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**1990  
ANNUAL  
REPORT**

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**MINNESOTA STATE  
BOARD OF  
INVESTMENT**

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# 1990 ANNUAL REPORT

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## MINNESOTA STATE BOARD OF INVESTMENT

**Governor Rudy Perpich**

**State Auditor Arne H. Carlson**

**State Treasurer Michael A. McGrath**

**Secretary of State Joan Anderson Growe**

**Attorney General Hubert H. Humphrey III**

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MEMBERS OF THE BOARD:  
GOVERNOR RUDY PERPICH  
STATE AUDITOR ARNE H. CARLSON  
STATE TREASURER MICHAEL A. McGRATH  
SECRETARY OF STATE JOAN ANDERSON GROWE  
ATTORNEY GENERAL HUBERT H. HUMPHREY III



EXECUTIVE DIRECTOR  
HOWARD J. BICKER

STATE OF MINNESOTA  
STATE BOARD OF INVESTMENT

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**The Minnesota State Board of Investment is pleased to submit its 1990 Annual Report.**

In general, fiscal year 1990 was a favorable period for institutional investors such as the Board. The stock market reached new record highs in May and June 1990. The bond market generated more modest returns as a result of on-going uncertainty about economic growth and inflation. Returns on financial assets easily exceeded the rate of inflation for the year.

**Several events should be highlighted as major accomplishments for the year:**

- **The Basic Retirement Funds, the largest group of funds managed by the Board, produced a total rate of return of 10.8% for fiscal year 1990.** Over the last five fiscal years the Basic Funds have generated a cumulative return of 92.1%, excluding alternative assets. Strong performance in the financial markets during recent years has been the primary factor in generating these favorable returns. (Refer to page 7.)
- **The Post Retirement Investment Fund generated earnings that will provide a life-time benefit increase of 5.1% for eligible retirees beginning January 1, 1991.** Over the last five years, benefit increases have been 6.7% on an annualized basis. (Refer to page 29.)
- **At the Board's request, a Task Force on Manager Retention was convened by the Board's Investment Advisory Council to review a variety of issues surrounding the Board's use of active stock and bond managers.** The Task Force endorsed the Board's existing policies concerning the mix of active and passive management and the use of customized benchmarks to evaluate individual managers. In addition, the Task Force recommended that the Board offset style bias among the active stock managers by modifying the characteristics of the index fund. (Refer to page 65.)

**On June 30, 1990, assets under management totaled \$16.3 billion.** This total is the aggregate of several separate pension funds, trust funds and cash accounts, each with differing investment objectives. In establishing a comprehensive management program, the Board develops an investment strategy for each fund which reflects its unique needs. **The primary purpose of this annual report is to clearly communicate the investment goals, policies, and performance of each fund managed by the Board.**

Through the investment programs presented in this report, the Minnesota State Board of Investment will continue to enhance the management and investment performance of the funds under its control.

Sincerely,

A handwritten signature in cursive script that reads "Howard J. Bicker".

Howard J. Bicker  
Executive Director



## **INVESTMENT ADVISORY COUNCIL**

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The Legislature has established a 17-member Investment Advisory Council to advise the Board and its staff on investment-related matters.

- The Board appoints ten members experienced in finance and investment. These members traditionally have come from the Minneapolis and St. Paul corporate investment community.
- The Commissioner of Finance and the Executive Directors of the three statewide retirement systems are permanent members of the Council.
- Two active employee representatives and one retiree representative are appointed to the Council by the Governor.

The Council has formed four committees organized around broad investment subjects relevant to the Board's decision-making: Asset Allocation, Equity Managers, Fixed Income Managers and Alternative Investments.

All proposed investment policies are reviewed by the appropriate Committee and the full Council before they are presented to the Board for action.

### **Members of the Council** (as of December 1990)

Henry H. Adams, Jr.	Executive Sec. & Investment Mgr., Mpls. Teachers Ret. Fund
John E. Bohan	Vice President, Pension Investments, The Pillsbury Co.
James R. Eckmann	Assistant Treasurer, Dayton Hudson Corporation
Elton Erdahl	Executive Director, Teachers Retirement Association
Paul L. Groschen	Executive Director, Minnesota State Retirement System
Kenneth F. Gudorf	Board Appointee
Peter Hutchinson	Commissioner, Minnesota Department of Finance
Vernell Jackels	Active Employee Representative
David B. Jeffery	Vice President and Resident Manager, Shearson Hamill
Malcolm W. McDonald**	Director & Corporate Secretary, Space Center, Inc.
Gary R. Norstrom	Treasurer, City of St. Paul
Joseph T. Rukavina	Active Employee Representative
Mary Most Vanek	Acting Executive Director, Public Employees Retirement Assoc.
Raymond B. Vecellio	Retiree Representative
Deborah Veverka	Manager, Pension Investments, Honeywell, Inc.
Jan Yeomans*	Director, Benefit Funds & Financial Markets, 3M Co.

\*Chair

\*\*Vice-Chair

## **CONSULTANT**

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Richards & Tierney, Inc. Chicago, Illinois



## **INVESTMENT BOARD STAFF**

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Howard Bicker	Executive Director
Beth Lehman	Assistant Executive Director
James E. Heidelberg	Assistant to the Executive Director

### **External Money Management**

Doug Gorence	Manager, External Portfolios
John Griebenow	Manager, Alternative Investments
James H. Lukens	Investment Analyst, Fixed Income
Michael J. Menssen	Investment Analyst, Equities
Mansco Perry III	Investment Analyst, Alternative Investments
Deborah F. Griebenow	Investment Analyst, Management Reporting

### **Internal Money Management - Stocks and Bonds**

Roger W. Henry	Manager, Internal Portfolios
A. Arthur Kaese	Senior Equity Analyst
N. Robert Barman	Senior Fixed Income Analyst
Arthur M. Blauzda	Senior Analyst, Shareholder Services
Harold L. Syverson	Security Trader

### **Internal Money Management - Cash Accounts**

Grant A. Feldman	Manager, Short-Term Accounts
John T. Kinne	Portfolio Manager, Short-Term

### **Administrative Staff**

L. Michael Schmitt	Administrative Director
Mable E. Patrick	Accounting Supervisor
Thomas L. Delmont	Accounting Officer, Intermediate
Nancy Wold	Accounting Officer
Kathy Sears	Computer Operator
Harriet Balian	Secretary to the Executive Director
Charlene Olson	Secretary, External Programs
Lin Nadeau	Secretary, Internal Programs
Lavern Jagg	Receptionist

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PART TWO of the Minnesota State Board of Investment's 1990 Annual Report contains financial statements, asset listings and accounting data.

## INTRODUCTION

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All investments undertaken by the Minnesota State Board of Investment (SBI) are governed by the common law prudent person rule and other standards codified in *Minnesota Statutes*, Chapter 11A and Chapter 356A.

### **Prudent Person Rule**

The prudent person rule, as codified in *Minnesota Statutes* 11A.09, requires all members of the Board, Investment Advisory Council, and SBI staff to “...act in good faith and 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.” *Minnesota Statutes* 356A.04 contains similar codification of the prudent person rule applicable to the investment of pension fund assets.

### **Authorized Investments**

In addition to the prudent person rule, the *Minnesota Statutes* contain a specific list of asset classes available for investment, including common stocks, bonds, short term securities, real estate, venture capital, and resource funds. The statutes prescribe the maximum percentage of fund assets that may be invested in each asset class and contain specific restrictions to ensure the quality of the investments.

### **Investment Policies**

Within the requirements defined by state law, the State Board of Investment, in conjunction with SBI staff and the Investment Advisory Council, establishes investment policies for all funds under its management. These investment policies are tailored to the particular needs of each fund and specify investment objectives, risk tolerance, asset allocation, investment management structure, and specific performance standards.

In recent years, the Board, its staff, and the Investment Advisory Council have conducted detailed analyses of the investment policies of the Basic Retirement Funds, the Post Retirement Investment Fund, the Supplemental Investment Fund, and the Permanent School Trust Fund. The results of these studies guide the on-going management of these funds and will be updated periodically.

### **Report Format**

**This annual report is published in two separate volumes.** This volume, **Part One**, contains the text of the annual report. It describes the investment policies and performance for each of the funds managed by the SBI. It also contains statistical data on the Board's managers. The second volume, **Part Two**, contains audited financial statements, asset listings and accounting data.





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## **FUNDS UNDER MANAGEMENT**

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**Basic Retirement Funds**

**Post Retirement Investment Fund**

**Supplemental Investment Fund**

**State Cash Accounts**

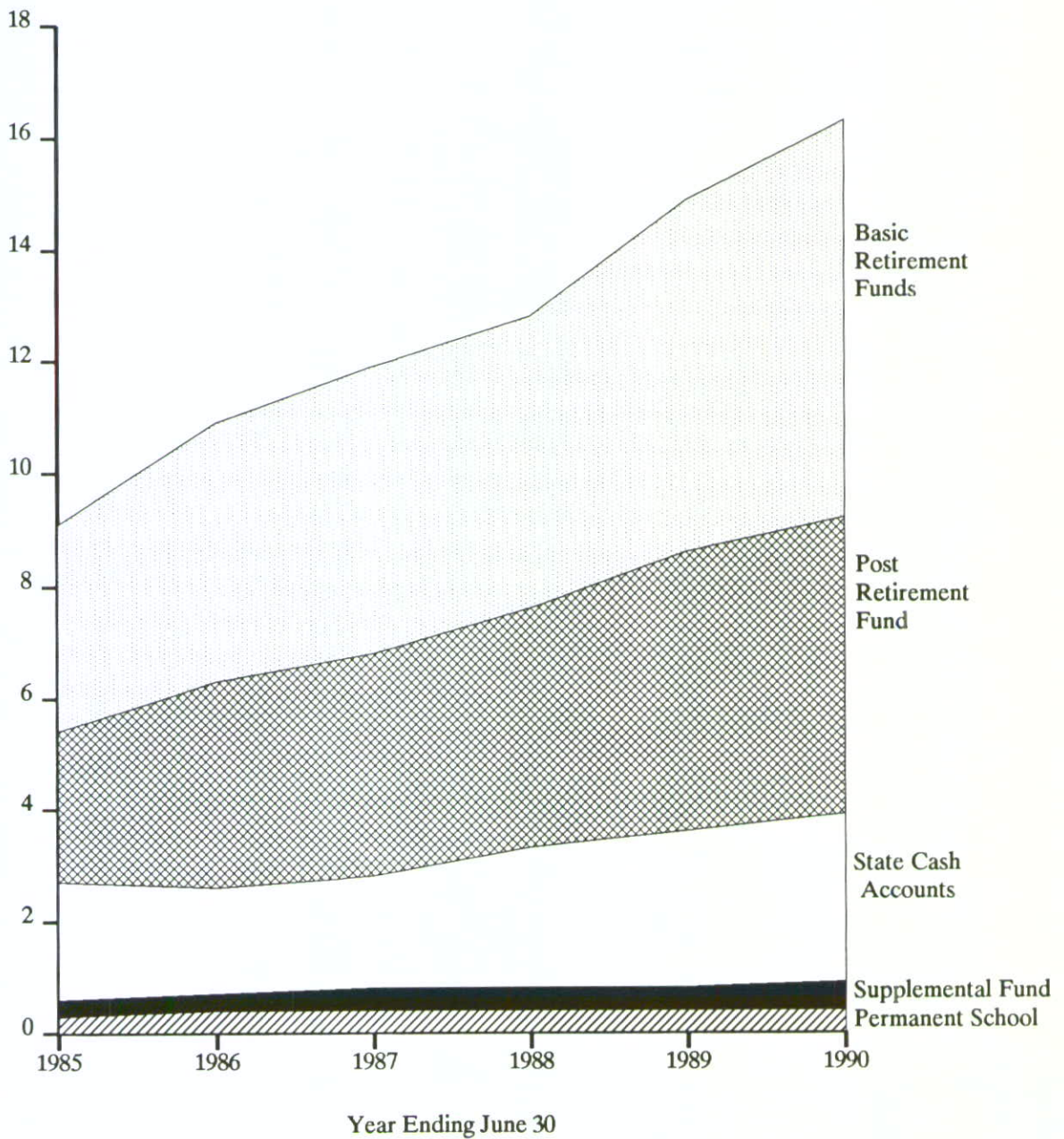
**Permanent School Trust Fund**

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# Growth in Assets

Fiscal Years 1986 - 1990

\$ BILLIONS





## FUNDS UNDER MANAGEMENT

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**Market Value  
June 30, 1990**

### **Basic Retirement Funds**

**\$ 7.1 billion**

The Basic Retirement Funds contain the pension assets of the currently working participants in eight major statewide retirement plans:

- Teachers Retirement Fund \$ 3,268 million
- Public Employees Retirement Fund 1,608 million
- State Employees Retirement Fund 1,408 million
- Public Employees Police and Fire Fund 595 million
- Highway Patrol Retirement Fund 105 million
- Correctional Employees Fund 69 million
- Police and Fire Consolidation Fund 43 million
- Judges Retirement Fund 3 million

### **Post Retirement Investment Fund**

**\$ 5.3 billion**

The Post Retirement Investment Fund is composed of the reserves for retirement benefits to be paid to retired employees. Permanent retirement benefit increases are permitted based on excess earnings from dividends, interest, and net realized capital gains.

### **Supplemental Investment Fund**

**\$ 0.5 billion**

The Supplemental Investment Fund includes the assets of the state deferred compensation plan, supplemental benefit arrangements, various retirement programs for local police and firefighters, and the unclassified employees of the state. Participants may choose among six separate accounts with different investment emphases designed to meet a wide range of investor needs and objectives.

- Income Share Account stocks and bonds \$ 245 million
- Growth Share Account actively managed stocks 74 million
- Common Stock Index Account passively managed stocks 10 million
- Bond Market Account actively managed bonds 6 million
- Money Market Account short-term securities 82 million
- Guaranteed Return Account guaranteed investment contracts 60 million

### **State Cash Accounts**

**\$ 3.0 billion**

These accounts are the cash balances of state government funds, including the Invested Treasurers Cash Fund, transportation funds, and other miscellaneous cash accounts. All assets are invested in high quality, liquid short-term debt securities.

### **Permanent School Trust Fund**

**\$0.4 billion**

The Permanent School Trust Fund is a trust established for the benefit of Minnesota public schools.

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### **Total Assets**

**\$16.3 billion**



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# **BASIC RETIREMENT FUNDS**

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**Investment Objectives**

**Asset Allocation**

**Investment Management**

**Investment Performance**

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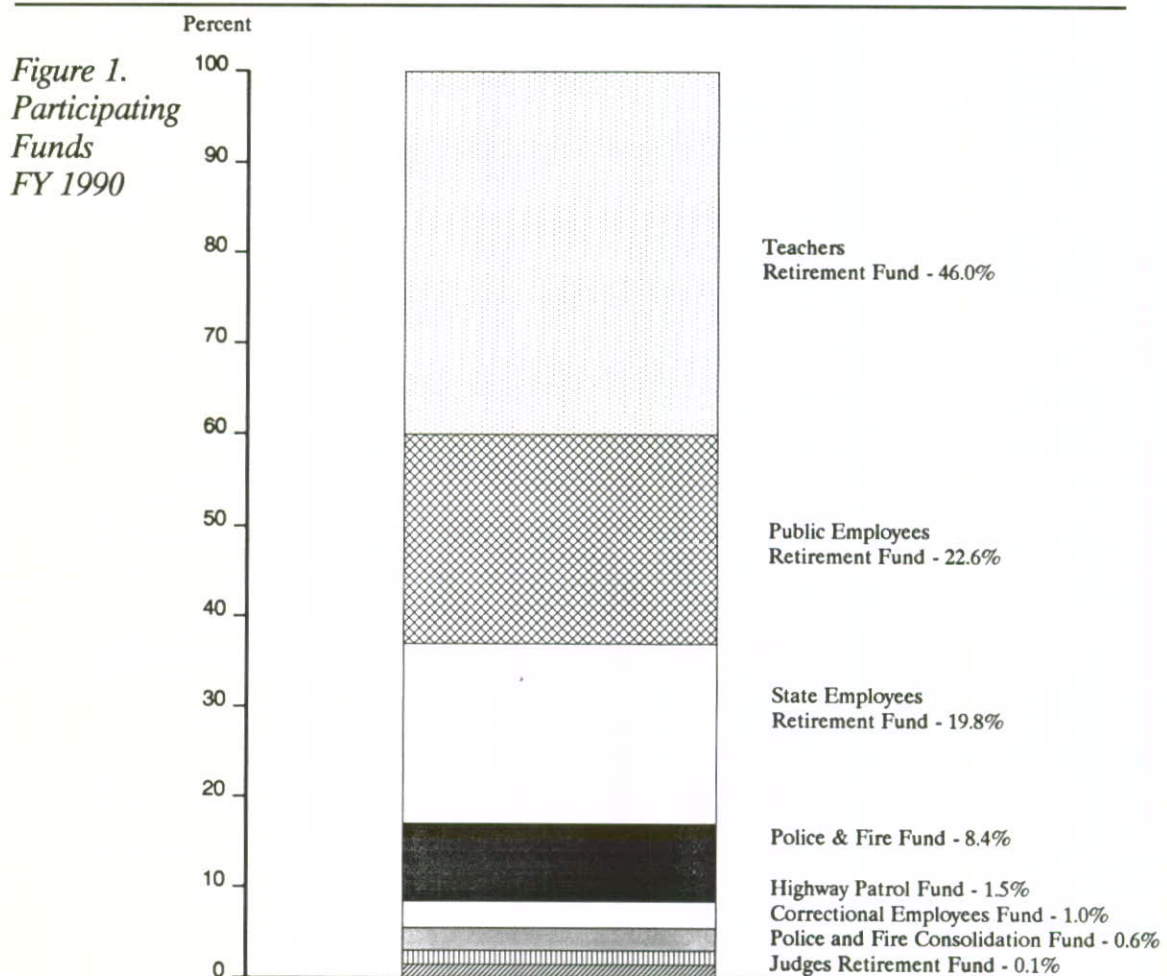




## BASIC RETIREMENT FUNDS

The Basic Retirement Funds are composed of the retirement assets for currently working participants in eight statewide retirement funds.

Figure 1 identifies the individual retirement funds which comprise the Basic Funds. The Funds serve as accumulation pools in which the pension contributions of public employees and their employers are placed during the employees' years of active service. Approximately 250,000 public employees participate in the Basic Funds. On June 30, 1990 the market value of the Funds was \$7.1 billion.



**INVESTMENT OBJECTIVES**

The State Board of Investment (SBI) has one overriding responsibility with respect to its management of the Basic Funds: to ensure that sufficient funds are available to finance promised retirement benefits.

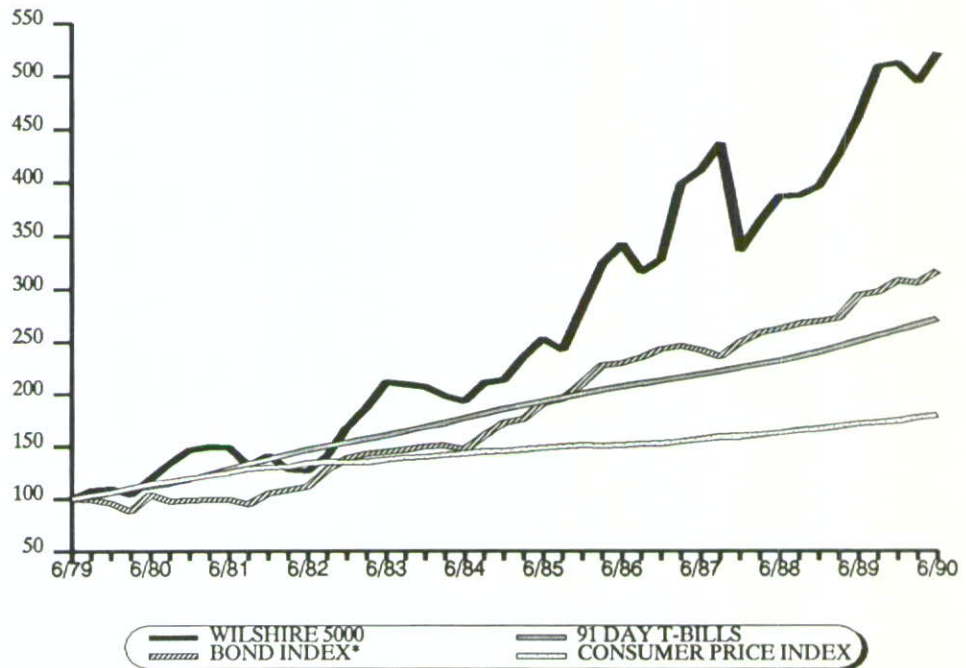
**Actuarial Assumed Return**

The Basic Funds invest the pension contributions of most public employees in the State of Minnesota during their working years. Employee and employer contribution rates are specified in state law as a percentage of an employee's salary. The rates are set so that contributions plus expected investment earnings will cover the projected cost of promised pension benefits. In order to meet these projected pension costs, the Basic Retirement Funds must generate investment returns of at least 8.5% on an annualized basis, over time.

**Time Horizon**

Normally, pension assets will accumulate in the Basic Retirement Funds for thirty to forty years during an employee's years of active service. This provides the Basic Funds with a long investment time horizon and permits the Board to take

*Figure 2.  
Performance of  
Capital Markets  
FY 1980-1990*



\* Salomon Broad Investment Grade Bond Index



advantage of the long run return opportunities offered by the capital markets in order to meet its actuarial return target.

As illustrated in Figure 2, historical evidence strongly indicates that common stocks will provide the greatest opportunity to maximize investment returns over the long-term. As a result, the Board has chosen to incorporate a large commitment to common stocks in its asset allocation policy for the Basic Funds. In order to limit the short run volatility of returns exhibited by common stocks, the Board includes other asset classes such as bonds and real estate in the total portfolio. These assets diversify the Basic Funds and reduce wide fluctuations in investment returns on a year to year basis. This diversification benefit should not impair the Basic Funds' ability to meet or exceed their actuarial return target over the long-term.

### Long-Term Objectives

Within this context, the Board has established several long-term investment objectives for the Basic Retirement Funds. Monitoring actual performance against these return objectives helps the Board to ensure that the Basic Funds will meet their long-term funding obligations:

- **Provide Real Returns.** Over a ten year period, the Basic Funds are expected to generate total returns that are 3-5 percentage points greater than the rate of inflation.
- **Exceed Market Returns.** Over a five year period, the Basic Funds are expected to outperform a composite of market indices weighted in a manner that reflects their long-term asset allocation policy.
- **Exceed Median Fund Returns.** Over a five year period, the Basic Funds are expected to outperform the median fund from a representative universe of public and private funds with a balanced asset mix of stocks and bonds.

## ASSET ALLOCATION

The allocation of assets among common stocks, bonds, and alternative investments can have a dramatic impact on investment results. In fact, asset allocation decisions overwhelm the impact of individual security selection within a total portfolio. Consequently, the Board has focused considerable attention on the selection of an appropriate long-term asset allocation policy for the Basic Funds.

## BASIC RETIREMENT FUNDS

### Long-Term Allocation Policy

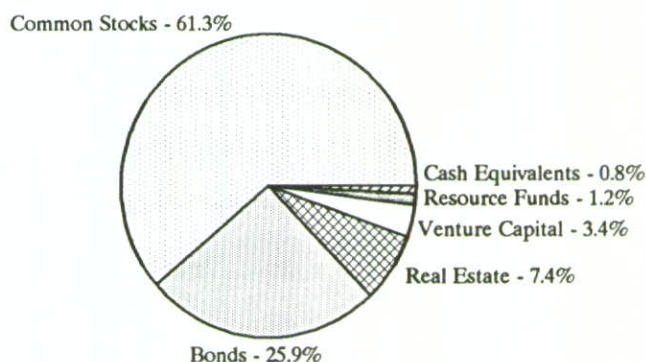
Based on the Basic Funds' investment objectives and the expected long run performance of the capital markets, the Board has adopted the following long-term asset allocation policy for the Basic Funds:

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

It should be noted that the Board has approved the addition of international stocks to the Basic Funds. When an appropriate implementation plan has been approved the asset allocation targets shown above will be adjusted by adding a 10.0% allocation to international stocks and lowering the domestic bond allocation to 14.0%.

