset class target and hence, the duration of the sponsor's bond index fund so that it is consistent with stated investment policy.

To the extent that a plan sponsor allows the duration of an asset class target to "float" from a policy duration target, the sponsor is making an implicit bet relative to his/her long-term policy portfolio. That is, the sponsor is allowing the risk composition of the asset class target to deviate from that which is consistent with the sponsor's long-term investment objectives. The deviation of a year or more in the duration of a floating custom target from a sponsor's objective represents a fairly significant "bet" away from established policy.

This implicit bet away from established investment policy is troublesome for several reasons. First, duration is the primary measure of the interest-rate sensitivity of a bond asset class target and, consequently, is the single most important risk characteristic of the target. Second, the floating movement of a target's duration is impacted by the actions of investors and issuers whose investment objectives may differ significantly from the sponsor's. In accepting a floating duration approach for a bond target, a plan sponsor allows the critical risk characteristic of the target to be established not by his/her own investment policy but by the actions of others.

The "duration slippage" problem for a bond asset class target and bond index fund can be minimized by utilizing a constant duration strategy. In contrast to the floating strategy, a constant duration strategy would allow the Board to effectively implement its long-term investment policy and maintain a consistent risk posture over time.

#### **Constant Duration Implementation Issues**

If a constant duration asset class target is used as the base for a bond index fund, the plan sponsor must specify a range within which the duration of the bond index fund can move before the index fund manager must rebalance back to the constant target. This range reflects the sponsor's trade-offs between implementing long-term investment policy and incurring additional transactions costs. If the duration range is set very wide, the sponsor's stated long-term policy will not be implemented effectively. On the other hand, if the range is set very narrow, the bond index fund manager may be forced to incur excessive rebalancing costs.

Staff believes a duration range of one-fourth year around a constant duration target of 5.0 years is sufficiently narrow to allow the Board's investment policy to be implemented effectively without causing excessive turnover within the Board's bond index fund. With this range the Board's future index fund manager should be able to use the normal cash inflows from portfolio income and maturities for necessary rebalancing,



keeping overall transactions in line with those of bond index funds which track "floating duration" market indices.

## **SECTOR COMPOSITION**

Like the choice of a target duration, the choice of the sector composition of the bond asset class target involves a balancing of the two bond component objectives. To fully reflect all the available opportunities in the bond market and realize maximum diversification benefits, a custom asset class target should include representation in the three major sectors of the bond market: Treasury/agencies, mortgages, and corporate bonds. However, because of the prepayment and call characteristics of mortgages and corporates, representation in these two sectors limits the deflation hedge capacity of the asset class target. As is explained in the Appendix, these characteristics may severely curtail the price appreciation experienced by mortgages and corporate securities when interest rates decline.

If deflation protection were the only concern, corporates and mortgages could be eliminated entirely from the Basic Funds' bond asset class target. However, this move would entail a substantial give-up in the diversification benefits and in the overall yield for the portfolio. Therefore, staff recommends that the asset class target retain some exposure to these two sectors but be structured to obtain additional call and prepayment protection. Staff recommends that the corporate sector in the custom target match the weighting of the Salomon BIG. Additional call protection, and hence deflation protection, can be built into the custom target by setting acceptable ranges for bond coupons or by specifying a desired mix of noncallable/callable securities. Generally, mortgages offer less of a yield advantage over Treasuries/agencies. Therefore, staff recommends that the mortgage sector be underweighted slightly in the target relative to the Salomon BIG, and prepayment protection be built in a manner similar to the call protection. These two

recommendations are made in conjunction with the constant duration recommendation. The constant duration approach allows the deflation capacity of the target to be maintained during interest rate declines despite the call and prepayment features of the corporate and mortgage sectors.

## **QUALITY**

The Salomon BIG includes bonds rated BBB or better and has an average quality rating of AAA. This high-quality rating is consistent with the needs of the Basic Funds' bond asset class target. Lower quality or "junk bonds" are not appropriate for inclusion in the bond asset class target. In the event of a severe economic depression, lower quality bonds would have a much greater probability of default than higher quality instruments. In addition, lower quality bonds act more like equity substitutes than fixed income instruments and consequently, provide less diversification benefits than do higher quality bonds. Staff's recommendation for the quality dimension of a custom asset class target is to maintain or exceed the average quality rating of the Salomon BIG.

## **RECOMMENDATIONS:**

Staff recommends that the Board adopt a custom asset class target for the Basic Funds' bond segment. Staff believes that a custom asset class target will be superior to conventional, published broad market indices in terms of meeting the Basic Funds' bond objectives. The intended result of the combined recommendations for duration, duration strategy, sector composition, and quality is to produce a custom asset class target with greater deflation hedge capacity than the Salomon BIG and approximately the same diversification benefits. The combined recommendations produce a target with a duration at the longer end of the market's normal range, (5.0 years) a quality level that meets or exceeds that of the market (AAA), and a sector composition that deviates slightly from the market to obtain greater call protection. The sector recommendations reflect a subjective

balancing of investment objectives and are intended as a general indication of the desired target characteristics. The constant duration approach is designed to allow the Board to maintain an appropriate and consistent risk posture over time, despite market movements to the contrary. In aggregate, the recommendations produce a custom target that deviates from the market in small but significant ways. The table below summarizes the recommended deviations from the current market characteristics.

**TABLE 3  
CUSTOM TARGET VS. MARKET CHARACTERISTICS**

	<b>Market*</b>	<b>Recommendations</b>
o Duration	4.5 Yrs.	5.0 Yrs.
o Duration Strategy	Floating Duration	Constant Duration
o Sector		
Treasury/Agency	56%	60%
Corporates	18	20
Mortgages	26	20
o Quality	AAA+	AAA+

\* Salomon BIG-September 30, 1987

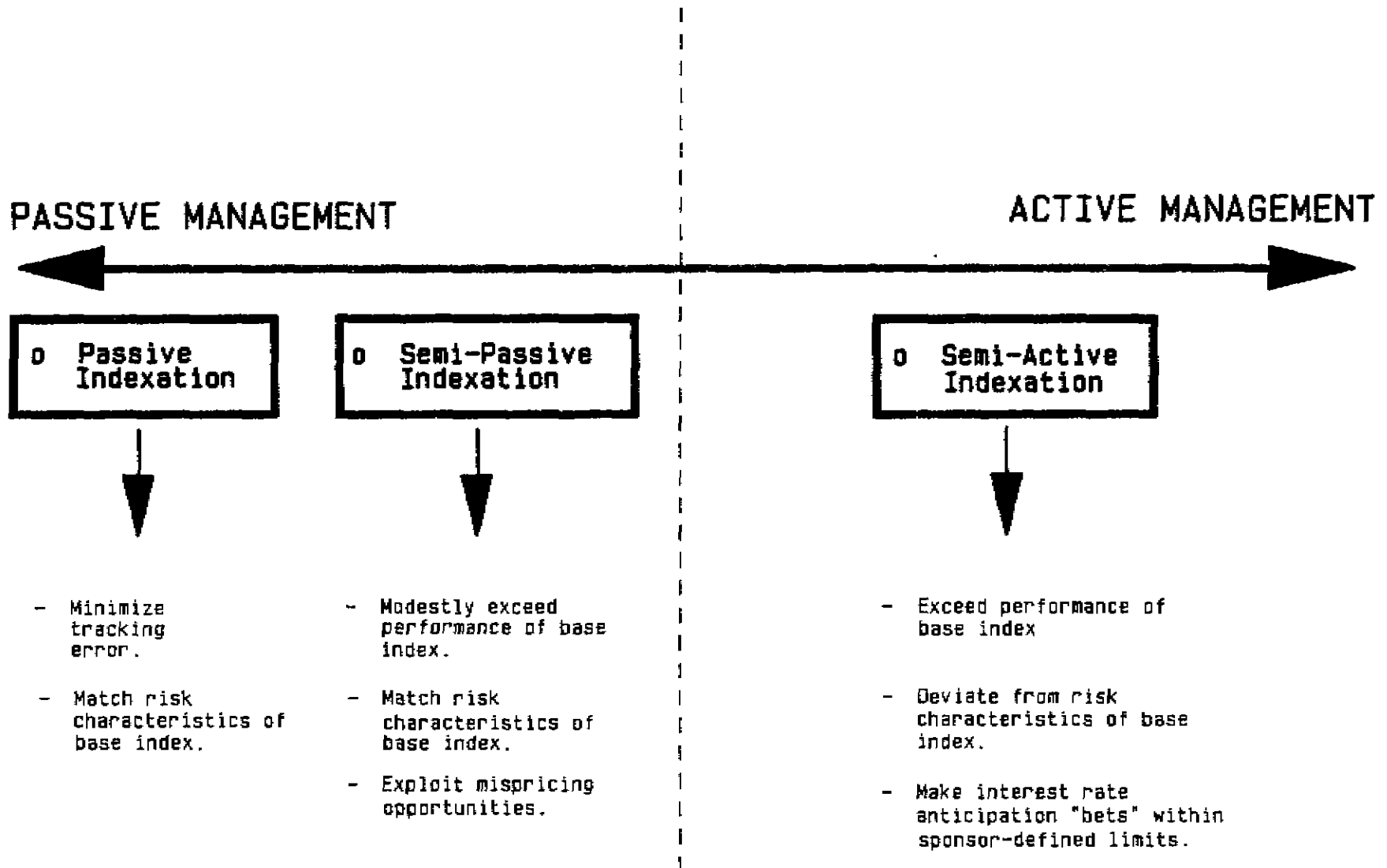
## SECTION 5: INDEXATION STRATEGY

Once the Basic Funds' bond asset class target has been determined, the second implementation issue to be considered is the selection of a bond indexation strategy. Although bond indexation generally is considered to be a form of passive management, there are a wide variety of approaches that bond index fund managers take to the construction and management of bond index funds. Bond indexation approaches can be classified along a continuum from passive to fairly active management. The figure on the following page illustrates this manner of evaluating various bond indexation approaches. Although the approach of an individual bond index manager can fall anywhere along the line from passive to active management, bond indexation approaches can be grouped into three broad categories:

- **Passive Bond Indexation**
- **Enhanced Bond Indexation (semi-passive)**
- **Enhanced Bond Indexation (semi-active)**

Each of the three indexation categories corresponds to a different approach to the selection of the actual bonds that will constitute an index fund. Because it is not feasible for an index fund manager to hold all of the bonds in a specified bond market index, the manager must use a sampling technique to select among the bonds in the universe. The overwhelming majority of all bond index fund managers use the same broad sampling technique, but differ in the investment objectives they set for the final selection phase of the sampling.

FIGURE 1  
BOND INDEXATION STRATEGIES



## **PASSIVE BOND INDEXATION - MINIMIZE TRACKING ERROR**

The most passive of bond indexation strategies is often termed "plain vanilla" indexation by bond index managers. The goal of a "plain vanilla" bond indexation approach is to replicate the performance of the underlying base universe of bonds with the highest degree of consistency. (For the Basic Funds' passive bond component, the underlying universe of bonds is the bond asset class target.) The "plain vanilla" indexer achieves this consistency by minimizing the variance of the monthly tracking error between the index fund and the base bond universe.

Tracking error is defined as the difference in performance between the index fund and the bond universe. Tracking error in a single time period may be either positive or negative. The factors causing tracking error are random. Consequently, over time the positive and negative errors tend to "wash out" and the expected value of the average monthly tracking error is zero.

The passive indexer minimizes the variance of the monthly tracking error by carefully matching the characteristics of the bonds in the index fund with those of the overall bond universe. There are a variety of strategies for matching bond characteristics. At the most detailed level, a passive indexer matches very tightly the entire cash flow structure of the bonds in the index fund to that of the bond universe.

## **ENHANCED BOND INDEXATION - SEMI-PASSIVE**

The goal of an enhanced bond indexer (semi-passive) is to add value to the indexation process through the superior selection of bonds for the index fund. Whereas the goal of a passive indexer is simply to match the performance of the base market index with a high level of consistency, the enhanced bond indexer attempts to exceed the performance of the base index by a modest amount through the use of relatively low-risk valuation strategies.

The underlying index that an index fund will track is categorized by risk characteristics (i.e., coupon, sector, maturity, etc.) into a large number of cells. A cell is comprised of all of the bonds in the underlying base index with a particular combination of risk characteristics. Each cell can be considered as a separate distribution of expected cash flows.

Typically, the index manager need select only a few of the available bonds in each target cell for the index fund itself. A passive manager will select the bonds that most closely match the aggregate target cell cashflows. A semi-passive manager, on the other hand, will consider not only the cell cashflow characteristics but also the relative values of the bonds within the cell. The manager will select bonds that are selling "cheap" or are mispriced relative to the other bonds in the cell.

Generally, the semi-passive manager stays very closely within the cellular constraints of the base index. The manager matches the duration and maturity of the index fund to that of the base index. In addition, the manager likely matches quality characteristics as well. If the manager "loosens" the index cellular constraints at all, it will be to make minor alterations in sector weightings of the index fund.

Depending upon the strategies employed by the individual index manager, the expected value to be added above the performance of the base universe from a semi-passive enhanced approach may range from 5 to 30 basis points (b.p.) per year. The variance of the monthly tracking error for a semi-passive index fund will be slightly greater

than that of a purely passive approach. Although the semi-passive manager's goal is for the index fund to exceed the performance of the base index, the possibility exists that the index fund will slightly underperform the target during some periods as well.

### **ENHANCED SEMI-ACTIVE**

The Semi-active index fund manager falls much closer to the active end of the spectrum between passive and active management. A semi-active manager might more aptly be termed a "structured active" manager than a true "indexer". In contrast to the passive and semi-passive approaches, the semi-active index manager does not stay within the tight cellular matrix of the target index in constructing and managing an index fund. Typically, the manager not only employs valuation strategies but also makes interest-rate anticipation "bets". The manager achieves this by allowing the key risk characteristics of the index fund to vary from those of the base index. The manager might allow the duration, sector, and/or quality characteristics to vary substantially from those of the target index, depending upon the manager's outlook for interest rates. The primary difference between a semi-active and an active manager is that the semi-active manager operates within pre-established ranges around the characteristics of the market. Generally, limits are established by the plan sponsor beyond which the key risk characteristics of the index fund may not be allowed to move.

As a semi-active manager deviates from the risk composition of the target index, the opportunity to both outperform and underperform the target increases. The expected value to be added above the base index might range from 50 to 100 b.p. per year. The variance of the monthly tracking error would be expected to exceed that of the other two approaches, reflecting the higher-risk strategies employed by the manager.



## **RECOMMENDATION**

Of the three indexation approaches, only the passive and semi-passive approaches are appropriate for the Basic Funds' passive bond component. The semi-active approach is more suitable for the active component of the Basic Funds' bond component. The passive approach is a very conservative one. It is the easiest of the approaches to implement and has the lowest cost. It also offers consistency of performance, with the index fund designed to track closely the monthly performance of the designated asset class target.

The semi-passive approach, although slightly less conservative than the passive approach, is still a relatively low-cost, low-risk strategy. The semi-passive index manager carefully matches the primary risk characteristics of the index fund with those of the asset class target. Within these fairly tight risk constraints, the manager attempts to exploit mispricing opportunities as they appear in the market over time. Staff recommends that the Board adopt the semi-passive approach to bond indexation. Staff believes that the semi-passive approach has the potential to add modest value to the Basic Funds at very low risk and at a reasonable cost relative to the other strategies.

## **SECTION 6: INDEX CONSTRUCTION**

The third passive implementation consideration is the index fund construction technique. This subject concerns the manner in which the index manager actually builds and rebalances the index fund over time. The section does not require a decision on the part of the Board. Rather, it is intended simply to describe the general construction process followed by an index fund manager.

Broad bond market indices contain 4,000 to 5,000 individual bond issues. Full replication of the market, or purchase of each issue, is not a feasible approach for bond index fund managers. Therefore, a bond index manager must employ some type of sampling technique to select a limited number of bonds for an index fund.

### **STRATIFIED SAMPLING TECHNIQUE**

The overwhelming majority of bond index fund managers use some variation of a stratified sampling technique for the construction and ongoing rebalancing of bond index funds. The stratified sampling technique is comprised of two separate phases: a categorization (stratification) phase and a sampling phase. In the first phase, the base market index is characterized by its key risk attributes: sector, coupon, maturity, quality, and callability. The categorization can be thought of as a large multi-dimensional matrix, with each bond in the base market index fitting into only one cell. Each cell contains all of the bonds in the base index with a particular combination of the five risk attributes. Some cells in the matrix may be completely empty. Others will contain very few issues and will be dropped from the final base index matrix.

Once the categorization process is finished, the index fund manager begins the sampling phase. The goal of the sampling phase is to select one or two of the available bonds from each base index cell for the index fund. The completed index fund will be

comprised of the same number of cells as the base market index but will contain substantially fewer bond issues.

The sampling phase lends itself to a linear programming approach. A linear programming model consists of an objective function and a series of linear constraints. A linear programming model is designed to minimize or maximize a particular investment objective, subject to the constraints. Investment objectives specified by bond index fund managers include minimizing tracking error variance or maximizing yield. Typically, the primary model constraints control the matching of cashflows within each index fund cell to those of the respective base market cell. Secondary constraints can be added by the manager to control turnover and transactions costs. In addition, the basic linear programming model can incorporate various valuation models to achieve index enhancements, as described in the previous section.

The combined categorization/sampling technique is a relatively straightforward method of building an index fund from a large universe of bond issues. Most importantly, it is a flexible system to use. It allows plan sponsors and investment managers to construct bond index funds to reflect special investment needs.

## APPENDIX

### Duration

Two additional topics must be addressed regarding the duration of the Basic Funds' bond asset class target. First, the appropriate measure of duration to be used is an "option-adjusted" duration. The conventional or "nominal" duration measure considers only two possible redemption dates for a bond: the maturity date or the first call date. Typically, if the bond is selling at or below its call price, the "nominal" duration measure is calculated considering all of the bond's cashflows up to the maturity date. If the bond is selling above its call price, only the cashflows up to the bond's first call date are considered. Since the bond may be called at some point between these two dates, the nominal duration may under- or overstate the bond's "effective" duration and, consequently, be a poor measure of the bond's true interest rate sensitivity. An "option-adjusted" duration uses option pricing theory to adjust the nominal duration for the probability that the bond will be called sometime between the call and maturity dates.

The use of an "option-adjusted" duration measure is particularly important for a deflation hedge target. As interest rates decline, the nominal duration of a bond will increase. However, the "option-adjusted" duration of a callable bond generally will decrease to reflect the increasing probability that the bond will be called. In this circumstance, the nominal duration of a callable bond will exceed the "option-adjusted" duration and may seriously overstate the actual deflation hedge potential of the bond.

Second, although duration is the primary measure of an asset class target's interest-rate sensitivity, the full distribution of a target's cashflows must be considered. That is, the coupon and maturity structure of the asset class target must be considered. Bond asset class targets can have identical durations but very different coupon and maturity distributions. In this situation, the asset class targets may respond similarly to a parallel

change in the level of interest rates but very differently to changes in the shape of the yield curve.

To minimize exposure to changes in the shape of the yield curve, the distribution of the custom asset class target's expected cashflows should be matched as closely as possible to that of the underlying market index, with minor adjustments being made at the short or long end of the maturity spectrum as necessary to achieve the desired target duration.

### **Embedded Option Features - Corporates and Mortgages**

The call features of many corporate bonds and the prepayment provisions of mortgage securities are called embedded option features. For simplicity, this discussion on embedded options will focus primarily on callable corporate bonds. However, the prepayment provisions of mortgages can be expected to have a similar impact on the behavior of mortgage securities as call provisions have on corporate bonds.

To understand the impact of embedded options on the deflation hedge capacity of callable corporate bonds, it is helpful to consider a callable bond as two distinct components:

- the purchase of a non-callable bond with otherwise equivalent characteristics as the callable bond.
- the sale of a call option to the issuer of the bond.

The call option allows the issuer to redeem or "call away" the bond from the owner at a predetermined price and time. The call feature is called an embedded option because the call cannot be traded separately from the non-callable component.

The market value of a callable bond should equal the value of a non-callable bond with equivalent characteristics less the value of the call option to the issuer:

$$P_c = P_{nc} - P_o$$

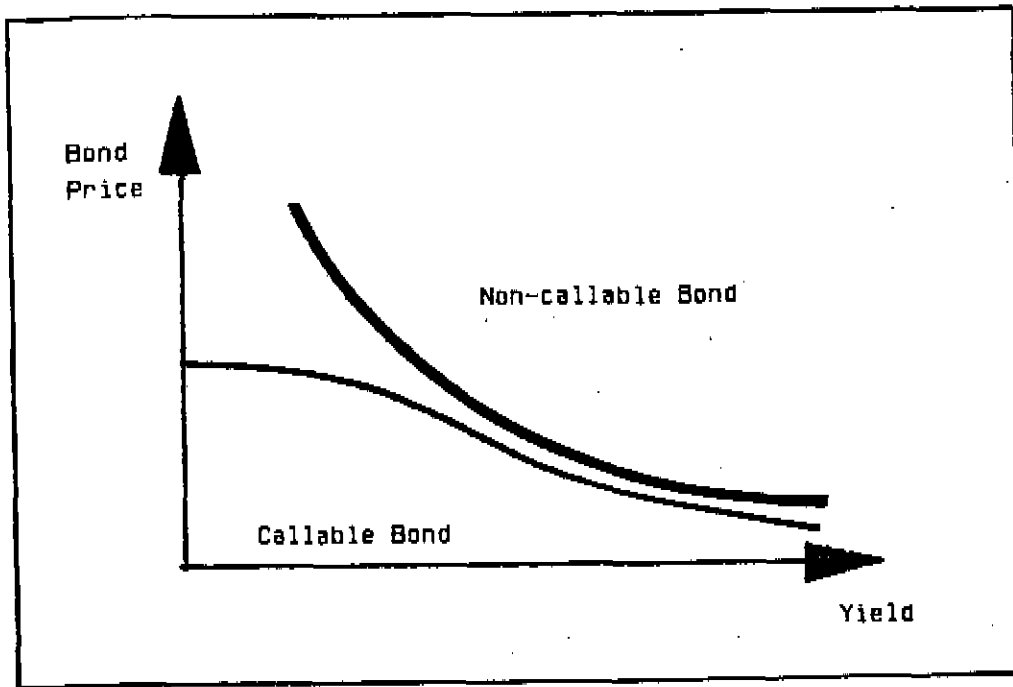
where:

$P_c$  = Price of callable bond  
 $P_{nc}$  = Price of non-callable bond  
 $P_o$  = Price of call option

The value of the call option to the issuer depends upon a number of factors, including the level of interest rates relative to the callable bond's coupon rate. If the level of interest rates drops below the bond's coupon, the value of the call option to the issuer increases. The increase in value reflects the issuer's potential savings if the higher coupon bond is redeemed and new bonds are issued at a lower rate. In this situation, the call option is said to be "in-the-money".

When interest rates decline, callable bonds with "in-the-money" call options experience less market value appreciation than would be expected from the characteristics of their non-callable component. The market value gain that would be experienced on the straight noncallable bond component for a given rate decrease is "absorbed" by the increase in the value of the option to the issuer. In fact, the price appreciation of a callable bond for a given rate change can be zero if the increase in the value of the call option to the issuer exactly offsets the price appreciation on the noncallable bond component. It is this response of callable bonds to interest rate declines that limit their effectiveness as deflation hedge vehicles. The figure below illustrates this price response.

**FIGURE 2**  
**EMBEDDED OPTIONS**  
**Impact on Interest Rate Sensitivity**



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# **CORPORATE PRIVATE PLACEMENT GUIDELINES**

**Staff Position Paper  
March 1990**

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## EXECUTIVE SUMMARY

The private placement market has grown substantially during the past decade. Private placement securities offer several advantages over regular corporate securities. Higher yields, attractive covenant features, call protection, and mandatory sinking fund provisions are some of the reasons institutional investors have used private placement securities on a wider scale.

This staff report covers the following topics; (1) private placement market background, (2) regulatory changes, (3) surveys on state and insurance company participation in private placements, (4) investment issues, and (5) SBI investment criteria.

Based on the preceding analysis, SBI staff conclusions are as follows:

**Anticipated regulatory changes will diminish the investment spread opportunity of private placements relative to other corporates. In the future, this will make private placements less advantageous for institutional investors such as the SBI.**

**Despite the above, private placement securities will continue to offer attractive investment features and remain appropriate for several of the SBI's internally managed portfolios.**

**SBI investment criteria should focus on investment grade private securities with appropriate size constraints.**

### PRIVATE PLACEMENT INDUSTRY BACKGROUND

Traditionally corporations have used private placements because they offered firms a more economical and rapid source of corporate funding. For many years, the private placement corporate bond market was dominated by a small number of dealers and the major insurance companies. The advent of the high yield market and the influx of new investors has dramatically changed this pattern in the industry. The growing popularity of

this segment of the market owes its strength to the unique characteristics as well as the regulatory environment for these instruments.

Bond investors like private placements because they can buy issues which have modestly higher yields and investment features not typically found in regular corporate bonds:

- Covenant features in privates often give enhanced protection to the bondholder in the event of corporate restructuring.
- Call protections can protect the bond holder against early redemption or compensate the holder through make-whole provisions.
- Investors can tailor cash flow characteristics through mandatory sinking fund provisions.

These features help explain the rapid development of the private placement market.

The chart below shows the growth in new issues during the past decade.

#### PRIVATE PLACEMENT ISSUE VOLUME

YEAR	ISSUES	AMOUNT (MILS)
1980	967	\$15,871
1981	1,051	18,373
1982	1,153	23,625
1983	1,522	34,620
1984	1,680	50,410
1985	2,043	67,138
1986	2,344	116,296
1987	2,947	139,683
1988	2,755	164,813

Source: IDD Information Services/Goldman Sachs

#### REGULATORY CHANGES

The growing activity of private placement transactions has expanded beyond the traditional straight debt financings that were the mainstays of this market. As the volume

of offerings has increased and the range of institutional buyers has expanded, the pressure for regulatory changes has heightened. The most important proposed change to the private placement market is an amendment to the Securities Act of 1933. Adoption of proposed Rule 144a would change Section 4(2) dealing with "transactions by an issuer not involved in a public auction." Previously, private securities were restricted from resale for a period of two years and subsequent transactions limited to qualified institutional investors.<sup>1</sup>

Proposed Rule 144a would liberalize regulations to allow any institutional investor with plan assets of \$50 million to purchase private placements in the secondary market. This change would greatly enhance liquidity in private placement securities and would bring additional investors into the private placement market. The ultimate effect of the rule change would be to diminish further the distinction between privates and traditional fixed income securities. The consequences of this blurring would be a reduction in spreads traditionally associated with privates.

#### **USE OF PRIVATE PLACEMENTS BY OTHER INVESTORS**

SBI staff surveyed several states and insurance companies to ascertain what programs these institutions had in the area of private placement securities. Among the state funds contacted were California Teachers (CalSTRS), California Public Employees (CalPERS), Michigan, New York, and Wisconsin. New York and CalPERS both are in the process of liquidating private placement portfolios to shift investment emphasis elsewhere. Both funds cited insufficient liquidity for funds of their size as a major concern. CalPERS, Michigan, and Wisconsin all have on-going private placement programs with portfolios of at least <sup>1</sup>A "qualified institutional buyer" is defined as (i) any "institutional buyer" that has total assets in excess of \$50,000,000; (ii) any investment adviser registered under the Investment Act of 1940 that has combined assets and assets

under management in excess of \$50,000,000; (iii) any investment company registered under the Investment Company Act of 1940 that is a part of a "family of investment companies" with aggregate total assets in excess of \$50,000,000; or (iv) any entity all of the equity owners of which are qualified institutional buyers.

\$1 billion dollars each. These programs had several similarities. Each focuses on:

- investment grade securities
- spread premiums of at least 25 basis points over corporates with 50 basis points as a working objective
- participating rather than lead roles

Each fund devotes considerable staff time to the area. California uses one portfolio manager and several credit analysts, Michigan has four investment professionals involved in private placements, and Wisconsin has a five person investment staff. These organizations use a combination of internal and external legal assistance in reviewing private placement documentation.

Wisconsin has the most active in-state investment program. CalPERS and Michigan have chosen to curtail activity in the past year due to fewer attractive new private offerings. They have focused new investments in other areas such as venture capital and leveraged buy-out funds.

SBI staff also surveyed five insurance companies: Allstate, Central Life, Metropolitan Life, Minnesota Mutual, and Principal Financial. All five organizations have active private placement programs. The size of the private portfolios range from \$200 million to \$16 billion. While most companies concentrate on investment grade securities one firm does use selected B rated bonds. These companies express a preference to be the lead investor, but are willing to participate in deals if the transaction is of sufficient size. Minimum spread expectations are 100 to 200 basis points off comparable maturity Treasury securities.



As a group, the insurance companies think that the impact of regulatory and market changes over the past few years has broadened the universe of private placement investors and enhanced liquidity in the market. Several firms express concern that the influx of new participants had narrowed spreads and made attractive deals more difficult to locate. A majority think that the quality and quantity of financial data has deteriorated, making it more difficult to analyze prospective financings.

### **INVESTMENT ISSUES**

The investment issues surrounding privates are their legality, market viability, and fund applicability.

Minnesota Statutes Section 11A.24 defines what constitutes a legal investment for the SBI. Subdivision 3 specifies corporate bond investment criteria for investment grade issues. These bonds must be payable in dollars and be rated among the top four quality categories by a nationally recognized rating agency. Subdivision 6(a) 5 permits the use of debt obligations not subject to Subdivision 3. Since private placement securities fall under one of the two subdivisions, the SBI can use the entire spectrum of private placement bonds.

Market viability requires suitable investment characteristics and sufficient market volume. To recap, the higher yield, attractive covenant features, flexible cash flow characteristics, broad universe of issues and increasing pool of institutional investors combine to give privates attractive investment characteristics. The large volume increase in new issue business and the prospect that proposed Rule 144A will pass suggest that liquidity in private placements will not be an issue. The combination of attractive investment characteristics and sufficient liquidity makes privates a viable investment vehicle for the SBI.

Fund applicability merits individual attention. The debt securities in the Post Retirement Fund are in a large cash match dedicated bond portfolio with minimal annual portfolio turnover. Under existing statutes, the Post Fund's principal investment objective is to deliver a high and stable stream of income. Private placement securities represent suitable investments for this fund due to the higher yield as well as the call protection features cited above. The large size of the Post Fund, however, dictates that investments in private placements should focus on only the larger issues to ensure the best liquidity possible in the event trading is required.

The Permanent School Fund is a medium sized account whose principal investment objectives are yield maximization and principal preservation. Since all income is distributed for school aid payments, developing higher yield is most desirable. Given the low turnover nature of this fund, private placement securities represent ideal instruments to enhance yields. Given the conservative nature of the fund regarding risk, however, investments should concentrate in the higher quality segments of the market.

The last internal account, the bond segment of the Income Share Account in the Supplemental Investment Fund, is a smaller portfolio where the goal is to maximize the total return. Capital appreciation potential assumes a more important role for this portfolio relative to the other funds. Nevertheless, private placements offer attractive opportunities because the smaller fund size permits positions that can be handled in the secondary markets without undue transaction cost impact. The major drawback to private placement securities in a total return account is the potential for inaccurate pricing to affect total return numbers during the holding period.

#### **SBI INVESTMENT CRITERIA**

It is important to have definitive investment criteria so that investments can be monitored for compliance with investment objectives and guidelines. These criteria are

also useful in notifying private placement dealers about the SBI's investment parameters. The SBI investment criteria cover the following topics: issue size, sector preferences, quality guidelines, participation preferences, minimum and maximum investment levels.

### ***ISSUE SIZE***

Setting a minimum issue size which permits use in all SBI accounts best uses available staff resources. The SBI minimum size for national issues is \$50 million. Issues of this size are distributed over a larger geographical area and have more buyers. If the SEC adopts Rule 144A, this issue size minimum will help ensure better liquidity in the secondary market. This size corresponds with the SBI's minimum standard for public corporate bond purchases. In the case of a Minnesota issue, the minimum size is \$10 million to allow greater flexibility.

### ***SECTOR PREFERENCES***

All sectors are considered but greater caution is taken in sectors with additional risk. For example, the increasing pace of technological change merits closer scrutiny of industrial issues which may be subject to technological obsolescence. Similarly, industries with above average event risk potential are avoided unless adequate safeguards in indentures are available.

### ***QUALITY GUIDELINES***

The SBI only invests in investment grade securities. The issuing corporation must have a credit rating among the top four categories by a nationally recognized rating organization. The higher quality ratings not only provide protection to principal, they favorably impact liquidity in the secondary market. Given the risk tolerance of the SBI portfolios, high yield or below investment grade privates are not appropriate.

In a situation where no credit rating exists or where the credit rating of the issuing corporation is among the lower investment grade levels, the SBI may seek credit enhancement. If an issue is credit enhanced, there are minimum quality requirements of the enhancer. If it is an insurance company, it must be rated within the top two rating quality categories by Best's Insurance Rating Service. If it is a bank's letter of credit, the bank must be rated in the highest quality category by a nationally recognized rating agency.

### ***PARTICIPATION PREFERENCES***

For national market offerings, our maximum participation rate in a private pool is 25%. The SBI's current public corporate maximum purchase size guideline is 20%. The higher level for privates reflects the smaller nature of these offerings. For Minnesota issues, our maximum participation rate is 50% of the offering.

### ***MINIMUM AND MAXIMUM POSITION SIZE***

Given the additional staff time associated with the review of private placement documents, the SBI has established purchase guidelines. The table below specifies the minimum and maximum purchase levels for internally managed SBI bond portfolios.

## PRIVATE PLACEMENT PURCHASE GUIDELINES

	POST	PERMANENT SCHOOL	INCOME
<b>ISSUE MIN.</b>			
% of Port.	.2%	.5%	.5%
\$(000's)	\$10,000	\$1,750	\$500
<b>ISSUE MAX.</b>			
% of Port.	.4%	1.0%	1.0%
\$(000's)	\$20,000	\$3,500	\$1,000
<b>CATEGORY MAXIMUM</b>			
% of Port.	5.0%	25.0%	10.0%
\$(000's)	\$225,000	\$87,500	\$10,000
<b>CURRENT POSITION</b>			
% of Port.	1.3%	2.6%	0%
\$(000's)			
PAR	\$78,365	\$8,968	\$0

### UTILIZATION OUTLOOK

The SBI staff believes that private placement securities offer distinct advantages over regular corporate fixed income securities. The SBI has used private placement securities in its portfolios since the 1970's. The current environment for privates sends conflicting signals, however. While the influx of new investors and the bigger universe of private placement issues has expanded market potential, expected returns have diminished from those available in the past. Strong demand from institutional buyers has narrowed spreads to low levels. SBI staff is concerned that narrow spreads in an uncertain economic environment diminish the appeal of these securities. While the SBI will monitor the new issue market to review investment opportunities, staff concludes that new private placement investments should provide wider spreads than currently available.

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# BOND MANAGER ALLOCATION AND REBALANCING GUIDELINES

## INTRODUCTION

In March 1992, the SBI adopted manager allocation and rebalancing guidelines for the domestic external equity program in the Basic Retirement Funds. The following paper gives staff's allocation and rebalancing recommendations for the bond program.

Staff recommends that the SBI use both general allocation guidelines and specific targets. The general guidelines outline the maximum and minimum allocation for active and enhanced index managers. The specific targets will be established using the guidelines described in the paper.

## GENERAL ALLOCATION GUIDELINES

It is the SBI's policy that a minimum 50 percent of the bond segment of the Basic Funds should be managed by enhanced index managers. This limitation affects the following recommended maximum and minimum allocations for the managers.

### Enhanced Index Managers

Staff recommends that an index manager manage a minimum of 15% and a maximum of 35% of the bond portfolio. If 50% of the portfolio is indexed, there will be a minimum two (2) index managers. There will be a maximum of six (6) index managers if the entire fund is indexed.

### Active Bond Managers

In general, staff recommends that an active manager manage a minimum of 5% and a maximum of 25% of the portfolio. If 50% of the portfolio is actively managed, there will be a minimum of two (2) and a maximum of five (5) active managers. Staff believes that it may be prudent to go outside these guidelines if a manager with an unusual style is hired. In this case, a manager's portfolio may represent only 1-2% percent of the total portfolio until staff and the Board are more comfortable with the new style.

## SPECIFIC MANAGER TARGETS

The target allocations for each manager will be determined using the following criteria:

- o The manager's excess returns/value added and volatility of the excess returns.
- o The manager's capacity to accept new contributions.

- o The manager's ability to maintain resources to implement the investment process. This includes staff turnover, account gains and losses, sufficient staff support, change in business emphasis, and manager account load.

The first criterion considers the returns of the manager relative to a benchmark and the relative volatility of the returns. A manager who has higher returns and is expected to continue having high returns should have a higher allocation. Additionally, if managers have equal excess returns, the manager with lower return volatility about the benchmark should have a higher allocation.

The remaining criteria are more qualitative in nature. The second point limits allocations to managers based on account size and total assets. The last point includes information that is not measured easily but is important for determining a manager's allocation.

The guidelines must be flexible. Staff recommended that the targets be reviewed when there are significant cash flows in or out of the portfolio and staff or the Stock and Bond Manager Committee think it is necessary to change a specific manager target allocation. For instance, if staff anticipates the fund will be rebalanced in the following quarter and recommends changing targets, staff will review the proposed allocations with the Stock and Bond Manager Committee. If staff believes the target percentages do not need to be changed, assets will be added or subtracted proportionately using the previously agreed upon allocation percentages.

## REBALANCING

Unlike the guidelines proposed for the stock segment, staff does not recommend a constant rebalancing strategy for the bond segment. Rebalancings may occur, but only after the recommended manager targets have been reviewed by the Stock and Bond Manager Committee. Since the current managers have similar styles and there is a high correlation in returns, rebalancing would add little or no return. An analysis of historical returns with the SBI's current managers illustrates this point.

For the analysis, staff rebalanced between the active managers and used approximately the same targets as the current allocations:

IAI	15 percent
Lehman	15 percent
Miller	25 percent
Western	<u>45 percent</u>
Total Active	100 percent

In the analysis, the allocations varied little from the targets. There were only two rebalancings necessary if the total portfolio was rebalanced whenever an individual portfolio was beyond two percent of the original allocation. Rebalancing added no value with these allocations in place for the last five years. If the portfolios were rebalanced when the managers deviated from the allocations by one percent, portfolio returns would have increased 0.00007 pt 0.7 basis point. This added value would have been reduced by the increased turnover costs due to the rebalancing activity.

The above shows rebalancing does not add value when using historical returns for the current bond managers. Staff also believes that rebalancing would not add significant value in the future since, unlike the SBI's equity manager group where investment styles are different, the SBI bond managers' investment styles are similar. It is more appropriate to rebalance if the correlation between returns is low. In the case of bond managers, it would probably be appropriate to use a constant rebalancing guideline if the managers had significantly different durations or if one was an international manager.

### **CONCLUSION**

Staff recommends that the Board adopt the above general allocation guidelines with flexible individual manager target allocations. Given the similarity between the manager styles and high correlation of returns, staff recommends that rebalancing only occur on an as needed basis with no set rebalancing guidelines.

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**The Rationale for Below Investment Grade Debt**

**Mansco Perry III**  
**Minnesota State Board of Investment**

**May 25, 1995**

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# The Rationale for Below Investment Grade Debt

## EXECUTIVE SUMMARY

In 1994, the Minnesota State Legislature granted the State Board of Investment (SBI) the authority to invest in below investment grade fixed income instruments. This paper reviews the below investment grade market and recommends a policy on the SBI's use of this new authority for retirement assets.

### **What is Below Investment Grade Debt?**

Below investment grade debt securities are generally considered to be corporate bonds rated below BBB by a major rating agency such as Standard & Poors or Moody's, or if unrated, are of similar quality. Historically, the SBI has invested only in debt labeled "investment grade", or debt that is rated among the top four rating categories by a nationally recognized rating agency (AAA, AA, A, BBB).

The size of the total below investment grade debt market has not been specifically defined. However, the aggregate of the estimated sectors is in excess of \$620 billion. The U. S. Corporate sector is estimated to be approximately \$300 billion. Emerging market debt is estimated at \$270 billion. The market for below investment grade mortgages is estimated at a minimum of \$25 billion. The market for non-rated debt with below investment grade characteristics is also estimated at a minimum of \$25 billion.

Below investment grade debt is commonly referred to as high yield debt and also "junk bonds." Historically, most below investment grade bonds were "fallen angels", which are bonds originally issued by firms with investment grade ratings but since downgraded. In the late 1970's, more firms began to issue below investment grade debt.

The below investment grade debt issues of the 1980's and 1990's have been for friendly mergers and acquisitions, hostile takeovers, leveraged buyouts (LBOs), management buyouts (MBOs), stock buybacks, and spin-offs of new, smaller companies. They have been issued by small and large companies, including some of the country's best known and most respected companies.

In recent years, it has been estimated that as much as 70 percent of the corporate bonds issued are rated below investment grade.

The definition of high yield bonds has expanded in recent times. Certain non-SEC registered and private placement securities are considered to be part of the market. High income coupon hybrids with price appreciation potential are in the mix. International bonds have also been added to the high yield universe. Governments, agencies, and corporations from Europe, Canada and Mexico issue non-investment grade U.S. dollar denominated high yield debt.

In recent years, 90% of the high yield market has been comprised of securities graded at single-B or better. Emerging market debt, including Brady bonds, and mortgages also comprise significant sectors of the below investment grade universe.

**Why Invest in Below Investment Grade Debt ?**

The primary reasons for considering an investment in below grade debt securities are not unlike the argument for investing in other asset classes. An investment in high yield debt provides diversification benefits and the opportunity to enhance total returns to one's aggregate portfolio. A potentially adverse factor for investing in high yield securities is the enhanced possibility of default by an issuer and subsequent loss of investment.

High yield bonds are a better diversifying asset, with respect to large cap stocks, than are other asset classes, such as international or small cap stocks. In fact, high yield bonds have no significant correlation with any other asset class.

Research on corporate bonds has shown that investors have been well compensated for accepting the additional credit risk associated with high yield bonds. Historically, the total return for high yield debt securities has been higher than for investment grade bonds. While there is inherently more risk with lower grades of debt securities, the corresponding volatility is not as significant as one might think. In particular, the volatility of BB securities is no higher than that of investment grade debt.

Investors in high yield debt receive a yield premium which compensates for the potential of default or loss which might be incurred by high yield debt. The annual average default rate over the past decade has been approximately 3.5 %. During the same time period, investment losses, due to defaults, in the high yield market have averaged approximately 2 % annually.

**How are the incremental returns provided by below investment debt captured?**

Fixed income managers can employ below investment grade debt to enhance the returns on an investment grade fixed income portfolio. The key ingredient to outstanding performance in the high yield markets is outstanding credit research capabilities.

**Staff Recommendation**

*Staff recommends that the SBI allow active and semi-passive fixed income managers the authority to invest in BB and B rated debt. Managers' use of these types of securities should be limited to a maximum of 10% of their SBI portfolio. Staff should have discretion in determining which managers are granted the new authority. The Lehman Aggregate (or its appropriate subset) will remain as the benchmark for these managers.*

## **INTRODUCTION**

In 1994, the Minnesota State Legislature granted the State Board of Investment (SBI) the authority to invest in below investment grade fixed income instruments. The purpose of this document is to provide background on the below investment grade market and outline the rationale for the SBI to invest in these securities.

While the paper discusses the broad spectrum of below investment grade debt, the primary focus will be on the use of BB, B and non-rated debt securities with similar risk characteristics.

Finally, Staff recommends that the SBI grant the authority to invest in below investment grade debt to several of the existing bond managers on a selective basis. The ability of these managers to invest in below investment grade debt should be constrained in an aggregate amount, with limitations as to exposure to any single issue, and subject to characteristics for the overall portfolio managed for the SBI by the respective manager.

### **WHAT IS BELOW INVESTMENT GRADE DEBT?**

"Below investment grade debt securities" are generally considered to be corporate bonds rated below BBB by a major rating agency such as Standard & Poors or Moody's, or if unrated, are of similar quality. Historically, the SBI has invested only in debt labeled "investment grade", or debt that is rated among the top four rating categories by a nationally recognized rating agency (AAA, AA, A, BBB). (See Appendix A for a more detailed explanation of bond ratings). The rating agencies analyze the financial condition of a corporation and then assign a rating assessing the overall financial health of the organization. To compensate investors for the greater risk of investing in lower-rated

securities, these bonds offer significantly higher yields than investment grade corporate bonds and Treasuries.

The definition of high yield bonds has expanded in recent times. Certain non-SEC registered and private placement securities are considered to be part of the market. High income coupon hybrids with price appreciation potential are in the mix. International bonds have also been added to the high yield universe. Governments, agencies, and corporations from Europe, Canada and Mexico issue non-investment grade U.S. dollar denominated high yield debt.

The size of the total below investment grade debt market has not been specifically defined. However, the aggregate of the estimated sectors is in excess of \$620 billion. The U. S. corporate sector is estimated to be approximately \$300 billion.<sup>1</sup> Dollar denominated emerging market debt is estimated at \$270 billion.<sup>2</sup> The market for below investment grade mortgages is estimated at \$25 billion minimum.<sup>3</sup> Non-rated debt with below investment grade characteristics is also estimated at a minimum of \$25 billion.<sup>4</sup>

### *U. S. Corporate Issues*

Below investment grade corporate debt is commonly referred to as high yield debt and also "junk bonds." Historically, most of these bonds were "fallen angels", which are debt securities originally issued by firms with investment grade ratings but since downgraded. In the late 1970's, more firms began to issue below investment grade debt to finance a wide variety of corporate needs broadly classified as restructurings. This

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<sup>1</sup> High Yield Handbook, CS First Boston, January 1995; 1994 High Yield Market Year-End Review, Salomon Brothers, February 17, 1995. Lehman Brothers High Yield Index, Lehman Brothers, October 1993.

<sup>2</sup> Emerging Markets Tradable Debt Universe, Salomon Brothers Inc., March 10, 1995

<sup>3</sup> Miller, Anderson & Sherrerd

<sup>4</sup> Miller, Anderson & Sherrerd

debt found new acceptance in the marketplace as many believed the default rates on these bonds did not justify the large yield spreads commonly exhibited. Firms unable to muster an investment grade rating viewed this market as a new source of financing. Previously, these firms were forced to borrow from banks, and junk issues were a lower-cost financing alternative. Prior to 1977, the market was predominated by issues representing fallen angels. In 1994, fallen angels comprised about 25% of the market.<sup>5</sup> The below investment grade corporate market rose from less than \$30 billion in the late 1970's to an estimated \$250 to \$300 billion market in 1994.

The below investment grade debt issues of the 1980's and 1990's have been for friendly mergers and acquisitions, hostile takeovers, leveraged buyouts (LBOs), management buyouts (MBOs), stock buybacks, and spin-offs of new, smaller companies. They have been issued by small and large companies, including some of the country's best known and most respected companies. (Appendix B includes a list of some U.S. companies that have recently issued high yield bonds as part of their debt structure).

In recent years, it has been estimated that as much as 70 percent of the corporate bonds issued are rated below investment grade. Frequently cited reasons for this expansion are the flexibility and permanence of high yield bonds when compared to short term bank debt. Banks typically demand stricter covenants from corporations and require them to periodically pay down their loans. High yield bond covenants are generally less restrictive than bank loan covenants and often do not require high levels of amortization of principal. High yield bonds are used by some firms as a strategic part of their balance

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<sup>5</sup> A Primer on High Yield Bonds for Institutional Investors, pages 1-2, Keystone Investment Management Corporation, 1994.



sheet as the increased leverage improves return on equity and minimizes the risk of hostile takeovers.

There is a broad spectrum of opportunities within the below investment grade range. Unfortunately, the terms "below investment grade" or "high yield" conjure up images of the speculative grade securities promoted by Drexel Burnham Lambert during the leveraged buyout craze of the mid-1980's. Rather, BB, B, and non-rated debt securities with similar risk characteristics predominate the high yield market and provide the most appropriate method of providing yield enhancements without a corresponding increase in portfolio risk.

While estimates of the below investment grade corporate market approach \$300 billion dollars, it is necessary to look at corporate based indices to get a feel for the segmentation of the market by investment grade ratings and other criteria.

In recent years, 90% of the high yield market has been comprised of securities graded at single-B or better:

#### **High Yield Market Composition by Rating Category**

<b><u>Grade Rating</u></b>	<b><u>Dec. 31, 1993</u></b>	<b><u>December 31, 1994</u></b>
Split BBB / BB	18 %	16 %
BB	30 %	31 %
B	40 %	45 %
CCC	4 %	4 %
CC or lower	0 %	0 %
Not Rated	7 %	4 %

*Source: Salomon Brothers*

The above information indicates that most of the below investment grade universe is at the high quality end of the high yield market with ratings of BB or B. One could postulate that focusing on this end of the below investment grade spectrum mitigates the degree of speculation one would associate with high yield debt. Additionally, as seen below, the high yield market is comprised of primarily intermediate term securities. The presence of intermediate term securities may lessen the price sensitivity associated with these securities.

#### **U. S. Corporate High Yield Market Composition by Maturity**

<u>Maturity</u>	<u>December 31, 1993</u>	<u>December 31, 1994</u>
< 5 years	14 %	10 %
5 - 10 years	66 %	72 %
> 10 years	20 %	18 %

*Source : Salomon Brothers*

#### ***Emerging Market Issues***

In defining the below investment grade market place, it is important to include emerging market debt. Emerging market debt is largely represented by sovereign debt of Latin American countries. These securities are dollar denominated, i.e. pay principal and interest in U.S. dollars. An important portion of these securities were created under the Brady plan and in some cases the principal and a portion of the interest of these securities is defeased by U.S. Treasury securities. The emerging debt market is estimated be \$270 billion and is an important adjunct to the medium and lower quality corporate credit market place. <sup>6</sup> Following is a breakdown of the traditional sources and forms of emerging market debt.

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<sup>6</sup>Many consider the Emerging Market debt to be Brady bonds and the sovereign and corporate debt of underdeveloped nations which are securitized and denominated in U.S. dollars. However, there are other

## Emerging Market Debt

(\$US Millions (FACE VALUE) as of March 10, 1995)

	<u>Brady Bonds</u>	<u>Sovereign Debt</u>	<u>Corporate Bonds</u>	TOTAL
Latin America	\$126,080	\$32,617	\$34,848	193,545
Eastern Europe	12,819	29,297	1,504	43,620
Asia	4,209	16,439	6,329	26,977
Africa / Mid East	2,756	4,151	669	7,576
TOTAL	\$145,864	\$82,504	\$43,349	\$271,718

Source: Salomon Brothers

### *Mortgages and Other Issues*

In recent years, pools of mortgages or other asset backed securities have been divided into "senior/subordinated" structures which enabled these pools of assets to receive high credit ratings. Defaults that are incurred on a pool of mortgages or other assets are directed first to a class of securities designated as subordinated with regard to credit risk. In the past, these subordinated bonds were retained by the originators of mortgage and asset backed securities. However, in recent years, these subordinated securities have been sold into the market place along with the senior tranches. This trend began as a result of change in the risk-based capital requirements imposed upon financial institutions who originate many of these securities.

The growth of the subordinated market for single family mortgage, commercial mortgage, and other asset-backed securities has created investment opportunities which can be compared to unsecured corporate debt and emerging market debt in the below investment grade categories. Indeed, at times, mortgages have appeared to have wider

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forms of tradable indebtedness which exist within the Emerging Markets Tradable Debt Universe. These include tradable loans and other forms of indebtedness which are mostly in the local currencies.

spreads than comparably rated corporates. It is estimated that the market for below investment grade mortgage securities is approximately \$25 billion. However, significant growth is expected to occur in the coming years.

Occasionally, a manager or analyst may uncover attractive securities that are non-rated, have defaulted or are rated below B. Because the recognized rating process often lags the improvement in credits, quality opportunities for investment in securities with competitive expected returns and credit quality comparable to more highly rated securities periodically appear. It is estimated that there may be in excess of \$25 billion of these type of securities outstanding.<sup>7</sup>

### **WHY INVEST IN BELOW INVESTMENT GRADE DEBT ?**

The primary reasons for considering an investment in below grade debt securities are not unlike the argument for investing in other asset classes. An investment in high yield provides diversification benefits and the opportunity to enhance total returns to one's aggregate portfolio. A potentially adverse factor for investing in high yield securities is the enhanced possibility of default by an issuer and subsequent loss of investment.

#### ***Correlations with Other Assets***

Following is a correlation matrix which compares how high yield bonds have fared against other asset classes:

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<sup>7</sup> There is no definitive index or source for below investment grade mortgages or non-rated debt to accurately gauge the size of the market. In discussions with SBI fixed income managers, in particular Miller, Anderson & Sherrerd, it appears as though \$25 billion is a reasonable estimate and conservative estimate for each sector.

## Correlations of High Yield Bonds with Other Asset Classes

1978 - 1993

	High yield <u>Bonds</u>	Treasury <u>Bills</u>	Investment Grade <u>Bonds</u>	Foreign <u>Bonds</u>	Large Cap <u>Stocks</u>	Small Cap <u>Stocks</u>	Foreign <u>Stocks</u>
<b>High Yield Bonds</b>	1.00						
<b>Treasury Bills</b>	-0.28	1.00					
<b>Investment Grade Bonds</b>	0.65	0.03	1.00				
<b>Foreign Bonds</b>	0.20	-0.43	0.16	1.00			
<b>Large Cap Stocks</b>	0.35	0.02	0.38	0.13	1.00		
<b>Small Cap Stocks</b>	0.47	0.02	0.10	-0.13	0.75	1.00	
<b>Foreign Stocks</b>	0.21	-0.29	0.08	0.61	0.42	0.20	1.00

*Source : Ibbotson Associates*

The above table indicates that high yield bonds have a 0.65 correlation with investment grade bonds and 0.35 correlation to large cap stocks. This relatively low correlation suggests high yield bonds are a better diversifying asset, with respect to large cap stocks, than are other asset classes, such as international or small cap stocks. The lower the correlation of returns, the greater the reduction in risk achieved by adding the asset to the portfolio. In fact, high yield bonds have no significant correlation with any of the other asset classes. Correlations with high yield bonds range from a low of -0.28 (with Treasury Bills) to a high of only 0.65 (with Investment Grade Bonds).

### ***Risk versus Return***

Research on corporate bonds has shown that investors have been well compensated for accepting the additional credit risk associated with high yield bonds.

Historically, the total return for high yield debt securities has been higher than for investment grade bonds. While there is inherently more risk with lower grades of debt securities, the corresponding volatility is not as significant as one might think. In particular, the volatility of BB securities is no higher than that of investment grade debt. An analysis of returns and standard deviations from corporate bonds of differing rating categories reveals the following:

**Corporate Bonds  
Total Returns and Standard Deviations  
1987 - 1994**

<u>Index</u>	<u>Annualized Total Return</u>	<u>Standard Deviation</u>
Aggregate	7.89%	4.60%
AAA Corporate	7.89%	4.84%
AA Corporate	8.16%	5.34%
A Corporate	8.30%	5.17%
BBB Corporate	8.89%	5.01%
BB Corporate	9.70%	5.13%
B Corporate	9.86%	7.92%
CCC or lower Corporate	N.A.	N.A.

*Sources: Lehman Brothers and Miller, Anderson & Sherrerd*

While below investment grade securities have had strong returns, volatility of those returns has been generally consistent with investment grade bonds. In addition, below investment grade rated securities often provide additional protection through a series of covenants that limit future activities of the issuing corporation, such as borrowing, dividends, asset sales, and change of control. These covenants are largely absent in securities of more highly rated issuers.

An analysis of investment grade bond returns for the 20-, 10-, and 5- year periods ending December 1994 shows that investors were rewarded for taking increasing levels of credit risk. On average, the ratings assigned by major nationally recognized rating organizations have successfully differentiated the credit risk associated with corporate issuers. The results in the following table demonstrate that higher returns have been achieved on lower rated issues:

**Annualized Total Returns  
U.S. Treasuries, Corporates, and the S&P 500  
Periods Ending December 1994**

	<u>20 Years</u>	<u>10 Years</u>	<u>5 Years</u>
7 - Year Treasuries	9.05%	9.98%	7.20%
Investment Grade Corporates	10.30%	10.66%	8.27%
AAA	9.60%	10.40%	8.12%
AA	9.90%	10.50%	8.15%
A	10.47%	10.67%	8.46%
BBB	11.86%	11.33%	8.66%
BB		14.78%	11.98%
B		12.58%	12.68%

*Sources: Lehman Brothers and Miller Anderson & Sherrerd*

The primary concerns to the investors in below investment grade debt, are the possibility of default and investment losses. To evaluate whether investors are compensated for the potential losses which might be incurred, one should compare the breakeven yield spread versus the actual yield spread versus Treasuries. The "breakeven yield spread" measures the incremental return in basis points a corporate bond would have to receive, versus comparable Treasuries, to offset any default losses incurred. The excess

to receive, versus comparable Treasuries, to offset any default losses incurred. The excess premium (i.e., actual yield spread - breakeven yield spread) is the additional return an investor would receive for accepting incremental credit risk. Following is a comparison of actual yield spreads for the 10 years 1984-1993 and the breakeven spread needed to compensate for defaults during that time period.

**Actual versus Breakeven Yield Spread over Treasury Issues : 10 Years 1984-1993**  
(in basis points)

	<u>Actual Spread</u>	<u>Breakeven Spread</u>	<u>Excess Premium</u>
AAA	41	9	32
AA	57	12	45
A	78	24	54
BBB	115	38	77
BB	322	195	127
B	549	378	171

*Source : Lehman Brothers, Salomon Brothers, Moody's Investor Service, and Miller, Anderson & Sherrerd*

As can be seen from the above table, investors of below investment grade debt have been rewarded handsomely for accepting incremental risk. Holders of BB and B securities received 127 and 171 additional basis points in annual yield for accepting the additional credit risk. CS First Boston has estimated that the excess premium received by high yield portfolios averaged 347 basis points per year during 1986-1993.<sup>8</sup>

<sup>8</sup> "The High Yield Market Today", page 3, Fidelity Management Trust Company, August 1994



## ***Default Risk***

The evidence appears to support the notion that below investment grade securities do provide incremental total returns to investment grade bonds without adding a correspondingly higher degree of risk to the portfolio. The potential risk to the portfolio from exposure to below investment grade debt can be inferred from the occurrence of default and loss of principal on high yield debt. The default rate is measured as the annual amount of principal defaulted of the total outstanding amount of high yield debt issued. Similarly, the loss rate is measured as the amount of principal and interest defaulted of the total outstanding amount of high yield debt issued. The following table lists the annual loss and default rates, for the period 1985 - 1994, for high yield debt issued from January 1, 1977 through December 31, 1994:

### **Summary of Annual Default Rates and Default Loss Rates, 1985 - 1994**

	<u>Annual Default Rate</u>	<u>Annual Loss Rate</u>
1985	2.16 %	1.19 %
1986	2.31 %	1.30 %
1987	2.22 %	1.21 %
1988	2.03 %	1.09 %
1989	2.76 %	1.62 %
1990	4.70 %	2.81 %
1991	6.06 %	3.48 %
1992	5.37 %	3.00 %
1993	4.47 %	2.46 %
1994	3.78 %	2.04 %

## **HOW ARE THE INCREMENTAL RETURNS PROVIDED BY BELOW INVESTMENT GRADE DEBT CAPTURED?**

Most investment managers focus on intense credit analysis to exploit the below investment grade market. Research staffs review companies in hopes of being able to identify bonds that are likely to provide superior total returns without exposing investors to excessive credit risk. Research analysts seek to identify those organizations with sound operating fundamentals, adequate interest and asset coverage, improving earnings prospects and strong management teams. Analysts and portfolio managers meet regularly with company management to better evaluate issues ranging from a company's asset value to intangibles like franchise value and quality of management at all levels of the organization. The expected outcome of this process is to determine which bonds have become cheap or overvalued. Potential strategies employed by managers are to focus on "overlooked" BB securities, searching for "rising stars", and identifying companies that are deleveraging their balance sheets. Each of these approaches relies on extensive credit analysis to identify potential opportunities.

### ***Overlooked BB's***

Generally, BB debt securities are overlooked by both investment grade and high yield oriented investors. The high yield market is dominated by investors who seek the highest current yields available in the marketplace. Most new below investment grade issuers are rated single B. Single B-rated issues tend to be callable and subordinated within the issuer's capital structure. These features tend to increase the yield on such securities and enhance their appeal to the investors seeking high current income. The

securities and enhance their appeal to the investors seeking high current income. The yields on BB rated issues are often too low for most high yield investors. On the other hand, many fixed income investors restrict purchases to investment grade securities, with a minimum rating of BBB. These investment grade investors also will not consider BB rated bonds for their portfolios. As a result, the BB bond market is often ignored by many fixed income investors.

BB rated bonds are commonly senior within the capital structure as are investment grade corporates. Many are call free and issued by larger and more mature firms. Although the sector is overlooked, BB bonds offer attractive returns relative to the investment grade market without significant incremental risk. As such, they represent an opportunity for the total return oriented investment manager with corporate bond expertise.

### *Rising Stars*

Many fixed income managers attempt to identify "rising stars". Rising stars are bonds which were rated as below investment grade and have been reclassified as investment grade by the rating agencies. By giving greater scrutiny to financial ratios than is given by the financial rating agencies (*i.e.*, Standard & Poors, Moody's, etc.), managers attempt to identify those high yield issues which will be upgraded. The agencies focus on a set of traditional accounting oriented indicators in determining their credit ratings. Investment managers will attempt to look more at the underlying economic value of firms to determine if there are some companies where the rating agencies have over- or under-

rated a company's financial condition. Additionally, the investment managers take a more future oriented approach than the rating agencies appear to be able to do. The rating agencies determine a credit rating at issuance and provide periodic reviews whereas the investment manager's research is continuous and more up-to-date. The ability to identify under-rated securities provides the potential to capture both high yield and capital appreciation as the debt is upgraded and the spread is tightened. The absence of continuous and widespread research in the market place creates inefficiencies. This provides opportunities for "cherry picking" for those managers able to identify situations where credit quality will improve. Managers able to identify these situations will reap the gains when the security has a larger following.

### ***The Deleveraging Strategy***

Other managers seek to identify firms that are deleveraging. This approach presumes that a company is making an effort to reduce debt and lower its interest cost which should result in higher earnings. The preferred deleveraging play is one where the company is rapidly paying down debt in order to enhance shareholder value. In such a case, the stockholder and bondholder have identical interests -- to improve the financial position and perceived value of the company by reducing the debt burden. If executed properly, deleveraging should result in an upgraded debt rating for the particular company. When a debt security is upgraded, the spread between the securities and a comparable Treasury bond should narrow. As spreads narrow, the price of the corporate bond will appreciate relative to the Treasury.

on companies that possess substantial financial strength (e.g., market capitalization, interest coverage, asset values, etc.) The strategy looks for a trend rather than an exact earnings per share calculation. Ideally, this means that the company only has to perform close to the expectations of a bond analyst (e.g., pay down \$300 million in debt during the year versus a \$500 million estimate) rather than have to meet an exact earnings estimate required by an equity analyst. In these situations, the bonds will improve regardless of the ultimate stock performance.

Clearly, the key ingredient to outstanding performance in the high yield markets is outstanding credit research capabilities. As a point of information, the ratings on more than \$4.2 billion of high yield debt issues were raised to investment grade in 1994.<sup>9</sup>

#### **STAFF RECOMMENDATION**

Staff recommends that the SBI allow its active and semi-passive fixed income managers the authority to invest in BB and B rated debt. Managers use of these types of securities will be limited to a maximum of 10% of their SBI portfolio. Staff shall have discretion, with the concurrence of the Domestic Manager Committee, in determining which managers are granted the authority based on the individual manager's experience and expertise. Due to the limited and tactical nature of this new authority, the Lehman Aggregate (or its appropriate subset in the case of a sector specialist) will remain as the benchmark for these managers.

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<sup>9</sup>The High Yield Market, page 30, Salomon Brothers, February 17, 1995

### Appendix A: Bond Ratings

	Very High Quality		High Quality		Speculative		Very Poor	
Standard & Poor's	AAA	AA	A	BBB	BB	B	CCC	D
Moody's	Aaa	Aa	A	Baa	Ba	B	Caa	C

At times both Moody's and Standard & Poor's have used adjustments to these ratings. S & P uses plus and minus signs: A+ is the strongest and A- the weakest. Moody's uses a 1, 2, or 3 designation --- with 1 indicating the strongest.

**Moody's      S & P**

Aaa	AAA	Debt rated Aaa and AAA has the highest rating. Capacity to pay interest and principal is extremely strong.
Aa	AA	Debt rated Aa and AA has a very strong capacity to pay interest and repay principal. Together with the highest rating, this group comprises the high grade bond class.
A	A	Debt rated A has a strong capacity to pay interest and repay principal, although it is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than debt in higher rated categories.
Baa	BBB	Debt rated Baa and BBB is regarded as having adequate capacity to pay interest and repay principal. Whereas it normally exhibits adequate protection parameters, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity to pay interest and repay principal for debt in this category than in higher rated categories. These bonds are medium grade obligations.
Ba B Caa Ca	BB B CCC CC	Debt in these categories is regarded on balance, as predominantly speculative with respect to capacity to pay interest and repay principal in accordance with terms of the obligation. BB and Ba indicate the lowest degree of speculation, and CC and Ca the highest degree of speculation. Although such debt will likely have some quality and protective characteristics, these are outweighed by large uncertainties or major risk exposures to adverse conditions. Some issues may be in default.
C	C	This rating is reserved for income bonds on which no interest is being paid.
D	D	Debt rated D is in default, and payment of interest and/or principal is in arrears.

## **Appendix B:**

### **1993 High Yield Issuers**

American Standard	Keystone Group
Ann Taylor	Kroger Company
Armco	Levitz Furniture
Bell & Howell	McCaw Cellular
Bethlehem Steel	McDonnell Douglas
Black & Decker	Owens-Illinois
Chrysler	Pathmark Stores
Coca-Cola Bottling	Revlon
Continental Cablevision	Shawmut National
Delta Airlines	Time Warner
Dr. Pepper / Seven-Up	Turner Broadcasting
Fort Howard	Unisys
Greyhound	United Airlines
Hospital Corp. of America	US Air

*Source: Keystone Investment Management Corp. ; Salomon Brothers, Lehman Bros.*

## GLOSSARY

**actual yield spread** - The yield spread between a high yield bond and a Treasury security. For usage in comparison with breakeven yield spread.

**below investment grade** - Bonds rated BB+ or lower by Standard & Poor's (Ba1 or lower by Moody's); also known as "high yield bonds" or "junk bonds."

**Brady Bonds** - Named for former U.S. Treasury Secretary Nicholas Brady, bonds which restructure the debt of foreign nations, generally issued as U.S. dollar obligations.

**breakeven yield spread** - A measure of the additional promised yield one would need on a high yield bond to match the comparable Treasury security when compensating for the default experience of high yield bonds.

**call provision** - Provision in a bond's indenture that defines the terms under which the issuer may redeem the bond prior to its scheduled maturity.

**covenant** - Legal agreement between the bond issuer and the bondholder which restricts the actions of the bond issuer in the interests of the bondholder.

**defeasance** - A technique whereby debt is discharged without repaying it prior to maturity.

**deleveraging** - The process of reducing the outstanding indebtedness of the issuer.

**emerging markets** - Generally, Latin American and other developing country markets which represent new, less-than-mature investment markets having a strong demand for external capital.

**investment grade bond** - A bond rated BBB- or higher by Standard & Poor's or Baa3, or higher by Moody's Investor Services.

**junk bonds** - A somewhat pejorative term developed in the early 1980's to describe both "fallen angels" and early original issue high yield bonds. Used as a synonym for high yield bonds.

**private placement** - A security not registered with the Securities and Exchange Commission; generally a smaller, less liquid financial transaction placed with a limited number of institutional purchasers. Many companies with public high yield bonds outstanding offered these issues as privates and later registered them.



**senior debt** - Loans or debt securities that have claim prior to junior obligations and equity on a corporation's assets in the event of liquidation. Senior debt commonly includes funds borrowed from banks, insurance companies, or other financial institutions, as well as notes, bonds, or debentures not expressly defined as junior or subordinated.

**sovereign debt** - Debt issued by the government of a foreign nation.

**subordinated debt** - Junior in claim on assets to other debt, that is, repayable only after other debts with a higher claim have been satisfied. Some subordinated debt may have less claim on assets than other subordinated debt; a junior subordinated debenture ranks below a subordinated debenture, for example.

**yield spread** - The yield differential measured in basis points between two securities, a security and an index, two indices, etc.

*Source: A Primer on High Yield Bonds for Institutional Investors, Keystone Investment Management Corporation, 1994; and Dictionary of Finance and Investment Terms 3rd. ed., Barron's, 1991.*

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**EXTENDED INVESTMENT SECTORS IN  
THE FIXED INCOME PROGRAM**

**Staff Position Paper**

**February 2002**

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## **Extended Investment Sectors in the Fixed Income Program**

**Erol Sonderegger, CFA  
Minnesota State Board of Investment  
February 2002**

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## EXECUTIVE SUMMARY

The State Board of Investment (SBI) fixed income program has had limited tactical exposure to the U.S. below investment grade and investment grade international bond sectors since the mid-1990s. The program has had no material exposure to Emerging Market Debt (EMD). This report provides a review of each of these sectors, termed "extended sectors". The review includes basic market characteristics, an in-depth review of risk-return characteristics and a discussion of the suitability of each sector for additional investment.

Our review of each sector concludes that each extended sector has sufficient size and liquidity for additional investment. Further, each can potentially provide risk-return benefits when added to a traditional U.S. Core fixed income portfolio such as the SBI's bond program. However, because of the equity-like nature of some of the sectors, a significant additional allocation would reduce the overall bond portfolio's effectiveness as an equity hedge, resulting in higher risk at the total portfolio level. The program's current allocation has resulted in a successful program that has met both its performance and diversification goals. However, staff concludes that given the significant potential of the extended sectors to improve expected returns and reduce the overall bond portfolio's risk, an additional allocation should be evaluated. A quantitative study conducted by staff identified several alternative portfolio allocations using the extended sectors. The combination of the U.S. High Yield and Non-dollar sectors with Core U.S. fixed income provides some measure of increased expected return, although risk at the total portfolio level would increase as well.

Staff also considered the impact of an increased allocation to these sectors on investment management and custody fees, and on the program's legal support needs. For all three sectors, management fees would increase if specialty managers were hired. On average specialty managers in these sectors have higher fees than U.S. Core managers. The custody issue is only relevant to the EMD sector, where investment in this sector could cause additional custodial fees. Lastly, both the High Yield and EMD sectors could require additional legal resources as more investments in these sectors could generate credit events that affect the portfolio.

Staff recommends that the current tactical investment strategy for U.S. High Yield and Non-dollar sectors be expanded. The recommendation expands tactical limits for selected existing active and semi-passive managers, subject to review of each manager's capabilities in

the extended sectors. Staff believes that this change will add some incremental value, and minimize additional cost, while maintaining the overall objectives of the fixed income program.

Currently, the SBI has authorized selected active fixed income managers to invest up to 10% of the assets in its portfolio in U.S. Below Investment Grade bonds and up to 10% in Non-dollar fixed income. Staff recommends that active managers be allowed, subject to a review of each manager's capability, to invest up to 15% in U.S. Below Investment Grade bonds, and up to 15% in Non-dollar fixed income, subject to a combined maximum of 20% of the manager's assets. Additionally, staff recommends that the fixed income program's semi-passive managers, subject to a review of investment capability, be allowed to invest up to 5% in U.S. Below Investment Grade and up to 5% in Non-dollar fixed income.

## INTRODUCTION

In 1988, the State Board of Investment (SBI) received authority to invest in international securities. This authority includes investment in international fixed income securities. In 1994, the Legislature authorized the SBI to invest in non-rated and below investment grade fixed income instruments. Both authorities are subject to investment limits as a percentage of total investments: no more than 5% of the total fund may be invested in below investment grade or non-rated securities, while the limit on international securities falls within the 35% maximum for alternative investments.

To date, investment in these extended sectors of the fixed income market has been handled on a limited, tactical basis by some of the program's existing fixed income managers deemed by the SBI to have expertise in either or both sectors. While the performance contribution of this strategy has been positive, the total allocation to the sectors has been small and the program has essentially retained a traditional U.S. Core profile. In addition, the continued evolution of the fixed income market since 1994 creates the need to review the current policy. This paper provides a review of the below investment grade corporate, non-U.S. dollar and emerging market sectors of the fixed income market, outlines the Program's actual investment experience in the sectors and recommends an allocation policy and management structure for the fixed income program.

## SECTION ONE: MARKET BACKGROUND

### ***What Are the "Extended Sectors" of the Fixed Income Market?***

For the purposes of this review, the term "*extended sectors*" refers to sectors of the fixed income market that fall outside the traditional, investment-grade universe of U.S. fixed income securities as represented by the Lehman Aggregate Index. Specifically, this review focuses on the following three extended sectors: 1) *U.S. Below Investment Grade Corporate Debt*; 2) *Non-U.S. Government and Corporate Debt*; and 3) *Emerging Market Debt*. Each of these markets has grown in size in recent years relative to the core sectors of the fixed income market represented in the Lehman Aggregate Bond Index (Corporates, Mortgages, Treasuries, Agencies, and Asset Backed securities). To give some sense of the relative size of the extended sector markets, a market capitalization weighted index combining the Lehman

Aggregate Index sectors with these three extended sectors would have the following weightings as of June 30, 2001: U.S. Core Fixed Income 45.6%, U.S. Below Investment Grade Corporate Bonds 2.2%, Non-U.S. Government and Corporate Debt 50.9%, and Emerging Market Debt 1.3%.<sup>1</sup>

The following sections provide a brief description of each extended sector under consideration. This description is intended to provide basic background and to outline the risk-return profile of each extended sector, both separately and with respect to a Lehman Aggregate-based fixed income portfolio. The profiles form the basis of the subsequent allocation recommendation.

### **Sector #1 - Non-Investment Grade U.S. Corporate Debt**

#### **Definition and Background**

Non-investment grade, or *high yield*, bonds are corporate bonds rated below BBB (or its equivalent) by a major rating agency (See Exhibit 1). The rating agencies analyze the financial condition of a corporation and then assign quality ratings to its bonds, assessing the capacity of the company to meet the financial obligations of its existing debt. With investment grade companies (rated AAA, AA, A, or BBB), this capacity is very high and the risk of default is low. With securities of non-investment grade companies, the uncertainty associated with receiving all interest and principal payments is greater. Therefore, investors demand higher yields as compensation for this increased credit risk.