Figure 3 presents the actual asset mix of the Basic Funds at the end of fiscal year 1990. Historical data on the Basic Funds' actual asset mix over the last five years are displayed in Figure 4.

Figure 3.  
Asset Mix  
June 30, 1990



	Market Value \$Millions	Actual Asset Mix	Policy Target
Common Stocks	\$4,358	61.3%	60.0%
Bonds	1,840	25.9	24.0
Alternative Assets:			
Real Estate	525	7.4	10.0
Venture Capital	241	3.4	2.5
Resource Funds	84	1.2	2.5
Unallocated Cash	58	0.8	1.0
<b>Total</b>	<b>\$7,106</b>	<b>100.0%</b>	<b>100.0%</b>



## **BASIC RETIREMENT FUNDS**

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### **Total Return Vehicles**

The SBI invests the majority of the Basic Funds' assets in common stocks. A large allocation is consistent with the investment time horizon of the Basic Funds and the advantageous long-term risk-return characteristics of common stocks. The rationale underlying the venture capital allocation is similar. However, the relatively small size of the venture capital market presents a practical limit to the amount that may be allocated to this asset class.

The Board recognizes that this sizable policy allocation to common stock and venture capital likely will produce more volatile portfolio returns than a more conservative policy focused on fixed income securities. It is understood that this policy may result in quarters or even years of disappointing results. Nevertheless, the long run return benefits of this policy are expected to compensate for the additional volatility.

### **Diversification Vehicles**

The Board includes other asset classes in the Basic Funds both to provide some insulation against highly inflationary or deflationary environments and to diversify the portfolio sufficiently to avoid excessive return volatility.

Real estate and resource (oil and gas) investments provide an inflation hedge that other financial assets cannot offer. In a period of rapidly rising prices, these "hard" assets can be expected to appreciate in value at a rate at least equal to the inflation rate. Further, even under more normal financial conditions such as low to moderate inflation, the returns on these assets are not highly correlated with common stocks. Thus, their inclusion in the Basic Funds serves to dampen return volatility.

The bond component of the Basic Funds acts as a hedge against a deflationary economic environment. In the event of a major deflation, high quality fixed income assets, particularly long-term bonds, will protect principal and generate significant capital gains. And, like real estate and resource funds, under normal financial conditions bonds help to diversify the Basic Funds, thereby controlling return volatility.

## **INVESTMENT MANAGEMENT**

All assets in the Basic Retirement Funds are managed externally by private money management firms under contracts or agreements with the SBI.



## BASIC RETIREMENT FUNDS

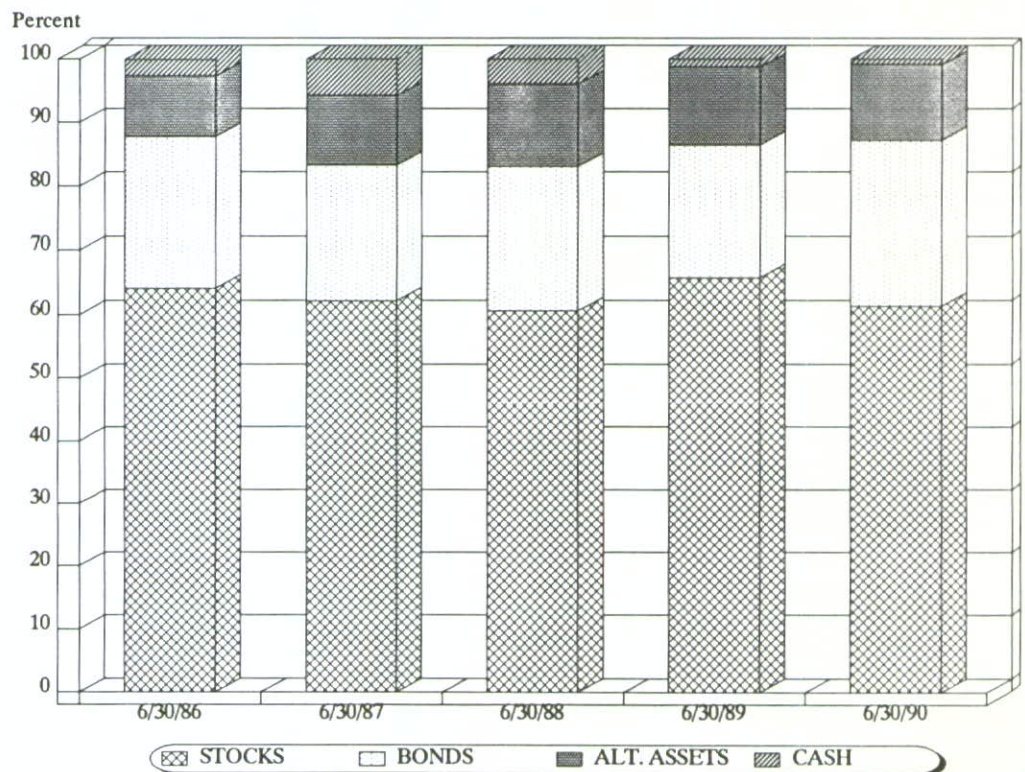
### Common Stock Segment

The Board allocates 60% of the Basic Funds to common stocks. The SBI utilizes a two-part approach to the management of the common stock segment:

- **Passive Management.** On an on-going basis, at least one-half of the stock segment will be passively managed, i.e. invested in an **index fund**. At the end of fiscal year 1990, approximately 60% of the stock segment was indexed.
- **Active Management.** No more than one-half of the stock segment will be actively managed. At the end of fiscal year 1990, approximately 40% of the stock segment was actively managed by a group of eleven external money managers.

An **index fund** is a well-diversified portfolio of common stocks designed to match the rate of return performance of a predetermined stock market index. The index fund utilized by the SBI tracks the Wilshire 5000, a broad-based equity market indicator composed of the common stocks of all U.S.-domiciled corporations for which daily prices are available. In effect, the Wilshire 5000 represents virtually the entire domestic common stock market.

Figure 4.  
Historical  
Asset Mix  
FY 1986-1990



## BASIC RETIREMENT FUNDS

The Board's decision to utilize an index fund is based on the inherent difficulty of actively managing a multi-billion dollar common stock portfolio. The Board has chosen to accept market returns on a substantial portion of its common stock portfolio through the utilization of an index fund. The Board seeks above-market returns through the active management of the remaining common stock assets.

The **actively managed segment** of the Basic Funds' common stock portfolio is designed to complement the core index fund. With the index fund providing adequate diversification for the Basic Funds' total portfolio, the active managers are expected to add incremental value over the long run through their investment management decisions.

A comprehensive monitoring system has been established to ensure that the many elements of the common stock portfolio conform to the Basic Funds' investment policy. Performance benchmarks have been established for each of the Board's managers. These benchmarks enable the SBI to evaluate more effectively the managers' decision-making, both individually and in aggregate, with respect to risk incurred and returns achieved. More information on benchmarks and the Board's monitoring policies is included in the Major Policy Initiatives Section.

*Figure 4 (con't).*  
*Historical*  
*Asset Mix*  
*FY 1986-1990*

	Market Value				
	1986	1987	June 30, 1988	1989	1990
<b>Common Stocks</b>					
\$Million	2,927.0	3,188.0	3,164.0	4,154.0	4,358.0
Percent	64.1	62.1	60.6	65.7	61.3
<b>Bonds</b>					
\$Million	1,083.0	1,089.0	1,178.0	1,318.0	1,840.0
Percent	23.7	21.2	22.5	20.8	25.9
<b>Real Estate</b>					
\$Million	331.0	405.0	465.0	502.0	525.0
Percent	7.3	7.9	8.9	7.9	7.4
<b>Venture Capital</b>					
\$Million	65.0	93.0	138.0	181.0	241.0
Percent	1.4	1.8	2.6	2.9	3.4
<b>Resource Funds</b>					
\$Million	42.0	68.0	78.0	96.0	84.0
Percent	0.9	1.3	1.5	1.5	1.2
<b>Unallocated Cash</b>					
\$Million	116.0	294.0	203.0	74.0	58.0
Percent	2.6	5.7	3.9	1.2	0.8
<b>Total Fund</b>					
\$Million	4,564.0	5,137.0	5,224.0	6,325.0	7,106.0



## BASIC RETIREMENT FUNDS

### **FY 1990 Changes**

During fiscal year 1990, the SBI terminated its relationship with BMI Capital. In April 1990, GeoCapital Corporation was retained as a replacement manager for a small capitalization stock portfolio.

**A description of each common stock manager's investment approach is included in the Manager Summary section. Their portfolio characteristics are included in the Statistical Data Appendix.**

### **Bond Segment**

The Board allocates 24% of the Basic Funds to bonds. The SBI uses a two-part approach to the management of the bond segment:

- **Semi-Passive Management.** On an on-going basis, at least one-half of the assets allocated to bonds will be managed by semi-passive managers. At the end of fiscal year 1990, approximately 50% of the bond segment was invested using an **enhanced index** approach.
- **Active Management.** No more than one-half of the bond segment will be actively managed. At the end of the fiscal year 1990, approximately 50% of the bond segment was actively managed by a group of five external money managers.

The group of **active bond managers** was selected for its blend of investment styles. Each of the managers invests in high quality, fixed income securities. The managers vary, however, in the emphasis they place on interest rate anticipation and in the manner in which they approach issue selection and sector weighting decisions.

In keeping with the objective of utilizing the bond portfolio as a deflation hedge, the active managers are restricted regarding the minimum average life of their portfolios. This requirement is designed to prevent the Basic Funds' total bond portfolio from assuming an excessively short-lived position and thus, severely diluting its deflation hedge capacity. Further, the bond managers are permitted to purchase only high quality (BAA or better) fixed income assets. In addition, to avoid extreme variability in total bond segment returns, the SBI constrains the maximum duration (average life) of the managers' portfolios to a band of three to seven years.

The goal of the **enhanced index managers** is to add incremental value to the Salomon Broad Investment Grade (BIG) Index through the superior selection of bonds for the portfolios. The



## **BASIC RETIREMENT FUNDS**

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enhanced index portfolios adhere very closely to characteristics of the Salomon BIG and match its duration and maturity structure. The semi-passive managers seek to add value by exploiting perceived mispricings among individual securities or by making minor alterations in the sector weightings within the portfolio. Although the enhanced index managers seek to exceed the performance of the index, the possibility exists that the semi-passive approach may slightly underperform the target index during some periods.

### **FY 1990 Changes**

At the end of fiscal year 1990, the SBI terminated its relationship with Morgan Stanley Capital Management, one of its active bond managers. The assets in the portfolio were transferred to other managers within the existing bond manager group.

**A description of each bond manager's investment approach is included in the Manager Summary section. Their portfolio characteristics are presented in the Statistical Data Appendix.**

### **Real Estate Segment**

The Board allocates 10% of the Basic Funds for investment in real estate. State law authorizes the SBI to invest in real estate through commingled funds, limited partnerships and trusts. Each of the Board's real estate investments involve at least four other participants. In addition, the Board's investment may not exceed 20% of a given commingled fund, partnership or trust. State law does not permit investment in real estate through direct investments, separate accounts or individual transactions.

By investing in several open-end and closed-end commingled funds, the SBI has created a large core portfolio of real estate that is broadly diversified by property type, location and financing structure. The core portfolio is designed to reflect the composition of the aggregate U.S. real estate market and, as such, is expected to earn at least market returns. The broad diversification of the core portfolio enables the SBI to select less diversified, special orientation managers for the remaining portion of the real estate segment. With their more focused approach to real estate management, these funds offer the ability to enhance the return earned by the core portfolio.

Prospective real estate managers are reviewed and selected based on the managers' experience, investment strategy and performance history.

## **BASIC RETIREMENT FUNDS**

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### **FY 1990 Changes**

At year-end the market value of the real estate portfolio comprised 7.4% of the Basic Funds. The SBI will continue to review and add new real estate investments, as needed, to fulfill the target 10% allocation.

During fiscal year 1990, the SBI elected to withdraw its investment with Prudential Investment Management, one of its open-end commingled real estate fund managers, in order to free assets for more targeted investment vehicles. In June 1990, the SBI approved commitments with two new specialty fund managers: LaSalle Income Parking Fund managed by LaSalle Partners Limited; and Copley Value Fund managed through a joint venture by Copley Real Estate Advisers, the Robert M. Bass Group and General Electric Capital Corporation. The LaSalle fund will focus on the acquisition and management of parking garages in selective markets. The Copley fund will invest opportunistically in large real estate portfolios including those controlled by sellers under intense financial pressure.

**A description of each real estate manager's investment approach is included in the Manager Summary section.**

### **Venture Capital Segment**

The Board allocates 2.5% of the Basic Funds to investment in venture capital. Under state law, the SBI is authorized to invest in venture capital through limited partnerships and corporations. As with real estate investments, each venture capital investment must involve at least four other investors, and the Board's investment may not exceed 20% of a particular limited partnership.

The SBI maintains a broadly diversified venture capital portfolio that is diversified across three dimensions: location, industry type and stage of corporate development of individual portfolio companies.

Prospective venture capital managers are reviewed and selected based primarily on the managers' experience, investment strategy, diversification potential and performance history.

### **FY 1990 Changes**

At year-end, the market value of Basic Funds' venture capital segment was 3.4%, somewhat above its long-term target. The SBI intends to make additional investments to replenish commitments that will expire in the mid-1990's when several of the SBI's current venture capital partnerships mature.



## **BASIC RETIREMENT FUNDS**

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During fiscal year 1990, the SBI approved additional commitments with three existing venture capital managers: Venture Partners Acquisition Fund II, a secondary interests fund managed by Brinson Partners (formerly First Chicago Investment Advisers); IAI Venture Partners II managed by IAI Venture Capital Group, and Matrix Fund III managed by Matrix Partners. In addition, the SBI committed assets to a new manager, Zell/Chilmark, which will invest in corporate restructurings.

**A description of each venture capital manager's investment approach is included in the Manager Summary section.**

### **Resource Fund Segment**

The Board allocates 2.5% of the Basic Funds' assets for investment in oil and gas partnerships. The SBI invests in partnerships structured specifically for pension funds and other tax-exempt investors. There must be four other participants in each of the SBI's resource investments and the Board may invest no more than 20% of a partnership's total capital. The resource partnerships in which the Board invests concentrate their investments in producing properties and royalty interests that are diversified geographically and/or geologically.

Resource investments are selected based on the managers' experience, investment strategy and performance history.

### **FY 1990 Changes**

At year-end, the market value of the resource fund segment was 1.2% of the Basic Funds. During fiscal year 1990, the SBI liquidated one of its investments with Apache Corporation and approved an additional commitment with First Reserve Corporation, manager of the AMGO oil and gas funds. The Board plans to continue to review resource investments for possible inclusion in the portfolio.

**A description of each resource fund manager's investment approach is included in the Manager Summary section.**

### **Unallocated Cash**

The Board allocates 1% of the Basic Funds to cash. Given the long-term objectives of the Basic Funds and their limited liquidity needs, the Board believes that a minimal commitment to short-term investments is most appropriate.

These cash reserves, as well as any cash held by stock and bond managers, are invested in a short-term investment fund (STIF) managed by State Street Bank and Trust, the Basic Funds' master custodian. The STIF is a separate account invested under



the same state statutes which guide all of the SBI's short-term investments.

### INVESTMENT PERFORMANCE

The Board has adopted performance objectives which are consistent with the objectives of the Basic Funds and realistic because they are both attainable and measurable. The evaluation of performance outcomes relative to established policy is an integral part of the SBI's investment program.

#### Evaluation Framework

Given the long-term investment time horizon of the Basic Funds, the performance evaluation time period is necessarily long-term as well. Recognizing that excessive attention to performance in the short run can be counterproductive, the SBI evaluates investment performance over a time horizon of approximately three to five years (roughly corresponding to a typical market cycle). While performance is measured and reviewed quarterly to identify trends and control extreme underperformance, decisions regarding the effectiveness of the Board's investment program are made over a considerably longer period.

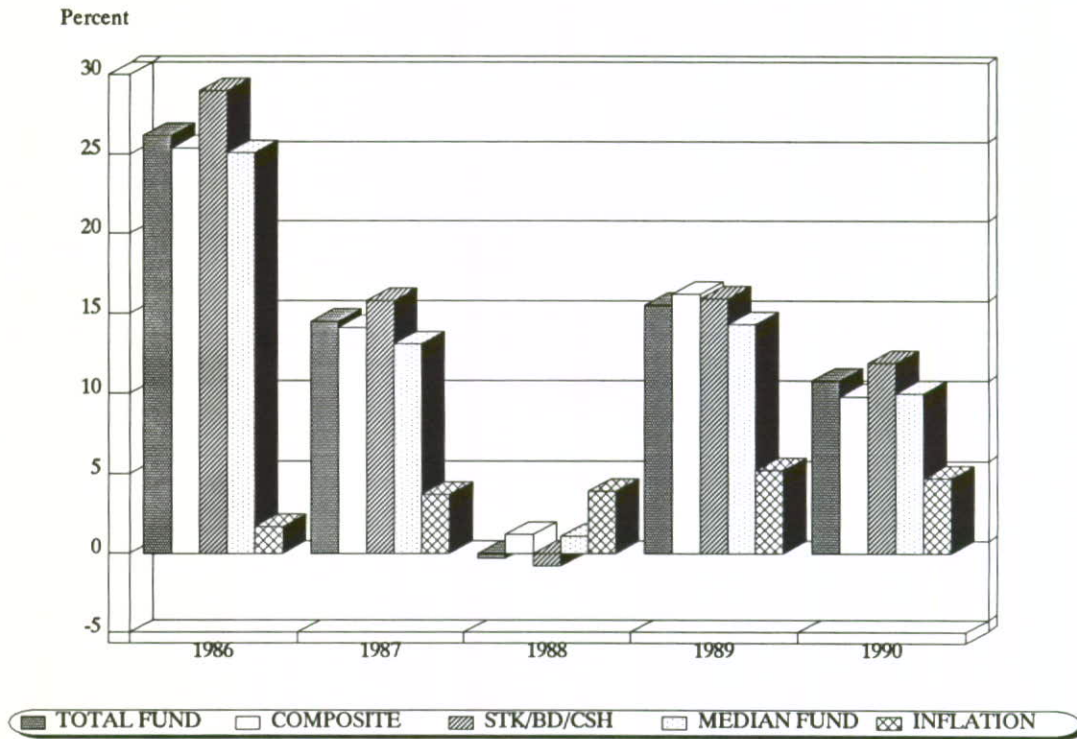
The Basic Funds' multi-manager structure requires that investment performance be evaluated on two distinct levels:

- **Total Fund.** Risk-return targets for the total fund ensure that long run strategic decisions which affect the total performance of the Basic Funds are implemented in a manner consistent with their investment policy. Specific standards have been selected to monitor performance on a total fund level.
- **Individual Managers.** Risk-return objectives for the individual managers are designed to ensure that they adhere to their assigned investment roles and to permit an evaluation of the value they add to the SBI's investment program. Individual benchmarks have been developed for each manager to monitor performance at the manager level.

#### Total Fund Performance

To a significant degree, the risk level of the total fund is set implicitly when the asset allocation and investment management structure are determined. Given the adequate funding levels and long-term investment time horizon of the Basic Funds, the Board believes an above-average risk posture is appropriate.

**Figure 5.**  
**Total Fund Performance**  
**Fiscal Years 1986 - 1990**



	1986	1987	1988	1989	1990	(Annualized)	
						3 YR.	5 YR.
<b>Total Fund</b>	26.2%	14.5%	-0.3%	15.5%	10.8%	8.5%	13.0%
Composite Index*	25.4	14.1	1.2	16.2	9.8	8.9	13.0
<b>Stocks, Bonds, Cash Only</b>	29.0	15.8	-0.8	15.9	11.9	8.7	13.9
Median Fund**	25.1	13.1	1.1	14.3	10.0	8.9	13.3
Inflation	1.7	3.7	3.9	5.2	4.7	4.6	3.8

\* 60% Wilshire 5000/24% Salomon Broad Investment Grade Bond Index/10% Wilshire Real Estate Index/1% 91 Day T-Bills/2.5% Venture Capital Funds/2.5% Resource Funds since July 1989.

\*\* Wilshire Assoc. Trust Universe Comparison Service (TUCS) median balanced portfolio. TUCS contains returns of more than 800 public and private funds.



## BASIC RETIREMENT FUNDS

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The Board's objective is to take advantage of the established relationship between risk and return. Higher risk investment strategies have been shown to offer higher long run returns than lower risk strategies. The SBI's risk target is implemented by committing the majority of the Basic Funds' assets to common stocks.

The Basic Funds' **risk objectives** are implicitly met by attaining the targeted policy asset mix. In this regard, the common stock and bond targets have been achieved. The Basic Funds began commitments to real estate, venture capital and resource funds in the early to middle 1980's. With alternative investments near their policy targets, only moderate additional activity is expected over the next several years.

The Basic Funds' **return objectives** are evaluated relative to three specific standards:

- **Real Return.** Over a ten year period, the Basic Funds are expected to produce returns that exceed inflation by 3-5 percentage points annually.
- **Composite Index.** Over a five year period, the returns produced by the total portfolio are expected to exceed those derived from a composite of market indices weighted in the same proportion as the Basic Funds' long-term asset allocation.
- **Median Fund.** Over a five year period, the Basic Funds, excluding alternative assets, are expected to outperform the median return produced by a representative sample of other public and private pension and trust funds with a balanced asset mix of stocks and bonds.

Overall, the Basic Funds have performed well compared to these standards:

- **Real Return.** Over the last ten years, the Basic Funds have exceeded inflation by 8.4 percentage points annualized. For fiscal year 1990, the Funds' return surpassed inflation by 6.1 percentage points.
- **Composite Index.** Over the last five years, the Basic Funds have equaled their market index composite. For fiscal year 1990, the Funds outperformed the composite by 1.0 percentage point.

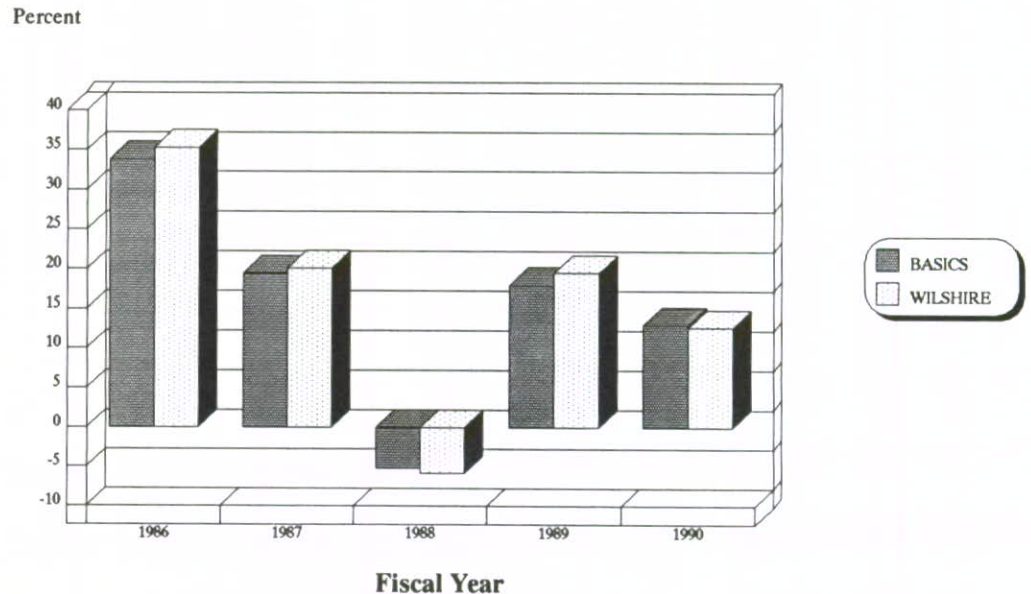
## BASIC RETIREMENT FUNDS

- Median Fund.** Over the last five years the Basic Funds, excluding alternative assets, were in the top third (33rd percentile) of public and private pension funds in the Wilshire Associates Trust Universe Comparison Service (TUCS). The Basic Funds ranked in the top third (31st percentile) of TUCS for fiscal year 1990, as well.