Before the evolution of the high yield market in the late-1970s, high yield bonds existed primarily as a private market dominated by insurance companies. Companies without an investment grade rating, looking to finance their capital structure with debt, generally turned to this private placement market as an alternative to bank loan financing. In addition to the well-established private market, a small public market of "fallen angel" high yield bonds existed as early as 1971. "Fallen angel" refers to the bonds of issuers that have lost their investment grade rating due to business or financial deterioration.

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<sup>1</sup> Source: Lehman Brothers, Richards & Tierney.

**Exhibit 1: Corporate Bond Ratings – Investment Grade and High Yield**

	Moody's	S&P	General Definition
<b>Investment Grade</b>	Aaa	AAA	Highest quality; extremely strong capacity to meet obligations.
	Aa	AA	Slightly less strong than AAA; very strong capacity to meet commitments.
	A	A	Issuer is somewhat susceptible to changes in circumstances and economic conditions; ability to meet obligations is strong.
	Baa	BBB	Adequate protection to meet obligations; adverse economic conditions are more likely to lead to a weakened ability to meet commitments.
<b>Speculative Grade</b>	Ba	BB	Less vulnerable than other speculative grade issues. Faces major ongoing uncertainties which could lead to inadequate capacity to meet obligations.
	B	B	Issuer currently has capacity to meet obligations; adverse conditions will likely impair the obligor's ability or willingness to meet its financial commitment
	Caa	CCC	Currently vulnerable to nonpayment; issuer is dependent upon favorable business, financial and economic conditions to meet its obligations.
	Ca	CC	Currently highly vulnerable to nonpayment
	C	C	Issuer may still be current, but a nonpayment event is imminent.
	D	D	Currently in default.

Source: Bloomberg

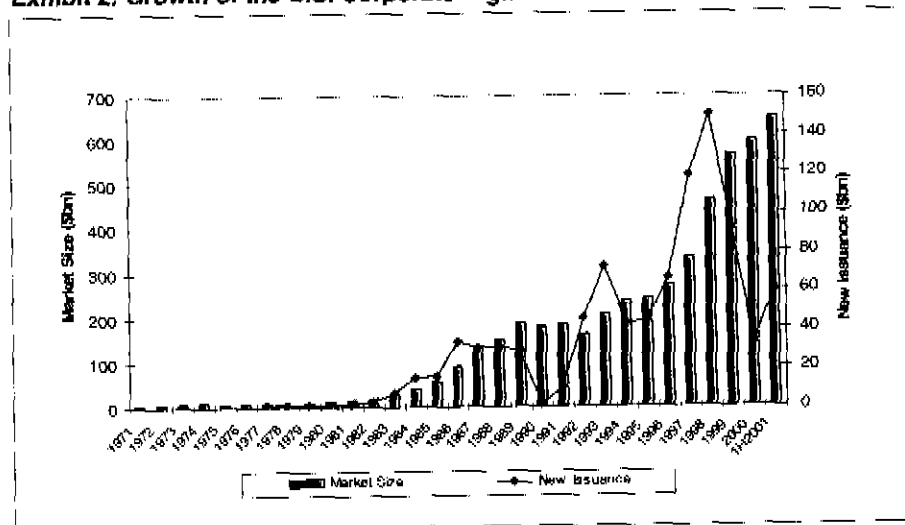
In the late-1970s, below investment grade issuers began to tap the public securities market with the help of investment banks such as Drexel Burnham Lambert. Drexel sought out small and mid-sized companies that needed access to debt capital to grow their businesses, and aggressively marketed the new supply of bonds to investors. Drexel emphasized portfolio diversification and modern portfolio theory, showing that a well-diversified portfolio of higher yielding bonds could exhibit a better risk-return profile than a less diversified portfolio of higher overall quality. Issuance of public high yield debt was limited to several billion dollars annually until the mid-1980s. At that time, issuance of high yield debt ballooned as a result of the increase in leveraged acquisitions and buyouts and growing investor demand for high yield on the heels of excellent historical returns. By the end of the 1980s, the high yield market had grown to \$250 billion in size.<sup>2</sup>

The aggressive, highly leveraged offerings of the 1980s fell on hard times during the economic slowdown of 1990. Also investor appetite for high yield securities fell as a result of the Savings and Loan crisis and changes in insurance company regulations governing high yield investments. These factors led to exceptionally poor performance in the sector in 1989 and 1990 as high yield issuers defaulted in record numbers and investors dumped high yield investments. The high yield market recovered after the early-1990s. The economy emerged from recession in 1992, new high yield bond issuance slowed, allowing the market to better absorb existing supply, and default rates fell back down to historically average levels. Despite

<sup>2</sup> Altman High Yield Bond and Default Study, Salomon Smith Barney, July 2001

poor returns in 1990 and the negative impacts of the Asian debt crisis in 1997 and the Russia default in 1998, the U.S. high yield sector managed to post the best 10-year return (averaging 305 basis points per year over Treasuries) of any sector of the U.S fixed income market.<sup>3</sup>

**Exhibit 2: Growth of the U.S. Corporate High Yield Market**



Source: Salomon Smith Barney, Altman High Yield Bond and Default Study, July 2001

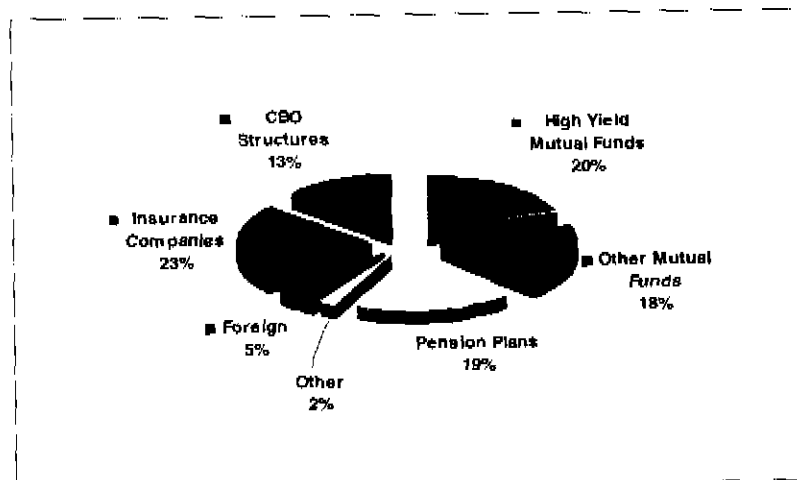
### The High Yield Market Today

As presented in Exhibit 2, the public U.S. corporate high yield market has nearly tripled in size since 1992 to nearly US\$650 billion of par value outstanding as of June 2001. High yield bonds now represent approximately 30% of all outstanding publicly traded corporate debt, or about 7% of all outstanding public debt securities.<sup>4</sup> Ownership and participation in the high yield market has broadened somewhat since the early-1990s. Although still dominated by institutional players, the considerable growth in ownership of mutual fund participants and securitized investment vehicles like collateralized bond obligations (CBOs) has increased market liquidity and created a more diverse market with respect to investor demand. Although Exhibit 3 below is somewhat dated, it clearly shows a diversity of ownership across a range of institutional players.

<sup>3</sup> Lehman Brothers, The U.S. Dollar-Denominated Universal Index, January 2000

<sup>4</sup> Based on composition of the Lehman Aggregate Bond Index as of June 30, 2001.

**Exhibit 3: High Yield Ownership as of December 31, 1998**



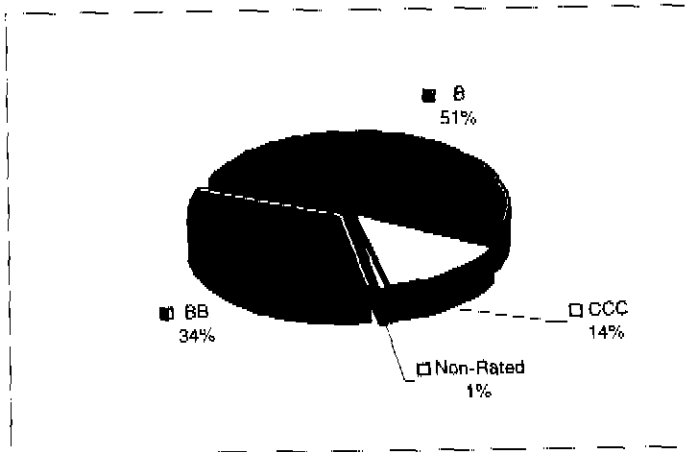
Source: DLJ/Credit Suisse First Boston

From a quality perspective, as shown in Exhibit 4, the majority of high yield bonds fall into the top two rating categories (BB and B). Although the period from 1992-1996 saw an overall increase in corporate credit quality as firms de-leveraged their balance sheets and benefited from a strong economy, new high yield issuer credit quality has trended lower in recent years. In January 2001, the percentage of new high yield issuers rated BB was only 28.3%, the lowest level recorded by Moody's in 80 years and only half of the long-term average of 53.8% of issuers.<sup>5</sup> Further, a recent study by Salomon Smith Barney shows that 21% of the high yield market is distressed (defined as priced to yield being more than 1000 basis points greater than comparable Treasuries).<sup>6</sup> Both of these statistics highlight that credit cycles are cyclical in nature; credit quality of issuers tends to deteriorate at the end of an economic expansion and through the trough of the cycle (as it has done in 2000 and 2001), and improves in the early and middle stages of the subsequent expansion.

<sup>5</sup> Default and Recovery Rates of Corporate Bond Issuers: 2000, Moody's Investors Service, February 2001

<sup>6</sup> Altman High Yield Bond and Default Study, Salomon Smith Barney, July 2001

**Exhibit 4: High Yield Market Breakdown by Quality**



Source: Bear Stearns High Yield Index as of November 30, 2001

The dramatic expansion in high yield issuance since 1980 has improved the industry diversification of the market. There are now some 1,200 non-investment grade issuers across 11 major industry sectors. Exhibit 5 highlights the distribution of securities in a representative index across these sectors.

**Exhibit 5: High Yield Market Breakdown by Industry Sector**

Industry Sector	Pct of Index
Basic Materials	9%
Capital Goods-Manufacturing	11%
Consumer Cyclical	21%
Consumer Non-Cyclical	12%
Energy	6%
Finance	3%
Media	17%
Technology	3%
Telecommunication	11%
Transportation	3%
Utility	3%
	100%

Source: Bear Stearns High Yield Index as of November 30, 2001

The market continues to have a strong intermediate maturity bias, with fully 70% of issuance in the 7-year to 10-year range, and another 21% between 3 and 5 years to maturity. The shorter nature of the high yield sector, relative to investment grade corporate bonds, is related to the increased credit risk and uncertainty associated with below investment grade issuers. In general, the yield compensation that investors demand for extending long-term credit (beyond 10 years) to a high yield issuer is so expensive relative to shorter maturities that



most issuers prefer to offer bonds ten years and in. One benefit of the high yield market being "shorter" than the investment grade market is that the high yield market is generally less impacted by changes in the overall level of interest rates than the broader market. The generally high coupons that high yield securities offer also aid this effect.

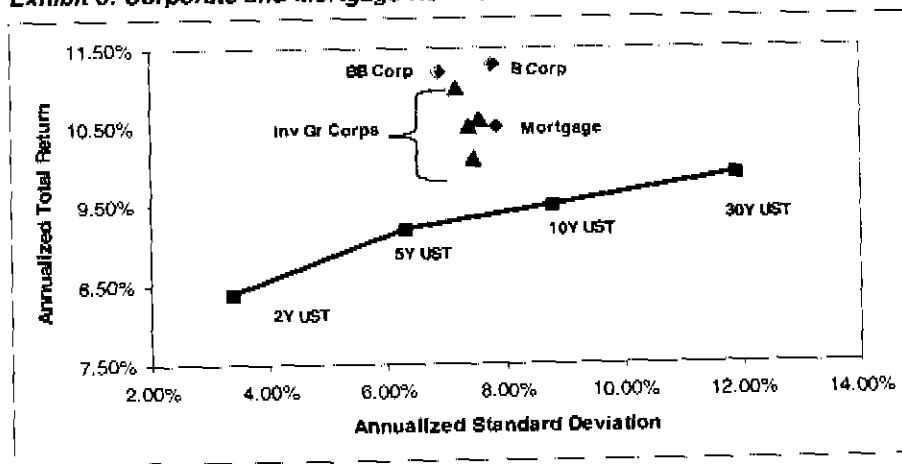
### The Case for an Allocation to High Yield

The rationale for investing in high yield, as with any sector or asset class, is grounded in modern portfolio theory. In order to be attractive the sector should provide attractive returns for a given level of risk. Further, the sector's profile should be unique enough – i.e. relatively uncorrelated with other assets – so as to provide diversification benefits that can be expected to lower overall portfolio risk per unit of return. The high yield sector can be shown to exhibit both of these characteristics relative to a traditional Core-only fixed income portfolio. The tradeoff for these benefits is increased price volatility, added default and liquidity risks.

### Risk Versus Return

Since industry-recognized indices were developed in the early-1980's, high yield bonds have offered a higher total return than investment grade bonds or other traditional fixed income asset classes. Interestingly, the marginal increase in return volatility from high yield has been less than would be implied by the increase in total return, particularly in the higher quality sectors of the high yield market. In other words, high yield has offered a superior risk-return profile relative to other credit sectors of the U.S. fixed income market. As Exhibit 6 shows, BB-rated and B-rated corporate bonds have exhibited a better risk-return profile than Treasuries or investment-grade corporates.

**Exhibit 6: Corporate and Mortgage Return Versus Risk Relative to Treasuries, 1980 to 2001**

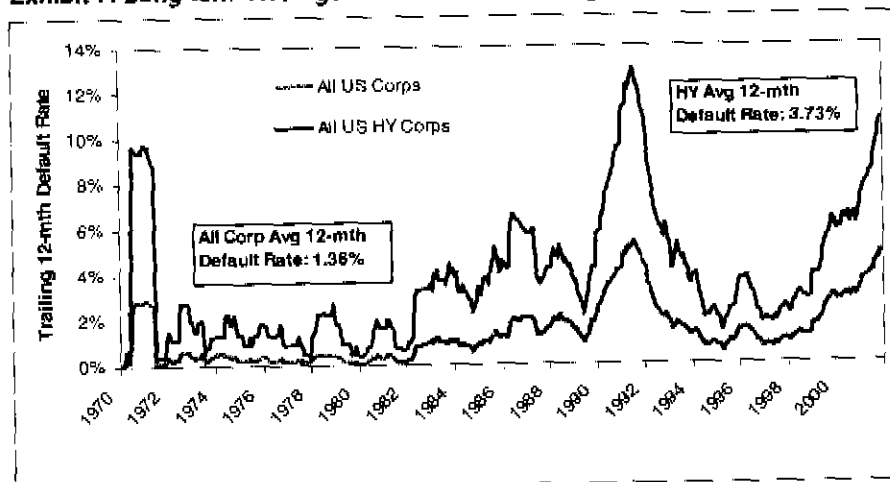


Source: Morgan Stanley Investment Management, Salomon Smith Barney

### Default Risk and Breakeven Premia

Default risk, or the risk that an issuer will fail to make timely interest and principal payments, is the most significant risk facing the high yield investor. High yield issuers are indeed more likely to experience default than investment grade issuers. Exhibit 7 shows the trailing 12-month default rate over time and the long-run average annual default experience as represented by Moody's.

**Exhibit 7: Long-term Average and 12-month Trailing Default Rates, 1970-2000**



Source: Moody's Investor Service

While default rates are important, they represent an incomplete picture of credit losses. As creditors, bondholders are entitled to some priority of claim on the issuers assets in the event of default. The amount ultimately returned to bondholders as a result of this claim is termed *recovery*. Therefore real credit losses to an investor are equal to *defaults minus recovery*. Exhibit 8 shows long-term average recoveries and net credit losses across the quality spectrum.

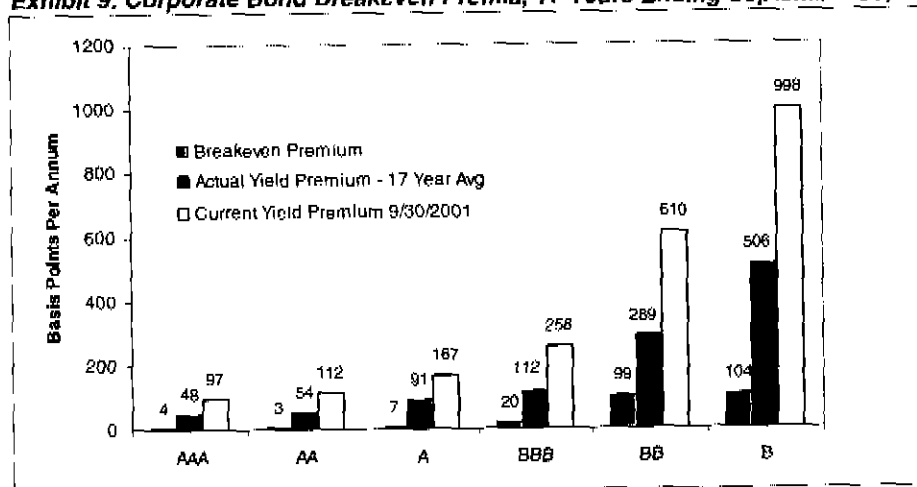
**Exhibit 8: Average Annual Defaults, Recoveries And Net Credit Losses**

Corporate Sector	Average Annual Default Rate	Average Annual Loss	Market-Implied Average Recovery
AAA	0.00%	0.00%	-
AA	0.08%	0.04%	50.00%
A	0.08%	0.04%	50.00%
BBB	0.30%	0.16%	46.67%
BB	1.43%	0.76%	46.85%
B	4.48%	2.37%	47.10%
All High Yield	2.95%	1.95%	33.90%

Source: Morgan Stanley Investment Mgmt, Moody's Investor Service, Salomon Smith Barney

With historical average credit losses for the high yield sector identified, one can calculate the minimum yield investors should require to own high yield rather than Treasuries. This yield determines the breakeven premium. The more investors are compensated above the breakeven premium, the more attractive the high yield sector becomes, *provided that investors believe that future default loss experience over their investment horizon will be similar to the historical average.*

**Exhibit 9: Corporate Bond Breakeven Premia, 17 Years Ending September 30, 2001**



Source: Morgan Stanley Investment Management

Exhibit 9 above demonstrates that high yield investors historically have been rewarded handsomely for bearing the incremental risks associated with high yield. On average, investors in BB-rated and B-rated credits have received 1.9% and 4.0%, respectively, in yield *above* that required to compensate for actual credit losses. Because uncertainty around default expectations and issue-specific risks are greater for lower-rated issuers, investors require more and more compensation above expected losses in order to be enticed to hold lower quality bonds. This excess premium can be a source of significant return for an investor willing to "ride out" periods of uncertainty or higher actual default losses.

Exhibit 9 also highlights that the current premium for high yield exceeds the historical average premium. In effect, high yield is historically cheap and analysis points to the fact that high yield expected returns at these yield levels can withstand a significant deterioration in default losses before falling to or below Treasury breakeven levels. A recent study by Morgan Stanley Investment Management postulates that if, from October 2001 levels, defaults reach 9.5% per year for the next two years and then return to the historical average (3.7%), high yield

would still achieve a 5.9% annual excess return over Treasuries over the next seven years.<sup>7</sup> To put this study in perspective, during the credit crisis of 1990-1991, trailing 12-month default rates were above 9.5% for 15 months.<sup>8</sup> In essence, the current downturn would need to lead to higher default rates than those observed in 1990-1991 to outstrip the yield advantage currently priced into the sector.

### **Liquidity and Market Segmentation**

Although default risk is the primary risk (and source of yield premia) for high yield, liquidity risk is another source of risk and potential return for the high yield investor. Despite the market's large size and coverage by brokerage houses, the market remains an institutional market where nearly all trading takes place person-to-person over the phone. Bid-ask spreads are wider than in investment grade markets, and because of the additional credit risk involved, brokerage firms are less likely to maintain significant inventory. All of these factors contribute to increased liquidity risk relative to the investment grade corporate market. Investors willing to bear this risk can reasonably expect to capture the incremental return such risk offers.

### **Correlation Among Returns**

High yield bonds consistently have exhibited low to moderate correlations with other fixed income and equity sectors, which suggests that there would be diversification benefits from adding high yield to a traditional fixed income portfolio. However, given high yield's higher correlation with equities, it is likely that an allocation to high yield would marginally reduce the fixed income program's effectiveness as a diversification to equities.

**Exhibit 10: Correlation of Monthly Returns of Selected U.S. Asset Classes, August 1983 – November 2001**

	High Yield	Broad US Fixed Inc	Inv Grade Credit	Mortgage-Backed	10-Year Treasuries	Large Stocks	Broad Stocks	Small Stocks
High Yield <sup>1</sup>	-	0.387	0.500	0.389	0.280	0.501	0.534	0.559
Broad US Fixed Income	0.387	-	0.973	0.939	0.965	0.249	0.222	0.092
Investment Grade Credit	0.500	0.973	-	0.910	0.919	0.308	0.290	0.178
Mortgage-Backed	0.389	0.939	0.910	-	0.854	0.232	0.208	0.084
10-Year US Treasuries	0.280	0.965	0.919	0.854	-	0.205	0.172	0.037
Large Stocks <sup>2</sup>	0.501	0.249	0.308	0.232	0.205	-	0.985	0.799
Broad Stocks <sup>3</sup>	0.534	0.222	0.290	0.208	0.172	0.985	-	0.879
Small Stocks <sup>4</sup>	0.559	0.092	0.178	0.084	0.037	0.799	0.879	-

<sup>1</sup> Lehman High Yield Index

<sup>2</sup> S&P 500 Index

<sup>3</sup> Wilshire 5000 Index

<sup>4</sup> Russell 2000 Index

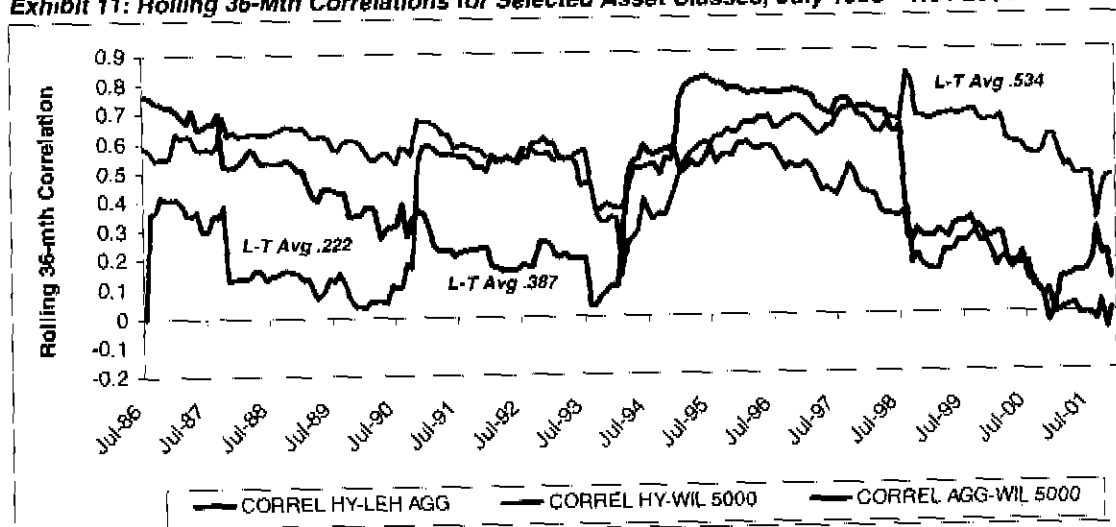
Source: Lehman Brothers, Standard & Poor's, Frank Russell, Wilshire Associates, Salomon Smith Barney

<sup>7</sup> Morgan Stanley Investment Management

<sup>8</sup> Source: Moody's Investor Service

From Exhibit 10 above, high yield returns have in fact displayed low correlation with broad U.S. fixed income (38.7% correlated) and moderate correlation with broad U.S. equities (53.4% correlated) over long time periods. While over equally long future periods correlations may trend around the long-term average, in the short-run correlations can be unpredictable. Exhibit 11 depicts this risk by showing the variance in rolling 36-month correlations over time. Over 36-month periods, high yield returns have shown a wide range of correlations with stocks (.82 to .14) and other bonds (.81 to -.03). Clearly the risk of correlation instability must be taken into consideration when making a decision to allocate to the sector.

**Exhibit 11: Rolling 36-Mth Correlations for Selected Asset Classes, July 1986 – Nov 2001**



Source: Lehman Brothers, Wilshire Associates

### **High Yield Portfolio Management**

The long-term return on a portfolio of high yield bonds can be represented as follows:

$$\text{Risk-Free Return} + \text{Yield Spread} - \text{Credit Losses}$$

In essence, the return from high yield is equal to the return from a riskless asset plus some compensation for credit, liquidity and other risks less *actual* credit losses. To achieve superior returns, an active manager must try to improve yield spread, reduce credit losses, or some combination of both. This emphasis on credit research and relative value is the foundation of active high yield portfolio management. While different active managers clearly bring their unique style(s) to bear on their particular approach to the sector, intense credit research is a common theme of success in the marketplace.

### MSBI High Yield Experience Review

In January 1996, the MSBI authorized certain active managers to invest in the high yield sector opportunistically, up to a maximum of 10% of their portfolios. Quality was limited to B- or better to avoid what was viewed as the riskiest part of the sector. The three active managers currently investing in high yield (American Express, Morgan Stanley, and Western Asset) have consistently maintained an allocation to the asset class. However, since these managers account for only about one-third of the program's fixed income assets and their high yield limit has been capped at 10% of their portfolios, a material allocation to high yield has not occurred.

Because the managers have flexibility with the size of their allocation to the high yield sector (from zero to 10%), the managers have two sources of added value: the sector bet and security selection within the sector. All three managers have actively used both "bets" to attempt to add value. The practice of investing opportunistically in high yield has added value to the program. Comparing the managers' actual performance with a passive 5% allocation to an appropriate high yield benchmark (BB and B rated HY bonds), the managers have added between 6 basis points and 48 basis points of relative value annually. Compared with a Lehman Aggregate benchmark, two of the three managers added value with their high yield investments. Exhibit 12 below shows the performance of the managers' high yield allocations since 1996.

**Exhibit 12: MSBI High Yield: Value Added From An Opportunistic Approach**

	Value Added in Basis Points Above the Lehman Aggregate Index*						
	1996	1997	1998	1999	2000	2001 YTD**	Avg Annual
American Express Asset Mgmt.	132	-85	-147	92	-32	3	-7
Morgan Stanley Dean Witter	183	32	-63	59	-31	-46	23
Standish, Ayer & Wood***	64	13	-71	-138	-5	n/a	n/a
Western Asset Management	63	75	56	101	-57	-37	35
<b>Benchmark Comparison:</b>							
Lehman High Yield Index Value Added Relative to the Lehman Aggregate****	39	15	-28	16	-81	-35	-13

\* The value added numbers presented show how each manager's decisions in the High Yield sector (sector weight and security selection) have benefited the portfolio relative to the benchmark. A positive number means that the manager's overall returns have been helped by their High Yield management, while a negative number means that High Yield has hurt performance.

\*\* Year-to-date through 9/30/2001.

\*\*\* Standish, Ayer & Wood was terminated in June 2001.

\*\*\*\* This benchmark information is presented to help the reader assess each manager's High Yield sector value added. For example, in 1996 Morgan Stanley's high yield management added 183 basis points to performance while a passive allocation to the High Yield index would have added only 39 basis points. The benchmark numbers are based on a 5% passive allocation to the Lehman High Yield BB-B Index.

Source: Individual managers, Lehman Brothers

### **Cost Considerations**

The two major cost considerations related to an investment in the high yield sector are increased fees and increased legal work. Investment management fees for a U.S. High Yield mandate are approximately three times higher than for a U.S. Core mandate (41 bp/year versus 15/bp/year).<sup>9</sup> Any assets managed in a dedicated high yield portfolio would incur this incremental cost. Custody fees would not be impacted by an increased allocation to High Yield from other fixed income sectors.

The increased likelihood of credit events, including defaults, in the high yield sector relative to investment grade credit increases the need for additional legal support. On average, about 3.7% of high yield issuers defaulted in any 12-month period from 1970 to 2001. In a portfolio of 100 issuers, one can expect 3 to 4 defaults annually. While in practice managers can avoid default or workout situations by selling distressed bonds in the marketplace (albeit at a deep discount), each default event in the portfolio has the *potential* to require legal opinion and/or an amount of representation to insure that the pension plans' interests are fully represented. To a large extent, investment managers involved with the default event can be expected to provide legal opinion and effort in these situations. However, if the SBI wishes to take more direct actions in these cases, additional legal resources will be necessary to adequately address events as they arise.

### **Extended Sector #2 - Non-U.S. Dollar Debt**

#### **Definition and Background**

U.S.-based equity investors have long looked abroad for total return opportunities and for diversification benefits. Increasingly, fixed income investors are looking for the same twin advantage. The largest and most accessible market in this sector is investment grade sovereign debt. The market itself has been around in some form for centuries, as governments have long issued debt as a form of financing. The practice of investing in the bonds of numerous foreign governments as part of a portfolio, however, took root from the advent of modern portfolio theory, the communication advances of the late-20<sup>th</sup> century and the continuing globalization of financial markets and infrastructure.

Today's market of investment grade non-dollar debt is significant for its size and diversity. Beyond the U.S. market, there are more than 22 countries with well-established, accessible government bond markets with a total market capitalization exceeding U.S.\$5 trillion,

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<sup>9</sup> Source: Investorforce.com and MSBI staff.

or about half of all investment grade fixed income worldwide. Each national market has a range of maturities, which form the countries' unique local interest rate yield curves. Exhibit 13 provides a snapshot of the market from a country and region or "bloc" perspective. It highlights the fact that although the universe of investable markets has grown significantly in the past 20 years, the market remains dominated by a limited number of industrialized nations that are characterized by high per capita output, productivity and income. Not surprisingly, bonds of these countries tend to have very high credit quality.

**Exhibit 13: World Government Bond Market Profile as of October 31, 2001**

	Market Weighting	Credit Rating	Yield to Maturity*	Breakdown By Region
Japan	28.2%	AA	0.7%	<p>Japan 28% UK 5% EuroZone 39% Dollar Bloc 28%</p>
<b>Dollar Bloc</b>	<b>27.6%</b>			
United States	24.4%	AAA	4.3%	
Canada	2.8%	AAA	4.5%	
Australia	0.4%	AAA	5.2%	
United Kingdom	4.8%	AAA	4.6%	
<b>EuroZone</b>	<b>38.4%</b>			
Germany	8.5%	AAA	4.1%	
Italy	8.4%	AA	4.2%	
France	7.9%	AAA	4.1%	
Spain	3.4%	AA+	4.2%	
Belgium	2.8%	AA+	4.3%	
Netherlands	2.3%	AAA	4.2%	
Austria	1.2%	AAA	4.3%	
Greece	1.2%	A	4.4%	
Denmark	1.1%	AAA	4.3%	
Sweden	0.8%	AAA	4.6%	
Portugal	0.6%	AA	4.3%	
Switzerland	0.6%	AAA	3.0%	
Finland	0.8%	AA+	4.1%	
Ireland	0.2%	AAA	4.5%	
<b>Total Market</b>	<b>100.0%</b>	<b>AAA-</b>	<b>3.3%</b>	

\* Average yield of the country's bonds represented in the index.

Source: Salomon World Government Bond Index

**Exhibit 14: Selected Country Economic and Market Data as of December 2001**

Country	Nominal YoY% GDP Growth	Inflation Rate (%)	Unemploy. Rate	10-Year Bond Yield	Country Credit Rating
Japan	1.6%	-1.0%	5.5%	1.4%	AA
United States	-1.3%	1.9%	5.7%	5.1%	AAA
Germany	0.4%	1.7%	9.5%	4.9%	AAA
Italy	4.3%	2.3%	9.3%	5.2%	AA
France	2.3%	1.2%	9.0%	5.0%	AAA
United Kingdom	2.3%	0.9%	3.2%	5.0%	AAA
Spain	2.6%	2.7%	9.2%	5.1%	AA+
Belgium	1.5%	2.2%	7.0%	5.1%	AA+
Canada	-0.6%	0.7%	7.5%	5.4%	AAA
Netherlands	0.4%	4.2%	2.0%	5.0%	AAA

Source: Bloomberg

Exhibit 14 highlights the diversity of economic and investment conditions among the major bond markets. It underscores the chief opportunity and chief challenge of international bond portfolio management: striving to understand and make judgments about 18 to 25 different



economies and bond markets simultaneously and dynamically. Although the non-dollar government bond market is more established, it should be noted that the non-dollar corporate and asset-backed securities market are the fastest growing sectors of the non-dollar asset class. This is particularly true in Europe, where corporations are increasingly adopting the U.S. model of direct bond issuance via the capital markets as a primary source of capital funding.

For the U.S.-based investor, currency risk is an important consideration for all international asset classes. Since most foreign governments and corporations issue bonds denominated in their country's local currency, investing in foreign bonds means gaining long exposure to a foreign currency. Since exchange rates are extremely volatile over short and intermediate time periods, this exposure can dramatically affect returns in any given period. This risk can be hedged away with derivative contracts, but not without incurring costs.

### **The Case for An Allocation to International Bonds**

Investors expand their portfolios into international bond markets for the same reasons that they diversify their domestic equity portfolios with international stocks: more excess return opportunities combined with the potential to reduce overall portfolio volatility because of the diversifying effects of international asset exposure.

### **Return versus Risk**

From 1975 to 2000, currency hedged non-U.S. bonds have outperformed U.S. bonds by about 1.2% per year (10.2% versus 9.0%). While some return advantage over U.S. bonds is consistent with a liquidity premium effect (as compensation for lower liquidity in foreign markets), a more conservative estimate is that the long-run return on foreign bonds is about the same as that for U.S. bonds.<sup>10</sup> So, from a return perspective, international bonds are basically equivalent to, or interchangeable with, U.S. bonds.

The attractiveness of the sector comes instead from lower volatility around the expected mean return. Indeed, hedged non-U.S. bonds displayed about 25% less risk than a U.S. bond portfolio from 1975 to 2000. Similar results from the period from 1987 to 2001 are outlined in Exhibit 15 below. Even holding returns equal over either time period, the lower risk of hedged non-U.S. bonds translates into a higher Sharpe ratio, meaning that non-U.S. bonds are more risk-return efficient than U.S. bonds. Note that not hedging non-U.S. bonds increases risk

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<sup>10</sup> The reasoning behind such an estimate is that real interest rates (nominal rates less inflation) are fairly stable through time and across currencies, and it is these rates that drive bond returns in the long run.

dramatically, as the bond returns inherit the volatility of the underlying currencies. The hedging decision is addressed in a following section.

**Exhibit 15: Sharpe Ratios – U.S. and Non-U.S. Bonds, Stocks  
January 1987 – December 2001**

	US Treasury Bills	Non-US Govt Bonds <sup>1</sup>	Non-US Govt Bonds Hedg <sup>1</sup>	Broad US Fixed Income <sup>2</sup>	10-Year US Treasuries	Large US Stocks <sup>3</sup>	International Stocks <sup>4</sup>
Annualized Return	5.5%	5.6%	8.1%	8.6%	8.1%	14.4%	4.6%
Annualized Standard Deviation	0.5%	9.2%	3.3%	4.0%	6.6%	14.2%	17.1%
Sharpe Ratio	N/A	0.02	0.82	0.79	0.39	0.63	(0.05)

<sup>1</sup> JP Morgan Non-US Govt Bond Index, Hedged or Unhedged  
<sup>2</sup> Lehman Aggregate Bond Index  
<sup>3</sup> S&P 500 Index  
<sup>4</sup> MSCI EAFE Free Index

Source: JP Morgan, Lehman Brothers, Standard & Poors, Morgan Stanley  
The Sharpe Ratio is a measure of return per unit of risk. It is calculated as: (Return of Asset Class – Return T-Bills)/Standard Deviation of Asset Class Returns.

**Correlation with other assets**

An attractive quality of non-U.S. fixed income is its relatively low correlation with other fixed income sectors and with both U.S. and foreign equities. Low correlations make it more likely that an allocation to non-U.S. bonds would reduce overall portfolio risk. Exhibit 16 below shows the long-term historical correlations of non-U.S. bonds with other asset classes. Although historical correlations have been low, the risk that such trends may not continue must be considered.

**Exhibit 16: Correlation of Non-U.S. Government Bonds With Selected Asset Classes  
January 1988 - November 2001**

	Non-US Govt Bonds	Non-US Govt Bonds Hedg <sup>1</sup>	Broad US Fixed Income	10-year US Treasuries	Large US Stocks	Broad US Stocks	International Stocks
Non-US Govt Bonds <sup>1</sup>		0.304	0.280	0.319	0.067	0.045	0.453
Non-US Govt Bonds - Hedged <sup>1</sup>	0.304		0.590	0.589	0.293	0.263	0.268
Broad US Fixed Income <sup>2</sup>	0.280	0.590		0.964	0.319	0.284	0.143
10-Year US Treasuries	0.319	0.589	0.964		0.258	0.213	0.088
Large Stocks <sup>3</sup>	0.067	0.293	0.319	0.258		0.980	0.578
Broad Stocks <sup>4</sup>	0.045	0.263	0.284	0.213	0.980		0.582
International Stocks <sup>5</sup>	0.453	0.268	0.143	0.088	0.578	0.582	

<sup>1</sup> JP Morgan Non-US Govt Bond Index, Hedged or Unhedged  
<sup>2</sup> Lehman Aggregate Bond Index  
<sup>3</sup> S&P 500 Index  
<sup>4</sup> Wilshire 5000 Stock Index  
<sup>5</sup> MSCI EAFE Free Index

Source: JP Morgan, Lehman Brothers, Salomon Smith Barney, Standard & Poors, Wilshire Associates, Morgan Stanley

**Hedged or Unhedged?**

At this time, the SBI is not strategically hedging its international equity exposure. One reason for this approach is due to the significant costs associated with active hedging (20-30 basis points per year). Furthermore, there is a belief that such hedging is not needed over sufficiently long investment horizons, where the net return impact of currency fluctuations is

expected to be zero.<sup>11</sup> In addition, currency-hedged international investments, both equity and fixed income, are more highly correlated with U.S. stocks and bonds, and therefore do not offer the same attractive risk-diversifying benefits as unhedged investments. These factors do not preclude an individual manager from hedging *opportunistically*. Indeed there are times when hedging a specific currency makes sense despite the associated cost. However, his or her benchmark would be unhedged to reflect the strategic bias to not hedging. Staff believes the same non-hedging policy should be applied in the case of international fixed income investments.

### **MSBI Experience: Morgan Stanley Investment Management**

MSBI has since late-1994 authorized an active fixed income manager, Morgan Stanley, to invest tactically up to 10% of the manager's portfolio in non-U.S. bonds. Over the 7-year period ended September 2001, the manager has added 12 basis points of annualized incremental return above the Lehman Aggregate Index. Nearly all of the incremental return came from the sector decision, i.e. the decision to invest outside the U.S. market. This experience, although limited, demonstrates that a non-U.S. allocation can add value to the fixed income program.

### **Cost Considerations**

Cost issues for an allocation to non-dollar debt are minimal. From a fee perspective, management fees do run about twice the average fee for a U.S. Core mandate (36 bp/year versus 15 bp/year). Custody expenses would be unaffected, however, there is the potential for lost securities lending income if the SBI does not wish to pool its non-dollar bond collateral with other lenders.<sup>12</sup> While legal issues could arise, staff expects these situations to be rare owing to the typically very high credit quality of non-dollar government issuers (A – AAA). Staff expects that the frequency of legal involvement would be the same or less than with the current U.S. Core portfolio. However, given the cross-border nature of these investments, it is likely that any legal issue that does occur would be more complicated than a similar issue occurring in the U.S. domestic market.

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<sup>11</sup> Currency fluctuations are essentially random with a long-run mean (expected value) of zero. Therefore the return impact from currency over long time periods should, in effect, net to zero. Essentially, if an investor can afford to wait out near-term volatility there's no compelling reason to hedge.

<sup>12</sup> The plan has typically required that all collateral associated with the plan's lending of securities be held separately from other lenders' collateral. This would not be possible in the case of non-dollar lending, since State Street runs all non-dollar lending out of a single euro-based collateral pool.

## Sector #3 - Emerging Market Debt

### **Market Definition and Background**

Emerging market debt ("EMD") refers to the sovereign and corporate debt of developing, or emerging, countries. The government and corporate bonds of such countries are generally considered *speculative* given the unique economic, political and other risks that face such nations as they develop their economies. The investment community considers EMD as distinct from other speculative fixed income such as U.S. corporate high yield securities because of its unique risk and reward characteristics.

Prior to 1989, the EMD market was dominated by large commercial banks with direct lending programs to emerging market countries. Throughout the 1970s, many fast-growing EM countries – particularly in Latin America – borrowed vast amounts of money from commercial banks to finance their continued expansion. Sophisticated commercial banks in the U.S., Europe and Asia were eager to lend to these emerging credits because of the significant yield premiums such loans could command, and out of their belief in the long-term credit worthiness of the EM economies. Also during this time, a market began to develop among the major banks to trade specific loans among themselves in an attempt to better diversify their exposures.

The economic slowdown of the late-1970s, combined with high interest rates and collapsing commodity prices, put a serious strain on the EM countries' ability to service their large debt burdens. By 1982, several countries, including Mexico and the Philippines, had defaulted on their loan balances; these countries and their lenders worked unsuccessfully for the following six years to come to agreement on a restructuring plan. Finally, in 1989 the U.S. government developed and helped finalize a major restructuring plan that came to be known as the Brady Plan, after its chief proponent then U.S. Treasury Secretary Nicolas Brady.

Under the program, non-performing loans were replaced with new, freely tradable bonds (called Brady bonds). A certain amount of the original loan balance was forgiven through a combination of below market interest rates on the new debt and/or a discount of the original principal amount of the debt. Lenders received a freely tradable asset whose principal and interest payments were partially secured by holdings in U.S. Government bonds. In return for debt relief, borrower nations agreed to certain financial and economic reforms.

The Brady Plan was very successful in several important respects. First, it allowed the participating countries to negotiate substantial reductions in their overall levels of debt and interest payments. Second, it succeeded in diversifying sovereign risk away from commercial bank portfolios to a more diversified set of investors throughout the financial and investment

communities. Third, it encouraged many Emerging Market countries to adopt and pursue ambitious economic reform programs. Finally, the Brady Plan has enabled many Emerging Market countries to regain access to the international capital markets for their financing needs.<sup>13</sup> Since the first Brady restructuring of Mexico's debt in 1990 more than 11 other nations have participated in the program. Exhibit 17 highlights the nations that have participated in Brady-type restructuring.

**Exhibit 17: Brady Plan Restructurings**

<b>Country</b>	<b>Year Completed</b>	<b>Country</b>	<b>Year Completed</b>
Costa Rica	1990	Bulgaria	1994
Mexico	1990	Dominican Republic	1994
Morocco	1990	Poland	1994
Venezuela	1990	Ecuador	1995
Uruguay	1991	Croatia	1996
Nigeria	1992	Panama	1996
Philippines	1992	Slovenia	1996
Argentina	1993	Peru	1997
Jordan	1993	Vietnam	1998
Brazil	1994		

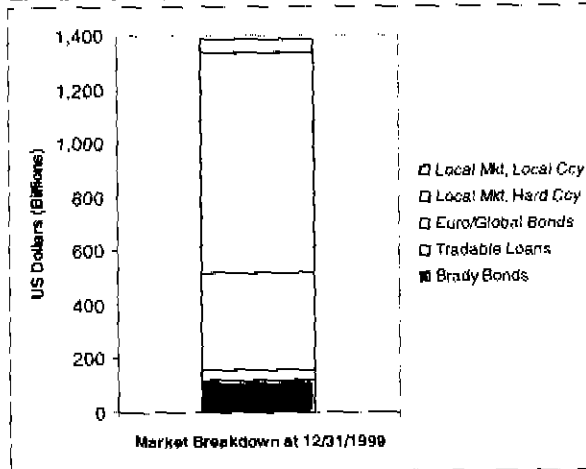
Source: Bloomberg, BradyNet.com

### **The EMD Market Today**

Since its formal beginnings with the Brady restructuring of 1990, the EM debt market has expanded both in terms of size and diversification. The market capitalization of the sector is now over U.S.\$1.4 trillion, with domestic debt making up 70% (U.S.\$966 billion) of the sector and external debt (U.S. dollar- or euro-denominated) making up about 30% (U.S.\$419 billion). The market is comprised of five major security segments, as outlined in Exhibit 18 below.

<sup>13</sup> Source: Bradynet.com

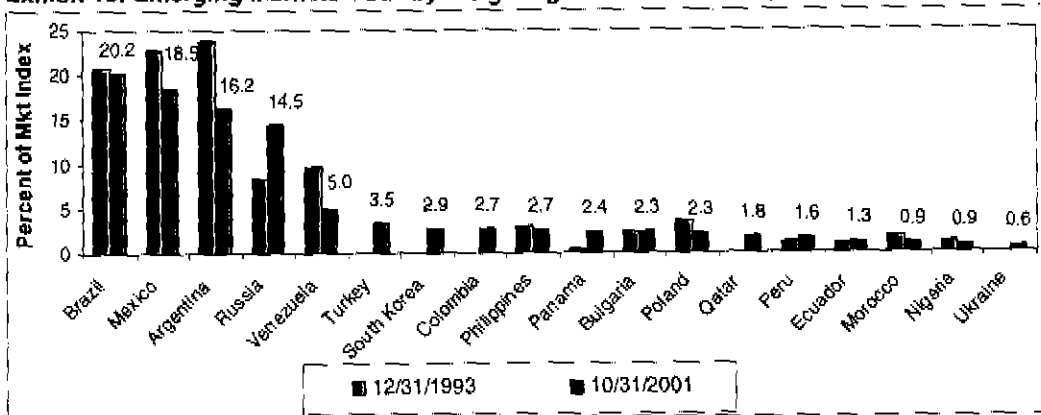
**Exhibit 18: Tradable EMD universe as of December 31, 1999**



Source: AIMR Core-Plus Bond Management Conference Proceedings October 2000, *Choosing the Plus in Core Plus*

Today's broad-based EMD indexes include bonds from up to 30 developing countries. In contrast, in December 1993 the dominant emerging markets index represented only eight countries. The diversification of the market can be seen in Exhibit 19. The exhibit also shows that the major economies of Latin America still constitute a significant portion of the market. As with the non-dollar asset class, EM corporate debt – issued in U.S.\$ or in local currency – is a growing part of the EM market.

**Exhibit 19: Emerging Markets Country Weightings as of October 31, 2001**



Source: JP Morgan (Emerging Markets Bond Index Plus "EMBI+")

Market liquidity is reasonably good, particularly in the benchmark, U.S. dollar-denominated issues of the larger countries. Market participants generally feel that the market in these bonds is more liquid than that for U.S. high yield corporate bonds. From a credit quality perspective, a large portion of the countries in the investable market is rated between BB to B by a major rating agency. However, there are an increasing number of crossover credits that

have achieved investment grade status, some earning as high as a BBB+ rating. The migration of certain EM issuers upwards in the quality spectrum has led to a more robust quality spectrum within EM debt. Exhibit 20 shows the credit quality of selected emerging markets.

**Exhibit 20: Credit Quality of Selected Emerging Market Issuers as of December 2001**

<b>Country</b>	<b>LT Issuer Rating</b>
<b><u>Investment Grade</u></b>	
South Korea	BBB+
Poland	BBB+
Qatar	BBB+
<b><u>Medium Quality - Speculative</u></b>	
Philippines	BB+
Colombia	BB
Panama	BB
Morocco	BB
Brazil	BB-
Mexico	BB-
Peru	BB-
<b><u>Lower Quality - Moderately Speculative</u></b>	
Russia	B+
Bulgaria	B+
Turkey	B-
Venezuela	B
Ukraine	B
<b><u>Poor Quality - Highly Speculative</u></b>	
Ecuador	CCC+
Argentina	CC
Nigeria	Not Rated

Source: Bloomberg

### **The Case for an Allocation to EMD**

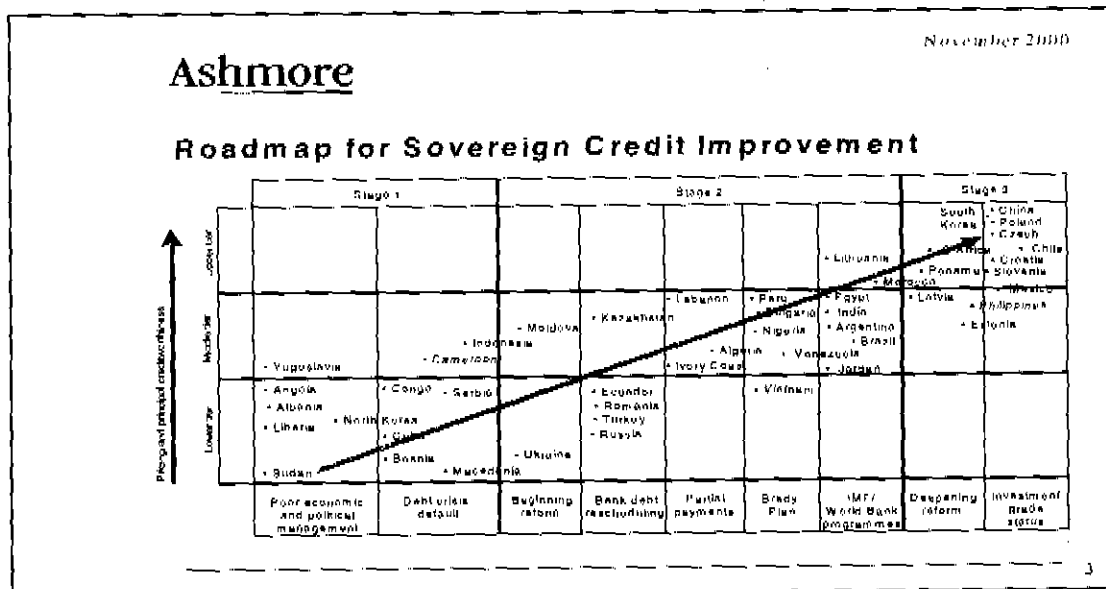
Investing in emerging market economies – in debt or equity securities – requires a healthy appetite for risk and a sufficiently long investment horizon. While the sector has shown enormous total return potential, the risk to principal and the volatility of investment returns over any specific horizon are equally formidable. Despite the amount of short-term or market risk present in the market, a case can be made for the addition of the asset class into a traditional fixed income portfolio.

### **EMD Investment Themes**

A common strategic investment theme behind an investment in EMD is that it is a pure play in the continued globalization of trade and financial markets, and the belief the fast-growing, developing economies will benefit most – on a relative basis with the rest of the world – from this continued integration. Empirical evidence suggests that as emerging economies move further into the mainstream in terms of trade, industrialization and market infrastructures their economies become less risky. In addition, the increased political stability that often results from a more solid economic footing also improves a nation's credit profile. Emerging market

investors hope to capitalize on this general trend toward improving credit quality. Exhibit 21 below plots selected credits at various stages in the development-creditworthiness cycle.

**Exhibit 21: The Sovereign Credit Improvement Cycle, November 2000**



Source: Ashmore Investment Management Limited

The credit quality of many EM countries has generally improved over the past decade, following the upward trend outlined in Exhibit 21. Defaults and restructurings have certainly occurred, but with less frequency than the countries' ratings would imply for a similarly rated U.S. corporation (.5% average annual default rate for EMD, 3.7% for high yield Corporates).<sup>14</sup> Unfortunately, the relatively short history of investable Emerging Market bonds (major EM indices were established in 1990) means that historical averages have limited usefulness in predicting future outcomes. Generally, however, market risk rather than default risk has dominated the risks associated with EMD. Market risk and event risk for EMD are closely related; both are caused by investor uncertainty and concern about world events and their impacts on emerging economies. This uncertainty often results in rapid and massive swings in prices for bonds, as investors rush to exit or enter a market that may be affected by the newest piece of news or data. Because of the uncertainty this volatility itself creates, investors typically demand extra compensation for investing in this sector. Investors who are able to tolerate sustained volatility may find the risk-reward profile of EMD compelling over long time periods.

<sup>14</sup> Source: Ashmore Investment Management Limited, Moody's Investor Service



## Risk and Return

EMD has provided equity-like returns over its history as an investable fixed income sector, posting annualized returns of 13.1% per year from 1990 to 2001. This compares with 7.6% for the Lehman Aggregate and 13.3% for the Wilshire 5000 index over the same period. In a recent study by Bridgewater Associates, emerging market bonds were shown to have returned 700 basis points per year over U.S. Treasuries for the period from January 1987 to December 1999.<sup>15</sup> Exhibit 22 shows the performance of EMD relative to other asset classes since the inception of major EMD indexes.

**Exhibit 22: Average Annual Returns of Selected Asset Classes**

	1990*	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001**	Annualized	
													5 Years	10 Years
Emerging Market Bonds	22.7	39.9	4.5	43.9	-16.4	26.8	34.6	18.9	-7.0	20.9	14.0	1.8	9.0	13.1
Lehman Aggregate	9.8	16.0	7.4	9.8	-2.9	18.5	3.6	9.7	8.7	-0.8	11.6	9.1	7.4	7.6
Non-US Govt Bonds, Hdgd	7.0	10.9	6.0	13.8	-5.1	18.2	12.2	11.3	12.1	2.5	9.7	6.9	8.5	8.8
US High Yield Bonds	-8.1	46.2	15.8	17.1	-1.0	19.2	11.4	12.8	1.9	2.4	-5.9	5.7	3.3	7.8
International Stocks	-4.4	12.2	-12.2	32.7	7.8	11.3	6.1	1.6	20.1	26.7	-14.2	-22.1	0.4	4.9
S&P 500 Index	-0.1	30.5	7.6	10.1	1.3	37.6	23.0	33.4	28.6	21.0	-9.1	-12.6	10.1	14.1

\* April 1990 - December 1990

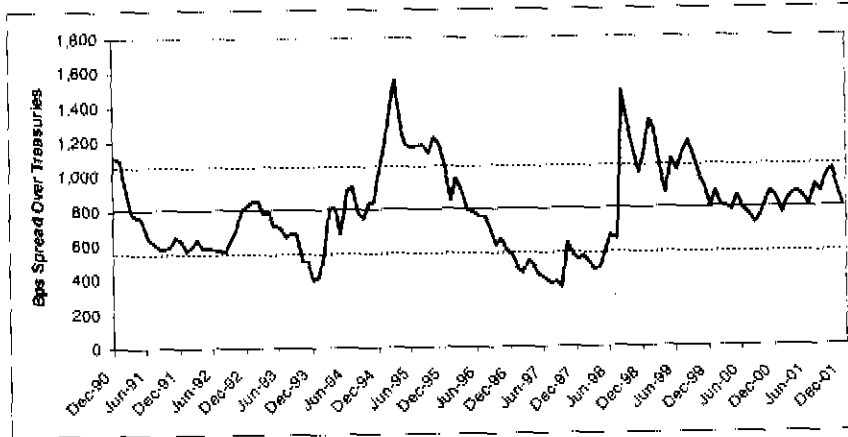
\*\* Year-to-date through November 2001.

Source: Salomon Smith Barney, Lehman Brothers, JP Morgan, Standard & Poors, Morgan Stanley

However, along with the strong returns the market has exhibited a tremendous amount of price volatility. As can be seen in Exhibit 23, the yield spread of emerging market bonds relative to U.S. Treasuries has traded within a wide range from +400 basis points to +1,600 basis points since 1991, with an average spread of 803 basis points. This underlying price volatility resulted in an average annual standard deviation of returns for EMD of 15.4%, about four times that of the Lehman Aggregate and more than both the S&P500 and Wilshire 5000 equity indexes. However, despite the high volatility, EMD ranks among the most attractive asset classes – equity or fixed income – in terms of reward per unit of risk. Exhibit 24 compares the returns, risks and Sharpe ratios of various sectors and asset classes.

<sup>15</sup> Bridgewater Associates, "The Optimal Passive Bond Portfolio", January 2000

**Exhibit 23: JP Morgan EMBI Spread versus U.S. Treasuries**



Source: Bloomberg

**Exhibit 24: Return, Risk and Sharpe Ratios of Selected Asset Classes, April 1990 – November 2001**

	Three-Month Treasury Bill	10-Year Treasuries	Lehman Inv Grade Credit	Lehman High Yield	Emerging Market Bonds	S&P 500 Stocks	Wilshire 5000 Stock Index
Annualized Return	5.02%	7.95%	8.89%	9.23%	15.94%	13.45%	12.81%
Annualized Standard Deviation	0.36%	6.48%	4.64%	7.73%	15.41%	14.59%	15.01%
Sharpe Ratio	N/A	0.45	0.83	0.54	0.71	0.58	0.52

Source: Salomon Smith Barney, Lehman Brothers, Standard & Poors, Wilshire Associates

### **Correlation of Returns**

An important quality of emerging market bonds is their historically low, and sometimes negative, correlation with other fixed income sectors. Low correlations allow for the potential of EMD to reduce overall portfolio risk when combined with other sectors. Exhibit 25 shows the long-term historical correlations of EMD with selected sectors and asset classes. While the average long-term correlations of EMD with the Lehman Aggregate are low (25% correlated), this historical average may not persist in the future, both as emerging economies develop and with the continued advancement of economic globalization and integration. EMD return correlation to equities, however, has been higher. Over the time period in Exhibit 25, EMD exhibited a 53% correlation with U.S equities.

**Exhibit 25: EMD Return Correlations with Selected Asset Classes, April 1990 – November 2001**

	Emerging Mkt Bonds	Non-US Govt Bonds Hedged	US High Yield Bonds	Broad US Fixed Income	10-Year US Treasuries	Large US Stocks	Broad US Stocks	International Stocks
Emerging Market Bonds <sup>1</sup>		0.262	0.405	0.254	0.170	0.522	0.534	0.406
Non-US Govt Bonds, Hedged <sup>2</sup>	0.262		0.247	0.591	0.600	0.179	0.155	0.268
US High Yield Bonds <sup>3</sup>	0.405	0.247		0.387	0.280	0.501	0.534	0.319
Broad US Fixed Income <sup>4</sup>	0.254	0.591	0.387		0.955	0.258	0.238	0.143
10-Year US Treasuries	0.170	0.600	0.280	0.955		0.224	0.197	0.088
Large Stocks <sup>5</sup>	0.522	0.179	0.501	0.258	0.224		0.985	0.578
Broad Stocks <sup>6</sup>	0.534	0.155	0.534	0.238	0.197	0.985		0.582
International Stocks <sup>7</sup>	0.406	0.268	0.319	0.143	0.088	0.578	0.582	

<sup>1</sup>Salomon Smith Barney Brady Bond Index  
<sup>2</sup>JP Morgan Non-US Govt Bond Index, Hedged  
<sup>3</sup>Lehman High Yield Bond Index  
<sup>4</sup>Lehman Aggregate Bond Index  
<sup>5</sup>S&P 500 Index  
<sup>6</sup>Wilshire 5000 Index  
<sup>7</sup>MSCI EAFE Free Index

Source: Salomon Smith Barney, JP Morgan, Lehman Brothers, Standard & Poors, Wilshire Associates, Morgan Stanley

### **Cost Considerations**

Introducing an allocation to emerging market debt into the fixed income program may result in additional costs to the program. These potential costs can be grouped into the three categories: increased fee expenses, lost securities lending income, and increased legal work.

*Increased fee expenses* – Investment management fees for an EMD product average about 4 times more than for a U.S. Core mandate (65 bp/year versus 15 bp/year).<sup>16</sup> This additional cost would be incurred if a specialist EMD manager were hired to manage a sector portfolio. Custody fees from the MSBI's custodian, State Street Bank, are based on a flat-fee scale. However, the current contract contains language limiting the SBI's investment in so-called Group E emerging market countries. The limits are based on transaction volume as well as total value of assets invested in these countries.<sup>17</sup> Based on the composition of the JP Morgan Emerging Markets Bond Index Plus (EMBI+), Group E countries are approximately 35% of the publicly traded EMD market. Based on a hypothetical portfolio allocation to EMD of 5% of fixed income assets (approx. \$450 million), the market value cap for Group E countries could be an issue. Exceeding this cap will result in additional custody expense.

*Lost securities lending income* – EMD securities do not participate in State Street's securities lending program. Since funding for an allocation to EMD would come from other lending-eligible fixed income securities, an EMD allocation will reduce the program's overall income from securities lending.

<sup>16</sup> Source: Investorforce.com and MSBI staff.

<sup>17</sup> Group E country limits are 3,000 transactions/year and total asset value of \$200 million. Source: State Street Bank, Boston MA.

*Increased legal work* – Investment in EMD securities is accompanied by the potential for credit events that impact the portfolio. These credit events, whether it is a default situation or a bond covenant issue, may require legal action. The program can expect and require a level of legal expertise and effort from its investment managers to aid in these situations, and to this end staff recommends that legal capabilities be a specific criterion for manager searches and evaluations as it relates to EMD. However, from a fiduciary perspective, relying solely on the manager's legal opinion and effort may not be sufficient. As a result, the program may need to work with the Attorney General's office to "budget" for additional legal resources if a significant allocation to EMD is considered.

## **SECTION TWO: DEVELOPING AN ALLOCATION RECOMMENDATION**

The above sections have provided background and insight into three extended sectors of the fixed income market. At issue is whether additional investments in these sectors will be of net benefit to the bond program. To answer this question, we need to understand the program's current allocation and address how further investment in each or all sectors will impact the expected risk and return profile of the program. We start with a qualitative approach, and then supplement with quantitative analysis from an optimizer program. The optimizer program takes certain assumptions about the risk, return and correlation of sectors and asset classes and develops a range of efficient portfolios, each with the lowest risk for a given level of return. For presentation purposes, in this section staff presents the median (or middle) risk portfolio within the range of efficient portfolios when discussing optimization results.

Simply put, the current fixed income program works. The program has an industry-accepted asset class target, the Lehman Aggregate, with a 50%-50% allocation of assets to *Core-Active* and *Core-Semi Passive* managers. The goals of the program are generally agreed to be:

- *To serve as a diversifier to equities*
- *To provide a deflationary hedge*
- *To achieve higher risk-adjusted returns than the asset class target*

From a performance perspective, the program has been successful, outperforming the Lehman Aggregate by 37 basis points per year, *net of fees*, since inception (1984) and exceeding the median TUCS plan sponsor over \$1 billion in size (top 40<sup>th</sup> percentile) over five years ending

September 30, 2001, the longest time period available. In addition, the program's Core fixed income profile means it is well positioned as a deflation hedge and as an equity diversifier.

So, why change? Indeed, the hurdle rate for changing or tweaking this successful program should be higher than for a program with less impressive historical results. That said, our review of the extended sector markets has shown that adding investments in each of the sectors to a Core bond portfolio has the potential to increase expected returns. At the same time, we've also shown that such investments have the potential to diversify a fixed income portfolio and lower overall risk. Exhibit 26 provides a brief recap of the sectors under consideration. The common themes among these sectors include diversification opportunity, enhanced return potential, and the fact that these sectors are increasingly mainstream markets. If it can be demonstrated that additional investment in extended sectors can reasonably be expected to produce higher expected returns with an acceptable level of incremental risk, staff believes that an increased allocation should be considered.

***Exhibit 26: Recap of Extended Asset Classes Under Consideration***

**High Yield US Corporate Bonds**

Major US market  
Increased return opportunity above core fixed income  
Higher risk  
Default losses are uncertain

**Non-dollar Bonds, including Government and Corporate Debt**

Huge worldwide market with vast opportunity set  
Currency risk must be addressed  
Similar return characteristics as US bonds, somewhat lower risk

**Emerging Markets Bonds**

Equity-like returns  
Low default risk, high market risk  
High levels of price and return volatility  
A bet on the continued globalization and harmonization of world economies

**Quantitative Analysis**

To construct a quantitative basis for our recommendation, staff conducted an optimization exercise similar to that used for previous asset allocation studies. An optimization analysis uses certain assumptions about the risk, return and correlation profiles of each asset class under consideration. The output from an optimizer is a set of unique portfolios consisting of specific weightings in each asset class. These portfolios represent the most efficient combinations of each asset at different overall risk levels; in other words, each portfolio produced by the optimizer maximizes expected return for each unit of expected risk.

Staff conducted the analysis to create hypothetical portfolios combining all of the extended sectors under consideration with Core U.S. bonds, and to simulate the effects of

adding investments in these sectors to the fixed income program. Initially, the optimizer was run with few "constraints" or limitations on the program's ability to allocate freely across the asset classes. In subsequent exercises, staff limited the maximum holdings allowed in each extended sector to constrain the expected tracking error of the hypothetical portfolios.

The basic assumptions used in the optimization exercise are summarized in Exhibits 28a-c below. The return, risk and correlation assumptions for each asset class were derived by staff using a combination of three elements: 1) long-run observable averages, 2) the key assumptions in staff's 1995 asset allocation study (See Appendix A), and 3) staff judgment regarding future expectations. Staff considers the investment horizon of the Combined Funds to be very long, stretching beyond 20 years. The long-run observable average returns and risks for key asset classes as published by Ibbotson Associates are presented in Exhibit 27.

**Exhibit 27: Long Run Historical Returns and Standard Deviations**

Sector	Beg Date	End Date	Average Annual Return (%)	Annual Standard Deviation (%)
Domestic Stocks - S&P 500	Jan-26	Dec-01	10.7	22.0
Domestic Stocks - Wilshire 5000	Jan-71	Dec-01	12.2	18.1
Int'l Stocks - MSCI EAFE Free	Jan-88	Dec-01	4.9	18.2
Domestic Bonds - LB Aggregate Bond	Jan-76	Dec-01	9.3	6.7
US High Yield Bonds - LB Hi-Yld	Jul-83	Dec-01	9.6	7.9
Non-US Bonds ML Non-US\$ Gvt Unhedged	Jan-86	Dec-01	8.9	11.5
Non-US Bonds - JPM US\$ Hedged Non-U.S. Gvt	Jan-86	Dec-01	8.3	3.9
EM Bonds - JPM-EMBI (Emerging)Composite	Jan-91	Dec-01	15.6	18.5
U.S. Inflation	Jan-26	Dec-01	3.1	1.9
U.S. 30 Day T-Bill	Jan-26	Dec-01	3.8	0.9

Source: Ibbotson Associates

Staff employed assumptions of 8% for both the expected nominal return and standard deviation of U.S. bonds. While these assumed values might differ from the observed value over a specific time period, staff believes that over the long run the assumed levels of risk and return are appropriate over a 20-25 year horizon.<sup>18</sup> Non-U.S. bonds were assumed to have no long-run premium above U.S. bonds, based largely on economic research that points to the fact that long run real interest rates across the developed world should be equivalent. Increasing return premiums were assigned to U.S. High Yield (1% premium over U.S. investment grade bonds) and EMD (1.5% premium over U.S. investment grade bonds). Again, the assumptions were assigned based on a combination of historical averages and staff judgment regarding future

<sup>18</sup> Given more recent market data (last 10 years), an argument can be made for a higher return assumption and a lower standard deviation assumption for US bonds. However, staff believes this would be in error because the past 10 years of generally falling interest rates have led to higher returns and lower volatility than can reasonably be expected to persist into the future.

expectations. The assumptions represent staff's best estimates based on our analysis. However, the assumptions may prove to be inaccurate over the long-term, resulting in investment performance that may differ from expectations. Alternatively, the assumptions may be accurate over the long run but over the near term performance and volatility of returns may diverge substantially from assumed long-run average levels.

**Exhibit 28a: Optimization Inputs – Long Run Return and Risk Assumptions**

	<b>Expected Return</b>	<b>Standard Deviation</b>
Broad US Bonds	8.0%	8.0%
Non-US Bonds, Unhedged	8.0%	11.0%
Non-US Bonds, Hedged	7.8%	7.0%
US High Yield Bonds	9.0%	10.0%
Emerging Market Debt	9.5%	17.0%

**Exhibit 28b: Optimization Inputs – Correlation of Long Run Returns Among Asset Classes**

	<b>Broad US Bonds</b>	<b>Non-US Bonds Unh</b>	<b>Non-US Bonds Hdg</b>	<b>US High Yield Bonds</b>	<b>Emerging Market Debt</b>
Broad US Bonds	-	0.45	0.75	0.50	0.25
Non-US Bonds, Unhedged	0.45	-	0.55	0.30	0.20
Non-US Bonds, Hedged	0.75	0.55	-	0.40	0.15
US High Yield Bonds	0.50	0.30	0.40	-	0.30
Emerging Market Debt	0.25	0.20	0.15	0.30	-

**Exhibit 28c: Optimization Inputs – Initial Constraints**

	<b>Min. Holding</b>	<b>Max. Holding</b>	
Broad US Bonds	0%	100%	
Non-US Bonds, Unhedged	0%	} 15% Combined Maximum	
Non-US Bonds, Hedged	0%		
US High Yield Bonds	0%	15%	
Emerging Market Debt	0%	15%	

**Exercise #1: Baseline With Minimal Constraints**

The first optimization exercise was constrained only with respect to the maximum allocation to each asset class. Exhibit 28c shows the initial constraints. The optimizer was not required to allocate a minimum amount to any asset class. The maximum percentage for the extended sectors was capped at 15% each to start. With these inputs, the optimizer constructed a range of optimal portfolios. The median risk portfolio is shown in Exhibit 29.

**Exhibit 29: Expected Outcomes from Optimal Portfolio Exercise #1**

<b>Exercise #1: Optimal Portfolio</b>	
Broad US Bonds	55.0%
Non-US Bonds (6% unhedged, 9% hedged)	15.0%
US High Yield Bonds	15.0%
Emerging Market Debt	15.0%
Expected Return	8.36%
Standard Deviation	7.29%
Sharpe Ratio	1.15

The optimizer “sold” 45% of the U.S. bond portfolio and “bought” 15% each of the U.S. high yield, non-dollar, and EMD sectors. The resulting portfolio gained 36 basis points of expected return, and risk (expressed as standard deviation of returns) *decreased* by 71 basis points relative to a 100% U.S. Core bond portfolio.

**Exercise #2: Real-World Constraints**

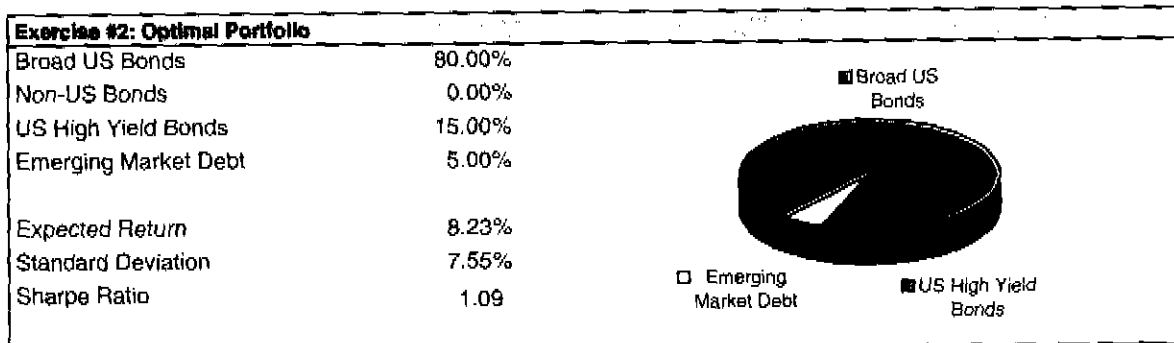
Exercise #2 added more realistic constraints on the maximum allocations to the extended sectors. First, an overriding constraint was established to cap the maximum combined allocation to all extended sectors at 20%; this effectively forced a minimum 80% allocation to Core U.S. fixed income. Furthermore, within the boundary of the 20% cap, EMD was limited to 5% of assets, and combined non-dollar (hedged and unhedged) was capped at 15%. U.S. High Yield was also capped at 15%. Despite lower allocations to the extended sectors, the optimal portfolio in Exercise #2 still provides 23 basis points higher yield than the base case portfolio and has 45 basis points less expected risk. Exhibits 30a and 30b review the constraints applied and expected outcomes of Exercise #2.

**Exhibit 30a: Optimization Constraints for Exercise #2**

	<b>Min. Holding</b>	<b>Max. Holding</b>	
Broad US Bonds	80%	100%	
Non-US Bonds, Unhedged	0%	} 15% Combined Maximum	
Non-US Bonds, Hedged	0%		
US High Yield Bonds	0%	15%	
Emerging Market Debt	0%	5%	



**Exhibit 30b: Expected Outcomes from Optimal Portfolio Exercise #2**



**Exercise #3 – Integrating With the Total Program**

The initial optimization exercises paint a picture of extended sector allocations as reducing risk and increasing expected return within the fixed income program. Naturally, the optimizer allocated significant assets to the EMD sector due to its higher relative return and its low correlation with U.S. fixed income, which resulted in risk diversification within the model. Upon review of the data, staff concluded that EMD and US High Yield might have been favored largely because of their low correlations with U.S. Core fixed income. This characteristic allowed the higher return of these asset classes to be “passed through” to the optimal portfolio, while the risk was mitigated by the low correlations. Unfortunately, if these lower correlations are not present in a total portfolio context, i.e. when equities are included, then the true benefits of an extended sector allocation may be less attractive. To test our concern, staff conducted a third optimization exercise that included the fixed income allocation and the entire program. Using the Combined Funds’ current policy asset allocation as a baseline portfolio, staff used the optimizer to build a range of efficient portfolios keeping the equity, alternative and total fixed income weightings constant but allowing for various combinations of Core fixed income, High Yield, Non-dollar and EMD sectors within the fixed income weighting. In essence, the analysis created an efficient sector allocation for fixed income while taking into account how the rest of the portfolio was invested. The assumptions used in the analysis, presented below in Exhibits 31a-c, were kept consistent with earlier exercises and with the assumptions used in staff’s 1995 asset allocation study (see Appendix A).

**Exhibit 31a: Optimization Inputs – Long Run Return and Risk Assumptions, Exercise #3**

	Expected Return	Standard Deviation
Domestic Stocks	11.0%	17.0%
International Stocks, Unhedged	11.3%	19.0%
Emerging Market Stocks	14.0%	23.0%
Private Equity	14.0%	23.0%
Real Assets	9.0%	12.0%
Yield-Oriented	10.0%	13.0%
Broad US Bonds	8.0%	8.0%
Non-US Bonds, Unhedged	8.0%	11.0%
US High Yield Bonds	9.0%	10.0%
Emerging Market Debt	9.5%	17.0%
Cash (U.S. T-Bill)	5.5%	3.0%

**Exhibit 31b: Optimization Inputs – Correlation of Long Run Returns Among Asset Classes, Exercise #3**

	Domestic Stocks	Int'l Stocks, Unhedged	Emerging Stocks	Private Equity	Real Assets	Yield Oriented	Domestic Bonds	Non-U.S. Bonds, Unhedged	U.S. HY Bonds	EMD	Cash - U.S. T-BILL
Domestic Stocks	-	0.45	0.30	0.50	0.30	0.45	0.35	0.10	0.55	0.50	-0.10
Int'l Stocks, Unh	0.45	-	0.30	0.15	0.25	0.30	0.20	0.45	0.30	0.40	-0.10
Emerging Stocks	0.30	0.30	-	0.00	0.30	0.00	-0.20	-0.20	0.30	0.35	-0.10
Private Equity	0.50	0.15	0.00	-	0.30	0.40	0.15	0.00	0.50	0.50	-0.10
Real Assets	0.30	0.25	0.30	0.30	-	0.15	0.20	0.10	0.20	0.25	0.30
Yield Oriented	0.45	0.30	0.00	0.40	0.15	-	0.60	0.00	0.20	0.20	0.20
Domestic Bonds	0.35	0.20	-0.20	0.15	0.20	0.60	-	0.45	0.50	0.25	0.10
Non-U.S. Bonds, Unhedged	0.10	0.45	-0.20	0.00	0.10	0.00	0.45	-	0.30	0.20	0.10
U.S. HY Bonds	0.55	0.30	0.30	0.50	0.20	0.20	0.50	0.30	-	0.15	0.10
EMD	0.50	0.40	0.35	0.50	0.25	0.20	0.25	0.20	0.15	-	0.20
Cash - U.S. T-Bill	-0.10	-0.10	-0.10	-0.10	0.30	0.20	0.10	0.10	0.10	0.20	-

**Exhibit 31c: Optimization Constraints for Exercise #3**

Asset Class/Sector	Min. Holding	Max. Holding
Domestic Stocks	44.6%	44.8%
International Stocks, Unhedged	12.0%	12.0%
Emerging Market Stocks	1.2%	1.2%
Private Equity	5.1%	5.1%
Real Assets	2.7%	2.7%
Yield-Oriented	1.0%	1.0%
<b>Broad US Bonds</b>	<b>17.0%</b>	<b>30.7%</b>
<b>Non-US Bonds, Unhedged</b>	<b>0.0%</b>	<b>10.0%</b>
<b>US High Yield Bonds</b>	<b>0.0%</b>	<b>10.0%</b>
<b>Emerging Market Debt</b>	<b>0.0%</b>	<b>1.5%</b>
Cash (U.S. T-Bill)	2.7%	2.7%

The results are presented in Exhibit 32 below. On a total program basis, the median risk optimal portfolio allocates 7.2% to the U.S. High Yield sector and 6.5% to the Non-dollar sector, and it achieves 7 basis points of incremental expected return. The portfolio has no allocation to EMD. Total portfolio risk increases by 13 basis points, to 10.94% per year. The increase in risk

is the result of increasing the allocation to an asset with a high equity correlation (U.S. High Yield) while at the same time reducing the allocation to an asset with good diversification qualities (U.S. Core). While the allocation to Non-dollar offsets this effect somewhat, the net result is increased portfolio risk. These results validate staff's concern about the conclusions drawn from the first two optimization exercises. Based on the last exercise, it is clear that equity correlations must be considered as a key driver of the overall risk/return potential of the extended sectors.

**Exhibit 32: Optimized Total Portfolio Versus Baseline Policy Asset Allocation**

		<b>Current</b>	<b>Optimal</b>	<b>Portfolio Difference</b>
<b>Domestic Stocks</b>		44.6%	44.6%	
<b>International Stocks</b>		13.2%	13.2%	
<i>Developed</i>	12.0%			
<i>EMD</i>	1.2%			
<b>Alternative Assets</b>		8.8%	8.8%	
<i>Private Equity</i>	5.1%			
<i>Real Assets</i>	2.7%			
<i>Yield-Oriented</i>	1.0%			
<b>Bonds</b>		30.7%	30.7%	
<i>US IG</i>	30.7%		17.0%	-13.7%
<i>US HY</i>	0.0%		7.2%	+7.2%
<i>International</i>	0.0%		6.5%	+6.5%
<i>EMD</i>	0.0%		0.0%	0.0%
<b>Cash</b>		2.7%	2.7%	0.0%
		100.0%	100.0%	
<b>Expected Return</b>		10.09%	10.16%	+ 7 bp
<b>Risk/Standard Deviation</b>		+/-10.81%	+/-10.94	+ 13 bp

**More or Less Risk? Assumption Risk and Tracking Error**

Both optimization exercises show that allocations to the more volatile U.S. High Yield and EMD sectors can actually reduce the bond portfolio's volatility over a long investment horizon. This outcome is due to the low return correlations assumed between the extended sectors and U.S. investment grade bonds (HY 50%, EMD 25%). As noted in earlier sections, the risk exists that such low correlations may not persist into the future; higher correlation of returns would translate into higher overall portfolio risk. Even more important, however, is that the low correlations to fixed income assets are accompanied by higher correlations to equities. The higher equity correlation can substantially change the relative risk profile of the extended sectors when viewed in a total portfolio context, making them net contributors to portfolio risk. This is particularly evident in the EMD sector.

Another way to view the risk of changing the program's allocation is to examine the historical tracking error of the proposed allocation relative to the program's current benchmark.

For the 11 ½-year period ended September 30, 2001, a hypothetical passive portfolio with the allocation presented in Exercise #2 (80% Core, 15% HY, 5% EMD) exhibited 1.54% of annual tracking error relative to the Lehman Aggregate index. This means that in any 12-month period, the performance of the Exercise #2 Portfolio fell within +/-1.54% of the performance of the Lehman Aggregate index about 67% of the time. About 33% of the time, the annual return difference is greater than +/-1.54%. It is important to note that this hypothetical portfolio is composed of index returns and therefore does not include active management risk. In practice, such a portfolio when actively managed would be likely to have even higher tracking error relative to the Lehman Aggregate Index.

In contrast, the current bond program exhibited 0.52% of tracking error (about one-third of the Exercise #2 portfolio's tracking error) versus the Lehman Aggregate over the same time period. Although the tracking errors compared here result from different sources, i.e. the hypothetical portfolio's tracking error comes from passive allocation to riskier asset classes while the current portfolio's tracking error comes from managers taking active risk within their portfolios, the results do point out the degree of fluctuation (or risk) that a portfolio as presented in Exercise #2 would create within the bond program relative to its historical experience.

### **SECTION THREE: TACTICAL VERSUS STRATEGIC**

Thus far, staff has presented research and analysis that point to the potential benefits of additional investment in three extended sectors of the fixed income market: US High Yield, Non-dollar and EMD. Each of the sectors considered were shown to be sizable, liquid markets offering unique risk and return opportunities relative to U.S. Core fixed income. The optimization analysis presented in this study concluded that the addition of U.S. High Yield and EMD to a U.S. Core bond portfolio is expected to have the most positive results in terms of increasing expected return and reducing overall bond portfolio risk. However, in a total portfolio context that recognizes the impact of return correlations relative to equities, the optimization analysis showed that the EMD sector was less attractive than the other sectors because of its tendency to add risk to the total portfolio. Alternatively, the Non-dollar sector was shown to have more value in a total portfolio context than initially predicted by a bond-only optimization.

In reaching its conclusion on the optimal program structure for the extended sectors in the bond program, staff considered the tactical option relative to a strategic, dedicated allocation approach. The strategic approach involves setting a dedicated allocation to one or more extended sectors. The allocation becomes fully strategic with the adoption of a new asset class

target that incorporates the extended sector allocation. Staff considered this approach, along with the concept of hiring dedicated sector managers to manage the strategic extended sector mandates.

In a strategic approach, the tradeoffs for the potential opportunity to add return and reduce long-term risk are near-term volatility relative to a U.S. Core portfolio, and the risk that future risk-return results for the extended sectors are less advantageous than assumed. In addition, the custody cost issues surrounding investment in certain EMD countries, as well as the potential for increased legal support for High Yield and EMD credit events must also be weighed against the potential added return. There are also costs associated with retaining new managers to manage assets in the extended sectors. The introduction of new managers presents the risk that the selected managers may fail to perform adequately relative to their benchmarks. In addition, if new managers or mandates are created, the program will face one-time transactions and other costs related to transitioning assets among managers and mandates. Finally, any potential for return enhancement and risk reduction within the fixed income program from investment in the extended sectors must be validated within the context of the total portfolio. Given the higher correlations of some extended sectors with equities, the benefit of risk reduction within the bond program could be lost if the bond program's usefulness as a diversifier to equities is reduced.

The strategic option was ultimately rejected, because the costs (management fees, custody expenses, legal costs, etc.) and risks (increased price volatility, default risk, geopolitical issues, liquidity, etc.) of the option were viewed to outweigh the expected benefit. In contrast to the strategic option, the enhanced tactical structure is low-cost and introduces minimal additional expected tracking error relative to the program's asset class target. Furthermore, the asset class target remains the Lehman Aggregate, which has performed well as an equity hedge since the program's inception.

#### ***Benefits of the Tactical Alternative***

Using tactical allocation has the potential to generate approximately 5 basis points of incremental annual expected return for the bond program. The main benefit of the enhanced tactical strategy is that it adds this incremental return with very little incremental cost. Besides being inexpensive, the proposed change is administratively simple since it requires no changes to the program's asset class target or to managers' benchmarks.

With a tactical allocation strategy, the allocation decision is dynamic and discretion rests with the program's investment managers. The decision to allocate to each sector is based on

the manager's judgment of the value the sector will provide over the investment horizon. This authority gives the managers the ability to rotate among more sectors of the market with the goal of finding value at the right times. This opportunity may be a source of value added separate from the benefits of a long-term (strategic) allocation.

### **Limitations**

Because not all of the program's managers have the expertise to invest tactically in the extended sectors, the tactical allocation alternative places limits on the program's maximum achievable allocation to these markets. A drawback of the tactical approach is that it relies on the abilities of the program's existing managers. Staff believes that all of the managers are capable and expects them to perform well in a core mandate, using their unique areas of expertise to outperform their Lehman Aggregate benchmark. However, they were selected for their abilities as Core managers. It is possible that some of the current managers do not have a specialist focus in one or more of the extended sectors and may not be authorized by the SBI to participate in the tactical allocation.

The enhanced tactical recommendation is affected by the potential for increased legal costs. Under the tactical approach, the bond program's maximum exposure to U.S. High Yield would be high enough that additional legal resources may be required from time to time to handle credit issues. However, limiting managers to only higher quality credits within the High Yield sector (BB and B rated issues) as part of their investment guidelines should minimize involvement in true default events.

## **SECTION FOUR: CONCLUSION**

Based on the qualitative and quantitative analysis, staff concludes that the potential benefits of an allocation to U.S. High Yield and Non-dollar are significant enough to justify additional investment. With respect to EMD, staff believes that the sector may offer an attractive risk-return profile. However, staff concludes that the EMD asset class is too volatile, and ultimately too equity-like, for it to be a good fit for a fixed income program among whose primary goal is equity diversification. Staff believes that EMD should not be included in the bond program at this time. Staff recognizes the potential risks that accompany an additional investment to the U.S. High Yield and Non-dollar sectors, including some increase in near-term volatility and the potential for underperformance. However, staff expects an additional

allocation, if properly executed, can add enough value to compensate for these risks over the long-term.

Based on these findings, staff recommends increasing the program's exposure to the extended sectors through the expansion of the tactical investment approach already in place for US High Yield and Non-dollar. The key factors in staff's conclusion include the relative low cost of the tactical approach, ease of implementation, and the prospect of some degree of increased performance without a significant increase in the costs and risks associated with a major shift towards a dedicated allocation.

**Implementation Approach: Recommendation**

Staff recommends the expansion of the program's overall exposure to the US High Yield and Non-dollar extended sectors through expanded use of the tactical investment strategy already in place. Specifically, staff proposes that the program's existing managers be allowed to invest a larger percent of their portfolio in one or more of these sectors. The SBI would conduct a detailed review of all of the managers to determine their ability to invest and add value in the extended sectors. This review may result in more of the program's existing managers being granted investment authority in one or more of these sectors. Exhibit 33 outlines a proposal for new tactical investment targets under this recommendation. Under the proposal, the tactical authority of active-mandate managers in U.S. High Yield and Non-dollar would be raised to 15% of each participating manager's total assets from 10% currently. To limit overall risk, a combined extended sector cap would be set at 20% of total portfolio assets. For the semi-passive managers, sector caps would be set at 5% each with a 10% maximum on the combined extended sector allocation.

**Exhibit 33: Tactical Guidelines Under Recommendation**

	Current Allocation		Proposed Allocation				
	Core	Tactical	Core	Tactical	Change	Tactical	Change
Broad US Bonds	100.00%		100.00%	<i>Active</i>		<i>Semi-Passive</i>	
Non-US Bonds	0.00%	10.00%	0.00%	15.00%	+5%	5.00%	+5%
US High Yield Bonds	0.00%	10.00%	0.00%	15.00%	+5%	5.00%	+5%
			<i>Combined Maximum</i>	20.00%		10.00%	

The fixed income asset class target would continue to be the Lehman Aggregate index. This is consistent with the tactical investment approach of this recommendation, which favors investment in broad U.S. fixed income unless the value offered by the other sectors is

particularly attractive. In addition, the Lehman Aggregate would remain the benchmark for all fixed income managers. A review of each manager's extended sector capabilities would take place.



**APPENDIX A: Basics, Post and Combined Funds Asset Allocation Review, July 1995**

**Exhibit A1: Risk/Return**

<b>Sector/Asset Class</b>	<b>Real Return*</b>	<b>Nominal Return**</b>	<b>Standard Deviation</b>
<b>Equities</b>			
Domestic Stocks	6.50%	11.00%	17.00%
International Stocks, Unhedged	6.75%	11.25%	19.00%
International Stocks, Hedged	6.55%	11.05%***	17.00%
Emerging Market Stocks	9.50%	14.00%	23.00%
<b>Alternative Assets</b>			
Private Equity	9.50%	14.00%	23.00%
Real Assets	4.50%	9.00%	12.00%
Yield-Oriented	5.50%	10.00%	13.00%
<b>Fixed Income</b>			
Broad US Bonds	3.50%	8.00%	8.50%
Non-US Bonds, Unhedged	3.50%	8.00%	12.00%
Non-US Bonds, Hedged	3.30%	7.8%***	5.00%
Cash Equivalents	1.00%	5.50%	3.00%
<b>Inflation</b>		4.50%	

\* Real Return = Nominal Return minus Inflation  
 \*\* Nominal Return is the long term (20+ years) expected return.  
 \*\*\* Unhedged Return minus assumed hedging cost of 20 basis points.

**Exhibit A2: Correlation Matrix**

	1	2	3	4	5	6	7	8	9	10	11
1 US Stocks	1.00										
2 Intl Stocks - Unh	0.45	1.00									
3 Intl Stocks - Hedg	0.60	0.80	1.00								
4 Emerging Mkts	0.30	0.30	0.30	1.00							
5 Priv Equity	0.50	0.15	0.25	0.00	1.00						
6 Real Assets	0.30	0.25	0.25	0.30	0.30	1.00					
7 Yield Oriented	0.45	0.30	0.35	0.00	0.40	0.15	1.00				
8 US Bonds	0.35	0.20	0.25	-0.20	0.15	0.20	0.60	1.00			
9 Intl Bonds - Unh	0.10	0.60	0.30	-0.20	0.00	0.10	0.00	0.40	1.00		
10 Intl Bonds - Hedg	0.30	0.20	0.40	-0.20	0.05	0.10	0.30	0.75	0.25	1.00	
11 Cash Equiv	-0.10	-0.10	0.00	-0.10	-0.10	0.30	0.20	0.10	-0.10	0.60	1.00

Source: Staff Position Paper approved at October 1995 SBI meeting. Attachment A: Assumptions Used in Simulations, page 11.

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**Currency Management  
in the SBI'S  
International Stock Program**

**Minnesota State Board of Investment  
Staff Position Paper  
August 1995**

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## Executive Summary

In September 1992, the State Board of Investment (SBI) adopted a position paper on international stock investing. That document outlined the rationale for international investing, reviewed a variety of investment management options and recommended an implementation plan for the initial stages of the Board's international stock program. This paper discusses one aspect of international investing, *currency management*, in greater detail.

For the purposes of this discussion, "currency management" means managing the foreign currency *exposure* in a portfolio of international stocks that a plan sponsor already holds. It does *not* mean allocating an additional percentage of the fund to a new asset class called "currencies".

Currently, the SBI's policy with respect to currency management can be summarized as "half managed" and "half unmanaged". The active international stock managers have the authority to hedge opportunistically/tactically when they believe it will add value or protect from loss relative to their benchmark, which is the Morgan Stanley Capital International index of Europe, Australia and the Far East (EAFE). The passive component which is indexed to EAFE, on the other hand, is "unhedged" at all times. That means no attempt is made to alter any of the currency exposure of the underlying stock portfolio and the portfolio is fully exposed to the currency impact associated with the rise and fall of the US dollar.

### Part 1: Background on Currency Issues

- There is no consensus among the experts on how a pension fund should approach currency management. The policies that plan sponsors choose will be highly dependent upon their individual views regarding currency management and particular constraints/needs of their respective retirement funds.
- Generally, securities are denominated in the currency of the country where they are issued. As a result, US investors incur foreign currency exposure at the same time they add international securities to their portfolios. The exchange rate in effect at the time of purchase affects the investor's initial cost in dollar terms. During the holding period, the exchange rate will move up or down from the rate in effect at the time of purchase. When those changes are translated back into dollars, the portfolio will register gains or losses solely due to the fluctuation in exchange rates during the holding period.
- The portion of portfolio returns due to currency translation back to the US dollar is called the "currency impact". (Return in US dollars = Local market return + currency impact). Currency impact can be positive or negative and can vary widely from year to year:

When the dollar *strengthens/appreciates*, the currency impact for US investors is negative and their portfolios will suffer currency *losses*.

When the dollar *weakens/depreciates*, the currency impact for US investors is positive, and their portfolios will generate currency *gains*.

- The currency exposure of an international stock portfolio can be altered by hedging. "Hedging" means selling an amount of foreign currency equal to the value of the underlying foreign stock. If a portfolio of international stocks were fully hedged, all the exposure to foreign currency would be converted to US dollars and exchange rate fluctuations would have no impact on returns measured in dollar terms.
- The SBI needs to make two distinct policy decisions with respect to currency management:

*Strategic/Constant Hedging.* Should the SBI hedge currency exposure at all times? This is a strategic decision that affects the risk profile of the total fund. Therefore, this decision should be made within the structure of the SBI's long term asset allocation policy.

*Tactical/Active Hedging.* Should the SBI attempt to move in and out of foreign currency exposure at particular points in time? This is a tactical decision that is similar to the decision to use or not to use active management. Therefore, the decision should be made based on a belief that tactical hedging provides an opportunity to add value to the policy benchmark.

## **Part 2: Decision on Strategic/Constant Hedging**

- Strategic/constant currency hedging can insulate international portfolios from the effect of currency fluctuations and thereby reduce the risk, or volatility of returns, associated with currency exposure. While expert opinions vary widely on this issue, research suggests that if a plan sponsor's international stock allocation is less than 20% of the total fund, constant hedging does not appear to generate significant risk reduction benefits for the total fund. Consequently, **staff recommends that the SBI reject constant hedging as long as the SBI's allocation to international stocks is less than 20% of the Combined Funds.** (Currently, the allocation to international stocks is 10% and the Asset Allocation Committee has recommended that the target be increased to 15%.) **If the SBI chooses to increase the allocation beyond 20% at some point in the future, the decision to employ a constant hedge should be re-examined.**
- The SBI's policy benchmark/asset class target should reflect the SBI's strategic policy decision with respect to currency. As a result, **staff recommends that the asset class target for the international stock program should remain the EAFE index, unhedged.**

### Part 3: Decision on Tactical/Active Hedging

- While staff does not recommend that the SBI employ a constant hedge at this time, tactical currency management remains an option. The goal of tactical hedging is to add value to a benchmark by increasing and decreasing exposure to particular currencies as they strengthen or weaken relative to other currencies. Tactical hedging adds value by hedging during periods of dollar strength/appreciation and not hedging during periods of dollar weakness/depreciation.
- Given the large impact that currency exposure can have on returns, staff recommends that the SBI consider tactical currency management alternatives for the entire international stock program. The goal of tactical currency management should be to add value to the currency component of the policy benchmark (i.e., the currency impact in the EAFE index measured in US dollar terms).

*Active Managers.* Currency management is one component of active international stock management. Generally, the SBI's active managers take a fundamental approach to currency management and make decisions with a two to three year time horizon in mind. Their currency views may be imbedded in their country and stock selection decisions or may result in an explicit decision to increase/decrease exposure to a particular currency through hedging activity. **Since currency management is already being addressed by the existing active managers, staff recommends that the SBI take no further action regarding currency management in this portion of the international program, at this time.** The SBI should, however, carefully evaluate the effectiveness of the managers' decisions with respect to currency in the future and determine if this type of currency management adds value to the program.

*Passive Manager/Index Fund.* As noted earlier, the currency exposure of the EAFE index fund is totally unmanaged. **Staff recommends that the SBI implement a tactical currency management program for the EAFE index fund only if it believes it can identify managers that will add at least 1 percentage point annualized, net of all costs, over time to the portfolio. If this goal is judged to be unrealistic or unattainable, the SBI should not proceed with a tactical currency program.**

### Part 4: Implementation Alternatives

- If the SBI chooses to implement a tactical hedging program for the EAFE index fund, two general approaches are available:

*Currency overlay*, where a manager uses a hedging program to alter the currency exposure of a portfolio without affecting the underlying securities. In currency

overlay, the manager is responsible for deciding when to hedge/not to hedge and executes the hedges on behalf of the client.

*Currency advisory relationships*, where one entity (usually an external firm) determines when to hedge/not to hedge, but another entity (usually the plan sponsor or custodian bank) is responsible for executing the recommended hedges.

- Currency overlay styles generally fall into two groups: a *forecasting approach* which attempts to anticipate the direction and level of exchange rates or a *systematic approach* which moves in and out of currencies in reaction to observable short term currency trends or fluctuations. Several of the firms offering currency overlay management also offer their services on an advisory basis as well. This means that essentially the same style options are available through currency overlay and currency advisory relationships.
- In general, currency managers do not have long track records (often no more than five years). As a result, it is difficult to say whether plan sponsors should have a high degree of confidence that tactical currency management can add value over time. The actual returns generated by some currency managers to date, however, are encouraging. In general, actual returns show that some currency overlay managers have been able to generate 2-3 percentage points value added annualized to the benchmarks selected by their clients. (It should be noted that unhedged benchmarks have not been widely used to date. Fully hedged or partially hedged benchmarks have been more common.)
- **If the SBI chooses to proceed with tactical currency management for the EAFE index fund, staff recommends that the SBI select a manager/advisor who utilizes a systematic approach to currency management.** There are two reasons for this recommendation. First, results from a systematic approach are more predictable and can be constrained with respect to the level of risk they entail. Second, a systematic approach would balance the more fundamental valuation/forecasting approaches used by the SBI's active managers and provide some measure of diversification with respect to currency management within the SBI's international program.
- While systematic currency management is expected to add value to the international program over time, it should be recognized that there is an element of "insurance" (i.e., protection against the negative effects of a rising dollar) associated with such a program. There will be times when the SBI will pay an "insurance premium" in terms of management fees and transactions costs without observable return to the portfolio because the negative event does not occur within the measurement period. This will impact the pattern of performance relative to an unhedged benchmark.

## Part 5: Recommended Structure

Staff believes that there is opportunity to add value through tactical currency management. Given the short history of most currency management approaches, it seems prudent to implement a program that has a simplified and relatively straightforward structure. If the initial program is successful, coverage could be expanded over time as experience with the program grows and actual results can be more thoroughly examined.

- **Currencies Included.** The program should be limited to currencies that comprise 5% or more of the exposure in the EAFE index. This includes: Japanese Yen, British Pound Sterling, German Mark, French Franc and Swiss Franc. Together, these five currencies comprise over 75% of the EAFE index. They are also the most liquid currencies in world markets.
- **Benchmark.** The benchmark for the program should be the unhedged return of the five currencies. The weights given each currency will be based on the proportionate weight in the underlying EAFE index and rebalanced on a quarterly basis.
- **Operating Constraints.** Hedging the above exposures back to the US dollar is the only type of hedge that should be authorized. Cross hedging and proxy hedging should not be allowed. Net long or short currency positions should be prohibited.
- **Authorized Instruments.** Currency positions should be implemented using currency forwards, options or futures. The manager should have the flexibility to use over-the-counter as well as listed/exchange traded instruments.

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## Introduction

In September 1992, the State Board of Investment (SBI) adopted a position paper on international stock investing. That paper outlined the rationale for international investing, reviewed a variety of investment management options and recommended an implementation plan for the initial stages of the Board's international stock program. This paper discusses one aspect of international investing, *currency management*, in greater detail.

It should be acknowledged at the outset of this discussion that there few clear cut answers to any of the issues that surround currency management. Neither the theoretical research among academics nor actual experience of investment professionals has been able to resolve such fundamental questions as:

- What drives currency movements?
- Are currencies a distinct asset class?
- Do currencies provide an opportunity to add value over the long term?

Given the disagreements about these topics, there is a notable lack of consensus among the experts on how a pension fund should approach currency management. The policies that plan sponsors choose will be highly dependent upon their individual views regarding currency management and the particular constraints/needs of their respective retirement funds.

The purpose of this paper is to provide background on currency issues and set forth a logical rationale for how the SBI should address currency management within the retirement portfolios under its control. As with all policies of the SBI, the recommendations presented here should be re-examined and re-formulated as circumstances change and experience grows.

Readers should note that there is a glossary in *Appendix A* which defines some of the terms used in the body of the paper.

### *Structure of the Current International Program*

As a prelude to the discussion of currency issues, it may be helpful to review the status of the SBI's current international program:

- The SBI began its international stock program in October 1992. At the present time, 10% of both the Basic Retirement Funds and the Post Retirement Fund (also referred to as the Combined Funds) are allocated to international equities. As of June 1995, the market value of this allocation was \$2.1 billion.
- The asset class target selected for the program is the Morgan Stanley Capital International Index of Europe, Australia and the Far East (EAFE). This index is market capitalization weighted and measured in US dollars, unhedged. "Unhedged" means that the benchmark index is fully exposed to changes in the value of the US dollar and will move up and down directly as the US dollar falls and rises in the currency markets.
- As a matter of policy, the Board has determined that at least one-half of the international allocation will be actively managed and the remainder will be indexed. As of June 1995, 50.2% of the international allocation is indexed to EAFE and 49.8% is managed by a group of 6 active managers. Currently, all the managers (both active and passive) use the EAFE index, unhedged, as their benchmark.
- The SBI's passive manager is State Street Global Advisers. They manage the index fund on a "full replication" basis (i.e., they include every stock in the EAFE index) and leave the portfolio "unhedged" (i.e., they do not attempt to alter any of the currency exposure of the underlying stocks).
- The active managers use varying approaches and were selected for the blend of their investment styles. Two managers (Baring International and Brinson Partners) manage active country/passive stock portfolios and focus on "top down" issues of country allocation and currency management. Two managers (Marathon Asset Management and Templeton Investment Counsel) concentrate on stock selection and are therefore considered primarily "bottom up" managers. The remaining two firms (Rowe Price-Fleming and Scudder, Stevens & Clark) use a combination of "top down/bottom up" in their approaches. Regardless of their style, each of the active managers has discretion to change the currency exposure of their respective portfolios, or "hedge opportunistically", when they believe that hedging will add value or protect against loss. This is a form of tactical currency management that is discussed in greater depth in Part 3 of the paper.



***Results to Date***

The SBI's decision to diversify internationally has been beneficial for the total portfolio to date. Comparative data since the inception of the international program in October 1992 are shown below:

<b>SBI Pools</b>	<b>1.0 Year 10/92 - 9/93</b>	<b>1.0 Year 10/93 - 9/94</b>	<b>0.75 Year 10/94 - 6/95</b>	<b>Annualized 2.75 Years 10/92 - 6/95</b>
<b>Int'l. Stocks</b>	<b>24.3%</b>	<b>11.9%</b>	<b>1.0%</b>	<b>13.2%</b>
<b>Dom. Stocks</b>	<b>18.0</b>	<b>1.7</b>	<b>16.7</b>	<b>13.0</b>
<b>Bonds</b>	<b>12.0</b>	<b>-3.5</b>	<b>11.6</b>	<b>7.1</b>

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## **Part 1: Background on Currency Issues**

### **What is currency?**

Simply put, currency is money. Money, in turn, can be defined as whatever people will accept as payment for goods and services or for settling debts. In most of the world today, money is comprised of notes issued by a central bank or governmental authority within a sovereign nation. The note itself has value only to the degree that its users have confidence in the issuer. Confidence in the issuer is affected by a variety of economic and political factors that are subject to change. As a result, the relative value of individual currencies will also fluctuate over time.

### **How are exchange rates established?**

The monetary units created by sovereign states vary (US dollar, Japanese yen, British pound sterling, German mark/, etc.). Exchange rates link one currency to another and establish the price of one currency in terms of another.

For much of the last century, exchange rates have been pegged to the value of another asset:

- Prior to World War I (c. 1880-1914), individual currencies were backed by the gold reserves of their respective states. The resulting "fixed gold standard" provided that each currency was stated in terms of the price of a specified weight of gold. Exchange rates were fixed by the ratio of the prices of different currencies for the same unit of gold. *Because currencies were backed by gold reserves, each currency could be redeemed for gold at the stated rate upon demand.*
- After World War II (c. 1944-1973), the major powers adopted what became known as the "fixed dollar standard" or "fiat money standard". Under the Bretton Woods Agreement of 1944, the price of US dollar was fixed at \$35 per ounce of gold and the prices of all other currencies were stated in terms of US dollars. The US dollar became the international reserve currency and it was the only currency that could be redeemed for gold upon demand.

Under a fixed rate regime, an investor's exchange rate risk was confined to official revaluation (raising the value) or devaluation (lowering the value) of a currency. Since revaluation or devaluation was expected to occur very rarely, fixed rate regimes were thought to foster international economic stability which, in turn, was considered to be a prerequisite for the expansion of world trade and world-wide economic growth.

Though they may have been beneficial to international trade, over time, fixed rate regimes became incompatible with domestic economic goals of key nations in the fixed rate systems. In 1914, Britain was the first to opt out of gold standard when the costs of the war effort forced them to borrow heavily. In 1971, the US unilaterally suspended the convertibility of the US dollar into gold when its expansionist monetary policies could no longer support the fixed rate regime. While efforts were made to revive fixed rates, they were unsuccessful and exchange rates were fully floating against the US dollar by 1973.

For the last two decades (c. 1973 to present), the world's major currencies have operated in a floating rate environment. Exchange rates move up and down, or "float", according to market forces. Over the long term, the level and direction of exchange rates appear to be influenced by a number of factors:

- differing rates economic growth
- differing rates of inflation
- interest rate differentials between countries
- comparative levels of trade deficit/surplus
- capital flows between countries
- political events

Since the markets are sensitive to the forces of supply and demand, the policies of central banks (e.g. the Federal Reserve in the US, Bundesbank in Germany, the Bank of England in the UK) which control the money supply within a country are very important to the currency markets. Central banks also play a large role in determining the level of interest rates within a country, another important variable in the level of exchange rates.

Exactly how these factors interact and what best explains currency movements in today's markets are matters of continuing and substantial debate. Some of the more prominent

theories are described in section entitled "What theories are used to explain exchange rate movements?"

*Figure 1* shows the changing values of the US dollar against the yen, deutschmark and pound sterling from 1960 to 1991 and covers the last portion of the fixed dollar standard and most of the floating rate era. Over the entire period, the US dollar appreciated/gained value at a rate of 1.27% annualized against the pound sterling. It depreciated/lost value against the deutschmark and yen at annualized rates of 3.27% and 3.11% respectively (1).

While the graph clearly displays these long term trends, it also shows that there have been pronounced, multi-year periods when these longer term relationships have not held. For example, from 1979 to 1984, the dollar appreciated relative to both the yen and deutschmark and since 1984 the dollar has generally depreciated relative to all three currencies. Even within these shorter periods, however, exchange rates have fluctuated both up and down.

**More information on the history of exchange rates is included in *Appendix B*.**

## **How are the currency markets structured?**

The currency markets are the largest financial marketplace in the world. With *daily* transactions of more than \$800 billion (2), they dwarf the activity of other markets and are the most liquid in the global marketplace.

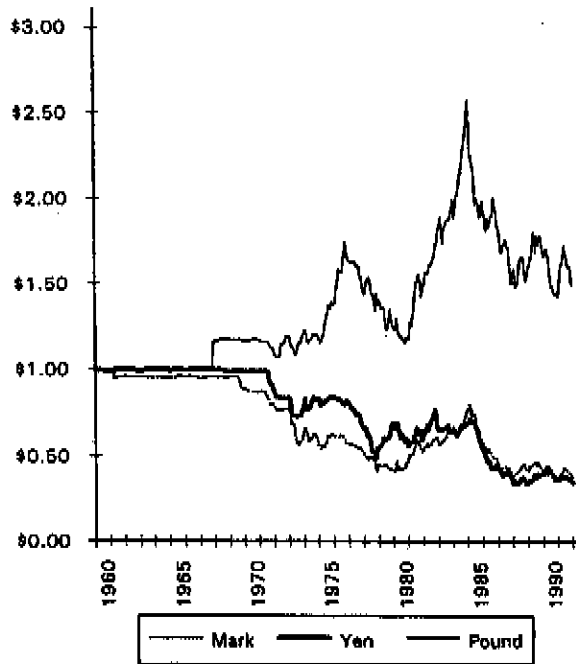
### ***Variety of Participants***

While foreign exchange markets originated to facilitate the conduct of trade between nations, the volume of imports and exports across all countries accounts for less than 2% of activity today. (See *Figure 2*.) In general, transactions in the currency markets fall into the following groups:

- **Cross Border Business Transactions.** These participants have bought or sold goods and need to translate the value of the transaction to another currency. All export and import activity would fall in the category. Buying or selling a financial asset between two countries, like stock or bond purchases, also requires foreign exchange transactions.

Figure 1

Value of US Dollar in Terms of Foreign Currency  
1960-1991

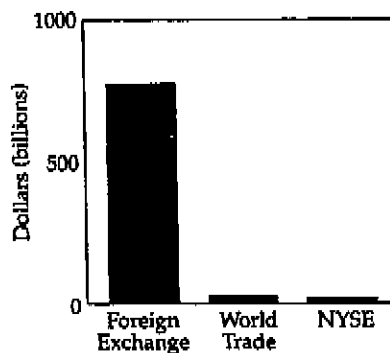


Value of U.S. dollar in terms of foreign currencies, 1960-1991 (1959 = 1). (Source: pre-1988 data from International Financial Statistics, various issues, published by the International Monetary Fund; data since 1988 are from The Wall Street Journal.)

Reproduced from: *Global Investing: The Professional's Guide to the World Capital Markets*, Ibbotson and Brinson, 1993, p.26.

Figure 2

Daily Trading Volume, 1992  
Foreign Exchange, World Trade and NYSE



Reproduced from: *Investing Worldwide V*, Association for Investment Management and Research, September 1994, p. 28.

- **Hedgers.** These participants want to eliminate the currency risk inherent in a portion of their business. For example, a German manufacturer selling in the US receives US dollars and uses the currency markets to lock in a mark/dollar relationship. Such participants are considered to be largely indifferent to the direction of currency movements and simply want to eliminate exchange rate risk from their business transactions.
- **Tactical Players.** These participants have an opinion on the direction of exchange rates and come to the currency markets to make that bet. For example, a stock manager may hold Japanese stock for a US client but believes that the value of the yen is likely to decline relative to the US dollar. The manager would use the currency markets to reduce or remove the yen exposure in the portfolio by selling yen and buying US dollars. Here the motivation is to add value to the underlying stock portfolio in US dollar terms.
- **Central Banks.** The interest of central banks centers on maintaining stable exchange rates which, in turn, facilitate global trade. Typically, they will intervene in the currency markets when a shock to the system is causing unacceptable levels of exchange rate volatility. By buying or selling currency at various points in time, they can help dampen the effects of these market disturbances. Their motivation is to maintain relative price stability, not to generate profits.
- **Foreign Exchange Market Makers.** These participants stand ready to buy and sell currencies at any time. They try to avoid overexposure to any one currency and earn a profit by capturing the difference between price to a buyer and seller associated with a currency transaction (bid/offer spread).

What is most notable is that, unlike stock or bonds markets, most transactions in the currency market are not profit motivated. This suggests that the market is inefficient from an investor's point of view. Further, since most currency transactions supply capital for only brief periods of time (a few hours to a few weeks), an investor who supplies capital for considerably longer time periods has had the opportunity to benefit from the trending nature of exchange rate movements.

### *Types of Transactions*

The currency market is known as an "interbank" market because transactions are made through a collection of banks and other financial institutions. Traders canvass these institutions looking for the best prices on behalf of their clients. With computer linkages around the globe that allow constant monitoring and trading, the currency market is very price competitive. Bid/offer spreads are considerably lower than the spreads associated with stock or bond transactions.

Most currency transactions take place using *spot rates* (the price for immediate delivery) or *forward rates* (the price for delivery at a specified date in the future). These physical contracts account for the preponderance of the turnover in the currency markets. *Options* (the right but not the obligation to buy or sell at a specified price and time in the future) comprise a much smaller portion of the daily volume but are still used quite widely. Other instruments (futures, swaps and synthetics) are available but the large size of most currency transactions dictate the use of spot rate contracts, forward rate contracts and options. *Figure 3* shows the daily liquidity of the most common currency hedging instruments. Trading characteristics of hedging instruments are shown in *Figure 4*.

### **What theories explain exchange rate movements?**

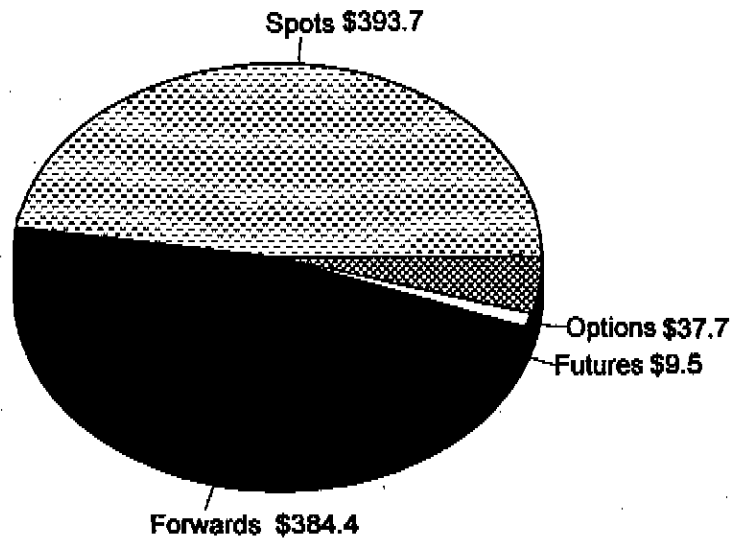
Several theories have been developed to explain or predict the movement of exchange rates. The two most commonly referred to are purchasing power parity and interest rate parity (3):

- **Purchasing power parity (PPP).** This theory focuses on differing inflation rates between countries and is based on the economic principle or "law of one price", i.e., that identical goods should be priced identically. It proposes that, over time, exchange rates will adjust so that the cost of similar goods and services will be the same whether paid for in local or foreign currency. As a result, PPP holds that exchange rates will move in a way that will offset differences in inflation rates between countries. The currency of a country with high inflation relative to another country should depreciate and the currency of a country with low inflation should appreciate. (4)
- **Interest rate parity.** This theory focuses on interest rate differentials and says that, over time, exchange rates will adjust to offset the difference in the level of interest



**Figure 3**

**Daily Liquidity of  
Currency Hedging Instruments  
(billions of dollars)**



Data Source: *Central Bank Survey of Foreign Exchange Rate Market Activity*, Bank for International Settlements, March 1993, p.17.

**Figure 4**

**Characteristics of  
Currency Hedging Instruments**

<i>Type</i>	<i>Bid/Offer Spread (in Basis Points)</i>	<i>24-Hour Trading Availability</i>
Spot and Forwards	3+	Yes
Options	10+	Yes
Futures	5+	No
Currency Swaps	10+	Yes
Synthetics	50++	No

Data Source: *Investing Worldwide V*, Association for Investment Management and Research, September 1993, p. 29.

rates between countries. The currency of a country with high interest rates relative to other countries should depreciate and the currency of a country with low interest rates should appreciate. (5)

While there is some empirical evidence that PPP and interest rate parity may hold over the very long term (perhaps 10 years or more), neither is particularly helpful in explaining exchange rate movements on a monthly or even yearly basis. *Figure 5* shows exchange rates and purchasing power parity of the dollar versus the yen, mark and pound sterling. While yen/dollar PPP and yen/dollar exchange rate both trend downward over the entire twenty year period, the relationship diverged dramatically for extended periods on several occasions. The graphs for mark/dollar and pound sterling/dollar show equally pronounced periods when PPP and exchange rates showed little correlation.

While it is difficult to construct a model that will satisfactorily explain shorter term movements in exchange rates, there is a growing body of literature that confirms that identifiable, and therefore exploitable, trends have persisted. (In statistical terms, these trends are said to exhibit autocorrelation and/or serial dependency). Based on daily, weekly and monthly data from seven major currencies since 1978, Ramaswami (1993) provided statistical evidence of non random patterns of movement lasting six months to three years or more. His work supports the earlier conclusions of Boothe and Grossman (1987), Diebold and Nerlove (1989), Liu and He (1991) and Kritzman (1993).

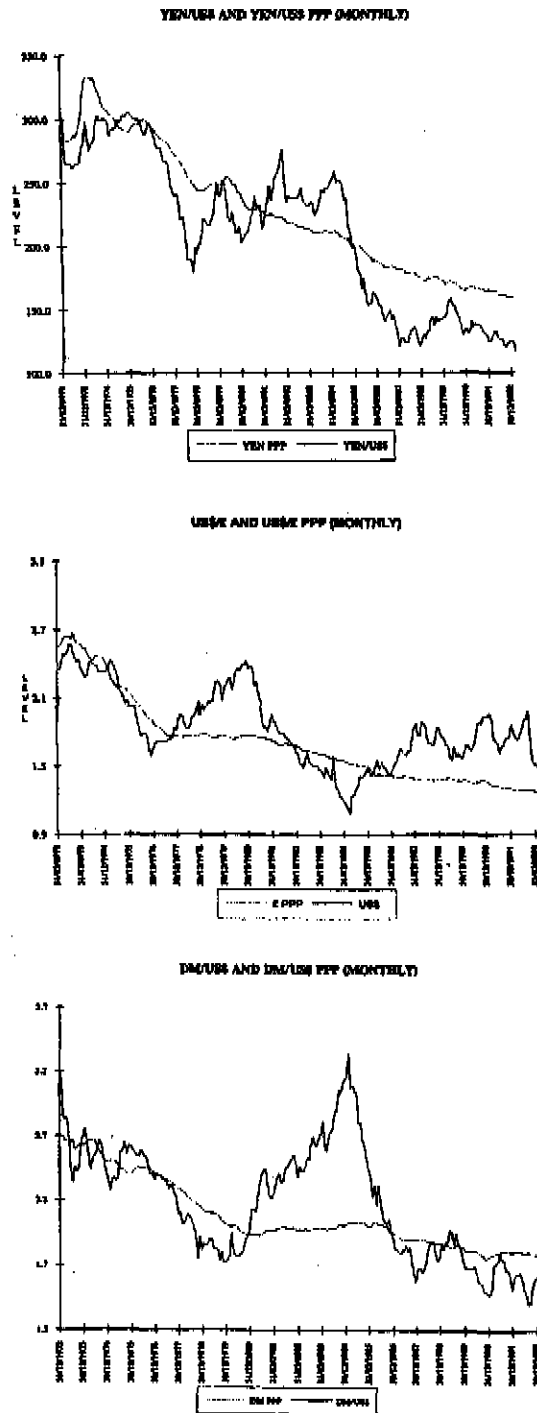
What accounts for these shorter term trends is not clear. The activity of central banks often is cited as one cause (6). Because stable exchange rates are more conducive to free trade, central banks typically intervene in the currency markets when exchange rates have been subject to unusual shocks (e.g. report of high and unexpected inflation). By buying or selling currency at such times, central banks help to dampen exchange rate volatility in the market place and thereby elongate currency trends. Market sentiment and momentum, whether substantiated by observable economic data or not, appear to play significant roles in short term trends as well.

### **What impact does currency have in an international stock portfolio?**

Generally, securities are denominated in the currency of the country where they are issued. As a result, investors incur foreign currency exposure at the same time they add

Figure 5

Comparison of Exchange Rates and Purchasing Power Parity  
US Dollar vs. Yen, Pound Sterling, Mark  
1972-1992



Reproduced from: *Understanding How Foreign Currency Affects International Equity Portfolios*, Baring International Investment Ltd., September 1993, Appendices.

international securities to their portfolios. The exchange rate in effect at the time of purchase affects the investor's initial cost in dollar terms. During the holding period, the exchange rate will move up or down from the rate in effect at the time of purchase. When those changes are translated back into dollars, the portfolio will register gains or losses solely due to the fluctuation in exchange rates.:

- When the dollar *strengthens/appreciates* relative to other currencies, US investors will suffer currency *losses* on their international portfolios.
- When the dollar *weakens/depreciates*, US investors see currency *gains*.

The difference between return measured in US dollars and return measured in local currency (i.e. the currency of the country where the stock was purchased) is the "currency impact". As shown in *Figure 6*, currency impact can help or hurt performance quite dramatically over a year-to-year basis.

### **Are stock market returns and currency movements linked?**

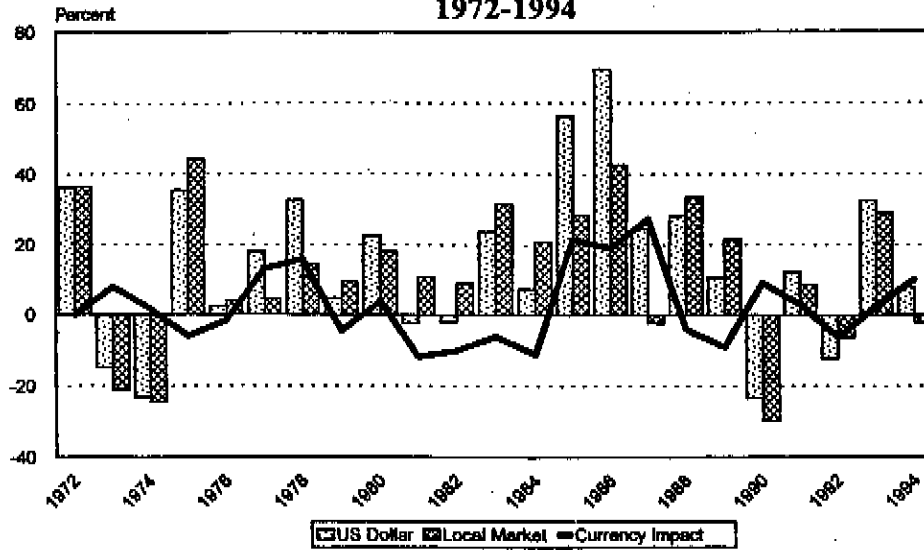
As the data in the previous section may suggest, currency impact and stock returns are not strongly linked. This is reflected in the difference between the economic forces that appear to affect stock values versus those that impact exchange rates:

- In broad terms, *stock values* often appear to be driven by domestic economic growth, corporate profits, payout ratios and comparative yields between stocks and long term bonds.
- As noted in prior sections of this paper, *exchange rates* seem to be influenced by larger international economic variables such as purchasing power parity, trade imbalances and central bank policies.

This narrative description is supported by statistical analysis. The data below displays the correlation of both monthly and annual returns from stock markets measured in local currency and the currency impact on a US investor are shown below. All of the correlations are close to zero which confirms that there is little or no correlation between the two sources of return:

Figure 6

EAFE Index Returns  
1972-1994



Year	US Dollar	Local Market	Currency Impact
1972	36.35%	36.41%	-0.05%
1973	-14.92	-21.13	7.87
1974	-23.16	-24.45	1.70
1975	35.39	44.07	-6.03
1976	2.54	4.10	-1.50
1977	18.06	4.34	13.15
1978	32.62	14.41	15.91
1979	4.75	9.57	-4.40
1980	22.58	18.04	3.84
1981	-2.28	10.79	-11.79
1982	-1.86	9.00	-9.96
1983	23.69	31.61	-6.02
1984	7.38	20.90	-11.18
1985	56.16	28.52	21.51
1986	69.44	42.46	18.94
1987	24.63	-2.27	27.53
1988	28.27	33.70	-4.04
1989	10.53	21.45	-8.99
1990	-23.45	-29.83	9.10
1991	12.13	8.70	3.15
1992	-12.17	-6.17	-6.39
1993	32.56	29.18	2.61
1994	7.78	-2.04	10.02
1995 Q1	1.86	-7.79	10.48
1995 Q2	0.73	0.48	0.25
1995 Q3	2.09	1.64	0.44
<b>Annualized</b>			
Last 3 yrs (1992-94)	7.86%	5.89%	1.86%
Last 5 yrs (1990-94)	1.50	-1.96	3.53
Last 10 yrs(1985-94)	17.55	10.16	6.71
Last 23 yrs(1972-94)	12.80%	10.29%	2.27%
Standard Deviation	23.46	20.49	11.08

**Local Market Return vs. Currency Impact  
Correlation Coefficients**

	<b>Monthly Last 23 Yrs. 1972-94</b>	<b>Annual Last 23 Yrs. 1972-94</b>	<b>Annual Last 3 Yrs. 1992-94</b>
<b>EAFE</b>	0.05	-0.17	0.08
<b>Germany</b>	-0.06	-0.29	-0.04
<b>Japan</b>	0.13	0.25	0.11
<b>UK</b>	-0.01	-0.24	-0.18

Source: Richards & Tierney based on data from MSCI

*Based on the preponderance of statistical evidence on this question, staff holds the consensus view that currency and stock returns are not strongly linked.*

**Are currencies a separate asset class?**

The lack of meaningful correlation between local market returns and the impact of currency over time supports of the view that currency should be treated and managed as a separate asset class. Opponents to "currency as a separate asset class" would argue that while there may be no correlation, there is also no expected long term return associated with holding foreign currency. As a result, they maintain, currencies should not be considered strategic assets like stocks and bonds.

For many years, the commonly quoted assumption has been that currency returns "will wash out" over a currency cycle, i.e., a currency may move up or down but will return to an equilibrium value. This view is consistent with purchasing power parity (PPP) and interest rate parity, the two prevailing economic theories concerning the factors that drive currency movements over the long term (see "What theories are used to explain exchange rate movements?" for more information). If this is the case, they argue, short term currency movements should be of little concern to a long term investor.

Do currencies return to their equilibrium value over time? Academic literature and actual experience raise doubts. If there is an equilibrium level it does not appear to be stable (Goodhart 1988). Further, if it does exist, it does not occur over a five year time frame

(Adler and Lehmann 1983). The dollar's long term appreciation against the pound and long term depreciation against the mark and yen (see *Figure 1*) also raise questions about the existence of an equilibrium value over time.

The lack of clarity about the nature of currencies has led some experts to classify currencies as "tactical assets" that can be used to take advantage of shorter term market opportunities. Layard-Liesching (1993) has characterized the differences between "strategic" and "tactical" assets in the following way:

- **Strategic assets** such as stocks and bonds have a stable risk premium and there is a high degree of confidence that the asset will provide positive returns over time. Strategic assets are typically evaluated in terms of risk/volatility versus return and positive returns are always assumed to be available from strategic assets over the long term.
- **Tactical assets** do not have a stable risk premium and do not offer intrinsic return. There is also a high degree of uncertainty whether positive returns will be available even over periods of three years or more. Tactical assets should therefore be evaluated in terms of the acceptable *loss* versus the percent of the return that could have been captured, *if* the opportunity for returns presents itself. The proviso is important because the opportunity to capitalize on tactical assets may not always be present.

*Staff's view is that currencies are not a separate asset class in the traditional sense, but they do exhibit a short term risk (especially risk of substantial loss) that should be explicitly managed. This view is consistent with the treatment of currencies as "tactical assets".*

### **What is currency hedging?**

Currency hedging reduces an investor's exposure to a currency that is present in a portfolio of non US assets such as international stocks. It is accomplished by buying and selling currencies through the currency markets using forwards, options and futures:

- *Hedging* is selling an amount of foreign currency equal to the value of the foreign stock in the portfolio. This reduces a US investor's exposure to that foreign currency.
- *Cross hedging* is selling an amount of foreign currency and buying a like amount of another foreign currency. This essentially trades exposure to one foreign currency for exposure to another.
- *Proxy hedging* uses a small number of currencies to approximate the behavior of a much larger group of currencies. For example, the twenty different currencies in the EAFE index can be approximated with varying combinations of a few major currencies: yen, pound sterling, mark, French franc, Swiss franc, and Australian dollar. (On June 30, 1995, these six currencies covered about 79% of the value of the EAFE index. Three currencies, yen, pound sterling and mark, covered about 65% of the index.) Proxy hedging can be more efficient and less costly than hedging each currency in a portfolio.

Typically, hedges allow an investor to use the currency markets to lock-in a fixed exchange rate for a period of time. At the end of the hedge, the investor will have a gain or loss from settlement of the forward contract (or other hedging instrument) that will offset the gain or loss due to currency impact in the stock portfolio being hedged:

- If the US dollar weakened/depreciated during the period, currency impact in the stock portfolio would be positive and the return from the hedge would be negative.
- Likewise, if the US dollar strengthened/appreciated during the period, currency impact in the stock portfolio would be negative, and the hedge would provide a positive return.

### **What is currency management?**

For the purposes of this discussion, "currency management" means managing the foreign currency *exposure* in a portfolio of international stocks that a plan sponsor already holds. It does *not* mean allocating an additional a percentage of the fund to a new asset class called "currencies".



The Board needs to make two distinct policy decisions with respect to currency management:

- *Strategic/Constant Hedging.* Should the SBI hedge its currency exposure at all times? This is a strategic decision that affects the risk profile of the total fund. Therefore, this decision should be made within the structure of the SBI's long term asset allocation policy.
- *Tactical/Active Hedging.* Should the SBI attempt to increase or decrease foreign currency exposure at particular points in time? This is a tactical decision that is similar to the decision to use or not to use active management. Therefore, the decision should be made based on a belief that tactical hedging provides an opportunity to add value to the policy benchmark/asset class target.

These concepts are discussed in greater detail in Part 2 and Part 3 of this paper.



## Part 2: Policy Decision on Strategic Hedging

### What is strategic hedging?

Strategic hedging involves hedging a constant proportion of foreign currency exposure at all times. It can be used to insulate an international stock portfolio from the effect of currency fluctuations and thereby reduce some of the risk associated with international investing.

The use of strategic/constant hedging has been heavily debated in recent years. While the risk reduction benefits can be significant, constant hedging will make international assets "behave" more like domestic assets and will therefore reduce the diversification benefit of including international stocks in a plan's asset allocation.

In order to come to some conclusion about constant hedging, it is advisable to ask two different questions:

- How does currency risk impact an international stock portfolio?
- How does constant hedging impact the risk profile of the total fund?

### How does currency risk impact an international stock portfolio?

The chart below shows the risk/volatility of both domestic and international stock portfolios during the floating exchange rate era beginning in the early 1970's.

**Risk in Stock Portfolios  
1972-1994  
Standard Deviation of Returns**

	(1) Local Stock Risk	(2) Currency Risk	(3) Total Risk	(4) 3:1
MSCI EAFE	±20.5%	±11.1%	±23.5%	1.15
Wilshire 5000	±17.5	none	±17.5	1.00

Sources: Richards & Tierney based on data from MSCI; Ibbotson Associations

The data illustrate several points:

- Currency risk alone (see column 2) is fairly high and is more than half the local market risk in an international stock portfolio.
- Because currency movements are not correlated with local market returns, total risk (see column 3) is much less than the sum of local market risk and currency risk
- Currency fluctuations associated with an unhedged international stock portfolio increased total risk by about 15% compared to a US-only stock portfolio (see column 4).

### **How does constant hedging impact the risk profile of the total fund?**

While the above data indicate that constant currency hedging could significantly reduce the volatility/risk of an *international* portfolio, the SBI's decision to constantly hedge all or a portion of its currency exposure should be made within the context of the risk profile of the *total fund*. At the total fund level, the impact of currency risk is considerably diluted due to the inclusion of other asset classes in the fund's asset allocation policy.

As noted earlier, the issue of how much of a pension plan's international exposure should be constantly hedged has undergone much debate. Unfortunately for plan sponsors such as the SBI, the opinions of experts differ quite widely on this topic. A sample of the varying points of view is presented below:

- Pernold and Schulman (1988) proposed that all investors should hedge 100% of their currency exposure at all times and measure performance against a hedged benchmark.
- Black (1989) also advocated that all investors should hedge the same fraction of their currency exposure at all times regardless of the composition of the underlying portfolio, but proposed that the resulting "universal hedge ratio" should be less than 100%.

- Lee (1990) argues that because currency returns vary significantly, the optimal hedge ratio should also vary from 0-100% and should be managed actively.
- Froot (1993) suggests that all currency hedging is counter productive for investors who evaluate performance over long time horizons.

Staff believes that the most practical approach to this question has been offered in separate studies by Nesbitt (1991) and Jorian (1989). Both suggest that the decision to hedge or not to hedge all currency exposure makes little difference in terms of *total fund* risk when international stocks comprise 10% or less of the total fund's asset allocation.

Nesbitt found that constant hedging reduces total fund risk by only 6 basis points with a 10% allocation to international stocks and by only 24 basis points at a 20% exposure. He also points out that due to the transactions costs associated with constant currency hedging, plan sponsors need to evaluate the risk reduction benefits of constant hedging in conjunction with the costs. He estimated that the likely range of costs for constant currency hedging is 0.25-0.50% annually. Using this data, he postulates the following "hedging rules" for plan sponsors with an average level of risk tolerance:

- Constant hedging will not be beneficial at international allocations below 5% of total assets.
- Constant hedging will be attractive at allocations of 10% only if hedging costs are on the low side of the cost estimate range.
- Constant hedging may be warranted at allocations above 15%, but not for 100% of the international exposure.

Each of the above percentages would be greater if the costs of constant hedging proved to be higher than Nesbitt's estimates. Other estimates put the transactions costs of constant hedging as high as 0.70% annually (7). In addition, Nesbitt appears to ignore any management fee that may be incurred to maintain the constant hedge and does not address any opportunity costs associated with cash flow demands of hedging. Nesbitt's rules also assume "an average level of risk tolerance" on the part of the plan sponsor. If a plan sponsor's risk tolerance were above average, this would also raise the percentages in Nesbitt's guidelines.

## **Should the SBI control currency risk through constant hedging?**

Staff finds the Nesbitt analysis very persuasive. The study presents sufficient data to support the conclusion that the SBI would not benefit from strategic/constant hedging until the international allocation grows well beyond its current level of 10% of the Combined Funds. Staff also believes that the SBI's long term asset allocation policy indicates a risk tolerance that is slightly higher than that of the average plan. As a result, staff concludes that constant hedging would not be beneficial for the Combined Funds until the international allocation reaches 20% or more.

**Staff recommends that the SBI reject strategic/constant hedging as long as the allocation to international stocks remains below 20% of the Combined Funds (the current allocation is 10% and the Asset Allocation Committee has recommended that the target be raised to 15%). If the SBI chooses to allocate more than 20% of the retirement funds to international stocks at some point in the future, the possibility of hedging a constant proportion of the currency exposure should be reconsidered and reevaluated.**

## **How should this decision be reflected in the SBI's policy benchmark?**

The SBI has chosen to include international stocks in its asset allocation strategy for the Combined Funds based on the diversification benefits they provide on a total fund basis. The analysis that supports that decision was based on the historical risk/return characteristics of the EAFE index, unhedged. As a result, the SBI's policy benchmark or asset class target for the international program has also been the EAFE index, unhedged since the inception of the program.

The policy benchmark should reflect the SBI's decision with respect to strategic/constant hedging. As discussed in the prior section, staff has not identified sufficient justification to introduce a constantly hedged policy position as long as the international allocation remains below 20% of the Combined Funds. As a result, the policy benchmark/asset class target for the international stock program should remain the EAFE index, unhedged.

**Staff recommends that the asset class target for the international stock program should remain the EAFE index, unhedged.**

### Part 3: Policy Decision on Tactical Hedging

#### What is tactical hedging?

While staff does not recommend that the SBI employ constant hedging at this time, tactical hedging remains an option. The goal of tactical hedging is to add value and/or protect against loss by increasing or decreasing exposure to particular currencies as they strengthen or weaken relative to other currencies. For a US investor, this amounts to a "bet" for or against the dollar. To maximize returns from tactical hedging, a US investor wants to be fully unhedged when the dollar is falling and fully hedged when the dollar is rising. Referring back to *Figure 6*, if all the negative currency impact from 1972-94 could have been avoided by fully hedging the portfolio during those years, an investor would have increased returns by nearly 4 percentage points annualized.

Is such foresight possible? Almost certainly not. As discussed in a prior section (see "What theories explain exchange rate movements?"), economic theories such as purchasing power parity and interest parity have only marginally predictive value over three to five year time frame. On a month-to-month or year-to-year basis, currency movements appear to be driven by a variety of economic, political and psychological variables whose interaction frequently defies prediction or forecast. Nevertheless, currency movements display shorter term trends that should be exploitable through tactical/active management. Investment approaches that capitalize on these trends offer the possibility to enhance returns or to protect against the likelihood of serious loss due to exchange rate movements.

Given their poor predictive value, staff has found very few currency managers who rely solely on fundamental valuations in their investment approaches. Nearly all include some form of technical analysis to discern and interpret the shorter term trends that often overwhelm the effects of a longer term cycle of currency appreciation and depreciation.

While the track records of tactical currency managers is relatively short, often not more than five years, the actual returns of some managers indicate that it has been possible to capture at least 2 percentage points value added annualized relative to the benchmark selected by the client. (It should be noted unhedged benchmarks have not been widely used to date. Fully hedged or partially hedged benchmarks have been more common.)

## Should the SBI use tactical hedging?

The SBI is already using tactical/active hedging for a portion of its international exposure:

- Each of the **active** managers has the authority to hedge opportunistically when they believe it will add value/protect from loss. Generally, the SBI's active managers take a fundamental valuation approach to currency and make decisions with a two to three year time horizon in mind. The currency views of "top-down" and "top-down/bottom-up" managers address currency explicitly as part of their investment process may be reflected in their country allocation/stock selection as well as an explicit decision to hedge currency exposure within the portfolio. While the "bottom-up" managers tend to avoid explicit hedging, a currency view is likely to be imbedded in their underlying stock selection decisions. As a result, the SBI's active international stock managers are using tactical currency management either explicitly or implicitly within their existing management processes.
- The **passive** component of the program, on the other hand, is totally unmanaged with respect to currency exposure. Given the large impact of currency (especially the negative impact during periods of dollar strength) staff believes that the SBI should consider tactical/active hedging for this portion of the portfolio as well.

Since the SBI initiated its international equity program in October 1992, the US dollar has generally depreciated relative to other currencies. This means that the SBI's decision to leave the indexed portfolio unhedged has been beneficial to overall returns to date.

If that is the case, why should the SBI consider changing its policy with respect to the EAFE index fund? As data in a prior section would suggest (see "What impact does currency have on portfolio returns?"), an unhedged/unmanaged stance is unlikely to be beneficial on a consistent basis. *So far*, the lack of attention to currency management in the SBI's EAFE index fund has not been detrimental. If the history of currency movements over the last 20 years is any guide, the SBI cannot count on that situation to continue.

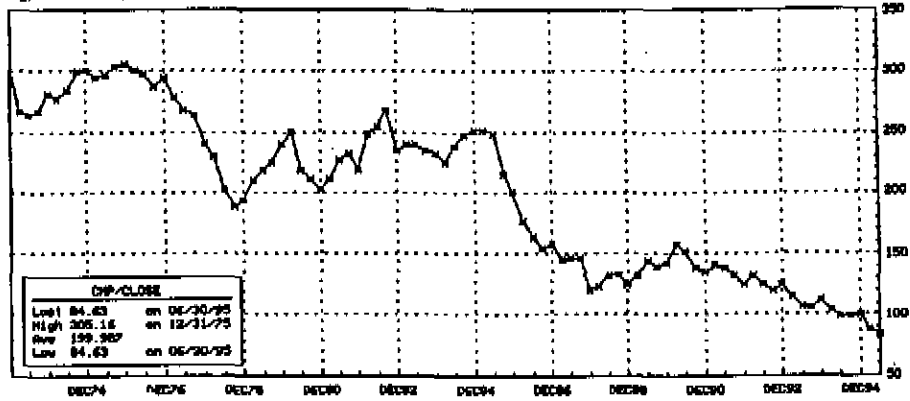
After reaching historic lows against major currencies in late 1994 and early 1995, the US dollar began to strengthen against the yen in July and August 1995 (see *Figure 7*). If the



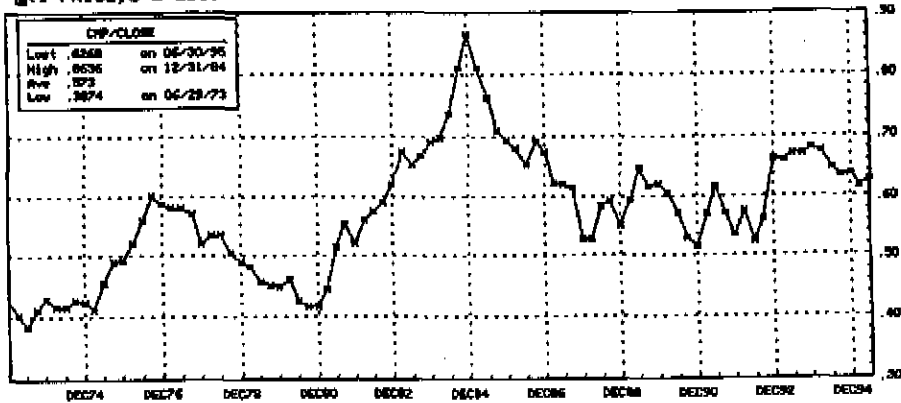
Figure 7

Spot Rate for Dollar vs. Yen, Mark, Sterling  
January 1973 - June 1995

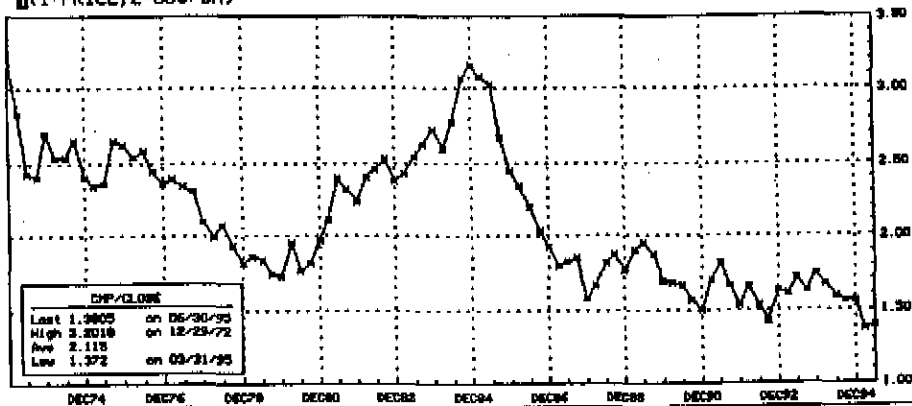
PRICE GRAPH for JPS JAPANESE YEN  
RANGE 12/29/72 TO 6/30/95 PERIOD 0 (D-U-M-Q-Y)  
1(1=PRICE, 2=US\$/¥)



GRAPH for BPS STERLING SPOT  
RANGE 12/29/72 TO 6/30/95 PERIOD 0 (D-U-M-Q-Y)  
1(1=PRICE, 2=L/US\$)



PRICE GRAPH for DMS DEUTSCHE MARK SPOT  
RANGE 12/29/72 TO 6/30/95 PERIOD 0 (D-U-M-Q-Y)  
1(1=PRICE, 2=US\$/DM)



Source: Bloomberg

US dollar continues to strengthen, the SBI could see much of the past gains due to currency impact disappear.

**Given the large impact that currency exposure has on returns, staff recommends that the currency exposure of the entire international program be explicitly managed. The goal of tactical currency management should be to add value to the currency exposure of the policy benchmark which is the EAFE index, unhedged.**

- **Since tactical currency management is already being addressed by the active managers, no change in policy is required for that half of the international stock portfolio *at this time*. The currency management capabilities of the existing managers should, however, be scrutinized in the future to determine whether their approaches to currency management are likely to add value over time.**
- **Since the currency exposure of the EAFE index fund is entirely unmanaged, staff recommends that the SBI consider introducing a tactical/active hedging program for the remaining half of the international portfolio.**

### **What goals should be established for a tactical hedging program?**

Based on the information and analysis presented in this paper, staff believes that a tactical hedging program for the EAFE index fund should have the following goals. They are listed in descending order of importance:

1. Avoid/minimize loss to the portfolio in periods when the dollar rises/strengthens relative to another currency or group of currencies.
2. Participate in gains available to the portfolio in periods when the dollar falls/weakens relative to another currency or group of currencies.
3. As a consequence of 1 and 2, reduce the volatility of returns associated with currency exposure in the underlying stock portfolio.

While attainment of these objectives should add value to the international program over time, it should be recognized that there is an element of "insurance" (i.e. protection against

the negative effects of a rising dollar) associated with tactical currency management. There may be times when the SBI will pay an "insurance premium" in terms of management fees and transactions costs without observable return to the portfolio because the negative event does not occur within the measurement period. (As discussed below, this will impact the pattern of performance relative to the benchmark selected by the SBI for its currency overlay program.)

### **What benchmark and return expectations are appropriate?**

The goal of the SBI's active management program for any asset class is for the active manager group, in aggregate, to add value to the policy benchmark or asset class target. It follows, then, that the goal of a tactical/active hedging program should be to add value to the currency component of the EAFE index, unhedged.

While this conclusion is consistent with the SBI's approach for active management of strategic assets such as stocks and bonds, its limitations for measuring the performance of a tactical hedging program need to be explicitly recognized:

- In general, a tactical hedging program will be unable to add much value to an unhedged benchmark during periods when the dollar is falling/depreciating because the benchmark itself reflects the optimal stance with respect to currency exposure. During these periods, even if the manager's currency position is "right", the manager is likely to underperform an unhedged benchmark due to the management fees and transactions costs associated with the investment approach (i.e., the "insurance premium" associated with currency management).
- Likewise, while tactical/active hedging should be expected to add value to an unhedged benchmark when the dollar is rising/appreciating, the extent of the value added will be dependent on the extent of the dollar's move relative to other currencies.

As a result, it may be necessary to evaluate performance differently during periods of dollar strength and dollar weakness as long as an unhedged benchmark is used for the tactical/active hedging program.

In order to address this measurement problem, some plan sponsors have elected to use a 50% hedged benchmark for their hedging programs. Theoretically, this benchmark should allow a manager to add value on a more consistent basis because the hedging program could move away from the benchmark (i.e., make measurable bets) under both dollar strength and dollar weakness.

**Staff recommends that the SBI use the EAFE index, unhedged as its benchmark for the tactical hedging program, *provided* that the SBI explicitly recognizes that a hedging program is likely to underperform that benchmark during periods of dollar weakness/depreciation.**

### ***Return Expectations***

Consistent with the objectives outlined above, staff believes the following return expectations are realistic for a tactical hedging program:

- During periods of dollar strength/appreciation, the manager should be expected to protect the portfolio against currency loss of 3 percentage points or more, annually.
- During periods of dollar weakness/depreciation, the manager should be expected to underperform the benchmark by no more than 3 percentage points, annually.
- Over a full cycle of strength and weakness, a tactical/active hedging program should be expected to add at least 1 percent point annualized to the return of the benchmark, net of all costs.

**Staff recommends that the SBI should not proceed with a tactical/active hedging program for the EAFE index fund if it appears the above expectations are unrealistic. Lower levels of value added will not be sufficient to justify the administrative effort needed to support the program.**

## Part 4: Implementation Alternatives

### What management options are available to the SBI?

If the SBI chooses to implement a tactical hedging program for the EAFE index fund, two types of programs are available:

- *Currency overlay management*, where a manager uses a hedging program to alter the currency exposure of a portfolio without affecting the underlying securities. In currency overlay, the manager is responsible for deciding when to hedge/not to hedge and executes the hedges on behalf of the client.
- *Currency advisory relationships*, where an external firm provides advice on when to hedge/not to hedge, but another entity (the plan sponsor, custodian bank or another investment manager) is responsible for executing the recommended hedges.

### What has been the experience with currency overlay?

Currency overlay is a relatively new phenomenon among US pension plan sponsors. The first publicly announced currency overlay program in the US was implemented in 1989. According to data from InterSec, US tax exempt investors had about \$25 billion in currency overlay programs as of June 1994. This equals about 11% of all international stock exposure among those investors (8). Generally, only the larger and more sophisticated funds currently employ currency overlay strategies. (See *Appendix C* for a list of plan sponsors known to use currency overlay programs).

While new to the plan sponsor community, banks and corporations have been managing the currency exposure of their corporate assets for some time. Not surprisingly, some of the currency overlay approaches in use today are based on the past experience of professionals in the banking and corporate treasury arena. In addition, some investment managers have historically held the view that currency and security decisions should be made separately. Several of those firms developed approaches to currency management for stock and bond portfolios that evolved into currency overlay products. As interest in currency overlay grows, firms that specialize in this area are becoming more common.