Fiscal year 1990 was a favorable period for institutional investors such as the SBI. The stock market continued its rally, hitting new record highs in May and June 1990. The bond market generated more modest returns as a result of on-going uncertainty about economic growth and inflation. Returns on financial assets easily exceeded the rate of inflation for the year.

Despite the dramatic stock market drop in October 1987 and subsequent market volatility, the financial markets have provided very strong returns in recent years. Given its long-term asset allocation, the Basic Funds have been well positioned to take advantage of these favorable markets. Over the last five years, the Basic Funds have provided a cumulative return of 92.1%, excluding alternative assets.

Figure 6.  
Stock Segment  
Performance  
FY 1986 -1990



	1986	1987	1988	1989	1990	(Annualized)	
						3 YR.	5 YR.
STOCK SEGMENT	33.8%	19.4%	-5.2%	18.0%	13.0%	8.1%	15.1%
Wilshire 5000	35.3	20.1	-5.9	19.5	12.7	8.2	15.5



## BASIC RETIREMENT FUNDS

Performance relative to total fund targets is presented in Figure 5. Common stock and bond segment performance are shown in Figure 6 and Figure 7.

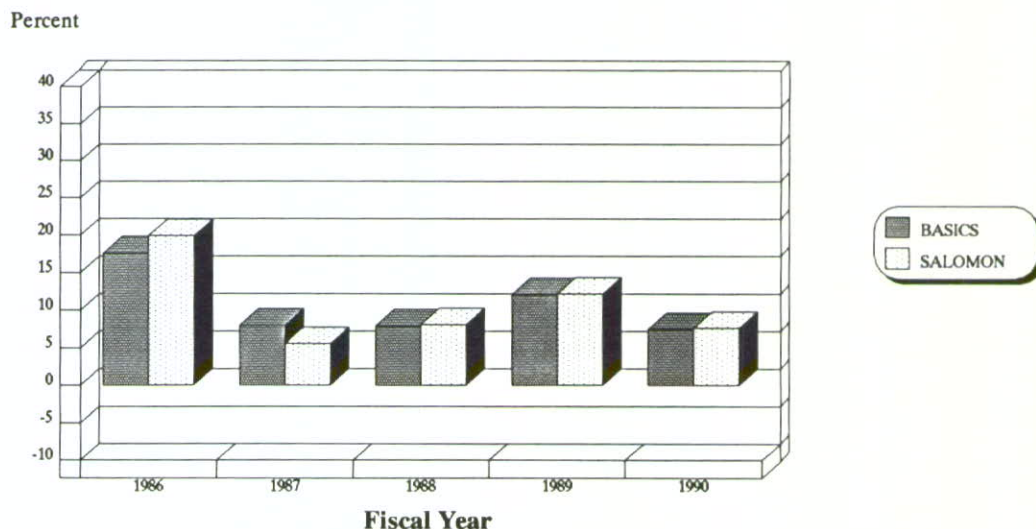
### Stock Manager Performance

Two primary long run **risk objectives** have been established for the Basic Funds' common stock managers:

- **Investment Approach.** Each manager (active or passive) is expected to hold a portfolio that is consistent, in terms of risk characteristics, with the manager's stated investment approach.
- **Diversification.** Each active common stock manager is expected to hold a highly non-diversified portfolio, while the index fund manager is expected to hold a well-diversified portfolio that tracks the entire stock market.

In the short run, the active common stock managers may depart from these two risk targets as part of their specific investment strategies.

Figure 7.  
Bond Segment  
Performance  
FY 1986-1990



	1986	1987	1988	1989	1990	(Annualized)	
BOND SEGMENT	17.6%	7.9%	7.9%	12.1%	7.5%	3 Yr.	5 Yr.
Salomon Index*	19.9	5.6	8.1	12.2	7.7	9.3	10.6

\* Salomon Broad Investment Grade Bond Index

## BASIC RETIREMENT FUNDS

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The common stock managers successfully fulfilled their long term risk objectives during fiscal year 1990. In general, the managers constructed portfolios consistent with their stated investment approaches and maintained appropriate levels of diversification.

The SBI evaluates the common stock managers' returns against the performance of customized indices constructed to represent the managers' specific investment approaches. These custom indices are commonly referred to as "benchmark portfolios." The **benchmark portfolios** take into account the equity market forces that at times favorably or unfavorably impact certain investment styles. Thus, the benchmarks are more appropriate return targets against which to judge the managers' performances than are broad market indices.

From a return perspective, common stock manager performance was favorable. Eight active managers (Alliance, Concord, Franklin, IDS, Investment Advisers, Lieber, Rosenberg, Waddell) exceeded their benchmarks for the year while two (Forstmann, Sasco) underperformed their individual targets. The index fund manager tracked the performance of the Wilshire 5000 within an acceptable range. As a group, the active and

*Figure 8.  
Stock Manager  
Performance  
FY 1990*

	<b>Total Portfolio Return</b>	<b>Benchmark Return</b>
Alliance Capital	23.6%	14.8%
Concord Capital	9.4	7.2
Forstmann Leff	7.6	10.5
Franklin	7.5	5.4
IDS Advisory	24.2	11.3
Investment Advisers	15.7	14.5
Lieber & Company	5.2	2.2
Rosenberg	11.4	11.3
Sasco Capital	3.4	6.4
Waddell & Reed	15.0	8.9
Wilshire Associates (index fund)	12.3	12.7
<b>Basic Funds' Common Stock Segment*</b>	<b>13.0%</b>	
<b>Stock Segment Performance Standards</b>		
Wilshire 5000	12.7%	
TUCS Median Managed Equity Portfolio	12.4	
<b>Inflation</b>	<b>4.7%</b>	

\* includes performance of any manager retained for less than the full fiscal year

## BASIC RETIREMENT FUNDS

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passive managers outperformed the broad market by 0.3 percentage points during fiscal year 1990.

**Fiscal year 1990 performance data for the individual common stock managers are presented in Figure 8. Historical information is included in the Statistical Data Appendix.**

### **Bond Manager Performance**

The SBI constrains the **risk** of the active bond managers' portfolios to ensure that they fulfill their deflation hedge and total fund diversification roles. The managers are restricted in terms of the duration (average life) of their portfolios and the quality of their fixed income investments.

The bond managers successfully fulfilled their long-term risk objective during fiscal year 1990. In general, the managers constructed portfolios consistent with their stated investment approaches and maintained appropriate levels of quality and duration.

As with the stock segment, the returns of each of the Board's active bond managers is evaluated relative to customized **benchmark portfolios**. Relative performance by the bond managers was somewhat disappointing. None of the active

*Figure 9.  
Bond Manager  
Performance  
FY 1990*

	<b>Total Portfolio Return</b>	<b>Benchmark Return</b>
Investment Advisers	6.0%	7.3%
Lehman Management	7.2	7.8
Miller, Anderson & Sherrerd	7.0	7.7
Morgan Stanley	6.7	8.5
Western Asset	7.8	8.1
Fidelity Management (enhanced index)	7.9	7.7
Lincoln Capital (enhanced index)	7.6	7.7
 <b>Basic Funds' Bond Segment</b>	 7.5%	
 <b>Bond Segment Performance Standards</b>		
Salomon Broad Investment		
Grade Bond Index	7.7	
TUCS Median Managed Bond Portfolio	7.1	
 <b>Inflation</b>	 4.7%	



## **BASIC RETIREMENT FUNDS**

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managers exceeded their respective benchmarks for the year. One of the semi-passive managers (Fidelity) outperformed its target for the year while the other (Lincoln) lagged the index by a modest amount. As a group, the active and semi-passive bond managers trailed the performance of the broad bond market by 0.2 percentage points for the year.

**Fiscal year 1990 performance data for the individual bond managers are presented in Figure 9. Historical information is included in the Statistical Data Appendix.**

### **Alternative Asset Managers**

The SBI reviews performance of its real estate investments relative to two standards:

- the Wilshire Associates Real Estate Index, an index of commingled real estate funds
- inflation, as measured by changes in the Consumer Price Index (CPI)

During the last year, the SBI's real estate portfolio has compared favorably to both standards (SBI real estate 5.9%, Wilshire Real Estate Index 3.3%, CPI 4.7%). Comparisons over the last five years are positive as well (SBI real estate 7.4% annualized, Wilshire index 7.1% annualized, CPI 3.8% annualized).

At this time, specific performance objectives have not been established for the venture capital and resource fund managers. The long-term nature of these investments and the lack of comprehensive data on the returns provided by the resource and venture capital markets preclude comprehensive performance evaluation. In the future, as markets for these assets become more institutionalized, the SBI will fully integrate appropriate performance standards for these assets into its performance analysis.



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# **POST RETIREMENT FUND**

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**Investment Objectives**

**Asset Allocation**

**Investment Management**

**Investment Performance**

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**T**he Post Retirement Investment Fund contains the pension assets of retired public employees covered by nine statewide retirement plans (i.e. the Basic Retirement Funds and the Legislative & Survivors Retirement Fund).

The assets of the Post Fund finance monthly annuities paid to retirees. These annuities may be adjusted upwards based on the earnings of the Post Fund. On June 30, 1990, the Post Fund had a market value of \$5.3 billion with over 60,000 retiree participants.

### **INVESTMENT OBJECTIVES**

**Actuarial  
Assumed  
Return**

Public employees participating in the statewide retirement plans are promised benefits based on their total years of service and their "high five" average salaries. When an employee retires, a sum of money sufficient to finance a fixed monthly annuity is transferred from accumulation pools in the Basic Funds to the Post Fund. In order to support promised benefits, the Post Fund must "earn" at least 5% on its invested assets each year. If the Post Fund exceeds this earnings rate, excess earnings are used to finance permanent benefit increases for eligible retirees.

**Earnings  
Objectives**

Within this framework, the State Board of Investment (SBI) pursues two objectives for the Post Fund:

- To generate 5% realized earnings each year to maintain current benefits.
- To generate at least 3% additional realized earnings each year to provide annual benefit increases to eligible retirees.

The Board views the first of these two objectives as being of primary importance. Furthermore, to achieve these two objectives, the SBI recognizes that the Post Fund requires a completely different investment approach than that applied to the Basic Retirement Funds.

## POST RETIREMENT INVESTMENT FUND

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The ability of the Post Fund to maintain current benefit levels and provide future benefit increases depends upon its realized earnings. State statutes define earnings for the Post Fund as interest and dividend income as well as realized equity and fixed income capital gains (or losses). Unrealized capital gains (or losses) have no direct impact on the benefits paid out to retirees. Unrealized capital gains (or losses) are excluded from defined earnings in order to make benefit payments largely insensitive to near-term fluctuations in the capital markets. (More information on the benefit increase formula is included in the Statistical Data Appendix.)

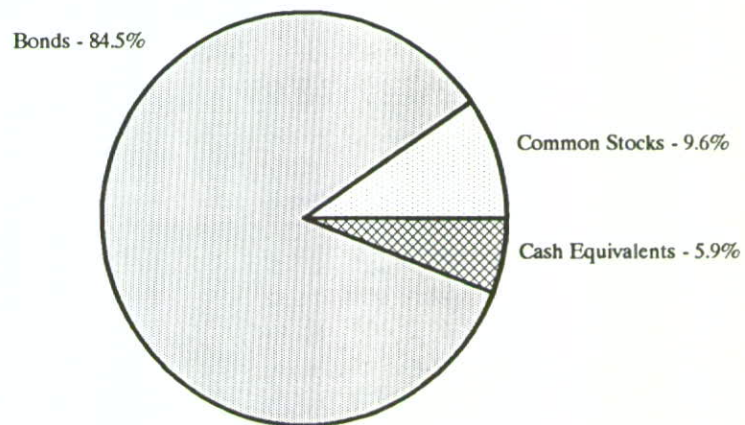
As a result, the Post Fund is not oriented toward long-term total rate of return maximization. Rather, the SBI attempts to generate a high, consistent stream of earnings for the Post Fund that will maintain current benefits, as well as produce income sufficient to increase benefits over time.

### ASSET ALLOCATION

The Board has designed the asset mix of the Post Fund to generate the sizable stable earnings stream referred to in the

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*Figure 10.*  
*Asset Mix*  
*June 30, 1990*



	Market Value	
	\$Millions	Percent
Common Stocks	\$ 514	9.6%
Bonds	4,512	84.5
Unallocated Cash	313	5.9
<b>Total</b>	<b>\$5,339</b>	<b>100.0%</b>



## **POST RETIREMENT INVESTMENT FUND**

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previous section. The Post Fund's year-end asset mix is presented in Figure 10. Historical asset allocation data is shown in Figure 11.

### **Dedicated Bond Portfolio**

The SBI invests the majority of the Post Fund's assets in a dedicated bond portfolio. A dedicated bond portfolio is a collection of high quality bonds with various maturities which generate cash flows from income and principal payments that match a specific stream of liabilities or benefit payments. The highly predictable benefits owed to the Post Fund's retired participants and the high real interest rates that have existed in recent years have created an ideal situation to employ a dedicated bond portfolio.

The dedicated bond portfolio facilitates the attainment of the Post Fund's two objectives. Most importantly, it ensures that funds are available at the required times to meet promised benefit payments. Also, the dedicated bond portfolio consistently earns enough additional interest income to permit a minimum annual benefit increase of 3%, provided the portfolio yields at least 8% on an annual basis. If the portfolio yield is greater than 8% or if stock investments do well, as was the case in recent years, the Post Fund can offer eligible retirees even more than this floor benefit increase.

### **Common Stocks**

While bonds represent the largest asset class in the Post Fund's total portfolio, common stocks also play an important role. Common stocks provide the Post Fund with a source of long run earnings growth not available from fixed income investments. In recent years, realized gains on common stocks have contributed importantly to large benefit increases.

### **Unallocated Cash**

Cash equivalents make up the remainder of the Post Fund's portfolio. Because the Post Fund's cash needs are very predictable, the SBI generally maintains a very small cash equivalents allocation. However, large cash flows into the Post Fund, which frequently occur at fiscal year-end, give a distorted view of the Post Fund's normal allocation to the segment.

### **Changes in Asset Mix**

During fiscal year 1990, the asset mix of the Post Fund did not change significantly. In the mid-1980's, the substantial decline in interest rates necessitated an increase in the size of the dedicated bond portfolio and a concomitant reduction in the size of the common stock portfolio. With lower interest rates, new cash flows into the Post Fund are invested at lower yields than in the recent past. If interest rates remain at relatively low levels, the size of the common stock portfolio will continue to shrink slowly as the dedicated bond portfolio grows larger.

**INVESTMENT MANAGEMENT**

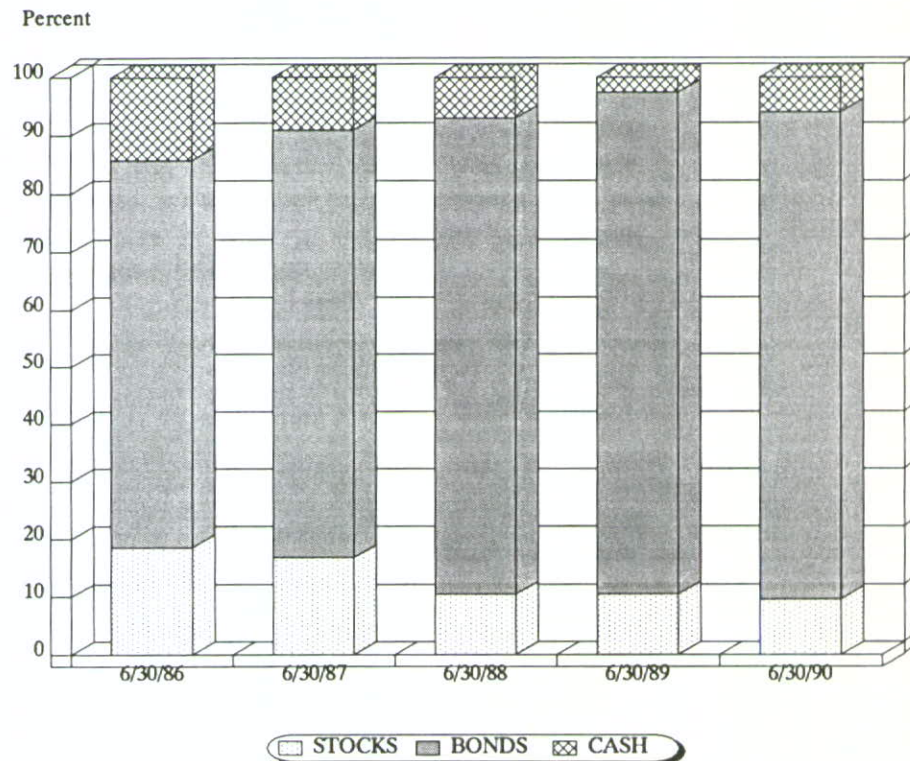
The Post Fund is managed almost entirely by SBI staff. The Board relies heavily on internal management for two reasons:

- **Dedicated Bond Portfolio.** The low turnover, limited discretion nature of the dedicated bond portfolio makes bond management by SBI staff cost effective.
- **Investment Constraints.** With respect to common stock management, the Post Fund's equity manager must be concerned with generating current income and avoiding realized losses. Most external investment managers are not used to functioning under the Post Fund's unique investment requirements. SBI staff, on the other hand, has operated under these constraints since the Post Fund's inception.

**Bond Management**

As described earlier, the dedicated bond portfolio represents the bulk of the Post Fund's assets. Staff constructs the lowest cost portfolio, within established constraints, that produces sufficient cash flows to fund promised benefit payments and maintains adequate quality levels.

*Figure 11.  
Historical  
Asset Mix  
FY 1986-1990*





**POST RETIREMENT INVESTMENT FUND**

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The management of the dedicated bond portfolio requires that the State's actuary supply the SBI with forecasts of benefit payments expected to be paid over a twenty-five year horizon. Based upon these forecasts, a computer program generates a list of bonds that will meet these forecasted benefit payments. Staff then attempt to purchase the recommended issues. If these bonds are not available, substitute bonds are purchased. Staff rebalance the dedicated bond portfolio annually following the receipt of the benefit payment projections from the State's actuary.

**Common Stock Management**

The focus of SBI staff's common stock management is long-term, value-based stock selection. Staff generally implement less aggressive investment strategies than those utilized by the Basic Retirement Funds' active stock managers. As the only common stock manager for the Post Fund, staff recognize the diversification requirements of the Post Fund's stock portfolio. Further, SBI staff are aware of the Post Fund's need to avoid investment strategies which generate high portfolio turnover and which, at times, could result in sizable realized losses.

SBI staff attempt to identify stocks that have attractive expected returns, yet do not possess significantly high levels of market

*Figure 11 (con't).  
Historical  
Asset Mix  
FY 1986-1990*

	Market Value				
	1986	1987	1988	1989	1990
<b>Common Stocks</b>					
\$Million	681.0	673.0	446.0	524.0	514.0
Percent	18.6	16.8	10.5	10.5	9.6
<b>Bonds</b>					
\$Million	2,457.0	2,965.0	3,511.0	4,358.0	4,512.0
Percent	67.2	74.2	82.5	86.9	84.5
<b>Unallocated Cash</b>					
\$Million	520.0	359.0	301.0	132.0	313.0
Percent	14.2	9.0	7.0	2.6	5.9
<b>Total Fund</b>					
\$Million	3,658.0	3,997.0	4,258.0	5,014.0	5,339.0
Percent	100.0	100.0	100.0	100.0	100.0



## POST RETIREMENT INVESTMENT FUND

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volatility. Staff use recommendations generated by quantitative valuation models as the primary source of investment candidates. Staff always maintain a fully invested position in the equity segment.

### Cash Enhancement

The SBI has established a cash enhancement program using financial futures for a portion of the Post Fund's cash reserves. Low risk stock index futures investment strategies are employed to improve the rate of return earned on cash equivalents. The strategies are low risk because each investment is fully hedged. That is, stock index futures contracts are simultaneously bought and sold, thereby eliminating market risk. The underlying mispricings between the contracts provide the source of returns to the cash enhancement program.

The Board has retained BEA Associates, New York, NY, a firm specializing in the management of financial futures, to manage the cash enhancement program.

## INVESTMENT PERFORMANCE

Because of its focus on generating current income, the risk composition of the Post Fund's investment portfolio is conservatively structured. The majority of the Post Fund's assets are invested in high quality bonds. Further, the Post Fund's common stock portfolio maintains a relatively high level of diversification and a moderate level of relative market volatility.

### Total Fund Performance

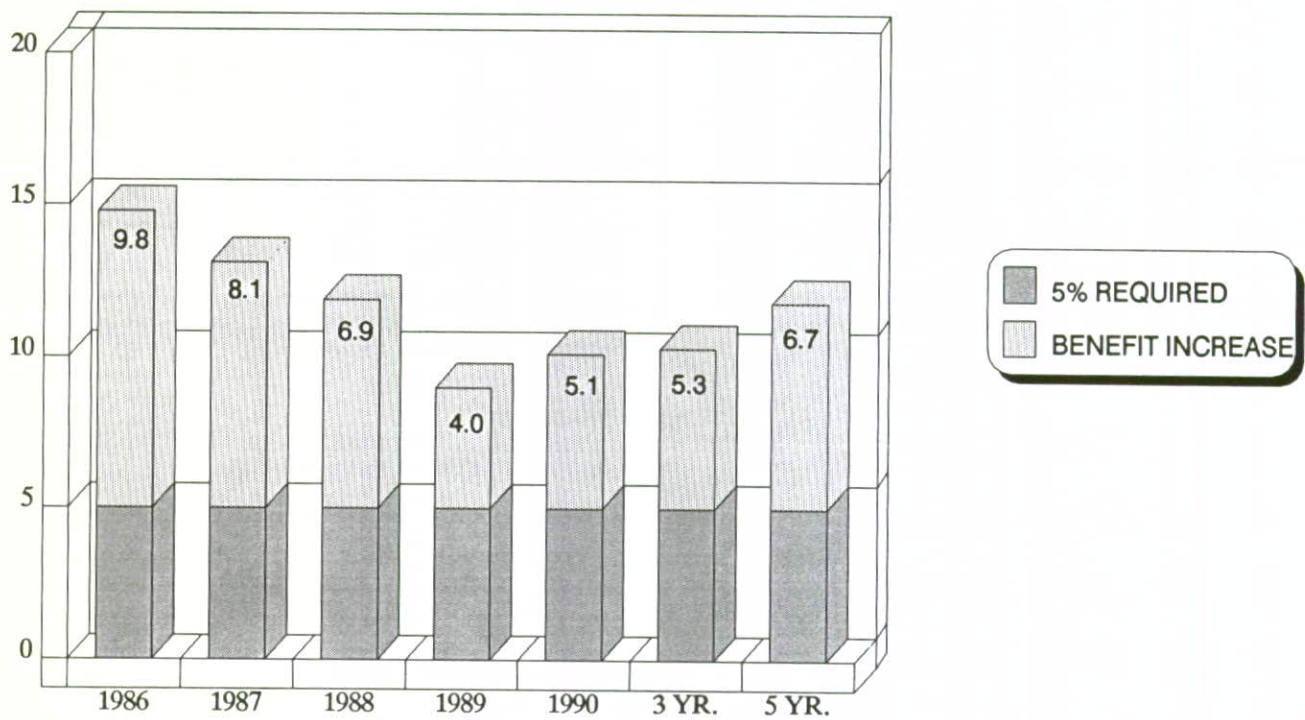
In terms of long-term rate of return objectives, the Fund's investment results are compared to two standards:

- **Actuarial Assumptions.** In order to finance promised benefit payments, the Post Fund must generate a level of interest and dividend income which, combined with realized net capital gains, meets the Post Fund's actuarial assumption of 5% per year.
- **Benefit Increase Level.** The Post Fund is expected to produce additional earnings sufficient to allow benefits to increase by at least 3% per year.

The Post Fund's total portfolio met all of the prescribed risk targets during the 1990 fiscal year. Approximately 85% of the fund was invested in bonds with an average quality rating of AAA. The Post Fund's common stock portfolio maintained a slightly above average level of relative market volatility and was consistently well diversified.