### *Style Groups*

Since the list of managers who provide currency overlay products is relatively short, obvious style groupings have not yet emerged and each manager's approach is somewhat unique. It is helpful, however, to think of managers lying somewhere on a continuum between two end points:

- **Forecast Approach.** These managers increase or decrease currency exposure based on their own forecasts of the direction and level of exchange rates. This approach is similar to the more traditional notion of active management for stocks or bonds. It includes an element of market timing that may be based on fundamental valuations, technical analysis, or both.
- **Systematic Approach.** These managers generally make no forecasts about the direction of currency movements or level of exchange rates and concentrate on avoiding potential loss due to the currency exposure of the underlying portfolio. They also expect to participate in the gains associated with currency depreciation. It would include managers who use options-based techniques and those who develop risk models specific to currency management.

Since the goal of either approach is to add value, both should be considered tactical/active currency management. The paths the managers take to that goal, however, will differ.

### *Historical Returns*

Currency overlay is relatively new and the performance histories of currency overlay managers are correspondingly short. It is unusual to find managers with verifiable track records based on managing "real" portfolios for much more than five years.

In general, the available data indicate that currency overlay managers have been able to add value during periods when the dollar is rising against other currencies. Managers appear to have a more difficult time generating value added during periods when the dollar is falling, especially when measured against an unhedged benchmark. (This is not surprising since it is difficult to surpass the returns generated by a totally unhedged stance when the dollar is weak.) Most currency overlay managers also appear to encounter difficulty when exchange rates move up and down in a relatively narrow range for an extended period of time.

Over an entire currency cycle, currency managers themselves state that they should be expected to provide at least 2-3 percentage points of value added annualized to the benchmark selected by the client. Defining just when the cycle begins and ends will, of course, be subject to debate and interpretation. How much value added is realistic to expect will depend, in part, on how much downside risk a plan sponsor is willing to endure over the short term. As with all investment approaches, the greater the short term risk/volatility, the higher the long term expected return.

### ***Management Structure***

Unlike other assets, there is not much room for style diversification within a currency overlay program. As a result, staff believes the following recommendations regarding management structure are appropriate:

- **No more than two (2) managers should be retained for the SBI's currency overlay program.**
- **If a single manager is selected, the manager should use a systematic approach to currency management. This is consistent with the primary objective of adding value by avoiding loss during periods of dollar appreciation. It will also produce a more predictable pattern of returns.**
- **If two managers are selected, one should have a systematic approach and the other should have an element of forecasting. This would provide some measure of style diversification. Two managers from the same end of the style continuum (i.e., both systematic or both forecasters) would be counterproductive.**

### **What has been the experience with currency advisory relationships?**

Staff is not aware of publicly available data on the performance of hedging programs using currency advisory relationships. However, several currency overlay managers state that they do provide such services at the present time. They report that the results have closely approximated the returns available through their currency overlay products.

Generally, the currency advice is transmitted via a set of recommended trades that are then executed by another entity (the plan sponsor, the custodian bank or another manager). It seems likely that strategies that rely on complex trading strategies to extract their value added or require the ability to trade on a 24 hour basis would be more difficult to implement in this fashion.



## Part 5: Recommended Structure

As noted earlier, staff believes the currency exposure of the entire EAFE index fund should be tactically managed. However, given the short history of most currency managers, it seems prudent to implement a program that has a simplified and relatively straightforward structure. The program could be expanded over time as experience with currency management grows and actual results can be more thoroughly examined.

**Staff recommends the following parameters for the program:**

**Currencies Included.** The program should be limited to currencies that comprise 5% or more of the exposure in the EAFE index. Together these currencies are expected to cover at least 75% of the currency exposure in the EAFE index. They are also the most liquid currencies in world markets:

### Percentage of EAFE Index as of June 30, 1995

Japanese Yen	40.9%
British Pound Sterling	16.8
German Mark	7.1
French Franc	6.3
Swiss Franc	5.7
<b>Total</b>	<b>76.8%</b>

**Benchmark.** The benchmark for the program should be the unhedged return of the above currencies. The weights given each currency will be based on the proportionate weight in the underlying EAFE index and rebalanced on a quarterly basis.

**Operating Constraints.** Hedging the above exposures back to the US dollar is the only type of hedge that should be authorized. Cross hedging and proxy hedging should not be allowed. Net long or short currency positions should be prohibited.

**Authorized Instruments.** Currency positions should be implemented using currency forwards, options or futures. The manager should have the flexibility to use over-the-counter as well as listed/exchange traded instruments.

**Portfolio Size.** At a 10% allocation to international stocks, the EAFE index fund is approximately \$1.0 billion. At the 15% allocation to international stocks recently recommended by the Asset Allocation Committee, the EAFE index fund would be approximately \$1.5 billion. The size of the currency management program under both allocations is shown below:

	with 10% target/ (\$1.0 billion index fund)	with 15% target/ (\$1.5 billion index fund)
Japanese Yen	\$409 million	\$613.5 million
British Pound Sterling	168 million	252.0 million
German Mark	71 million	106.5 million
French Franc	63 million	94.5 million
Swiss Franc	57 million	85.5 million
<b>Total</b>	<b>\$786 million</b>	<b>\$1152.0 million</b>

## Part 6: Administrative Issues

There are several administrative issues that need to be addressed by plan sponsors embarking on a hedging program:

- funding the associated cash flows
- providing for adequate counterparty banks
- interface with the custodian

### *Funding Cash Flows*

Unlike traditional asset managers who require receipt of securities and/or cash equivalents to initiate their investment program, currency overlay managers/currency advisory relationships require only a line of credit to begin a hedging program. As the hedging instruments (usually forwards or options) mature, the settlement process will generate either positive or negative value depending on the way exchange rates move.

The gains and losses of a tactical/active hedging program are realized at the time of maturity. Gains result in cash deposits to the fund. If there is a loss, the plan sponsor will need to deliver cash at settlement and provisions must be made to assure cash is available. There are two ways this can be handled:

- *Use Assets from the Total Fund.* Since the direction of cash flows generally can be estimated with two to four weeks notice, the manager/advisor can provide the plan sponsor with sufficient notice to deliver the necessary cash on the settlement date. This is an effective way to handle realized losses, provided the plan sponsor has adequate cash somewhere in the portfolio to provide for these potential cash draws. If sufficient cash is not available, the plan sponsor would be forced to liquidate other securities to raise the cash to settle the forward contracts or options. In addition to the transactions costs necessary to liquidate securities, this process also could have a detrimental impact on the fund's asset allocation policy. This would be most pronounced during a period when currency market trends generate a prolonged period of losses.
- *Establish a Cash Buffer for the Overlay Program.* In this instance, a cash account is established with the custodian bank specifically for the use of the currency overlay

manager. Cash flows associated with the overlay program would be deposited or withdrawn as necessary. The advantage is that the fund would not be forced to liquidate securities at potentially inopportune times to settle losses on the hedging program. On the other hand, while a cash buffer provides a distinct funding source, it also entails an opportunity cost because the assets invested in cash equivalents will likely generate a lower rate of return than other assets over the long term.

If a tactical/active hedging program is implemented for the EAFE index fund, staff suggests that the SBI maintain a cash buffer of approximately \$30-40 million at all times.

#### *Providing for Adequate Counterparty Banks*

Since a currency overlay manager/currency advisor does not control the underlying assets associated with the hedging program, lines of credit must be established between the plan sponsor and the bank(s) with whom the hedging instruments are traded. Designated counterparty banks will quote prices on the forward contracts and will be responsible for delivery at the time of settlement. Ordinarily, a plan sponsor will need to establish counterparty relationships with four to six banks or financial institutions to ensure that the manager has access to the most competitive rates. In addition, diversifying across a number of counterparties will reduce the credit risk associated with an individual institution.

There is some legal/constitutional question about the ability of the SBI to enter into relationships that require lines of credit. If this proves to be insurmountable, the SBI would need to explore other alternatives such as providing pools of collateral to back currency transactions.

#### *Interface with the Custodian*

Adequate custodial services are integral to the smooth operation of a currency overlay program. At a minimum:

- The custodian must be able to provide the manager with access to all transaction data related to the overlay account. This would include spot and forward positions in each currency along with estimates of the market value of the outstanding contracts. This data will be essential for the currency overlay manager and should be produced through a daily data download or made available directly through on-line computer access.

- The custodian must be able to calculate hedged and unhedged rates of return using time weighted rate of return methodology and determine the currency contribution to return. This capability will be necessary to enable returns on the currency overlay program to be integrated with the other components of the plan sponsor's reporting and performance measurement system.

Staff believes that the SBI's current custodian for retirement assets, State Street Bank & Trust, has at least adequate services available in both areas. Most currency overlay managers already have at least one State Street client and they report their interaction has been satisfactory.

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## Endnotes

1. This data is taken from Roger G. Ibbotson and Gary P. Brinson, *Global Investing: The Professional's Guide to the World Capital Markets*, p.26
2. Based on data published in "Central Bank Survey of Foreign Exchange Market Activity in April 1992" published by the Bank for International Settlements.
3. There are other theories that are used to explain the relationship of exchange rates:
  - The **Fischer Open Relation** is a more sophisticated version of interest rate parity. It states that the observed interest rate is composed of two parts, the inflation rate and the real interest rate. If real rates are equal across countries, then the difference in interest rates between two countries can be solely explained by the difference in inflation. Investors will allocate funds to the country with the highest real rates of return until the rates are equalized. Like purchasing power parity (PPP), this theory is better suited to explaining long term exchange rate movements than shorter term trends.
  - The **Exchange Rate Expectation Hypothesis** states that the expected spot rate for one period from now should be equal to the current forward rate for that same period. Since empirical evidence shows that forward rates have no forecasting value for future spot rates, this theory is not widely used.
  - The **Balance-of-Payments Approach** holds that when a country has a balance of payments deficit, the country will have a correspondingly higher demand for foreign currency. This higher demand will cause foreign currencies to appreciate. Eventually, this theory says that the currency of the deficit producing country will depreciate, making its goods and services more attractive in the marketplace. In turn, this will work to restore equilibrium currency prices. Critics of the theory say that the balance of payments status is a reflection of the past and that surplus/deficit trends are only one factor that impact currency relationships.
4. The formula for purchasing power parity (PPP) can be stated as:

$$\frac{S(1)}{S(0)} = \frac{1+I(f)}{1+I(d)}$$

where:

- S(1) = the future spot rate of a foreign currency one period from now
- S(0) = the current spot rate of a foreign currency
- I(f) = foreign inflation rate
- I(d) = domestic inflation rate

5. The formula for interest rate parity can be stated as:

$$\frac{1+i(f)}{1+i(d)} = \frac{F(1)}{S(0)}$$

where:

- i(f) = foreign nominal interest rate
- i(d) = domestic nominal interest rate
- S(0) = spot rate
- F(1) = forward rate for delivery at time 1

6. For further discussion see Arnott and Pham (1993), Kritzman (1993), Kubarych (1983) and Ramaswami (1993).
7. Callan Associates cites "street" estimates of 20 to 70 basis points annually. They estimated trading costs of 52 basis points annually to using one-month forward contracts. This cost estimate includes a 5 b.p. opportunity cost for the associated with cash flows but does not include any additional management fee to maintain the constantly hedged position. See "Foreign Currency and Institutional Portfolio: Practical Issues to Consider", p. 19.
8. An "InterSec Client Memorandum" dated October 1994 provides the following data for US tax exempt investors as of June 1994:

total international equity assets	\$226.0 billion
total currency overlay	24.6 billion
overlay as percent of intl. assets	10.9%



## Appendix A

### Glossary of Terms

Central Banks	The central monetary authority of a government. Central banks determine the supply of money and the general level of interest rates in a country. In the US the central bank is the Federal Reserve.
Cross Hedge	Selling an amount of one foreign currency and buying a like amount of another foreign currency.
Currency	The monetary unit of a sovereign state. For example, US dollar, Japanese yen, German mark (deutschmark), British pound sterling.
Currency Overlay	The process of altering/managing the currency exposure of an international portfolio without affecting the composition of the underlying stocks.
Currency Risk	The volatility in returns associated with a movement in exchange rates.
Devaluation	An action by a governmental authority to unilaterally lower the value of its currency. Devaluation will lower the existing exchange rate for a currency.
Dollar strength	A rise/appreciation in the value of the dollar relative to another currency or currencies. When the dollar strengthens, a US investor will see <i>losses</i> in an international portfolio due to currency.
Dollar weakness	A fall/depreciation in the value of the dollar relative to another currency or currencies. When the dollar weakens, a US investor will see <i>gains</i> in an international portfolio due to currency.
Fixed Exchange Rate	An exchange rate mechanism by which a currency or group of currencies is pegged or "fixed" to the value of another asset. Generally, under fixed rate regimes, the only exchange rate risk is the risk of devaluation/revaluation.

Floating Exchange Rate	An exchange rate mechanism where the value of currency is determined by market forces. Rates will move up and down or "float" based on economic, political and psychological variables.
Forward Rate	The price for delivery of a currency at a specified date in the future. Most forward contracts are for periods of one, three or six months.
Hedge	Selling an amount of foreign currency and buying a like amount of the US currency.
Hedging	Action taken to reduce the exposure of a currency or group of currencies in an underlying international stock portfolio.
Interest Rate Parity	An economic theory that states that exchange rates will adjust to offset the difference in the level of interest rates between countries.
Option	The right but not the obligation to buy or sell an asset at a specified date in the future for a specified price.
Purchasing Power Parity	An economic theory that states that exchange rates will adjust to offset the difference in inflation rates between countries.
Revaluation	An action by a governmental authority to unilaterally raise the value of its currency. Revaluation will raise the existing exchange rate for a currency.
Spot Rate	The price for delivery of a currency for immediate delivery; today's price for a currency.
Unhedged	State where no attempt is being made to alter the currency exposure of an underlying stock portfolio.

## Appendix B

### A Short History of Exchange Rates

During the last century, currency markets have been subject to a mix of fixed and floating exchange rate environments. The major regimes are outlined below.

#### **The Gold Standard**

During the period prior to World War I (c. 1880 to 1914) the value of a nation's currency was dependent on its reserves of gold. Each country maintained a direct and fixed relationship between its official stock of gold and its currency and paper money could be freely converted into gold. Gold was also used as the mechanism to settle international trade and investment transactions. As a result, there was a direct link between the balance of payments position of a country and its domestic money supply. Pegging each currency to gold led to fixed exchange rates. For example, if 1 ounce of gold = \$500 and 1 ounce of gold = 100 pounds, the US/British exchange rate would be "fixed" at 5 to 1.

The gold standard was expected to be a self balancing mechanism based on international trade flows (also called the "price-specie flow"). If a country ran a trade deficit, it would be paying out a greater portion of gold than it was taking in. Since the money supply and gold were directly linked, the net loss of gold reserves also lowered the supply of that currency. A lower money supply would force a reduction in prices for domestic goods and make that nation's exports more attractive to its trading partners. This would lead to an increase in exports and to a correction in the balance of payments/trade deficit.

It is generally thought that nations were willing to uphold the gold standard because they placed a premium the economic benefits of free international trade even if this came at the expense of domestic economic goals (e.g., deficit spending aimed at various social priorities, a build up of defense, etc.).

#### **The Interwar Period**

The gold standard was abandoned during the WWI when the domestic priorities of defense spending took precedence over free trade. Britain was the first to opt out in 1914 and most other nations quickly followed suit. While attempts were made to revert to the gold standard when hyperinflation struck in Germany and other countries after the war, the system ultimately collapsed by the mid 1930's. Its demise is generally attributed to aggressive rounds of currency devaluation by countries seeking to make their exports more competitive. This type of "beggar thy neighbor" policy had a destabilizing effect that made the gold standard impossible to uphold for most nations. By 1934, the only currency that was officially convertible to gold was the US dollar.

### **The Bretton Woods Era**

At the close of World War II, representatives of the Allied governments met in Bretton Woods, New Hampshire to confer on future monetary and trade policy. The resulting Bretton Woods Agreement of 1944 was designed to restore stability to the international economic system and prevent the types of "abuses" that arose during the interwar period. It was also designed to provide governments with some measure of monetary flexibility to attain domestic economic goals that would require the ability for governments to run deficits a nation's balance of payments.

The ideas of John Maynard Keynes, Britain's foremost economist at the time, and Harry Dexter White, the US Secretary of the Treasury, dominated the discussion and shaped the ultimate agreement. The Agreement was also influenced by a League of Nations report issued at the end of WWII which labeled floating rates as highly undesirable. The report said that floating rates discouraged international trade and postulated that unpredictable exchange rates would have severe repercussions on the deployment of domestic resources.

Under the agreement that was finally negotiated, the US government (which had 60% of the world's gold reserves at the end of WWII) would guarantee that the dollar would be convertible to gold at \$35 per ounce and the exchange rate for other currencies would be pegged to the dollar. The "fixed dollar standard" or "fiat money standard" gave other nations an indirect link to gold and thus preserved the goal of fixed exchange rates. If a nation's currency began to move away from the stated rate, its government would be forced to intervene to bring it back to equilibrium through the imposition of capital controls. In addition, in rare circumstances, official revaluation/devaluation of a currency was possible. The International Monetary Fund (IMF) was created to provide liquidity in times of imbalance and it was given authority to grant limited and temporary balance of payments credits to assist nations in maintaining monetary equilibrium.

Though the Agreement was created in 1944, it did not become fully operational for some time. For example, conditions for convertibility were not established for many European nations until 1958. West Germany did not comply until 1961 and Japan entered the system in 1964.

There are many reasons, some structural and some political, given for the demise fixed dollar standard. The following perspectives are the most commonly cited explanations:

- Attaining the goals of increased trade and investment required additional liquidity in the international monetary system. Under the fixed dollar standard, this expansion required more US dollars, but this, in turn would erode confidence in the \$US/gold convertibility standard that was the linchpin of the Bretton Woods Agreement. The untenable choice between a liquidity crisis or a crisis of confidence was identified as early as 1959 and became known as the "Triffin Dilemma" after the author of the article in which the predicament was first written.

- The adjustment mechanism in the Agreement was inadequate. The conditions that should lead to devaluation/revaluation were not well specified and countries were reluctant to take either action to restore equilibrium to the system.
- As the supply of US dollars expanded to finance the expansionist economic policies of the Johnson and Nixon administrations, countries with a balance of payments surplus had to expand their monetary supply to maintain a fixed exchange rate based on the dollar. This had the effect of "exporting inflation" and meant that the stronger a country's currency, the less control it had over inflationary pressures. This runs counter to assumptions about economic "fairness".
- The growth of multinational companies and the creation of the unregulated Eurodollar market made national management of exchange rates ineffectual.
- The use of the US dollar as the world's reserve currency led to a misuse of economic power by the US. As long as foreign holders of US dollars did not demand convertibility to gold, the US was afforded a unique opportunity to engage in expansionist money policy associated with defense spending, foreign aid and domestic programs without additional domestic taxation. Ultimately, this situation could not persist and the US would be forced to renege on the basic premise of the Bretton Woods Agreement.

In the late 1960's, the demands for gold convertibility on the US dollar began to increase rapidly when the value of gold had surpassed the stated fixed conversion rate. In August 1971, US President Nixon suspended gold convertibility and imposed a 10% surcharge on certain imports in an effort to get other countries to negotiate new currency parities with new fixed rates that would reflect a devaluation of the dollar.

The major economic powers met at the Smithsonian Institution in December 1971. The resulting "Smithsonian Agreement" accommodated the desire of the US for devaluation of the dollar and provided for wider bands of fluctuation around the fixed rates before government intervention would be required. However, the devaluations of the dollar in December 1971 and February 1973 were generally regarded as "too little, too late" to save fixed rates and the dollar became fully floating by the end of 1973.

### **Floating Rate System**

The beginning of the floating rate era is usually pegged to the 1973 action by the newly formed European Monetary Union (EMU) to allow the US dollar to freely float against the participating European currencies. In 1979, the EMU gave way to the European Monetary System (EMS) which sought to establish tighter bands of fluctuation for currencies in the EMS relative to each other, but retained a free float against the dollar.

While most nations felt that floating rates should be temporary, it became impossible to re-institute a fixed rate system due to divergent national priorities. For example, the UK saw floating rates as compatible with its expansionary domestic priorities and West Germany,

Switzerland and Holland believed that floating rates would offer freedom from imported inflation. France, on the other hand, demanded a return to fixed rates to prevent what they felt would be inevitable chaos and Japan appeared primarily concerned about the effect of fixed rates on its growing exports. In addition, the shock of the oil crisis and the emergence of stagflation heightened economic uncertainty worldwide and served to extend the growing inertia with respect to re-establishing some type of international agreement on exchange rates.

While it is often referred to as a floating rate "system" it is not supported by an international agreement on how it should operate or a mechanism to ensure international economic cooperation. In the early 1980's, the US was generating higher and higher deficits which were blamed on an overvalued dollar which, in turn, made US exports uncompetitive. The major economic powers, the "Group of Five" or "G-5" (US, UK, Japan, Germany and France) met in 1985 at the Plaza Hotel in New York City to discuss domestic and international priorities. In the resulting "Plaza Accord", they agreed coordinate their respective economic policies in an attempt to drive down the value of the dollar. In 1987, the G-7 (the former G-5 plus Canada and Italy) met at the Louvre in Paris and signed the "Louvre Accord" in which the members agreed to cooperate to reduce the variability in exchange rates by government intervention in the currency markets to slow the speed with which exchange rate adjustments occur. Some have termed this situation a "dirty float" because this type of intervention means that exchange rates are not determined purely by market forces.

Readers desiring more information on the history of exchange rates and the political ramifications of the various regimes should refer to Gilpin (1987) and Walter (1993).

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**INTERNATIONAL EQUITY INVESTING  
FOR THE BASIC RETIREMENT FUNDS**

**Position Paper**

**August, 1992**

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## EXECUTIVE SUMMARY

This paper reviews the rationale for international investing and highlights a number of issues which should be addressed as the Board develops its investment program for international equities. The major conclusions and recommendations are:

- The case for international investing lies in three areas: increased investment opportunity, greater diversification and potential for higher return. Nearly two-thirds of the world's market now lie outside the U.S. By diversifying across world markets the Board can both enhance return and reduce risk/volatility of the total portfolio.
- Japan, U.K., Germany and France comprise about three quarters of the value of the international markets. Fourteen (14) other countries in Europe and the Pacific Basin make up the remainder of the more well established stock markets. Emerging markets in Central and South America, Eastern Europe and Asia are growing rapidly and pose special investment considerations and limitations.
- The Board's decision to allocate 10% of the Basic Funds to international stocks is well within current practice among pension investors. A strong case can be made for increased commitments in the future as the Board's experience with international investing grows.
- The Board's South Africa policy will reduce the range investment opportunities but should not diminish the diversification potential of an international program. Restrictions will have either a positive or negative effect on performance, depending on the time period analyzed.
- Some additional costs are an unavoidable part of transacting in the international markets. All U.S. investors incur withholding taxes on dividend income from foreign securities. In addition, transaction costs and management fees are higher for international portfolios. As with the Board's domestic portfolios, however, all these costs will be deducted before returns are calculated. Income from securities lending on the Board's international portfolio will offset a portion of global custody charges and may even provide a net gain for the portfolio.
- International stock returns can be attributed to three factors: country allocation, stock selection and currency effect. Historically, about 80% of returns have been due to country or market allocation. In theory, greater inefficiencies in the international markets should offer opportunity to enhance return through stock selection as well.
- Investors incur foreign exchange exposure or currency risk when they buy foreign securities. When the dollar strengthens/appreciates, U.S. investors will suffer currency

losses on their portfolios. When the dollar weakens/depreciates, U.S. investors see currency gains. Currency hedging can insulate international portfolios from the effect of currency fluctuations. Hedging can reduce risk/volatility of an international equity portfolio substantially. At the same time it will reduce the diversification benefit to some degree.

- There are strong arguments both for and against systematic currency hedging. At the present time, staff and the Investment Advisory Council (IAC) recommend that the Board allow the individual active managers to use currency management as part of their portfolio management process and not adopt a constant hedging strategy for the entire allocation. The option to hire a single currency overlay manager to address this issue at the total portfolio level deserves further study in the future.
- There are three sources for broad international index data: Morgan Stanley Capital International Index of Europe, Australia and the Far East (EAFE), Financial Times Europe-Pacific Basin (FT) and Salomon Brothers Frank Russell Europe-Asia (SFR). None of the three sources is ideal. Overall, staff/IAC recommend EAFE as the Board's index source. SFR's greater investability and FT's broader market coverage are not sufficient to overtake EAFE's advantage as the most widely recognized and accepted index source among U.S. investors.
- Staff/IAC recommend that the Board use a capitalization weighted version of EAFE which has been adjusted to reflect investment restrictions imposed by foreign governments on U.S. investors and the SBI's policies on liquor, tobacco and South Africa. Active managers should use a target index which has been re-weighted back to country market weights in order to minimize the tracking error that will be incurred by the SBI's South Africa policy.
- International investment managers fall into several broad categories:
  - Top-down (focus on country allocation)
  - Bottom-up (focus on stock selection)
  - Top-down/Bottom-up (combination of both disciplines)
  - Active/Passive (active country, passive stock)
  - Regional Mandates (focus on geographic area)
  - Passive (indexation)

Most assets are actively managed by firms who employ a combination top-down/bottom-up style, with a lesser number of managers who are more purely top-down or bottom up. Active/passive and passive strategies are newer, growing strategies. Regional mandates, either active or passive, take advantage of specialized strengths and skills of certain managers and are gaining interest among plan sponsors.

- Staff/IAC recommend a two-phase approach to the investment management structure:
  - Initial Structure: 100% passive
  - Longer Term Structure: at least 50% active

Passive management offers immediate diversification benefits, can be implemented relatively quickly, and provides predictable returns relative to the SBI's chosen benchmark or target. Active managers should be sought as soon as practicable to enhance returns.

- An index manager could be selected as early as September 1992. Active manager searches should begin as soon as possible with the goal of adding one or more managers by December 1992. Additional manager selections are likely during calendar 1993.

**BASIC RETIREMENT FUNDS  
INTERNATIONAL EQUITY PROGRAM  
SUMMARY OF RECOMMENDATIONS**

**Asset Class Target:**

- Source Morgan Stanley Capital International Index of Europe, Australia and the Far East (EAFE)
- Weighting Capitalization, subject to restrictions shown below
- Currency U.S. Dollar, Unhedged

**Restrictions:**

- Active and Passive eliminate securities that U.S. investors are not allowed to own  
  
eliminate securities that are affected by the SBI's policy on liquor and tobacco
- Active only eliminate securities that are affected by the SBI's policy on South Africa and re-weight back to market weights by country

**Hedging Strategy:**

- Passive no hedging
- Active opportunistic/tactical hedging by individual managers

**Management Structure:**

- Initial 100% passive
- Longer Term at least 50% active

**Timing:**

- Passive select manager by September 1992
- Active begin search process as soon as possible\*

\* Active managers will be added as soon as practicable. Attractive candidates will be identified through an on-going search process during 1992-93.

## **INTRODUCTION**

At its meeting on September 11, 1991, the State Board of Investment (Board) approved the addition of international equities to the Basic Retirement Funds and directed staff, in conjunction with the Investment Advisory Council (IAC)), to develop an appropriate implementation plan for the Board's consideration. This position paper reviews the rationale for international investing and highlights a number of issues which should be addressed as the Board develops its investment program for international equities. Where appropriate, staff/IAC recommendations on specific issues are presented.

The paper is organized around the following questions:

- *What is the rationale for international investing?*
- *How much should be allocated to international stocks?*
- *How do South Africa restrictions affect international portfolios?*
- *How do the costs of international portfolios and domestic portfolios compare?*
- *What is the relative importance of country allocation, stock selection and currency management in actual returns?*
- *Should currency risk be controlled?*
- *Are adequate benchmark indices available?*
- *What management options are available?*

## **WHY INTERNATIONAL?**

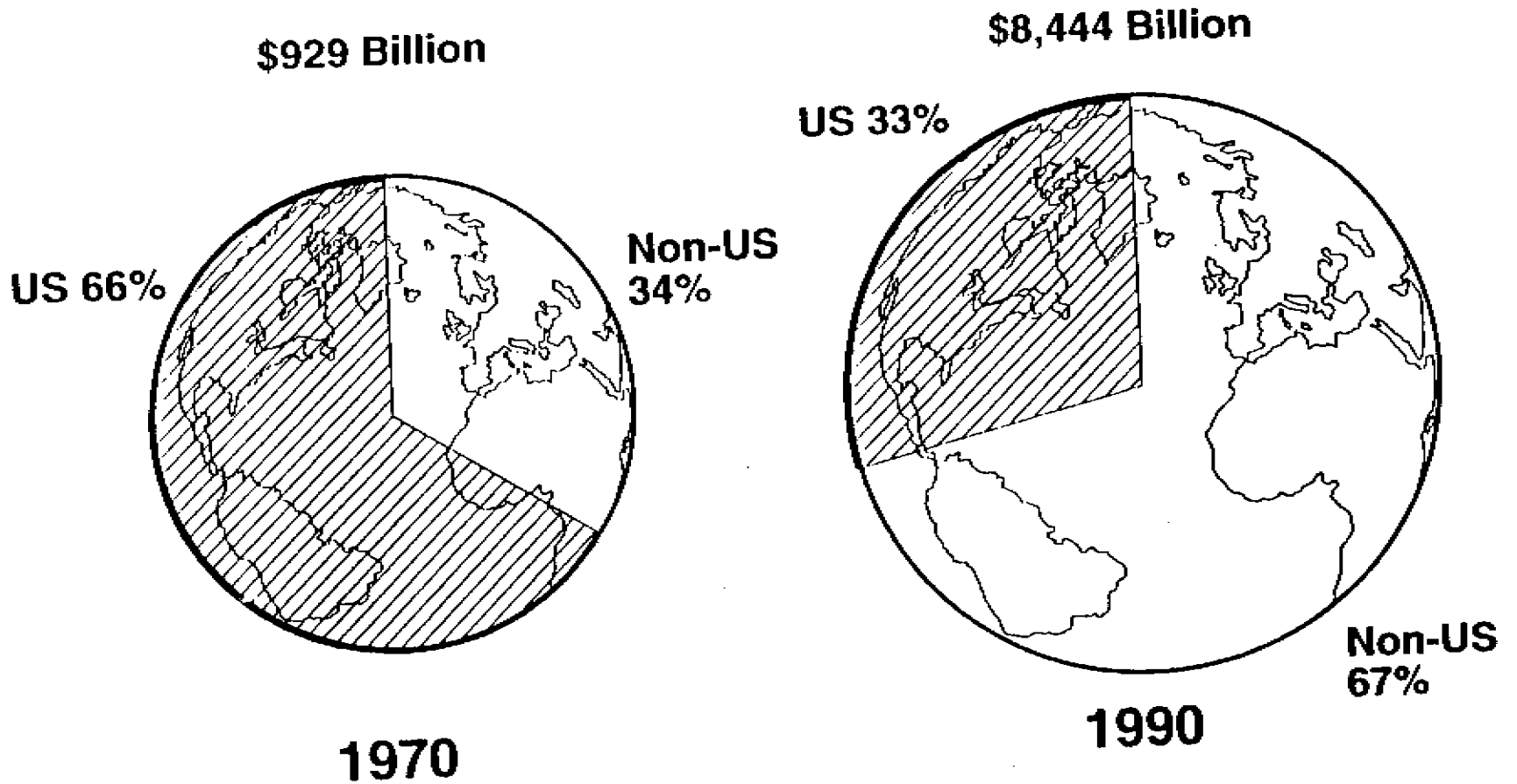
The case for international investing is well established. Its attractiveness is three-fold:

- increased investment opportunity
- diversification
- potential for higher return

Today, more than half the value of the world's capital markets lies outside the U.S. As shown in Figure 1, the U.S. stock market made up nearly two thirds of the value, or capitalization, of the world stock markets in 1970. By 1990, this proportion was reversed;

FIGURE 1

# World Market Capitalization



**FIGURE 2**

**MORGAN STANLEY CAPITAL INTERNATIONAL INDEX  
OF EUROPE, AUSTRALIA AND THE FAR EAST  
EAFE\***

<b>By Country Weights</b>	<b>12/31/89</b>	<b>12/31/90</b>	<b>12/31/91</b>
Japan	61.03%	51.37%	49.50%
United Kingdom	12.75	17.82	18.25
Germany	5.77	6.83	6.58
France	4.86	5.61	5.85
Switzerland	1.91	2.56	2.96
Netherlands	2.37	2.83	2.94
Australia	2.13	2.26	2.74
Italy	2.41	2.50	2.22
Spain	1.62	1.81	2.05
Hong Kong	1.06	1.43	1.95
Singapore	0.94	1.13	1.25
Belgium	1.00	1.24	1.17
Denmark	0.59	0.79	0.85
Sweden	0.65	0.70	0.64
Austria	0.33	0.51	0.49
Norway	0.28	0.37	0.30
New Zealand	0.24	0.18	0.22
Finland	0.04	0.04	0.03
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
<b>By Region</b>			
Europe	34.60%	43.63%	44.34%
Pacific Basin	65.40	56.37	55.66
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

\*Includes only those companies which U.S. investors may purchase.

Source: Morgan Stanley Capital International  
Richards and Tierney

approximately two thirds of stock market capitalization is now in non-U.S. markets. This change means that many of the world's largest corporations are based in Europe or the Pacific Basin. In addition, certain industries (e.g. consumer electronics) have little presence among U.S.-based companies. Expanding the investment universe beyond the U.S., therefore, substantially increases investment opportunity.

Where are these increased opportunities? The most widely quoted international index is the Morgan Stanley Capital International Index of Europe, Australia and the Far East (EAFE). As shown in Figure 2, four (4) countries (Japan, U.K., Germany, and France) comprise more than three quarters of the market value of the established international stock markets. Fourteen (14) other countries in Europe and the Pacific Basin make up the remainder. While new stock markets in Central and South America, Eastern Europe and Asia are developing rapidly, these less well established markets are usually referred to as "emerging markets" and are not included in EAFE. Staff believes that emerging markets have unique investment opportunities and limitations and therefore should be considered separately from the more established international markets. These markets should not be ignored, however. Over the next decade their combined share of the international markets could grow to over 10%. (1)

Despite growing economic integration, global events still impact markets differently. For example, the stock market "crash" in October 1987 affected stock markets all over the world but forced greater declines in the U.S. than most other markets. A more recent example comes from the events leading up to the Gulf War in the summer of 1990 when concerns about an interruption in oil supplies impacted the Japanese stock market more severely than other markets. This was due, in part, to Japan's greater dependence on imported oil.

These examples suggest that investments in non-U.S. securities still offer diversification benefits despite the growing trend toward globalization. Figure 3 presents annualized return and risk data for U.S. and international markets as well as the



**FIGURE 3**

**U.S. VS NON U.S. EQUITIES  
ANNUALIZED RISK, RETURN AND CORRELATION**

<b>10 Years Ending</b>	<b>U.S.</b>		<b>Non-U.S.</b>		<b>Correlation (2)</b>
	<b>Return</b>	<b>Risk (1)</b>	<b>Return</b>	<b>Risk (1)</b>	
1981	6.5	17.5	10.6	19.1	.54
1982	6.7	18.6	7.0	19.6	.55
1983	10.6	18.2	11.1	18.4	.59
1984	14.8	15.6	14.8	17.5	.44
1985	14.2	14.0	16.4	15.3	.32
1986	13.7	14.4	22.3	17.3	.31
1987	15.2	17.0	22.9	18.9	.42
1988	16.2	16.5	22.4	19.4	.40
1989	17.4	16.6	22.9	19.6	.36
1990	13.8	17.1	17.2	21.9	.41

(1) Standard Deviation

(2) R-squared, Coefficient of Determination

Source: Frank Russell

corresponding correlation coefficient. As shown, the correlation between U.S. and international markets actually declined over the period. The data indicate that diversification potential from international investing remains strong.

Over time, certain regions of the world are likely to become more highly integrated. European countries are breaking down trade barriers and may move toward a common central bank and single currency. Growing trade and investment among countries in the Pacific Basin may bring more economic unity to that region as well. However, full integration of economic policies and financial markets does not appear imminent and world markets are not likely to move in tandem in the near future. Diversification across markets takes advantage of this phenomenon and offers a consistent way to control risk and dampen volatility of the total portfolio.

Historical returns have made international investing very attractive:

	<b>U.S. Stocks</b>	<b>International Stocks</b>
Last 20 Years	11.2%	15.4%
1970's	5.9	10.1
1980's	17.6	22.8

Source: Ibbotson Associates

Generally, the higher historical returns from international markets are attributed to the higher growth rates of countries outside the U.S. Recent gross domestic product (GDP) growth for major economies is shown below:

	<b>Annual GDP Growth 1988 - 1990</b>
Japan	5.5%
Germany	4.1
France	3.3
Italy	3.3
U.S.	2.6
U.K.	2.5

Source: PanAgora Asset Management

Many observers believe that European and Pacific Basin economies will continue to outpace the U.S. in the 1990's. International stock investments provide a means to participate in these higher growth rates and offer the potential for higher returns than the U.S. market.

Despite the obvious attraction of higher returns, diversification remains the strongest argument for international investing. Non-U.S. securities will continue to provide counter cyclical investment returns to the U.S. market. Over time, adding international stocks to the Basic Funds offers the potential to both enhance returns and reduce the risk/volatility of the total portfolio.

## HOW MUCH SHOULD BE ALLOCATED?

The Board has approved a 10% allocation to international stocks in the Basic Retirement Funds. The total fund asset allocation targets for the Basic Funds are:

Equities		60%
Domestic Stocks	50	
International Stocks	10	
Alternative Investment		15
Private Equity		
Real Estate		
Fixed Income		25
Domestic Bonds	24	
Cash Equivalents	1	
		<hr/>
		100%

How does the 10% international stock target compare to other public and private pension fund investors? A 5-10% allocation is typical among large pension plans at the present time but many plans are considering increasing their allocation in the 10-20% range.(2) A list of some of the large public funds who are investing internationally is included on Appendix A. The allocation to international securities among these funds ranges from 3% to 20%.

Figure 4 shows the effect of adding non-U.S. stocks to an equity portfolio for 15 year periods ending 1983 through 1990. Each line represents the risk/return relationship for a stock portfolio with 0, 10, 20 and 30% international exposure. In each time period, increasing international stocks reduced volatility and increased return. With 10% of the total Basic Funds allocated to international, the analogous exposure for the Basic Funds' stock segment is about 17% ( $10 \div 60 = 16.7\%$ ). Computer driven optimization models suggest that international allocations substantially above the 30% level will provide continued risk/return benefits. (3)

The Board's decision to allocate 10% of the Basic Funds to international equities clearly is within the range of current practice among pension plan sponsors. While a

higher allocation could be justified based on risk/return analysis, staff believes that the 10% target represents a prudent commitment to a new asset class within the Basic Funds. As the Board gains greater experience with international investing, it may be appropriate to increase the allocation target in the future.

#### **WHAT IMPACT DO SOUTH AFRICA RESTRICTIONS HAVE?**

The Board's resolution on South Africa applies the same restrictions to foreign and domestic holdings in all of the Board's actively managed stock portfolios. (4) Under this policy, the Board's active international stock managers will be directed to refrain from purchasing stock of companies with direct investment in South Africa unless the manager determines that failure to complete a purchase would be a breach of the manager's fiduciary responsibility.

Staff relies on information compiled by the Investor Responsibility Research Center (IRRC) in Washington D.C. to identify U.S. companies with direct investment in South Africa. (5) IRRC maintains a similar service for international companies and staff has access to this information through the Board's subscription to IRRC's South Africa Review Service. A list of publicly traded international companies with direct investment in South Africa is in Appendix B.

A South Africa restriction has two impacts on either domestic or international portfolios:

- It reduces the range of investment opportunities.
- It can have either a positive or negative affect on performance, depending on the time period examined.

As shown in Figure 5, about 27% of the market capitalization, or value, of EAFE is eliminated when South Africa-related securities are excluded. The impact is not uniform across all countries, however. For example:

FIGURE 4

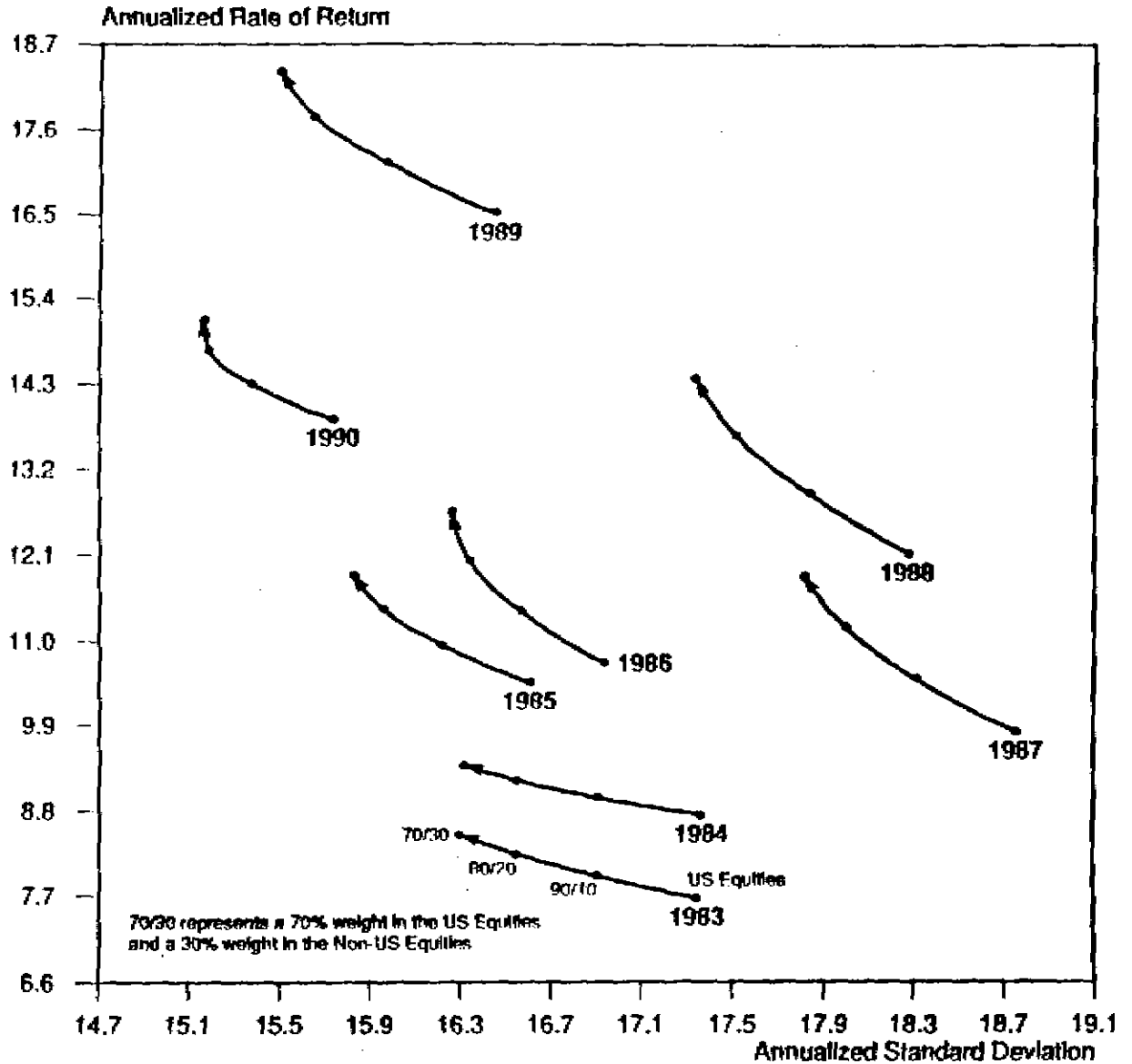
# Long Term: Increased Return and Reduced Risk

Risk-Return  
Performance  
Comparisons

Combinations  
of Indexes:  
US Equities  
Non-US Equities

Currency:  
US\$

Time Period:  
15 Years Ending  
4th Quarter  
1983-1990



10

**FIGURE 5****THE IMPACT OF SOUTH AFRICA HOLDINGS ON THE EAFE INDEX  
12/31/91**

	<b>EAFE</b>	<b>South Africa Free EAFE</b>	
Number of companies	1,052	864	
% capitalization of index	100%	72.9%	
	<b># Companies in EAFE</b>	<b># Companies Excluded</b>	<b>Market Capitalization Removed</b>
Australia	54	4	23.4%
Austria	20	1	3.3
Belgium	20	1	7.8
Denmark	26	3	17.5
Finland	29	0	0.0
France	71	9	21.1
Germany	60	31	82.0
Hong Kong	35	0	0.0
Italy	65	9	40.4
Japan	266	16	8.5
Netherlands	23	4	51.2
New Zealand	8	0	0.0
Norway	30	1	1.7
Singapore	54	0	0.0
Spain	38	0	0.0
Sweden	35	7	15.6
Switzerland	71	45	90.0
U.K.	<u>147</u>	<u>57</u>	<u>55.1</u>
Total	1,052	188	27.1%

Sources: Morgan Stanley Capital International  
Richards & Tierney

- The United Kingdom is reduced by about 55%
- Germany is reduced by about 82%
- Japan is reduced by about 9%

As a result, South Africa restrictions will increase exposure to the Pacific Basin/Japan, unless country weights are adjusted.

South Africa restrictions will alter industry diversification as well. A "South Africa Free" EAFE index shows increased exposure to financials, utilities and banks and a decrease in the energy, health and consumer goods sectors. The remaining securities in the index have a greater bias toward small company stocks and growth oriented companies than an unrestricted EAFE index. (6)

Return data for South Africa restricted indices have been available for only three to four years; too short a time period for meaningful analysis. Historical returns can be approximated, however, if an index is carefully reconstructed to reflect South Africa restrictions over time. In 1990, J.P. Morgan completed such a study using return data from 1982-1988. (7) Richards & Tierney used a similar methodology to extend the data through 1991. Three sets of returns were calculated and compared:

- Market returns calculated using a universe similar to EAFE (Unrestricted).
- Returns calculated after South Africa restricted securities were excluded (Restricted).
- Returns calculated after restricted securities were excluded but country weights were adjusted back to their original market weights (Restricted and Reweighted).

The results of the analysis are shown in Figure 6:

- South Africa restrictions marginally raised returns over the time period studied. The impact tended to be positive from 1982-89 and negative from 1989-91 relative to an unrestricted index.
- Restrictions are likely to increase the volatility of returns, unless the country weights are adjusted (Unrestricted 19.7; Restricted 21.1; Restricted and Re-weighted 19.8).



- Restrictions will cause significant year-to-year tracking error relative to EAFE. The SBI could easily experience returns that deviate from the index by up to  $\pm 8$  percentage points or more in any year due to South Africa restrictions. If the index is re-weighted, the expected tracking error drops to within  $\pm 4$  percentage points but is still significant.

Diversification potential is usually measured by correlation data. Correlation coefficients for most asset classes range between 0 and 1; the lower the number, the stronger the diversification effect. The J.P. Morgan study provided the following correlation data:

**Correlation of Monthly Returns  
1982-89**

	U.S.	Non Restricted	Re-weighted
U.S.	1.00		
Non-U.S.	0.45	1.00	
Non-U.S. Restricted	0.38	0.98	1.00
Non-U.S. Restricted/and Re-weighted	0.42	0.99	0.99

Source: J.P. Morgan

As shown above, the correlation between non-U.S. portfolios is high (0.98-0.99). This indicates that non-U.S. portfolios with or without restrictions will move up and down together. The correlation between the non-U.S. portfolios and the U.S. portfolio is fairly low (0.38-0.45). This indicates South Africa restrictions do not diminish the diversification potential of an international portfolio.

Staff concludes that the Board's South Africa restrictions will alter the composition of its international portfolios relative to a broad index. While the resulting performance differences could be either positive or negative, the deviations are likely to be material on a quarterly or yearly basis. Therefore, staff recommends that the Board utilize a benchmark for its active managers that is "South Africa Free" and reweighted back to market weights on a country by country basis.

**FIGURE 6****IMPACT OF SOUTH AFRICA RESTRICTIONS ON RETURNS (1)**

	<b>Non-U.S. Markets Unrestricted</b>	<b>(2) South Africa Restricted</b>	<b>(3) South Africa Restricted and Re-weighted</b>
1982	-0.08%	-3.31%	-1.19%
1983	23.40	24.94	23.41
1984	8.86	12.93	10.83
1985	58.40	56.87	62.25
1986	67.61	78.49	67.34
1987	25.14	30.25	26.28
1988	27.16	29.41	27.10
1989	11.26	7.92	10.52
1990	-23.85	-27.74	-23.48
1991	12.62	12.14	10.67
Annualized	18.39%	18.86%	18.61%
Standard Dev.	19.56	21.12	19.83
Estimated Tracking Error	--	$\pm 7.54$	$\pm 3.77$

- (1) Data obtained from J.P. Morgan using BARRA returns 1982-88 and from Richards & Tierney using FT Actuaries returns from 1989-91.
- (2) Returns calculated after South Africa restricted securities were removed.
- (3) Returns calculated after South Africa securities were removed but country weights were adjusted back to market weights.

Source: Richards & Tierney

## **WHAT ARE THE COSTS?**

The costs of investing internationally are higher than the costs for domestic portfolios in four key areas:

- withholding taxes
- trading/transaction costs
- management fees
- custody charges

Foreign investors must pay withholding taxes on dividend income imposed by other governments. While the exact amount depends on the different tax treaties between the U.S. and each country, the average non-reclaimable tax is 15% of dividend income received. Aggregate dividend yield on international portfolios is less than 2% so the net tax amounts to 25-30 basis points. (8) (9) Domestic investors do not pay this tax in their home markets.

Transaction costs, i.e. commissions and stamp taxes, are also higher, although these costs are coming down in most markets. Withholding taxes and higher transaction costs are an unavoidable part of doing business in the international markets. As with domestic portfolios, however, manager returns are calculated after these costs have been taken into account.

Investment management fees for actively managed portfolios are about 50-60 basis points higher than for domestic portfolios. The higher fees are assumed to reflect the higher costs of international research and global communication. The management fees for passive/index investing have been about 15-20 basis points higher for international portfolios. As with the Board's domestic portfolios, however, management fees will be deducted before returns are calculated.

Custody costs are higher for international portfolios as well. Global custody is a complex process which involves a network of local subcustodians. The personnel costs associated with an effective network along with increased record keeping demands have

kept global custody costs high relative to U.S.-only portfolios. It should be noted that income generated by securities lending on international portfolios can offset a large portion of these costs and may even provide a net gain for the portfolio.

A summary of all these costs is shown below:

<b>Costs That are Deducted Before Returns are Calculated</b>	<b>(Basis Points) U.S.</b>	<b>(Basis Points) International</b>
• Withholding taxes	----	25-30
• Transaction costs	less than 20	60 or more
• Management fees		
Active	30-50	50-70
Passive	2-8	15-30

**Costs That May Be  
Offset By Income  
From Securities Lending**

- Custody charges 5-6 20-25

Sources: First Chicago Investment Advisers  
Grantham, Mayo, Van Otterloo & Company

Higher costs are, for the most part, an unavoidable part of transacting in the international markets. As with the Board's domestic portfolios, most of these costs will be deducted before returns are calculated on the Board's portfolio. In addition, income from securities lending may provide a new gain for the portfolio.

**WHAT ARE THE SOURCES OF RETURN?**

The actual returns of international stock portfolios can be attributed to a combination of three factors:

- Country allocation
- Stock selection
- Currency effect

Overall, country allocation or market selection decisions dominate actual returns. This is demonstrated by the wide range between the best and worst performing countries in the EAFE index over the last 10 years:

<b>Year</b>	<b>Best Performing Market</b>	<b>EAFE</b>	<b>Worst Performing Market</b>
1981	38%	-2%	-29%
82	24	-2	-44
83	81	24	-7
84	46	7	-36
85	176	56	-23
86	121	69	-2
87	56	25	-24
88	57	28	-13
89	104	11	-9
90	10	-23	-37

Source: Boston International Advisors, Inc.

Empirical studies confirm that, on average, 80% of overall international portfolio return comes from country or market selection allocation. (10) (11) Evidence indicates that managers as a group appear to add value from their country allocations. Indeed, conditions for efficiency across markets do not appear to exist and at least the larger markets are dominated by local investors.

Stock selection also impacts portfolio returns. International markets are considered less efficient than the U.S. market. The lack of uniform accounting and disclosure standards in international markets are usually cited as the major contributors to inefficiency. In theory, international active managers should be able to exploit these inefficiencies and generate value added returns more easily than domestic managers.

The difference between return measured in U.S. dollars and return measured in local currency is the currency effect. As shown below, currency impact can help or hurt performance over the short term.

#### **EAFE Index Return**

	<b>U.S. Dollar</b>	<b>Local Currency</b>
1990	-23.4%*	-29.8%
1989	10.5	21.5*
1988	28.3	33.7*
1987	24.6*	-2.3
1986	69.4*	42.5
1985	56.2*	28.5
1984	7.4	20.9*
1983	23.7	31.6*
1982	-1.9	9.0*
1981	-2.3	10.8*

\* Better performer

Source: Cambridge Associates, Inc. based on data from Morgan Stanley Capital International Perspective

#### **SHOULD CURRENCY RISK BE CONTROLLED?**

Foreign securities are denominated in their own currencies. As a result, investors incur foreign exchange exposure at the same time they add international securities to their portfolios. The exchange rate in effect at the time for purchase affects the investor's initial cost in dollar terms. During the holding period, the currency exchange rate will move up or down from the rate in effect at the time of purchase. When these changes are translated back into dollar terms, the portfolio will register gains or losses solely due to the fluctuation in exchange rates. When the dollar strengthens/appreciates relative to other currencies, U.S. investors will suffer currency losses on their international portfolios. When the dollar weakens/depreciates U.S. investors see currency gains.

Time horizon is extremely important in analyzing the significance of foreign exchange movements on returns. As shown in Figure 7, the U.S. dollar had two major down cycles and one major up cycle between 1976 and 1988. When examined over both an up and down cycle, cumulative returns are much the same whether measured in dollar terms or local currency (see Figure 8). Before both the up and down cycles have been completed, however, dollar returns can differ markedly from local returns. These differences can be difficult for investors to tolerate since currency cycles can be protracted.

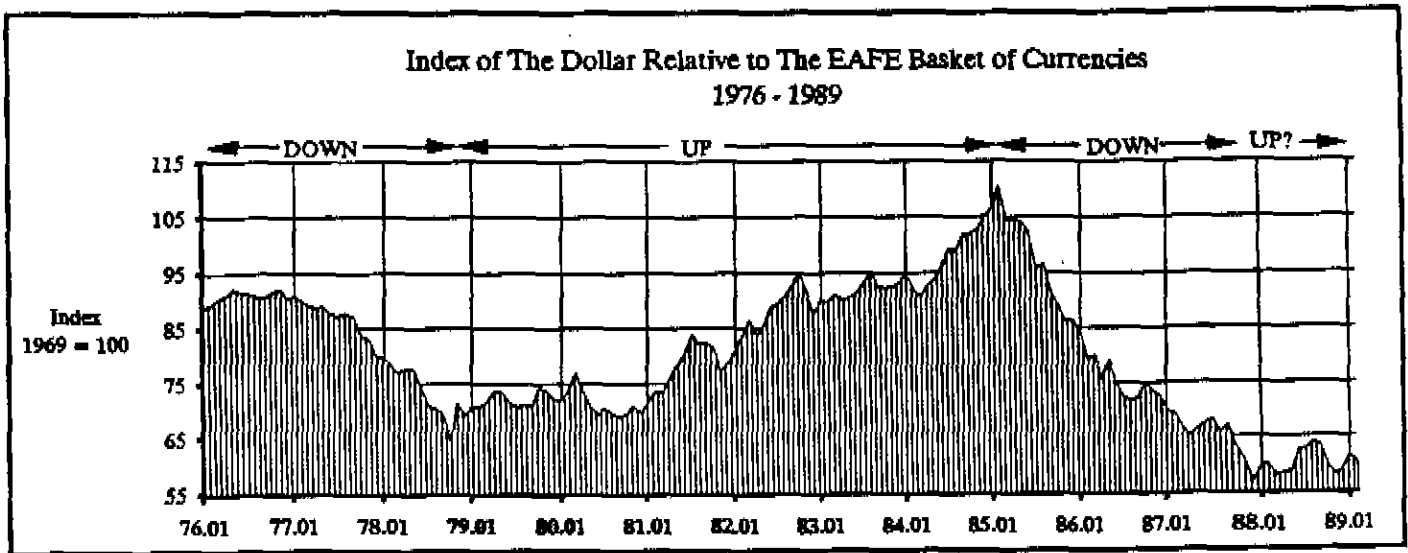
Currency hedging can insulate international portfolios from the effect of currency fluctuations. Typically, the hedge is accomplished by using the forward currency markets to lock-in a fixed exchange rate for a specified period of time. By removing currency exposure, the risk/volatility of an international equity portfolio can be reduced by 15-30%. Since it is possible to hedge currency with fairly low transaction costs (estimates are usually cited in the range of 25-30 basis points per year), hedging is considered a very cost effective risk reduction technique by many investors.

The reduction in risk/volatility afforded by currency hedging is not entirely free, however:

- When the fluctuations associated with currency exposure are removed, international securities behave more like domestic securities and some diversification benefit is lost.
- Depending on the frequency and aggressiveness of the hedging strategy, transactions costs can erode total portfolio return. If the hedging strategy is carried out by a manager specifically hired for this purpose, incremental management costs will be incurred as well.

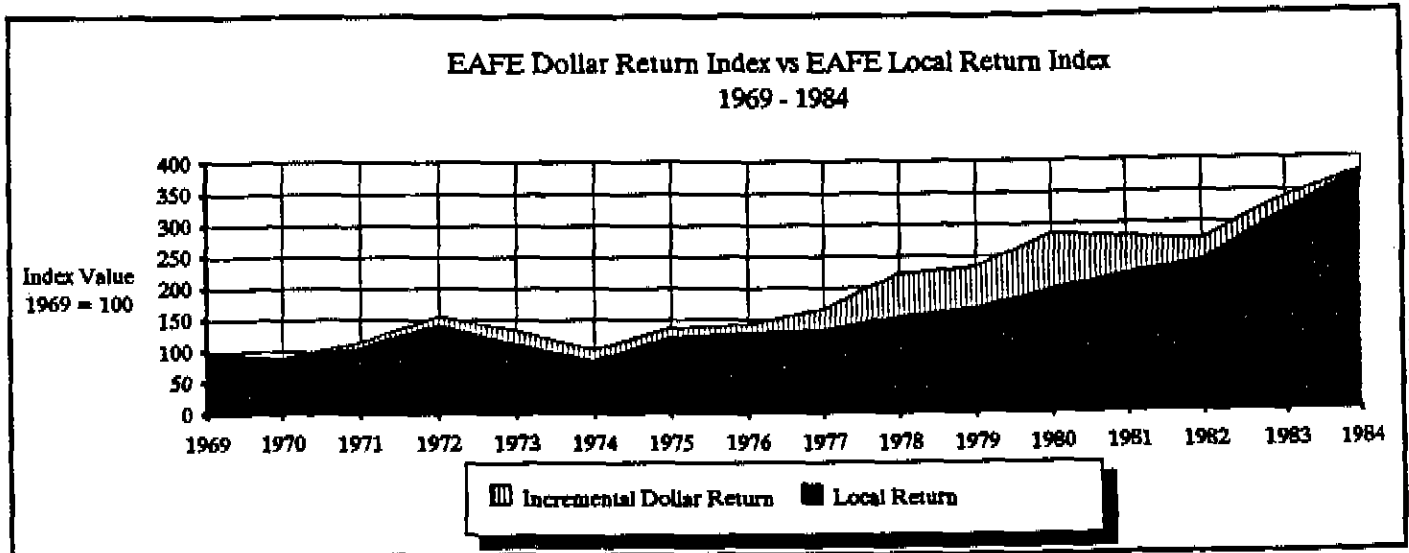
Several prominent theorists and practitioners advocate viewing currency risk as an active decision that should be explicitly controlled. (12) In effect, currency can be treated as a separate asset class and pension plan sponsors have a variety of options in dealing with it:

FIGURE 7



Source: Callan Associates

FIGURE 8



Source: Callan Associates



- **Systematic Approach**

This approach involves hedging all currency exposure, or a constant proportion of the exposure, at all times. The plan sponsor can implement the hedge itself or hire a currency overlay manager to maintain the hedge. This strategy has the greatest potential for risk reduction since the currency exposure is managed on a consistent basis. While this strategy has been the subject of a great deal study recently, a very small number of plan sponsors have taken this approach to date. (13)

- **Opportunistic Approach**

This strategy allows selective hedging based upon a currency forecast and is more often used when the goal of currency management is enhanced return. Tactical hedging can be implemented by a single currency overlay manager or left to the judgment of individual portfolio managers. Since individual managers vary greatly in the emphasis they place on currency management, the latter approach may result in uneven attention to currency exposure.

Currency hedges can be implemented using a single currency, all currencies or a basket of currencies. Nearly all exposure can be covered using a few major currencies: U.S. Dollar, Pound Sterling, Japanese Yen, Deutschmark. As a result, most hedging is accomplished by transacting in those few currencies.

There are strong arguments on both sides of the currency hedging question. The risk reduction potential of a systematic approach is significant. On the other hand, the long time horizon and relatively high risk tolerance of the Basic Retirement Funds make the portfolio an ideal candidate for opportunistic hedging. At this time, staff and the Investment Advisory Council (IAC) recommend that the Board design its investment structure around an opportunistic approach to currency hedging. At the outset, the individual active managers should be allowed to use currency management as part of their portfolio management process. The option to hire a single currency overlay manager to address this issue at the total portfolio level deserves further study.

#### **ARE ADEQUATE INDICES AVAILABLE?**

There are three sources for broad international indices available to plan sponsors:

- Morgan Stanley Capital International's Europe, Australia and the Far East (EAFE).
- Financial Times Europe-Pacific Basin (FT)
- Salomon Brothers Frank Russell Europe-Asia (SFR)

EAFE pre-dates the other two and was created before indexing was contemplated for international portfolios. It became the first source for research and comparison of international markets and managers. FT sought to aid in comparison and research, but also aimed to provide an index that was more diversified and more easily applied to *indexation strategies*. SFR tried to create a broad index that traded easily in order to focus on the problems associated with creating and maintaining index funds. (14)

None of the three provides an ideal index; the choice of one over the other must relate to the plan sponsor's judgment about relative importance of the following factors:

- construction rules
- coverage and diversity
- investability and cost
- quantity and availability of data

All three indices are capitalization weighted, that is, issues in the index are weighted according to the value of their outstanding stock. While Modern Portfolio Theory holds that the most efficient and representative portfolio is capitalization weighted, this methodology poses several problems for international indices:

- It gives greater importance to countries with highly developed public equity markets.
- It overstates the value of some corporations because of "cross ownership" and results in some degree of double counting. (Cross ownership refers to the fact that many international corporations own significant portions of the stock of other companies.)
- It overstates the value of shares actually available due to government restrictions on foreign ownership or to the lack of liquidity on very closely held companies.

EAFE, FT and SFR differ in the way they address the latter two issues. A summary of their characteristics is shown in Figure 9:

- EAFE attempts to include at least 60% of each industry in each country in its index. There is no adjustment for cross ownership, closely held companies or non-purchasable shares.
- FT includes a significantly higher number of issues in each country and is therefore broader than EAFE. While it does not adjust for cross ownership, FT excludes stock which cannot be purchased by U.S. investors and makes adjustments for closely held companies.
- SFR has fewer issues than either EAFE or FT because it focuses on larger capitalization companies. SFR adjusts for restricted stocks and closely held companies and is the only one of the three indices that attempts to compensate for cross holdings.

In terms of coverage and diversity, FT appears to be superior to the others. It includes a greater number of issues and its country by country sub-indices are better proxies for individual markets. EAFE ranks second in this area while SRF is the narrowest of the benchmarks. While all three indices have a large capitalization bias, FT captures a greater number of smaller issues and is thus more representative of the entire international market.

SFR ranks highest on investability. Its small number of issues and its concentration in larger, more liquid names makes it the lowest cost index in terms of trading and tracking. FT likely will be the most costly since more and smaller issues translate into higher commissions and higher custody costs. FT's larger number of names present some additional challenges when passive managers attempt to replicate the index through sampling. EAFE appears somewhere between SFR and FT on the investability scale.

EAFE has a clear lead in terms of accessibility to data. Historical records on EAFE cover two decades while FT and SFR were created within the last few years. As a result, EAFE has a wealth of fundamental data that the other two indices cannot match.

Overall, staff and the Investment Advisory Council (IAC) believe that EAFE is strongest index source for the Board's international program at this time. The benefits offered by FT's broader market coverage and SFR's greater investability are not sufficient to overtake EAFE's advantage as the most widely recognized and accepted index source among U.S. investors.

**FIGURE 9****COMPARISON OF INDEX SOURCES**

	<b>EAFE</b>	<b>SFR</b>	<b>FT</b>
Adjustments for			
- cross ownership	no	yes	no
- closely held co's	no	yes	yes
- non-purchasable shares	no	yes	yes
Countries	18	20	20
Companies	981	541	1,683
Total Capitalization	\$2.9 trillion	\$2.2 trillion	\$3.8 trillion
Mean Capitalization	3.0 billion	4.0 billion	2.3 billion
Median Capitalization	1.0 billion	1.8 billion	0.7 billion
Large Cap > \$5 billion	63%	70%	59%
Medium Cap 0.5 - 5 billion	55	33	39
Small Cap < 0.5 billion	3	2	2
Correlation			
EAFE	---	.994	.997
SFR	.994	---	.989
FT	.997	.989	---
Standard Dev.	20.6%	21.2%	20.8%

Source: Bankers Trust, September 1988

Staff Ranking (1 = highest)

- coverage	2	3	1
- investability/cost	2	1	3
- history/amount of data	1	2-3	2-3

EAFE - Morgan Stanley Capital International Index of Europe, Australia and the Far East

SFR - Salomon, Frank Russell Index

FT - Financial Times - World Actuaries Index

**FIGURE 9 (con't)**

**COMPARISON OF INTERNATIONAL INDICES**

	<b>SRF</b>	<b>MSCI</b>	<b>FT</b>
<b># of Securities</b>			
	163	239	457
Japan	70	132	327
UK	27	58	99
Germany	57	84	126
France	30	67	102
Italy	13	22	38
Netherlands	39	65	88
Australia	21	50	55
Switzerland	16	36	35
Sweden	18	31	46
Hong Kong	20	32	42
Spain	14	20	63
Belgium	8	15	21
New Zealand	14	55	62
Singapore/Malaysia	9	26	39
Denmark	8	17	25
Norway	4	-	17
Ireland	5	11	16
Austria	2	21	25
Finland	3	-	-
Luxembourg			
As of 6/30/88			
	<b>SFR</b>	<b>MSCI</b>	<b>FT</b>
<b>% Capitalization</b>			
	66.0%	62.7%	64.9%
Japan	14.5	13.0	14.6
UK	3.8	4.3	4.3
Germany	3.1	3.6	3.2
France	1.7	2.1	2.1
Italy	2.3	2.1	1.8
Netherlands	2.1	2.4	2.3
Australia	1.4	2.4	1.5
Switzerland	0.5	1.3	0.4
Sweden	1.0	1.3	1.2
Hong Kong	1.5	1.6	1.5
Spain	0.7	0.9	1.0
Belgium	0.2	0.3	0.2
New Zealand			

**FIGURE 9 (con't)**

**COMPARISON OF INTERNATIONAL INDICES**

<b># of Securities</b>	<b>SFR</b>	<b>MSCI</b>	<b>FT</b>
Singapore/Malaysia	0.3	0.9	0.3
Denmark	0.2	0.4	0.3
Norway	--	0.2	0.1
Ireland	0.2	--	0.2
Austria	*	0.1	0.1
Finland	*	--	0.1
Luxembourg	*	--	--
As of 6/30/88			
* Less than 0.05%			

Source: Bankers Trust      SFR Salomon Frank Russell  
Data as of 6/30/88      MSCI Morgan Stanley Capital Int'l EAFE  
FT Financial Times

## **HOW SHOULD THE BOARD'S INTERNATIONAL BENCHMARK BE WEIGHTED?**

As cited in the previous section, capitalization weighting of an international index gives greater importance to countries with large public markets. There are some advantages to this in terms of greater liquidity, investibility and wider choice of issues. In addition, capitalization weighted indices are somewhat unstable over time. For example, the Japanese market grew from 15% of EAFE in 1970 to 70% by 1989 and dropped to about 50% in 1990. Plan sponsors have used different weighting schemes to develop a reasonable country allocation for an international benchmark. For the most part, these methods have been devised to reduce the perceived overweighting of Japan created by a purely capitalization weighted index (15):

- Use a benchmark that weights each country by its gross domestic product (GDP).
- Set the benchmark at 50% Europe and 50% Pacific Basin.

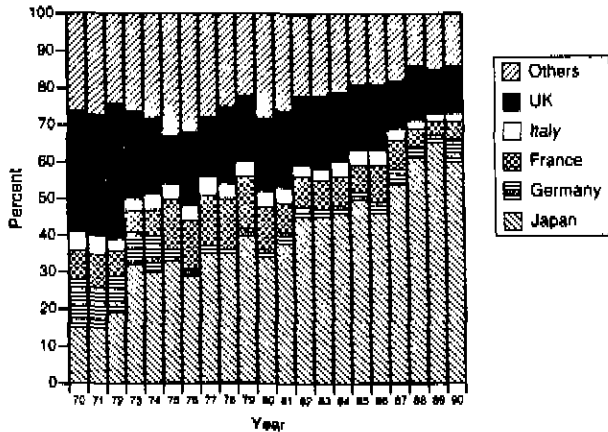
GDP-weighted benchmarks have become fairly popular among plan sponsors and Morgan Stanley now publishes a GDP-weighted version of EAFE. GDP weights are quite stable over time and are more equally spread over the major international markets. Figure 10 shows the history of capitalization versus GDP weighted EAFE from 1970-1990 and Figure 11 compares actual EAFE and GDP-EAFE weights as of June 30, 1990. Despite its appeal, the GDP-EAFE has some problems of its own:

- Morgan Stanley re-weights the entire index only once per year based on data that is nearly a year old. Month-to-month changes are again subject to changes in market capitalization.
- The resulting weights for some countries seem inappropriate. For example, Italy takes on a weight equal to or greater than the U.K. despite the fact the U.K. is the world's third largest market and Italy's public market is very small. Since Germany's public market is small compared to its total economy, its proportion of a GDP-weighted benchmark can be questioned as well.

FIGURE 10

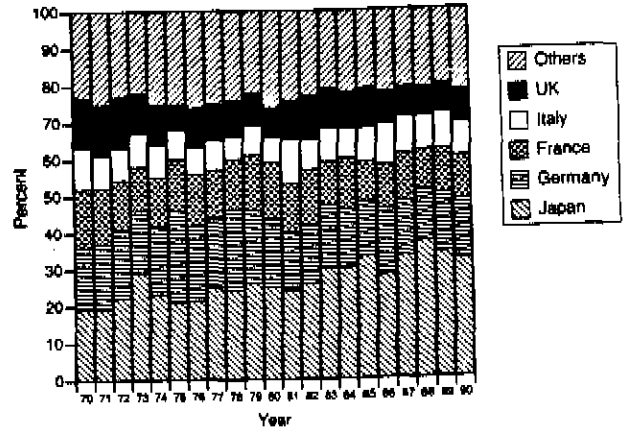
HISTORY OF CAPITALIZATION VS GDP WEIGHTED EAFE  
1970-1990

Capitalization Weighted



Source: Boston International Advisors, Inc.

Gross Domestic Product (GDP) Weighted



Source: Boston International Advisors, Inc.

FIGURE 11

COMPARISON OF GDP AND EAFE WEIGHTS					
June 30, 1990					
MARKET	GDP WEIGHTS	EAFE INDEX	MARKET	GDP WEIGHTS	EAFE INDEX
Austria	1.6%	0.5%	Switzerland	2.1	3.3
Belgium	1.9	1.1	United Kingdom	9.2	15.2
Denmark	1.3	0.7	Europe	65.1%	43.5%
Finland	1.4	0.3	Australia	3.1%	2.3%
France	11.6	5.7	Hong Kong	0.7	1.4
Germany	14.9	7.0	Japan	30.3	51.5
Italy	10.4	3.0	New Zealand	0.5	0.2
Netherlands	2.8	2.5	Singapore	0.3	1.1
Norway	1.1	0.5	Pacific	34.9%	56.5%
Spain	4.6	1.8			
Sweden	2.2	1.9	Total	100.0%	100.0%

Source: Morgan Stanley Capital International Perspective, July 1990



A benchmark that is weighted 50% Europe and 50% Pacific Basin, with countries weighted by capitalization within each region, is another way to address the high weight given Japan in purely capitalization weighted indices. This approach has several benefits:

- It ensures the benchmark will be diversified across international markets. Since no single country will be over half of the benchmark, Japan's status in a capitalization weighted benchmark is addressed effectively and permanently.
- It provides greater stability to country weights within the benchmark without the distortions of a GDP-weighted approach.
- It recognizes two distinct economic regions within international markets. This has applications to a regional approach in a plan sponsor's investment management structure.
- It imposes a "buy low/sell high" rebalancing discipline within the international segment of a portfolio. As shown below, this has the potential to enhance returns:

**1970-1991**

	<b>EAFE</b>	<b>50/50</b>
Annualized Return	14.28%	15.61%
Standard Deviation	17.69	17.44

Source: Richards & Tierney, Inc.

The 50/50 weighting scheme also presents some disadvantages:

- The gains produced by the rebalancing discipline may be eroded or eliminated through additional transaction costs.
- It may imply some unintended judgment about the relative performance potential of various regions or countries.

The high weight given Japan in capitalization weighted benchmarks remains cause for concern. A recent study concluded that reasonable adjustments for cross ownership would cut Japan's presence by roughly half its current weight in the world markets. (16). Despite this distortion, however, staff and the Investment Advisory Council (IAC)

recommend that the Board adopt a capitalization weighted target for its international program. Capitalization weighted EAFE is the accepted index among plan sponsors and money managers. Staff/IAC cannot find an overwhelming advantage to alternative weighting schemes at this time. It should be noted that the recent decline of the Japanese market has defused the issue, at least to some extent. The weight of Japan in the EAFE index was approximately 39% as of June 1992.

The EAFE index employed by the SBI should be adjusted to reflect the following investment restrictions:

- Securities that foreign governments do not allow U.S. investors to buy. This will affect both active and passive segments.
- Securities that are prohibited by the SBI's policy on liquor and tobacco (17). This policy affects both active and passive segments.
- Securities that are restricted by the SBI's resolution on South Africa (18). This policy affects the active segment only.

In order to minimize the tracking error associated with the South Africa restrictions, staff/IAC further recommend that the target for the active segment be re-weighted back to market weights by country (see the section "What Impact Do South Africa Restrictions Have?" for more information on tracking error due to restrictions).

## **WHAT ARE THE INVESTMENT MANAGEMENT OPTIONS?**

Plan sponsors have a wide range of options in building their international portfolios. While investment approaches are expanding and evolving over time, the following categories are often used to describe the international manager universe today:

- Top-Down

The top-down approach focuses on economic or other fundamental factors in an attempt to determine which local markets will perform better than others. Country allocation decisions are therefore of primary importance. Stock selection and currency

management, while still part of the active management process, usually receive less attention.

This approach takes advantage of the large impact that country allocation has on returns. Its disadvantage is that a change in country allocation can affect a large percentage of the portfolio and will drive up transaction costs.

- **Bottom-Up**

As the term implies, bottom-up strategies concentrate on stock selection and attempt to capitalize on the inefficiencies in foreign markets. In this approach country and currency decisions are either secondary or are treated as a residual of the stock-picking philosophy. Styles emphasizing value, growth, small or large companies are more frequently seen in bottom-up approaches than in top-down methodologies. Quantitative disciplines are also gaining favor within this category.

- **Top-Down/Bottom-Up**

Many managers state that both top-down and bottom-up decisions are important in their portfolio contribution process. Typically however, one of the disciplines is given greater emphasis.

- **Active/Passive**

The active/passive approach is an offshoot of the top-down strategy that has emerged over the last five years. Here, the country allocation decision is actively managed but stock selection is implemented through a collection of country by country index funds. This approach evolved in response to the observation that many top-down managers added value through country selection but gave up much of the return through poor stock selection or high transaction costs. This strategy usually requires a minimum of \$50-100 million in assets due to the large number of stocks that must be held to replicate indices for multiple countries.

- **Passive**

Passive management/indexation gained favor in the 1980's as a economical way to place sizable amounts of assets in the international markets. The poor relative performance of many managers during the last decade fueled the growth of indexation as well.

- **Regional Mandates**

Regional (e.g. Europe, Pacific Basin, Europe ex-U.K., Japan-only) can be applied to any of the above strategies. This approach takes advantage of specialized strengths and skills of certain managers and has growing interest among plan sponsors.

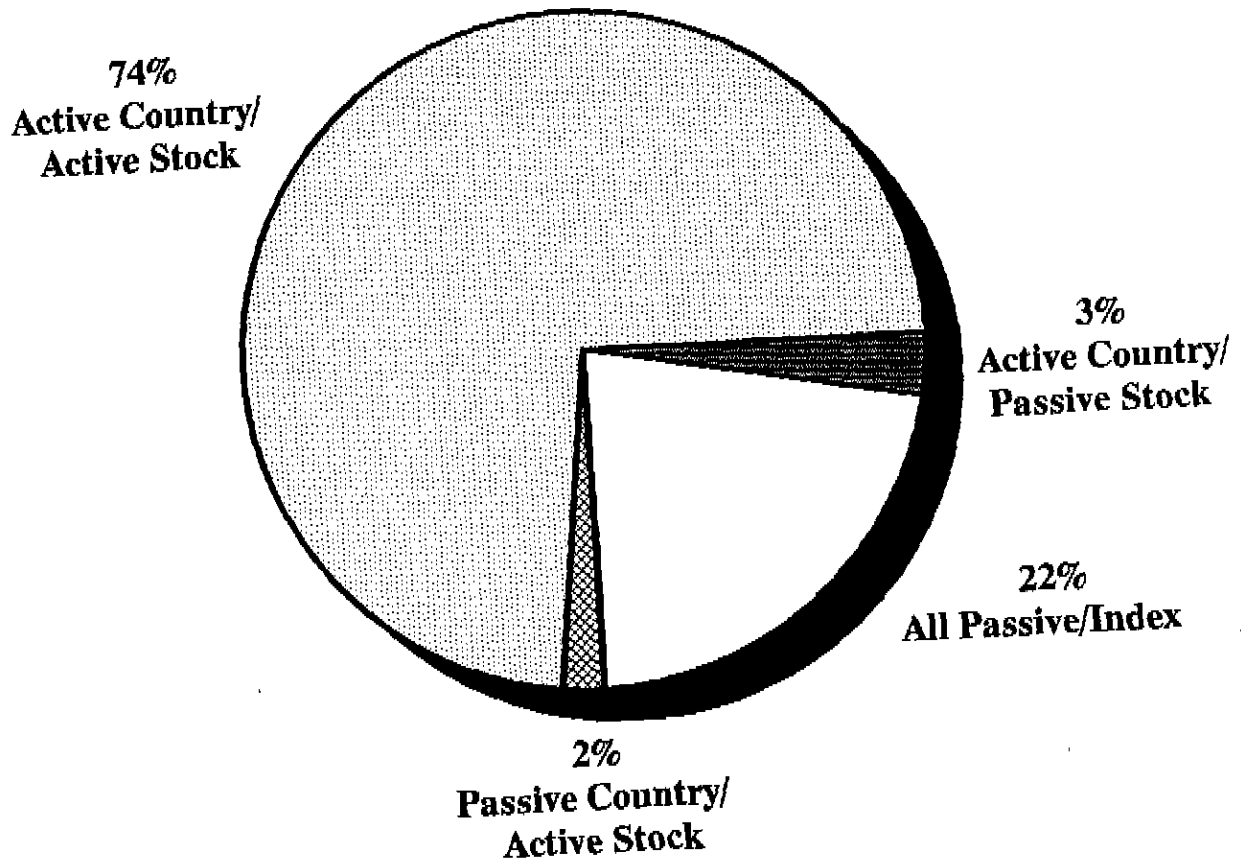
How are international portfolios being managed today? According to InterSec Research Corporation, nearly three quarters of U.S. tax exempt international equities are managed actively, about twenty percent is indexed and the remainder is in combinations of active and passive strategies (see Figure 12). Passive management has grown quite rapidly since the mid-1980's but mixes of active and passive management are relatively new.

How have international managers performed? The performance of the median manager in InterSec's universe over the 10 years ending 1991 is shown in Figure 13. Over the 3 and 5 year periods, the median manager outperformed EAFE but over the 10 year period the median manager underperformed the index by nearly one-half percentage point annualized. The spectacular growth and performance of the Japanese markets during the mid 1980's had a large impact on these results. Many managers underweighted Japan for several years because they felt the Japanese market was seriously over-valued. This decision hurt returns relative to EAFE for a protracted period. Yearly returns from InterSec's data base illustrate that "beating the index" can be difficult for international managers over extended periods (see Figure 14).

It is important to recognize that the performance of international active managers is more volatile than that of domestic managers. As shown in Figure 15, the median U.S. active manager in the Trust Universe Comparison Service (TUCS) provided returns that were within  $\pm 3$  percentage points around the U.S. market from 1987-1991. The variability of the median international active manager in TUCS was more than four times that level, i.e. within  $\pm 13$  percentage points around the international market during the same period. The additional volatility of international managers will impact the SBI's evaluation process. Longer time frames may be necessary to judge a manager's potential to add value relative to EAFE due to the additional volatility/variability of returns.

Figure 12.

# International Investment Approaches Used by U.S. Tax Exempt Funds December 1991

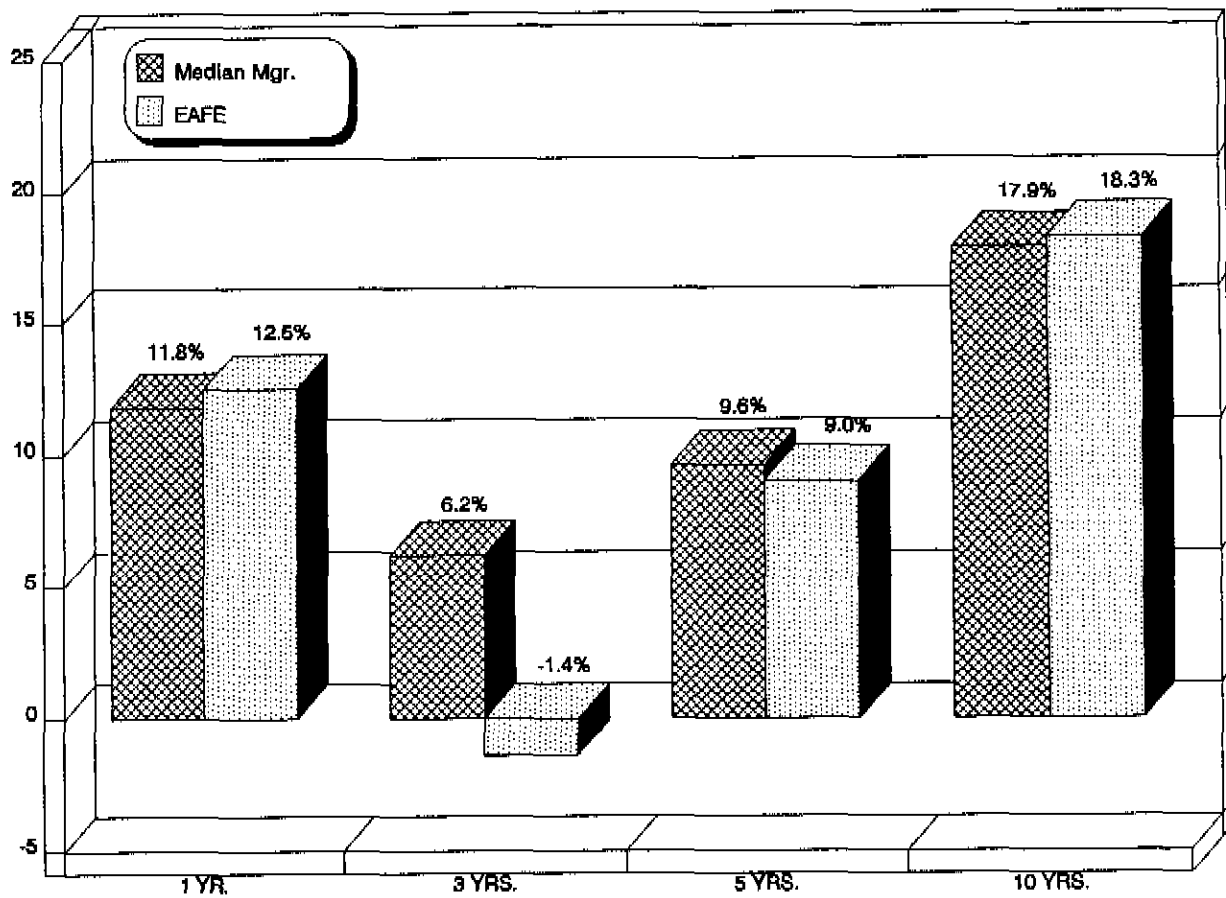


Source: InterSec Research Corp.

Figure 13.

## Median Manager Performance Periods Ending Dec. 31, 1991 Annualized Returns

PERCENT



Source: InterSec Research Corp.

**FIGURE 14**

**MEDIAN MANAGER VS. EAFE  
ANNUAL PERIODS**

	<b>EAFE</b>	<b>InterSec Median Manager</b>	<b>Median Manager Over (+)/Under (-) EAFE</b>
1991	12.13%*	11.85%	-0.28 percentage points
1990	-23.45	-13.30*	+10.15
1989	10.53	21.63*	+11.10
1988	28.27*	17.35	-10.92
1987	24.63*	11.30	-13.33
1986	69.45*	60.00	-9.45
1985	56.16*	55.90	-0.26
1984	7.38*	-2.90	-10.28
1983	23.69	28.70*	+5.01
1982	-1.86	3.90*	+5.76

\* better performance

Sources: Median manager returns from InterSec Research Corp.  
EAFE returns from Richards & Tierney

**FIGURE 15****VARIABILITY OF ACTIVE MANAGER RETURNS****ANNUAL RETURN**

	<b>TUCS Median International Manager</b>	<b>EAFE</b>	<b>Difference</b>
1991	11.16%	12.13%	-0.97% percentage points
1990	-13.59	-23.45	9.86
1989	20.69	10.45	10.16
1988	15.46	28.27	-12.81
1987	14.87	24.63	-9.76

	<b>TUCS Median U.S. Manager</b>	<b>Wilshire 5000</b>	<b>Difference</b>
1991	31.64%	34.20%	-2.56 percentage points
1990	-4.19	-6.18	1.99
1989	26.25	29.17	-2.92
1988	17.14	17.94	-0.80
1987	3.90	2.27	1.63

Sources: Median manager data from Trust Universe Comparison Service (TUCS)

EAFE and Wilshire data from Richards & Tierney



## **HOW SHOULD THE BOARD STRUCTURE ITS INTERNATIONAL PROGRAM?**

Staff and the Investment Advisory Council (IAC) recommend a two-phase approach to the investment management structure for the international equity segment of the Basic Funds:

- Initial Structure - 100% passive
- Longer Term Structure - at least 50% active

Passive management is an appropriate investment strategy, particularly during the start-up phase of the SBI's international program:

- It provides immediate diversification benefits through exposure across international markets.
- Large sums of money can be deployed relatively quickly and at lower administrative cost.
- The returns produced by an index manager will be predictable relative to the SBI's chosen benchmark or target.
- The search process for an index manager will be less complex and time consuming than for multiple active managers. Staff/IAC expect that the Board could hire an index manager as early as September 1992 and begin funding in October 1992.
- Initial reliance on passive management provides time for the SBI to become familiar with the administrative issues of international investing (global custody and settlement, multi-currency accounting and performance reporting) without the added complexity of a multiple manager structure.

Active management is very attractive over the longer term. Staff and the IAC agree that the SBI should seek incremental gains/valued added through a variety of active strategies:

- top-down
- bottom-up
- top-down/bottom-up
- active country/passive stock
- regional specialists
- emerging market specialists

Staff/IAC do not propose a specific allocation to any particular active approach and do not suggest a definite timetable for incorporating any strategy. Rather, they recommend that the SBI begin its search for active managers as soon as practicable. As attractive candidates are identified, they should be incorporated into the SBI's international program. Staff/IAC expect that one or more active managers could be hired by the end of calendar 1992. The SBI should expect to add other candidates during calendar 1993.

Over time, staff/IAC believe that the SBI should seek to have at least 50% of the international allocation actively managed. Before adding active managers above the 50% level, however, the Board should expressly affirm a higher commitment to active management.

A summary of all recommendations contained in this position paper can be found in Figure 16.

## FIGURE 16

### BASIC RETIREMENT FUNDS INTERNATIONAL EQUITY PROGRAM SUMMARY OF RECOMMENDATIONS

#### Asset Class Target:

- Source Morgan Stanley Capital International Index of Europe, Australia and the Far East (EAFE)
- Weighting Capitalization, subject to restrictions shown below
- Currency U.S. Dollar, Unhedged

#### Restrictions:

- Active and Passive eliminate securities that U.S. investors are not allowed to own.  
  
eliminate securities that are affected by the SBI's policy on liquor and tobacco
- Active only eliminate securities that are affected by the SBI's policy on South Africa and re-weight back to market weights by country

#### Hedging Strategy:

- Passive no hedging
- Active opportunistic/tactical hedging by individual managers

#### Management Structure:

- Initial 100% passive
- Longer Term at least 50% active

#### Timing:

- Passive select manager by September 1992
- Active begin search process as soon as possible\*

\* Active managers will be added as soon as practicable. Attractive candidates will be identified through an on-going search process during 1992-93.

## FOOTNOTES

1. Callan Associates, "Investing in International Equities: Issues to Consider," 1989.
2. Robert E. Angelica, AT&T, "International Investing Practices of Large Corporate Pension Funds," Investing Worldwide, Association for Investment Management and Research (AIMR) 1990.
3. Frank Russell Company states that mean-variance asset allocation models recommend up to 75% non-U.S. equities. Wilshire Associates states that efficient frontier studies demonstrate that up to a 60% allocation to international stocks can reduce risk and enhance returns
4. Amended and Restated Resolution of the Minnesota State Board of Investment Concerning South Africa, March 1, 1989.
5. Direct investment is defined by IRRC as 10% or more equity in an active South Africa company or employees in South Africa.
6. Alliance Capital Management L.P., "Impact of South Africa Free Constraints in Non-U.S. Equity Markets," June 30, 1991.
7. J.P. Morgan Investment, "South Africa-Free International Investment 1982-1989," 1990.
8. One (1) basis point equals 1/100 of 1%.
9. Anthony W. Robinson, First Chicago Investment Advisers, "Comparison of Fundamental Issues in International and Domestic Equity Investing," International Investing for U.S. Pension Funds, Institute for Fiduciary Education (IFE), May 1989.
10. Rosaland M. Hewsenian, Wilshire Associates, "Summary of International Investing - What are the Issues?," International Investing for U.S. Pension Funds, IFE, May 1989.
11. Christopher A. Nawakowski, InterSec Research Corp., "A Review of Trends in Global Investing," Initiating and Managing a Global Investment Program, AIMR, November 1990.

12. See Andre F. Pernold and Evan C. Shulman, "The Free Lunch in Currency Hedging: Implications for Investment Policy and Performance Standards," Financial Analysts Journal, May-June 1988 and Fisher Black, "Universal Hedging: Optimizing Currency Risks and Reward in International Equity Portfolios," Financial Analysts Journal, July-August 1989.
13. Less than 1% of the international equity portfolios in the InterSec Research Corp universe of U.S. tax exempt investors used either partially or fully hedged benchmarks as of September 1990. This indicates a similarly low percentage of portfolios use systematic hedging.
14. Investment Management Group, Bankers Trust Company, "Comparison of International Indices," September 1988. This publication is the source for most of the data and analysis presented in this section.
15. David Umstead, Boston International Advisors, Inc., "The Portfolio Management Process," Initiating and Managing a Global Investment Program, AIMR 1990.
16. Kenneth R. French and James M. Poterba, "Were Japanese Stock Prices Too High?" Journal of Financial Economics, Vol. 29, 1991.
17. SBI policy prohibits holding the stock of companies who derive more than 50% of their revenues from sale of liquor and tobacco.
18. SBI policy directs its active stock managers to refrain from purchasing stock of companies with direct investment in South Africa unless the manager determines that failure to complete a purchase would be a breach of the manager's fiduciary responsibility.

## APPENDIX A

### Statewide Public Pension Funds Invested Internationally

California Public Employees Retirement System  
California Teachers Retirement System  
Public Employees Retirement Association of Colorado  
Connecticut Trust Funds  
Delaware State Pension Funds  
*Public Employee Retirement System of Idaho*  
State Universities Retirement System of Illinois  
Teachers Retirement System of the State of Illinois  
Illinois State Board of Investment  
Florida Retirement System Trust Fund  
Iowa Public Employees Retirement System  
Commonwealth of Massachusetts Pension Reserves Investment Trust  
Public Employees Retirement System of Mississippi  
Montana Board of Investments  
*Public Employees Retirement System of Nevada*  
New Jersey Division of Investment  
New York State Common Retirement Fund  
North Dakota State Investment Board  
School Employees Retirement System of Ohio  
Oregon Investment Council  
Pennsylvania State Employees Retirement System  
South Dakota Investment Council  
Tennessee Consolidated Retirement System  
Teacher Retirement System of Texas  
Utah State Retirement Board  
Washington State Investment Board  
Wisconsin Investment Board

Source: Informal survey conducted by SBI staff in October 1991.

Number of states <b>with</b> international investments	24
Number of states <b>without</b> international investments	<u>9</u>
Total number of states in survey	33

## **APPENDIX B**

### **PUBLICLY HELD INTERNATIONAL COMPANIES WITH DIRECT INVESTMENT IN SOUTH AFRICA**

**NOVEMBER 1990**

#### **AUSTRALIA**

The Broken Hill Pty. Co. Ltd.

Everald Compton International Pty. Ltd.

G.C.F. Investments Pty. Ltd.

Goodman Fielder Wattie Ltd.

G.H. Michell Holdings Pty. Ltd.

The News Corp. Ltd.

Qantas Airways Ltd.

Siddons Ramset Ltd.

TNT Ltd.

#### **AUSTRIA**

Ludwig Engel KG

Hoerbiger Ventilwerke AG

Osterreichische Industrieholding AG (OIAG)

Plasser & Theurer Export von Bahnbaumaschinen GmbH

Konrad Rosenbauer KG

#### **BELGIUM**

CMB N.V.

Hamon-Sobelco S.A.

Solvay et Cie. Societe Anonyme

UCB S.A.

## **CANADA**

Menora Resources Inc.

Unican Security Systems Ltd.

## **DENMARK**

The East Asiatic Co. Ltd. A/S

Novo Nordisk A/S

Potagua A/S

Sophus Berendsen A/S

## **FEDERAL REPUBLIC OF GERMANY**

Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG

AGIV Aktiengesellschaft Furr Industrie und Verkehrswesen

Allianz AG

Allweiler AG

Altana Industrie-Aktien und Anlagen AG

J.H. Bachmann GmbH & Co

BASF AG

Baumwollspinnerei Gronau AG

Bayer AG

Bayerische Hpotheken- und Wechselbank AG (Hypobank)

Bayerische Landesbank Girozentrale

Bayerische Motoren Werke AG

Bayerische Vereinsbank AG

Bekum Maschinenfabrikenen GmbH

Bergische Achsenfabrik Fr. Kotz & Sohne

Bochumer Eisenhutte Heintsmann GmbH & Co. KG

Boehringer Ingelheim Zentrale GmbH

Boehringer Mannheim GmbH

Dr. Th. Bohme KG, Chemische Fabrik GmbH & Co.

Robert Bosch GmbH

Burkert GmbH & Co. KG

Colonia Versicherung AG

Commerzbank AG

Continental AG



Daimler-Benz AG  
Degussa AG  
Detia Degesch GmbH  
Deutsche Afrika Linen  
Deutsche Babcock AG  
Deutsche Bank AG  
Deutsche Bundesbahn  
Deutsche Steinindustrie AG  
Didier-Werke AG  
DLW AG  
Dragoco Geberding & Co. GmbH  
Dresdener Bank AG  
DS-Chemie GmbH & Co. KG

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH  
EVT Energie- und Verfahrenstechnik GmbH

A. W. Faber-Castell Unternehmensverwaltung GmbH & Co.  
FAG Kugelfischer Georg Schafer KGaA  
Falke-Gruppe  
C. & E. Fein GmbH & Co.  
Freudenberg & Co.  
Fuchs, Petrolub AG Oel + Chemie

GEA Luftkühlgesellschaft Happel GmbH & Co.  
Gedore Werkzeugfabrik Otto Dowidat  
Gewerkschaft Eisenhütte Westfalen GmbH  
Gildemeister AG  
Th. Goldschmidt AG

Haftpflichtverband der Deutschen Industrie Versicherungsverein AG  
E. Heitkamp Baugesellschaft mbH & Co. KG  
Helm AG  
Hermann Hemscheidt Maschinenfabrik GmbH & Co.  
Henkel KGaA  
Richard Hirschmann Radiotechnisches Werk  
Hoechst AG  
Hoesch AG  
Philipp Holzmann AG  
Hüttenes- Albertus Chemische Werke GmbH

Industrieaufbaugesellschaft Schaeffler KG  
Industrie- Werke Karlsruhe Augsburg AG

Jackstadt GmbH

Max Kettner Verpackungsmaschinenfabrik GmbH & Co. KG  
Kienbaum Verwaltungsgesellschaft mbH  
Klockner-Becorit GmbH  
Klockner-Moeller Gruppe  
Klockner-Werke AG  
KM-Kabelmetal AG  
Knorr-Bremse KG  
Korber AG  
Kunz Holding GmbH & Co. KG

Lapple GmbH, Verwaltungs- und Beteiligungsgesellschaft  
Ledermann GmbH & Co.  
(Deutsche) Lufthansa AG

Madaus AG  
MAN AG  
Mannesmann AG  
F.X. Meiller Fahrzeug- und Maschinenfabrik GmbH & Co. KG  
E. Merck Beteiligungen oHG  
Metallgesellschaft AG  
Miele & Cie. GmbH & Co.  
Motorenfabrik Hatz GmbH & Co. KG  
Munchener Ruckversicherungs-gesellschaft

Neckar Drahtwerke GmbH  
Nixdorf Computer AG  
Norddeutsche Affinerie AG

Optyl Holding GmbH & Co.

Pennekamp & Huesker KG  
G.M. Pfaff AG  
Preussag AG

Rheiner Maschinenfabrik Windhoff AG  
Rohde & Liesenfeld GmbH & Co.  
Rohm GmbH  
August Rugeberg KG

Johannes Schafer Vorm Stettiner Schraubenwerke GmbH & Co. KG  
Schering AG  
L. Schuler GmbH  
Gebr. Sedlmayr GmbH & Co.  
Semikron International

Siemens AG  
Staff GmbH & Co.  
Sud-Chemie AG

Tente Rollen GmbH & Co.  
Thyssen AG Vorm August Thyssen-Hutte  
Treuarbeit AG Wirtschaftsprüfungsgesellschaft  
Steuerberatungsgesellschaft  
Gebrüder Trox GmbH

Uhlmann & Co. KG  
UTP Schweiss-Material GmbH & Co.

Vega AG  
Volkswagen AG

Wacker-Chemie GmbH  
WAP Reinigungssysteme GmbH & Co.  
Max Weishaupt GmbH  
Wella AG  
Westfalia Separator AG  
Ernst Winter & Sohn GmbH & Co.  
Adolf Würth GmbH & Co. KG

Carl-Zeiss-Stiftung  
Zeppelin-Stiftung  
Zimmerman & Jansen GmbH

## **FRANCE**

Air France Cie. (Nationale)  
L'Air Liquide S.A.  
Assurances Generales de France

Banque Francaise du Commerce Exterieur

Chargeurs S.A.  
Compagnie Financiere de Suez  
Compagnie de Fives-Lille S.A.  
Compagnie Generale d'Electricite (CGE)

Dollfus-Mieg & Cie. S.A.  
Louis Dreyfus et Cie. S.A.  
Faiveley Enterprises S.A.

Lafarge-Coppee S.A.  
L'Oreal S.A.

Pechiney  
Prouvost S.A.  
Rhone-Poulenc S.A.  
Societe Nationale des Chemins de fer Francais (SNCF)  
Societe Parisienne d'Entreprises et de Participations S.A. (SPEP)

Total Compagnie Francaise des Petroles  
Tractel S.A.

## **GREECE**

National Bank of Greece

## **ISRAEL**

Bank Leumi Le-Israel

El Al Israel Airlines Ltd.

## **ITALY**

Assicurazioni Generali S.p.A.

Coe & Clerici S.p.A.

Ente Nazionale Idrocarburi (E.N.I.)

Fiat S.p.A.

Istituto Per La Ricostruzione Industriale (I.R.I.)

Montedison S.p.A.

Ing. C. Olivetti & C. S.p.A.

## **JAPAN**

Amada Co. Ltd.

Brother Industries Ltd./Brother Kogyo

Chori Co. Ltd.

C. Itoh & Co. Ltd./Itochu Shoji

Japan Air Lines Co. Ltd./Nippon Koku

Kanematsu-Gosho Ltd.

Kinsho-Mataichi Corp.

Komatsu Ltd./Komatsu Seisakusho

Marubeni Corp.

Mayekawa Industries Co. Ltd.

Meiwa Trading Co. Ltd./Meiwa Sangyo

Mitsubishi Corp./Mitsubishi Shoji

Mitsui & Co. Ltd./Mitsui Bussan

Moritani & Co. Ltd.

NGK Spark Plug Co. Ltd./Nippon Tokushu Togyo

Nichimen Corp.

Nippon Seiko K.K.

Nippon Suisan Kaisha Ltd.

Nissho Iwai Corp.

Sany Electric Co. Ltd./Sanyo Denki

Sumitomo Corp./Sumitomi Shoji

Toyo Menka Kaisha Ltd./Tohmen

Toyota Tsusho Corp.

## **LUXEMBOURG**

Ellipse S.A.

## **THE NETHERLANDS**

DSM N.V.

Hunter Douglas N.V.

Internatio-Muller N.V.

KLM Royal Dutch Airlines/Koninklijke Luchtvaart Maatschappij N.V.

Koninklijke Distilleerderijen Erven Lucas Bols N.V.

Koninklijke Nedlloyd Groep N.V.

Philips International B.V.

Royal Dutch Petroleum Co.  
Royal Packaging Industries Van Leer B.V.  
(Koninklijke Emballage Industries Van Leer B.V.)

#### **NETHERLANDS ANTILLES**

Velcro Industries N.V.

#### **NORWAY**

Unitor Ships Service A/S

#### **PORTUGAL**

Air Portugal (TAP)

Banco Nacional Ultramarino

#### **SPAIN**

Pescanova S.A.

#### **SWEDEN**

Asea AB  
Atlas Copco AB

Incentive AB

Sandvik AB  
SKF AB

#### **SWITZERLAND**

Adia S.A.  
Applied Research Laboratories S.A.

BBC Brown Boveri Ltd.  
Birkhart Transport AG  
Gebruder Buhler AG

Ciba-Geigy AG  
CS Holding

Danzas AG

Endress + Hauser Consult AG

Hermes Precisa International S.A.

Hesta AG

Holderbank Financiere Glaris Ltd.

Kuhne & Nagel International AG

MAAG-Zahnrad und Maschinen AG

Nestle S.A.

Oerlikon-Buhrle Holding Ltd.

Roche Holding Ltd.

Sandoz Ltd.

Schindler Holding Ltd.

Schweizerische Aluminium Ltd./Alusuisse

Schweizerische Bankgesellschaft/Union Bank of Switzerland

Schweizerische Eternit Holding AG

Schweizerischer Bankverein/Swiss Bank Corp.

Schweizerische Ruckversicherungsgesellschaft (Swiss Reinsurance Co.)

Spedag Speditions AG

STAG AG

Gebruder Sulzer AG

Swissair/Schweizerische Luftverkehr AG

Tarego AG

Transco Holding AG

## **UNITED KINGDOM**

Allied Capital Investment P.L.C.

APV P.L.C.

Avdel P.L.C.

Babcock International Group P.L.C.

B.A.T. Industries P.L.C.

The Beckenham Group P.L.C.

BET P.L.C.

Blackwood Hodge P.L.C.

Blue Circle Industries P.L.C.

The BOC Group P.L.C.  
The Boots Co. P.L.C.  
Bowthorpe Holdings P.L.C.  
BPB Industries P.L.C.  
British Airways P.L.C.  
The British Aviation Insurance Co. Ltd.  
British & Commonwealth Holdings P.L.C.  
British Petroleum Co. P.L.C.  
Brown Shipley Holdings P.L.C.  
BTR P.L.C.  
The Burmah Oil P.L.C.

Cadbury Schweppes P.L.C.  
Century Oils Group P.L.C.  
Charter Consolidated P.L.C.  
Chloride Group P.L.C.  
Horace Clarkson P.L.C.  
Clayhithe P.L.C.  
Coates Brothers P.L.C.  
Coats Viyella P.L.C.  
Commerical Union Assurance Co. P.L.C.  
Cookson Group P.L.C.  
Courtaulds P.L.C.  
Courtaulds Textiles P.L.C.  
Croda International P.L.C.

Davies & Metcalfe P.L.C.  
Davy Corp. P.L.C.  
Delta P.L.C.  
Desoutter Bros. (Holdings) P.L.C.  
Dobson Park Industries P.L.C.  
Drummond Group P.L.C.

B. Elliott P.L.C.  
E.R.F. (Holdings) P.L.C.  
Evode Group P.L.C.

J.H. Fenner (Holdings) P.L.C.  
Fine Art Developments P.L.C.  
Fisons P.L.C.  
Foseco P.L.C.

GEI International P.L.C.  
General Accident Fire & Life Assurance Corp. P.L.C.  
General Electric Co. P.L.C.



Gestetner Holdings P.L.C.  
GKN P.L.C.  
Glaxo Holdings P.L.C.  
Clopec Holdings Ltd.  
Goode Durrant P.L.C.  
Grand Metropolitan P.L.C.  
Great Universal Stores P.L.C.  
Walter Greenbank P.L.C.  
Guardian Royal Exchange P.L.C.  
Guinness P.L.C.

Haden MacLellan Holdings P.L.C.  
Hall Engineering (Holdings) P.L.C.  
Hanson P.L.C.  
Harrisons & Crosfield P.L.C.  
Hawker Siddeley Group P.L.C.  
Hickson International P.L.C.  
Hi-Tec P.L.C.  
Howden Group P.L.C.  
Hunting P.L.C.

Imperial Chemicals Industries P.L.C.

Johnson Matthey P.L.C.

Kelp Ltd.

The Laird Group P.L.C.  
Laporte P.L.C.  
Leica P.L.C.  
Thomas Locker (Holdings) P.L.C.  
London Finance & Investment Group P.L.C.  
London International Group P.L.C.  
Lonrho P.L.C.  
Lopex P.L.C.  
Low and Bonar P.L.C.  
Lucas Industries P.L.C.

Marley P.L.C.  
Maxwell Communication Corp. P.L.C.  
McKechnie P.L.C.  
The Morgan Crucible Co. P.L.C.

James Neill Holdings P.L.C.  
Norcross P.L.C.

Norton Opax P.L.C.

The Ocean Group Ltd.

Paringa Mining & Exploration Co. P.L.C.

Pearson P.L.C.

The Peninsular and Oriental Steam Navigation Co.

Pilkington P.L.C.

Pirelli U.K. P.L.C.

The Plessey Co. P.L.C.

Powell Duffryn P.L.C.

Prudential Corp. P.L.C.

PWS Holdings P.L.C.

Racal Electronics P.L.C.

Reckitt & Colman P.L.C.

Record Holdings P.L.C.

Reed International P.L.C.

Renold P.L.C.

Rolls Royce P.L.C.

Royal Insurance Holdings P.L.C.

The RTZ Corp. P.L.C.

Scapa Group P.L.C.

Senior Engineering Group P.L.C.

Siebe P.L.C.

The 600 Group P.L.C.

SmithKline Beecham P.L.C.

Smith & Nephew P.L.C.

STC P.L.C.

Sun Alliance & London Insurance P.L.C.

Suter P.L.C.

Tate & Lyle P.L.C.

Telfos Holdings P.L.C.

Thames Water P.L.C.

Thermal International Holdings P.L.C.

Thorn EMI P.L.C.

TI Group P.L.C.

T&N P.L.C.

Tomkins P.L.C.

Tootal Group P.L.C.

Trafalgar House P.L.C.

Unilever P.L.C.

United Industries P.L.C.

Vickers P.L.C.

Wassall P.L.C.

The Weir Group P.L.C.

Wellcome P.L.C.

Wellman P.L.C.

Wiggins Teape Appleton P.L.C.

Willis Faber P.L.C.

George Wimpey P.L.C.

Wolseley P.L.C.

WPP Group P.L.C.

Yule Catto & Co. P.L.C.

Source: "International Business in South Africa 1990, "Investor Responsibility Research Center, Inc., Washington, D.C.

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# **INTERNATIONAL EQUITY INVESTING**

**Minnesota State Board of Investment**

**Staff Position Paper**

**May 1999**

# INTERNATIONAL EQUITY INVESTING

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## EXECUTIVE SUMMARY

This paper reviews international equity investing and the International Equity Program for purposes of enhancing the long-term performance of the Minnesota State Board of Investment's (SBI's) retirement funds.

In the introduction, the case for international investing is reaffirmed. The attractiveness is three-fold: increased investment opportunity, diversification to lower overall portfolio risk, and the potential for higher total portfolio returns.

After a review of major international indices, Staff and the Investment Advisory Council (IAC) found that there are several good indices available to measure international manager performance. In recent years, competition between the major index providers has diminished the differences between the indices. However, some differences between the indices remain. While none of the published indices are perfect, Staff/IAC recommends continuing to use Morgan Stanley Capital International's (MSCI's) EAFE Free to measure developed market managers and Emerging Markets (EM) Free to measure emerging market managers. The Staff/IAC also recommend eliminating the fixed weight asset class target put in place in late 1996, and replacing it with a floating, market capitalization, weighted index. The recommended index is MSCI's "EAFE Free & EM Free" which is a published index.

Staff/IAC reviewed information on investment firms that offer global equity products to determine if they would offer any advantages for the SBI's retirement funds. A global equity product is a portfolio of stocks from developed countries including the United States, where managers add value through stock selection and over or under weighting countries. Results of the survey showed that there are a limited number of firms offering global equity products that can handle a sizeable portfolio. In addition, a global mandate would not provide any different U.S. exposure than the program currently experiences within the current rebalancing guidelines in place. Staff/IAC have concluded that global management is not a viable option at this point for the SBI.

Staff/IAC also reviewed information on regional mandates collected by InterSec Research Corporation, and found that regional equity products are very limited in number. Regional investing presents an additional problem for institutional investors: the need to allocate funds to all regions within the asset class target at appropriate weightings. Most institutional investors prefer to hire broad market investment managers to make the country/regional allocation decisions. Country/regional allocation is a strategy that portfolio managers can use to add value to the International Equity Program. For these reasons, Staff/IAC believe there is limited opportunity to successfully implement a regional investment program at this time.

Staff/IAC reviewed the issue of active versus passive management for the International Equity Program. Due to inefficiencies in the international equity markets, it is recommended that the SBI adopt a policy requiring at least 33% of the International Equity Program be actively managed and at least 33% of the International Equity Program be passively managed.

Currently, there are very few investment firms offering semi-passive or enhanced index products. Therefore, Staff/IAC is not recommending this type of product, but will continue to review developments in this area.

In emerging markets, the recommendation is to use active management only in order to take advantage of opportunities in these highly inefficient markets.

Recommendations on the current international manager structure include the following:

1. Restrict all EAFE managers to investments in developed markets.
2. Allow active EAFE managers to be active country and active stock managers.
3. Measure the performance of passive managers against EAFE Free. The active managers may or may not be measured against a custom benchmark.

4. To prudently manage the SBI's current allocation to international equities, the SBI should maintain a minimum of four active EAFE Free managers and three EMF managers.

In 1995, the SBI put a currency overlay program into place to minimize short-term absolute return volatility of the International Equity Program due to currency movements. In 1998, the SBI reduced the size of the currency overlay program by 50% to reduce the tracking error relative to the unhedged asset class target and to reduce the risk associated with the sizable account controlled by one manager.

The SBI has had continuing discussions about currency management, and has the following concerns with regard to the currency overlay program:

1. The performance of the active and passive international managers in aggregate is measured against an unhedged asset class target. Retaining the currency overlay program at its current level will cause significant tracking error relative to the unhedged asset class target
2. Staff believes Record Treasury Management has a process that can add value to the International Equity Program. However, the size of the account should be in line with other active international equity managers to ensure that the returns of their account will not significantly impact the International Equity Program.

Staff/IAC recommends the following:

- The SBI give Staff/IAC the discretion to allow the active international equity managers to continue to use currency management in the SBIs' portfolios.
- The SBI discontinue the use of a currency overlay program to hedge international currency exposure.
- The SBI retain Record Treasury Management as an active manager to manage foreign currencies with the goal of adding value to the total program until a review of all active managers is complete. The size of the currency manager's underlying portfolio should be in line with the average size of an active EAFE manager (currently \$500 million).

## INTRODUCTION

The purpose of this paper is to formally review the International Equity Program. The intent is to evaluate the program with the objective of enhancing the long-term performance of the retirement funds managed by the Minnesota State Board of Investment (SBI).

The SBI approved the addition of international equities as an asset class in the retirement funds in September 1991. In October 1995, the SBI approved an allocation to emerging markets. The International Equity Program has been successful, and the addition of international stocks has been beneficial to the retirement funds. However, approaches to international investing have evolved significantly since the inception of the SBI's International Equity Program. Therefore, Staff and the Investment Advisory Council (IAC) agreed to review international equity investing and evaluate the International Equity Program. Specifically, the following areas are addressed:

- Evaluate **indices** for the asset class target and individual manager benchmarks.
- Explore the potential use of **global managers**.
- Explore the potential use of **regional managers**.
- Examine the **international program structure**.
- Re-examine the **currency overlay program**.

This paper examines these topics and incorporates the current Staff/IAC position and recommendations where appropriate.

## **BACKGROUND**

### **WHY INVEST IN INTERNATIONAL MARKETS?**

The case for international investing, in both developed and emerging markets, remains strong. The attractiveness is three-fold:

- Increased investment opportunity.
- Diversification to lower overall portfolio risk.
- Potential for higher total portfolio returns.

### **INCREASED INVESTMENT OPPORTUNITY**

As of year-end 1998, half of the value in the world's capital markets resides outside of the United States. Investing in international markets allows the SBI to significantly increase its investment opportunity set. **Figure 1** shows the global capital markets measured by market capitalization weight in the Morgan Stanley Capital International's (MSCI) All Country World Index (ACWI). While the U.S. makes up 49% of the value, or capitalization, of the world markets, four countries (Japan, the United Kingdom, Germany, and France) represent the next 28%. In addition, emerging equity markets (i.e. Latin America, Eastern Europe, Africa and the Middle East, and Asia excluding Japan) are developing rapidly and currently comprise approximately 4% of the world markets.

**Figure 1. Market Capitalization by Country as of December 31, 1998.**

**Morgan Stanley Capital International  
All Country World Index (ACWI)**

<u>Country</u>	<u>Weight (%)</u>	<u>Country</u>	<u>Weight (%)</u>
Argentina	0.18	Korea	0.40
Australia	1.16	Malaysia	0.21
Austria*	0.15	Mexico	0.44
Belgium*	0.87	Netherlands*	2.94
Brazil	0.45	New Zealand	0.08
Canada	1.73	Norway	0.17
Chile	0.17	Pakistan	0.02
China Free	0.03	Peru	0.04
Colombia	0.03	Philippines	0.10
Czech Republic	0.04	Poland	0.05
Denmark	0.40	Portugal*	0.30
Finland*	0.70	Russia	0.05
<b>France*</b>	<b>4.25</b>	Singapore	0.31
<b>Germany*</b>	<b>4.82</b>	South Africa	0.39
Greece	0.28	Spain*	1.51
Hong Kong	0.93	Sri Lanka	0.00
Hungary	0.06	Sweden	1.19
India	0.30	Switzerland	3.64
Indonesia	0.07	Taiwan	0.75
Ireland*	0.22	Thailand	0.10
Israel	0.13	Turkey	0.08
Italy*	2.36	<b>United Kingdom</b>	<b>9.61</b>
<b>Japan</b>	<b>9.49</b>	<b>United States</b>	<b>48.75</b>
Jordan	0.01	Venezuela	0.04
		<b>All Country</b>	<b>100.0</b>
		<b>World Index</b>	

\* These countries are currently members of the European Economic and Monetary Union (EMU), have converted to the euro currency, and are 18.12% of the ACWI. Luxemburg (not listed) is the eleventh country in the EMU.

## DIVERSIFICATION TO LOWER OVERALL PORTFOLIO RISK

The theory of diversification in investment portfolios, for which Harry Markowitz, Ph.D., won a Nobel Prize, states that combining uncorrelated assets into a single portfolio results in a superior risk/return trade-off. Correlation is a statistical measure of how much markets move together over a discrete period of time. A correlation of +1.0 would indicate the returns of a market moved exactly like the returns of another market - up or down. A correlation of zero would indicate there was no association of returns, that is, if one market's return increased, the return of the other could not be predicted.

**Figure 2** shows the historical correlation of several asset classes: developed markets (hedged), developed markets (unhedged), emerging markets (unhedged), U.S. equity, and U.S. bonds. The ten-year correlation data indicates that developed (either hedged or unhedged) and emerging market equity returns are not well correlated to either U.S. equity or U.S. bonds, thus using international equities in a portfolio will provide diversification. A portfolio that is diversified with international securities is likely to exhibit more stable performance over time and a superior risk/return trade-off.

Recently, the foreign markets have seemed more correlated due to short-term negative market shocks that bring all security markets down together. While the world has become more interdependent, global events still impact stock markets differently. For example, despite a significant financial meltdown in Asia, Russia, and Brazil during 1998 and a *negative 25%* return in MSCI's *Emerging Markets Free Index*, the U.S. equity market returned *positive 28%* for the year as measured by the S&P 500.



Figure 2.

## Historical Correlation of Returns 1988 - 1998

	Developed Markets (Hedged)	Developed Markets (Unhedged)	Emerging Markets (Unhedged)	US Equities	US Bonds
Developed Mkts. (Hedged)	1.00				
Developed Mkts. (Unhedged)	0.85	1.00			
Emerging Mkts. (Unhedged)	0.57	0.49	1.00		
US Equities	0.62	0.50	0.50	1.00	
US Bonds	0.16	0.17	0.01	0.39	1.00

Despite growing global economic integration, the correlation between various national markets continues to be sufficiently low that diversification through international equities reduces risk.<sup>1</sup> **Figure 3** shows the historical correlation of U.S. markets (as represented by the S&P 500) with a sample of financial markets from around the world. The chart indicates that the equity markets of foreign countries through 1997 were not highly correlated with U.S. equities. (Data for 1998 was not available at the time of this review.)

**Figure 3** also shows that the correlation between the U.S. and international markets remained relatively constant for the two periods shown, 1971-1986 and 1988-1997. This indicates that international equity markets had not become more correlated with the U.S. equity markets during those periods, and that diversification benefits of international investing remained strong.

---

**Figure 3. Correlation of International Equities with U.S. Equities**

Correlation of select country markets with S&P 500.

	<u>1971 – 1986*</u>	<u>1988 – 1997**</u>
Canada	0.66	0.69
Netherlands	0.55	0.57
UK	0.47	0.56
EMU	N/A	0.50
Singapore	0.37	0.48
<b>ACWI ex-US</b>	<b>N/A</b>	<b>0.47</b>
France	0.40	0.46
Hong Kong	0.26	0.46
Switzerland	0.44	0.45
<b>EAFE</b>	<b>0.47</b>	<b>0.45</b>
Germany	0.32	0.38
Mexico	N/A	0.35
Japan	0.27	0.26
Brazil	N/A	0.26
Greece	N/A	0.08
Turkey	N/A	-0.08

Source: \* Solnick (1991), International Investments

\*\* Barclays Global Investors

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## **POTENTIAL FOR HIGHER TOTAL PORTFOLJO RETURNS**

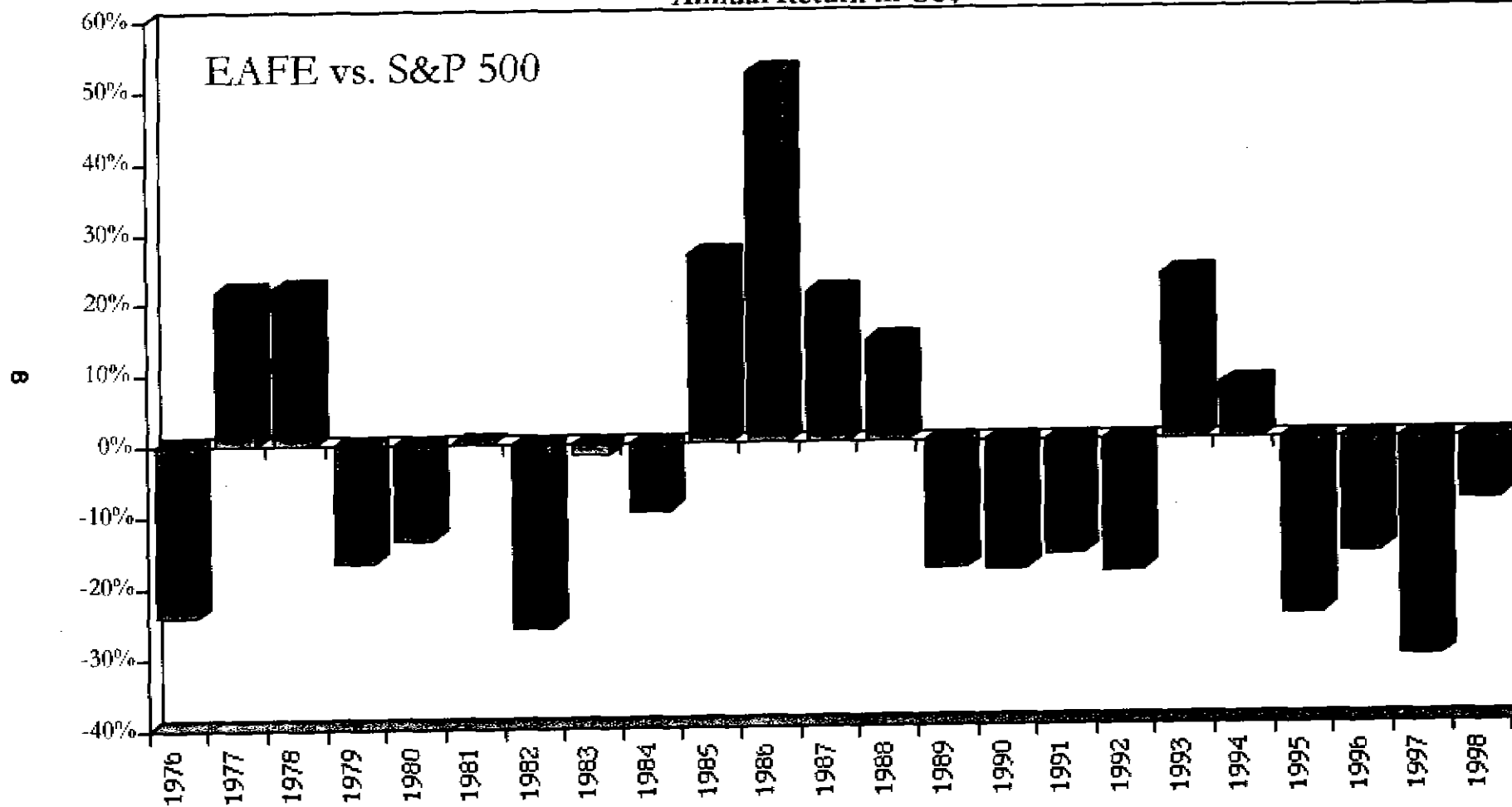
The growing global economy has rewarded many international companies with healthy sales and higher earnings. This environment has led many investors into the international equity markets. Staff believes that the expected returns of international equities are commensurate with the risks. By adding international equities to the plan, the SBI is able to get more exposure to equity markets without paying a higher price in overall program volatility.

International markets have generated higher returns than the U.S. market in some periods. **Figures 4(a) and 4(b)** show the annual returns of the developed markets and the emerging markets, respectively, relative to the U.S. equity market as represented by the S&P 500. Developed markets are represented by the MSCI Europe, Australia and Far East Index (EAFE) and emerging markets are represented by the MSCI Emerging Markets Free Index (EMF) and International Finance Corporation (IFC) indices. During periods where the bars are above the horizontal line, the foreign markets outperformed the U.S. S&P 500. During periods where the bars are below the horizontal line, the foreign markets under-performed the U.S. markets. During the most recent 8-year period, U.S. markets generated higher returns than international markets due to a strong U.S. economy, low interest rates, minimal inflation, restructured corporations, and high corporate profits. During other periods, such as the late 1970's and for a period from the late 1980's through the early 1990's, international stock markets outperformed U.S. stock markets. Many believe that the current trend of higher U.S. returns will again reverse with international markets outperforming the U.S.

Figure 4(a)

## Developed Markets Relative Performance

Annual Return in US\$



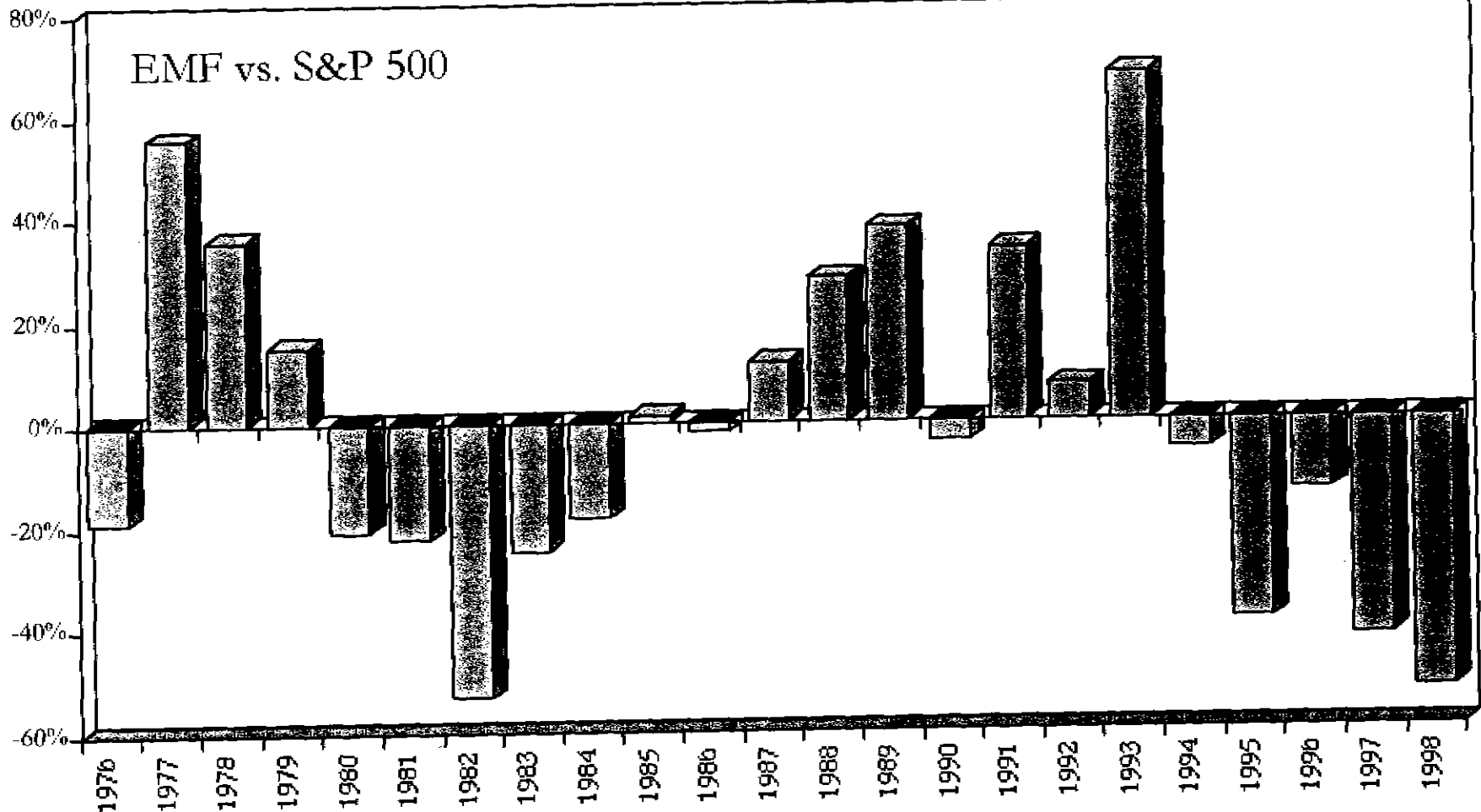
During periods where the bars are above the horizontal line, foreign markets outperformed the U.S. market.



Figure 4(b)

## Emerging Markets Relative Performance

Annual Return in US\$



During periods where the bars are above the horizontal line, foreign markets outperformed the U.S. market.



1976-1984: Composite of IFC Emerging Markets Database Markets: Argentina, Brazil, Chile, Mexico, India, South Korea, Thailand, Zimbabwe; 1985-1987: IFC Investable Index; 1988-1998: MSCI Emerging Markets Free Index

## **THE CURRENT INTERNATIONAL EQUITY PROGRAM**

As of December 31, 1998, the International Equity Program consisted of four active developed markets managers, one passive developed markets manager, three emerging markets managers, and one currency manager. The developed markets managers' benchmark is the MSCI EAFE Free. The emerging markets managers' benchmark is MSCI EM Free index. The term "Free" refers to an index that is free of securities with local market restrictions on share ownership by foreign investors. Therefore, a "Free" index reflects actual buyable opportunities for a foreign investor. Throughout this paper, EAFE and EAFE Free may be used interchangeably, as the indices are very similar. At this time, the difference is limited to one country, Singapore, where foreign ownership restrictions exist.

The asset class target for the International Equity Program is currently a fixed weight target: 87% EAFE Free and 13% EM Free. This target was set in December 1996 after the Board approved an allocation of up to 2% of the total Fund to stocks of emerging markets. At that level, emerging markets represented approximately 13% of the SBI's international stock pool. Coincidentally, at that time, MSCI's All Country World Index also had a weighting of about 13% in emerging markets.

## BENCHMARK INDICES

This section addresses the indices (benchmarks) that are available to measure international managers investing in developed and emerging markets. As market indices are constantly evolving, a periodic review is warranted.

Custom benchmarks, similar to those used in the SBI Domestic Equity Program, are not a viable option for international equity investing at this time. A significant amount of quantitative research, database improvements and tool development will need to occur before institutional investors can seriously consider their use. However, customized benchmarks could become feasible in the future, and staff will continue to monitor changes taking place in the industry.

### AVAILABLE INDICES

Currently, there are four major index “providers” available for **developed markets**. They include:

- The Morgan Stanley Capital International Indices (MSCI).
- The Salomon Smith Barney World Equity Indices (Salomon).
- The Financial Times Actuaries World Indices (FT-AWI).
- The Dow Jones Global Indices (DJGI).

There are also four major providers of **emerging markets** benchmarks. They include:

- The Morgan Stanley Capital International Indices (MSCI).
- The Salomon Smith Barney World Equity Indices (Salomon).
- The International Finance Corporation (IFC).
- ING Baring Securities (Baring).

## DESCRIPTIONS OF EACH INDEX FAMILY

Staff conducted a review of the following firms in fall of 1998. At that time, the data available from most of the index providers was through December 1997.

*Morgan Stanley Capital International (MSCI)* was formed in 1986 when Morgan Stanley & Co. purchased *Capital International Perspective S.A.* for their data and indices. Capital International had developed Capital International World Indices in the late 1960's to allow comparisons across stock markets and industries.

Today, *Capital International* retains full editorial discretion over index deletions and additions. Historical information dates back to December 1969. Their research database includes 28,000 securities. The indices are constructed by aggregating the appropriate MSCI Country Indices. The MSCI EAFE Index is the most widely recognized and used developed markets index in the U.S. As of December 1997, it included 21 developed markets, 1080 stocks and a total capitalization, (market price multiplied by shares outstanding) of \$5.9 trillion. The Emerging Markets Free (EMF) Index included 26 countries and 991 securities. The All Country World Index (ACWI) is a capitalization-weighted combination of EAFE, EMF, the U.S., and Canada. As of September 30, 1998, ACWI included 47 countries, approximately 2500 securities, and a total market capitalization of \$20.9 trillion. Each index, ACWI, EAFE, and EMF, is an aggregate of the appropriate country indices. The chart in **Appendix A** shows the countries included in each of these indices.

MSCI constructs a country index by listing every security in that market with its price, shares, significant owners, free float, and monthly trading volume. Then, they examine each industry group to identify the most investable securities: those with the largest size, most trading volume, and the largest free float (market capitalization not owned by governments, other companies, or a significant position by an individual owner). They avoid cross-ownership (companies substantially owned by other companies) where possible and require companies to have at least 25% free float to be included in the index. MSCI selects what they believe to be the most investable stocks, and includes them in the



country index at their full market capitalization weight. The target is to select about 60% of the market capitalization of each industry group. Combining all industry groups then results in the index holding 60% of the market capitalization of each country. This consistency in construction methodology across countries ensures that each country's weight in the regional and composite indices is proportional to its weight in the total universe.<sup>2</sup>

*Salomon Smith Barney's (Salomon)* flagship index is the Europe and Pacific Broad Market Index (BMI). As of December 31, 1997, it held 21 developed countries, 3,949 securities, and total market capitalization of \$5.8 trillion. The BMI can be divided into two sub-indices: the Primary Market Index (PMI) with a total of 957 large-capitalization stocks representing the top 80% of each country's available market capitalization and the Extended Market Index (EMI) with 2,992 stocks representing the bottom 20%. The Salomon emerging market index, included 27 countries and 1,128 stocks as of December 1997.<sup>3</sup> The indices are designed to measure the institutional investable equity universe as it exists; hence, the indices cover about 95% of the universe capitalization.

The BMI is a market capitalization weighted index that includes all listed shares of all companies with market capitalization (float) of at least \$100 million. Salomon does an annual index reconstitution in which all issues are marked-to-market in May with respect to percentage float, total shares outstanding and industry classification. Companies are added to the BMI if their float equals or exceeds \$100 million. Companies are deleted if their float falls below \$75 million. The reconstituted index is pre-announced and is implemented at the July 1 opening each year.<sup>4</sup>

*Financial Times Actuaries World Indices (FT-AWI)* are jointly compiled by FT-SE International Limited, Goldman, Sachs & Co. and Standard & Poor's in conjunction with the Institute of Actuaries and the Faculty of Actuaries. Their indices are predominately used by European fund managers. Data dates back to December 1985. At the end of December 1997, the EuroPac Index included 1,474 securities with a total market capitalization of \$6.9 trillion in 23 countries. This index is divided into two sub-indices:

the Large Cap Index, which represents the top 75% in market capitalization in each country, and the Medium/Small Cap Index, which represents the bottom 25% in market capitalization in each country.

FT-AWI indices include approximately 80 to 85% of the market value of equity securities available to international investors. Securities that comprise the bottom 5% are excluded. FT-AWI eliminates securities that have traded less than 15 days in the last two quarters. The remaining securities are examined to determine the average market capitalization. All securities larger than the average are included in the index, and the sector distribution is determined from these large-cap issues. Securities smaller than average are ranked by market cap in each economic sector and added to the index until the sector weights are close to the sector distribution set by the large-cap issues.<sup>5</sup> FT-AWI imposes restrictions on securities with less than 25% free float: any securities with greater than 25% free float are included at full capitalization weighting.<sup>6</sup>

*Dow Jones Global Indices (DJGI)*, tracks both real-time and historical data. Dow Jones currently calculates 13 regional indexes and 35 country indexes. They do not have a developed market index that can be used as a comparison to the indices discussed above. As of June 30, 1998, the Dow Jones Global Index included 34 countries, about 2900 securities, and market capitalization of \$18 trillion. Their indices represent 80% of the world's investable equity capital, and they are market capitalization weighted.

The construction of an index begins by including the top 50% of companies by market capitalization, which are sorted into industries. The remaining companies are reviewed individually to assess how adding each company will affect the industry weightings until the 80% target is reached. Where significant foreign ownership restrictions apply, the proportion of shares available to foreign investors is included. Issues are not included if they have had more than 10 non-trading days in a quarter. Companies whose stock is 75% controlled by another corporation or a government are excluded.<sup>7</sup>

*The International Finance Corporation (IFC)* has developed the International Finance Corporation Investable, an emerging market index. As of December 31, 1997, this index included 31 emerging countries and 1,424 securities. It includes all emerging market countries where stock markets are open to foreign investors to some degree. IFC adjusts capitalization to account for foreign ownership restrictions. In 1996, IFC also began incorporating a cross-holding adjustment, and began excluding those shares held by the government of the local country. IFC selects the largest, most liquid securities, covering 70% of the market to create the IFC Investable. The index excludes stocks that have less than \$10 million in trading volume per year (\$40,000 per day) and foreign investable market capitalization below \$25 million.<sup>8</sup>

*ING Baring Securities (Baring)* compiles the Baring Securities Emerging Market Index (BEMI). Baring's goal is to create a benchmark of markets and shares international investors could realistically trade. In 1994, Baring established the Baring-Extended, a broader index series including 24 countries (instead of 21) and 600 securities (instead of 450). As of December 31, 1997, the Extended BEMI included 26 countries and 643 securities.

Barings includes countries undergoing rapid industrialization with at least \$2 billion in market capitalization and 100 listed companies, but they may exclude countries for political risk, foreign investment restrictions, and lack of institutional interest. Barings includes stock with capitalization greater than 1% of all stocks in the country. It excludes stocks with free-float of less than 10% of their total capitalization or with average daily trading volume of less than \$100,000. Before being added to the index, the stock's weighting is adjusted for foreign ownership or free-float adjustments, whichever gives the more conservative weighting to the index.<sup>7</sup>

## ADVANTAGES AND DISADVANTAGES OF THE INDICES

The indices described above are not perfect, but at this time they are the best benchmarks available to use as a measure of investment manager performance. In recent years, the competition between index providers to offer a better index has diminished the differences between the benchmarks. However, many differences still remain and this section addresses the primary advantages or disadvantages of each index.

### Developed Market Indices

The major difference between the developed market indices is the coverage of the total market capitalization in each market. The differences are listed below:

	Mkt. Cap. Coverage
MSCI EAFE	60%
SALOMON BMI	95%
FT-AWI	85%
Dow Jones Global Index	80%

Depending on the plan sponsor's objective, each of these indices is an investable benchmark, that is, one in which a foreign investor has the option to forgo active management and simply hold the passive benchmark portfolio. If the investor desires the most comprehensive coverage of the international markets, Salomon BMI or FT-AWI may be preferred. However, if the desire is to achieve international diversification, MSCI EAFE will accomplish that while keeping the investor in the largest and most liquid international stocks.

In the developed markets, MSCI EAFE has the advantage of being the most widely used and recognized index by U.S. institutional investors. Ninety-seven percent of U.S. institutional investors use MSCI benchmarks to measure international equity performance. It also has the longest history, dating back to December 1969. Moreover,

MSCI is starting to market stock index futures that will match its country indices with a 1% tracking error. EAFE's coverage of the developed markets, while not as comprehensive as its peers, is appropriate for international diversification. Having fewer names in the benchmark is not a disadvantage, as the correlation of the four developed market indices is about 97%. Fewer names also saves/reduces transaction costs in a passive implementation. **Figure 5** compares the number of countries and securities in each of the developed market indices.

**Figure 5. Developed Market Index Composition  
As of December 1997**

	<u>Number of Countries</u>	<u>Number of Stocks</u>
MSCI EAFE Index	21	1,080
Salomon Europe and Pacific BMI	21	3,949
FT-AWI EuroPac Index	23	1,474
Dow Jones	N/A	N/A

**Emerging Market Index Composition  
As of December 1997**

	<u>Number of Countries</u>	<u>Number of Stocks</u>
MSCI EMF Index	26	991
Salomon Emerging Mkt. Index	27	1,128
IFC Investable	31	1,424
Extended BEMI	26	643

A disadvantage with MSCI EAFE is that they use a selection process to include the most investable securities in their indices instead of firm rules that would allow investment managers to predict index changes.

An advantage of FT-AWI EuroPac Index is that it is widely used by European fund managers. It also includes only issues that are available to foreign investors after

adjusting for the percentage held by the government. The disadvantages are its lack of use by U.S. institutional investors and less historical data, with inception being 1985.

The Salomon Broad Market Index has the deepest market coverage, holding 3,949 securities in 21 countries. It attempts to represent every investable company worth more than \$100 million free float market capitalization and adjust for cross-ownership. Salomon's indices, also, closely track the local market derivatives. However, the disadvantage is that a significant number of small capitalization names are included in the index: approximately 2,600 securities have a market capitalization of \$500 million or less. For a large plan sponsor trying to put sizeable amounts of money into international markets, transactions in these smaller securities will be more difficult and costly.

Dow Jones indices are relatively deep, covering 80% of the market capitalization. However, they have the shortest history with inception in December 1991. Dow Jones is marketing stock index futures based on their Dow Jones country indices. There has not yet been significant use of the Dow Jones indices by U.S. institutional investors, but the indices are available real-time and are published in the Wall Street Journal daily.

### **Emerging Markets**

In the emerging markets, any of the benchmarks discussed above could be used to capture the returns of the emerging markets. The MSCI EMF and the IFC Investable are the most commonly used emerging markets indices in the U.S.

The MSCI EMF is similar to its competitors with regard to the number of countries and securities in its index (see **Figure 5**). MSCI also uses a consistent methodology to select index constituents across both emerging and developed markets, which is an advantage if there is a desire to measure the combined developed and emerging markets managers with one asset class target.

The Salomon Emerging Market Index and The IFC Investable have the most comprehensive coverage with the largest number of countries and securities

(see **Figure 5**). The Baring-Extended BEMI has a large-cap bias, and consequently is the most liquid index.

#### **ASSET CLASS TARGET: FIXED WEIGHT VS FLOATING WEIGHT**

Currently, the SBI's international equity asset class target is a fixed weight combination of the MSCI's EAFE Free Index for developed markets and the MSCI's EM Free Index for the emerging markets. In late 1996, the target was set at 87% EAFE Free and 13% EM Free based on the allocation to emerging markets and the resulting developed and emerging market weights in the actual portfolio at that time.

This fixed weight method requires little portfolio rebalancing if both developed and emerging market investment returns are similar. But when the developed and emerging markets have very different returns or move in opposite directions, as they did in 1998, the actual portfolio weightings diverge from the fixed target requiring a rebalance back to the target weights of EAFE and EMF. As of December 1998, the SBI's actual emerging market weighting was 9% compared to the target's 13% due to market movements.

The strategy to periodically rebalance a program, that is to sell high priced assets and buy low priced assets, is known to add value to programs over the long-term. However, emerging market transaction costs of 2 to 3% quickly reduce the potential value added from a rebalance strategy. Staff does not believe using a fixed weight target with periodic rebalancing is cost effective in the international markets at this time. If trading in the international markets becomes more efficient, Staff will reexamine this issue.

An asset class target can be based on market capitalization weights, GDP-weights, or some other method. However, anything other than a floating, capitalization-weighted target will require more frequent rebalances. A floating target will significantly reduce the need to rebalance, as the portfolios will move in tandem with the target based on market capitalization. Capitalization-weighted indices are essentially self-balancing

which reduces ongoing management and transaction costs. However, changes to the benchmark such as the addition or deletion of a country will still require a portfolio rebalance.

## **BENCHMARK RECOMMENDATION**

None of the indices are perfect, but EAFE Free is an industry standard. It is well known and the most widely used benchmark by active managers. EAFE Free has significant coverage in the area of international stocks where large institutional investors transact, and more product is available geared to EAFE Free. At this time, Staff believes the advantages to changing benchmarks do not outweigh the costs. **Therefore, Staff recommends that the SBI continue to use MSCI EAFE Free Index to measure the developed market managers.**

For emerging markets, MSCI's EMF is widely used and recognized index. It includes an appropriate number of countries and securities for an institutional investor. **Staff recommends the SBI continue to use MSCI's EMF Index to measure the emerging market managers.**

The major advantage to using both MSCI's EAFE Free and EMF for developed and emerging market is that they can be combined, based on market capitalization weights, into one international index for use as the asset class target. MSCI's construction process ensures that the industry and country weights within the indices are representative of the overall market allowing a combination of the two indices into one.

**Staff recommends that the SBI use MSCI's "EAFE Free & EMF" index as the asset class target for the International Equity Program, replacing the current fixed weight target with a floating, capitalization weighted index, effective July 1, 1999 (the start of fiscal year 2000).**



Note that moving from the fixed target of 13% emerging markets to a floating weight target could cause the SBI's total Fund allocation to emerging markets to go higher than the 2% originally approved. While the new EAFE Free & EMF target would put emerging markets at about 1.5% of the total Fund right now, a floating benchmark could at times put the emerging markets at an allocation higher than 2%. The approval of this measure would replace the original mandate limiting emerging market stock to 2% of the total fund.

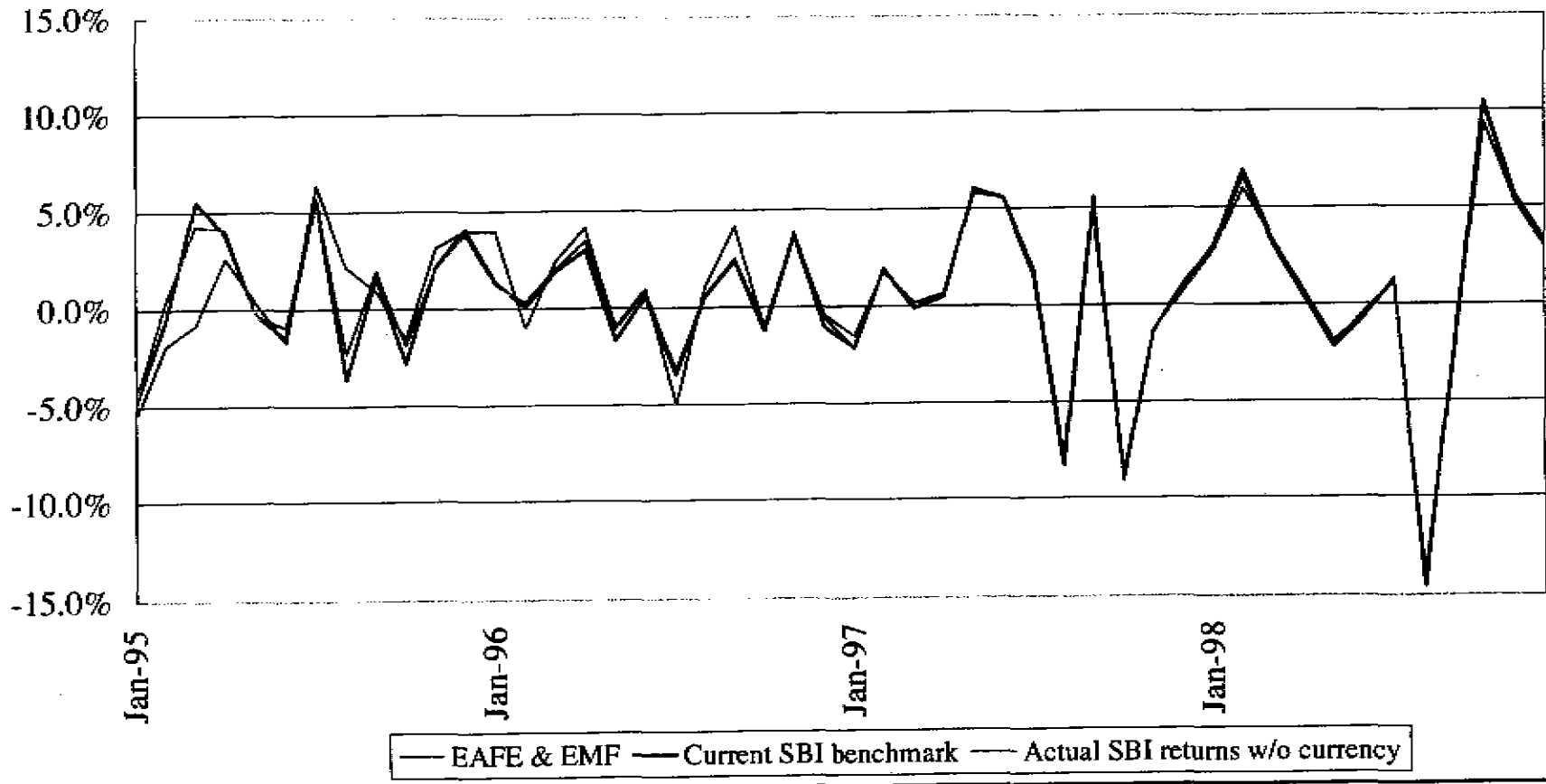
A comparison of the monthly returns in **Figure 6** shows that a benchmark of EAFE Free & EMF closely track the returns of the current fixed weight benchmark and the actual International Equity Program, indicating that it will provide a similar target with respect to risk and return that the SBI has had in place over the last few years.