**Figure 12.**  
**Realized Earnings**  
**Fiscal Years 1986-1990**

PERCENT



	1986	1987	1988	1989	1990	(Annualized)	
						3 YR.	5 YR.
Realized Earnings*	14.8%	13.1%	11.9%	9.0%	10.1%	10.3%	11.7%
Benefit Increase**	9.8	8.1	6.9	4.0	5.1	5.3	6.7
Inflation	1.7	3.7	3.9	5.2	4.7	4.6	3.8

\* Interest, dividends and net realized capital gains.

\*\* Payable starting January 1 of the following calendar year.

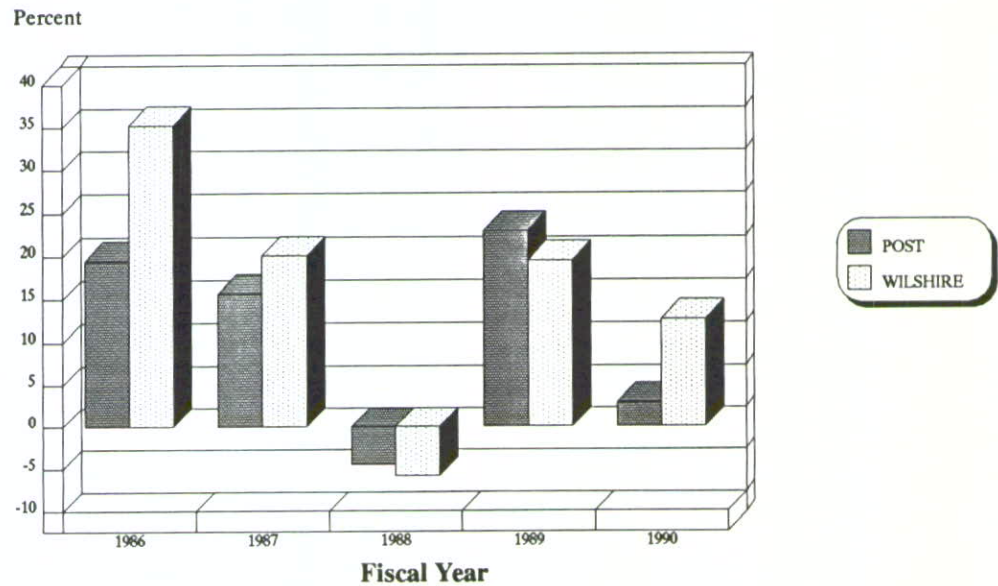
## POST RETIREMENT INVESTMENT FUND

Overall, investment **returns** relative to performance objectives were satisfactory for the 1990 fiscal year. The Post Fund generated income and realized net capital gains in excess of the amount needed to fund promised benefits. The surplus earnings will permit a benefit increase of 5.1% beginning January 1, 1991.

As shown in Figure 12, the Post Fund has generated benefit increases of 6.7% on an annualized basis over the last five years. During this period, investment returns were high compared to inflation, which increased at an annualized rate of 3.8%. The formula used to compute benefit increases was revised in 1980. During the eleven years since the revised formula was instituted, benefit increases have been 6.7% on an annualized basis. This compares to an annualized inflation rate of 5.5% for the same period.

**More information on the benefit increase formula is included in the Statistical Data Appendix.**

*Figure 13.  
Stock Segment  
Performance  
FY 1986-1990*



	1986	1987	1988	1989	1990	(Annualized)	
						3 YR.	5 YR.
<b>STOCK SEGMENT</b>	19.5%	15.7%	-4.5%	22.9%	2.9%	6.5%	10.8%
<b>Wilshire 5000</b>	35.3	20.1	-5.9	19.5	12.7	8.2	15.5



## POST RETIREMENT INVESTMENT FUND

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### Segment Performance

**Common stock** performance, on a relative basis, was not favorable in FY90. The contrarian value style pursued by the Post Fund's internal equity manager underperformed the Wilshire 5000 by 9.8 percentage points for the fiscal year. Historical performance data on the stock segment of the Post Fund is shown in Figure 13.

At the end of fiscal year 1990, the **dedicated bond portfolio** had a duration or average life of 7.8 years and a current yield of 7.8%. This is consistent with the design of the dedicated bond portfolio. More information on the dedicated bond portfolio is shown in Figure 14.

During fiscal year 1990, the **cash enhancement program** produced a 14.5% total rate of return. This is substantially above the rate of return generated by investments in 91 Day Treasury Bills and indicates the cash enhancement program met its objective during its third year of operation.

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*Figure 14.  
Bond Portfolio  
Statistics  
June 30, 1990*

Value at Market	\$ 4,512,158,804
Value at Cost	4,135,028,828
Average Coupon	5.58%
Current Yield	7.83
Yield to Maturity	8.92
Current Yield at Cost	8.38
Time to Maturity	15.36 Years
Average Duration	7.75 Years
Average Quality Rating	AAA
Number of Issues	436



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## **SUPPLEMENTAL INVESTMENT FUND**

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**Income Share Account**

**Growth Share Account**

**Common Stock Index Account**

**Bond Market Account**

**Money Market Account**

**Guaranteed Return Account**

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**T**he Minnesota Supplemental Investment Fund is a multi-purpose investment program that offers a range of investment options to state and local public employees. The different participating groups use the Supplemental Fund for a variety of purposes:

- It functions as the investment manager for all assets of the Unclassified Employees Retirement Plan.
- It acts as the investment manager for all assets of the supplemental retirement programs for state university and community college teachers and for Hennepin County Employees.
- It is one investment vehicle offered to public employees as part of the state's Deferred Compensation Plan.
- It serves as an external money manager for a portion of some local police and firefighter retirement plans.

The Supplemental Investment Fund serves more than 20,000 individuals. On June 30, 1990, the market value of the entire fund was \$477 million.

### **Fund Structure**

A wide diversity of investment goals exists among the Supplemental Fund's participants. In order to meet those needs, the Supplemental Fund has been structured much like a "**family of mutual funds.**" Participants may allocate their investments among one or more accounts that are appropriate for their needs, within statutory requirements and rules established by the participating organizations. Participation in the Supplemental Fund is accomplished through the purchase or sale of shares in each account.

### **Fund Management**

The investment objectives, asset allocation, investment management and investment performance of each existing account in the Supplemental Fund are explained in the following sections.

## SUPPLEMENTAL INVESTMENT FUND

### **Range of Investment Options**

Participants in the Supplemental Fund have six different investment options:

- **Income Share Account**, a balanced portfolio of stocks and bonds
- **Growth Share Account**, a portfolio of actively managed common stocks
- **Common Stock Index Account**, a passively managed common stock portfolio
- **Bond Market Account**, an actively managed fixed income portfolio
- **Money Market Account**, a portfolio of liquid, short-term debt securities
- **Guaranteed Return Account**, an investment option utilizing guaranteed investment contracts (GIC's)

### **Share Values**

Each account in the Supplemental Fund establishes a share value and participants may buy or sell shares monthly, based on the most recent unit value.

In the Income Share Account, the Growth Share Account, the Common Stock Index Account and the Bond Market Account, shares are priced monthly based on the market value of the entire account. Individuals measure the performance of these accounts by changes in share values, which in turn are a function of the income and capital appreciation (or depreciation) generated by the securities in the accounts.

In the Money Market Account and the Guaranteed Return Account, share values remain constant and the accrued interest income is credited to the accounts through the purchase of additional shares at predetermined intervals.

The investment returns shown in this report are calculated using a time-weighted rate of return formula. These returns may differ slightly from calculations based on share values, due to the movement of cash flows in and out of the accounts.



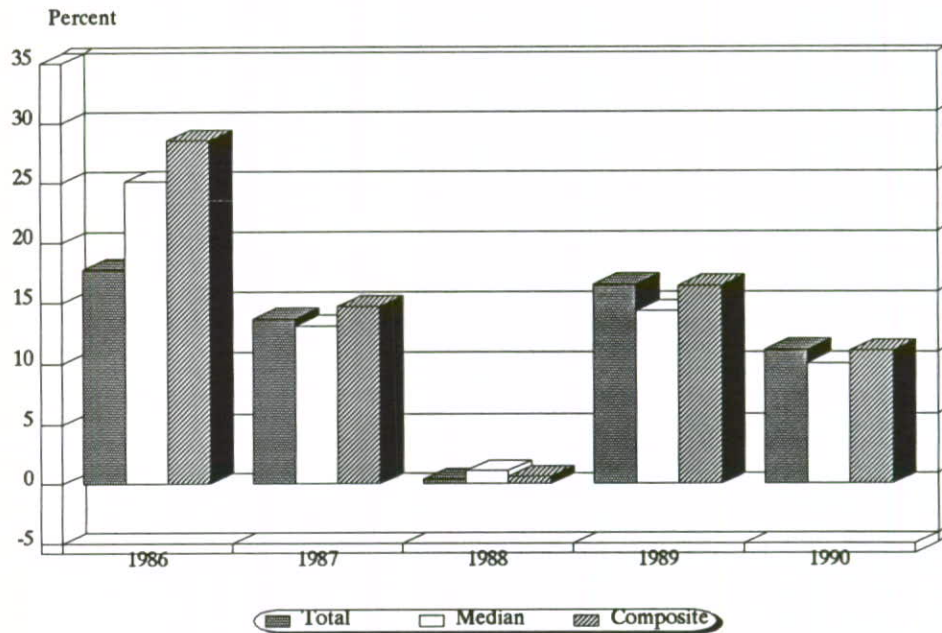
INCOME SHARE ACCOUNT

Objective

The \$245 million Income Share Account resembles the Basic Retirement Funds in terms of investment objectives. The Account seeks to maximize long-term inflation-adjusted rates of return. The Income Share Account pursues this objective within the constraints of protecting against disastrous financial environments and limiting short run portfolio return volatility.

The SBI invests the Income Share Account in a balanced portfolio of common stocks and fixed income securities. The Account's policy asset allocation calls for the following long-term asset mix: **60% common stocks, 35% bonds, 5% cash equivalents.** Common stocks provide the potential for significant long-term capital appreciation, while bonds provide both a hedge against deflation and the diversification needed to limit excessive portfolio return volatility.

Figure 15.  
Income Share  
Account  
FY 1986-1990



	1986	1987	1988	1989	1990	(Annualized)	
						3 YR.	5 YR.
TOTAL ACCOUNT	17.8%	13.7%	0.4%	16.5%	11.1%	9.1%	11.7%
Median Fund*	25.1	13.1	1.1	14.3	10.0	8.9	13.3
Composite**	28.5	14.7	0.6	16.4	11.0	9.1	13.8

\* TUCS Median Balanced Portfolio

\*\* 60% Wilshire 5000/35% Salomon Broad Investment Grade Bond Index/5% 91 day T-Bills

## SUPPLEMENTAL INVESTMENT FUND

**Management** The Income Share Account's investment management structure combines internal and external management. SBI staff manage the entire fixed income segment. Currently, the entire common stock segment is managed by Wilshire Associates as part of a passively managed index fund designed to track the Wilshire 5000. Prior to April 1988, a significant portion of the stock segment was actively managed.

**Performance** Similar to the other SBI funds which utilize a multi-manager investment structure, the Board evaluates the performance of the Income Share Account on two levels:

- **Total Account.** The Income Share Account is expected to exceed the returns of a composite of market indices weighted in the same proportion as its policy asset allocation. In addition, the Income Share Account's performance is expected to exceed the performance of the median fund from a universe of other balanced funds over the long-term.
- **Individual Manager.** The passive stock manager is expected to track closely the performance of the Wilshire 5000. The internal bond manager for the account is expected to exceed the performance of the Salomon Broad Investment Grade Bond Index.

The Income Share Account provided a return of 11.1% for fiscal year 1990, outperforming its market index composite and the median fund. A five year history of performance results is presented in Figure 15.

## GROWTH SHARE ACCOUNT

**Objective** The Board has established above-average capital appreciation as the primary investment objective of the \$74 million Growth Share Account. To achieve this objective, the Account maintains a large equity exposure with the following long-term asset allocation: **95% common stocks, 5% cash equivalents.**

The small cash equivalents component represents the normal cash reserves held by the Growth Share Account as a result of new contributions not yet allocated to common stocks. The Growth Share Account's asset mix may vary from its assigned policy allocation at times, depending on the Account managers' near-term outlook for the capital markets.



## SUPPLEMENTAL INVESTMENT FUND

Because of its substantial common stock policy allocation, the Growth Share Account's returns are more variable than those of the balanced Income Share Account. The Board expects higher long run returns from the Growth Share Account's investments to compensate for the additional variability of returns.

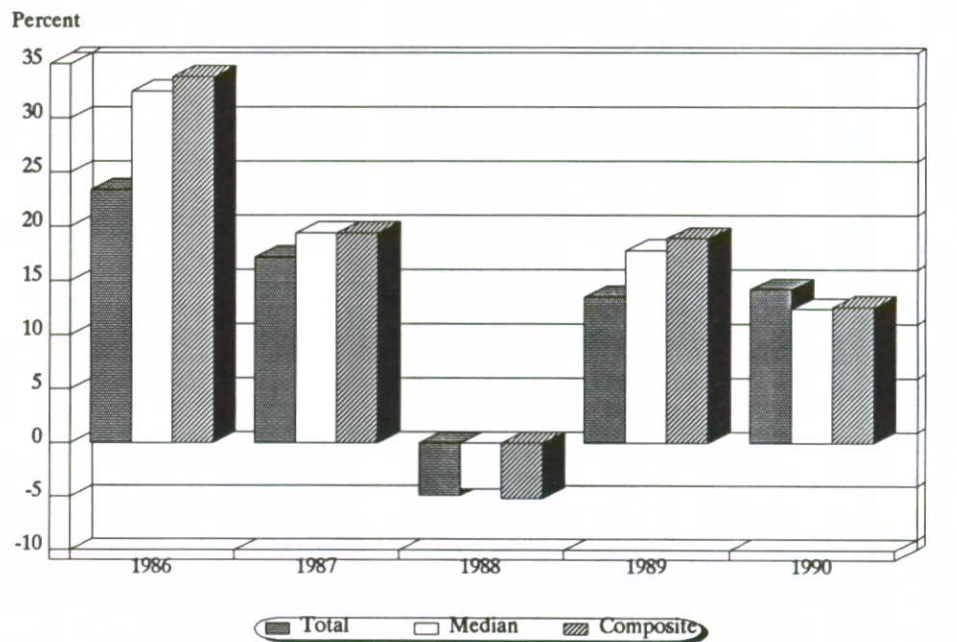
### Management

The SBI has assigned the entire common stock portfolio of the Growth Share Account to external managers. The allocation to active common stock managers, rather than to an index fund, reflects the more aggressive investment policy of the Growth Share Account. Currently, these assets are managed by the same active managers utilized by the Basic Retirement Funds. Prior to April 1988, a significant portion of the account was invested by other active managers.

### Performance

Like the Income Share Account, the Board evaluates the performance of the Growth Share Account on two levels:

Figure 16.  
Growth Share  
Account  
FY 1986-1990



	1986	1987	1988	1989	1990	(Annualized)	
						3 YR.	5 YR.
<b>TOTAL ACCOUNT</b>	23.4%	17.2%	-4.9%	13.5%	14.2%	7.2%	12.3%
Median Fund*	32.5	19.4	-4.3	17.8	12.4	8.8	15.8
Composite**	33.8	19.4	-5.2	18.9	12.6	8.3	15.2

\* TUCS Median Managed Equity Portfolio

\*\* 95% Wilshire 5000/5% 91 Day T-Bills



## SUPPLEMENTAL INVESTMENT FUND

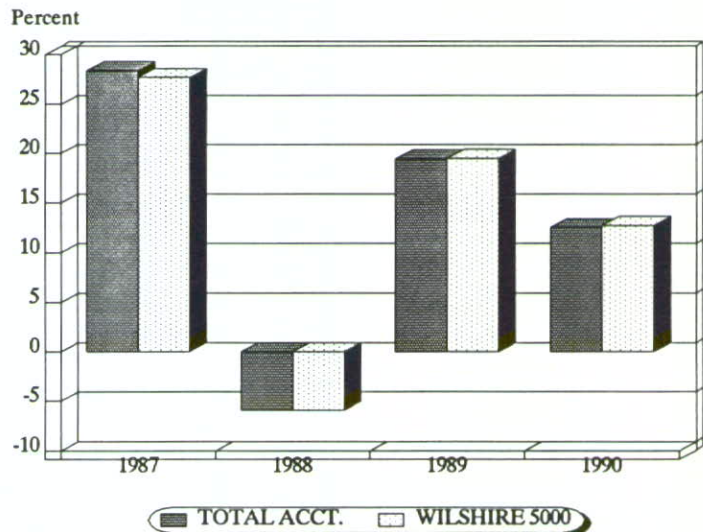
- **Total Account.** The Growth Share Account is expected to exceed the returns of a composite of market indices weighted in the same proportion as its policy asset allocation. The Account's performance is also expected to surpass the performance of the median portfolio from a universe of managed equity portfolios.
- **Individual Manager.** Performance objectives for the external managers are described in the Basic Retirement Funds discussion.

The Growth Share Account outperformed both the composite and median manager for the year by a substantial margin. A five year history of performance results is shown in Figure 16.

### COMMON STOCK INDEX ACCOUNT

The Common Stock Index Account began accepting contributions at the end of July 1986. At the end of fiscal year 1990, it had a market value of \$10 million.

Figure 17.  
Common Stock  
Index Account  
FY 1987-1990



	1987*	1988	1989	1990	(Annualized)	
					3 Yr.	Since Incept.*
Total Account	28.4%	-5.9%	19.4%	12.5	8.1%	13.2%
Wilshire 5000	27.7	-5.9	19.5	12.7	8.2	13.1

\* Since July 30, 1986.

## SUPPLEMENTAL INVESTMENT FUND

**Objective** The investment objective of the Common Stock Index Account is to generate returns that match the performance of the common stock market, as represented by the Wilshire 5000. To accomplish this objective, the SBI allocates all of the Common Stock Index Account's assets to **passively managed common stocks**.

This 100% common stock allocation means that the Common Stock Index Account's returns, like those of the Growth Share Account, are more variable than the returns produced by the balanced Income Share Account. The Board expects that this greater variability in returns will be compensated over the long run by higher returns.

**Management** The Common Stock Index Account is invested entirely by Wilshire Associates, the SBI's passive stock manager.

**Performance** The performance objective of the Common Stock Index Account is straightforward. The Account is expected to track closely the performance of the Wilshire 5000. The SBI recognizes that the Account's returns may deviate slightly from those of the Wilshire 5000 due to the effects of management fees, new contributions, dividend flows or tracking error.

During fiscal year 1990, the Common Stock Index Account produced a return of 12.5%, 20 basis points under the Wilshire 5000. This is within the range of acceptable tracking error.

Total account results for prior years are shown in Figure 17.

## **BOND MARKET ACCOUNT**

The Bond Market Account began accepting contributions at the end of July 1986. At the end of fiscal year 1990, the market value of the Account was \$6 million.

**Objective** The Bond Market Account offers participants a means of adding a fixed income component to their set of investments. The account is **invested entirely in investment-grade government and corporate bonds** with intermediate to long maturities.

## SUPPLEMENTAL INVESTMENT FUND

The Account earns investment returns through interest income and capital appreciation. Because bond prices move inversely with interest rates, the Account entails some risk for investors. However, historically, it represents a lower risk alternative than the investment options that include only common stocks.

### Management

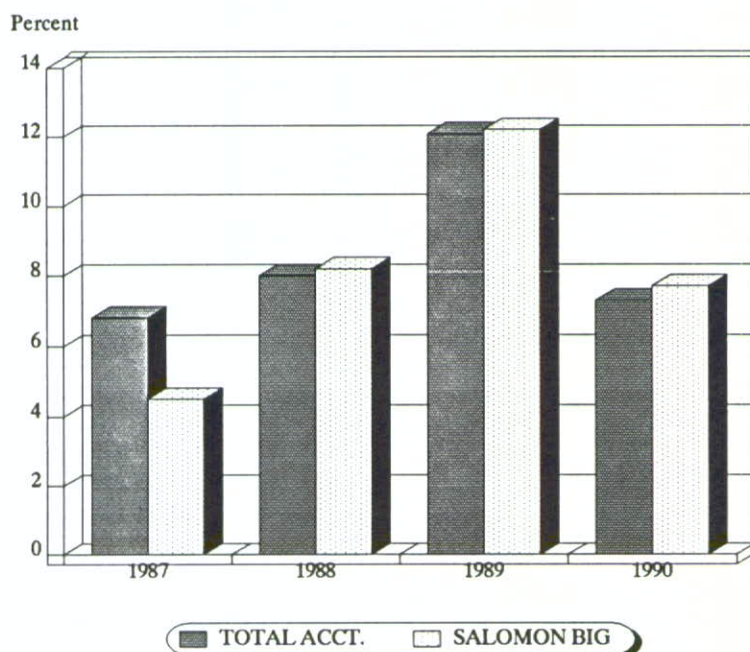
The SBI has assigned the entire bond portfolio to external managers. These assets are managed by the same active managers utilized by the Basic Retirement Funds. A discussion of the SBI's active bond managers is presented in the Basic Funds section.

### Performance

The Bond Market Account is expected to exceed the performance of the bond market, as represented by the Salomon Broad Investment Grade Bond Index. For fiscal year 1990, the Bond Market Account trailed this target, with a 7.3% return compared to the Salomon index return of 7.7%.

Total account results for prior years are shown in Figure 18.

Figure 18.  
Bond Market  
Account  
FY 1987-1990



	1987*	1988	1989	1990	(Annualized)	
					3 Yr.	Since Incept.*
Total Account	6.8%	8.0%	12.1%	7.3%	9.1%	8.7%
Salomon Index	4.5	8.2	12.2	7.7	9.3	8.3

\* Since July 30, 1986.



**MONEY MARKET ACCOUNT**

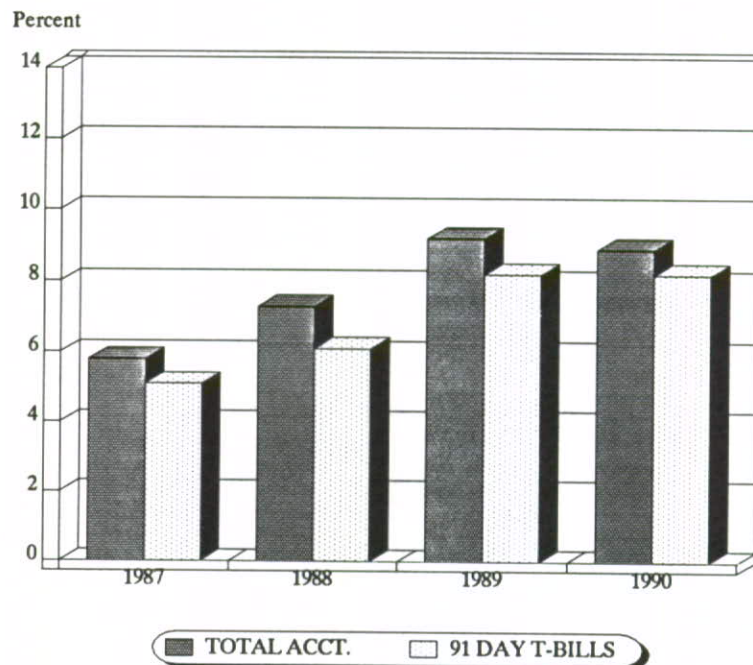
**Objective** The Money Market Account invests solely in **short-term, liquid debt securities**. The Account's investment objectives are to preserve capital and offer competitive money market returns. At the end of fiscal year 1990, the Money Market Account had a market value of \$82 million.

**Management** The Account utilizes the same short-term investment manager as the Basic Retirement Funds, which is State Street Bank and Trust Company.

**Performance** The Account is expected to produce returns competitive with those available from short-term debt securities. The Money Market Account exceeded that target in fiscal year 1990 with a 8.9% return versus a return on 91 Day Treasury Bills of 8.2%.

Total account results for prior years are shown in Figure 19.

*Figure 19.  
Money Market  
Account  
FY 1987-1990*



	1987*	1988	1989	1990	(Annualized)	
					3 Yr.	Since Incept.*
Total Account	5.8%	7.3%	9.2%	8.9%	8.5%	8.0%
91 Day T-Bills	5.1	6.1	8.2	8.2	7.5	7.0

\* Since July 30, 1986.

**GUARANTEED RETURN ACCOUNT**

**Objective** The Guaranteed Return Account opened for subscription in November 1986. The Guaranteed Return Account is designed to offer participants a fixed rate of return for a specified period of time with negligible risk. At the end of fiscal year 1990, the account totaled \$60 million.

**Management** The SBI invests the Guaranteed Return Account in **three-year guaranteed investment contracts** (GIC's) offered by major U.S. insurance companies and banks. Annually, the SBI accepts bids from banks and insurance companies that meet financial quality criteria defined by State statute. Generally, the insurance company or bank bidding the highest three-year GIC interest rate will be awarded the contract for the three-year period. Participants in the Guaranteed Return Account then receive that interest rate on contributions made over the next twelve months.

Within the constraints of permitting only top-rated U.S. insurance companies and banks to bid on the GIC contracts, the SBI desires to maximize the three-year interest rate offered to Guaranteed Return Account participants. The Board believes the competitive bidding presents the most effective method of achieving this goal.

**Performance** The Board was very satisfied with the winning bid of 8.40% on the 1989-1992 GIC, which was 59 basis points over prevailing interest rates on three-year Treasury Notes at the time of the bid.

<b>Contract Period</b>	<b>Annual Effective Interest Rate</b>
Nov. 1, 1987 - Oct. 31, 1990	8.45%
Nov. 1, 1988 - Oct. 31, 1991	9.01%
Nov. 1, 1989 - Oct. 31, 1992	8.40%

The 1987-1990 contract was awarded to Principal Mutual Life, Des Moines, IA. The 1988-1991 contract was awarded to Mutual of America, New York, NY and the 1989-1992 contract was placed with John Hancock, Boston, MA.

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# **PERMANENT SCHOOL TRUST FUND**

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**Investment Objectives**

**Asset Allocation**

**Investment Management**

**Investment Performance**

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**T**he Permanent School Trust Fund is a trust fund created by the Minnesota State Constitution and designated as a long-term source of revenue for public schools. Proceeds from land sales, mining royalties, timber sales, lakeshore and other leases are invested in the Fund.

Income generated by the Fund's assets is used to offset state school aid payments. During fiscal year 1990, investment income reported to the Minnesota Department of Finance totaled \$33 million.

### **INVESTMENT OBJECTIVES**

The State Board of Investment (SBI) invests the Permanent School Trust Fund to produce a high, consistent level of income that will assist in offsetting state expenditures on school aids.

#### **Investment Constraints**

The Fund's investment objectives are influenced by the restrictive legal provisions under which its investments must be managed. These provisions require that the Fund's principal remain inviolate. Further, any net realized capital gains from stock or bond investments must be added to principal. Moreover, if the Fund realizes 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.

These legal provisions limit the investment time horizon over which the Permanent School Trust Fund is managed. Long run growth in its assets is difficult to achieve without seriously reducing current spendable income and exposing the spendable income stream to unacceptable volatility. The SBI, therefore, invests the Fund's assets to produce the maximum amount of current income, within the constraint of maintaining adequate portfolio quality.

### ASSET ALLOCATION

The SBI maximizes current income by investing all of the Permanent School Trust Fund's assets in fixed income securities.

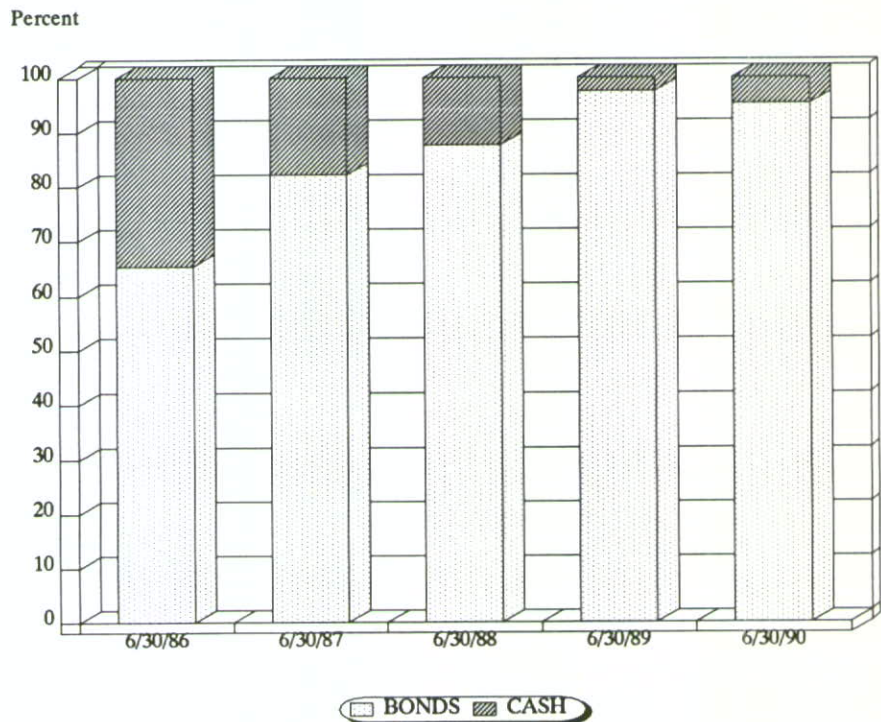
The SBI has a strong incentive not to invest in equity assets for several reasons:

- Common stock yields are considerably lower than bond yields. Thus, common stocks generate less current income than bonds.
- Stock prices are highly volatile and at times may produce realized capital losses that will reduce spendable income.
- Net capital gains become part of the Permanent School Trust Fund's principal. Therefore, the effect of the volatility of common stock prices on the Permanent School Fund's spendable income cannot be smoothed out by including past realized capital gains in spendable income.

Considering these constraints, the Board completely eliminated the Fund's small common stock component in fiscal year 1986,

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*Figure 20.  
Historical  
Asset Mix  
FY 1986-1990*





## PERMANENT SCHOOL TRUST FUND

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investing the proceeds in fixed income securities. Historical asset mix data for the Fund are shown in Figure 20.

### INVESTMENT MANAGEMENT

SBI staff manage all assets of the Permanent School Trust Fund. Given the existing legal restrictions of the Fund, external managers would find it extremely difficult to invest the Fund's portfolio.

The Fund's emphasis on producing high levels of current spendable income through passive investments is not compatible with the investment style of most money managers. In addition, with the move to an all fixed income portfolio, SBI staff management of the Fund is the most cost-effective approach.

The staff manage the Fund's bond portfolio primarily through a buy-and-hold, laddered maturity approach. Virtually all securities are held to maturity after purchase. To minimize reinvestment risk and reduce exposure to dramatic interest rate fluctuations, the portfolio purchases securities with uniformly staggered maturity dates.

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*Figure 20 (con't).*  
*Historical*  
*Asset Mix*  
*FY 1986-1990*

	Market Value				
	June 30,				
	1986	1987	1988	1989	1990
<b>Bonds</b>					
\$Million	239.0	297.0	313.6	375.0	359.0
Percent	65.4	82.2	87.6	97.5	95.2
<b>Unallocated Cash</b>					
\$Million	126.0	64.0	44.2	9.6	18.2
Percent	34.6	17.8	12.4	2.5	4.8
<b>Total Fund</b>					
\$Million	365.0	361.0	357.8	384.6	377.2
Percent	100.0	100.0	100.0	100.0	100.0

## INVESTMENT PERFORMANCE

The Permanent School Trust Fund's investment objective is to maximize spendable income, within the constraint of maintaining adequate portfolio quality.

From a total portfolio **risk perspective**, the Fund is very conservatively structured, as its target asset mix calls for a full commitment to fixed income securities. Within the bond portfolio, SBI staff control risk by establishing a laddered portfolio structure, thereby avoiding significant interest rate bets. Further, the staff purchase only investment-grade bonds and seek to maintain an overall portfolio quality rating of at least AA.

From a **rate of return perspective**, the Board is not concerned with the Fund's total rate of return. Market value changes have no effect on the Fund's ability to produce spendable income. Spendable income is affected only to the extent that any securities are sold at losses. Thus, the Fund's return objective is to maintain a high current yield on new investments.

The Fund achieved its risk-return performance objectives during the year. On June 30, 1990, the Fund's bond portfolio had a duration of 7.2 years, an average quality rating of AAA and a current yield of 9.0%. Further, for fiscal year 1990 the Fund generated income in excess of the Minnesota Department of Finance's spendable income target.

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*Figure 21.*  
*Bond Portfolio*  
*Statistics*  
*June 30, 1990*

Value at Market	\$358,956,742
Value at Cost	343,574,060
Average Coupon	9.00%
Current Yield	9.00
Yield to Maturity	8.96
Current Yield at Cost	9.22
Time to Maturity	15.11 Years
Average Duration	7.22 Years
Average Quality Rating	AAA
Number of Issues	132

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# **CASH MANAGEMENT**

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**Internal Cash Pools**

**Securities Lending Program**

**Certificate of Deposit Program**

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**INTERNAL CASH POOLS**

**State Cash  
Accounts**

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. To this end, the SBI invests these cash accounts in short-term, liquid, high quality debt securities. These investments include U. S. Treasury and Agency issues, repurchase agreements, bankers acceptances, and commercial paper. On June 30, 1990, the combined value of all agency cash balances was \$3 billion.

**Pool  
Structure**

Most of the cash accounts are managed by SBI staff through two pooled investment vehicles, which operate much like money market mutual funds:

- **Trust Fund Pool.** This pool contains cash balances of retirement-related accounts managed internally as well as the cash in the Permanent School Fund. The Trust Fund Pool has an average daily balance of \$ 0.2 billion.
- **Treasurer's Cash Pool.** This pool contains cash balances from the Invested Treasurer's Cash and other accounts necessary for the operation of state agencies . The Treasurer's Cash Pool has an average daily balance of \$2.2 billion.

Because of special legal restrictions, a small number of cash accounts cannot be commingled. These accounts are therefore invested separately.

**Performance**

For fiscal year 1990, both the Trust Fund Pool and the Invested Treasurer's Cash Pool outperformed the total return on 91 Day Treasury Bills:

Trust Fund Pool	8.8%
Treasurer's Cash Pool	9.0
91Day Treasury Bills	8.2%

### **SECURITIES LENDING PROGRAM**

As part of its internal cash management program, the SBI administers a securities lending program in which U. S. Treasury and Government Agency securities held by the SBI are loaned to banks and government security dealers for a daily fee. These loans are fully collateralized. The Securities Lending Program generated approximately \$3.3 million in additional income for the funds managed by the Board in fiscal year 1990.

### **CERTIFICATE OF DEPOSIT PROGRAM**

The SBI also manages a certificate of deposit (CD) program in which it purchases CD's from Minnesota banks and savings and loan institutions. The SBI receives a market rate of return on these investments, using the average secondary CD market rate quoted by the New York Federal Reserve Bank. Only the cash reserves of pension funds (i.e., Basic Retirement Funds or Post Retirement Fund) are used in the program. As a result, all investments are fully insured by the Federal Deposit Insurance Corporation (FDIC).

The Minnesota Certificate of Deposit program provides a reliable source of capital to Minnesota financial institutions, regardless of size, many of which do not have access to the national CD market. The Board designed the program so that no single institution is favored in the allocation of assets.

During fiscal year 1990, the SBI purchased over \$121 million of CD's from Minnesota financial institutions. Since it began the program in 1980, the SBI has purchased over \$1.5 billion of CD's from over 465 financial institutions throughout the state.



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## **MAJOR POLICY INITIATIVES**

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**Task Force on Manager Retention**

**Custom Tilted Index Fund**

**Benchmark Portfolios**

**Performance-Based Fees**

**Manager Continuation Policy**

**Police and Fire Fund Consolidation**

**Resolution on South Africa**

**Mandate on Northern Ireland**

**Proxy Voting**

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## **TASK FORCE ON MANAGER RETENTION**

At the request of the State Board of Investment (SBI), the Investment Advisory Council (IAC) formed a special study group to examine a variety of issues relating to the use of stock and bond managers in the Basic Retirement Funds. The Task Force on Manager Retention was chaired by Judith Mares and included four additional members of the IAC: James Eckmann, James Hacking, Deborah Veverka and Jan Yeomans.

### **Issues Addressed**

The Task Force began its review in October 1989 and presented its final report in June 1990. The group addressed four questions:

- should the SBI continue to use both active and passive managers?
- should the SBI continue to use customized benchmarks to measure manager performance?
- should the SBI change the guidelines it uses to make retention and termination decisions regarding its managers?
- should the SBI take action to reduce the existing bias toward small capitalization growth in the stock manager group?

### **Active/Passive Mix**

As outlined in the Basic Retirement Funds section, Board policy calls for at least one-half of the stock and bond segments of the Basic Funds to be managed passively.

- **Stocks.** Passive (index) management was first used in 1983. At that time, two-thirds of the stock segment was indexed and one-third was placed with active managers. This proportion has remained fairly constant since that time.
- **Bonds.** Semi-passive (enhanced index) management was introduced at the start of fiscal year 1989. At that time, one-half of the bond segment was moved from active managers to enhanced index managers. This division has remained quite stable during the last two years.



## MAJOR POLICY INITIATIVES

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The Task Force recommended no change to the Board's policy on active/passive mix. The group based its endorsement of the existing guideline on two conclusions:

- **Potential for Value Added.** The Task Force believed that active management can add value over the long-term. As a result, the group concluded that it is appropriate for the SBI to utilize active stock and bond managers in the Basic Funds.
- **Size Constraints.** Given the large size of the Basic Funds, the Task Force concluded that the assets committed to active management must be constrained. The one-half active, one-half 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 active stock and bond managers with portfolios of \$150-200 million each. The Task Force believed that the universe of managers capable of effectively handling accounts of this size is somewhat limited. In addition, there are constraints on the number of active managers that can be monitored and evaluated effectively by SBI staff. The current guideline addressed these constraints on a practical level.

### Benchmarks

The SBI began using customized benchmarks to measure the performance of its active managers in 1986. The Task Force reviewed the SBI's experience with benchmarks and concluded that they should continue to be used as an evaluation tool. The Task Force believed that a customized benchmark is a better representation of a manager's specialized investment style or approach than a broad market index. Therefore, the group endorsed the SBI's existing policy to use benchmarks as the quantitative standard against which managers are measured. (For more information see "Benchmark Portfolios" which appears later in this section of the Annual Report.)

### Retention/ Termination Decisions

The SBI has used both qualitative and quantitative standards to evaluate managers since external management was introduced in the Basic Funds in 1983. These standards were formalized in 1988 when the Board adopted its Manager Continuation Policy, a set of comprehensive guidelines that are used to make retention and termination decisions. (For a more complete description, see "Manager Continuation Policy" which appears later in this section of the Annual Report).

The Task Force reviewed the policy to determine if modifications were advisable. The group endorsed the underlying

## MAJOR POLICY INITIATIVES

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structure of the evaluation framework. However, the Task Force concluded that the existing focus on cumulative performance might allow recent deterioration to be overlooked. As a result, the Task Force recommended changes that would trigger an in-depth analysis at various intervals. The analysis would include all aspects of a manager's organization, investment approach and performance history.

### **Bias/Misfit Control**

The Task Force concluded that the use of multiple specialized active managers is appropriate as long as the manager group covers the entire market adequately (i.e. the aggregate benchmark of the manager group approximates the broad market or asset class target). The group observed that the SBI has not provided this coverage with its 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. The Task Force noted that this bias or "misfit" is the primary reason why the SBI's active stock managers, in aggregate, have underperformed the broad market.

The Task Force concluded that unintended misfit is counter productive and should be minimized as efficiently as possible. The group recommended that the characteristics of the index fund should be modified or "tilted" to compensate for misfit in the stock segment of the Basic Funds. (More information on this recommendation is presented in the following section.)

### **Board Action**

At its meeting in June 1990, the Board adopted all recommendations of the Task Force on Manager Retention.



## **CUSTOM TILTED INDEX FUND**

“Misfit” is the difference between the aggregate benchmarks of the active managers and the asset class target. The Basic Funds’ active stock manager group has shown a significant misfit versus its target, the Wilshire 5000, 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 in the past.

Analysis showed that the aggregate benchmarks of the current active managers group could 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.

### **Alternatives**

The State Board of Investment (SBI) could take one of three basic courses of action with respect to misfit:

- It could make an explicit choice to leave the misfit in place indefinitely. This amounts to a judgement that small growth stocks will outperform the market in the future.
- It could 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 index fund.
- It could 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 SBI believes that unintended misfit is counter-productive over the long-term and may mask the value added by active management. Therefore, the SBI has concluded that it should reduce its exposure to misfit risk in a cost efficient manner.



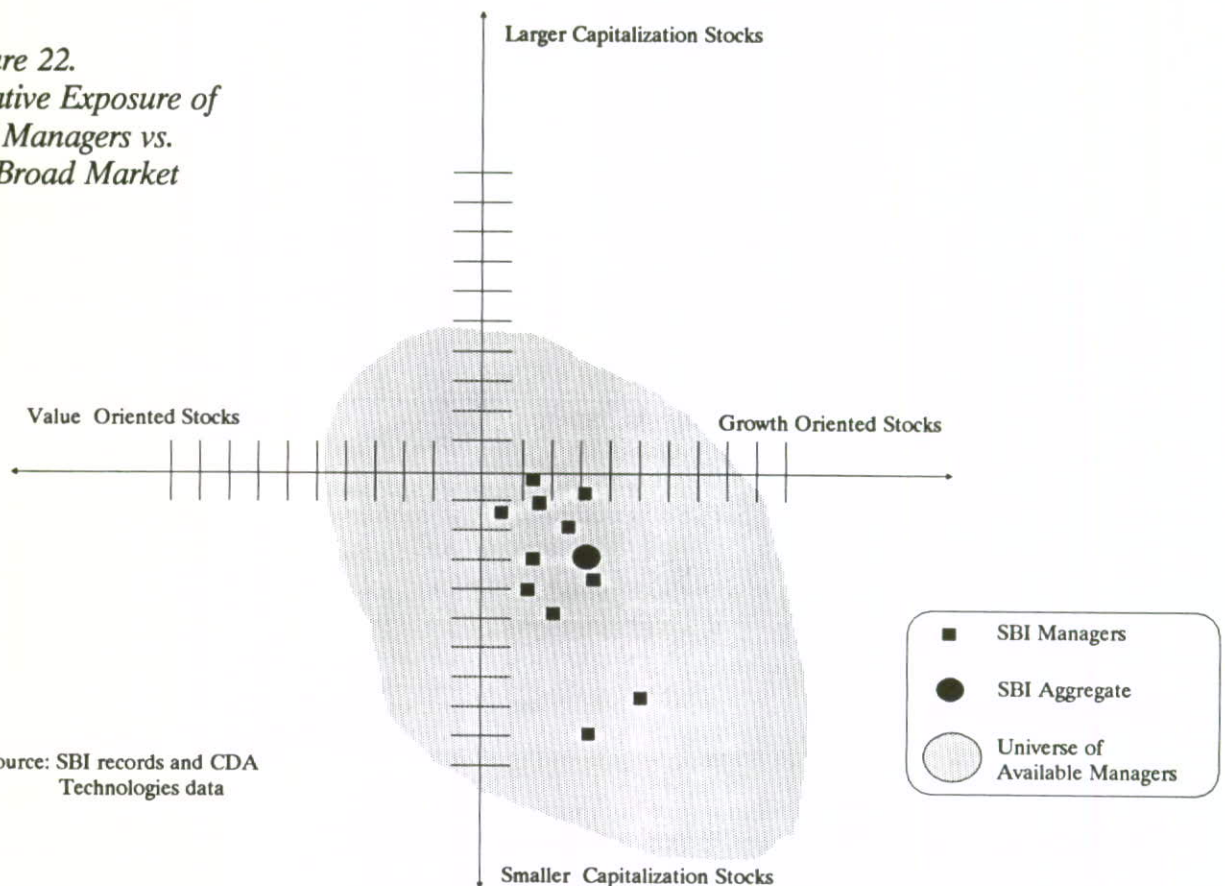
## MAJOR POLICY INITIATIVES

### Implementation Options

With the assistance of the Task Force on Manager Retention (see previous section) the SBI examined several strategies 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 22).
- **Adding New Active Managers.** The universe of available active managers is oriented toward the small-growth area of the market (see Figure 22). 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 the stock segment, they did not reduce the overall misfit significantly.

Figure 22.  
Relative Exposure of  
SBI Managers vs.  
the Broad Market



## MAJOR POLICY INITIATIVES

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- **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.
- **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 in the Basic Funds somewhat. However, like the large-value index, the performance of a

*Figure 23.  
Relative  
Efficiency of  
Misfit Control  
Strategies*

Strategy	Resulting Misfit	Net Change
Current Active Stock Managers Combined with:		
Current Index	± 1.43	—
Large Value Style Index		
● \$300 million	± 1.33	-0.10
● \$500 million	± 1.35	-0.08
● \$700 million	± 1.45	+ 0.02
Active Manager Completeness Fund	± 1.14	-0.29
Tilted Index Fund	± 0.59	-0.84

Note: All figures are annualized percentage points.  
Source: SBI data using BARRA analytics.

completeness fund of this size would vary widely on a year-to-year basis.

- **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.

A summary of the analysis of the various alternatives is shown in Figure 23. The SBI concluded that use of a tilted index fund is clearly the most efficient method available to control its misfit risk.

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 tilted 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.

### Transition

The SBI 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 negative \$65 million. Strong relative performance in the small-growth area of the market in the future could reverse this impact. However, the Board does not believe it is prudent to delay implementation of misfit control indefinitely.

Therefore, the SBI concurred with the recommendation of the Task Force on Manager Retention that the 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, any remaining portion of the "tilt" to the index will be made immediately. This implementation schedule will minimize the transaction costs associated with the transition.



### BENCHMARK PORTFOLIOS

The State Board of Investment (SBI) has utilized benchmark portfolios for each of its active stock and bond managers in recent years. These benchmarks are an integral component of the Board's manager evaluation process and provide the foundation for a performance-based fee system.

#### Purpose

A benchmark portfolio is a customized index that represents the investment style of an individual money manager. A benchmark reflects the prominent risk characteristics that a manager's portfolio would exhibit if the manager were making no active investment judgments.

A benchmark portfolio is a more appropriate target to use in measuring the performance of an individual manager than a broad market index. At times, managers may perform well simply because their styles are "in favor." As representations of managers' styles, benchmark portfolios compensate for this factor. This allows plan sponsors to evaluate more effectively the value individual managers add to the investment process.

#### Characteristics

A benchmark which fairly represents a manager's investment process should possess the following characteristics:

- **Unambiguous.** The names and weights of securities comprising the benchmark are clearly delineated.
- **Investable.** The option is available to forego active management and simply hold the benchmark.
- **Measurable.** It is possible to calculate the return of the benchmark at predetermined intervals.
- **Reflective of current investment opinions.** The manager has current investment knowledge (be it positive, negative, or neutral) of the securities which make up the benchmark.
- **Specified in advance.** The benchmark is constructed prior to the start of an evaluation period.

With these characteristics in mind, a benchmark is constructed by identifying the salient features of the manager's investment process, selecting securities for the benchmark that are consistent with that process and developing a weighting scheme for the securities as well as a normal cash position. The benchmark must be rebalanced on a predetermined schedule.

## **MAJOR POLICY INITIATIVES**

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The description above was drawn from material developed by the SBI's consultant, Richards & Tierney.

### **Development**

SBI staff developed the initial benchmark portfolios for the Board's active common stock managers in fiscal year 1986. During the following year, responsibility for maintaining appropriate benchmarks was shifted from staff to the individual managers. During fiscal years 1988 and 1989 benchmark portfolios were developed and adopted for each of the Board's active bond managers.

### **Monitoring**

All benchmarks are monitored by Board staff and the Board's consultant. Individual manager performance relative to benchmarks is calculated by the consultant on a quarterly basis.

Benchmark portfolios will continue to be a key component of the Board's on-going investment management program. They have proven to be useful tools in manager evaluation and are integral to the application of performance-based fees.