As can be seen in **Figure 7**, the country weightings in the International Equity Program generally are in line with those of the EAFE Free & EMF target. The slight differences are due to: 1) the smaller weighting in emerging markets in the current International Equity Program and 2) the active bets made by the international equity managers.

Figure 6

### Monthly Return Comparison

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**Figure 7**  
**Country Weightings As of December 1998**

Country	Actual Int'l Equity Program Weightings	EAFE Free & EMF Weightings	Difference (Actual Portfolio to EAFE Free & EMF)
Argentina	0.7%	0.4%	0.3%
Australia	2.9%	2.3%	0.6%
Austria	0.3%	0.3%	0.0%
Belgium	1.7%	1.8%	-0.1%
Brazil	1.1%	0.9%	0.2%
Canada	0.2%	0.0%	0.2%
Chile	0.4%	0.3%	0.1%
China	0.1%	0.1%	0.1%
Columbia	0.0%	0.1%	-0.1%
Czech Republic	0.1%	0.1%	0.0%
Denmark	0.6%	0.8%	-0.2%
Egypt	0.1%	0.0%	0.1%
Finland	1.8%	1.4%	0.4%
France	9.5%	8.6%	0.9%
Germany	9.2%	9.7%	-0.5%
Ghana	0.1%	0.0%	0.1%
Greece	0.3%	0.6%	-0.3%
Hong Kong	2.1%	1.9%	0.2%
Hungary	0.3%	0.1%	0.2%
India	0.4%	0.6%	-0.2%
Indonesia	0.0%	0.1%	-0.1%
Ireland	0.4%	0.5%	-0.1%
Israel	0.1%	0.3%	-0.2%
Italy	4.5%	4.8%	-0.3%
Japan	17.7%	19.2%	-1.5%
Jordan	0.0%	0.0%	0.0%
Korea, Republic of	0.3%	0.8%	-0.5%
Luxembourg	0.1%	0.0%	0.1%
Malaysia	0.4%	0.4%	0.0%
Mexico	0.8%	0.9%	-0.1%
Netherlands	6.3%	5.9%	0.4%
New Zealand	0.4%	0.2%	0.2%
Norway	0.4%	0.4%	0.1%
Pakistan	0.0%	0.0%	0.0%
Peru	0.1%	0.1%	0.0%
Philippines	0.2%	0.2%	0.0%
Poland	0.1%	0.1%	0.0%
Portugal	0.5%	0.6%	-0.1%
Russia	0.0%	0.1%	-0.1%
Singapore	0.7%	0.6%	0.1%
South Africa	0.6%	0.8%	-0.2%
Spain	2.7%	3.1%	-0.4%
Sri Lanka	0.0%	0.0%	0.0%
Sweden	3.0%	2.4%	0.6%
Switzerland	7.0%	7.3%	-0.3%
Taiwan	0.2%	1.5%	-1.3%
Thailand	0.2%	0.2%	0.0%
Turkey	0.2%	0.2%	0.1%
United Kingdom	19.3%	19.4%	-0.1%
United States	1.8%	0.0%	1.8%
Venezuela	0.1%	0.1%	0.0%
	100.0%	100.0%	

## **GLOBAL MANAGEMENT**

As the world marketplace evolves companies compete on an increasingly global basis. Globalization is increasingly forcing investment management firms to conduct their research differently than they have in the past. Where before firms may have had analysts researching the best stocks in a region, today they need to take a more global perspective and evaluate firms relative to their competitors in other parts of the world.

Globalization has raised the question of whether the SBI should use global managers that research and invest in stocks both within and beyond the borders of the U.S. A global manager selects the best stocks in each industry and either directly or indirectly sets the country allocation.

### **MAJOR INVESTMENT FIRMS**

Based on information provided by InterSec Research Corporation, ten firms had a global equity product with more than \$750 million in assets under management as of December 1998. Staff reviewed pertinent information from each of these firms. A list of the investment firms, their performance, benchmarks, and assets under management are included in **Figure 8**.

### **BENCHMARKS**

The benchmark used by nine of the ten investment firms examined was the MSCI World Index. The World Index is a developed market index that includes EAFE plus the U.S. and Canada. (It does not include emerging markets, which makes it different from the All Country World Index discussed earlier. See Appendix A.) The tenth firm used a benchmark composite consisting of at least two or more indices such as the MSCI ACWI or EAFE and others including Salomon, Russell 3000, or Wilshire 5000.

Figure 8.

**GLOBAL MANAGER SURVEY  
PERFORMANCE SUMMARY**

Manager	Product	Assets under Management	Performance (Annual Returns)										
			1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	
JP Morgan	Global Equity	9,655 MM	16.8	16.2	18.7	4.1	24.6	-2.8	20.7	-7.1	18.0	17.2	
Lazard Asset Mngmt	Global Equity	8,875 MM	17.1	17.9	24.9	4.8	25.0	-1.9	23.6	1.9	33.5	36.2	
Brinson Partner's	Global Equity	6,024 MM	17.1	20.9	25.9	-0.1	22.7	6.5	25.3	-10.6	27.5	23.4	
Scudder Kemper	Global Equity	4,611 MM	18.2	15.9	24.0	0.5	36.5	5.1	20.6	-8.9	31.0		
Capital Guardian Trust	Global Equity	3,474 MM	21.1	18.9	22.0	5.4	29.5	-0.5	18.5	-11.3	25.8	21.5	
Janus Capital	Janus Aspen Worldwide	2,889 MM	22.2	29.0	27.4	1.5							
Marvin & Palmer	Global Equity	2,101 MM	25.2	13.3	17.6	-13.1	42.1	-0.2	36.3	-6.3	26.6	15.9	
Sanford C. Bernstein	Global Strategic Value	1,449 MM	21.8	22.0	30.6	2.8							
TCW Group*	Comprehensive Asset Allocation	1,060 MM	13.7	16.1	19.6	-6.1	36.8	11.9					
Templeton	Global Tax-exempt Equity Composit	750 MM	12.2	21.6	24.3	0.4	34.8	6.7	22.1	-11.1	24.7		
<b>Benchmarks:</b>	MSCI World		15.8	13.5	20.7	5.1	22.5	-5.2	18.3	-17.0	16.6	23.3	
	Comp. Asset Alloc. Benchmark composite*		13.9	12.1	20.9	4.1	19.4	-0.6					

\* TCW Group's benchmark consists of at least 2 indexes. Generally, a 40-50% MSCI weighting in World, ACWI ex US, or EAFE, and other components can include Salomon, Russell 3000, or Wilshire 5000.

## PERFORMANCE

As **Figure 8** indicates, performance is varied. At times, the firms have significantly outperformed the benchmarks, such as Marvin & Palmer's 1993 return of 42.1% against the benchmark return of 22.5%. At other times, the firms have significantly underperformed, such as the 1994 return by Marvin & Palmer of -13.1% versus the benchmark of 5.1%.

Staff reviewed specific portfolio weightings of several of the largest of these global managers in order to analyze and evaluate the country allocations each of the managers were willing to make in their global product. **Figure 9** lists the manager, the largest U.S. position during the last 5 years, the normal range around the benchmark that their U.S. position was 90% of the time during the last 5 years, and their U.S. weight in the global product on December 31, 1998. The MSCI World Index is included in the chart as a reference.

**Figure 9. Global Managers' U.S. Country Bets**

<u>Manager</u>	<u>Largest US Position in the Last 5 Years</u>	<u>Normal Range of US Allocation Relative to Bmk in Last 5 Years (Percentage Pts.)</u>	<u>U.S. Wtg. on 12/98</u>
Brinson	45.2%	+/- 0-10	42.8%
Cap Guardian	40.7%	+/- 10-20	38.2%
Janus Capital	30.0%	+/- 20-30	30.0%
Lazard Asset Mgmt.	22.0% over bmk	+/- 10-20	46.6%
Scudder Kemper	31.4%	+/- 20-30	31.4%
TCW Group	20.0% over bmk	+/- 0-20	24.0%
<b>MSCI World Index</b>	<b>49.1%</b>	<b>+/- 35-45%*</b>	<b>48.8%</b>

\* The range of the U.S. weightings in the MSCI World Index during the last 5 years.

The information collected indicates that some managers are willing to make fairly significant bets with respect to their U.S. position relative to the benchmark, by under or over weighting their holdings by 20 to 30% relative to the benchmark. These bets often account for a significant portion of the under or over performance of a global manager relative to a benchmark. On December 31, 1998, all six managers had incorrectly under weighted the U.S. market during a period of very strong U.S. market returns.

Staff also compared the performance of the ten global managers to the SBI's combined U.S. and International Equity Program. The ten global managers' returns were combined on an equal-weighted basis. **Figure 10** below shows that the SBI outperformed the equal weighted global managers' returns.

**Figure 10.**

**SBI and Global Manager Performance Comparison**

<u>Period</u>	<u>SBI's Int'l And U.S. Equity Returns</u>	<u>Equal Wtd. Return of Ten Global Mgrs.</u>	<u>SBI better/(poorer) than Equal Wtd. Global Mgrs.</u>
3Q98	(12.8%)	(13.1%)	0.3%
2Q98	1.3%	2.6%	(1.3%)
1Q98	13.3%	13.8%	(0.5%)
1997	25.4%	18.4%	7.0%
1996	19.4%	18.9%	0.5%
1995	31.0%	22.9%	8.1%

The SBI's allocation to U.S. and international equities has undoubtedly contributed to the SBI's better performance relative to the equal-weighted global managers' returns. Since the SBI has a 50% allocation to U.S. equities and a 15% allocation to international equities, in a global scense, the SBI's U.S. equity position is 77% with the remaining 23% in other international stocks. Hence the large over-weighting in the U.S., during the last few years, when the U.S. stock market has been performing extremely well, caused the SBI's returns to outperform the global managers' aggregate returns.

## **ASSETS UNDER MANAGEMENT**

Assets under management in global mandates have increased in recent years. The ten largest global products range from \$750 million to \$9.7 billion. This is a very limited universe from which to select. If the SBI becomes interested in allocating part of the retirement fund assets to a global manager, a 10% allocation would be about \$4 billion. Historically, the SBI has limited a portfolio to no more than one-third of the assets in a manager's product. Therefore, the SBI would need to use multiple global managers for such an allocation.

## **GLOBAL IMPACT ON ASSET ALLOCATION**

The SBI currently uses rebalancing guidelines that allow an asset class to deviate up to 10% from the asset allocation target weighting before mandatory rebalancing becomes necessary. This means that the 50% U.S. equity allocation can fluctuate between 45% and 55% of the total fund assets without the need to rebalance back to the 50% target. If the U.S. equity position goes below 45% or above 55% a rebalance is mandatory.

The example in **Figure 11** illustrates the impact the addition of a global mandate would have on the SBI's U.S./international allocation. The example shows that the country allocations from a global mandate would not shift the SBI's equity program's allocation to U.S. equities beyond the current rebalancing guidelines unless the global manager chose the extremely risky position of holding no U.S. stock in a global portfolio.



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**Figure 11.****Example of Global Impact on SBI Asset Allocation**Assumptions:

- Reduce the allocation to both U.S. and international equities by 5 percentage points each (i.e., reduce the current U.S. allocation from 50% to 45% and the international allocation from 15% to 10%).
- Allocate 10% of fund assets or about \$4 billion to global management.
- In the global portfolio, the U.S. exposure is assumed to be 24% (the lowest U.S. exposure on December 31, 1998 from figure 9).

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<u>Asset Class</u>	<u>New Allocation</u>	<u>10% Global Allocation</u>	<u>Total Allocation</u>	<u>Current Program's +/- 10% Tolerance</u>
U.S.	45.0%	2.4%	47.4%	45.0% - 55.0%
Int'l	10.0%	7.6%	17.6%	13.5% - 16.5%

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**RECOMMENDATION**

At this point, Staff/IAC have decided not to recommend global management for the SBI. The addition of a global mandate would not provide a different U.S. exposure than the program currently experiences with current rebalancing guidelines in place. In addition, the number of managers with sizable assets under management in a global product is limited.

Staff will continue to meet with global managers and follow the trends in the industry to keep the SBI apprised of future developments in the area of global management.

## REGIONAL MANAGEMENT

A natural way for investors to think about international investing is by region. Many investment firms continue to offer products for Europe, the Pacific, Japan, and others. Regional investing can provide the investor with the ability to get the specific regional exposure desired, or to make an active decision to over or under weight a region versus a more comprehensive index.

The use of regional mandates requires a specific allocation process. Absent a forecast, the decision to allocate has been delegated to EAFE style managers by most institutional investors. Additionally, it is difficult to find investment firms that can handle a regional portfolio for a large institutional investor such as the SBI. Most institutional investors have not used regional managers, so the assets under management in these types of products have grown more slowly than in EAFE products.

### MAJOR INVESTMENT FIRMS

Staff reviewed information on regional mandates collected by InterSec Research Corporation. The Intersec data indicates that managers with regional mandates had no advantage within their region relative to those with an EAFE mandate. Assuming the SBI would allocate at least \$200 million to any new firms hired, the focus was on firms with at least \$600 million under management in any regional product. As of December 1998, there were approximately 18 firms with a regional product with total assets exceeding \$600 million.

The list of products, managers, and assets under management are included in **Figures 12 (a) through (f)**.

Figure 12(a)

## Active European Equity by Manager

Manager	Assets (US \$ Mil) Year-end 1997
Mercury Asset Mgmt. International Ltd.	2,190
Clay Finlay, Inc.	1,906
Capital Guardian Trust Co.	1,632
J.P. Morgan Investment Mgmt., Inc.	1,529
Morgan Grenfell Invt. Services Ltd.	1,251
Paribas Asset Management, Inc.	1,238
Scottish Widows Invt. Mgmt. Ltd.	792
Rowe Price-Fleming International, Inc.	775
Oechsle International Advisors	739
Baillie Gifford Overseas Limited	686
Phillips & Drew	635
Lombard Odier Int'l. Portfolio Mgmt. Ltd.	587
Marathon Asset Management Ltd.	530
Putnam Investments	436
Sanford C. Bernstein & Co., Inc.	425
Alliance Capital Mgmt., L.P.	378
Walter Scott and Partners Ltd.	309
Schroder Capital Mgmt. International, Inc.	286
Citibank Global Asset Management	203
Carlson Investment Management (U.S.) Inc.	183
Morgan Stanley Asset Mgmt., Inc.	177
U.S. Trust Company of New York	168
DSI International Management, Inc.	149
Lazard Asset Management	147
Odey Asset Management Ltd.	119
Scudder Kemper Investments, Inc.	114
GE Investments	100
Baring Asset Management, Inc.	80
TCW Group	51
WorldInvest Ltd.	37
Investment Advisers, Inc.	31
Philippe Investment Management	31
Julius Baer Investment Mgmt., Inc.	29
Pictet International Mgmt. Ltd.	29
Prime Lipper Asset Management	27
Seligman Henderson Co.	22
GIM Capital Management, Inc.	17
Wellington Management Company, LLP	1
<b>Total</b>	<b>18,037</b>

**Figure 12(b)**

**Active Pacific Equity by Manager**

Manager	Assets (US \$ Bill) Year ended 1997
Nomura Asset Management U.S.A. Inc.	2,075
Schroder Capital Mgmt. International, Inc.	1,552
Rowe Price-Fleming International, Inc.	833
Putnam Investments	634
Chancellor LGT Asset Management	571
SG Pacific Asset Management, Inc.	419
J.P. Morgan Investment Mgmt., Inc.	374
Scudder Kemper Investments, Inc.	302
Global Asset Management	257
Templeton Worldwide, Inc.	249
American Express Asset Mgmt. Int'l., Inc.	227
Daiwa International Capital Mgmt. Corp.	153
Baring Asset Management, Inc.	152
Sit/Kim International Invst. Assoc., Inc.	111
GE Investments	100
Clay Finlay, Inc.	80
Walter Scott and Partners Ltd.	55
U.S. Trust Company of New York	41
HSBC Asset Mgmt. Americas, Inc.	33
Alliance Capital Mgmt., L.P.	9
Wellington Management Company, LLP	1
<b>Total</b>	<b>8,228</b>

**Figure 12(c)**

**Active Pacific ex Japan Equity by Manager**

Manager	Assets (US\$ Mil) (Year-end 1997)
Schroder Capital Mgmt. International, Inc.	278
Scudder Kemper Investments, Inc.	253
Chancellor LGT Asset Management	195
Clay Finlay, Inc.	116
Baring Asset Management, Inc.	111
Global Asset Management	103
Crosby Asset Mgmt. (Hong Kong) Ltd.	100
Wellington Management Company, LLP	98
Fidelity Management Trust Co.	79
Alliance Capital Mgmt., L.P.	30
<b>Total</b>	<b>1,362</b>

**Figure 12(d)**

**Active Japan Equity by Manager**

Manager	Assets (US \$ Mill) yearend 1997
J.P. Morgan Investment Mgmt., Inc.	2,174
DSI International Management, Inc.	348
Barclays Global Investors	285
Morgan Stanley Asset Mgmt., Inc.	261
Schroder Capital Mgmt. International, Inc.	226
Acadian Asset Management	222
Nomura Asset Management U.S.A. Inc.	200
Grantham Mayo Van Otterloo and Co. LLC	156
Scudder Kemper Investments, Inc.	135
INVESCO Global Asset Mgmt. (N.A.), Inc.	128
Daiwa International Capital Mgmt. Corp.	110
Fidelity Management Trust Co.	91
Rowe Price-Fleming International, Inc.	76
TCW Group	76
Brinson Partners, Inc.	73
Global Asset Management	72
Alliance Capital Mgmt., L.P.	71
First Quadrant, L.P.	57
Seligman Henderson Co.	56
SG Pacific Asset Management, Inc.	44
Martin Currie Inc.	38
Nikko Global Asset Mgmt. (USA), Inc.	33
Wellington Management Company, LLP	10
Sanford C. Bernstein & Co., Inc.	5
Nicholas-Applegate Capital Mgmt.	5
Mercury Asset Mgmt. International Ltd.	2
<b>Total</b>	<b>4,953</b>

**Figure 12(e)**

**Active Far East ex Japan Equity by Manager**

Manager	Assets (US \$ MB) Year-End
Newport Pacific Management	1,024
Morgan Stanley Asset Mgmt., Inc.	200
HSBC Asset Mgmt. Americas, Inc.	188
American Express Asset Mgmt. Int'l., Inc.	180
Bankers Trust Company	96
Capital Guardian Trust Co.	70
Daiwa International Capital Mgmt. Corp.	26
TCW Group	7
Citibank Global Asset Management	3
<b>Total</b>	<b>1,793</b>

**Figure 12(f)**

**Active Latin American Equity by Manager**

Manager	Assets (US \$ Mil) Year-end 1997
Scudder Kemper Investments, Inc.	648
Batterymarch Financial Mgmt., Inc.	477
Rowe Price-Fleming International, Inc.	216
Globalvest Management Company LP	135
Morgan Stanley Asset Mgmt., Inc.	28
Investment Placement Group	7
<b>Total</b>	<b>1,512</b>



## **PRODUCTS/REGIONS OFFERED**

As of December 1998, there were 6 investment firms with an Asian product that had total assets exceeding \$600 million. In European equities, there were 11 investment firms that offered a product with assets exceeding \$600 million. And in Latin America, there is only one investment firm with a product that has more than \$600 million in assets.

## **ALLOCATIONS/REBALANCING**

Regional investing requires the institutional investor to allocate funds across regions. Most institutional investors prefer to hire broad market investment managers to make the country/regional allocation decisions. Those decisions are an area of expertise for many portfolio managers, and an area in which they can add value to the International Equity Program. In addition, if a regional program were set up, a regional target allocation would need to be determined, then, as the market returns of one region outperformed another, it would become necessary to rebalance the regional portfolios back to the target allocations. This rebalance would be necessary whenever the market takes the portfolios too far from the target allocation. As mentioned earlier, in international markets these rebalances can be costly and may place a drag on performance.

## **RECOMMENDATION**

**At this time, the Staff/IAC believes there is limited opportunity to successfully implement a regional investment program. Staff will continue to monitor the trend in regional investing.**

## INTERNATIONAL PROGRAM STRUCTURE

This section addresses the International Program structure and the related recommendations of Staff and the IAC.

### ACTIVE VERSUS PASSIVE MANAGEMENT

In 1992, the SBI created the International Equity Program with a structure that required at least 50% of the program to be actively managed. This approach uses index funds to get broad exposure to the asset class while active management is used to add value. Similarly, the SBI's Domestic Equity and Fixed Income Programs each have core index exposure and active managers to add value. To date, this strategy has been relatively successful for the SBI.

International equity markets are less efficient than U.S. equity markets, due in large part, to the behavior and legal considerations in many local markets. Therefore, it can be argued that some active managers will outperform the indices. Consistent with the policy of the past 15 years, the SBI has allocated a significant portion of assets to active management, based upon the belief that the SBI can identify and retain active managers that will outperform their benchmarks over the long term. Since October 1992, the international managers have added 70 basis points, net of fees, to the return of the composite benchmark (87% EAFE Free and 13% EMF).

The SBI should continue to have at least one-third of the program actively managed in order to take advantage of the inefficient international markets. As the SBI identifies additional active managers that can add value relative to the benchmark, the weighting in active management could increase to more than 50% of the International Equity Program.

While active management is important to the International Program, the SBI should maintain some exposure to passive management. Passive management is an appropriate investment strategy that provides diversification benefits. It also allows large sums of money to be invested at lower administrative cost. The returns produced by an index manager are predictable relative to a chosen benchmark, usually +/-50 basis points annualized. The SBI should maintain some core exposure to passive management to control the tracking error of the total *International Equity Program*. The amount of passive management should not fall below one-third of the International Program in order to maintain stability in the program relative to the benchmark.

**Staff/IAC recommends that the SBI adopt a policy that requires at least 33% of the International Equity Program be actively managed, and at least 33% of the International Equity Program be passively managed.**

Staff and the IAC have had discussions about alternatives to the present structure. An option is to add semi-passive, enhanced index, or risk controlled managers to the International Equity Program similar to the approach used for the Domestic Equity Program. Staff reviewed this alternative and found that there are very few organizations offering enhanced indexing for international securities. Those that do, generally, have very short track records. **Staff/IAC is not recommending a semi-passive, enhanced index, or risk controlled management approach at this time, but will continue to review developments in this area.**

**For emerging markets, Staff/IAC is recommending active management exclusively** in order to obtain the best risk/reward relationship. Staff believes that the high level of market inefficiency and the opportunities presented by those inefficiencies will allow active managers who do company and country research to add value relative to passive management.

Passive management in the emerging markets has historically had a higher tracking error, or deviation from the benchmark, than in developed markets. This is due to liquidity

constraints, longer trade settlement periods and settlement failures in the emerging markets. In addition, trading costs in emerging markets are about three times higher than in EAFE countries and about five times higher than in the U.S.<sup>9</sup> According to State Street Global Advisors, over a long period of time, tracking error is expected to be -20 to -125 basis points.

Given these considerations, Staff/IAC have reached the following conclusions with respect to active versus passive management:

- ***Staff/IAC concur with the current policy that the International Equity Program should have core exposure through an EAFE Free index account and retain active managers to add value to the asset class target.***
- ***Staff/IAC recommend new policy language that requires the International Equity Program to be at least 33% actively managed and at least 33% passively managed.***
- ***Finally, the Staff/IAC recommends that the emerging markets continue to be actively managed.***

## CURRENT MANAGER COMPOSITION

As mentioned earlier, Staff/IAC recommend that the developed market managers continue to be measured against the MSCI EAFE Free index and the emerging market managers continue to be measured against the MSCI EM Free index. This recommendation is no change from existing policy.

The current active EAFE managers have been part of the SBI's program since 1993. The EM Free managers were hired in 1996. The current international equity managers provide a good mix of management styles. The list of current managers, their general style, and their hire dates are listed in **Figure 13**.

---

**Figure 13. List of Current International Equity Managers**

<u>Manager</u>	<u>General Style</u>	<u>Hire Date</u>
<b>Active EAFE Free Managers</b>		
Brinson	Active Country/Passive Stock	Apr. 1993
Marathon	Bottom-up, value	Nov. 1993
Rowe Price	Combination, emphasizes top-down, growth	Nov. 1993
Scudder	Combination, emphasizes top-down, thematic /value	Nov. 1993
<b>Active EM Free Managers</b>		
City of London	Combination, closed end funds	Nov. 1996
Genesis	Combination, emphasizes bottom-up, growth	May 1996
Montgomery	Combination, emphasizes risk control	May 1996
<b>Passive EAFE Free</b>		
State Street	Passive EAFE Free	Oct. 1992

---

## **RECOMMENDATIONS**

Staff and the IAC recommend the following changes to the current international managers:

- 1. Restrict all EAFE managers to investments in developed markets. The authority to invest in emerging markets was granted to EAFE managers prior to the SBI retaining emerging markets managers. Currently, the active EAFE managers may hold up to 15% of the portfolio in emerging market stocks.**
- 2. Allow active EAFE managers to be active country and active stock managers.**
- 3. Measure the performance of passive managers against EAFE Free. The active managers may or may not be measured against a custom benchmark.**
- 4. Given the SBI's current allocation to international equities, the SBI should maintain a minimum of four active EAFE Free managers and a minimum of three EM Free managers. Staff and the IAC believe this number is necessary to prudently manage the assets in the International Equity Program.**

## CURRENCY MANAGEMENT

### WHAT IS CURRENCY MANAGEMENT?

International investment returns consist of two components: the movement of stock prices in the local market (the local market return) and the impact of currency translation (currency returns). To invest in a non-dollar security, a U.S. investor must first convert dollars to the local currency and use the local currency to purchase foreign securities. Subsequently, share price quotations, stock dividends, and sale or redemption proceeds must be converted from that currency back into U.S. dollars to calculate the portfolio's U.S. dollar returns. Because foreign exchange rates fluctuate constantly with changes in each currency's supply and demand, currency movements can increase or decrease the dollar value of the investment even if the security's price remains unchanged. The local market return and the currency return combine into the U.S. dollar return of the international portfolio.

Currency movements can significantly impact the portfolio returns. At times, a strong U.S. dollar can eliminate the local market gains of the EAFE Index. Alternatively, a weak U.S. dollar can increase the portfolio's U.S. return beyond the local market return. While currencies may contribute to the total return volatility, currencies, in and of themselves, add no long-term value to a program because there is no economic value to holding a currency.

When foreign countries perform differently than one's home economy, currency exposures provide a measure of diversification, so currency is an important contributor to the diversification that international investing brings to a plan. The longer the plan's time horizon the more diversification is derived from the currency exposure.<sup>10</sup> Figure 2, earlier in this paper, showed the correlation of various asset classes. The correlation of unhedged international equity with U.S. equity was 0.50 and the correlation of hedged international equity with U.S. equity was slightly higher at 0.62. This indicates that

unhedged international equity may be a slightly better diversifier in a U.S. portfolio than hedged equity.

Currency adds short-term volatility to the absolute returns of an International Equity Program. Investors can attempt to protect a portfolio from this short-term volatility through the use of hedging at a cost. Currency hedging reduces an investor's exposure to a currency by changing the foreign currency into the U.S. dollar through the currency markets using forward contracts, options, or futures. Hedging allows an investor to lock-in a fixed exchange rate. The net result to the investor is the return of the stock less the cost of the hedge.

## **HISTORY OF THE SBI'S CURRENCY OVERLAY PROGRAM**

The active EAFE managers have always had the ability to hedge currency within their portfolios. In many instances, this is an important part of their investment management process. Staff/IAC believe the active managers should continue to be measured against an unhedged benchmark, but they can make tactical bets using currency hedging.

In 1995, after a lengthy study, the SBI added currency management as an overlay on the passive EAFE index portfolio. The intent was to reduce the short-term absolute return volatility in the International Equity Program. The goals of the currency program were to:

1. Avoid/minimize absolute loss to the portfolio in periods when the dollar rises/strengthens relative to another currency or group of currencies.
2. Participate in absolute gains available to the portfolio in periods when the dollar falls/weakens relative to another currency or group of currencies.
3. As a consequence of 1 and 2, reduce the absolute volatility of returns associated with currency exposure in the underlying stock portfolio.



Record Treasury Management Limited was hired in late 1995 to manage a percentage of the SBI's currency exposure in the International Equity Program. They employ a systematic approach that uses a form of dynamic hedging. The SBI limits the overlay program to the major currencies that individually comprise 5% or more of the value of the passive EAFE index. Until recently, this included the Japanese Yen, British Pound Sterling, German Mark, French Franc, Swiss Franc, and Dutch Guilder which in aggregate made up about 75% to 80% of the value of the EAFE index. On January 1, 1999, the Euro went into affect as the currency of the European Union reducing the currencies in the overlay program to four: European Euro, Japanese Yen, British Pound Sterling, and Swiss Franc. These currencies in aggregate make up about 90% of the value of the EAFE index.

In 1998, the Staff/IAC recommended a 50% reduction in the currency overlay program, as the program represented a sizeable amount of assets controlled by one investment firm. Staff/IAC wanted to reduce the tracking error and the investment firm risk resulting from such a large account.

Through December 1998, the currency overlay program has successfully minimized the volatility of the International Equity Program's absolute returns as the SBI intended, and it has added almost one hundred and fifty million dollars to the International Equity Program.

#### **CONCERNS ABOUT THE CURRENCY OVERLAY PROGRAM**

Staff, the IAC and the SBI's consultants have had an ongoing discussion about the future of the currency overlay program. Staff/IAC believe the process used by Record Treasury Management can add value by taking advantage of opportunities created through the trending nature of currencies. It is felt that their returns are asymmetrical, that is, they add value when the U.S. dollar is strong, but they do not give up as much value when the

U.S. dollar is weak because their process takes them out of the market. However, Staff/IAC has the following concerns:

1. The performance of the active and passive international managers in aggregate is measured against an unhedged asset class target. Retaining the currency overlay program at its current level will cause tracking error relative to the unhedged asset class target
2. Staff believes Record Treasury Management has a process that can add value to the International Equity Program. However, the size of the account should be in line with other active international equity managers to ensure that the returns of their account will not significantly impact the International Equity Program.

## **RECOMMENDATIONS**

For the reasons mentioned above, Staff/IAC are making the following recommendations:

- **Staff/IAC recommend that the SBI give Staff/IAC the discretion to allow the active international equity managers to continue to use currency management in the SBIs' portfolios.**
- **Staff/IAC recommend the SBI discontinue the use of a currency overlay program to hedge international currency exposure.**
- **Staff/IAC recommend the SBI retain Record Treasury Management as an active manager to manage foreign currencies with the goal of adding value to the total program until a review of active managers can be conducted. The size of the currency manager's underlying portfolio should be in line with the average size of an active EAFE manager (currently \$500 million).**

Selected Free MSCI Regional and Composite Indices  
Weights as of 12/31/98\*

USA					51.0%		49.0%
Canada					1.8%		1.7%
Austria	0.5%		0.3%		0.2%		0.2%
Belgium	2.6%		1.9%		0.9%		0.9%
France	12.8%		9.4%		4.4%		4.3%
Germany	14.5%		10.7%		5.0%		4.9%
Ireland	0.7%		0.5%		0.2%		0.2%
Italy	7.1%		5.2%		2.5%		2.4%
Netherlands	8.9%		6.5%		3.1%		3.0%
Portugal	0.9%	Europe	0.7%		0.3%		0.3%
Spain	4.6%	(33.3%)	3.4%		1.6%		1.5%
Switzerland	11.0%		8.1%		3.8%		3.7%
United Kingdom	29.0%		21.3%		10.1%		9.7%
Denmark	1.2%		0.9%		0.4%		0.4%
Finland	2.1%		1.6%		0.7%		0.7%
Norway	0.5%		0.4%	EAFE	0.2%	World	0.2%
Sweden	3.6%		2.6%	(45.8%)	1.2%	(96.0%)	1.2%
Australia		8.3%	2.6%		1.2%		1.2%
New Zealand		0.6%	0.2%		0.1%		0.1%
Japan		80.3%	All	68.0%	21.0%		9.6%
Hong Kong		7.9%	Country	6.7%	2.1%		0.9%
Singapore		2.9%	Far East	2.2%	0.7%		0.3%
			(12.3%)				
Malaysia	0.0%	0.0%	1.5%	0.0%	0.0%		0.4%
							All
China	1.9%	0.2%	0.2%	All	0.7%		0.0%
Indonesia	4.8%	0.6%	0.5%	Country	1.8%		0.1%
Korea	29.3%	Emerging	2.9%	Asia	10.7%		0.4%
Philippines	5.9%	Markets	0.7%	Pacific	2.1%		0.1%
Taiwan	27.3%	Asia	3.2%	(13.8%)	9.9%		0.4%
Thailand	7.6%	(1.7%)	0.9%	0.7%	2.8%		0.1%
India	21.7%			2.1%	7.9%		0.3%
Pakistan	1.2%		0.1%		0.4%		0.0%
Sri Lanka	0.2%				0.1%		0.0%
Argentina	13.3%				4.6%	Emerging	0.2%
Brazil	34.1%	Emerging			11.9%	Markets	0.5%
Chile	12.8%	Markets			4.5%		0.3%
Colombia	2.1%	Latin			0.8%	(4.0%)	0.0%
Mexico	32.2%	America			11.3%		0.4%
Peru	2.7%	(1.3%)			1.0%		0.0%
Venezuela	2.8%				1.0%		0.0%
Czech Republic	6.2%				1.1%		0.0%
Greece	40.1%	Emerging			7.3%		0.3%
Hungary	8.9%	Markets			1.6%		0.1%
Israel	18.2%	Europe/			3.3%		0.2%
Jordan	1.1%	Mid East			0.2%		0.0%
Poland	7.7%	(0.7%)			1.4%		0.1%
Russia	6.9%				1.3%		0.1%
Turkey	11.0%				2.0%		0.1%
South Africa					10.3%		0.4%

\* Weights in parentheses indicate % of All Country World Index.

Source: Morgan Stanley Capital International



## FOOTNOTES

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# **EMERGING MARKETS INVESTING**

**Minnesota State Board of Investment  
Staff Position Paper  
February 1996**

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# **Emerging Markets Investing**

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## **EXECUTIVE SUMMARY**

In October 1995, the State Board of Investment (SBI) approved an allocation to emerging markets of up to 2% of the Combined Funds. This paper discusses emerging markets, the investment opportunities and limitations they present, and an implementation plan regarding the new allocation.

There is not one clear cut definition of emerging markets. The most widely accepted definition comes from the World Bank. It defines an emerging market as a country with an average per capita GNP of less than US\$8,955. Other entities focus on typical characteristics, such as relatively rapid economic growth and an immature equities market.

Staff recommends use of the common custodial definition: a non-EAFE (Europe, Australia and the Far East), non-North American market that has a functional stock exchange or a very active over-the-counter market, securities that are available to foreign portfolio investments, and a convertible currency or a capital-plus-income repatriation plan. Although Malaysia is included in EAFE, Staff recommends that it be considered an emerging market, since it has emerging market characteristics.

Many investors are concerned about the greater level of volatility in these markets. There are other risks as well, such as political instability, dramatic currency swings, illiquidity, high transaction costs and unpredictable growth. Studies have shown that emerging markets have low correlations with each other and with the developed countries. There is wide agreement that adding a diversified emerging markets portfolio to a fund can increase potential returns without increasing risk because of these low correlations (and may lower total portfolio risk if the allocation is sufficiently large).

Only small allocations were considered by Staff because of current liquidity constraints in emerging markets. The 2% allocation approved by the Board will translate to 13% of the international program. Staff recommends allowing the current active international managers to continue to invest opportunistically in emerging markets, capping their exposure at 15% to avoid overexposure.

There are five widely accepted emerging markets benchmarks - two from Morgan Stanley Capital International (MSCI), two from the International Finance Corporation (IFC) and one from Barings. Although none of the benchmarks are an ideal representation of a

portfolio manager's universe, Staff believes that investable indexes with broad exposure are the best currently available. The MSCI Emerging Markets Free (EMF) Index and the IFC Investable (IFCI) Index fit these general criteria. While both indexes have favorable and unfavorable characteristics, Staff recommended the MSCI EMF over the IFCI because of its superior risk/return characteristics, and its somewhat less concentrated country weights.

There is little agreement on the success of top-down versus bottom-up management in the emerging markets. Staff therefore recommends that managers be chosen for success within their unique investment style. Other selection criteria should include the quality and depth of resources, stability of the management team, size of assets under management, and length of track record. Three investment vehicles are available (closed-end fund, separate accounts, and commingled funds) and selection should be based on the method that is most advantageous to the particular needs of the SBI.

## **EMERGING MARKETS**

In October 1995, the State Board of Investment (SBI) increased its long term international equity asset allocation from 10% to 15% of the Combined Funds. As part of this increase, the Board approved an allocation of up to 2% of the total portfolio to the stocks of emerging markets. At this level, emerging market equities would represent approximately 13% of the SBI's international stock pool.

This position paper discusses the rationale for an allocation to emerging markets, describes the opportunities and limitations of emerging markets investing, and presents an implementation plan for the SBI's investments in these markets. The discussion is divided into four sections:

- rationale for emerging markets investing
- investment considerations and constraints
- benchmark issues
- management structure

### **PART 1: Rationale For Emerging Markets Investing**

#### **Definition of Emerging Markets**

There is no uniform definition of what constitutes an "emerging market." The most widely quoted definition comes from the World Bank. They define an emerging market as a country with an average per capita gross national product (GNP) of less than US\$8,955.<sup>1</sup>

The International Finance Corporation (IFC), which promotes the growth of private enterprises in its developing member countries, has stated that emerging implies change and that change seems to run through everyone's definition.<sup>2</sup> The IFC has also said that "emerging" can refer to any market in a developing economy, with the implication that all have the potential for development."

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<sup>1</sup> From the International Finance Corporation, a member of the World Bank Group. As of December 31, 1994.

<sup>2</sup> International Finance Corporation, "Emerging Stock Markets Factbook 1994," page 2.

Other common characteristics of emerging markets include:<sup>3</sup>

- relatively rapid economic growth
- an immature equities market
- a government which promotes growth through the private equity sector
- a trend towards stable economic, financial and political institutions.

Countries which have many of these characteristics are captured in a common definition used by custodians. They define an emerging market as a non-EAFE (Europe, Australia and the Far East), non-North American market that has a functional stock exchange or a very active over-the-counter market, securities that are available to foreign portfolio investments, and a convertible currency or a capital-plus-income repatriation plan.<sup>4</sup>

This definition allows inclusion of markets with very small market capitalizations which are not included on the traditional emerging markets indexes, or countries with greater per capita incomes having many of the characteristics common to emerging markets. Although Malaysia is part of the EAFE index, and would therefore be excluded from the definition, custodians generally include it as an emerging market because it has emerging market characteristics.<sup>5</sup>

Whatever definition is used, it is important to recognize that characteristics may be dissimilar from country to country. Emerging market countries may have vastly different political systems, or be in markedly different economic stages.<sup>6</sup>

*Staff recommends that the SBI use the common custodial definition for emerging markets: a non-EAFE, non-North American market that has a functional stock exchange or a very active over-the-counter market, securities that are available to foreign portfolio investments, and a convertible currency or a capital-plus-income repatriation plan. Like most custodians, Staff would also include Malaysia as an emerging market.*

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<sup>3</sup> The following is based on information published by Douglas Stone, "The Emerging Markets and Strategic Asset Allocation," Russell Research, July 1990, page 4.

<sup>4</sup> State Street Global Navigator, "Defining Emerging Markets," Nov/Dec 1992.

<sup>5</sup> Originally, Singapore and Malaysia had a combined market which was included in EAFE. When they split their markets, Malaysia remained in the EAFE index even though it was not truly a developed market.

<sup>6</sup> More information is included in Part 2: Investment Considerations and Constraints.



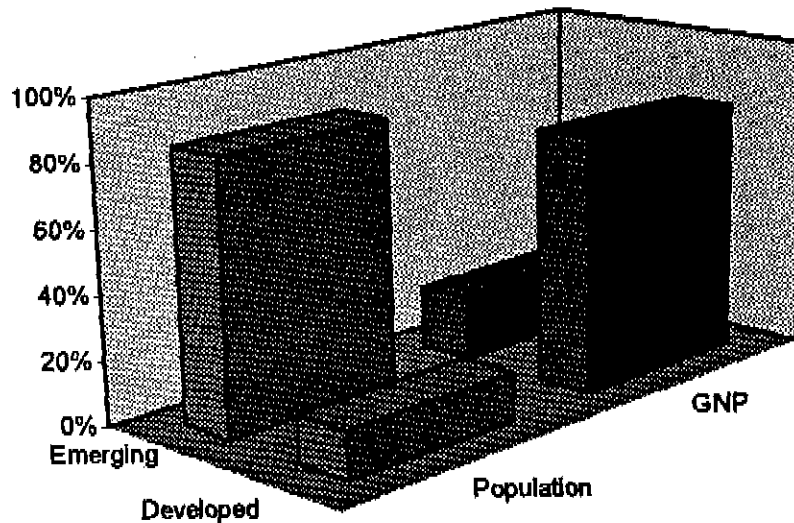
## Benefits

Few plan sponsors or investment managers focused on emerging markets until the late 1980's. Interest continues to grow in response to the potential for higher returns over time, and low correlations among emerging and developed markets.

While emerging markets accounted for 85% of the world's population in 1993, they represented only 20% of world GNP (see Exhibit 1). By the end of 1994, emerging stock markets comprised almost 13% of the world stock market capitalization, a growth of 21% over 1993.<sup>7</sup> Economic growth in these countries is projected to be 5.6%, approximately double the 2.7% projected annual growth for developed countries.<sup>8</sup>

Exhibit 1

### Comparison of World Population and GNP, 1993



Source: International Finance Corporation, *Emerging Stock Markets Factbook 1995*

Return history for emerging markets is relatively short (the oldest index, compiled by the International Finance Corporation, began in 1985), but comparisons show that emerging markets have outperformed other markets. The five year annualized return for the

<sup>7</sup> International Finance Corporation, "Emerging Stock Markets Factbook 1995."

<sup>8</sup> According to the International Monetary Fund (IMF), June 1995.

Morgan Stanley Capital International Emerging Markets Free Index (MSCI EMF) is 22.3%. This is significantly higher than the five year annualized return for the MSCI EAFE, the MSCI World, the S&P 500 or the Wilshire 5000 (see Exhibit 2). The outperformance is more notable considering the stunning U.S. returns in calendar 1995 compared to the negative return for emerging markets (see Appendix A, B and C for additional return data).

Exhibit 2

Emerging Markets Periods Ending December 31, 1995  
(U.S. Dollars)

Index benchmarks:	Annualized Return			Standard Deviation
	One Year	Three Years	Five Years	Five Years
S&P 500	37.6%	15.3%	16.6%	+9.9%
Wilshire 5000	36.4%	14.9%	17.3%	+9.9%
MSCI World	20.7%	15.8%	11.7%	±11.4%
MSCI EAFE	11.2%	16.7%	9.4%	±15.4%
MSCI Emerging Markets Free	-5.2%	15.4%	22.3%	±18.8%

Source: Richards & Tierney.

Correlations within emerging markets and between other asset classes are low (see Exhibit 3). This provides important diversification benefits for the total portfolio. By adding an asset class (such as emerging markets) with a low correlation to other assets, the risk/volatility of the total portfolio may be reduced.

It is important to note that the history of data available to compute emerging markets correlations is short, which may affect the statistical significance of these numbers. Also, the emerging markets indexes themselves have changed rapidly, which may lessen the reliability of the correlation numbers. Nonetheless, Staff believes that correlations are likely to remain low in the future.

### Exhibit 3

#### **Correlation Coefficient Matrix of Selected IFCI Total Return Indexes, Five Years Ending December 1994**

	S&P500	EAFE	IFCI	BRA	GRE	KOR	MAL	MEX	THA	VEN
S&P 500	1.00									
EAFE	0.44	1.00								
IFCI Composite	0.48	0.42	1.00							
BRAZIL	0.26	0.20	0.49	1.00						
GREECE	0.03	0.12	0.26	0.33	1.00					
KOREA	0.02	0.11	0.28	-0.09	-0.04	1.00				
MALAYSIA	0.34	0.41	0.66	0.01	-0.02	0.17	1.00			
MEXICO	0.36	0.23	0.69	0.20	-0.09	0.32	0.37	1.00		
THAILAND	0.38	0.28	0.61	0.08	0.13	0.17	0.63	0.34	1.00	
VENEZUELA	-0.11	-0.09	-0.03	-0.05	0.07	0.20	-0.10	-0.05	-0.14	1.00

Source: International Finance Corporation, *Emerging Stock Markets Factbook 1995*

The positive effect diversification into emerging markets has on an international portfolio is shown in Exhibit 4. This "efficient frontier" shows the return increase and risk reduction that an investor would have gained during this period when adding emerging markets to a passive EAFE portfolio.<sup>9</sup> The risk reduction advantage ends when an international portfolio includes 50% or more emerging markets. At that point, risk begins increasing again, even though returns continue increasing.

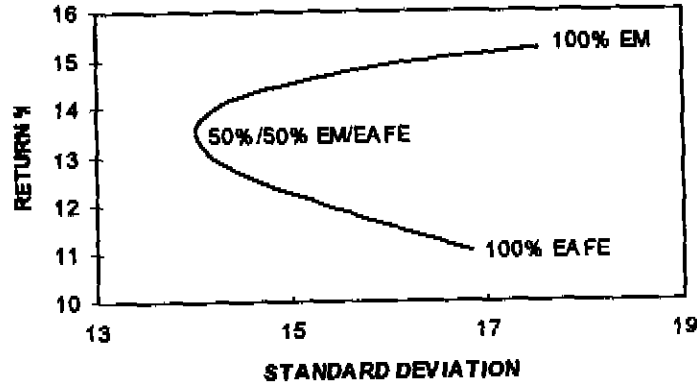
#### **Volatility/Risk**

While the efficient frontier analysis highlights the benefits of adding emerging markets to a portfolio, the SBI must recognize the volatility that is inherent in these markets. The return swings associated with a *single market* can be quite dramatic. Turkey is an excellent example as shown in Exhibit 5. It declined 50.7% in 1992 followed by a stupendous recovery of 230.6% in 1993, then a decline of 39.6% the next year.

<sup>9</sup> The efficient frontier used the IFC Investable Index, which was comprised of 25 countries as of December 31, 1995.

Exhibit 4

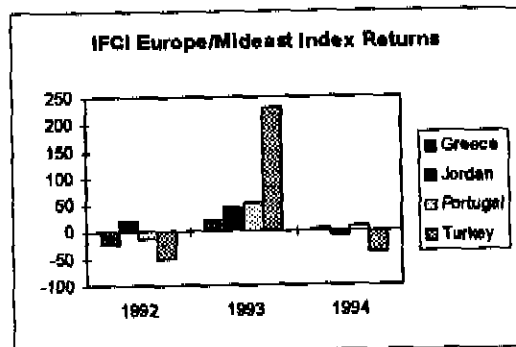
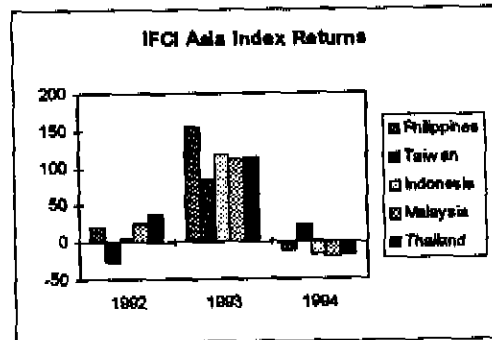
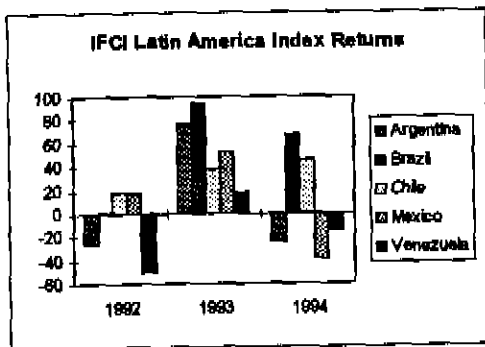
Emerging Markets Diversification Benefits with EAFE



Returns: Sep. 1991 - Sep. 1995

Source: Ibbotson. The IFC Investable Index is used for emerging markets.

Exhibit 5

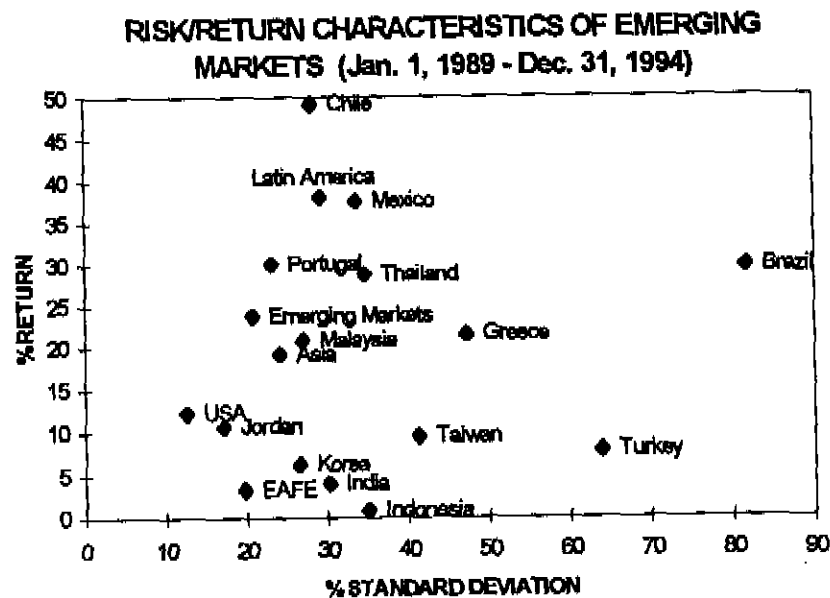


Source: International Finance Corporation, *Emerging Markets Factbook 1995*

Due to the low correlations between individual markets, the volatility of a diversified *emerging markets portfolio* is much lower than for most individual markets. However, the volatility associated with emerging markets investing is higher than for developed markets (MSCI EMF  $\pm 18.8\%$ , MSCI EAFE  $\pm 15.4\%$  for the last five years).

Risk/return characteristics for several markets, including the U.S., EAFE, and the IFC's Investable (IFCI) emerging markets index, are shown in Exhibit 6. Emerging markets had a much higher annualized return than the U.S. or EAFE, for slightly higher risk.

Exhibit 6



Source: International Finance Corporation, *Emerging Stock Markets Factbook 1995*

This chart can be used to highlight the similarity between the risk/return patterns for emerging markets and venture capital. The risk associated with an individual market (like a single venture capital investment) is high and returns can be very positive or very negative on a year to year basis.

On the other hand, the risk of an emerging markets portfolio (as with a venture capital fund) is much lower because investments are more diversified across both strong and weak

performers. A few high return markets are expected to offset low returns from other markets (analogous to the "winners" and "losers" in a venture capital fund). Overall, investors expect higher long term returns to compensate for higher volatility and lower liquidity relative to other asset classes.

### **Recommended Allocation**

When considering an emerging markets allocation, the effect it will have on both the international program and the total fund should be analyzed. Five of the SBI's international managers invest opportunistically in emerging markets (Barings, Marathon, Rowe-Price Fleming, Scudder and Templeton). One active manager (Brinson) has historically excluded emerging markets, other than Malaysia. The passive manager, State Street Global Advisors, does not invest outside the EAFE index.

The SBI's recent aggregate exposure to emerging markets is shown in Exhibit 7. This data is interesting because it shows the changes in the SBI's exposure to emerging markets over a few quarters:

- *International program.* Without Malaysia<sup>10</sup>, the emerging markets exposure has been as low as 2.12% and as high as 3.35% over the last two years. As of December 31, 1995, the emerging markets exposure was 2.14% excluding Malaysia. This compares to the long term target of up to 13% of the international program.

*Total fund.* The total fund had an emerging markets exposure of 0.24% on December 31, 1994, excluding Malaysia. This compares to the long term target of up to 2% of the total fund.

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<sup>10</sup> Malaysia is included in both the EAFE and the emerging markets indexes. The SBI's investment in Malaysia has been less than the EAFE benchmark weight, so it has not been included as an emerging market for this analysis.

## Exhibit 7

### TOTAL INTERNATIONAL PORTFOLIO

#### Emerging Markets Weights

	1Q 1994	2Q 1994	3Q 1994	4Q 1994	1Q 1995	2Q 1995	3Q 1995	4Q 1995
<b>Latin America</b>								
Argentina	0.10	0.10	0.12	0.11	0.12	0.11	0.11	0.11
Brazil	0.08	0.08	0.28	0.26	0.28	0.35	0.39	0.29
Chile	0.06	0.07	0.18	0.19	0.11	0.14	0.12	0.14
Colombia								
Mexico	1.18	1.13	1.12	0.81	0.24	0.29	0.36	0.29
Peru								
Venezuela								
<b>Total</b>	<b>1.42</b>	<b>1.38</b>	<b>1.70</b>	<b>1.17</b>	<b>0.78</b>	<b>0.89</b>	<b>0.88</b>	<b>0.83</b>
<b>East Asia</b>								
China							0.02	
Korea	0.57	0.69	0.71	0.44	0.41	0.41	0.46	0.37
Philippines				0.03		0.10	0.13	0.14
Taiwan								
<b>Total</b>	<b>0.57</b>	<b>0.69</b>	<b>0.71</b>	<b>0.47</b>	<b>0.41</b>	<b>0.51</b>	<b>0.63</b>	<b>0.51</b>
<b>South Asia</b>								
India	0.07					0.04	0.04	0.04
Indonesia								0.01
Malaysia	1.99	1.85	2.06	1.76	1.83	1.93	1.94	1.92
Pakistan								
Sri Lanka								
Thailand	0.45	0.32	0.35	0.35	0.31	0.39	0.43	0.35
<b>Total</b>	<b>2.51</b>	<b>2.17</b>	<b>2.41</b>	<b>2.11</b>	<b>2.14</b>	<b>2.36</b>	<b>2.41</b>	<b>2.32</b>
<b>Europe/Mideast /Africa</b>								
Czech Republic					0.04	0.07	0.11	0.10
Greece	0.03	0.04	0.03	0.04	0.04	0.05	0.05	0.03
Hungary								
Jordan								
Poland								
Portugal	0.21	0.17	0.18	0.17	0.18	0.20	0.15	0.09
S. Africa		0.08	0.30	0.31	0.43	0.35	0.34	0.28
Turkey								
Zimbabwe								
<b>Total</b>	<b>0.24</b>	<b>0.29</b>	<b>0.51</b>	<b>0.52</b>	<b>0.65</b>	<b>0.80</b>	<b>0.84</b>	<b>0.60</b>
<b>Other</b>								
Cayman Islands			0.08					
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.08</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total EM Exposure</b>	<b>4.74</b>	<b>4.63</b>	<b>5.41</b>	<b>4.27</b>	<b>3.95</b>	<b>4.36</b>	<b>4.56</b>	<b>4.06</b>
<i>w/o Malaysia</i>	2.75	2.68	3.35	2.51	2.12	2.43	2.62	2.14
<b>Number of Countries</b>	<b>10</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>13</b>	<b>14</b>	<b>14</b>
<i>w/o Malaysia</i>	9	9	10	10	10	12	13	13

\* Malaysia is also part of EAFE. Malaysia's EAFE weight is 2.19% as of 12/31/95

The SBI's current exposure also lacks broad diversification in terms of the number of countries represented in the portfolio. Exhibit 8 compares the distribution of the SBI's emerging markets exposure to the country weights within two leading emerging markets indexes, MSCI EMF and the IFC Investable (IFCI). It shows that the SBI's current exposure includes slightly more than half of the countries included in the indexes.

These figures suggest that the SBI would receive two benefits from a separate allocation to emerging markets specialists: higher exposure to emerging markets within the international program and greater diversification within the emerging markets exposure. Both should assist the SBI in achieving higher returns for the total portfolio without increasing total portfolio risk over the long term.

Asset mix simulations support this conclusion (see Exhibit 9). The simulations use the same return, risk and correlation assumptions as those employed by Staff for the most recent asset allocation review (refer to Tab D of the materials for the October 1995 meeting of the SBI for more information on the asset allocation study). The results show that even a small allocation to emerging markets provides risk/return benefits for the total fund.

A 2% allocation within the Combined Funds translates to \$471 million and a 4% allocation to \$972 million, as of December 31, 1995. Given the liquidity constraints associated with emerging markets investing, a 2% allocation appears to be an appropriate target for the Combined Funds at the present time. The SBI may choose to consider higher exposure at some point in the future, after it has greater experience with emerging markets investing or the aggregate capitalization and liquidity of emerging markets increases.

*Staff reiterates its recommendation that up to 2% of the Combined Funds be allocated to emerging markets specialists. While asset mix simulations suggest that higher exposure would provide additional benefits to the Funds, Staff believes that a 2% target is an appropriate initial allocation due to the liquidity constraints associated with emerging markets investing. At this level, 13% of the international program would be exposed to emerging markets through emerging markets specialists.*



Exhibit 8

**EMERGING MARKETS WEIGHTS - December 31, 1995**

	<u>Indexes</u>		<u>Actual SBI Exposure</u>	
	<b>IFCI</b>	<b>EMF</b>	<b>w/o Malaysia</b>	<b>w/Malaysia</b>
<i>Latin America</i>				
Argentina	3.7%	3.8%	4.9%	2.6%
Brazil	10.6	11.2	12.9	7.0
Chile	1.9	5.3	6.3	3.4
Colombia	1.3	0.8	-	-
Mexico	9.3	8.3	12.9	7.0
Peru	1.1	1.2	-	-
Venezuela	0.4	0.4	-	-
<i>East Asia</i>				
China	0.3	-	-	-
Korea	2.9	3.3	16.5	8.9
Philippines	2.8	3.0	6.3	3.4
Taiwan	2.8	-	-	-
<i>South Asia</i>				
India	2.3	5.8	1.8	0.9
Indonesia	2.3	5.4	0.5	0.2
Malaysia	19.8	16.7	-	46.2
Pakistan	0.8	0.6	-	-
Sri Lanka	0.1	0.1	-	-
Thailand	4.7	9.9	15.6	8.4
<i>Europe/Mideast/Africa</i>				
Czech Republic	-	-	4.5	2.4
Greece	1.6	1.3	1.3	0.7
Hungary	0.1	-	-	-
Israel	-	2.8	-	-
Jordan	0.2	0.2	-	-
Poland	0.3	0.2	-	-
Portugal	1.4	2.0	4.0	2.2
South Africa	27.0	16.4	12.5	6.7
Turkey	2.3	1.3	-	-
Zimbabwe	0.0*	-	-	-
	100%	100%	100%	100%

<b>Number of Countries</b>	<b>25</b>	<b>22</b>	<b>13</b>	<b>14</b>
<b>Number of Stocks</b>	<b>1136</b>	<b>890</b>	<b>159</b>	<b>307</b>
<b>Market Capitalization</b>	<b>\$600 billion</b>	<b>\$690 billion</b>	<b>\$58 million</b>	<b>\$109 million</b>
<b>Average Market Capitalization</b>	<b>\$528 million</b>	<b>\$775 million</b>	<b>\$365 million</b>	<b>\$355 million</b>

\*less than 0.1%.

Sources: IFC, MSCI and State Street Analytics

Exhibit 9

**Effect of Adding Emerging Markets Exposure**

**Asset Mix Simulations - Combined Funds**

(assumes Basic and Post are equal in size)

Domestic Equity	47.5%	47.5%	47.5%
<b><i>International Equity</i></b>	<b><i>15.0%</i></b>	<b><i>13.0%</i></b>	<b><i>11.0%</i></b>
<b><i>Emerging Markets Equity</i></b>	<b><i>0.0%</i></b>	<b><i>2.0%</i></b>	<b><i>4.0%</i></b>
Alternative Assets	10.0%	10.0%	10.0%
Domestic Bonds	27.5%	27.5%	27.5%
Non Dollar Bonds	20.5%	20.5%	20.5%
Cash Equivalents	2.0%	2.0%	2.0%
<b>Expected Return</b>	<b>10.19%</b>	<b>10.24%</b>	<b>10.30%</b>
<b>Standard Deviation</b>	<b><u>+11.41%</u></b>	<b><u>+11.29%</u></b>	<b><u>+11.19%</u></b>

**Effect on Existing International Managers**

Should the SBI restrict its current managers from investing in emerging markets when the separate allocation is implemented? No. The emerging markets exposure among the SBI's existing manager group has been minimal (see Exhibit 10). As a matter of policy, the SBI's active managers do not expect to include more than 10-15% exposure to emerging markets within their individual portfolios.

Staff believes that this small exposure will not significantly affect the SBI's aggregate emerging markets investments after emerging markets specialists are added to the international program. The opportunistic approach used by the active managers should continue to be viewed as a return enhancement relative to their EAFE benchmark rather than a method to gain broad exposure to emerging markets.

When the emerging markets allocation is fully funded, aggregate emerging markets holdings (active, passive and emerging markets managers included) will range from approximately 13-18% of the international program, including all holdings in Malaysia. If

Exhibit 10

**SBI'S EMERGING MARKETS EXPOSURE**

*December 31, 1995*

	<u>Excluding Malaysia</u>	<u>Including Malaysia</u>
Barings	5.75%	7.53%
Brinson	--	1.07
Marathon	5.32	6.76
Rowe-Price Fleming	6.47	9.34
Scudder	3.96	6.34
Templeton	10.32	10.32
State Street (EAFE index)	--	2.18
<b>Total International Pool</b>	<b>2.14</b>	<b>4.06</b>
<b>Total Combined Funds</b>	<b>0.24</b>	<b>0.46</b>

Source: State Street Analytics

all active managers invested in emerging markets at their maximum policy weights at the same time (a highly unlikely scenario), the aggregate exposure could be as high as 19-20% of the international program, or approximately 3% of the total fund. This level of exposure is still beneficial for the international program, as a review of the efficient frontier in Exhibit 5 shows.

*Staff recommends that the current active international managers be allowed to continue to invest opportunistically in emerging markets, as originally anticipated when those managers were retained. In order to avoid overweighting, staff recommends that active international managers be allowed to hold no more than 15% of their portfolio in emerging markets equities.*

*Staff does not expect this limit to alter the portfolio strategy of any existing manager, however, this constraint should be formalized and reflected in contractual investment guidelines.*

## PART 2: Investment Considerations and Constraints

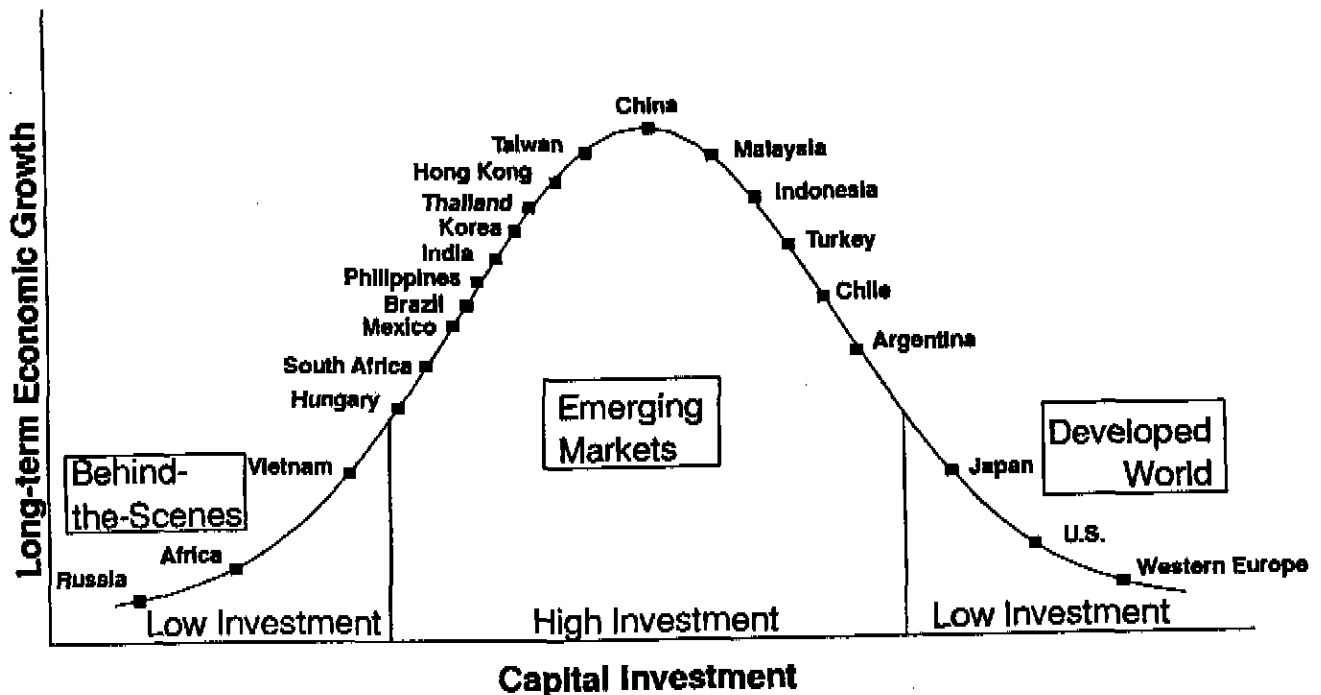
In the following few sections, more detailed information on emerging markets will be given, including life cycles, volatility factors, accounting and currency issues, regulatory and custody problems, costs, and market impact. This information is given to develop a more thorough understanding of emerging markets.

### Emerging Markets Life Cycle

Emerging markets go through a distinct life cycle (see Exhibit 11). Throughout this cycle, equity prices tend to fluctuate widely, especially in the early stages of development. This may be caused by capital issuance increases and large inflows of foreign funds that may result in periodic overvaluation. Overvaluation can also occur as domestic liquidity picks up, driving prices out of proportion to economic fundamentals. Overvaluations set the stage for a downward correction, which may be triggered by unexpected political or economic events.

Exhibit 11

## Market Economic Lifecycle



Source: Morgan Stanley

Eventually, as the markets continue to develop and mature, growth will stabilize and equity risk premiums will fall to levels typical of a developed country. By this time, many government companies are privatized, new issues are frequent, a service sector is evolving, and equity and currency derivatives have developed.

Japan is an example of a market that went through the emerging stages to become a fully developed market during recent decades. There was a time when the U.S. was also considered an emerging market, so the concept of emerging markets is not new.

Understanding the emerging market life cycle leads to a better understanding of the volatility inherent in these markets. It is unrealistic to expect them to behave like developed markets and an investor must understand that wide fluctuations will occur. This type of rapid growth is difficult, if not impossible, to achieve in developed countries, which is why long-term expected returns are higher in emerging markets. However, an investor pays a risk premium for those returns through higher volatility.

### **Volatility Factors**

Volatility can result from many things, among them are:

- economic and/or political instability
- currency swings
- illiquidity
- rapid and/or unpredictable growth
- constant change

Other factors may also increase the volatility in a market. Many emerging markets lack the institutional mechanisms available in more developed markets to dampen speculative tendencies. In some markets, insider trading is commonplace. In India, for example, it is not even illegal. A country may also be highly dependent on a small range of commodity exports or industrial sectors. In this case, volatility can result from a lack of diversification within an economy and its stock market.

"Thin" markets can increase volatility. If a market has only a handful of stocks (or a few stocks with large capitalizations compared to the rest) and one or two do poorly, they will have more impact in a thin market than in a market which is "deeper" (like the U.S. market and those of most other developed markets).

Repatriation risk may occur when a country restricts the ability of investors to bring principal and income back to their countries of origin. Many countries restrict the repatriation of money to prevent the rapid movement of "hot money," which can cause greater volatility in a market.

Expropriation was a risk experienced by many companies and investors in Vietnam after the war and in Portugal in the 1970's. This is the risk that the government will seize private companies and nationalize them. Even the threat of expropriation could significantly increase volatility. Although expropriation could occur again, it has been decades since a country has attempted or done this.

Managers address repatriation and expropriation risk by scrutinizing the markets and economies in which they invest. Most firms will eliminate countries from consideration until adequate markets mechanisms and infrastructure exist. In general, volatility can be controlled through broad diversification across multiple markets. Most emerging markets specialists will hold investments in 20 or more markets at a given time, which effectively limits their exposure to the adverse conditions in a single economy.

### **Accounting Issues**

Accounting methods differ from country to country. Even in developed markets, comparing companies from different countries is problematic. There are additional accounting issues to be aware of in the emerging markets, as well as a limited amount of reliable information. Because of accounting differences, financial statement valuation methods that work in developed countries may not be meaningful in emerging markets.

In many emerging countries, the most important factor affecting accounting is inflation. In countries with moderate inflation, portfolio managers can make adjustments to the appropriate balance sheet items and to income statements so that comparisons can be made in real terms.<sup>1</sup> Countries with hyper-inflation may use price indexing, where prices, wages, interest paying accounts and debt are indexed periodically to rise with inflation. Adjustments for hyper-inflation are unnecessary in countries with price indexing.

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<sup>1</sup> Gary S. Schieneman, "The Research Challenge: Analyzing the Numbers," *Managing Emerging Markets Portfolios*, AIMR, February 1994, pages 40-41.

Some practitioners think that ensuring the financial strength of a company is more important in emerging markets than elsewhere, thus balance sheets take on greater importance than income statements. Income statements, however, are more prevalent in the emerging markets and balance sheets may be unavailable. Even when balance sheets do exist, they lack uniformity. Since no standards exist for book value, for example, what is included can vary widely, even between companies within a market.<sup>2</sup>

Such accounting differences often result in earnings ratios and book values that are not comparable to those in developed countries. Portfolio managers compensate for these differences by adjusting ratios or substituting measures that are more meaningful. For example, while many managers look at absolute and relative values in developed markets, absolute values may be more relevant in emerging markets.<sup>3</sup> A stock that is cheap relative to its own market may not be a good buy if the market is already overvalued.

### **Currency Issues**

Generally, derivatives are non-existent or underdeveloped in the emerging markets, which means that currency risk cannot be hedged away. This leaves investors vulnerable to currency swings. For example, the late 1994/early 1995 devaluation of the Mexican peso had a profound impact on that market and on investor's perceptions.

Many of the emerging markets tie their currencies to the U.S. dollar. For U.S. investors, this mitigates much of the currency risk that may occur in these markets. For those currencies not tied to the U.S. dollar, portfolio managers may choose to avoid companies that have a large currency risk; i.e., avoid companies that do not have any foreign sources of revenue or that have a lot of foreign debt on the balance sheets. Other portfolio managers may factor currency risk into a country's (or a stock's) expected return before making their investment decisions.

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<sup>2</sup> Donald M. Krueger, "Valuation Techniques for Emerging Market Securities," *Managing Emerging Markets Portfolios*, AIMR, February 1994, pages 32-33.

<sup>3</sup> Shaw B. Wagener, "Bottom-Up Investing in Emerging Markets," *Managing Emerging Markets Portfolios*, AIMR, February 1994, page 30.

## **Regulatory and Custodial Issues**

There are many regulatory and custody barriers in emerging markets. These problems are not caused just by the laws and regulations set forth by the local securities commissions. Problems also occur from the difficulty in enforcing contractual and property rights, or where corporate governance practices are unfavorable to shareholders. Rules regulating competition, or the structure of industrial and financial ownership may cause additional difficulties.<sup>4</sup>

An example of a unfavorable shareholder's rights practice occurred in Russia. Russia does not have share certificates, hence ownership is recorded in the register of the issuer. A London company called TransWorld Metals bought a 20% stake in aluminum producer Krasnoyarsk. After a dispute, Krasnoyarsk crossed TransWorld Metals' name off its registry, eliminating TransWorld's investment. An example of the difficulty in enforcing contractual rights occurred in China. Lehman Brothers have a lawsuit against China United Petroleum Chemicals and Minmetals International Non-Ferrous Metal Trading Company for renegeing on obligations incurred during foreign exchange transactions.

Foreign investors may also have taxation, ownership limitations, currency rules and repatriation regulations set by governments to prevent what is considered by the governments to be excessive foreign control. Some countries require the foreign investor to get prior approval from the government, or an investor identification number or special license. Obtaining approvals, ID's or licenses may take days or weeks.

The most common market entry requirement pertains to currency transactions. Some countries require foreign investment money to flow through a specially created cash account, or different currency types, so the government can keep track of foreign investment money. South Africa, for example, previously had a financial rand and a commercial rand for its currency. Financial instruments were bought and sold in financial rand, but interest and dividends accrued in commercial rand.

Custodial issues must also be addressed by investors. A large majority of the custodial problems arise from markets that have manual settlement and clearing. India, although it has had a functional market for many years, has a system that is so manual it can take

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<sup>4</sup> Rudof van der Bijl, "Regulatory Environments in Emerging Markets," *Managing Emerging Markets Portfolios*, AIMR, February 1994, page 80.



months to settle a trade. Some emerging markets are now emphasizing quick settlement and have instituted measures to cancel a trade that settles too slowly or to fine the company that fails to settle on time. In the U.S., investors have been accustomed to 5 day settlement (recently changed to 3 day). In Israel, settlement is the same day, which can be onerous when money is transferring from another part of the world.