**More detail on historical manager performance relative to benchmark portfolios is contained in the Statistical Data Appendix.**

## **PERFORMANCE-BASED FEES**

After the Securities and Exchange Commission removed its prohibition on performance-based fees, the State Board of Investment (SBI) was among the first institutional investors to implement this method of compensation.

### **Structure**

In general, the Board uses symmetrical fulcrum fee systems. These fee systems establish a base compensation for a manager and a performance benchmark against which additional compensation (positive and negative) is paid. If a manager's performance matches that of the target, no additional fee is paid. If performance exceeds the target, an additional predetermined amount is paid. If performance fails to match the target, the base fee is reduced by the same predetermined formula. As a result, performance above the target produces additional payments to managers that are equivalent to those withheld from managers for performance below target.

### **Active Stock Managers**

Since fiscal year 1987, each of the Board's external active stock managers has been paid using a fee schedule that compensates managers for their performance relative to their benchmark portfolios. The current formula is summarized below:

- As assets under management increase, the base fee rate paid to the manager decreases in line with the manager's sliding fee scale.
- All excess performance calculations reflect base fee payments. The manager's actual portfolio return is calculated net of the base fee. The manager is expected to outperform the benchmark portfolio, net of the base fee, by 150 basis points.
- Performance fees are calculated by assigning a one-quarter weight to the return of the most recent year and a three-quarters weight to the returns over the most recent three years.
- Regardless of the base fee, the manager reaches the maximum performance fee rate at 900 basis points above the benchmark return. Performance at 600 basis points below the benchmark results in a fee rate of zero.
- The minimum fee rate is zero and the maximum total fee rate is twice the base fee.



## MAJOR POLICY INITIATIVES

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### **Enhanced Bond Index Managers**

The Board believes this fee structure retains the simplicity and non-volatile nature of a symmetrical fulcrum fee structure. At the same time, it permits the SBI to benefit from the reduced fees charged by managers as account sizes increase.

The Board uses a performance based fee to compensate its enhanced bond index managers. In several respects, the performance fee for these managers is similar to the schedule described above:

- The excess performance calculation is calculated net of the base fee.
- The manager receives one additional basis point in fee for every fifteen basis points of performance above the Salomon Broad Investment Grade Bond Index. Performance below the index generates reductions in fees by the same proportion.
- The minimum fee is 5 basis points and the maximum is 10 basis points.

The Board believes this formula ensures that the managers maintain a level of risk that is appropriate for a semi-passive investment approach.

**MANAGER CONTINUATION POLICY**

Evaluating the performance of a diverse group of money managers is an integral feature of the Board's investment policy. In order to make informed judgments regarding the current capabilities of its managers, the State Board of Investment (SBI) has adopted a set of specific evaluation guidelines. These guidelines form a "**manager continuation policy**" that assists the Board in its decisions concerning retention and termination of money managers.

The Board believes its 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.

Investment skill is difficult to confirm statistically. Reliance solely on portfolio returns is inadvisable so qualitative aspects of a manager's operation must also be considered. Therefore, the Board's manager continuation policy includes both quantitative and qualitative performance criteria.

**Qualitative  
Criteria**

Qualitative performance evaluation criteria relate to those aspects of a money manager's investment operation that cannot be expressed as measurable targets. Investors such as the Board 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 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 mechanisms

Failure to meet one or more of these criteria is not sufficient reason to terminate a manager. As a general rule, qualitative evaluation is applied in conjunction with 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 reevaluation of the Board's relationship with the firm: a change in the firm's ownership or important members of its management team, a significant gain or loss of accounts within the preceding year, a change in the manager's investment style, or an inability to create or maintain an appropriate benchmark portfolio.

### Quantitative Criteria

Quantitative performance evaluation criteria relate 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 Board recognizes that 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 24 depicts a statistically valid method of assessing the variability of manager performance relative to a benchmark. The horizontal line represents the return on the manager's customized benchmark. Cumulative performance exceeding the benchmark will plot above the horizontal line; cumulative performance falling below the benchmark will plot below the line. The area between the two curved lines represents a confidence interval based on the manager's actual return relative to its 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



## MAJOR POLICY INITIATIVES

low. Since performance results are reviewed on a cumulative and annualized basis, the confidence interval range narrows over time. As more information is received, the ability to make judgments about a manager's investment skill increases. The Board has incorporated this confidence interval approach in the quantitative evaluation of its stock and bond managers.

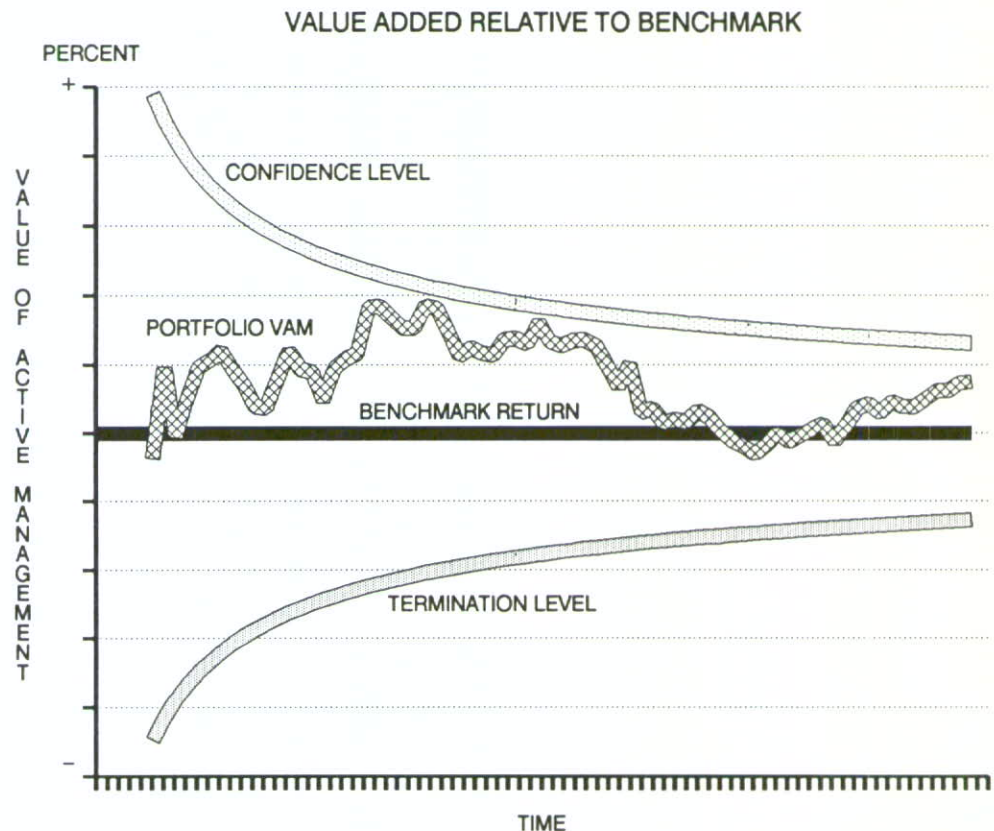
### Review Cycle

Staff review the results of summary qualitative and quantitative evaluations for each manager with the Investment Advisory Council on a quarterly basis.

In addition, each active manager receives a detailed review at least once every three years. This review covers all aspects of the manager's organization and investment approach as well as an in-depth performance attribution analysis. A similar detailed review is conducted if a manager's performance over the most recent five year period trails its benchmark.

These analyses are the foundation for recommendations to the Board concerning the retention and termination of the Board's active stock and bond managers. They provide a comprehensive and consistent approach to performance evaluation and offer a clearer measure of a manager's ability to add value over time.

Figure 24.  
Confidence  
Interval



## **POLICE AND FIRE FUND CONSOLIDATION**

In 1987, legislation was enacted that establishes procedures for voluntary consolidation of local police and fire plans with the Public Employees Retirement Association (PERA). When a merger is approved, assets are transferred from the local plan to the Basic Retirement Funds and Post Retirement Fund.

By statute, the executive director of the State Board of Investment (SBI) has authority to accept assets in-kind or to require that individual holdings be converted to cash prior to the transfer. Since the investments made by local plans are similar to those made by the SBI, most assets can be transferred at their market value.

During fiscal years 1988-1990, twelve plans with assets totaling \$73 million merged with PERA under the procedures established by *Minnesota Statutes* Chapter 353A:

- Anoka Police Relief Association
- Buhl Police Relief Association
- Duluth Police Pension Association
- Hibbing Firemen's Relief Association
- Hibbing Police Relief Association
- Red Wing Fire Relief Association
- Red Wing Police Relief Association
- Rochester Police Relief Association
- St. Cloud Firefighter's Relief Association
- St. Louis Park Fire Department Relief Association
- West St. Paul Firemen's Relief Association
- Winona Fire Relief Association

Several other organizations are in various stages of the approval process and are expected to merge during fiscal year 1991.



**RESOLUTION ON SOUTH AFRICA**

In October 1985, the State Board of Investment (SBI) adopted a resolution concerning its holdings in companies doing business in countries of South Africa and Namibia. In March 1989, the SBI revised and restated the resolution.

**Original  
Resolution**

The original resolution established a four phase timetable for the SBI's divestment program which was tied to a company's rating on its implementation of the Sullivan Principles, a set of fair employment guidelines established by Dr. Leon Sullivan. In addition, the resolution required that the divestment action associated with each phase of the resolution would not take place before the Board obtained legal and financial advice concerning any impact on its fiduciary responsibilities.

After reviewing reports from its financial and legal advisers, the Board decided not to immediately liquidate holdings affected by the resolution. Rather, it chose to implement the requirements of each phase by instituting a policy of "**divestment through attrition.**" Under this policy, the Board's active stock managers were directed to discontinue purchases of stock in companies affected by the resolution unless the manager determined that the failure to buy a particular securities would be a violation of its fiduciary responsibility. As existing holdings were sold during the normal course of business, it was expected that stock holdings in the restricted companies would decline.

During fiscal years 1986-1988, substantial progress was made toward full divestment using the divestment through attrition policy. The reduction was due both to sales of shares during the normal course of business and the decision of many companies to withdraw their operations from South Africa.

**Revised  
Resolution**

In March 1989, the Board revised the original resolution to reflect the divestment through attrition policy and to recognize the continual change in the specific companies that have South African operations.

The revised resolution provides that the Board will divest from its actively managed stock portfolios the remaining holdings of all companies doing business in South Africa by March 1, 1991. In the event a stock becomes subject to divestiture after March 1, 1991, the stock is to be divested within two years.

The SBI relies on information available through the Investor Responsibility Research Center (IRRC) in Washington, D.C. to



## MAJOR POLICY INITIATIVES

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identify companies with direct investment in South Africa. The Board directs its active stock managers to discontinue purchases of these companies unless the manager determines that failure to complete a purchase would be a breach of the manager's fiduciary responsibility.

At the time the Board adopted the revised resolution, the SBI's active stock managers held shares in 21 companies with direct investments in South Africa. By the end of fiscal year 1990, the number had been lowered to 9 companies indicating that progress continues to be made through the Board's divestment through attrition policy.

### **Task Force**

When the original resolution was adopted, the Board created a Task Force on South Africa to advise the SBI on its implementation process. Designees of each of the five Board members serve as members of the Task Force along with a representative from the statewide retirement systems, a representative of public employees and a representative from the private sector. The Task Force continues under the revised resolution and meets periodically to monitor the SBI's progress in implementing the resolution.

**MANDATE ON NORTHERN IRELAND**

**Requirements**

In 1988, the Legislature enacted statutory provisions concerning the Board's investments in U.S. companies with operations in Northern Ireland. The statute requires the State Board of Investment (SBI) to:

- Annually compile a list of U.S. corporations with operations in Northern Ireland in which the SBI invests.
- Annually determine whether those corporations have taken affirmative action to eliminate religious or ethnic discrimination. The statute lists nine goals modeled after the MacBride Principles.
- Sponsor, co-sponsor and support resolutions that encourage U.S. companies to pursue affirmative action in Northern Ireland, where feasible.

The statute does not require the SBI to divest existing holdings in any companies and does not restrict future investments by the SBI.

**Implementation**

The SBI uses the services of the Investor Responsibility Research Center (IRRC), Washington D.C., to determine corporate activity in Northern Ireland. In January 1990 the SBI held stocks or bonds in 27 out of 35 corporations identified by IRRC as having operations in Northern Ireland.

The SBI filed shareholder resolutions with 26 of these corporations during the 1990 proxy season. The resolutions asked corporations to sign the MacBride Principles, to implement affirmative action programs or to report on the steps they have taken to alleviate religious or ethnic discrimination. Ten (10) resolutions were withdrawn when the targeted companies agreed to provide information on their employment activity in Northern Ireland. The voting results on the remaining 16 resolutions are shown below:

<b>Company</b>	<b>Affirmative Vote</b>	<b>Company</b>	<b>Affirmative Vote</b>
Baker Hughes	9.9%	McDonnell Douglas	6.3%
Ball	5.5	Minnesota Mining	4.1
Dun & Bradstreet	12.5	Mobil	10.6
DuPont	3.9	NCR	7.9
Exxon	5.7	Sonoco Products	5.6
General Motors	9.4	United Technologies	5.0
IBM	11.7	Unisys	14.0
Marsh & McLennan	8.8	Xerox	11.5



**PROXY VOTING**

As a stockholder, the State Board of Investment (SBI) is entitled to participate in corporate annual meetings through direct attendance or casting its votes by proxy. Through proxy voting, the Board directs company representatives to vote its shares in a particular way on resolutions under consideration at annual meetings. Resolutions prepared at annual meetings range from routine issues, such as those involving the election of corporate directors and ratification of auditors, to non-routine items involving such matters as merger proposals and corporate social responsibility issues. In effect, as a shareholder the SBI can participate in shaping corporate policies and practices.

**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 which is comprised of a designee of each Board member. 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.

**Voting  
Guidelines**

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.

**Corporate  
Governance  
Issues**

- **Routine Matters.** In general, the SBI supports management on routine matters such as uncontested election of directors; selection of auditors; management proposals on compensation issues including savings plans and stock options; and limits on director and officer liability or increases in director and officer indemnification permitted under the laws of the state of incorporation.
- **Shareholder Rights Issues.** 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; and 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; and adopting anti-greenmail provisions.

### Social Responsibility Issues

- **Buyout Proposals.** In general, the SBI **supports** friendly takeovers and management buyouts.
- **Special Cases.** The Proxy Committee evaluates hostile takeovers, contested election of directors, compensation agreements that are contingent upon corporate change in control, and recapitalization plans on a case-by-case basis. In addition, the Committee reviews all corporate governance issues affecting companies incorporated or headquartered in Minnesota on a case-by-case basis.
- **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); 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; or 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. Also, 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.
- **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 addition, the SBI **supports** resolutions that request a corporation to report on progress toward achieving the objectives of the Valdez

## MAJOR POLICY INITIATIVES

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Principles, an environmental code of conduct for corporations.

- **Other Social Responsibility 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.

### **FY 1990 Proposals**

During fiscal year 1990, the SBI voted proxies for more than 1,900 corporations.

In the corporate governance area, shareholders submitted over 30 proposals to redeem "poison pills" (an anti-takeover device) or submit them to shareholder vote. These proposals passed at 11 companies. More than 40 proposals were submitted concerning confidential voting; 4 proposals received more than half of the shares cast and 13 firms agreed to adopt the procedure.

In the social responsibility area, South Africa again was the dominant social issue with over 70 proposals. Other social responsibility issues included proposals regarding environmental protection and awareness and the campaign against religious discrimination in Northern Ireland.





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# **INVESTMENT MANAGER SUMMARIES**

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**Common Stock Managers**

**Bond Managers**

**Alternative Investment Managers**

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**COMMON STOCK MANAGERS**

**Alliance  
Capital  
Management**

Alliance searches for companies likely to experience high rates of earnings growth on either a cyclical or secular basis. Alliance invests in a wide range of growth opportunities from small, emerging growth to large, cyclically sensitive companies. There is no clear distinction on the part of the firm as to an emphasis on one particular type of growth company over another. However, the firm's decision-making process appears to be much more oriented toward macroeconomic considerations than is the case with most other growth managers. Accordingly, cyclical earnings prospects, rather than secular, appear to play a larger role in terms of stock selection. Alliance is not an active market timer, rarely raising cash above minimal levels.

**Concord  
Capital  
Management**

Concord is an opportunistic theme investor that does not limit itself to any particular group of stocks, avoiding preconceptions about where value currently lies. Concord believes that the marketplace is generally efficient but feels that isolated opportunities exist due to biases inherent in the traditional approaches used by the majority of the investment profession. Concord's non-traditional approach allows the firm to discover these opportunities early and to capture the total appreciation of the undervalued stocks. Concord's goal is to remain as fully invested as possible; the firm rarely raises cash above a minimal level.

**Forstmann Leff  
Associates**

Forstmann Leff is a classic example of a "rotational" manager. The firm focuses almost exclusively on asset mix and sector weighting decisions. Based upon its macroeconomic outlook, the firm will move aggressively into and out of asset classes and equity sectors over the course of a market cycle. The firm tends to purchase liquid, large capitalization stocks. Forstmann Leff will make sizable market timing moves at any point during a market cycle.

**Franklin  
Portfolio  
Associates**

Franklin Portfolio Associate's investment decisions are quantitatively driven and controlled. The firm believes that consistent application of integrated multiple valuation models produces superior investment results. The firm's stock selection model is a composite model comprised of 30 valuation measures each of which falls into one of the following groups: fundamental momentum, relative value, future cash flow, and economic cycle analysis. The firm believes that a multi-dimensional approach to stock selection provides greater consistency than reliance on a limited number of valuation criteria. The firm attributes its value-added to its stock picking ability. Franklin's portfolio management process focuses on buying and selling the right stock rather than attempting to time the market or pick the right sector or industry groups. The firm always remains fully invested.



## INVESTMENT MANAGER SUMMARIES

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### **GeoCapital Corp.**

GeoCapital invests primarily in small capitalization equities with the intent to hold them as they grow into medium and large capitalization companies. The firm uses a theme approach and an individual stock selection analysis to invest in the growth/technology and intrinsic value areas of the market. In the growth/technology area, GeoCapital looks for companies that will have above average growth due to a good product development program and limited competition. In the intrinsic value area, the key factors in this analysis are the corporate assets, free cash flow, and a catalyst that will cause a positive change in the company. The firm generally stays fully invested, with any cash positions due to the lack of attractive investment opportunities.

### **IDS Advisory**

IDS employs a "rotational" style of management, shifting among industry sectors based upon its outlook for the economy and the financial markets. The firm emphasizes primarily sector weighting decisions. Moderate market timing is also used. Over a market cycle IDS invests in a wide range of industries. It tends to buy liquid, large capitalization stocks. While IDS makes occasional significant asset mix shifts over a market cycle, the firm is a less aggressive market timer than most rotational managers.

### **Investment Advisers Inc.**

Investment Advisers is a "rotational" manager. Its macroeconomic forecasts drive its investment decision-making. The firm emphasizes market timing and sector weighting decisions. Investment Advisers invests in a wide range of industries over a market cycle. It tends to hold liquid, medium to large capitalization stocks. The firm is an active market timer, willing to make gradual but significant asset mix shifts over a market cycle.

### **Lieber & Co.**

Lieber and Co. seeks to identify investment concepts that are either currently profitable or likely to become so in the near future, yet whose prospects are not reflected in the stock prices of the companies associated with the concepts. The investment concepts upon which the firm focuses are related to both macroeconomic trends and specific product developments within particular industries or companies. Stocks purchased by Lieber tend to be those of well-managed, high growth and high return on equity, small-to-medium sized companies. The stocks may be undervalued due to the failure of investors to recognize fully either the value of new products or a successful turnaround situation. Particularly attractive to Lieber are small-to-medium sized takeover candidates. The firm generally is fully invested, with any cash positions the result of a lack of attractive investment concepts.

### **Rosenberg Institutional Equity Management**

Rosenberg Institutional Equity Management believes the market is inefficient in the relative valuation of individual companies within groups of similar companies. Rosenberg uses quantitative techniques to identify and purchase undervalued stocks. The firm's valuation system, as embodied in several computer programs, analyzes accounting data on over 3,500 companies. Unlike traditional analysis which assigns an entire company to one industry, Rosenberg compares each company's separate business segments with similar business operations of other companies. These separate valuations are then integrated into a single valuation for the total company. The difference between Rosenberg's valuation and

## INVESTMENT MANAGER SUMMARIES

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the current market price is the expected profit opportunity. Stocks with large positive profit opportunity are candidates for purchase. The firm does not strive to outperform its benchmark by timing the market or by "betting" on factors. The firm always remains fully invested.

### **Sasco Capital Inc.**

Sasco is a long term investor that concentrates exclusively on stock selection. Sasco looks for companies that are selling at a discount to both their asset value and future earnings power. Sasco analyzes a corporation's individual business segments and invests in those that are undergoing major fundamental and structural change to increase their value. Sasco does not attempt to time the market. The firm strives to remain fully invested at all times.

### **Waddell & Reed**

Waddell & Reed focuses its attention primarily on small capitalization aggressive growth stocks. However, the firm has demonstrated a willingness to make significant bets against this investment approach for extended periods of time. The firm is an active market timer and will raise cash to extreme levels at various points in the market cycle.

### **Wilshire Associates**

The index fund managed by Wilshire Associates is a well-diversified portfolio of common stocks designed to match the rate of return performance of the Wilshire 5000. This index is a broad-based equity market indicator composed of the common stocks of all U.S. domiciled corporations for which daily prices are available. In effect, the Wilshire 5000 represents virtually the entire domestic common stock market.

**Portfolio statistics for each of the active equity managers can be found in the Statistical Data Appendix.**



### BOND MANAGERS

#### **Investment Advisers Inc.**

Investment Advisers is a traditional top down bond manager. The firm's approach is oriented toward correct identification of the economy's position in the credit cycle. This analysis leads the firm to its interest rate forecast and maturity decisions, from which the firm derives most of its value-added. Investment Advisers is an active asset allocator, willing to make rapid, significant moves between cash and long maturity investments over the course of an interest rate cycle. Quality, sector and issue selection are secondary decisions. Quality and sector choices are made through yield spread analyses consistent with interest rate forecasts. Individual security selection receives very limited emphasis, focusing largely on specific bond characteristics such as call provisions.

#### **Fidelity Management Trust**

Fidelity Management Trust manages a diversified semi-passive portfolio of fixed income securities designed to simulate the characteristics of the Salomon Broad Investment Grade (BIG) index, a diversified market indicator composed of government, mortgage and corporate securities. The BIG index represents virtually the entire investment grade fixed income market. While matching the risk profile of the BIG index, Fidelity seeks to enhance returns by actively managing yield curve, sector, and issue exposure. The objective is to provide modest increments to the BIG index return on a consistent basis.

#### **Lehman Management**

Lehman's primary emphasis is on forecasting cyclical interest rate trends and positioning its portfolios in terms of maturity, quality and sectors, in response to its interest rate forecast. However, the firm avoids significant, rapidly changing interest rate bets. Instead, it prefers to shift portfolio interest rate sensitivity gradually over a market cycle, avoiding extreme positions in either long or short maturities. Individual bond selection is based on a quantitative valuation approach and the firm's internally-conducted credit analysis. High quality (A or better) undervalued issues are selected consistent with the desired maturity, quality and sector composition of the portfolios. In August, 1989, Lehman completed a management buyout and became Lehman Ark.

#### **Lincoln Capital Management**

Lincoln Capital manages a diversified semi-passive portfolio of fixed income securities designed to simulate the Salomon Broad Investment Grade (BIG) index. Lincoln employs quantitative disciplines that model the BIG index according to a variety of risk variables. Lincoln seeks to enhance returns relative to the BIG index by modest alterations to the BIG index sector weightings, the use of undervalued securities, and an aggressive trading strategy in mortgage securities. The objective is to provide modest increments to the BIG index return on a consistent basis.

#### **Miller, Anderson & Sherrerd**

Miller Anderson focuses its investments in misunderstood or under-researched classes of securities. Over the years this approach has led the firm to emphasize mortgage-backed securities in its portfolios. Based on its economic and interest rate outlook, the firm establishes a



## **INVESTMENT MANAGER SUMMARIES**

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desired maturity level for its portfolios. This decision is instituted primarily through the selection of specific types of mortgage securities that have prepayment expectations consistent with the portfolio's desired maturity. In addition, the firm will move in and out of cash gradually over an interest rate cycle. The firm never takes extremely high cash positions and keeps total portfolio maturity within an intermediate three-to-seven year duration band. Unlike other firms that also invest in mortgage securities, Miller Anderson intensively researches and, in some cases, manages the mortgage pools in which it invests.

### **Morgan Stanley Capital Management**

Morgan Stanley takes a very conservative approach to fixed income investing, emphasizing the preservation of capital through the generation of consistent real returns. This philosophy has led the firm to maintain a vast majority of its portfolio in short to intermediate maturity, high quality (A or better) securities. Large positions in maturities longer than ten years are held only as temporary trading opportunities. These positions are increased or reduced gradually as the firm's expectations of the cyclical level of interest rates changes. Issue selection is of secondary importance to maturity decisions. Rather, given its maturity decisions, the firm prefers to make sizable investments in specific areas of the market where it believes persistent misvaluations are present.

### **Western Asset Management**

Western recognizes the importance of interest rates changes on fixed income portfolio returns. However, the firm believes that successful interest rate forecasting, particularly short-run forecasting is extremely difficult to accomplish consistently. Thus, the firm attempts to keep portfolio maturity in a narrow band near that of the market, making only relatively small, gradual shifts over an interest rate cycle. It prefers to add value primarily through appropriate sector decisions. Based on its economic analysis, Western will significantly overweight particular sectors, shifting these weights as economic expectations warrant. Issue selection, like its maturity decisions, are of secondary importance to the firm.

**Portfolio statistics for each of the active bond managers can be found in the Statistical Data Appendix.**

**ALTERNATIVE INVESTMENT MANAGERS**

**Real Estate**

**Aetna Life  
& Casualty**

**Fund: RESA**

Real Estate Separate Account (RESA) is an open-end commingled real estate fund managed by the Aetna Life and Casualty Company of Hartford, Conn. The fund was formed in January, 1978. The fund has no termination date; investors have the option to withdraw all or a portion of their investment. RESA invests primarily in existing equity real estate. Investments are diversified by location and type of property. On-site management of properties is contracted to outside firms or conducted by a joint venture partner.

**Equitable  
Real Estate  
Group**

**Fund: Prime Property Fund**

Prime Property Fund was formed in August, 1973 by the New York-based Equitable Real Estate Group, Inc. The account is an open-end commingled real estate fund. The fund has no termination date; investors retain the option to withdraw all or a portion of their investment. The fund makes equity investments in existing real estate. The fund's portfolio is diversified by location and property type. Management of the fund's properties is contracted to outside firms or is conducted by joint venture partners.

**Heitman  
Advisory Corp.  
(HAC)**

**Funds: HAC Group Trust I  
HAC Group Trust II  
HAC Group Trust III**

HAC Group Trusts are closed-end commingled funds managed by the Heitman Advisory Group. The majority of the trust investments are equity real estate. The real estate portfolios are diversified by the type and location of the properties. Centre Properties, Ltd., an affiliate of Heitman, manages the trusts' wholly-owned properties. Properties that are partially owned by the trusts may be managed by joint venture partners. Heitman Advisory is based in Chicago.

**Prudential  
Investment  
Management**

**Fund: PRISA I**

PRISA I is an open-end commingled real estate fund. One of the largest and oldest of the open-end funds, PRISA I was formed in July, 1970 by the Prudential Investment Management Corporation of New Jersey. PRISA's real estate portfolio consists primarily of equity investments in existing properties. Investments are diversified by both the type and location of properties. Prudential contracts with outside firms for the on-site management of its properties or retains joint venture partners as



## INVESTMENT MANAGER SUMMARIES

property managers. The fund has no termination date. Investors have the option quarterly to withdraw a portion or all of their investment.

**Fund: RREEF USA III**

**Rosenberg Real  
Estate Equity  
Funds  
(RREEF)**

RREEF USA III is a closed-end commingled fund managed by the Rosenberg Real Estate Equity Funds. Typically, the trust purchases 100% of the equity of its properties with cash. The trust generally does not utilize leverage or participating mortgages. Properties are diversified by location and type. RREEF's in-house staff manages the trust's real estate properties. The firm's primary office is located in San Francisco.

**Funds: AEW - State Street Real Estate Fund III  
AEW - State Street Real Estate Fund IV  
AEW - State Street Real Estate Fund V**

**State Street  
Bank & Trust**

State Street Real Estate Funds are closed-end commingled funds managed by the State Street Bank and Trust Company of Boston. State Street Bank has retained Aldrich, Eastman and Waltch (AEW) as the funds' advisor. The funds' special orientation is the use of creative investment vehicles such as convertible and participating mortgages to maximize real estate returns. The real estate portfolios are diversified by location and property type. On-site property management typically is contracted to outside firms or conducted by joint venture partners.

**Funds: TCW Realty Fund III  
TCW Realty Fund IV**

**Trust Company  
of the West  
(TCW)**

TCW Realty Funds are closed-end commingled funds. The funds are managed as joint ventures between Trust Company of the West and Westmark Real Estate Investment Services of Los Angeles. These managers utilize specialty investment vehicles such as convertible and participating mortgages to enhance real estate returns. Investments are diversified by location and type. Portfolio properties are typically managed by local property management firms.

## Venture Capital

**Fund: Allied Venture Partnership**

**Allied  
Capital**

Allied Venture Partnership was formed in September, 1985 and has a ten-year term. Based in Washington D.C., the fund focuses on later-stage, low technology companies located in the Southeastern and Eastern U. S. Most investments will be made in syndication with Allied Capital, a large, publically owned venture capital corporation formed in 1958.



## INVESTMENT MANAGER SUMMARIES

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### **Funds: Venture Partnership Acquisition Fund I**

#### **Brinson Partners**

Brinson Partners Venture Partnership Acquisition Funds I was formed in 1988. The limited partnership has a ten year term. Brinson Partners is based in Chicago, Illinois. Fund I invests exclusively in secondary venture capital limited partnership interests which are sold by investors who for a variety of reasons have decided to sell some or all of their venture capital holdings.

### **Fund: DSV Partners IV**

#### **DSV Management Ltd.**

DSV Partners IV limited partnership was formed in April, 1985. It has a twelve-year term. DSV Partners IV is the fourth venture fund to be managed by DSV Management Ltd. since the firm's inception in 1968. The firm has offices in Princeton, New Jersey, and California. DSV Partners' investment emphasis is on portfolio companies in the start-up and early stages of corporate development. The geographic focus of the partnership is on East and West Coast firms. Investments are diversified by industry type.

### **Fund: Golder, Thoma and Cressey Fund III**

#### **Golder, Thoma & Cressey**

Golder, Thoma and Cressey Fund III, a venture capital limited partnership, was formed in October, 1987. The fund is based in Chicago, Illinois and has a ten year term. The fund will invest in growing private businesses, found and build companies in fragmented industries and invest in small leveraged buyouts. In addition, the portfolio will be diversified geographically and by industry.

### **Fund: Inman & Bowman**

#### **Inman & Bowman Management**

The Inman & Bowman limited partnership was formed in June, 1985. Its investment focus is early-stage, high-technology firms. The fund will emphasize investments in California, where the general partner, Inman & Bowman Management, is based. However, the fund will consider investments in the Pacific Northwest as well. The partnership has a ten-year term.

### **Fund: Superior Venture Partners**

#### **IAI Venture Capital Group**

Superior Ventures is a Minnesota-based venture capital limited partnership. It was formed in June, 1986 and has an eleven-year term. Superior Ventures is managed by IAI Venture Capital Group, a subsidiary of Investment Advisers, Inc. Up to 15% of the fund will be invested in other Minnesota-based venture capital limited partnerships. The remainder of the fund will be invested in operating companies located within the state.

## INVESTMENT MANAGER SUMMARIES

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	<b>Funds: KKR 1984 LBO Fund KKR 1986 LBO Fund KKR 1987 LBO Fund</b>
<b>Kohlberg, Kravis, Roberts &amp; Co. (KKR)</b>	KKR's Leveraged Buyout Funds are structured as limited partnerships. The funds invest in large leveraged buyouts. The partnerships' portfolio companies are mature, low technology companies with very diversified operations. Kohlberg, Kravis, Roberts and Co. operates offices in New York and San Francisco.
<b>Matrix Partners</b>	<b>Fund: Matrix Partners II</b>  Matrix Partners II limited partnership was formed in August, 1985 and has a term of ten years. The fund's investment emphasis is on high-technology firms in the early and expansion stages of corporate development. However, for diversification the Fund's portfolio will include a sizable component of non-technology firms. The portfolio may include several small leveraged buyout investments as well. The fund is managed by five general partners with offices in Boston, San Jose, and San Francisco.
<b>Norwest Venture Capital Management</b>	<b>Fund: Northwest Venture Partners I</b>  Northwest Venture Partners I was formed in January, 1984 and has a term of ten years. Norwest Venture Capital Management, a wholly owned subsidiary of Norwest Corp., is the general partner and manager of the partnership. Norwest Venture Capital also manages the Northwest Growth Fund, a small business investment company (SBIC), and Northwest Equity Capital, a leveraged buyout fund. Northwest Venture Partners' investment focus is on high technology companies in the early stages of corporate development. However, the partnership's portfolio also includes investments in expansion stage firms and is diversified by the location and industry type of its portfolio companies.
<b>Smith Barney Venture Corp.</b>	<b>Fund: First Century III</b>  First Century III was formed in December, 1984. It is structured as a limited partnership with a term of ten years. The general partner and manager of the partnership is Smith Barney Venture Corp., a subsidiary of Smith Barney Harris Upham and Co. Smith Barney Venture has offices in New York and San Francisco. This is the third fund formed by the firm since 1972. The partnership invests primarily in early stage, high technology companies. Investments are diversified by location and industry group.
<b>Stamps, Woodsum &amp; Co.</b>	<b>Fund: Summit Ventures I Summit Ventures II</b>  Summit Ventures are limited partnerships with ten-year terms. The funds were formed by Stamps, Woodsum & Co., the managing general partners of the fund, and Shearson/American Express. Stamps and Woodsum focus on profitable, expansion stage firms that have not yet



received any venture backing. The majority of the partnerships investments are in high tech firms. Investments are diversified by location and industry type.

### **T. Rowe Price**

T. Rowe Price, a Baltimore-based money management firm, was selected to manage stock distributions from the Board's venture capital limited partnerships. T. Rowe Price has extensive research capabilities in the small capitalization company area. In addition, the firm has a large trading staff with particular expertise in the trading of small capitalization and illiquid stocks.

## Resource Funds

### **Funds: Apache Equipment Financing Notes Apache Acquisition Net Profits Interest**

### **Apache Corporation**

Apache Equipment Financing Notes are a \$150 million private placement to finance Apache's portion of production facility expenditures. The expenditures were made under the terms of a series of offshore joint ventures in the Gulf of Mexico. The joint ventures were organized by Shell Oil Company. In addition to fixed interest payments of 10% per annum, noteholders will receive additional interest of 2% of Apache's share of gross revenues from the joint ventures. The 2% additional interest will be paid to noteholders throughout the life of producing properties. Apache Corp. is based in Denver.

Apache Acquisition Net Profits Interest is a \$190 million private placement to acquire a non-operating interest in the net profit generated by oil and gas properties acquired in 1986 from Occidental Petroleum Company. Investors will receive a 85% net profits interest in the financed share of producing properties until the cumulative total of such payments equals the investment cost plus 8% per year return on investment (the "Payout"). However, if the cumulative net profit discounted at 10% should fail to exceed a defined cumulative cash flow comparably discounted, investors will receive a 90% net profits interest until Payout. After Payout, investors will receive a 75% net profits interest for the life of the producing properties.

### **Fund: British Petroleum Prudoe Bay Royalty Trust**

### **British Petroleum Company**

The British Petroleum Prudhoe Bay Royalty Trust is an overriding royalty interest (ORI) in the Prudhoe Bay Field, Alaska, the largest oil and gas producing field in the U.S. The ORI will equal 15.35% of the first 90,000 barrels per day of oil production net to British Petroleum's interest in the Prudhoe Bay Field. British Petroleum's current total production from the field is over seven times greater than this amount.



## INVESTMENT MANAGER SUMMARIES

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Under terms of the agreement, production costs are fixed and can vary only with inflation. The oil price is tied directly to the West Texas Intermediate spot price. British Petroleum has guaranteed an average minimum price of \$15 per barrel for the first 2.5 years.

**Funds: AMGO I  
AMGO II  
AMGO IV  
AMGO V**

**First  
Reserve  
Corp.**

American Gas and Oil (AMGO) funds are structured as limited partnerships. The general partner and manager of the funds is First Reserve Corp. The general partner's long-term investment strategy is to create diversified portfolios of oil and gas investments. The portfolios are diversified across four dimensions: location, geological structure, investment type, and operating company.

**Fund: Morgan Petroleum Fund II**

**J.P. Morgan  
Investment  
Management**

Morgan Petroleum Fund II was formed in July 1988 and is managed by J.P. Morgan Investment Management, Inc. The fund managers have an office in Houston, Texas. Fund investments will be diversified geographically and by company. Most investments will take the form of an overriding royalty interest and will include, primarily, property acquisitions and development drilling.

**A summary of the Board's commitments to these real estate, venture capital, and resource funds can be found in the Statistical Data Appendix.**



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# **STATISTICAL DATA APPENDIX**

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**Manager Portfolio Statistics**

**Historical Performance Summaries**

**Time-weighted Rate of Return**

**Benefit Increase Formula**

**Fee and Commission Data**

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**Statistical Data Appendix**

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## STOCK MANAGER RISK FACTOR EXPOSURE GLOSSARY

The following definitions describe the risk factors that the State Board of Investment (SBI) uses in monitoring its stock managers. The terms are referred to in Table 1.

SBI analysis of a stock manager's portfolio, in part, utilizes the BARRA E2 risk model. The BARRA model contains a number of risk factors that the SBI has found to correlate highly with a manager's investment style. That is, a manager tends to exhibit consistent exposures to many of these risk factors over time. The benchmark construction process includes identifying these persistent exposures and capturing them in the benchmark portfolio.

Factor exposures are calibrated relative to approximately 1400 of the largest market capitalization (HICAP) companies. An exposure level of 0 for a particular stock to a particular factor indicates that the stock has the same exposure as the capitalization-weighted average of the HICAP stocks. Around that zero exposure, deviations are measured in standard deviation units. Thus, an exposure level of +1 indicates that the stock has an exposure to the factor larger than roughly 68% of the HICAP stocks.

<b>Beta</b>	Forecasts the sensitivity of a stock's return to the return on the market portfolio. The BARRA E2 beta is a forecasted beta, based on a company's exposure to thirteen common risk factors and fifty-five industries.
<b>Book-to-Price (B/P)</b>	Measures the book value of a company's common equity divided by market capitalization.
<b>Dividend Yield (Div. Yld.)</b>	Used as a predictor of dividend yield for the coming year.
<b>Earnings-to-Price (E/P)</b>	Incorporates several variants of a company's earnings-price ratio. Includes the current earnings-price ratio, the normalized (5 year) earnings-price ratio, and analysts's forecasted earnings-price ratio as compiled by the Institutional Brokerage Estimate Services (IBES).
<b>Earnings Variability (Earn. Var.)</b>	Indicates the variability of a company's earnings. Comprised of six descriptors: historical earnings variance, cash flow variance, earnings covariability with the economy, the level of concentration of the company's earnings from various sources, the incidence of extraordinary items, and the variability of the company's earnings estimates as compiled by IBES.
<b>Equity Allocation (Eq. Alloc.)</b>	Measures the percent of the manager's total portfolio invested in common stocks, preferred stocks and convertible securities.
<b>Financial Leverage (Finl.)</b>	Measures the extent to which a company utilizes financial leverage to finance its operations. Comprised of three descriptors: debt-to-total assets (at market), debt-to-total assets (at book), and uncovered fixed charges.
<b>Foreign Income (For. Inc.)</b>	Measures the extent to which a company's operating income is generated outside of the U.S.

## STOCK MANAGER RISK FACTOR EXPOSURE GLOSSARY

<b>Growth</b>	Indicates potential growth in a company's earnings over the next five years. Comprised of seven descriptors: most recent five-year dividend payout, most recent five-year dividend yield, most recent five-year earnings-price ratio, change in capital structure, normalized (5 year) earnings-price ratio, recent earnings change, and forecasted earnings growth.
<b>Labor Intensity (Labor Int.)</b>	Measures the degree to which labor, as opposed to capital, is used by a company as a factor of production. Derived from three descriptors: labor expense relative to assets, fixed plant and equipment (inflation adjusted) relative to equity, and depreciated plant value relative to gross plant value.
<b>Monthly Turnover (Mo. T/O)</b>	Measures the total equity asset sales divided by the average value of the equity assets in the manager's portfolio.
<b>Size</b>	Indicates the relative size of the company. It includes three descriptors: market capitalization, total assets, and the length of earnings history.
<b>Success (Suc.)</b>	Describes the extent to which a company has been "successful" in the recent past, in terms of both earnings and stock prices. Composed of six descriptors: most recent five-year earnings growth, most recent one-year earnings growth, forecasted next year's earnings growth, historical alpha, and relative strength. (The last two descriptors are calculated over the most recent year and most recent five-years).
<b>Trading Activity (Trad. Act.)</b>	Measures the trading characteristics of a company's stock. Comprised of six descriptors: most recent five-year share turnover, most recent year share turnover, quarterly share turnover, stock price, trading volume relative to stock price variance, and the number of IBES analysts following the stock.
<b>Variability in Markets (Var. Mkts.)</b>	Measures the volatility of a stock's return related to its past behavior and the behavior of its options. Variants of the factor are calculated for optioned stocks, listed but not optioned stocks, and thinly traded stocks. A partial list of the descriptors that make up this factor include: historical beta, option-implied standard deviation of return, daily standard deviation of return, cumulative price range, stock price, and share turnover.



Table 1.

## EXTERNAL ACTIVE STOCK MANAGERS

Risk Factor Exposures  
July 1985 - June 1990

	Beta	Var. Mkts.	Suc.	Size	Trad. Act.	Growth	E/P	B/P	Earn. Var.	Finl.	For. Inc.	Labor Int.	Div. Yld.	Mo. T/O	Eq. Alloc.
<b>Alliance Capital</b>															
Minimum	1.09	0.13	0.15	-0.28	0.17	0.41	-0.25	-0.55	-0.12	-0.12	-0.33	0.18	-0.80	0.81	90%
Average	1.14	0.26	0.32	0.06	0.42	0.57	-0.13	-0.36	0.04	0.08	0.06	0.28	-0.66	4.71	97%
Maximum	1.19	0.45	0.51	0.31	0.61	0.72	-0.04	-0.25	0.22	0.28	0.26	0.37	-0.50	10.91	100%
Bmrk. Avg.	1.16	0.37	0.01	-0.42	0.26	0.50	-0.04	-0.20	0.06	-0.03	-0.03	0.44	-0.55	N.A.	95%
<b>Concord Capital*</b>															
Minimum	1.12	0.23	-0.42	-0.77	0.43	0.14	0.10	0.16	0.20	0.01	-0.02	0.16	-0.24	0.00	97%
Average	1.15	0.32	-0.29	-0.57	0.51	0.20	0.25	0.22	0.24	0.06	0.10	0.22	-0.19	2.39	98%
Maximum	1.19	0.51	-0.21	-0.42	0.63	0.29	0.37	0.28	0.29	0.11	0.24	0.33	-0.13	6.31	99%
Bmrk. Avg.	1.04	0.18	-0.12	-0.72	0.12	0.11	0.02	0.09	0.15	-0.05	-0.36	0.01	-0.09	N.A.	95%
<b>Forstmann Leff</b>															
Minimum	1.01	0.05	-0.16	-1.35	0.19	-0.14	-0.35	-0.45	-0.04	-0.08	-0.37	-0.19	-1.08	1.69	44%
Average	1.16	0.52	0.27	-0.37	0.59	0.36	0.04	-0.16	0.26	0.13	0.13	0.11	-0.49	17.33	65%
Maximum	1.42	1.26	0.70	0.20	1.37	1.07	0.36	0.03	0.56	0.40	0.58	0.38	-0.14	57.51	94%
Bmrk. Avg.	1.13	0.36	0.02	-0.50	0.24	0.36	-0.04	-0.04	0.16	0.07	-0.04	0.23	-0.35	N.A.	70%
<b>Franklin Portfolio*</b>															
Minimum	1.04	0.22	-0.07	-0.95	0.06	0.14	0.15	0.10	0.18	-0.10	-0.61	-0.14	-0.26	3.62	94%
Average	1.06	0.27	0.03	-0.83	0.10	0.22	0.26	0.16	0.27	-0.03	-0.56	0.03	-0.18	7.40	98%
Maximum	1.09	0.31	0.15	-0.78	0.17	0.31	0.41	0.25	0.38	0.06	-0.52	0.16	-0.09	10.28	99%
Bmrk. Avg.	1.04	0.21	-0.11	-0.74	0.14	0.11	-0.01	0.10	0.16	-0.07	-0.39	0.01	-0.10	N.A.	95%
<b>GeoCapital Corp.**</b>															
Minimum	1.22	0.90	-0.41	-2.21	0.49	0.94	-0.72	-0.46	0.53	0.46	-0.45	0.50	-0.98	0.00	76%
Average	1.22	0.95	-0.35	-2.15	0.54	0.99	-0.67	-0.42	0.56	0.60	-0.43	0.51	-0.93	1.10	85%
Maximum	1.23	1.00	-0.24	-2.09	0.57	1.06	-0.61	-0.38	0.59	0.70	-0.40	0.52	-0.91	2.31	93%
Bmrk. Avg.	1.19	0.78	-0.02	-2.00	0.42	0.93	-0.42	-0.22	0.38	0.18	-0.38	0.53	-0.80	N.A.	95%
<b>IDS Advisory</b>															
Minimum	1.07	0.17	0.05	-0.47	0.07	0.20	-0.22	-0.37	0.00	-0.18	-0.43	0.03	-0.53	0.84	86%
Average	1.12	0.34	0.34	-0.12	0.28	0.35	-0.06	-0.24	0.15	-0.03	0.05	0.25	-0.44	7.44	95%
Maximum	1.16	0.55	0.57	0.12	0.50	0.47	0.11	-0.13	0.36	0.21	0.51	0.37	-0.09	17.36	100%
Bmrk. Avg.	1.01	0.05	-0.03	-0.17	0.04	0.04	0.02	0.03	0.03	-0.02	-0.09	0.00	-0.04	N.A.	90%

Bmrk. Avg. = Benchmark average.

Aggregate Active figures include data only for managers retained on 6/30/90.

\* Manager retained on 4/1/89. Data covers period from 4/1/89 - 6/30/90 only.

\*\* Manager retained on 4/1/90. Data covers period from 4/1/90 - 6/30/90 only.



Table 1. Con't.