All markets have problems such as fraud and abuse. These factors may be especially prevalent in emerging markets, where market mechanisms and infrastructure are still developing.<sup>5</sup> However, many emerging countries are reviewing and implementing regulations which should help curb these problems.

As discussed, there are a large number of regulatory and custodial issues associated with emerging markets. Working through these problems can be expensive and difficult. A portfolio manager must have strong custodial and brokerage relationships to ensure adequate resolution when these circumstances arise. The SBI should ensure that emerging markets portfolio manager candidates pay careful attention to these issues and have the appropriate relationships in place.

State Street, the SBI's custodian, is one of the largest custodial banks with exceptional expertise in emerging markets.<sup>6</sup> They are capable of efficiently handling large emerging markets accounts, which would eliminate many of the custodial problems typically associated with these markets.

### **Costs**

Transaction costs in the emerging markets can be higher than in the developed markets for several reasons. Commission rates are often high, typically between 50 and 200 basis points. "Spreads" between the bid and offer prices are normally wider than in developed markets. There are also various taxes payable and higher custody fees.<sup>7</sup> Finally, varying liquidity levels can cause a price impact on markets when a large institutional order is placed.

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<sup>5</sup> *Managing Emerging Markets Portfolios*, AIMR, February 1994, page 5.

<sup>6</sup> *Global Custodian Survey*, Fall 1994, page A29.

<sup>7</sup> Higher custody costs are due to regulatory and custodial problems unique to emerging markets, and subcustodial costs that are incurred when the custodian is not present in a market.

Pension Consulting Alliance (PCA) estimates that annual costs range between 3.25% and 7.70%, with turnover ranging between 45% and 90% annually.<sup>8</sup> As with any portfolio, keeping turnover low helps reduce the portfolio's overall costs. This is especially true in emerging markets because costs are much higher. Exhibit 12 gives examples of commission and taxes, and bid/offer costs in various markets. Manager fees range from approximately 0.30% per annum for a passive account to 1.50% per annum for active management.<sup>9</sup> In addition, custodial costs range from 0.20-0.30% per annum.

Portfolio managers may be able to reduce commission costs through negotiation and strong relationships with brokerage firms. The SBI may be able to reduce manager fees through negotiation or by placing larger amounts of assets with a manager to take advantage of the price breaks typically associated with larger portfolios.

Even though overall costs may be high, a conservative (high) cost estimate for an actively managed portfolio indicates that additional returns can still be gained after costs. For a \$50 million portfolio with 100% turnover, estimated costs are 4.68% (most managers turn over a portfolio less frequently - 50% turnover would be an average of every two years). This estimate includes management fees of 1.50%, commission and taxes of 0.60%, bid-offer spread (both ways) of 2.28% and custodial fees of 0.30% (the commission and taxes, and bid-offer spread numbers are based on the costs for investing in the IFCI index).<sup>10</sup>

Referring to the five year period in Exhibit 2 (1991-1995) and assuming that future returns will be similar, emerging markets would give an additional 8.22% return over EAFE after these estimated costs have been subtracted. With these assumptions and estimates, adding emerging markets to an international program will add value over the long-term, even though total costs may be quite high. As these markets become more efficient, total costs should decrease.

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<sup>8</sup> Costs include management fees, commissions, taxes, bid/ask spreads and market impact.

<sup>9</sup> From Staff records based on a portfolio size of \$50 million.

<sup>10</sup> Custodial costs and manager fees for the SBI will be substantially less than these estimates because of management fee price breaks for larger portfolios and lower negotiated custodial fees.

Exhibit 12

**IFCI EMERGING MARKETS TRANSACTION COSTS (1995)**

<b>Market</b>	<b>Commissions and Taxes</b>	<b>Bid-Offer Spread (One Way)</b>
<i>Latin America</i>		
Argentina	0.60%	1.40%
Brazil	0.50	1.60
Chile	1.50	1.50
Colombia	1.10	2.50
Mexico	0.45	0.84
Peru	1.00	2.00
Venezuela	1.75	2.00
<i>East Asia</i>		
Korea	0.50	0.50
Philippines	0.75	1.10
Taiwan	0.15	0.80
<i>South Asia</i>		
India	1.90	2.50
Indonesia	0.90	1.85
Malaysia	0.55	0.50
Pakistan	1.15	2.50
Sri Lanka	1.60	2.50
Thailand	0.70	0.80
<i>Europe/Mideast/Africa</i>		
Greece	0.80	1.05
Hungary	1.10	3.00
Jordan	0.80	2.50
Poland	2.00	0.68
Portugal	0.70	1.25
South Africa	0.35	1.25
Turkey	0.65	1.25
Zimbabwe	2.30	2.50
<i>IFCI Index</i>	<b>0.60</b>	<b>1.14</b>
Latin America	0.66	1.41
Asia	0.70	0.88
Europe/Mideast/Africa	0.44	1.24

Source: State Street Global Advisors

## **Market Impact**

Market impact is an issue that has not been discussed in great detail in emerging markets literature. However, it deserves a few words here. In the emerging markets, stock availability may be limited and market capitalizations are small. In addition, many countries have foreign ownership restrictions or other restrictions which may reduce liquidity. These conditions create a limited supply of shares from which to buy compared to markets of developed countries. When large pools of money come into small markets at the one time, competition for these shares can drive up prices artificially.

Investors can reduce market impact by investing smaller amounts of money at any given time. A portfolio of \$50-75 million is considered a relatively large portfolio in the emerging markets. By not investing more than this at one time or with one portfolio manager, the investor can help control market impact. If larger amounts of money will ultimately be invested, it may be prudent to invest through several tranches, and not publicize when it will happen or how much it will be.

Portfolio managers can also help control market impact in several ways. They can limit the amount of money they invest at one time, or limit the number of investors they will take on during a specific time period. They can also limit their trades to less than a stock's or a market's average daily volume (many managers recommend limiting trades to no more than 1/3 of the average daily volume).

Market capitalizations in the emerging markets are increasing rapidly, as companies grow to meet the demands of the population, as countries privatize public companies to raise cash, and as consumer wealth is created. Over time, this should increase liquidity and reduce the market impact of transactions in emerging markets, unless investor demand outpaces supply.

*Staff recommends that the SBI invest in the emerging markets in tranches, limiting the initial dollar amounts given to each portfolio manager hired. In addition, attention to turnover, transaction costs and market impact should be considerations in the SBI's choice of managers.*

### **PART 3: Benchmark Issues**

There are a variety of indexes which can be used as a performance standard or benchmark for emerging markets. None is ideal for evaluation purposes and there is no universally accepted index among plan sponsors or investment managers.

Compiling a representative index for emerging markets is problematic for several reasons. The most important reasons are investability, pricing, new markets and country weightings.<sup>11</sup>

- *Investability* is the foremost problem, because a number of countries establish restrictions on access to foreign investors. These restrictions may eliminate foreign ownership completely, may limit the proportion of shares that may be purchased by foreigners, or may create separate share classes for foreign investors (which frequently trade at a premium to local shares). In addition, companies in emerging markets are often dominated by a founding family or governmental agency. Consequently, the shares available to other investors may be considerably less than the company's outstanding shares (free float).
- *Index pricing inaccuracies* can be caused by varying commission and tax rates, and wide differences between prices quoted by buyers and sellers of the same security (bid/ask spread). In addition, an institutional-sized order in a market or stock with low liquidity may move prices from published levels.
- *As countries open their markets* to foreign investors, they may be added to one or more indexes. This changing environment creates additional complexity. Obtaining accurate data, determining if and when a market should be included, and selecting representative stocks create extra work and difficult decisions for index providers.
- *Index country weights* are typically based on market capitalizations. Market under- and over-valuations can significantly distort capitalization, especially as a proportion to GNP. Index compilers have considered adjusting country weights based on each the size of each market's economy, but have not done so to date.

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<sup>11</sup> Information in the following "bullet" points is taken from Genesis Investment Management Limited, "The global Emerging Markets Indices, An Overview," pages 5-8.

With these considerations in mind, there are two published indexes that the SBI should consider: International Finance Corporation Investable Emerging Markets Index (IFCI) and Morgan Stanley Capital International Emerging Markets Free (MSCI EMF).

Both MSCI and the IFC publish global indexes as well, which include one or more markets that are not open to foreign investors. They are less representative of the investment universe available to the SBI and Staff excluded them for this reason. Barings also publishes an emerging markets index composed of fewer and more liquid stocks in larger capitalization markets. It is the least diversified published index, and was excluded on this basis.

The remainder of this section provides comparative information on MSCI EMF and IFCI. For additional data on other emerging markets indexes, readers should refer to Appendixes D, E, F and G.

The IFCI and MSCI EMF are both capitalization weighted, although their construction methodologies vary considerably. The characteristics of each can be summarized as follows:

- **IFCI.** This index excludes markets that are effectively closed to foreign investors. It also excludes stocks whose annual trading volume is less than \$10 million or whose investable market capitalization is below \$25 million. The index is comprised of approximately 60% of the capitalization of each market and is not adjusted for cross holdings or low trading volumes. The four largest markets in the index are Malaysia, South Africa, Brazil and Mexico, which comprised 66.7% of the index as of December 31, 1995.
- **EMF.** This index includes countries which are open ("free") to foreign investors, although their decision rules on this criteria are somewhat flexible. It adjusts for cross holdings and also excludes certain shares or portions of market capitalization in Mexico, Philippines, Venezuela and Korea to reflect their judgment on the free float available to foreign investors. The four largest markets in the index are Malaysia, South Africa, Brazil and Thailand, which comprised 54.2% of the index as of December 31, 1995.

Selected features of the methodology used by each provider are in Exhibit 13.

Exhibit 13

**INDEX METHODOLOGY**

	<b>IFCI</b>	<b>MSCI EMF</b>
<b>Country Selection</b>	Follows World Bank criteria, i.e. GNP per capita is less than \$8955.	Generally follows World Bank criteria as shown for IFCI. Also considers liquidity, regulatory environment, and perceived risk.
<b>Stock Selection</b>	Includes top 60% of each market.	Aims to capture 60% of total markets cap and industry groups.
<b>Minimum Average Daily Trading Volume</b>	\$10 million in last year.	Determined on country by country basis
<b>Adjustments Made for Market Restrictions</b>	Yes.	Taiwan excluded. Korea held at 20% of market cap.
<b>Adjustments for Float</b>	No.	Very low float may exclude a stock.
<b>Adjustments for Cross Holdings</b>	No.	Yes.
<b>Market Cap and Price History*</b>	Since 1989.	Since 1988.
<b>Data Availability on Individual Companies</b>	Since 1989 for earnings, book value, dividends.	Since 1993 for earnings, cash earnings, book value, dividends.
<b>Pricing</b>	Weekly.	Daily.
<b>Updates</b>	As necessary.	Annually.

\* Data histories will vary depending on when each country was included in the index.

Sources: Acadian and Brinson.

In terms of the number of countries and issues, IFCI is the broadest index with 25 countries and 1136 stocks as of December 31, 1995. By comparison, EMF has 22 countries and 890 issues. When market capitalization is considered, the picture reverses. EMF is broader in terms of market capitalization (EMF \$690 billion vs. \$600 billion IFCI). Country weights in EMF are also less concentrated, with 54.2% in its largest four market compared to IFCI with 66.7% in its largest four markets (review Exhibit 8).

Both indexes plan to add countries in 1996. The IFCI added the Czech Republic on Jan. 1, 1996. Other countries they are considering for 1996 include: Costa Rica, Ecuador, Jamaica, Tunisia, Morocco, Egypt, Kenya, Mauritius, Ghana, Botswana, Cote d'Ivoire, Latvia, Slovakia, Slovenia, Russia, Bangladesh. EMF does not publicly announce countries to be added until approximately two months before inclusion in the index.

Two reasons for investing in emerging markets are the potential for superior investment returns and the low correlations of returns with other equity assets. Selection of an SBI benchmark should take these issues into consideration. In this regard, EMF appears to have a slight edge over the IFCI, although history (1989-1995) is too short to draw firm conclusions.

Return comparisons are shown in Exhibit 15. Comparisons are shown for the IFCI, EMF, EAFE and World Indexes. Both the IFCI and EMF reflect the outperformance of emerging markets available over this time period. However, their cumulative and year-to-year returns are quite different due to differences in construction methodology and country inclusion.

EMF had the highest returns over the last seven years. EMF also provided the highest return per unit of risk as shown in Exhibit 16. This means that the EMF outperformed the IFCI on both an absolute and on a risk adjusted basis during the time period considered.



Exhibit 15

**INVESTMENT RETURNS OF GLOBAL EMERGING MARKETS INDEXES**  
**December 31, 1988 to December 31, 1995**

<b>INDEX</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>Dec. 31, 88 to Dec. 31, 95</b>
IFC Investable	55.47	(5.20)	36.06	1.18	75.26	(13.55)	(10.29)	175.78
MSCI EM Free	59.19	(13.74)	55.94	9.05	71.26	(8.67)	(6.94)	239.89
MSCI EAFE	9.22	(24.71)	10.19	(13.89)	30.50	6.24	9.42	18.37
MSCI World	14.75	(18.75)	16.03	(7.17)	20.40	3.36	18.70	48.34

Sources: Genesis Investment Management Limited, MSCI and IFC

Note: Based on Price Indexes, not Total Return Indexes

Exhibit 16

**VOLATILITY AND AVERAGE MONTHLY RETURNS OF**  
**GLOBAL EMERGING MARKETS INDEXES**  
**(DECEMBER 31, 1988 TO DECEMBER 31, 1995)**

<b>INDEX</b>	<b>Volatility (% Monthly Standard Deviation)(A)</b>	<b>Average Monthly % Return (B)</b>	<b>% Return Per Unit of Risk (B/A)</b>
IFC Investable	5.91	1.39	0.23
MSCI EM Free	6.49	1.68	0.26
MSCI EAFE	5.31	0.34	0.06
MSCI World	4.02	0.55	0.14

Source: Genesis Investment Management Limited

Correlations with the MSCI EAFE are shown in Exhibit 17. While the emerging markets indexes are very similar in this regard, the IFCI has the lowest correlation to EAFE.

### Exhibit 17

#### CORRELATION OF MONTHLY RETURNS WITH MSCI EAFE

(December 31, 1988 to December 31, 1995)

<u>INDEX</u>	Correlation Coefficient with <u>MSCI EAFE</u>
IFC Investable	0.39
MSCI EM Free	0.41

Source: Genesis Investment Management Limited

Data for the EMF index is available more quickly than for the IFCI, although construction methodology is monitored more carefully by the IFCI. For administrative reasons, using the MSCI EMF fits well with the SBI's use of the MSCI EAFE index for its international program. Both the IFCI and the MSCI EMF are widely used as benchmarks.

*Staff recommends the use of the MSCI Emerging Markets Free Index for its emerging markets allocation because of superior risk/return characteristics, its investability, and its less concentrated country weights. For the entire international program, a blended benchmark combining the MSCI EAFE and EMF should be used. Once the emerging markets allocation is completely funded, the international program pool should use a blended benchmark weighted 87% EAFE and 13% EMF.*

## **PART 4. Management Structure**

### **Passive, Structured and Active Approaches**

There are three different investment structures from which to choose in the emerging markets area. **Passive** investing attempts to replicate an index and its returns. Tracking error is the return above or below the index return. Tracking error can be attributed to several things, including the tax treatment of dividends and how they are reinvested, or using ADR's instead of local stocks. *Passive investing in emerging markets is relatively new and not widely used. Tracking error tends to be quite high, in the range of  $\pm 0.40\%$  to  $\pm 1.00\%$ , annually, compared to  $\pm 0.05\%$  to  $\pm 0.30\%$  for developed markets.*

**Structured** investing follows a specific structure for investing, but does not attempt to replicate index returns. Examples of structured investing are equal weighting, liquidity tiering, and other methods that follow a specific structure but do not make active decisions away from that structure. Structured investing is fairly widely used in the emerging markets.

**Active** investing can vary from very active with big bets against an index, to relatively inactive with small bets made around an index. *Due to inefficiencies in the emerging markets, most portfolio managers believe that they should be able to add significant value over the emerging market indexes through active approaches.*

The short-term statistical evidence available to support this is inconclusive. For the four year annualized period ending December 31, 1995, median managers beat the IFC Emerging Markets Investable but underperformed the MSCI Emerging Markets Free, according to the Russell universe. Data from InterSec indicates that median managers tied or slightly outperformed the MSCI Emerging Markets Free for the same period. It should be noted that, in addition to inclusive data, four years is an insufficient time period from which to draw conclusions, and there are very few managers who have been investing in emerging markets as a separate asset class for more than four years.

### **Country versus Stock Selection**

There is not a strong consensus for country selection (or top-down investing) versus stock selection (or bottom-up investing) in emerging markets. Studies have shown that a large percentage of a manager's return is due to country selection. For example, State Street

found that 46% of an individual stock's return is explained by its country's return in the emerging markets versus 30% for developed markets. Research suggests this occurs because of the lack of breadth, depth and industry diversity, and the tendency for emerging markets to be trending in nature.<sup>12</sup>

One must be careful, however, when using attribution numbers. If a stock picking manager finds good stock values in a country that does well, is the value added actually due to country selection or to their bottom-up stock analysis? In most attribution models, only the value added above the country index will be counted as stock attribution, even though country selection was not part of their decision.

The reason most frequently given for the bottom-up approach is summed up in the Association for Investment Management and Research's (AIMR) February 1994 publication, "Fundamental analysis can be particularly effective in emerging markets because the markets are less efficient than developed markets and are relatively uncorrelated with other markets, because company performance can vary from market performance, and because research on individual companies can add significant value."

The same source points out that top-down knowledge is also necessary when selecting individual stocks, but this knowledge is used to pick attractive companies rather than countries. They suggest that the two styles of investing are not mutually exclusive and may be used ideally together in emerging markets investing.

Staff has found that most companies do combine the two approaches, selecting companies with good fundamentals in markets they believe will prosper. One difference between top-down and bottom-up investing, however, is that a bottom-up manager may select a great stock even if they feel the country will not be strong, whereas a top-down investor would be more likely to avoid that country altogether.

Most sources agree that commitment, and on-site research are essential to the investment process, whether top-down or bottom-up. A portfolio manager must travel to both the countries and companies of interest to get up-to-date information and verify data.

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<sup>12</sup> "Emerging Markets Research Summary," State Street Global Advisors, 2nd Quarter 1994, page 21.

### **Criteria for Portfolio Managers**

Over the past year, Staff have been actively reviewing available emerging markets specialists. From this review, Staff developed several criteria that were important in screening portfolio managers:

- quality and depth of resources
- stability of the management team
- assets under management
- length of track record

A portfolio manager must be committed to researching and evaluating all aspects of emerging markets investing. In addition to country and security analysis, attention to trading costs and custodial issues are particularly important in these markets.

Given the large number of markets and their unique characteristics, this generally requires building and maintaining an investment team of sufficient size to support a complex investment process. The current management team must be responsible for the track record presented by the investment firm, and prospects must appear high that they will stay together.

Generally, the SBI does not want to be more than one-third of a firm's assets in the discipline under consideration. For example, if each firm were to receive a \$100 million to invest in emerging markets, each would need to have at least \$200 million in its global emerging markets product in order to be considered.

There are relatively few emerging markets managers with track records longer than three years, however, firms with longer histories are preferable. Generally, firms with records of less than three years should not be considered.

### **Investment Vehicles**

There are three different investment vehicles available to emerging markets investors. Each type has its own advantages and disadvantages. The three types are:

- closed-end funds<sup>13</sup>
- separate funds
- commingled funds.

Closed-end funds are often started when entry into an emerging market is limited. A country which wants to encourage foreign investment but discourage "hot money" investing may allow a closed-end fund to invest in their market. Closed-end funds trade on the stock exchange of one or more countries, so they do not have the problem of handling redemptions in illiquid emerging markets. Active investors often choose these funds because of the greater liquidity.

When a closed-end fund is first offered, the initial offering price usually reflects the net asset value of the underlying shares in the fund. After the initial offering, the price often falls to a discount. However, closed-end funds have also sold at a premium. Another characteristic of closed-end funds is that performance tends to be more closely correlated to the U.S. market than foreign markets. This may indicate that closed-end funds do not provide as much diversification as direct participation in a market.<sup>14</sup>

The two methods for direct participation in a market are separate accounts and commingled funds. Both methods can be used for active or passive management. Separate accounts are the most flexible for an investor but can be more expensive, especially if the size of the account is small (less than \$25 million). The flexibility comes from the investor's ability to tailor the separate account to suit the investor's specific needs. Expenses are related to higher custody, settlement and transaction costs incurred by separate portfolios, however, expenses decrease as the size of the portfolio increases. Additionally, an emerging market may require the plan sponsor to provide required documentation before a portfolio manager will be allowed to invest or settle trades.

Commingled accounts include monies from several different investors. A commingled account is managed more or less like a *mutual fund*. Commingled funds can be advantageous in emerging markets because they eliminate hurdles in entering markets, exposure is immediate, custody and settlement are simplified, and plan sponsors avoid

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<sup>13</sup> A fund whose shares are traded through brokers at market prices; the fund will not redeem shares at their net asset value. The market price of the fund can differ from the net asset value.

<sup>14</sup> Leslie B. Kautz, Howard D. Perlow and George Sands, "Emerging Markets: A Framework for Institutional Investment," *The Journal of Investing*, Spring 1993, page 49.

potential problems that may arise from establishing custodial relationships in emerging markets.

There are also several cost efficiencies to be gained from investing in a commingled account. The first comes from the savings in custody costs. The biggest custody issue is probably forged and/or fraudulent shares. Follow-up on custody issues will cost less for one fund when the cost is spread out among many investors instead of one investor bearing the whole cost.

Another cost savings comes from regulatory and settlement costs. A country may require detailed information and/or documentation from each separate account before investment will be allowed. Many countries now have penalties for failure to settle. Again, for a commingled fund, even though there may be many investors, the documentation or settlement is only required once for the whole fund, instead of for each investor. These cost considerations are frequently a reflection of the size of the portfolio that is invested. The smaller the portfolio, the more likely that commingling will provide cost savings to the investor. Given the size of the SBI's allocation and portfolios, commingling may not be as advantageous.

In the past, the SBI has avoided commingled funds for several reasons:

- *investment restrictions*
- *loss of in-depth reporting*
- *expense*
- *inability to vote proxies*
- *lag time in pricing/valuation.*

Three of these reasons are not a problem for the emerging markets program, because the SBI investment restrictions have been lifted, commingled funds now offer in-depth reporting similar to separate funds (including detailed asset listings), and commingled accounts can be less expensive for the reasons mentioned previously. One commingling issue for the SBI would be the inability to vote our own proxies. This could be addressed by reviewing a commingled fund manager's proxy voting policies for their compatibility with SBI practices.

The lag time in pricing/valuation associated with many commingled vehicles will also continue to be a problem for the SBI. For a variety of administrative reasons, the SBI has recently converted from five day to one day pricing/valuation on all stock and bond holdings. Commingled funds that do not have one day pricing or do not price securities in time for our custodian to process the data would be unable to participate in the SBI's emerging markets program.

*Staff recommends that investment in the emerging markets can be accomplished through closed-end funds, separate accounts, or commingled funds, as long as the commingled fund has timely one day pricing.*

#### **FINAL RECOMMENDATION SUMMARY**

There is wide agreement that investing even a small percent of a portfolio in emerging markets can increase potential returns without increasing risk at the total fund level. Although these markets are more volatile than those in developed countries, the low correlations these markets have with each other and with the developed countries may actually help reduce portfolio risk.

*Although many definitions* are used for the emerging markets, Staff recommends the use of the custodial definition: a non-EAFE, non-North American market that has a functional stock exchange or a very active over-the-counter market, securities that are available to foreign portfolio investments, and a convertible currency or a capital-plus-income repatriation plan. Staff would include Malaysia as an emerging market, even though it is part of the EAFE index.

*Staff recommends making an allocation* to emerging markets because of the potential for increased returns, the potential for reduced risk through greater diversification, and because the long-term view required for emerging markets investing is compatible with the SBI's asset allocation strategy for the Combined Funds. A 2% allocation was recommended by Staff, endorsed by the IAC, and approved by the Board in October 1995. Additionally, Staff recommends allowing the current active international managers to continue investing opportunistically in emerging markets, but limiting their emerging markets exposure to 15% of their portfolio to avoid overweighting.



*The benchmark recommended by Staff* is the MSCI Emerging Markets Free Index because of its superior risk/return characteristics, its investability, and its less concentrated country weights. Once the emerging markets allocation has been fully implemented, a blended benchmark should be used for the international program, weighted 87% EAFE and 13% EMF.

*Management structure* could include passive, structured or active investing. Passive investing is not widely used; active is the most prevalent in emerging markets. Important portfolio manager criteria include the quality and depth of resources, stability of the management team, assets under management, and length of track record. Closed-end funds, separate accounts and commingled funds should all be considered and a choice based on the method that is most advantageous for the SBI.

## APPENDIX A

### Emerging Markets Annualized Returns to December 31, 1994 (U.S. Dollars)

Index Benchmarks:	<u>1994</u> One Year	<u>1992-94</u> Three Year	<u>1990-94</u> Five Year	<u>1989-94</u> Six Year
S&P 500	-2.0%	10.2%	5.4%	8.8%
MSCI World	3.4%	4.9%	1.7%	3.8%
MSCI EAFE	6.2%	6.1%	-0.2%	1.3%
MSCI EM Global	-2.4%	18.3%	7.5%	13.7%
MSCI EM Free	-8.7%	19.5%	18.1%	24.1%
IFC Global	-2.2%	16.6%	4.8%	11.5%
IFC Investable	-13.6%	15.3%	14.6%	20.6%
Baring	-6.2%	18.2%	14.9%	19.8%

Notes: These numbers are based on price indexes, not total return indexes. Six years is the longest period for which common data exists for all the above indexes.

Source: Genesis Investment Management Limited, March 1995

## APPENDIX B

### IFC GLOBAL TOTAL RETURN INDEXES

Ten Years from December, 31 1984 to December, 31 1994

	ANNUAL PERCENT CHANGE									
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
IFCG Composite	27.7	12.8	13.5	58.2	54.7	-29.9	17.6	0.3	67.5	-0.5
IFCG Latin America	65.6	-2.5	-30.4	70.2	51.6	-3.7	123.5	5.7	56.6	-0.1
IFCG Asia	9.7	27.7	31.4	72.0	54.9	-36.1	0.5	1.3	70.1	0.5
S&P500	31.7	18.6	5.2	16.5	31.6	-3.1	30.4	7.6	10.0	1.3
MSCI EAFE	56.7	69.9	24.9	28.6	10.8	-23.2	12.5	-11.9	32.9	8.1

	ANNUALIZED PERCENT CHANGE									
	10 YR	9 YR	8 YR	7 YR	6 YR	5 YR	4 YR	3 YR	2 YR	1 YR
IFCG Composite	18.6	17.6	18.3	19.0	13.4	6.6	18.4	18.7	29.1	-0.5
IFCG Latin America	26.3	22.5	26.1	37.3	32.4	28.9	38.7	18.3	25.1	-0.1
IFCG Asia	18.5	19.5	18.5	16.8	9.5	2.1	14.6	20.1	30.7	0.5
S&P500	14.3	12.5	11.8	12.8	12.2	8.7	11.8	6.2	5.6	1.3
MSCI EAFE	17.9	14.2	8.7	6.6	3.3	1.8	9.2	8.2	19.9	8.1

## APPENDIX C

### International Finance Corporation Investable Total Return Indexes 1990-1994 (annual percent change in U.S. dollars)

Selected Markets	1990	1991	1992	1993	1994
<i>Latin America</i>					
Argentina	-42.5	444.9	-25.7	77.2	-24.3
Brazil	-69.5	285.1	1.0	94.2	67.3
Chile	44.9	110.9	18.0	37.2	46.0
Mexico	27.2	113.9	16.7	51.6	-38.6
Venezuela	-	56.9	-50.7	17.5	-14.5
<i>Asia</i>					
Philippines	-57.8	71.3	20.6	153.5	-11.1
Taiwan	-	-	-26.5	85.3	22.7
Indonesia	-	-40.4	3.9	116.7	-18.7
Malaysia	-9.4	10.3	24.1	110.9	-19.2
Thailand	-24.4	20.6	38.5	113.8	-18.2
<i>Europe/Mideast/Africa</i>					
Greece	105.3	-19.0	-25.8	22.9	3.4
Jordan	7.1	7.3	20.1	45.4	-7.3
Poland	-	-	-	739.6	-42.4
Portugal	-33.9	5.2	-12.6	52.5	9.5
Turkey	2.5	-45.8	-50.7	230.6	-39.6

Source: International Finance Corporation, *Emerging Stock Markets Factbook 1994*.

## APPENDIX D

### INDEXES AND COUNTRIES REPRESENTED - December 31, 1994

<u>Indexes</u>	<u># of Stocks</u>	<u># of Countries</u>	<u>Countries within Index</u>
Barings Securities Emerging Markets	315	15	Argentina, Brazil, Chile, Greece, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Portugal, Taiwan, Thailand, Turkey
International Finance Corporation Global	1,266	24	Argentina, Brazil, Chile, Colombia, Greece, Hungary, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Sri Lanka, Taiwan, Thailand, Turkey, Venezuela, Zimbabwe
International Finance Corporation Investable	890	23	Argentina, Brazil, Chile, Colombia, Greece, Hungary, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Portugal, Sri Lanka, Taiwan, Thailand, Turkey, Venezuela, Zimbabwe
Morgan Stanley Capital International Emerging Markets Global	864	20	Argentina, Brazil, Chile, Colombia, Greece, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Portugal, Sri Lanka, Taiwan, Thailand, Turkey, Venezuela
Morgan Stanley Capital International Emerging Markets Free	768	19	Argentina, Brazil, Chile, Colombia, Greece, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Portugal, Sri Lanka, Thailand, Turkey, Venezuela

Sources: IFC and MSCI.

## APPENDIX E

### INVESTMENT RETURNS OF GLOBAL EMERGING MARKETS INDEXES December 31, 1988 to December 31, 1994

<u>INDEX</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>Dec. 31, 88 to Dec. 31, 94</u>
IFC Global	51.71	(30.90)	15.63	(1.37)	64.15	(2.18)	91.95
IFC Investable	55.47	(5.20)	36.06	1.18	75.26	(13.55)	207.42
MSCI EM Global	50.59	(33.03)	29.11	2.63	65.50	(2.42)	115.81
MSCI EM Free	59.19	(13.74)	55.94	9.05	71.26	(8.67)	265.22
Baring EM	47.70	(27.39)	66.59	5.69	66.64	(6.16)	195.29
MSCI EAFE	9.22	(24.71)	10.19	(13.89)	30.50	6.24	8.18
MSCI World	14.75	(18.75)	16.03	(7.17)	20.40	3.36	25.12

Source: Genesis Investment Management Limited, March 1995

Note: Based on Price Indexes, not Total Return Indexes

## APPENDIX F

### VOLATILITY AND AVERAGE MONTHLY RETURNS OF GLOBAL EMERGING MARKETS INDEXES (DECEMBER 31, 1988 TO DECEMBER 31, 1994)

<b>INDEX</b>	<b>Volatility (% Monthly Standard Deviation)(A)</b>	<b>Average Monthly % Return (B)</b>	<b>% Return Per Unit of Risk (B/A)</b>
IFC Global	6.19	1.10	0.18
IFC Investable	6.06	1.75	0.29
MSCI EM Global	6.34	1.27	0.20
MSCI EM Free	6.73	2.04	0.30
Baring EM	7.40	1.79	0.24
MSCI EAFE	5.55	0.26	0.05
MSCI World	4.21	0.40	0.10

Source: Genesis Investment Management Limited, March 1995

## APPENDIX G

### CORRELATION OF MONTHLY RETURNS OF GLOBAL EMERGING MARKETS INDEXES WITH MONTHLY RETURNS OF MSCI EAFE AND MSCI WORLD INDEXES

(December 31, 1988 to December 31, 1994)

<u>INDEX</u>	<u>Correlation Coefficient with MSCI EAFE</u>	<u>Correlation Coefficient with MSCI World</u>
IFC Global	0.31	0.36
IFC Investable	0.38	0.45
MSCI EM Global	0.37	0.41
MSCI EM Free	0.41	0.47
Baring EM	0.39	0.45

Source: Genesis Investment Management Limited, March 1995



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**IMPLEMENTATION OF REAL ESTATE INVESTMENT  
OBJECTIVES**

**Originally Drafted in Memo Form  
to the  
State Board of Investment**

**August 10, 1983**

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The Asset Mix Committee of the Investment Advisory Council is recommending that a total of 10% of the Basic Retirement Funds' assets be invested in real estate. Currently, approximately 3% of the Basic Retirement Funds is invested in the open-end commingled funds sponsored by the Prudential, Equitable, and Aetna Insurance Companies. The purpose of this memorandum is to outline the proposed strategy and criteria to be used in evaluating and selecting additional real estate investments for the Basic Retirement Funds.

### The Role of Real Estate in the Basic Retirement Funds Portfolio

Two fundamental characteristics of real estate make it a desirable investment for the Basic Retirement Funds:

- (1) Real estate investments provide a hedge against inflation, and
- (2) Real estate investments provide additional diversification which reduces the volatility of total portfolio returns with no required sacrifice in the level of returns.

#### 1. Real Estate As An Inflation Hedge

The following data illustrates the relative annualized total returns produced by stocks, bonds, real estate, and the Consumer Price Index over a range of time periods according to various studies.

#### ANNUALIZED TOTAL RETURN

STUDY (see below)	TIME PERIOD	REAL ESTATE	STOCKS	BONDS	CPI ANNUAL INCREASE
1.	(1947-78)	8.1%	10.3%	2.2%	3.7%
2.	(1949-69)	9.5	11.6	2.0	2.2
3.	(1951-78)	13.9	11.4	3.4	3.6
4.	(1973-78)	14.3	3.6	6.6	8.1
5.	(1972-80)	11.3	7.0	3.1	8.5

1. Ibbotson & Fall, Journal of Portfolio Management, 1978.
2. Robichek, Cohen & Pringle, Journal of Business, July 1972.
3. McMahan Associate Report, 1980.
4. Hoag, Journal of Finance, May 1980.
5. Karp Associates Report, 1981.

The excellent rate of return performance provided by income producing commercial and industrial real estate properties during past periods of inflation can be attributed primarily to the ability of the properties' income streams not only to stay abreast of inflation, but even grow at strong sustained rates in real terms. Rental rates commanded by existing properties tend to correlate directly with new building costs. These costs, as

measured by the Construction Cost Index, have consistently exceeded the rise in the Consumer Price Index by as much as 50%.

It should be noted that the data that was used in the studies summarized in this report, for the most part, are based upon appraised values rather than actual transactions. Thus, some smoothing of performance results tends to occur. However, staff believes that the conclusions of these studies, regarding the basic risk-return characteristics of real estate, are still valid.

## 2. Diversification

Historical data, such as presented in the following table, indicate that the volatility of real estate returns, as measured by the standard deviation of returns, is lower than that of stocks and bonds, without generating a correspondingly lower rate of return.

### COMPARISON OF TOTAL RETURNS 1951-1978 Total Return

	<u>Nominal</u>	<u>Real</u>	<u>Standard Deviation</u>
Real Estate (a)	13.92%	10.25%	3.83%
Bonds (b)	3.45	(0.22)	6.65
Equities (b)	11.44	7.77	18.29

Table 2

### COMPARISON OF TOTAL RETURNS 1968-1978 Total Return

	<u>Nominal</u>	<u>Real</u>	<u>Standard Deviation</u>
Real Estate (a)	17.97%	11.27%	1.51%
Bonds (b)	6.15	(0.55)	8.81
Equities (b)	4.80	(1.90)	18.40

#### Sources:

- (a) John McMahan Associates, Inc.: returns are for Specific Composite of properties including office, shopping center and industrial property types.
- (b) Roger Ibbotson and Rex Sinquefeld, Stocks, Bonds, Bills & Inflation (The Financial Analysts' Research Foundation, 1977).



Just as importantly, historical data also suggests that the returns on real estate investments are uncorrelated or even negatively correlated with those of stocks and bonds. In a portfolio context, the result of this relationship is that weak returns on one asset class will often tend to be offset by strong returns on another, and vice versa. Thus, it is possible to reduce the variability of returns in a portfolio without diluting the level of returns by including real estate along with stocks and bonds.

### **CORRELATION COEFFICIENT 1951-1978**

Real estate to: \_\_\_\_\_

Equities	(.18)
Bonds	.08
T-Bills	.64

Source: John McMahan Associates

### **Legal Requirements Governing Real Estate Investments**

The State Board of Investment is authorized to invest in real estate through limited partnerships, bank sponsored collective funds, trusts, and insurance company commingled accounts (MS11A.24, Subd. 5). The Board's investment may not exceed 20% of any commingled fund or partnership, and there must be at least four other unrelated investors. The SBI does not have the authority to make direct investments in real estate.

### **Investment Strategy for the Real Estate Portfolio**

Currently, \$95.7 million, or approximately 3% of the Basic Retirement Funds' Portfolio, is invested in the following three large open end commingled funds: The Aetna Life Insurance Company's Real Estate Separate Account, Equitable Life Assurance Society's Separate Account 8, and the Prudential Insurance Company's PRISA Account. The combination of investments in these three accounts provides substantial diversification by both property type and location of investments.

Based upon the size of the SBI's proposed real estate portfolio and the statutory requirement to utilize commingled funds or limited partnerships as investment vehicles, three general approaches are available to the State Board of Investment in expanding its real estate investments:

- 1) Maintain a broadly diversified real estate portfolio composed of participations in open and closed end commingled funds whose investment objectives specify diversification by property type and location.

- 2) Employ an aggressive, non-diversified approach through the use of specialized funds. Specialized funds are those commingled funds or limited partnerships that invest in a single property type, in a specific geographic region, in development and renovation projects, or in equity-oriented mortgage vehicles. This strategy does not include the use of diversified commingled real estate funds. Current SBI investments in such funds, therefore, would be liquidated.
- 3) Maintain a core portfolio of open and closed end diversified commingled funds and add investments in less diversified and/or specialized closed end funds.

Placed on the spectrum of investment risk and return, the first strategy involves the lowest risk, lowest expected return form of equity real estate investment. While the broad diversification of this approach will produce a relatively low level of portfolio return volatility, it also provides little opportunity to achieve returns beyond those offered by the commercial real estate market in aggregate.

The second strategy possesses the greatest potential for achieving returns significantly superior to those of the overall commercial real estate market. Presuming the choice of proficient specialty real estate managers and property-timed selections of particular sectors of the real estate market, this highly focused investment strategy can produce returns exceeding those of the diversified approach. On the other hand, poor manager and/or real estate sector selection can lead to inferior performance. Thus, this non-diversified investment style, by accepting considerably amounts of non-market risk, will tend to produce portfolios with much greater relative levels of return volatility than the diversified style.

The third strategy represents a middle ground between the two extremes. It attempts to limit portfolio return volatility by holding a sizable core diversified portfolio. Yet at the same time, it seeks to enhance the return on the total real estate portfolio by retaining a group of managers who are willing and capable of making aggressive investments in attractive areas of the market.

Staff recommends that the Board adopt the third real estate investment strategy. Staff believes that this approach provides a proper long-term balance between investment risk and return. The first strategy does not take full advantage of the long-term investment perspective of the Basic Retirement Funds. The Basic Funds, because of their long investment time horizon, are capable of assuming a somewhat higher degree of investment risk, in exchange for higher expected investment returns, than is offered by the broadly diversified first strategy. On the other hand, the second strategy entails a much higher level of risk. In aggregate, the size and number of specialized funds with proven records is limited. Given the size of the SBI's proposed real estate allocation, the relatively constrained availability of specialized funds, together with their greater level of investment risk, makes this alternative unacceptable at this time.

Specifically, staff recommends that the Board:

- 1) Invest 30-40% of the real estate portfolio in diversified open-end commingled funds. These funds will provide a degree of liquidity in the event that the Board alters its real estate asset allocation in the future.
- 2) Invest 30-40% of the real estate portfolio in diversified closed end commingled funds. These funds will provide access to a large number of managers who do not offer the open end vehicle.
- 3) Invest 20-30% of the real estate portfolio in less diversified, more focused closed end commingled funds. These funds will offer the ability to enhance the return earned by the total real estate portfolio, the majority of which will be invested in diversified style and earn market returns.

In addition, staff recommends that these new investments in the closed end funds be made over a period of two to three years. There are two primary reasons for this strategy. First, without explicitly market timing, it will allow the SBI to participate in various phases of the real estate market cycle. The cycle affects the office, industrial and retail sectors of the market differently at different points in time. Thus, investing over a period of several years provides the Board with an additional element of diversification. The second reason is that the size of the SBI's proposed real estate investment is simply too large to be placed in a combination of closed end funds in a single year.

### Investment Criteria

Effective selection from the universe of real estate managers making offerings in the institutional investor market requires the disciplined application of a set of investment criteria. These criteria should emphasize both the quality of the real estate manager as well as the ability of the manager to meet the specific investment needs of the SBI. Staff believes that each potential real estate manager considered by the SBI should be evaluated in light of the following criteria:

- 1) Organization
  - Background, performance and expertise of the firm in equity real estate
  - Relative prominence of real estate among the firm's undertakings
  - The relationship among real estate investment, brokerage, and management activities within the firm
  - Firm's past experience as a fiduciary
  - Ownership structure

## 2) Staff

- Experience and age of key professionals and their staffs
- Length of time staff members have been working together
- Turnover rate
- Potential impact of staff departures
- Compensation and incentive systems

## 3) Proposed Types of Investments

- Composition by property type and location
- Stages of property development (existing fully leased properties vs. development deals)
- Use of financing arrangements and mechanisms (e.g., joint ventures, convertible mortgages, participating mortgages).

## 4) Acquisition Process

- Background research utilized for designing types and areas of investment
- Process for introducing properties to the firm
- Overall time-frame for investing fund assets
- Timeliness of decision-making process when a property is under consideration
- Role of committees and other entities in decision-making process

## 5) Property Management

Effective property management can enhance the value of individual properties in the fund portfolio. Data compiled by Evaluation Associates indicates that, over the last five years, those real estate funds that conduct on-site property management through the funds' own or an affiliate staff have outperformed funds that use external property management. The emphasis a firm places on property management will be a major consideration in the evaluation. Criteria include:

- Property management - internal or external
- Compensation of the on-site managers

- The relative responsibilities of the supervisory asset managers and the on-site property managers

#### 6) Sell Criteria

- The existence of a sell discipline
- Specific factors leading to sell decision
- The firm's sales history

#### 7) Leverage

- While the use of leverage can enhance fund returns, it also exposes the investment to a higher level of risk. A firm's historical and proposed use of leverage will be evaluated to ensure that the fund will not be exposed to an inordinate level of financial risk.

#### 8) Size of the fund

- Due to the size of the retirement assets to be committed to real estate and the 20% limitation on the investment in a single fund, the real estate funds generally should have a minimum value of \$100 million.

#### 9) Other Fund participants

- In closed end funds, the timing of asset liquidation can be determined by a vote of plan participants. Therefore, it is important that other participants possess goals and objectives consonant with those of the SBI.

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**VENTURE CAPITAL**

**JANUARY  
1984**

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## **I. Introduction**

In recent years, the impressive returns generated by venture partnerships and the well-chronicled successes of venture-backed firms such as Cray Research and Apple Computer have stimulated investor interest in venture capital. This investor enthusiasm has resulted in an increased flow of funds to the venture industry, which, in turn, has led to growth in the number and size of venture partnerships soliciting new commitments.

It is with this backdrop of rapid venture industry growth that the State Board of Investment is initiating its examination of venture capital partnerships. Staff believes that, given the current industry activity, it is particularly important for the Board to adopt a well-defined and rigorous venture capital selection process. The process and corresponding set of selection criteria recommended by staff are designed to identify attractive venture capital limited partnerships and provide a comprehensive framework against which the risk/return characteristics of individual venture partnerships may be examined.

It is the purpose of this paper to: describe the development and current status of the venture capital industry; present a rationale for including venture capital investments in the SBI portfolio; recommend a selection process and a set of selection criteria; and finally, consider the process of monitoring venture capital investments. Section II of the paper presents an overview of the venture capital industry including its history, current sources of venture capital funds, and types of venture firms. Also included is a description of the selection process and criteria employed by the typical venture capital partnership in making portfolio company investments. Section III examines the rationale for making investments in venture capital limited partnerships. Sections IV and V present the investment strategy, the selection process, and the

selection criteria recommended by staff. Finally, Section VI discusses a suggested process for monitoring venture capital investments.

## **II. What Is Venture Capital?**

Investments in venture capital typically involve the provision of long-term equity financing to rapidly growing high-technology businesses in primarily their early and expansion stages of development. However, venture capital investments also include leveraged buyout financings of mature firms. Portfolio companies acquired through leveraged buyouts are generally stable, low-technology industrial or manufacturing firms.

Early stage financing is composed of three forms of investment: seed, start-up and first stage financings. Seed financings typically provide small amounts of capital to entrepreneurs for the refinement of a product concept. Start-up financings provide capital for product development and initial marketing. Finally, initial commercial manufacturing and sales are funded through first stage financings.

In the early stages of a company's development, a capital infusion without active external management assistance is often insufficient to make a venture successful. However, in the later stages of company growth, entrepreneurs are typically less reliant upon outside management assistance. Thus, early stage investments often present the greatest opportunity for value-added contributions by venture capitalists in the form of direct participation in company policy decision-making and implementation.

Expansion financing includes intermediate stage and bridge (transition stage) financings. Funds for working capital, plant expansion, and product improvement

are provided through intermediate stage financings. Bridge financings typically provide capital to well-managed young companies that have passed through the early venture risk phase of their development and are candidates for acquisition or public financing within a two year period. In general, these companies will not only have fully-developed management teams and a product in the market but will also be generating significant revenues.

Leveraged buyouts refer to the acquisition of a portion or all of an existing company by a new corporation, which is funded, simultaneously with the acquisition, by significant amounts of debt relative to the contributed equity. Typically, the portfolio company buyer provides 25% of the acquisition price and uses the assets of the portfolio company as collateral to borrow the remaining 75% to 90% of the acquisition price from a combination of banks, insurance companies, and pension funds.

Most often, companies acquired in leveraged buyout transactions are stable and mature, low-growth manufacturing firms which may be revitalized by buyout specialists and company management with the infusion of new capital. Closely-held private industrial companies and divisions or subsidiaries of large conglomerates often are attractive buyout candidates.

#### **A. History of Venture Capital**

Early venture capital activity was dominated by wealthy families such as the Rockefellers, Phipps, and the Whitneys. However, in 1946, the first significant step toward the institutionalization of venture capital investing occurred with the formation of the Boston-located American Research and Development Corporation (ARD). The initiation of public stock offerings by ARD to attract outside capital

signaled a new direction in venture investing. ARD also established the high-technology, value-added orientation of the industry.

The second major event in the development of the venture capital industry took place in 1958 with the enactment of the Small Business Investment Act which provided for the creation of Small Business Investment Companies (SBICs). The purpose of the act was to stimulate the flow of capital to small businesses for which conventional sources of financing were not available. The SBICs, which were licensed by the Small Business Administration, utilized tax advantages and government lending at below market rates to provide equity capital and long-term loans to small firms.

During the 1960s, the growth in the number and size of SBICs increased the public awareness of the need for small business funding and provided the major impetus for the expansion of the entire venture capital industry. However, many of the early SBICs failed to generate adequate returns for investors in relation to the returns produced by traditional investments due to inadequate loan standards and excessive government regulations. In order to avoid these regulations, a number of private firms, structured primarily as limited partnerships, were established in the late 1960s.

The recession of 1974 and 1975 created significant problems for the new private venture limited partnerships, which focused initially on early stage financings. During this period, the public markets were relatively unreceptive to new issues, and thus, the financing options open to venture-backed private firms were limited. To support the growth of fledgling portfolio companies, venture capitalists were forced to expand into later stage financings. Venture capitalists also turned to leveraged buyouts and public market transactions of undervalued emerging growth company

stocks to generate higher returns than were available, at that time, through early stage financings.

Investor interest in the venture capital industry diminished somewhat during the recession. However, the period is particularly important for current institutional investors because there emerged from this venture capital cycle a cadre of skilled venture capitalists who were experienced in all stages of venture financing, highly flexible in adapting to market conditions, and able to add considerable value to *venture investments through long-term involvement with entrepreneurs.*

The lowering of the capital gains tax and the liberalization of ERISA investment requirements caused a resurgence in venture activity in the late 1970s and early 1980s. As domestic and foreign investors directed an increased flow of capital to the industry, banks, corporations, and professional venture capitalists formed new subsidiaries and partnerships to manage the funds.

## **B. Venture Capital Today**

### Industry Size

The venture capital industry has grown rapidly in recent years. Disbursements by private venture capitalists to portfolio companies increased from \$500 million in 1969 to \$1.8 billion in 1982. During the same period, the total capital resources committed to the venture industry expanded from \$3 billion to \$7.6 billion. Of the total \$7.6 billion in venture capital under professional management at the end of 1982, however, only 25% represented funds available for new investments. The remaining 75% represented capital which had already been disbursed to portfolio companies and funds which were being reserved for follow-on financing rounds.

In early 1983, 70 private venture capital firms were soliciting an additional \$2 billion in new capital commitments. During the first six months of the year, 33 of the partnerships successfully attracted \$1.15 billion in new funds. By the end of 1983, new commitments should bring the total venture capital under professional management to over \$9 billion.

Although the venture capital industry has exhibited dramatic growth, the capital resources committed to the industry currently represent only 1/10 of 1% of total U.S. pension fund assets. The size of the industry in terms of financing business growth may further be put into perspective by comparing the \$1.8 billion in 1982 venture capital disbursements to portfolio companies with IBM's 1982 research and development budget of \$2.1 billion.

### Sources of Funds

The most important sources of venture capital today are pension funds, individuals and families, insurance companies, domestic corporations, and foreign investors.



*Pension funds are currently the primary suppliers of venture capital. Although a few pension funds occasionally make direct investments in high-technology firms, most pension funds invest in venture capital through independent limited partnerships.*

Wealthy individuals and families continue to be the second major source of venture funds. Of particular interest in this group are entrepreneurs of successful venture-backed firms, who are becoming actively involved in limited partnerships as both investors and advisors.

A third source of capital for the venture industry are insurance companies and domestic corporations. For insurance companies, the long-term orientation of venture investments allows the matching of long-term liabilities with corresponding long-lived assets. For domestic corporations, which provide funds to the industry indirectly through independent partnerships and directly through subsidiaries, obtaining information regarding new technologies and products is often an important venture capital investment objective.

Finally, foreign individuals and corporations are making significant commitments to U.S. venture partnerships. Like domestic corporations, foreign high-tech firms are attempting to keep abreast of new technologies and expand their product markets through venture investment programs.

### Types of Venture Funds

Currently, there are three main types of venture capital firms which initiate and manage venture portfolio company investments: 1) private venture firms, 2) Small Business Investment Companies (SBICs), and 3) corporate subsidiaries.

Independent private venture capital firms, which play the dominant role in providing equity capital to young, fast-growing firms, currently manage almost 60% of the total venture capital. Most of the independent venture firms are institutionally funded and professionally managed limited partnerships.

The current popularity of limited partnerships as venture investment vehicles is due primarily to the advantages the limited partnership structure affords institutional investors: 1) the limited partners' liability is limited to their partnership interest, 2) the partnership itself is not taxed, and 3) the partnership's life can be tailored to the duration of the investments.

The second type of venture capital firm is the SBIC. SBICs, which are owned by banks, corporations, venture capital firms and individuals, together account for 17% of the total venture capital funds under management.

Although SBICs enjoy tax benefits and access to below market government funding, they are also subject to certain restrictions: 1) an SBIC may not own more than 49% of the equity of an individual company, 2) not more than 20% of an SBIC's capital may be committed to a single company, and 3) individual portfolio companies funded by SBICs must have assets of less than \$5 million.

The remaining 25% of venture funds are managed by corporations. This group includes subsidiaries of financial corporations and non-financial corporate venture capital divisions. Typically, financial subsidiaries initiate venture capital investments in order to maximize total parent company return on investment. In addition to this objective, non-financial venture divisions frequently seek access to new parent-related technologies, products, and firms through their venture investments.

### **C. Venture Capitalists' Selection Process and Criteria**

The selection process and criteria utilized by venture capitalists in making portfolio company investments vary according to the investment orientation of the venture partnership. This discussion applies particularly to limited partnerships. At the present time, limited partnerships are the only form of venture capital investments in which the SBI has legal authority to invest. The Board is not authorized to make direct venture capital investments.

#### **Early Stage-Oriented Partnerships**

Venture capitalists who specialize in early stage financings typically receive over 300 funding applications each year. Junior and/or senior partners screen the applications for potential investment candidates, generally selecting only 10% of the applications for further consideration.

*In many private venture firms, each of the general partners focuses on the analysis of a particular industry or group of industries. For example, it is not uncommon to find one partner of a technology-oriented venture firm specializing in the computer and software service industries while another covers the medical/health care and biotechnology/genetics fields.*

Typically, for each of the companies under serious consideration, the general partner who specializes in the particular industry involved conducts a thorough analysis of the company's business plan. Of principal interest to the partner are the product and market descriptions, management resumes, and current and pro forma financial statements included in the plan.

The general partner then continues the portfolio company investigation by conducting extensive meetings with the company's management team, bank officers, trade suppliers, competitors and customers, as well as former employers and subordinates. At this point, technical and market consultants may be enlisted to analyze the product and the competitive environment.

Finally, the general partner presents his findings and makes a recommendation to the venture team. In most firms, a unanimous vote of the senior general partners is required before an investment may be made in a portfolio company. In general, of the many funding applications received each year, only 1% to 3% will be accepted by the venture team.

A 1983 survey by SBI staff of over 50 venture capital limited partnerships revealed that most of the early stage-oriented partnerships sampled employ a similar set of selection criteria. The Key criteria cited by the majority of the venture firms are the quality, experience, and integrity of a company's management. In order for the venture capitalists to be able to add value to early stage investments, general partners select entrepreneurs who are willing to work closely with them. Venture capitalists also prefer company management teams with previous operating, marketing, and technical experience. In fact, several early stage venture capital partnerships limit funding to entrepreneurs who have already successfully started and operated a high-tech company.

The size of the potential market for a portfolio company's products is the focus of a second set of selection criteria. Early stage venture capitalists typically seek companies whose products are well-positioned to compete in rapidly expanding markets. These companies generally have products which are proprietary in nature, fill a particular market niche, or enjoy a competitive advantage due to patent or

trademark protection, distributive power, cost advantages, or industry barriers to entry.

A third set of criteria relates to the type of product produced by a portfolio firm. Although early stage venture limited partnerships frequently invest in high-technology industries, general partners rarely fund entrepreneurs whose products need substantial research before the product can be brought to market.

#### Transition Stage-Oriented Partnerships

The selection process followed by venture capitalists who specialize in transition (bridge) financings is similar to that followed by early stage specialists. The funding applicants, however, are companies who have already passed through their early venture risk phase. Since many later stage companies have already been investigated by previous venture investors, a transition analysis is typically not as rigorous as an early stage investigation.

Transition stage specialists employ four primary selection criteria. When public markets are particularly receptive to new issues, the valuations of later stage companies increase significantly as lead investors and entrepreneurs anticipate successful public offerings. Thus, the first and key criterion for transition financing specialists is the conservative pricing of the bridge round.

A second selection criterion for transition specialists is an experienced and complete management team. In addition, unlike early stage portfolio companies, transition candidates must already have a product in the market and be generating substantial revenues. Finally, in most circumstances transition portfolio companies should already have reached profitability.

### Leveraged Buyout Specialists

The leverage employed in the acquisition of a buyout company creates substantial financial risk. Because fluctuations in cash flows may create difficulties in meeting debt service obligations, buyout specialists seek investments in stable companies with steady earnings. Therefore, the selection criteria utilized by buyout specialists in selecting mature portfolio companies are somewhat different than the criteria employed by traditional venture capitalists in the analysis of young, high-growth firms.

Further, in classic leveraged buyouts, the assets of the portfolio company are used as collateral to borrow from 75% to 90% of the firm's acquisition price from a group of institutional investors, typically, banks, insurance companies, and pension funds.

Banks generally provide loans which are secured by a portfolio company's current or fixed assets. Insurance companies and pension funds, on the other hand, frequently acquire "vertical strips" of unsecured senior debt and subordinated debt with warrants to augment their equity participation. Thus, since leveraged buyout specialists must negotiate the pricing of the debt, equity, and debt/equity hybrids, the investigation and negotiation phase of the investment process is generally much more complex for leveraged buyouts than traditional venture investments.

Like early and transition stage venture capitalists, buyout specialists regard a quality, committed management team as the key to a successful investment. Typically, buyout specialists expect management to purchase 10% to 20% of the portfolio firm's equity on similar terms as institutional investors.

Unlike traditional venture capitalists, however, buyout specialists target low-technology firms with proprietary products, strong distribution channels,

manufacturing efficiencies and low capital expenditure needs. Especially attractive to buyout specialists are companies with excess assets which can be sold after the acquisition to immediately reduce debt. Desirable portfolio company financial characteristics include low debt ratios, consistent cash flows, and minimal contingent liabilities.

#### **D. Future Industry Concerns and Directions**

The rapid growth of the venture capital industry has engendered considerable discussion concerning the large amount of capital available for disbursement in relation to the number of attractive investment opportunities. This issue of whether there are "too many dollars chasing too few deals" is one that deserves the attention of venture capital investors.

The great increase in the number of both venture firms and new capital commitments does suggest the possibility of competing venture capitalists driving up portfolio company valuations and concomitantly, lowering eventual venture capital returns. Venture capitalists, however, report an increase in the number of high quality investment proposals submitted to them. Leveraged buyout specialists, too, point to a rise in investment opportunities resulting from the continued deconglomeration of American business. Thus, it appears that there may be many attractive venture investment opportunities still available.

However, junior partners, investment bankers, and entrepreneurs, encouraged by the flow of capital to the venture industry, are organizing new limited partnerships in record numbers. This means that much of the capital now being solicited will be managed by general partners who lack extensive direct venture capital experience. Thus, the key concern for venture capital investors may not be the over-abundance

of venture dollars, but rather the scarcity of experienced general partners to invest and manage them.

An additional concern for investors may be the trend toward the raising of very large \$100 to \$160 million funds. Many of these large funds, termed "megafunds", are managed by senior partners who are very experienced in venture investing. The rapid growth of the capital under "megafund" management suggests, though, that senior partners may be forced to delegate many investment responsibilities to junior partners and inexperienced associates. In addition, the pressure to invest \$150 million over three to four years may result in an increase in the size and number of individual portfolio company investments. Thus, the managers of the very large funds now being raised may be precluded from making the kind of small, time-intensive, value-added investments which generated high returns on previous funds.

### **III. Rationale for Venture Capital Investing**

Institutional investor involvement in venture capital investments has grown dramatically over the past several years. This increased participation has primarily been due to the attractive returns produced by venture capital funds. In addition, venture capital investments have come to be viewed as a means of increasing the degree of diversification in a pension fund without sacrificing returns.

Historically, venture capital investors have been rewarded with impressive returns on their investments. Although returns of 25% to 30% per annum have been typical, extraordinary returns of 40% to 60% per annum have been reported by some funds. Stan Pratt, a leading venture capital consultant, analyzed the rates of return reported by 50 venture capital funds during the period 1960 to 1980. Pratt found that both the mean and median reported rates of return for the twenty year period were



approximately 25%. The standard deviation, a measure of the volatility of the returns, was 13%. A summary of Pratt's analysis is presented in Table 1.

**TABLE 1**

**Return on Investment (ROI) Analysis for 50  
Venture Capital Funds**

<b><u>Initial year of Fund or Initial year of Calculation</u></b>	<b><u>Number of Funds</u></b>	<b><u>Average Duration</u></b>	<b><u>Median Return</u></b>	<b><u>Mean Return</u></b>	<b><u>Standard Deviation</u></b>
1960-to-1970	13	10.9 Yrs.	20.6%	23.7%	15.5
1970-to-1975	28	7.5 Yrs.	23.4%	24.0%	12.4
1975-to-1980	9	3.2 Yrs.	29.7%	30.9%	12.1
1960-to-1980	50	7.6 Yrs.	24.1%	25.2%	13.3

- \*Includes:
- 1) private partnerships
  - 2) publicly-held venture capital funds
  - 3) corporate venture capital investment programs
  - 4) bank affiliated venture funds

Source: Capital Publishing Corp., 1982

Investments in venture capital firms have, in fact, outperformed most financial assets over the past decade. Comparisons between the mean compound return generated by venture firms (using Pratt's data) and returns on several market indices are presented in Table 2.

**TABLE 2****TOTAL RETURN OF VENTURE CAPITAL INDEX**

<u>Year</u>	<u>Venture Capital 100 Index a</u>	<u>S&amp;P 500</u>	<u>Wilshire 5000</u>
1973	-41.5%	-14.9%	-18.5%
1974	-47.2	-25.3	-28.4
1975	134.3	37.3	38.5
1976	60.0	23.7	26.6
1977	41.7	-7.3	-2.6
1978	59.4	6.5	9.3
1979	41.4	18.6	25.6
1980	77.4	32.5	33.7
1981	-13.4	-5.0	-3.7
1982	26.1	21.6	18.7
10 Year - 1973-82 Annualized Return	21.8%	6.8%	7.7%

- a The index is the unweighted stock price of companies meeting the following criteria: the companies must have been public for less than twelve years; early financing was provided by professionally managed venture funds; and the venture capitalist is still involved.

Source: Capital Publishing Corp., 1982

Related to the potential high rewards are the risks of venture capital investing. However, when considering venture capital, the risk inherent in an individual portfolio company investment should be clearly distinguished from the risk of a limited partnership's diversified package of investments and the aggregate risk of a total pension portfolio.

Individual venture investments are made in firms with highly uncertain futures. Many young firms may either fail completely or may never produce acceptable returns on investment. However, the risk of investing in an individual company, although high relative to traditional stock and bond investments, is not as great as is widely believed. Successful venture capitalists mitigate individual portfolio company risk through thorough analysis and careful selection of portfolio investments, conservative pricing of the securities acquired, and utilization of protective provisions in purchase agreements.

In addition, unlike passive equity investors, venture capitalists have the opportunity to become actively involved in the management of portfolio companies. Through their value-added involvement, venture capitalists are frequently able to solve operating, marketing, and technical problems as they occur. Further, highly experienced general partners are often able to anticipate and prevent problems before they arise, thereby increasing the likelihood of a company's success.

To further reduce the risk inherent in an individual portfolio company investment, venture capitalists generally reserve up to 25% of a limited partnership's committed capital for future portfolio company needs. Use of this follow-on reserve, termed "liquidity management", gives general partners greater flexibility in timing additional syndicated financing rounds and in scheduling the eventual investment liquidation through a new public issue or a merger. Thus, astute liquidity management lessens

the impact of market and economic conditions on the outcome of a venture-backed company.

Leveraged buyouts do not possess the same economic risk as early stage and expansion venture investments. However, the debt employed in the leveraged acquisition of a company creates substantial financial risk. An economic downturn or an increase in product competition may decrease company cash flows and make debt service obligations difficult to meet. To mitigate the total risk inherent in an individual leveraged buyout, buyout specialists target mature companies which have essentially passed through their early high business risk phase. After a buyout company has been acquired, buyout specialists focus their value-added activities on generating cash quickly in order to reduce the burden of leverage.

That venture capitalists are often successful in their risk reduction efforts can be seen in the results of a study conducted by Stan Pratt of 218 investments made by five venture capital firms between 1960 and 1978. Of the individual venture-backed companies Pratt studied, the majority (60%) either broke even or provided a positive return to the limited partnership investors. In addition, the gains from several of the more successful investments far outweighed the total losses. Pratt found that the combined profits of the seven most successful investments out of the total 218 were more than three times the sum of all the losses.

In addition to mitigating the risk of individual investments, venture capitalists further reduce the risk to venture capital investors by carefully constructing a diversified portfolio of company investments. Over the life of a partnership, early and transition stage venture capitalists typically invest in 25 to 30 companies. Most often, leveraged buyout specialists make 5 to 10 portfolio company investments over the life of the partnership. Although some venture partnerships focus on specific types

of venture capital investments, most funds are diversified according to portfolio company stage of financing, industry segment, and geographic location. In addition, because venture capital investments may be adversely affected by market or economic conditions, venture capitalists typically "diversify over time" by investing committed capital slowly over a period of three to five years.

The successful reduction of venture capital risk through diversified portfolio construction is supported by Stan Pratt's observation that every independent venture capital fund backed by institutional investors and capitalized with at least \$5 million has generated a positive return for its investors.

Institutional investors can further lessen their venture capital risk by investing in a number of partnerships. These investors, like general partners, may reduce risk by diversifying total venture capital portfolios according to the financing stage, industry, and geographic orientation of the limited partnerships.

As discussed in the report of the Asset Mix Committee of the Investment Advisory Council, the Basic Retirement Funds have a long-term investment time horizon. Since liquidity concerns are minimal, the long-term orientation and the relatively high return-high risk characteristics of venture capital are consistent with the Basic Funds' needs.

#### **IV. Venture Capital Investment Strategy**

According to the asset allocation guidelines adopted by the Board, up to 2.5% of the Basic Retirement Funds' portfolio will be committed eventually to venture capital investments. The inclusion of venture capital investments in the Basic Retirement

portfolio is more than justified by the high returns which have been generated by venture capital limited partnerships.

However, as the Board initiates its venture capital investment program, it must consider not only the returns generated by venture capital investments but also the risks associated with those returns. As discussed in Section III, the total risk of venture capital investing can be reduced by constructing a well-diversified portfolio of venture capital investments.

Therefore, staff recommends that the Board establish and maintain a broadly diversified venture capital portfolio comprised of participations in balanced limited partnerships whose objectives specify diversification by industry type, stage of corporate development, and location.

Specifically, the total venture capital portfolio should be constructed in such a manner as to permit investment participation in the three major stages of corporate development: start-up or early stage companies, expansion financings, and leveraged buyouts. In addition, staff recommends that the Board seek investment representation in the six major geographic centers of Boston, California, Colorado, Minnesota, New York, and Texas. The SBI also should diversify its investments across six main industry groups: communications, computers, genetics, medical/health care, energy, consumer related, and industrial products.

Finally, staff recommends that the venture capital investments be made over a two to three year period. This will not only enable the Board to take advantage of investment opportunities as they arise, but it will also provide an additional element of diversification by allowing the SBI to participate in the various phases of the venture capital market cycle.

A venture capital portfolio constructed in this manner should produce a relatively low level of return volatility while generating returns which approximate those of the aggregate venture capital market.

At some point in the venture capital investment program, it may be desirable for the Board to consider investments in special-orientation limited partnerships. With the large numbers of new partnerships being formed, many general partners are attempting to establish venture capital market niches by concentrating their investments in a specific geographic region and/or industry sector or by targeting portfolio companies in a particular growth stage.

Staff recommends that the Board consider participating in special-orientation venture funds only after it has undertaken a sizable commitment to broadly diversified funds. There are two primary reasons for recommending this approach. First, due to their complexity and the added risk, special-orientation funds will require considerably more investigation by potential limited partners than will the diversified venture funds. Staff believes that such analysis will be more effectively done once the Board has gained experience with the diversified funds. Second, there currently exist relatively few special-orientation funds. It is unlikely that the SBI could commit more than a small fraction of its venture capital allocation to such funds. Thus, the Board should focus its initial efforts on the diversified funds where the bulk of its venture capital assets will be placed.

## **V. Selection Process**

### **Initial Step**

The first step in the selection process is the solicitation and screening of potential general partners. An initial list of candidates should be generated with the assistance



of investment advisors employed by the SBI and by contacts with other institutional investors. Due to the rapid growth of the venture capital industry, the candidate list should be updated at frequent intervals to ensure SBI access to newly formed partnerships.

For the screening, the SBI staff should contact by telephone each general partner on the candidate list. The purpose of the contact is to identify those general partners and limited partnerships which meet the following criteria:

1. *Statutory Requirements --*

The SBI is authorized to invest in venture capital through limited partnerships (MS11A.24, Subd. 6). The Board's investment may not exceed 20% of any partnership, and there must be at least four other unrelated investors in each partnership. The SBI may not make direct venture capital investments.

2. *Size of Fund --*

Due to the size of the assets to be committed to venture capital and the 20% limitation on the investment in a single fund, the venture capital limited partnerships which the SBI selects generally should have a minimum initial capitalization of \$30 million.

3. *Staff Experience --*

The venture industry is becoming an extremely competitive one. Therefore, it is imperative that the general partners with whom the Board invests have direct venture capital experience in selecting portfolio companies, structuring investment transactions, syndicating financing rounds, managing venture portfolios, and arranging for the liquidation of portfolio company investments.

4. *Compatibility with SBI Investment Objectives --*

For corporate development venture capital investors, obtaining information about new technologies and products may take precedence over generating a return on partnership investment. Thus, it is particularly important that the principal focus of the limited partnerships in which the SBI invests be the maximization of total rate of return rather than the identification of new technologies. In addition, since critical partnership issues can be determined by a vote of limited partner investors, it is also important that other fund participants possess goals and objectives consonant with those of the SBI.

5. *Diversification Potential* –

As discussed in Section III, a reduction in the volatility of portfolio returns may be achieved by diversifying the venture capital portfolio according to the industry, location, and corporate development stage of individual portfolio companies. Therefore, the general partner candidates should be questioned by staff regarding proposed investment strategy in order to determine whether the partnership will make a contribution towards diversifying the total SBI venture capital portfolio.

Second Step

General partners who pass the screening should be interviewed by the SBI staff in staff's offices. At this point in the selection process, there are numerous factors, both quantitative and qualitative, which must be considered.

Investment Criteria

1) Organization

Ownership structure

Background and performance of the firm in venture capital

Firm's past experience as a fiduciary

Affiliation with other firms

Relative prominence of venture capital among the firm's undertakings

2) Staff

Experience and age of general partners (emphasis on direct venture capital experience and complementary skills)

Allocation of responsibilities

Length of time staff members have worked together

Turnover rate

Potential impact of staff departures

Co-investment network of professional venture capitalists

Participation in national and local venture capital associations

Support personnel

Affiliation with research organizations/consultants

Compensation and incentive systems

3) Partnership Legal Agreement

Revenue sharing (general partners' carried interest)

Management fee structure (committed capital vs. net asset value based)

Additional expenses allocated to limited partners (accounting, legal, and organizational expenses as a percent of committed capital)

Life of partnership and extension options

Take-down schedule of committed capital

Distribution of return (cash vs. in-kind distributions, re-investment of returns)

Subscription policy

Role of limited partners in partnership decision-making and valuation processes

4) Partnership Investment Strategy

Authorized forms of investment (common stock, debt, convertible securities)

Origination of investments (proportion of lead vs. co-investment positions)

Diversification strategy (location, industry, stage of corporate development)

Maximum proportion of capital committed to single industry, location, firm, or development stage

5) Portfolio Company Selection Process

Proposed schedule for investing fund assets

Processes for generating, investigating, and accepting funding applications

Selection criteria utilized in the investigation process

6) Portfolio Company Investment Management

Type and quality of business assistance provided by general partners to portfolio company entrepreneurs

Liquidity management (e.g., use of cash reserves for follow-on financings)

Syndication of financing rounds

Role of general partners, outside advisors, and investors in portfolio company decision-making

Protective covenants and management incentive provisions utilized in purchase agreements

Preparation for termination of portfolio company investments (initial public offering, merger, sale to management)

Distribution of partnership returns (cash vs. in-kind distributions, re-investment of returns)

Other fund participants

7) Reporting Policies

Frequency and form of communication with limited partners

Financial statements provided to limited partners

Annual meetings for investors and portfolio company entrepreneurs

Portfolio valuation policy

Although the selection criteria are largely self-explanatory, there are several points regarding partnership staff which merit additional comment. Perhaps the most

important assets of a venture capital partnership are the experience and abilities of its general partners and associates. Unlike passive investors, venture capitalists must be able to add value to their investments by assisting portfolio company entrepreneurs in a variety of ways. Since it is unlikely that an individual general partner will possess all the requisite skills, it is imperative that the team of partners have a complementary mix of operating, technical, entrepreneurial, and accounting skills to bring to bear on portfolio companies.

In addition, the success of a partnership depends on effective interaction among the general partners and associates. To ensure continuing cooperation over the life of the partnership, it is also critical that the general partners have managed a previous venture capital fund together or have established a venture co-investment relationship.

Due to the heavy capital requirements of fast-growing, high-technology firms, a number of venture capital limited partnerships typically will participate in financing rounds throughout a portfolio company's development. Generally, the partners who originate the portfolio company investment are able to establish investment terms which are more favorable than those accorded later-round investors. In most cases, the initial general partners assume the lead investor position and bear the major responsibility for assisting company management and for communicating with venture co-investors. Thus, lead investors typically possess the greatest degree of control over the success of portfolio company investments. This, together with the favorable investment terms which may be negotiated by initial general partners, means that the lead position is a desirable one. Therefore, it is important that the general partners with whom the SBI invests possess the ability to originate and lead portfolio investments.

To ensure early access to potentially attractive lead investment opportunities in an increasingly competitive environment, the general partners which the Board selects should have developed an extensive network of investment banking, accounting, law, corporate management and investment professionals from whom funding applications flow. However, because of the time-intensive nature of lead investing, general partners must also have access to attractive co-investment opportunities. Since these opportunities typically are brought to the attention of general partners by fellow venture capitalists, candidates must have established co-investment relationships with other major venture capital partnerships.

Finally, a quantitative analysis of the general partners' past return performance, although an essential part of a partnership evaluation, should be subordinate to the consideration of more qualitative factors. Since general partners are particularly vulnerable to changing economic conditions over the long life of a partnership, the general partners' past performance record may not be indicative of future partnership returns. In addition, since the returns from one extraordinarily profitable investment may mask poor returns from a large number of other investments, an examination of the distribution of partnership returns is more valuable than an analysis of the magnitude of past returns.

#### Final Selection

For the final stage in the selection process, staff should interview all of the general partners and associates of each partnership. This interview should be conducted in the partner's offices. There the discussion can focus with greater detail on the second-step selection criteria. Particular attention will be paid to those that relate to the experience of staff and the proposed partnership investment strategy. Depending upon the need for additional information, the staff should also meet with past and/or

present portfolio company entrepreneurs and institutional investors who have participated in the general partners' previous funds.

## **VI. Post-Investment Monitoring Process**

Limited partners are legally prevented from becoming involved in partnership strategy and policy-making. In addition, transferring a limited partnership interest or withdrawing from a partnership may be extremely difficult, if not impossible. Therefore, the objective of the monitoring process is neither to alter the outcome of the investments nor to time their liquidations.

However, there are several important reasons why the partnership investments should be monitored. First, staff must review the activities of the general partners in order to ensure that both the investment guidelines set forth in the limited partnership agreements and SBI statutory requirements are being met. Further, staff must report to the Board the progress of the investments. Finally, staff should evaluate the investment skills of the general partners in order to determine whether the Board should participate in the partners' succeeding funds.

Staff will begin the monitoring process by examining the semi-annual and annual financial statements provided by the partnerships. In addition, staff will request individual investment summaries for each portfolio company investment. Discussions concerning investment activities and portfolio valuations will be held with general partners on a regular basis and annual partnership meetings will be attended by a staff member. Staff will also continue to consult with Stan Pratt, institutional investors, and general partners to obtain information regarding specific venture capital firms and trends in the venture capital industry.

The information provided by the general partners, venture capital consultants, and institutional investors will be used by staff to establish a venture capital data base. Staff will utilize the data base to make individual limited partnership assessments and comparisons across partnerships.

The general effectiveness of partnership investment strategy and the success of general partners in adding value to individual portfolio companies as measured by portfolio returns on limited partner investment will be of principal concern in the limited partnership evaluations.



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**ENHANCED CASH STRATEGIES  
USING FINANCIAL FUTURES**

**Staff Position Paper  
December 1986**

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## EXECUTIVE SUMMARY

Trading in the financial futures markets has expanded dramatically in recent years. This popularity is due largely to the fact that financial futures offer investors the ability to rapidly and cost-effectively implement a number of investment strategies.

The SBI's use of financial futures has been quite limited. This position paper proposes low risk investment strategies utilizing stock index futures contracts. The proposed program will provide the Board with a conservative introduction to financial futures.

A stock index futures contract is an obligation to deliver cash based upon the movement in the value of a particular stock market index. The buyer of a stock index futures contract participates in stock price moves in the same way as would a direct owner of the stocks in the market index.

Institutional investors use stock index futures in several different ways, including index fund management, market timing, portfolio insurance, and mispricing strategies. It is this last use of stock index futures that is the focus of this paper.

Staff proposes three low risk stock index futures investment strategies referred to as "enhanced cash" strategies. These strategies are designed to improve the rate of return earned on cash equivalents. Each strategy entails low risk because each strategy holds a hedged position. That is, stock index futures contracts are simultaneously bought and sold, thereby eliminating market risk. The underlying mispricings between the contracts represent the source of returns to the enhanced cash strategies. Details of the three strategies are presented in the body of the paper.

Staff proposes that the enhanced cash strategies be applied to the Post Retirement Investment Fund. The Fund relies on a high current level of income to finance benefit increases. With the sharp decline in interest rates that have occurred over the last few

years, the ability of the Fund to pay out benefit increases has diminished. If the return on the Fund's cash reserves can be boosted in a low risk manner, the Fund's beneficiaries will benefit directly.

Staff proposes a \$100 million commitment to the enhanced cash program. The program should be run by an external manager specializing in the management of financial futures. Staff recommends that the manager be compensated through a performance fee based upon the demonstrated ability of the manager to add value to the return on the Fund's short-term fixed income investments.

## I. INTRODUCTION

The financial futures market offers investors the ability to implement a variety of investment strategies quickly and at a low cost. As a result, the volume of trading in financial futures has grown rapidly in recent years. Institutional investor participation likewise has increased significantly as the market's liquidity and depth have grown.

The SBI's use of financial futures has been quite limited up to this point. The Board's only financial futures investments have been through one of its active equity managers, who has used stock index futures as a tool to carry out market timing decisions. The primary reason for this low level of activity has been a general lack of familiarity with these investment instruments on the part of the SBI staff and the Boards' managers.

Staff believes it is important that the Board become comfortable with the use of financial futures in a broad range of investment programs. The purpose of this paper is to propose to the Board an investment strategy that utilizes financial futures in a very low risk fashion. Staff believes that in the initial phases of financial futures investments the Board should take a cautious approach. As the Board's familiarity with financial futures increases, it may choose to pursue higher return, higher risk investment strategies.

Part II of this paper provides a brief overview of stock index financial futures. Stock index futures are a type of financial futures and are central to the investment strategy proposed in this paper. Part III describes the concepts behind the proposed financial futures investment strategies. Part IV discusses the risks associated with each of these strategies. Part V explains why these strategies are well-suited for the Post Retirement Investment Fund. Finally, Part VI contains specific staff recommendations regarding implementation of the proposed strategies.

## II. BRIEF DESCRIPTION OF STOCK INDEX FUTURES

A stock index futures contract is an obligation to deliver cash based upon the movement in the value of particular stock market index over a specified period of time. If the stock market index goes up in value, the seller of the futures contract pays the buyer, and vice versa if the stock market index goes down in value. The buyer of a stock index futures contract participates in movements of the value of the stocks in the index, just as a direct owner of those stocks would participate. The seller of a stock index futures contract experiences just the opposite effect of moves in stock values as would the owner of the stocks in the index. As a result, ownership of futures contracts inherently is no more risky than is the ownership of common stocks directly. It is the particular investment strategies applied to stock index futures that can make their purchase or sale either risky or conservative.

Trading of stock index futures has grown rapidly in the four years since the inception of the first contracts. The growth of stock index futures trading has been so strong that frequently the daily total dollar trading in stock index futures surpasses the direct dollar trading in common stocks. This large volume of trading is clear testimony to the widespread acceptance of stock index futures trading as a convenient, low cost means of transacting in common stock portfolios. As the liquidity and depth of the stock index futures market has grown, so too has institutional investor participation increased. Large institutional investors, including pension funds, routinely buy and sell stock index futures to accomplish a number of objectives.

Institutional investors utilize stock index futures in several different ways, including:

- **Index fund management.** In lieu of directly owning the stocks which compose a particular index (e.g., S&P 500), an investor can own the futures contract on that index.



- **Market timing strategies.** An investor can quickly increase or decrease his equity exposure by buying or selling stock index futures. This strategy avoids the expense and delay involved in selling the individual stocks held by the investor.
- **Portfolio insurance.** By appropriately buying and selling futures contracts based on movements in the value of the investor's portfolio, the investor can "insure" that the portfolio's return will not fall below a certain pre-specified level.
- **Mispricing strategies.** Misvaluations among various stock index futures contracts frequently arise. At a very low risk, nimble investor can take advantage of these misvaluations by simultaneously buying the undervalued futures contracts and selling the overvalued futures contracts. It is this last stock index futures investment strategy which is the focus of this report.

There are five stock market indices upon which futures contracts are traded.

These indexes are:

- S&P 500
- NYSE Composite
- Value Line Composite
- S&P 100
- Major Market Index

These indexes are similar in the sense that the movements in their values are all highly correlated to long-run movements in the overall stock market. However, the differences in the composition of the indexes are significant enough to cause sizable differences in performance over the short-run. For example, the S&P 100 represents large capitalization, highly liquid issues. The Value Line Index, on the other hand, is dominated by smaller capitalization, less popular issues. The appropriate contract for an investor to use will depend upon the investor's specific investment strategy. Nevertheless, the S&P 500 contract is by far the most heavily traded futures contract.

Without going into detail, several aspects of stock index futures contracts are worthy of mention. The first point is the fact that stock index futures contracts settle only

in cash. No stocks ever change hands. Depending upon which way the stock index moves, the buyer compensates the seller (or vice versa) in cash based on a standard formula. The precise formula for computing how much the seller owes the buyer (or vice versa) depends upon the specific contract being traded. Most stock index futures contract terms specify that cash delivery will equal \$500 times the difference between the futures contract's price at the time of purchase and the final contract settlement price. The final settlement price is equal to the stock market index's value at the close of trading on the expiration date of the futures contract, assuming that the futures contract is held to expiration. Otherwise, the final settlement price is the price of the futures contract when sold.

The second aspect of stock index futures is that they are issued with specific expiration dates. The expiring months are March, June, September, and December. The actual expiration days vary slightly among the four types of contracts. At any time there are six contracts outstanding for each index. The contract expiration dates are staggered every three months and extend up to eighteen months. As each contract expires, trading begins in a new contract.

The third aspect of stock index futures (and common to other types of financial futures) is that buyers and sellers are required to make a small good faith deposit at the time of the initial transaction. This deposit is adjusted daily based upon the movement of the stock market index. The initial deposit can be made in the form of Treasury bills. The interest on the Treasury bills is retained by the depositor. Thus, the initial deposit results in no lost income to the depositor. The daily adjustments to the initial deposit, on the other hand, are made in cash. These adjustments represent the gains or losses incurred daily on the futures positions outstanding as the market value of the futures contract changes.

The fourth aspect of stock index futures (again common to other types of financial futures) is that all trading is done with a third party. Buyers and sellers of futures

contracts do not trade directly. Rather, each financial futures exchange has a clearing corporation that acts as a guarantor of all trades. The clearing corporation serves as a buyer to every seller and a seller to every buyer. Investors need not be concerned with the identity or creditworthiness of the opposing party in a trade because the clearing corporation stands behind all trades.

### III. ENHANCED CASH STRATEGIES

Staff proposes that the Board implement three low risk stock index futures investment strategies. These strategies are designed to improve the rate of return earned on cash equivalents. Staff believes that it is possible to exceed money market interest rates by 200 to 300 basis points (i.e., two to three percentage points) annually while assuming little additional risk. The use of stock index futures to achieve this improved return on cash equivalents will be referred to as enhanced cash strategies.

In general, an enhanced cash strategy involves the purchase and simultaneous sale of two different stock index futures contracts. These purchase/sale combinations are designed to capture a perceived mispricing between the two different futures contracts. At the same time, these positions are designed to insulate (or hedge) the investment from changes in the stock prices that underlie the futures contracts. By both buying and selling two different index futures contracts, an investor has no net exposure to broad movements in stock prices. He both wins and loses if stock prices go up or down. On the other hand, the mispricings that exist between the two contracts is expected to provide the investor with a small, but positive, incremental return that adds to the return on the investor's cash equivalents holdings.

The three cash enhancement strategies proposed by staff are called the calendar spread, the inter-market spread, and the hedged put.

The calendar spread strategy involves the sale (or purchase) of a futures contract with the closest (near) expiration date and simultaneous purchase (or sale) of a futures contract on the same stock market index, but with a later (far) expiration date. The theoretical difference between the prices of the far and near contracts can be precisely calculated. Specifically, if "fairly" valued, the price difference should equal the difference

between the risk-free interest (e.g., Treasury bill interest rate) and the dividend yield of the stock market index, calculated for the period of time between the two expiration dates.

Occasionally, this price differential (referred to as the spread) moves away from its "fair" value. If the spread is too low, this implies that the far contract is undervalued relative to near contract. In this case, the calendar spread strategy calls for buying the far contract and selling the near contract. Just the opposite transactions would occur if the spread were too high.

These deviations from "fair" value, or mispricings, occur because of supply and demand imbalances in the market for futures contracts. An investor that is forced to transact immediately may be willing to buy at a premium or sell at a discount relative to the futures contract's "fair" value. Market participants will not allow this situation to persist. In time the actions of traders seeking to capitalize on these mispricings will move prices back to normal. A return to equilibrium allows the hedged position of the calendar spread strategy to be closed-out at a profit.

The inter-market spread strategy is established by the purchase of a stock index futures contract on one stock index and the simultaneous sale of a stock index futures contract on a different stock index. The expiration date of both futures contracts is the same. As with the calendar spread strategy, an inter-market spread strategy attempts to capitalize on the mispricings of stock index futures contracts relative to one another. The theoretical "fair" value of the inter-market spread is calculated by taking the difference between the current prices of the underlying stock indexes, less the difference in the dividend yields for those indexes over the life of the futures contracts.

As discussed above, on occasion the actions of investors, particularly those requiring instant liquidity, can create a temporary supply/demand imbalance in the futures market. This imbalance can cause the price of one stock index futures contract temporarily to depart from its "fair" relationship with the price of another stock index futures contract. Futures contract traders will move to eliminate this mispricing. The inter-market spread

strategy calls for buying the stock index futures contract which is selling "cheap" and selling the stock index futures contract which is selling "rich." A return to a "fair" spread between the prices of the two futures contracts will allow the hedged position of the inter-market spread strategy to be closed out at a profit.

The hedged put strategy is more complicated than the other two strategies. Nevertheless, it involves a purchase/sale combination that produces a low risk investment designed to benefit from futures contract mispricings. The hedged put strategy requires the purchase of a put option on the S&P 500 index and the simultaneous sale of a "synthetic" put on the same stock market index. A put is the right, but not the obligation, to sell a financial asset at a predetermined price. The "synthetic" put is created from appropriate combinations of S&P 500 stock index futures and holdings of cash equivalent.

The rationale underlying the hedged put strategy is that investors constructing portfolio insurance positions cause futures prices to trade out of line with their "fair" value. Portfolio insurance is an investment strategy designed to protect a portfolio from falling below a certain minimum value, while at the same time only moderately restricting the portfolio's upside potential. Portfolio insurance has become extremely popular among institutional investors in the last two years. Most portfolio insurance is implemented through appropriately adjusted positions in stock index futures contracts and cash equivalents.

A portfolio insurance program requires that stock index futures positions be adjusted based upon movements in the stock market. These stock index futures transactions must be carried out quickly if a portfolio insurance program is to be effective. This demand for immediate liquidity may cause significant temporary mispricings of stock index futures. It is these mispricings that present the opportunity for the hedged put strategy to be successful.

The hedged put strategy "sells" portfolio insurance to anxious buyers. Because portfolio insurance works by creating "synthetic" put options through positions in stock

index futures contracts, the hedged put strategy calls for selling these "synthetic" puts, or taking the opposite positions in the portfolio insurers futures contracts. As stock market moves cause portfolio insurers to adjust their stock index futures positions, the hedged put strategy accommodates these shifts by making opposite adjustments of its own.

The sale of "synthetic" puts to portfolio insurers is hedged by the simultaneous purchase of actual put options on stock market indexes. This step removes market risk, but permits the strategy to benefit from the stock index futures mispricing that portfolio insurers may cause.

#### IV. ENHANCED CASH STRATEGY RISKS

The enhanced cash strategies discussed in the previous section are designed to be utilized in conjunction with a portfolio of cash equivalents. The combined set of investments are expected to produce a return which exceeds that of a traditional short-term investment fund (STIF) by roughly 200 to 300 basis points per year. This incremental return, however, cannot be guaranteed. The possibility exists that the enhanced cash strategies will not add value to the STIF investments. Further, it is possible, although unlikely, that the enhanced cash strategies may perform poorly enough to detract from the STIF returns. This section examines the risk that the enhanced cash strategies may fail to produce the expected positive returns. This risk is examined from two perspectives: the risk associated with the three individual enhanced cash strategies; and, the risk of the enhanced cash strategies in aggregate.

In general, the risk of any of the enhanced cash strategies underperforming the STIF return over a given year are minimal. Each strategy entails simultaneously buying and selling stock market exposure. These strategies, therefore, are hedged in the sense that market risk is neutralized. Whether the broad stock market moves up or down will not have a material influence on the returns produced by these strategies. With the strategies insulated from market risk, what remains is the risk that the perceived mispricings from which the strategies are attempting to profit may never be corrected or that the mispricing opportunities are lost due to unforeseen forces impacting the specific futures contract prices involved in the strategies.

With respect to the calendar spread strategy, there are two primary sources of risk. The first source is related to changes in short-term interest rates. The "fair" value of the spread between the prices of the near and far contracts is a function of short-term interest



rates. If those rates change, it will affect the "fair" value of the spread and perhaps upset the mispricing strategy, if the change is significant enough and in the "wrong" direction.

The second source of risk in the calendar spread strategy is the possibility of abrupt changes in stock prices or price expectations that might move the value of the spread in a direction opposite that anticipated by the strategy. For example, what if abrupt changes in stock prices occur close to or on the expiration day of the near contract? Because the near contract's price always equals the value of the stock market index on expiration date, its price will reflect the move in stock prices. But if investors expect a large abrupt stock price change to quickly reverse itself, the far contract's price may remain unchanged, despite the move in stock prices. This situation could adversely affect the "fair" value of the spread between the near and far contracts.

With respect to the inter-market spread strategy, the primary source of risk is that the two stock market indexes underlying the futures contracts bought and sold may fail to track each other well. If the stock market index whose futures contract is bought performs considerably worse than the stock market index whose futures contract is sold, the "fair" value of the spread between the two futures contract prices may collapse, reducing or eliminating profit opportunities from positions taken earlier.

With respect to the hedged put strategy, the primary risk is related to the level of market volatility. The more volatile is the stock market, the more frequently portfolio insurers are required to adjust their futures contract position. Because it is these adjustments that produce the profit opportunities for the hedged put strategy, the more volatile is the stock market the more profitable is the strategy. If the stock market were to remain relatively flat for an extended period, mispricing opportunities sufficient to recover the costs of buying stock index puts and selling "synthetic" puts might not occur.

While the risks associated with these three enhanced cash strategies are real, their magnitude is not large. The strategies would be taken only if spread mispricings are quite large and the source of the mispricings is well understood. Therefore, the adverse events

discussed above would have to be unusually large to wipe out the profit opportunities available from the mispricings. Further, with the calendar spread and inter-market spread strategies, the time that the hedged positions are in place normally is very short. Thus, the chances of adverse events happening in the short period of time in which these strategies are in place is not great.

More importantly, however, when viewed from a total portfolio perspective, the "package" of enhanced cash strategies is even less risky than the individual strategies themselves. This is due to the diversification effect of utilizing all three strategies in the portfolio. That is, the odds of any one strategy performing poorly are small. The odds of all three strategies jointly performing poorly are much smaller. The factors that affect the risk of each strategy are largely unrelated. The chance of several unrelated, low probability, adverse events occurring is quite small.

Further, the risk of the enhanced cash strategies in the total portfolio is further reduced because the strategies are implemented a number of times over the course of a year. Small positions, relative to the total portfolio, are taken each time one of the strategies is used. Thus, while it is possible that one strategy during one of its applications may perform poorly, the chances of all three strategies consistently performing poorly during their numerous applications over a year is extremely low.

At worst, experience indicates that the use of enhanced cash strategies could result in a cash return which underperforms the STIF return by 150 basis points during a year. This is merely an opportunity cost. The strategies entail almost zero risk of suffering absolute losses from a total portfolio perspective. Given that the expected return of the strategies is 200 to 300 basis points above the STIF return, and could run higher, the risk of these strategies appears very acceptable.

## **V. APPLICABILITY TO THE POST RETIREMENT INVESTMENT FUND**

The enhanced cash strategies discussed in the previous section are well-suited for the conservative, high current income investment policy applied to the Post Retirement Investment Fund.

The Fund has two primary investment objectives:

- Produce earnings on investments sufficient to finance benefits promised retirees.
- Generate additional (excess) earnings which permit benefit increases that compensate, to some degree, for inflation.

The first objective is achieved through the investment of Fund assets in a dedicated bond portfolio. The dedicated bond portfolio is a collection of various maturity, high quality bonds that generates cash flows just sufficient to meet promised retiree benefits.

The second objective is attained through two strategies. The first strategy invests additional Fund assets in the dedicated bond portfolio so as to ensure a minimum 3% annual benefit increase. The second strategy invests most of the Fund's remaining assets in common stocks. Common stocks provide a long-term source of growing earnings to the Fund, which fixed income assets cannot produce.

Approximately 75% of the Post Retirement Investment Fund's assets are currently invested in the dedicated bond portfolio. Another 20% of the Fund's assets are invested in common stocks. The remaining 5% of the Fund's assets are targeted for investment in liquid short-term fixed income securities. These cash equivalents play two roles in the Fund's asset mix. Most importantly, they provide a source of liquidity in the Fund to meet immediate cash outflow needs. The liquidity of cash equivalents also permits the Fund to more quickly react to profitable investment opportunities. Cash equivalents, whose yields

are very interest rate sensitive, also provide a degree of inflation protection should interest rates and inflation rates rise.

The enhanced cash strategies are designed to augment the returns produce by the Post Retirement Investment Fund's short-term fixed income holdings. With the sharp declines in interest rates experienced over the last two years, the Fund's potential to produce excess earnings has declined considerably. If, as expected, the enhanced cash strategies produce higher yields than the traditional short-term investments, the additional earnings will flow straight to eligible retirees in the form of benefit increases. At the same time, the assets committed to the enhanced cash strategies will continue to serve the same roles in the Fund's portfolio as do the traditional cash equivalents. That is, the enhanced cash strategies will be low risk investments that provide the Fund with liquidity and inflation protection.

## VI. STAFF RECOMMENDATION

Staff recommends that the Board approve the investment of \$100 million of the Post Retirement Investment Fund in an enhanced cash program. The program would be designed to increase the rate of return earned on the Fund's cash equivalent holdings.

Staff believes that the proposed enhanced cash strategies are most effectively implemented by an external money manager. Staff does not have the expertise in-house to actively invest in financial futures. External management firms, who specialize in the trading of financial futures, can provide the Board with a thorough understanding of the market and can offer sophisticated trading capabilities.

The role of the enhanced cash manager would be two-fold. First, the manager could invest some, or all, of the assigned assets in short-term securities. Second, and more importantly, the manager would search for opportunities in the stock index futures market to implement the enhanced cash strategies. A small portion of the program's assets would serve as the initial good faith deposit when futures are either bought or sold. These assets would also finance any required changes in that initial deposit.

It should not be expected that the manager would be continually engaged in stock index futures investments. Mispricing opportunities are not always present. Further, they usually last only a very short time. Once the mispricings have been corrected by the market, the manager would withdraw from the financial futures market. Over the course of a year, it is likely that anywhere from twenty to thirty opportunities to implement the enhanced cash strategies will arise. These opportunities are expected, on average, to last one to three weeks. Nevertheless, the profits available from these limited, brief mispricing opportunities are expected to supply the 200 to 300 basis point incremental return over the return offered by a traditional short-term investment fund (STIF).

Certain investment restrictions should be placed on the enhanced cash manager. The first constraint should be that the manager's short-term fixed income investments can be made in only those short-term securities authorized by Minnesota Statutes. This constraint will put the manager on an equal footing with a typical STIF and allow the manager to demonstrate his ability to add value to the STIF's investments. The second constraint should specify the particular financial futures instruments in which the manager will be allowed to invest. Specifically, the manager should be permitted to invest in all exchange-listed stock index futures, stock index options, and options on stock index futures. The third constraint should limit the position size that can be taken by the manager in any one of the three strategies. As discussed earlier, a reasonable downside risk target for the enhanced cash strategies would be to underperform the STIF's return by no more than 150 basis points. By definition, no one strategy or combination of strategies at any point in time can exceed, in terms of dollar hedged exposure, the \$100 million assigned to the enhanced cash strategy program. Furthermore, because the hedged put strategy is relatively more risky than the other two strategies, it will be limited to no more than 40% of the total program without prior approval.

The assets assigned to the enhanced cash program should be transferred to a custodian bank designated by the manager, with prior review by SBI staff. The custodian bank is responsible for a number of administrative activities associated with futures trading. The activities must be carried out efficiently if the enhanced cash program is to be effective.

Staff recommends that a performance-based fee arrangement be used to compensate the enhanced cash manager. The structure of the enhanced cash program is well-suited to a performance fee. An unambiguous and measurable benchmark is available through the STIF maintained by State Street Bank, the Board's custodian bank. The manager's performance also is easily measured. All of the manager's investments are liquid and daily

marked to market. Thus, the ability of the manager to add value to the benchmark will be readily apparent.

Staff recommends that the performance fee structure used for the enhanced cash program be a symmetrical fulcrum fee. This fee structure would be similar to that applied to the Board's equity managers. Specifically, typical current fees charged by managers offering enhanced cash strategies are .25% of assets under management. Staff recommends that this .25% fee be used as the base fee in the performance fee structure. If the manager should produce the expected 200 basis point incremental return (net of all investment expenses except the management fee) above the STIF return, then the manager would receive the .25% base fee. For performance above or below this 200 basis point expected incremental return, the excess returns would be split 1:14 with the manager. If the manager outperformed the STIF return by 550 basis points, he would receive a total fee of .50%. If the manager should under perform the STIF by 150 basis points, he would receive no fee at all. Total fees would be capped at a minimum of zero and a maximum of .50%.

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**THE USE OF PENSION FUND ASSETS FOR STRATEGIC  
INVESTING**

**Staff Position Paper**

**December, 1983**

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## EXECUTIVE SUMMARY

Strategic investing can be broadly defined as the use of pension assets to achieve certain goals in addition to that of providing for the financing of employee retirement benefits. The extent and the manner in which the State Board of Investment (SBI) should participate in strategic investing has been an issue of considerable debate.

Strategic investments can be classified as either economic or non-economic. Economic strategic investments cause plan participants to be just as well off as if their pension fund had acquired non-strategic investments. On the other hand, non-economic strategic investments involve a redistribution of wealth from plan participants to other individuals and groups. As a result, plan participants are made worse off by their pension fund participating in such investments.

Economic strategic investments can be further categorized into financially comparable and collateral return investments. *Financially comparable investments possess financial characteristics (i.e., risk and return) equivalent to those of available non-strategic investments.* Collateral return investments have poorer financial characteristics than do available non-strategic investments. However, collateral return investments produce other, perhaps intangible, benefits significant enough to compensate plan participants for their direct financial loss.

Minnesota statutes, which include the prudent person rule, and trust law, in general, clearly prohibit the SBI from participating in non-economic strategic investments. These investments fail to "...maximize the total rate of return without incurring undue risk." Further, it appears that the SBI would not be fulfilling properly its fiduciary obligations if it acquires collateral return strategic investments. As a result, it is recommended that financially comparable strategic investments should be the only strategic investments considered by the SBI. This form of strategic investing offers the most prudent and legally compatible means of instituting social policy through the use of pension assets.

Several recent SBI investments may be classified as "financially comparable strategic investments." These investments include the Certificate of Deposit Program, the Minnesota Single Family Mortgage Loan Program, and the Minnesota Plan (dealing with small businesses). These strategic investments each have several important common features that make them attractive from a fiduciary standpoint. They all provide a market rate of return at least equal to that offered by available non-strategic investments of similar risk. Moreover, each investment allows the retirement funds to assume low levels of risk. In addition, these investments are consistent with the SBI's asset allocation guidelines. Finally, each investment was developed through a lengthy, deliberative process involving a broad group of concerned parties.

A portion of the SBI's pension assets could serve as a pool of available capital for financing certain strategic projects. The investment vehicles that the SBI acquires should be designed to protect the retirement funds from the often unquantifiable investment risk of strategic investments. This objective can be achieved through the use of state and federal guarantees, private insurance, and by the limitation of the Board's participation in any single investment vehicle so as to share risk among several investors.

Since strategic investments are designed generally to implement public policies, the State or some other entity should bear the risks associated with strategic investing rather than the pension funds. If particular strategic investments produce excessive risks or inadequate returns, plan participants should not be asked to subsidize these projects. This proposed investment structure ensures that such a result cannot occur.

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## I. INTRODUCTION

The extent to which the assets of pension funds should be utilized to achieve certain social objectives is an issue which has generated considerable debate. In Minnesota the subject of strategic investing has been addressed by many different individuals and groups including members of the legislature, independent research organizations, and various potentially affected constituencies. Generally, their recommendations have tended to concentrate on the potential use of the large pool of pension assets entrusted to the management of the State Board of Investment (SBI).

The purpose of this position paper is fourfold. First, to clarify and develop certain key concepts relating to strategic investing, particularly as they apply to the SBI and the retirement funds, so as to allow for more focused discussions. Second, to present examples where strategic investing has been successfully undertaken by the SBI on several occasions in the past. Third, following this review, the fundamental aspects of these investments which made them attractive from both a fiduciary and a strategic investing standpoint are identified. Finally, this paper develops a general procedure for designing and implementing strategic investments. Through this suggested approach the SBI can continue to provide for the financial well-being of the retirement funds while at the same time produce additional benefits for the public.

## II. ISSUES AND CONCEPTS

Discussions concerning strategic investing have frequently suffered from a lack of precise terminology. Literally interpreted, all investments by pension funds have some impact, no matter how small, on the allocation of resources across the economy and society. Thus, one could conceivably view all of the investment actions conducted by the SBI as "strategic investing." As an extreme example consider the acquisition of Treasury bonds by the SBI. Although it is by no means the purpose behind the investment, the purchase aids the federal government in financing its rapidly growing deficit. As a result, in a very marginal sense the SBI assists in holding down interest rates and facilitates stronger national economic growth. A lengthy list of similar investments with at least some indirect social impact could be compiled. However, such an exercise would be of little benefit in focusing the discussion on developing a practical means of evaluating and implementing strategic investing.

A more productive approach is to more narrowly define the term "strategic investing." Once accomplished, the identification of specific current and potential SBI investments as "strategic" can be undertaken. From that point the analysis can then be concentrated solely on the limited group of investments which are truly "strategic" in nature.

### Plan Participants

However, before strategic investing can be adequately defined, several basic concepts must be addressed. First is the distinction between plan participants (also referred to as plan beneficiaries) and non-plan individuals or groups. Plan participants are those workers, active or retired, who have made contributions directly to a pension fund through employer and/or employee subscriptions. These workers in return will receive, or already receive, retirement benefits paid from their contributions and the earnings on those contributions. Non-plan individuals are quite simply any persons or groups other than those defined above as plan participants.

### **Risk and Return**

The second basic concept is that of risk and return. As it relates to investments, return is the reward that an investor receives for foregoing present consumption. The return on an investment may come in the form of current income (i.e., interest or dividends) and/or capital gains (i.e., the appreciation in the value of an asset). Some investments, such as bonds, are generally designed to provide returns only in the form of current income. *Growth stocks*, on the other hand, pay little or no dividend income and thus reward their owners through long-term appreciation in per share price.

The risk of an investment is a function of the variability or uncertainty of the return on the investment. U.S. Treasury bills, for instance, have essentially no investment risk as the payment of interest and principal is guaranteed by the federal government. Thus, there is no uncertainty regarding the return on this asset. The return promised the investor by the Treasury is what the investor will receive. On the other hand, an equity investment in a newly formed corporation is generally quite risky. Initially, it is very uncertain whether the firm will prosper. For every success story there is a long list of new ventures that quickly go out of business. Hence, the future value of an investment in a unseasoned corporation is highly uncertain.

Financial theory argues that investments with low risk will yield relatively low returns. Correspondingly, *high risk investments tend to produce relatively high returns over time*. The explanation for this relationship is straightforward. Investors dislike risk. Therefore, they demand and receive compensation for assuming greater risk in the form of higher returns. Historical evidence conclusively supports this view. (1) In light of this fundamental investment fact, investors should accept investments with above average risks only if commensurately above average rates of return are expected to be earned. To properly fulfill its fiduciary responsibilities, a pension fund must apply this principle to both strategic and non-strategic investments alike.

### **Strategic Investing**

With the preceding background discussion in mind, the following broad definition of strategic investing, as it applies to pension funds, is proposed:

**The use of pension assets to achieve certain goals in addition to fulfilling the legal and fiduciary requirements of providing for the financing of employee retirement benefits.**

While this definition provides a point of departure for the purpose of classifying and evaluating strategic investments, a further specification is both possible and desirable. It has been suggested that strategic investments can be categorized into two broad types: Economic and non-economic. (3)

#### **Economic Strategic Investing**

Economic strategic investments involve the use of pension plan funds to purchase assets which not only directly benefit plan participants but non-plan individuals and groups as well. Moreover, these investments leave the plan participants at least as well off as they would be if their pension fund had acquired non-strategic investments. Plan beneficiaries sacrifice nothing in terms of their overall welfare (which is a function of intangible benefits as well as financial benefits) and at the same time the general public is made better off. Economic strategic investments can be further divided into two categories: Financially comparable and collateral return investments.

A financially comparable investment involves no financial subsidy from plan participants to non-plan individuals or groups. The financial characteristics (i.e., returns and risks) of such strategic investments are equivalent to those of other non-strategic investments available to the pension fund. The only significant difference between the two is that the former are explicitly designed to benefit non-plan individuals as well as plan beneficiaries. For example, the SBI's CD program, described in Section IV, provides a

source of capital to Minnesota banks. Many of these banks often have difficulty obtaining funds at interest rates available to larger money center banks. The CD program allows these banks to inject more capital into the State's economy. At the same time the SBI earns a return on its investment equivalent to that which it could receive in the national money markets. Moreover, the investment entails no additional risk as it is fully insured by the FDIC and the FSLIC.

Unlike financially comparable strategic investments, collateral return investments do entail a financial subsidy from plan participants to others outside the pension fund. However, the plan participants are assumed to benefit significantly from the social impact of the strategic investments. In fact, the benefits are assumed to be so great that they outweigh the direct financial consequences of the plan participants' lower return, higher risk assets. As an example, consider a pension fund's possible investment in the pollution control equipment of a municipality. While the financial return on the investment might be very low, conceivably, the psychological satisfaction and health benefits gained by reducing pollution levels for plan beneficiaries who live in the municipality might more than offset the financial loss involved in receiving lower retirement benefits.

#### **Noneconomic Strategic Investments**

Noneconomic strategic investments imply a financial subsidy from plan participants to non-plan individuals and groups for which the plan participants are not fully compensated by some social impact. As a result, plan beneficiaries are worse off because their pension fund undertakes a noneconomic strategic investment. Quite simply, these investments involve an involuntary redistribution of wealth at the expense of plan beneficiaries. For example, the purchase of a general obligation municipal debt security by a pension fund at a below market rate, other factors being equal, would be considered to be a noneconomic strategic investment.

### Strategic Investment Vehicles Vs. Strategic Investments

It may be difficult to categorize a particular strategic investment as economic or noneconomic. Data may simply not exist which will allow a complete analysis of the risk-return characteristics of that investment. Yet at the same time it may be possible to package a given strategic investment into an investment instrument with well-delineated risk-return attributes. This subject is discussed at length in Section VI. At this point it is sufficient to note that the transformation of a strategic investment into a properly constructed strategic investment vehicle greatly enhances its attractiveness to a pension fund.

#### The Issue

As it applies to SBI-managed pension assets, the primary issue underlying the debate concerning the viability of strategic investing can be phrased as follows:

**Can strategic investment vehicles be designed which fully satisfy the legal and financial constraints on prudent investments, yet also serve to encourage economic growth in Minnesota?**

From the definitions presented above, several conclusions can be drawn initially. Noneconomic strategic investments clearly are unacceptable. These investments result in a net loss to plan participants. From a philosophical standpoint it is difficult indeed to request plan participants to incur sacrifices in the name of the public good when the public does not equally share in these sacrifices, since it is ultimately the plan participants' wealth which is placed at risk. Just as important is the fact that noneconomic strategic investments are not compatible with trust law in general and Minnesota statutes in particular. Minnesota statutes specify that plan assets are to be "responsibly invested to maximize the total rate of return without incurring undue risk." [ (2), pp. 181] To knowingly invest in vehicles which earn a sub-market return is in clear violation of this

statute. Generally, all persons and organizations advocating strategic investing by the SBI have explicitly rejected the idea of making investments which this paper characterizes as noneconomic. For example, in a paper prepared for the Minnesota Project, Thomas Triplett and Susan Von Mosch note that, "It is not only illegal, but also unethical, for any pension fund manager to act in a way that does not give precedence to the direct economic interests of fund beneficiaries." [ (5), pp. 10]

Collateral return investments may represent a more acceptable form of strategic investment. By definition, plan participants are at least as well off with such investments (although not necessarily in a financial sense) as with alternative non-strategic investments. As a practical matter, however, collateral return investments may be extremely difficult to evaluate. That is, the social benefit to plan beneficiaries, which may be quite intangible, must be deemed to outweigh the direct financial loss from investing in assets that do not maximize financial returns. Who will make such a determination is unclear. Moreover, the collateral benefits must be quite large in order to outweigh the financial loss since these benefits will have to be shared with society at large. In addition, there is a significant question as to whether collateral return strategic investments are the most efficient means of financing social projects. If these projects are truly advantageous, it would seem more reasonable for the government to finance them directly, since all members of the public benefit, rather than ask only plan participants to sacrifice financial returns for the public's welfare. Finally, collateral return investments also may not be in accordance with trust law and Minnesota statutes. It is highly debatable whether plan trustees have the legal authority to trade off financial retirement benefits for social benefits, even if the "value" of the social investments is at least equal to that of the retirement benefits from the perspective of plan participants.

The case for financially comparable strategic investments is much stronger than that for either collateral return or noneconomic strategic investments. Financially, plan beneficiaries are no worse off when the pension fund participates in financially comparable

investments than if it had acquired other non-strategic investments. Thus, financially comparable investments more clearly satisfy trust law relating to maximizing financial returns and accepting prudent risk. Several difficulties remain, however, in undertaking such investments. First, the number of truly financially comparable investments may be limited. This may result in an undesirable concentration in the few available opportunities. Second, the research required to investigate these types of strategic investments would be significant relative to traditional non-strategic investments. Pension funds may lack the resources to do proper due diligence investigations of these investments. Finally, and most importantly, data on these investments may be difficult or impossible to obtain. This situation may in turn complicate the problem of constructing reliable risk-return forecasts, a crucial component of the complete investment analysis required if the SBI is to be certain that the pension plan participants' financial interests are best served.

Assuming that these problems can be overcome, financially comparable investments should be the only strategic investments considered by the SBI. This form of strategic investing offers the most prudent and legally compatible means of instituting social policy through the use of pension assets. Such investments will allow no room for doubt that the plan participants' interests remain uncompromised while providing a vehicle through which strategic investing can be conducted.



### **III. LEGAL AND FINANCIAL CONTEXT**

#### **Justification of Action**

Strategic investment programs should be supported by a set of sound underlying rationales, together with relevant evidence. Once these arguments are accepted, general policies and specific actions (legislative, administrative and procedural), necessary for the implementation of the programs, can be determined.

Following extensive discussion and debate, the justification for any strategic investing by the SBI requires affirmative answers to the following questions:

1) "Plan participants" derive their livelihood (employment and the benefits that derive from employment) from the willingness and the ability of the citizens of the State to provide a particular public service. Further, the ability to provide a particular service is a function of a strong and healthy economic base. Therefore, can it be stated that the participants should have an interest in contributing to economic growth?

2) Is it true that the State's projected future rate of economic growth may be inadequate to assure the general welfare of all Minnesotans? Is it accurate to conclude that a major inhibiting factor is the lack of readily available capital for new or expanding businesses?

3) Does a significant "gap" exist between the legitimate demand for capital by new or expanding businesses and the present or future supply of capital? Are well-managed firms with a sound product and a likely market not able to gain access to the capital markets?

4) Because public pension funds, including those for which the SBI serves as trustee, are a large and growing pool of capital, do the trustees of such funds have a responsibility to consider the various potential strategic uses of the capital which they control?

5) Will the State's future economic growth be enhanced by the participation of the pension funds in more fully meeting its capital needs without displacing the capital available from other sources?

6) Is it possible to effectively target strategic investments so as to achieve the desired impact on the desired segments of the Minnesota economy? Can these strategic benefits be readily measured?

It is not the purpose of this paper to provide answers to these questions. They are policy issues which are beyond the expertise and assigned areas of responsibility of the SBI staff. Nevertheless, they represent concerns of the greatest importance and, therefore, must be addressed in due course. If these questions can be adequately answered in the affirmative (and evidence presented to support those answers), then it is appropriate to consider whether or not the legal framework will allow consideration of, at least, some limited approach to strategic investing.

#### **Application of Minnesota Statutes**

Minnesota statutes (Chapter 11A, M.S. 1982), that govern the actions of the SBI in its management of the funds entrusted to it, are considered to be among the most flexible of all state investment laws. They provide considerable discretion to the members of the SBI to invest pension assets. They provide wide latitude in asset allocation and in the selection of specific investment instruments.

Chapter 11A states, in part, that the purpose of the SBI shall be to "...establish standards which will ensure that state and pension assets subject to this legislation will be responsibly invested to maximize the total rate of return without incurring undue risk." [ (2), pp. 181] This same chapter provides that the members of the SBI are the "trustees" (an important provision to be discussed later) for the funds managed by the Board. Moreover, it provides that the Board, in its management of the assets, is to be governed by the standard of care commonly known as the "prudent person rule."

There is no provision in Minnesota law that requires, encourages or prohibits strategic investing. The statutes require only that efforts be made to maximize the rate of return; that undue risk be avoided; that members of the Board act as trustees for the funds under their management; and, that the investments of the Board be guided by the prudent person

rule as well as certain limitations on asset allocation and allowable investments. Noneconomic strategic investments are implicitly prohibited. However, the statutes leave further goals and objectives to the SBI's discretion. Minnesota statutes, thus, provide no clear directive, either affirmatively or negatively, to the application of a policy of strategic investing.

### **Application of Trust Law**

In a series of memoranda issued between 1981 and 1982, the Attorney General's office carefully reviews the application of trust law to SBI investments in addressing the question of the legal authority of the SBI to place funds in venture capital investments. Several aspects of the role of the trustee as presented in these memoranda are relevant to the discussion of strategic investment. They include:

1) The law of trusts and the associated commentary by legal scholars offer no firm rule or guide for trustees. The only guidance to be obtained from such sources consists of general legal principles.

2) The role of the trustee is different from that of an ordinary investor. While the prudent investor may take certain risks, the prudent trustee may not. One opinion, in a Massachusetts case, stated the following guiding principle for the trustee: "...A trustee, whose duty it is to keep the trust fund safely invested in productive property, ought not to hazard the safety of the property under any temptation to make extraordinary profits." [ (4), pp. 6] Thus, a trustee has a duty to preserve the assets of the trust which is equal, if not superior, to a concomitant duty to produce income from those assets.

3) While statutory authority may increase the investment freedom of a trustee, the law continues to impose the duty to preserve the trust fund on the trustee as he or she exercises that freedom.

4) In attempting to answer the question of the duty imposed on a trustee in consideration of the investment in a high risk or possibly speculative investment, the Attorney General has cited a case which concluded that "...a trustee is not authorized to

make or retain trust investments that are speculative, even where they are of such promise and character that a prudent person might make them for himself...the investment should be in property which has a valuation, in the general sense of the community, founded on income, and not upon remote eventualities and a succession of contingencies...an investment should be in an enterprise that has been profitable; the inquiry should be whether or not the enterprise has been, and not merely whether it will be, profitable."

[ (4), pp. 3]

5) Trustees are obligated to invest the funds entrusted to them solely in the interests of the benefiting parties (plan participants in the case of pension assets). Any incidental benefits to a third party (i.e., non-plan participants) are permissible only if such investments maximize the funds' returns within a given risk level, the fiduciary acts without any trace of self-interest, and the investments produce an additional benefit to plan participants as members of the larger group.

6) In a later memorandum, the Attorney General discusses the application of the pending federal "Public Employee Pension Plan Reporting and Accountability Act of 1982" (PEPPRA) to "social investing." The committee notes to the legislation contain the following statement: "The exclusive benefit rule which currently applies to state and local plans under the Internal Revenue Code is continued. However, the Committee recognizes that while acting solely in the interest of plan participants and beneficiaries, plan trustees may consider the societal impact of their investment decision when choosing between economically comparable investments." [ (6), pp. 44] If this interpretation is accepted, it would appear to preclude the use of collateral return strategic investments.

Although it may be argued that the Attorney General's opinion is a legally conservative one, in developing a policy of strategic investment such a stance may be well advised.

#### IV. CASE HISTORIES

The SBI has participated in several investments in recent years that may be classified as "strategic." These investments were of the financially comparable form discussed earlier in this paper. That is, they possessed risk-return characteristics similar to those of other available non-strategic investments. The purpose of this section is to describe those investments in some detail and to identify certain key characteristics which can be applied to future strategic investments.

It has often been argued that the purchase of the securities of larger Minnesota firms (e.g., Control Data, General Mills, Minnesota Mining and Manufacturing, etc.) qualifies as a strategic investment. This paper does not treat these investments as "strategic." These large corporations have ready access to the nation's capital markets. The SBI's purchase or sale of their securities does not affect this access or the price that these firms must pay for capital. In contrast, the investments discussed below are "strategic" in the sense that they involve making capital available to sectors of the Minnesota economy whose interactions with the capital markets may be in some way restricted.

##### Certificate of Deposit Program

In 1980, the State Board of Investment introduced a program to purchase certificates of deposit (CD's) from banks and savings and loan institutions in Minnesota. Since that time, approximately \$500 million has been loaned to 365 financial institutions throughout the State. Approximately 79% of these loans have been made to institutions outside of the Twin Cities metropolitan area. The Minnesota Certificate of Deposit Program is explicitly designed to provide a reliable source of capital to all Minnesota financial institutions, regardless of size, many of which do not have access to the national CD market. In implementing the program it is assumed that the banks will reinvest the CD money in local communities, thus stimulating the State's economy. At the same time the retirement funds

are able to earn a rate of return equal to that available in the money markets with no assumption of additional risk.

On a quarterly basis, the SBI commits a specific amount of funds to purchase three and six-month certificates of deposit. The amount of assets committed each quarter is based on the size of the retirement funds' cash positions and the relative attractiveness of other investment alternatives. The Board takes subscriptions from the local financial institutions through eight major clearinghouse banks. A market rate is set by the Board utilizing the average secondary CD market rate quoted by the New York Federal Reserve Bank on the day of subscription.

The risk incurred through this program is minimal. The Federal Deposit Insurance Corporation (FDIC) and Federal Savings and Loan Insurance Corporation (FSLIC) cover each individual retirement fund plan participant. As a result, the entire CD investment is fully insured.

The Board has designed the loan process so that no institution or region is favored in the allocation of assets. There is no limit to the amount any one financial institution may request. The SBI fills each subscription up to \$500,000 in full, provided that the total does not exceed the amount the Board has allocated for investment during that quarter. If the total offering has not been filled by the allotments of \$500,000 or less, all subscriptions over \$500,000 receive allocations on a pro rata basis to fill the offering.

In keeping with the asset allocation strategy for the short-term portfolios of the retirement funds, the certificates of deposit mature in a three-to-six month time period. Since the inception of the program in 1980, the SBI has come to market on a regular quarterly basis, thereby demonstrating its commitment to Minnesota's financial institutions and providing a stable source of capital. The program has been publicized throughout the State with the use of direct mailings, newsletters, financial publications, and SBI staff presentations.

The Certificate of Deposit Program is the result of a cooperative effort by a large number of organizations in Minnesota. In developing the program, the Board worked closely with the Minnesota Legislature, representatives of the Minnesota financial community, and the eight clearinghouse banks, whose participation is crucial to the success of the program.

#### **Minnesota Single Family Mortgage Loan Program**

The 1982 Minnesota Single Family Mortgage Loan Program was the result of a unique and innovative financing mechanism developed by the Minnesota Housing Finance Agency (MHFA) in conjunction with the Minnesota State Board of Investment. The program is designed to provide affordable mortgage loans to low and moderate income first time home buyers, a goal that State policymakers have long supported. Moreover, like the CD program, this program also creates an investment vehicle which gives the SBI a return competitive with alternative non-strategic low-risk investments.

The Minnesota Housing Finance Agency historically has financed mortgage loans through the issuance of thirty-year tax exempt bonds. However, due to the high level of interest rates on thirty-year bonds in 1982, the program was financed through the sale of eleven-year revenue bonds, which bore significantly lower interest rates than the longer issue. The lower interest rate on the bonds, combined with State appropriations, enabled the MHFA to offer affordable mortgage loans.

In order to sell the shorter maturity bonds, the MHFA had to guarantee bondholders that the mortgages would be refinanced or sold at the end of the eleven years and the bonds retired. The SBI enabled the MHFA to give that guarantee by committing to purchase up to \$60 million in mortgage loans not in default at the end of the eleven years. The mortgages will provide a 15.30% return to the retirement funds. This return was thirty basis points higher than the return that was available at the time on Government National Mortgage Association (GNMA) pass-through certificates, an alternative mortgage investment available to the SBI. The Board required a higher yield from the

MHFA program because, unlike the MHFA mortgages, GNMA investments are fully guaranteed by the U.S. Government. The higher yield compensates in part for the absence of the federal government guarantee. In addition to the competitive rate of return, the retirement funds receive an annual commitment fee of 1/4 of 1%. The commitment fee is a standard feature of any investment involving a forward time commitment of funds.

A number of characteristics make this program a safe, secure investment for the retirement funds. The pool of mortgages to be purchased by the SBI will be "seasoned" in the sense that they will be eleven years old at that time. Given that most mortgage defaults take place in the first five years, these seasoned mortgages will represent very high quality investments. In addition, both the individual mortgages and the entire pool are covered by private mortgage insurance. The certificates representing ownership in the mortgage pool have received a AA rating from the Standard and Poor's Corporation.

In addition to the return and risk characteristics describe above, the investment fulfilled the Board's asset allocation objectives for the investment portfolio. In order to pay consistent, substantial benefit increases to retirees, the Post Retirement Fund is oriented toward high yielding, fixed income securities. The high yield and high quality of the mortgage program made it an attractive investment for the Post Retirement Fund.

Similarly, the investment fulfilled the Board's structural objectives for its fixed income portfolio. Due to the forward commitment feature, the average life of the mortgages purchased by the SBI will be only eight years, whereas most mortgages have a twelve year average maturity. Assuming prepayments, the average life of the pool will be approximately six years.

The Board is also reducing the "private placement" component of the portfolio. Though it offers a high yield, a large component of private placements can reduce portfolio liquidity and inhibit active portfolio management. The eleven year forward commitment provision of the MHFA program gives the SBI the advantage of the high yield from a private placement without the negative impact on liquidity. When the



mortgages are actually purchased by the Board in eleven years, the private placement portion of the fixed income portfolio will have been substantially reduced, and any negative impact of the new addition will be significantly decreased.

The Minnesota Single Family Mortgage Loan Program was the result of extensive discussions and negotiations between the Minnesota Housing Finance Agency and State Board of Investment. The proposal was approved in concept by the individual Board members during the initial negotiations when it appeared that the requirements of both agencies could be fulfilled. Subsequently, the SBI and MHFA sought and secured the necessary statutory changes to implement the program. The proposal was discussed and approved by several legislators who are involved in pension fund issues. From the initial proposal to final implementation, the SBI worked over a period of several months with the MHFA in designing an attractive investment opportunity for the retirement funds with a final closing taking place in September, 1982.

#### **The Minnesota Plan**

The State Board of Investment has approved a proposal to invest in a program sponsored by the Minnesota Small Business Finance Agency. This program, called the Minnesota Plan, will provide U.S. government guaranteed, fixed rate, long-term Small Business Administration (SBA) loans to Minnesota small businesses. Currently, SBA loans are available only for a maximum term of seven years, generally at variable rates adjusted quarterly at a level  $2\frac{3}{4}\%$  above prime. The Minnesota Plan, a pilot project approved by the U.S. Small Business Administration, is designed to give small businesses the stable debt service payments necessary to implement their long term investment and operational plans by providing loans for up to twenty years at a fixed rate of interest.

In order to finance this program, the Minnesota Small Business Finance Agency (MSBFA) will sell taxable business loan revenue bonds. The proceeds from the bond sale will be used by MSBFA to purchase the U.S. government guaranteed portion of SBA loans issued by banks to Minnesota small businesses. In effect, the bond issued by the

MSBFA will be backed by the guarantee of the U.S. Small Business Administration, a full faith and credit obligation of the U.S. government. Because of the sound characteristics of this proposal as well as the attractive return available, the SBI has committed to purchase the bonds issued by the MSBFA.

The SBI will earn a rate of return which exceeds the yield from ten-year U.S. Treasury bonds by 1.5 percentage points. The return is based on U.S. Treasury obligations because of the similarity in quality and risk of the two investments. In addition, the SBI will receive a commitment fee of 1/2 of 1% of the aggregate principal amount of the bonds.

The bonds will be rated at least AA by the Standard and Poor's Corporation, which signals the quality of the instrument and offers liquidity in the event of the anticipated development of an active secondary market for these securities. The bonds will have a twenty-year maturity with sinking fund payments in accordance with the actual loans in the underlying pool. As a result, the average life of the bonds will be approximately ten years. At this time the SBI anticipates an investment of between \$10-20 million in the program.

This innovative financing mechanism for small businesses is the result of extensive research done by the MSBFA. The investment features were designed by the Agency in conjunction with the SBI. Negotiations between the staffs of the MSBFA and SBI proceeded over a period of eight months. The members of the SBI approved the concept in the initial stage of discussions and formally approved the terms of the agreement in May, 1983.

## **V. ELEMENTS OF PRUDENT STRATEGIC INVESTING**

The preceding discussion described in detail examples of strategic investment vehicles acquired by the SBI. From these descriptions several key features can be identified that made those investment vehicles sound and prudent from a risk-return perspective. These elements are outlined below.

### **1) Strategic investment vehicles must provide a market rate of return.**

State statutes and trust law clearly direct the SBI to accept only those strategic investments which provide an expected return which is no less than that available in the market for non-strategic investments of comparable risk. In determining the suitable market rate which should be earned on a newly created strategic investment vehicle, it is necessary to identify existing non-strategic investments which possess similar risk. The current expected returns from these investments can then be applied to the strategic investment. For example, the pool of MHFA mortgages to be purchased by the SBI is similar in quality and in design to the pools of mortgages assembled by GNMA servicers. Thus, it was appropriate to peg the rates on mortgages in the MHFA pool to returns provided by GNMA pass-through certificates, adjusting for the slight structural differences between the two investments.

### **2) Any differences in risk between comparable existing non-strategic investments and the newly created strategic investment vehicle under consideration must be reflected in the rate of return earned on that strategic investment.**

Even though comparable non-strategic investments generally can be found, it is likely that they will exhibit some differences in structure that will make their risk slightly

different than that of the strategic investment vehicle under consideration. The return on the strategic investment vehicle must be adjusted for this risk difference. For example, the MSBFA bonds' principal and interest are obligations of that Agency. In turn, these payments are backed by the federal SBA's guarantee of the underlying small business loans. On the other hand, U.S. Treasury bonds' principal and interest are directly guaranteed by the federal government. As a result, the timely payment of cash flows is slightly less secure with the MSBFA bonds than with Treasury bonds. This fact, combined with the more limited marketability of the MSBFA bonds, requires that a higher yield be earned on them relative to Treasury bonds.

3) Strategic investment vehicles should be designed to allow the retirement funds to assume low levels of risk. This objective may be accomplished by the transfer of most or all risk to other entities or through the sharing of risk with other investors. Many proposed strategic investments entail participation in "unseasoned" ventures which have highly unpredictable returns. The inability to measure the risk-return characteristics of these investments makes them unattractive to pension fund trustees who must be concerned with whether the strategic investments offer a truly prudent alternative to available non-strategic investments. As a result, it is desirable to package strategic investments so as to shift risk from the retirement funds to other entities such as state or federal governments. This process can produce strategic investment vehicles which have readily quantifiable risk-return features. Therefore, they can be subjected to the necessary analysis required if the pension fund trustees are to completely fulfill their fiduciary responsibilities. The MSBFA program provides an example of this approach. Because of the federal guarantee, the SBI accepted none of the direct risks involved in lending to small Minnesota businesses. Instead, the SBI merely provided a source of capital to these firms while the federal government took on the investment risk by ultimately guaranteeing payment of principal and interest.

4) The strategic investment vehicles purchased by the SBI should be consistent with its asset allocation guidelines.

Particularly because any strategic investment vehicles which are acquired by the SBI will most likely be long-term in nature, it is essential that these investments be compatible with the Board's established asset allocation guidelines. For example, the high yield/high quality nature of the MHFA mortgage pool purchase was quite consistent with the asset mix needs of the Post Retirement Fund.

5) Each strategic investment vehicle developed by the SBI in conjunction with other organizations should be the result of a comprehensive, prudent process involving a broad group of interested parties.

In each case the development of a viable strategic investment vehicle was the product of extensive deliberations over no less than a six-month period. The discussions have involved the Board, SBI staff, the Investment Advisory Council, the Attorney General's staff, representatives of the retirement funds and retiree groups, the Minnesota Legislature, various state agencies, and members of the Minnesota financial community. It is impractical to believe that sound strategic investment vehicles can be quickly developed without in-depth consultation and planning. Further, it is not realistic to expect that every worthy social project can be translated readily into an investment vehicle that the SBI can prudently accept. It is apparent that the process of packaging strategic investments into vehicles that meet the Board's fiduciary responsibilities is time-consuming and complex.

## **VI. A SUGGESTED APPROACH TO STRATEGIC INVESTING**

The SBI must invest the assets of the retirement funds so as to maximize the welfare of the plan participants. As discussed in Section III, this directive prohibits the acceptance of investments that do not produce the highest level of expected return for a given level of risk. In turn, the Board's fiduciary responsibilities prohibit it from financially subsidizing State-designated projects using pension assets, no matter how worthy the cause. If the SBI is to participate in strategic investing, then the investments that it considers must satisfy this ultimate criteria. Therefore, the SBI's strategic investments should be limited to financially comparable investments. Moreover, the risk-return characteristics of these investments must be readily quantifiable so that the SBI, plan beneficiaries, and others can be certain that the investments truly do produce maximum expected returns for given risk levels.

With these considerations in mind, this paper proposes the following approach to designing strategic investment vehicles. Specifically, a portion of the SBI's pension assets could serve as a pool of available capital for the financing of certain strategic projects. Due to the often uncertain nature of the returns on strategic investments, the SBI's strategic investment vehicles must be designed to protect the retirement funds from undue investment risk. It may be the case that strategic investments created to accomplish social objectives do not produce returns sufficient to compensate for their relatively high risks. Further, there may be little or no reliable data on the risk-return characteristics of these investments. This fact generally is the reason why the private sector is reluctant or unwilling to participate in them.

It is proposed that interested parties develop financially comparable strategic investment vehicles for review by the SBI. In addition, the Board should complement this effort by continuing to generate and refine similar programs of its own. The risks and returns on these strategic investment vehicles should be largely unrelated to those of the

underlying strategic investments. This objective can be achieved by some form of State or federal guarantee or private insurance. Alternatively, the SBI's participation in any particular strategic investment might be limited to a specified fraction of the total investment. The remaining financial participation could be assumed by a number of private investors such as corporate pension funds. This type of risk sharing would limit the exposure of the retirement funds, as well as increase the likelihood that the strategic investment actually is prudent from a risk-return perspective. Finally, there must be some compensation (e.g., higher yields, commitment fees, etc.) for the fact that these investments are not likely to be as easily salable as are the SBI's traditional stock and bond investments.

The rationale behind this approach is straightforward. The reason that the State does not directly finance strategic investments that it may view as desirable primarily is due to *its inability to obtain the necessary funds in sufficient quantity*. The SBI pension assets represent a large and growing pool of funds which potentially could meet a portion of this need. However, since strategic investments are designed generally to implement public policies benefiting the entire State, the State or some other entity should bear the investment risks rather than the pension funds. If the risks are too high, or the returns too low, then the plan participants should not be asked to subsidize these projects. This proposed investment structure avoids the subsidization of State-designated projects, yet seeks to provide strategic capital where appropriate.

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## Proxy Voting Guidelines

The Minnesota State Board of Investment (SBI) has formulated proxy voting guidelines by which it casts votes on a wide range of corporate governance and social responsibility issues.

As a stockholder, the Board is entitled to participate in corporate annual meetings by casting its votes by proxy or through direct attendance at the meetings. The following guidelines constitute an effort by the SBI to manage and control its proxy voting process. A glossary of terms is included to aid reader understanding.

### Overview of the SBI

By the Minnesota Constitution, the Board is composed of the Governor, the State Auditor, the State Treasurer, the Secretary of State, and the Attorney General. The Board employs a professional staff to carry out its policies. The Board and staff are assisted by a seventeen member Investment Advisory Council.

The SBI invests the pension assets of the three statewide public employee retirement systems with approximately 312,000 members:

- Public Employees Retirement Association (PERA)
- Teachers Retirement Association (TRA)
- Minnesota State Retirement System (MSRS)

The SBI also invests the cash balances of state government funds and assets of several trust funds.

### Statutory Purpose

According to statute, state assets and pension assets are to be responsibly invested by the SBI to maximize the total rate of return without incurring undue risk.<sup>1</sup> Currently, non pension accounts do not hold equities. The focus, therefore, of the SBI's proxy voting activities is the extensive equity holdings within the pension asset portfolios.

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<sup>1</sup> *Minnesota Statutes* 1989 Supplement, Section 11A.01.

# Minnesota State Board of Investment

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## **Fiduciary Responsibility**

As fiduciaries of pension assets, members of the Board and the executive director owe a fiduciary duty to the members of the plans, to the taxpayers of the state and political subdivisions who help to finance the plans, and to the State of Minnesota.<sup>2</sup>

In addition to the general standard of fiduciary conduct, members of the Board, the executive director, the members of the Investment Advisory Council, staff, and members of Board committees must carry out their duties in accordance with the prudent person standard as articulated in statute.<sup>3</sup>

## **Voting Process**

The Board recognizes its fiduciary responsibility to cast votes on proxy issues. The SBI does not delegate the duty to its external investment managers. Rather, the SBI actively votes all shares according to guidelines established by its Proxy Committee.

The Board delegates proxy voting responsibilities to its Proxy Committee. Each Board member appoints one member to the Proxy Committee. The five member Committee meets only if it has a quorum and casts votes on proxy issues based on a majority vote of those present. In the unusual event that it reaches a tie vote or a quorum is not present, the Committee will cast a vote to abstain.

The Committee has formulated guidelines by which it casts votes on a wide range of corporate governance and social responsibility issues. Each year the Proxy Committee reviews existing guidelines and determines which issues it will review on a case-by-case basis. The Proxy Committee also reviews certain corporate governance issues pertaining to companies headquartered in Minnesota.

## **Corporate Governance Issues**

### **Routine Matters**

In general, the SBI supports management on routine matters of corporate governance. These issues include:

- uncontested election of directors.
- selection of auditors.
- management proposals on compensation issues including savings plans and stock options.
- limits on director and officer liability or increases in director and officer indemnification permitted under the laws of the state of incorporation.

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<sup>2</sup> *Minnesota Statutes* 1989 Supplement, Section 356A.04, subdivision 1.

<sup>3</sup> *Minnesota Statutes* 1989 Supplement, Section 11A.09, and Section 356A.04, subdivision 2.

# Minnesota State Board of Investment

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## Shareholder Rights

In general, the SBI opposes proposals that would restrict shareholder ability to effect change. Such proposals include:

- instituting supermajority requirements to ratify certain actions or events.
- creating classified boards.
- barring shareholders from participating in the determination of the rules governing the board's actions, such as quorum requirements and the duties of directors.
- prohibiting or limiting shareholder action by written consent.
- granting certain stockholders superior voting rights over other stockholders.

In general, the SBI supports proposals that preserve shareholder rights to effect change. Such proposals include:

- requiring shareholder approval of poison pill plans.
- repealing classified boards.
- adopting secret ballot of proxy votes.
- reinstating cumulative voting.
- adopting anti-greenmail provisions.

## Buyouts

In general, the SBI supports friendly takeovers and management buyouts.

## Special Cases

The SBI evaluates the following proposals on a case-by-case basis:

- hostile takeovers.
- contested election of directors.
- compensation agreements that are contingent upon corporate change in control.
- recapitalization plans.

Notwithstanding the above, in general, the SBI casts its votes to preserve existing management's discretion concerning corporate governance issues if the company is incorporated or is headquartered in Minnesota.

## Social Responsibility Issues

### South Africa and Namibia

The SBI supports a variety of proposals regarding South Africa including those that:

- encourage the signing of the Statement of Principles (formerly Sullivan Principles; see Attachment A).
- encourage withdrawal from South Africa.
- sever all company ties with South Africa.
- promote the welfare of black employees and improve the quality of black life outside the work environment.
- limit strategic sales to South Africa.
- apply economic pressures on the South African government.
- request a report on operations in South Africa.

### Northern Ireland

The SBI supports resolutions that call for the adoption of the MacBride Principles as a means to encourage equal employment opportunities in Northern Ireland (see Attachment B).

The SBI supports resolutions that request companies to submit reports to shareholders concerning their labor practices or their sub-contractors' labor practices in Northern Ireland.

In addition to casting proxy votes, the SBI sponsors and cosponsors Northern Ireland resolutions as required by *Minnesota Statutes*, Section 11A.241.

### Environmental Protection/Awareness

In general, the SBI supports resolutions that require a corporation to report or disclose to shareholders company efforts in the environmental arena.

In general, the SBI supports resolutions that request a corporation to report on progress toward achieving the objectives of the Valdez Principles (see Attachment C).

### Other Issues

In general, the SBI supports proposals that require a company to report or disclose to shareholders company efforts concerning a variety of social responsibility issues. In the past, these reporting resolutions have included issues such as affirmative action programs, animal testing procedures, nuclear plant safety procedures and criteria used to evaluate military contract proposals.

In general, the SBI opposes proposals that require a company to institute a specific business action in response to such issues. As an example, the SBI voted against a shareholder proposal which would have required a utility to phase out operations of a nuclear power plant.

**Attachment A**

**Statement of Principles for South Africa  
(Formerly The Sullivan Principles)**

**As of October 1989**

- Principle 1**            Nonsegregation of the Races in All Eating, Comfort, Locker Room, and Work Facilities.
- Principle 2**            Equal and Fair Employment Practices for All Employees.
- Principle 3**            Equal Pay for All Employees Doing Equal or Comparable Work for the Same Period of Time.
- Principle 4**            Initiation and Development of Training Programs That Will Prepare Blacks, Coloureds and Asians in Substantial Numbers for Supervisory, Administrative, Clerical, and Technical Jobs.
- Principle 5**            Increasing the Number of Blacks, Coloureds, and Asians in Management and Supervisory Positions.
- Principle 6**            Improving the Quality of Employees' Lives Outside the Work Environment in Such Areas as Housing, Transportation, Schooling, Recreation, and Health Facilities.
- Principle 7\***            Working to Eliminate Laws and Customs That Impede Social, Economic, and Political Justice.

\*Formerly called "Fourth Amplification."

Source: *Thirteenth Report on the Signatory Companies to the Statement of Principles for South Africa*, Arthur D. Little, Inc., Cambridge, MA, October 31, 1989.

**Attachment B**

**The MacBride Principles**

**As of January 1989**

The MacBride Principles were announced in simultaneous news conferences in the United States and Northern Ireland at the beginning of November 1984. In early 1986, MacBride issued a set of amplifications of the principles. The amplifications responded to objections from the British government, a number of U.S. companies and others that employers would violate the Fair Employment Act if they implemented the principles in Northern Ireland. The following is the amplified version of the principles:

1. **Increasing the representation of individuals from underrepresented religious groups in the work force including managerial, supervisory, administrative, clerical and technical jobs.**

A work force that is severely unbalanced may indicate prima facie that full equality of opportunity is not being afforded all segments of the community in Northern Ireland. Each signatory to the MacBride Principles must make every reasonable lawful effort to increase the representation of underrepresented religious groups at all levels of its operations in Northern Ireland.

2. **Adequate security for the protection of minority employees both at the workplace and while traveling to and from work.**

While total security can be guaranteed nowhere today in Northern Ireland, each signatory to the MacBride Principles must make reasonable good faith efforts to protect workers against intimidation and physical abuse at the workplace. Signatories must also make reasonable good faith efforts to ensure that applicants are not deferred from seeking employment because of fear for personal safety at the workplace or while traveling to and from work.

3. **The banning of provocative religious or political emblems from the workplace.**

Each signatory to the MacBride Principles must make reasonable good faith efforts to prevent the display of provocative sectarian emblems at their plants in Northern Ireland.

4. **All job openings should be publicly advertised and special recruitment efforts should be made to attract applicants from underrepresented religious groups.**

Signatories to the MacBride Principles must exert special efforts to attract employment applications from the sectarian community that is substantially underrepresented in the work force. This should not be construed to imply a diminution of opportunity for other applications.



## Minnesota State Board of Investment

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5. **Layoff, recall and termination procedures should not in practice favor particular religious groupings.**

Each signatory to the MacBride Principles must make reasonable good faith efforts to ensure that layoff, recall and termination procedures do not penalize a particular religious group disproportionately. Layoff and termination practices that involve seniority solely can result in discrimination against a particular religious group if the bulk of employees with greatest seniority are disproportionately from another religious group.

6. **The abolition of job reservations, apprenticeship restrictions, and differential employment criteria, which discriminate on the basis of religion or ethnic origin.**

Signatories to the MacBride Principles must make reasonable good faith efforts to abolish all differential employment criteria whose effect is discrimination on the basis of religion. For example, job reservations and apprenticeship regulations that favor relatives of current or former employees can, in practice, promote religious discrimination if the company's work force has historically been disproportionately drawn from another religious group.

7. **The development of training programs that will prepare substantial numbers of current minority employees for skilled jobs, including the expansion of existing programs and the creation of new programs to train, upgrade and improve the skills of minority employees.**

This does not imply that such programs should not be open to all members of the work force equally.

8. **The establishment of procedures to assess, identify and actively recruit minority employees with potential for further advancement.**

This section does not imply that such procedures should not apply to all employees equally.

9. **The appointment of a senior management staff member to oversee the company's affirmative action efforts and the setting up of timetables to carry out affirmative action principles.**

In addition to the above, each signatory to the MacBride Principles is required to report annually to an independent monitoring agency on its progress in the implementation of these principles.

Source: *The MacBride Principles and U.S. Companies in Northern Ireland*, Investor Responsibility Research Center, Washington D.C., 1989.

**Attachment C**

**Text of the Valdez Principles**

**As of June 1990**

**Introduction**

By adopting these principles, we publicly affirm our belief that corporations and their shareholders have a direct responsibility for the environment. We believe that corporations must conduct their business as responsible stewards of the environment and seek profits only in a manner that leaves the Earth healthy and safe. We believe that corporations must not compromise the ability of future generations to sustain their needs.

We recognize this to be a long term commitment to update our practices continually in light of advances in technology and new understandings in health and environmental science. We intend to make consistent, measurable progress in implementing these principles and to apply them wherever we operate throughout the world.

**1. Protection of the Biosphere**

We will minimize and strive to eliminate the release of any pollutant that may cause environmental damage to the air, water, or earth or its inhabitants. We will safeguard habitats in rivers, lakes, wetlands, coastal zones and oceans and will minimize contributing to the greenhouse effect, depletion of the ozone layer, acid rain, or smog.

**2. Sustainable Use of Natural Resources**

We will make sustainable use of renewable natural resources, such as water, soils and forests. We will conserve nonrenewable natural resources through efficient use and careful planning. We will protect wildlife habitat, open spaces and wilderness, while preserving biodiversity.

**3. Reduction and Disposal of Waste**

We will minimize the creation of waste, especially hazardous waste, and wherever possible recycle materials. We will dispose of all wastes through safe and responsible methods.

**4. Wise Use of Energy**

We will make every effort to use environmentally safe and sustainable energy sources to meet our needs. We will invest in improved energy efficiency and conservation in our operations. We will maximize the energy efficiency of products we produce or sell.

**5. Risk Reduction**

We will minimize the environmental, health and safety risks to our employees and the communities in which we operate by employing safe technologies and operating procedures and by being constantly prepared for emergencies.

**6. Marketing of Safe Products and Services**

We will sell products or services that minimize adverse environmental impacts and that are safe as consumers commonly use them. We will inform consumers of the environmental impacts of our products or services.

**7. Damage Compensation**

We will take responsibility for any harm we cause to the environment by making every effort to fully restore the environment and to compensate those persons who are adversely affected.

**8. Disclosure**

We will disclose to our employees and to the public incidents relating to our operations that cause environmental harm or pose health or safety hazards. We will disclose potential environmental, health or safety hazards posed by our operations, and we will not take any action against employees who report any condition that creates a danger to the environment or poses health and safety hazards.

**9. Environmental Directors and Managers**

We will commit management resources to implement the Valdez Principles, to monitor and report upon our implementation efforts, and to sustain a process to ensure that the Board of Directors and Chief Executive Officer are kept informed of and are fully responsible for all environmental matters. We will establish a Committee of the Board of Directors with responsibility for environmental affairs. At least one member of the Board of Directors will be a person qualified to represent environmental interests to come before the company.

**10. Assessment and Annual Audit**

We will conduct and make public an annual self-evaluation of our progress in implementing these Principles and in complying with all applicable laws and regulations throughout our worldwide operations. We will work toward the timely creation of independent environmental audit procedures which we will complete annually and make available to the public.

Source: *The 1990 CERES Guide to The Valdez Principles*, the CERES Coalition, Boston, MA, 1990.

**Attachment D**

**Text of Minnesota Statutes Cited in Document**

**As of May 1990**

**11A.01 STATEMENT OF PURPOSE.**

The purpose of this chapter is to establish standards, in addition to the applicable standards of chapter 356A, to ensure that state and pension assets subject to this legislation will be responsibly invested to maximize the total rate of return without incurring undue risk.

**11A.09 STANDARD OF CARE.**

In the discharge of their respective duties, the members of the state board, director, board staff, and members of the council and any other person charged with the responsibility of investing money pursuant to the standards set forth in sections 11A.01 to 11A.25 shall act in good faith and shall exercise that degree of judgment and care, under circumstances then prevailing, which persons of prudence, discretion, and intelligence exercise in the management of their own affairs, not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived therefrom. In addition, for the investment of pension fund assets, the members and director of the state board and members of the investment advisory council shall act in accordance with chapter 356A.

**356A.04 GENERAL STANDARD OF FIDUCIARY CONDUCT.**

Subdivision 1. **Duty.** A fiduciary of a covered pension plan owes a fiduciary duty to:

- (1) the active, deferred, and retired members of the plan, who are its beneficiaries;
  - (2) the taxpayers of the state or political subdivision, who help to finance the plan;
- and
- (3) the state of Minnesota, which established the plan.

Subd. 2. **Prudent person standard.** A fiduciary identified in section 356A.02 shall act in good faith and shall exercise that degree of judgment and care, under the circumstances then prevailing, that persons of prudence, discretion, and intelligence would exercise in the management of their own affairs, not for speculation, considering the probable safety of the plan capital as well as the probable investment return to be derived from the assets.