## EXTERNAL ACTIVE STOCK MANAGERS

## Risk Factor Exposures

July 1985 - June 1990

	Beta	Var. Mkts.	Suc.	Size	Trad. Act.	Growth	E/P	B/P	Earn. Var.	Finl.	For. Inc.	Labor Int.	Div. Yld.	Mo. T/O	Eq. Alloc.
<b>Investment Advisers</b>															
Minimum	1.05	0.01	-0.13	-0.45	0.21	0.22	-0.33	-0.36	-0.16	-0.16	-0.17	-0.08	-0.64	0.00	66%
Average	1.09	0.21	0.24	-0.10	0.39	0.35	-0.11	-0.23	0.04	-0.01	0.32	0.17	-0.42	5.28	80%
Maximum	1.16	0.49	0.43	0.13	0.79	0.51	0.14	0.18	0.34	0.13	0.62	0.35	-0.24	35.58	94%
Bmrk. Avg.	1.03	0.04	-0.01	0.07	0.07	0.05	0.00	-0.03	-0.01	-0.01	0.12	0.04	-0.05	N.A.	85%
<b>Lieber &amp; Co.</b>															
Minimum	1.03	0.10	-0.32	-1.98	0.02	0.34	-0.10	-0.18	-0.02	-0.20	-0.63	0.35	-0.63	0.10	87%
Average	1.07	0.34	0.01	-1.60	0.13	0.40	0.04	-0.02	0.10	-0.02	-0.47	0.51	-0.51	3.85	95%
Maximum	1.11	0.55	0.36	-1.34	0.29	0.51	0.16	0.10	0.24	0.10	-0.27	0.64	-0.40	11.43	100%
Bmrk. Avg.	1.09	0.48	-0.07	-2.00	0.02	0.58	-0.04	-0.05	0.27	0.04	-0.40	0.57	-0.61	N.A.	95%
<b>Rosenberg Institutional*</b>															
Minimum	1.01	0.03	-0.12	-0.33	0.01	0.01	0.24	0.29	0.07	-0.05	-0.08	-0.11	-0.06	1.81	99%
Average	1.02	0.06	-0.03	-0.25	0.04	0.04	0.28	0.32	0.11	-0.02	-0.02	-0.06	-0.04	4.51	100%
Maximum	1.03	0.09	0.04	-0.17	0.08	0.07	0.30	0.35	0.17	0.02	0.04	-0.02	0.01	6.43	100%
Bmrk. Avg.	1.01	0.06	-0.05	-0.24	0.03	0.06	-0.01	0.05	0.05	0.00	-0.14	-0.01	-0.05	N.A.	98%
<b>Sasco Capital*</b>															
Minimum	1.06	0.15	-0.53	-1.11	0.13	0.31	-0.34	0.23	0.86	0.33	-0.13	-0.01	-0.30	0.00	94%
Average	1.07	0.25	-0.32	-0.92	0.18	0.44	-0.25	0.32	0.93	0.38	-0.04	0.05	-0.24	2.34	97%
Maximum	1.09	0.42	-0.16	-0.78	0.23	0.59	-0.15	0.40	0.98	0.49	0.08	0.20	-0.18	6.07	99%
Bmrk. Avg.	1.09	0.38	-0.18	-1.02	0.26	0.31	-0.10	0.14	0.71	0.29	-0.03	0.13	-0.22	N.A.	95%
<b>Waddell &amp; Reed</b>															
Minimum	1.10	0.28	-0.09	-1.29	0.40	0.16	-0.38	-0.24	0.16	-0.24	-0.35	0.07	-0.80	0.00	45%
Average	1.20	0.62	0.16	-0.73	0.78	0.50	-0.18	-0.02	0.45	0.01	0.01	0.37	-0.51	11.41	73%
Maximum	1.30	0.92	0.35	-0.16	1.20	0.79	0.24	0.19	0.75	0.25	0.50	0.54	-0.05	27.19	90%
Bmrk. Avg.	1.17	0.56	-0.10	-1.17	0.39	0.57	-0.21	0.03	0.37	0.29	-0.12	0.37	-0.56	N.A.	80%
<b>Aggregate Active</b>															
Minimum	1.09	0.24	-0.07	-0.53	0.30	0.28	-0.11	-0.22	0.17	0.01	-0.10	0.07	-0.60	N.A.	N.A.
Average	1.13	0.37	0.11	-0.38	0.48	0.40	-0.05	-0.06	0.23	0.09	0.04	0.21	-0.45	N.A.	N.A.
Maximum	1.19	0.52	0.25	-0.24	0.63	0.53	0.02	0.08	0.29	0.18	0.19	0.35	-0.28	N.A.	N.A.

Bmrk. Avg. = Benchmark average.

Aggregate Active figures include data only for managers retained on 6/30/90.

\* Manager retained on 4/1/89. Data covers period from 4/1/89 - 6/30/90 only.

\*\* Manager retained on 4/1/90. Data covers period from 4/1/90 - 6/30/90 only.

Table 2.

## EXTERNAL ACTIVE STOCK MANAGERS

Sector Weights  
Actual Portfolio Less Benchmark Portfolio  
July 1985 - June 1989

	Cons. Non Dur.	Cons. Dur.	Basic Mat.	Cap. Goods	Energy	Tech.	Trans.	Util.	Finl.
<b>Alliance Capital</b>									
Minimum	-6.03%	-1.88%	-9.93%	-6.40%	-14.86%	-12.08%	-4.12%	-13.94%	-5.16%
Average	5.27	0.50	-5.03	-1.61	-1.89	-0.75	2.22	-2.31	3.59
Maximum	25.52	2.79	2.68	3.96	7.09	7.33	8.66	6.39	19.02
Bmrk. Avg.	37.09	4.35	11.68	7.11	6.27	13.80	2.80	5.19	11.71
<b>Concord Capital*</b>									
Minimum	-8.65	-2.49	-1.65	-0.03	-3.81	10.35	-0.22	-12.92	-4.57
Average	-6.71	-1.99	6.07	0.90	-0.37	13.77	0.87	-12.13	-0.41
Maximum	-4.24	-1.16	11.65	1.93	1.24	16.28	1.85	-11.48	4.45
Bmrk. Avg.	28.14	4.31	11.85	5.83	5.28	5.32	3.31	16.10	19.87
<b>Forstmann Leff</b>									
Minimum	-17.35	-5.77	-4.39	-7.29	-7.69	-10.55	-3.69	-10.60	-16.64
Average	1.86	-2.50	8.26	-3.49	4.58	-1.88	-0.49	-3.10	-3.24
Maximum	23.04	3.34	21.83	2.43	26.09	13.57	6.03	14.14	21.04
Bmrk. Avg.	33.34	4.89	13.64	7.45	5.44	9.93	3.45	6.71	15.14
<b>Franklin Portfolio*</b>									
Minimum	-2.59	-1.94	-0.55	-1.43	-4.57	-1.17	-2.38	-8.41	-1.19
Average	1.45	-0.83	1.08	-0.07	0.35	0.64	-0.67	-3.08	1.14
Maximum	6.57	0.09	2.03	0.94	2.36	2.76	0.62	1.63	3.51
Bmrk. Avg.	29.99	4.08	10.82	6.28	5.29	5.15	2.66	16.59	19.14
<b>GeoCapital Corp.**</b>									
Minimum	12.50	-3.67	-2.64	-3.53	-6.45	-10.86	-3.07	5.10	7.20
Average	13.68	-3.63	-2.36	-1.58	-6.42	-10.21	-3.06	5.66	7.93
Maximum	14.45	-3.56	-2.09	-0.36	-6.40	-9.09	-3.06	5.95	8.57
Bmrk. Avg.	51.85	3.62	6.20	6.09	6.43	14.33	3.07	4.15	4.29
<b>IDS Advisory</b>									
Minimum	-7.87	-2.94	-2.55	-6.56	-11.76	-10.61	-2.26	-14.81	-13.22
Average	0.48	1.01	8.70	2.30	-1.23	-1.69	2.90	-8.32	-4.16
Maximum	8.25	6.74	20.60	9.71	5.68	7.42	10.92	4.06	9.91
Bmrk. Avg.	28.96	4.48	10.58	6.78	9.31	9.86	2.66	15.30	12.08

Bmrk. Avg. = Benchmark average

Aggregate Active figures include data only for managers retained on 6/30/90.

\* Manager retained effective 4/1/89. Data covers period from 4/1/89 to 6/30/90 only.

\*\* Manager retained effective 4/1/90. Data covers period from 4/1/90 to 6/30/90 only.



Table 2 Con't.

## EXTERNAL ACTIVE STOCK MANAGERS

Sector Weights  
Actual Portfolio Less Benchmark Portfolio  
July 1985 - June 1989

	Cons. Non Dur.	Cons. Dur.	Basic Mat.	Cap. Goods	Energy	Tech.	Trans.	Util.	Finl.
<b>Investment Advisers</b>									
Minimum	-17.79	-5.32	-1.71	-4.35	-11.14	-5.26	-2.68	-14.06	-9.16
Average	7.26	-3.35	5.89	-0.39	-5.24	2.58	2.21	-4.74	-4.22
Maximum	15.58	1.42	9.75	5.90	4.64	10.44	9.15	3.45	11.80
Bmrk. Avg.	31.80	5.12	10.78	7.10	11.14	9.68	2.85	12.76	8.78
<b>Lieber &amp; Co.</b>									
Minimum	-8.67	-2.30	-8.20	-7.90	-2.28	-6.56	-1.48	-5.68	-18.86
Average	5.33	0.18	-1.43	-3.98	-0.38	-2.48	1.07	-1.98	3.67
Maximum	16.29	5.01	5.49	0.12	1.73	2.92	4.15	0.14	21.95
Bmrk. Avg.	31.54	6.37	11.02	9.88	3.20	9.63	2.38	3.82	22.15
<b>Rosenberg Institutional*</b>									
Minimum	0.07	-0.81	2.56	-2.57	0.41	-1.78	0.26	-3.60	-6.44
Average	1.99	0.25	4.22	-1.83	1.58	-0.15	0.49	-2.12	-4.43
Maximum	3.44	1.47	5.42	-1.27	4.18	2.06	0.75	-0.49	-1.73
Bmrk. Avg.	27.35	5.17	9.33	6.38	8.71	8.06	2.29	17.48	15.22
<b>Sasco Capital*</b>									
Minimum	-6.21	-2.19	-6.04	-2.72	8.60	0.09	-1.40	-0.44	-1.63
Average	-3.14	-0.62	-4.49	-1.49	10.49	1.17	-0.90	0.25	-1.27
Maximum	-1.08	0.26	-2.32	-0.71	13.09	2.53	0.05	0.73	-0.81
Bmrk. Avg.	22.06	3.44	21.01	9.48	14.78	7.79	5.08	6.70	9.66
<b>Waddell &amp; Reed</b>									
Minimum	-18.41	-6.45	-7.49	-6.17	-9.37	-5.76	-5.85	-2.34	-0.94
Average	-5.26	0.15	-2.12	-0.46	-3.05	2.20	-0.51	3.18	5.88
Maximum	9.71	5.11	5.41	4.67	7.73	16.75	4.50	18.80	21.00
Bmrk. Avg.	36.12	7.55	18.68	10.41	8.60	11.05	5.77	0.75	1.07
<b>Aggregate Active</b>									
Minimum	-3.72	-1.98	-2.87	-4.64	-8.92	-3.38	-1.74	-7.12	-7.90
Average	2.04	-0.41	1.95	-1.31	-1.22	0.17	1.37	-3.01	0.41
Maximum	7.56	2.37	7.07	2.10	5.74	6.95	5.22	0.54	14.19

Bmrk. Avg. = Benchmark average

Aggregate Active figures include data only for managers retained on 6/30/90.

\* Manager retained effective 4/1/89. Data covers period from 4/1/89 to 6/30/90 only.

\*\* Manager retained effective 4/1/90. Data covers period from 4/1/90 to 6/30/90 only.



Table 3.

**EXTERNAL ACTIVE STOCK MANAGERS****Five Year Quarterly Performance Summary**

	3Q 85	4Q 85	1Q86	2Q86	3Q86	4Q86	1Q87	2Q87	3Q87	4Q87
<b>Alliance Capital</b>										
Actual Portfolio	-3.2%	17.8%	19.3%	5.9%	-11.8%	5.2%	27.4%	4.7%	10.8%	-21.4%
Benchmark Portfolio	-5.9	17.3	15.5	3.7	-9.9	2.6	22.8	3.2	5.1	-24.2
<b>Concord Capital</b>										
Actual Portfolio	Manager not retained until 2Q89.									
Benchmark Portfolio	Manager not retained until 2Q89.									
<b>Forstmann Leff</b>										
Actual Portfolio	-4.2	16.3	18.8	8.9	-10.8	3.4	19.8	1.6	8.4	-17.6
Benchmark Portfolio	-3.1	12.9	11.0	3.8	-5.6	2.6	16.1	2.1	4.2	-16.1
<b>Franklin Portfolio</b>										
Actual Portfolio	Manager not retained until 2Q89.									
Benchmark Portfolio	Manager not retained until 2Q89.									
<b>GeoCapital Corp.</b>										
Actual Portfolio	Manager not retained until 2Q90.									
Benchmark Portfolio	Manager not retained until 2Q90.									
<b>IDS Advisory</b>										
Actual Portfolio	-5.9	19.7	17.2	7.5	-10.1	4.5	22.4	3.7	5.9	-20.7
Benchmark Portfolio	-4.1	16.2	13.9	5.7	-7.4	3.9	20.5	3.2	5.2	-19.5
<b>Investment Advisers</b>										
Actual Portfolio	-7.2	18.5	12.4	4.6	-8.9	4.1	19.7	4.0	8.8	-15.2
Benchmark Portfolio	-4.1	16.2	13.9	5.7	-7.4	3.9	20.5	3.2	5.7	-18.9
<b>Lieber &amp; Company</b>										
Actual Portfolio	-1.9	14.6	13.9	11.0	-9.5	0.1	20.1	-1.4	2.7	-23.0
Benchmark Portfolio	-3.1	15.8	14.1	5.9	-10.8	2.2	20.4	0.1	4.1	-24.8
<b>Rosenberg Institutional</b>										
Actual Portfolio	Manager not retained until 2Q89.									
Benchmark Portfolio	Manager not retained until 2Q89.									
<b>Sasco Capital</b>										
Actual Portfolio	Manager not retained until 2Q89.									
Benchmark Portfolio	Manager not retained until 2Q89.									
<b>Waddell &amp; Reed</b>										
Actual Portfolio	-2.0	10.4	16.4	2.0	-6.4	5.1	18.4	2.4	9.8	-20.8
Benchmark Portfolio	-3.5	13.0	12.1	2.7	-6.9	3.0	22.1	3.6	6.0	-21.0
<b>Aggregate Active*</b>	-4.7	15.2	15.2	4.5	-8.6	3.9	21.0	2.3	6.9	-21.8
<b>Market Index</b>										
Wilshire 5000	-4.3	16.8	14.4	5.8	-7.7	4.0	21.2	3.3	6.2	-23.1

\* Aggregate Active performance numbers include returns of any managers retained during the time period shown but subsequently terminated by the Board.

Table 3 Con't.

**EXTERNAL ACTIVE STOCK MANAGERS****Five Year Quarterly Performance Summary**

	1Q 88	2Q 88	3Q88	4Q88	1Q89	2Q89	3Q89	4Q89	1Q90	2Q90
<b>Alliance Capital</b>										
Actual Portfolio	4.0%	9.6%	-3.5%	0.6%	10.0%	11.7%	15.2%	0.3%	-2.6%	9.7%
Benchmark Portfolio	6.8	6.0	-0.9	1.3	6.7	8.3	10.7	-3.6	-0.9	8.5
<b>Concord Capital</b>										
Actual Portfolio	Manager not retained until 2Q89.					6.8	7.3	-2.5	-1.2	5.8
Benchmark Portfolio						8.4	9.1	-1.5	-3.8	3.7
<b>Forstmann Leff</b>										
Actual Portfolio	6.9	3.4	-2.6	2.6	8.3	2.1	9.8	-2.2	-2.7	2.9
Benchmark Portfolio	6.7	5.5	0.1	1.6	6.3	6.2	7.8	-1.0	-1.3	5.0
<b>Franklin Portfolio</b>										
Actual Portfolio	Manager not retained until 2Q89.					9.7	11.1	-2.5	-3.2	2.4
Benchmark Portfolio						8.4	7.4	-2.2	-3.6	4.1
<b>GeoCapital Corp.</b>										
Actual Portfolio	Manager not retained until 2Q90.									6.0
Benchmark Portfolio										6.1
<b>IDS Advisory</b>										
Actual Portfolio	0.6	7.1	-3.7	1.6	8.2	7.5	15.8	-0.5	0.3	7.6
Benchmark Portfolio	7.5	5.3	0.3	2.3	6.6	8.6	8.8	-0.3	-2.7	5.5
<b>Investment Advisers</b>										
Actual Portfolio	-1.5	4.6	-1.0	1.9	7.4	6.5	12.4	0.2	-2.9	5.8
Benchmark Portfolio	5.6	5.8	0.7	3.0	6.4	7.2	9.4	0.9	-2.0	5.8
<b>Lieber &amp; Company</b>										
Actual Portfolio	16.2	4.6	0.8	0.1	7.2	6.1	8.8	-3.9	-5.3	6.2
Benchmark Portfolio	15.0	6.9	-1.0	0.3	7.1	6.4	8.0	-3.6	-3.8	2.1
<b>Rosenberg Institutional</b>										
Actual Portfolio	Manager not retained until 2Q89.					8.7	10.7	-0.6	-2.4	3.7
Benchmark Portfolio						8.2	9.5	0.1	-3.3	4.9
<b>Sasco Capital</b>										
Actual Portfolio	Manager not retained until 2Q89.					7.4	9.1	-1.8	-2.0	-1.4
Benchmark Portfolio						6.2	8.5	-2.0	-1.2	1.3
<b>Waddell &amp; Reed</b>										
Actual Portfolio	8.1	7.3	-5.9	1.2	5.2	10.4	12.1	-2.7	-0.3	5.8
Benchmark Portfolio	11.1	5.5	-1.7	1.0	6.5	5.9	7.9	-2.5	-0.3	3.9
<b>Aggregate Active*</b>	7.3	6.8	-2.8	0.5	8.1	7.9	11.7	-1.4	-2.2	5.8
<b>Market Index</b>										
Wilshire 5000	8.0	6.5	0.2	2.3	7.4	8.5	10.1	0.6	-3.5	5.5

\* Aggregate Active performance numbers include returns of any managers retained during the time period shown but subsequently terminated by the Board.

Table 4.

**EXTERNAL STOCK MANAGERS**  
**Five Year Annualized Performance Summary**

	Year Ending 6/30/90		Two Years Ending 6/30/90		Three Years Ending 6/30/90		Five Years Ending 6/30/90	
	Actual Portfolio	Benchmark Portfolio	Actual Portfolio	Benchmark Portfolio	Actual Portfolio	Benchmark Portfolio	Actual Portfolio	Benchmark Portfolio
<b>Active Managers</b>								
Alliance Capital	23.6%	14.8%	21.4%	15.4%	13.5%	6.3%	21.1%	13.2%
Concord Capital	9.4	7.2	Manager retained effective 4/1/89					
Forstmann Leff	7.6	10.5	9.0	12.7	5.5	7.7	13.7	12.6
Franklin	7.5	5.4	Manager retained effective 4/1/89					
GeoCapital	6.0	6.1	Manager retained effective 4/1/90					
IDS	24.2	11.3	18.9	15.0	8.5	8.2	16.7	15.3
Investment Advisers	15.7	14.5	15.5	16.4	8.2	9.0	14.1	15.8
Lieber & Company	5.2	2.2	9.9	7.5	5.1	3.6	12.1	10.6
Rosenberg	11.4	11.3	Manager retained effective 4/1/89					
Sasco Capital	3.4	6.4	Manager retained effective 4/1/89					
Waddell & Reed	15.0	8.9	12.8	10.4	8.7	6.2	14.5	12.8
<b>Passive Manager</b>								
Wilshire Associates	12.3%	12.7%	15.8%	16.0%	8.1%	8.2%	15.4%	15.5%
<b>Total Basic Retirement Funds' Common Stock Segment*</b>								
	13.0%	11.7%	15.5%	15.0%	8.1%	7.9%	15.1%	15.0%
<b>Capital Markets Data</b>								
Wilshire 5000	12.7%	—	16.1%	—	8.2%	—	15.5%	—
91-Day Treasury Bills	8.2	—	8.2	—	7.5	—	7.1	—
Inflation	4.7	—	4.9	—	4.6	—	3.8	—

\* Total segment performance numbers include returns of any managers retained during the time periods shown but subsequently terminated by the Board.



## BOND MANAGER PORTFOLIO CHARACTERISTICS GLOSSARY

The bond manager portfolio statistics glossary is designed to define terminology the State Board of Investment uses in evaluating a bond manager's investment philosophy, risk characteristics and performance data. The definitions refer to categories shown in Table 5.

<b>Average Quality Weightings</b> (Avg. Qual.)	Refers to the average rating given the total portfolio's securities by Moody's Corp. A security's rating indicates the financial strength of its issuer and other factors related to the likelihood of full and timely payment of interest and principal.
<b>Bond Allocation</b> (Bond Alloc.)	The percent of the manager's total portfolio invested in bonds.
<b>Coupon</b>	The annual interest payment received on the manager's total portfolio stated as a percent of the portfolio's face value.
<b>Current Yield</b> (Cur. Yield)	The annual interest payment produced by the manager's total portfolio stated as a percent of the portfolio's market value.
<b>Duration</b> (Dur.)	A measure of the average life of the total portfolio. Duration is a weighted average maturity where the time in the future that each cash flow is received is weighted by the proportion that the present value of the cash flow contributes to the total present value (or price) of the total portfolio.
<b>Number of Issues</b> (# of Issues)	The number of different bond issues held in the manager's portfolio.
<b>Quarterly Turnover</b> (Qtr. T/O)	The manager's total bond sales during the quarter divided by the average value of the manager's bond portfolio over the quarter.
<b>Term to Maturity</b> (Term to Mat.)	A measure of the average life of the total portfolio. Term to maturity is the number of years remaining until the average bond in the portfolio makes its final cash payment.
<b>Yield to Maturity</b> (Yield to Mat.)	The compounded annualized return that the manager's total portfolio would produce if it were held to maturity and all cash flows were reinvested at an interest rate equal to the yield to maturity.

Table 5.  
**EXTERNAL ACTIVE BOND MANAGERS**  
**Portfolio Characteristics**  
**July 1985 - June 1990**

	Qtr. T/O	# Of Issues	Bond Alloc.	Coupon	Cur. Yield	Yield To Mat.	Avg. Qual.	Dur.	Term To Mat.
<b>Investment Advisers</b>									
Minimum	0.0%	13	88%	7.60%	7.60%	8.00%	AAA	3.10 Yrs.	4.00 Yrs.
Average	15.2	18	96	8.49	8.30	8.68	AAA	4.54	8.06
Maximum	42.0	25	99	9.90	9.30	9.90	AAA	7.00	16.37
<b>Lehman Management</b>									
Minimum	14.0	26	81	7.70	7.80	7.30	AA	3.50	5.00
Average	40.0	40	93	8.82	8.69	8.68	AAA	3.96	7.20
Maximum	103.0	54	100	11.40	10.90	10.20	AAA	4.50	8.60
<b>Miller Anderson</b>									
Minimum	11.0	37	73	6.90	7.18	7.80	A	3.10	5.50
Average	45.2	56	91	8.59	8.70	9.58	AA	4.94	9.67
Maximum	86.0	76	99	10.50	10.20	13.00	AAA	6.60	16.11
<b>Morgan Stanley</b>									
Minimum	9.0	7	73	7.60	7.90	8.20	AA	2.20	3.40
Average	53.7	15	95	8.95	9.07	9.14	AAA	45.03	11.28
Maximum	160.0	20	100	11.20	11.50	11.00	AAA	6.66	23.00
<b>Western Asset</b>									
Minimum	12.0	34	84	8.40	8.50	8.30	AA	4.20	8.40
Average	43.2	45	92	8.94	9.08	9.45	AA	5.31	12.07
Maximum	97.0	55	100	10.70	11.00	11.10	AAA	6.70	18.90

**Table 6.**  
**EXTERNAL ACTIVE BOND MANAGERS**  
**Sector Weights**  
**July 1985 - June 1990**

	(In Percentages)								
	Govt	Agcy	Ind	Util	Fin	Tran	Mtgs	Misc	Cash
<b>Investment Advisers</b>									
Minimum	46	0	0	0	2	0	0	0	1
Average	68	6	6	0	10	0	7	0	4
Maximum	83	18	25	3	19	0	15	0	12
<b>Lehman Management</b>									
Minimum	46	0	2	0	5	0	5	0	0
Average	59	2	7	2	11	0	12	0	6
Maximum	71	12	14	8	26	0	20	0	19
<b>Miller Anderson</b>									
Minimum	0	0	2	0	3	0	20	0	1
Average	23	0	6	0	20	1	41	1	7
Maximum	45	4	9	5	59	2	64	5	18
<b>Morgan Stanley</b>									
Minimum	0	0	0	0	0	0	0	0	0
Average	28	1	8	0	9	0	46	2	4
Maximum	60	10	43	1	28	0	75	13	27
<b>Western Asset</b>									
Minimum	6	3	7	5	1	0	23	0	0
Average	16	8	15	10	7	2	35	1	7
Maximum	33	13	24	17	18	4	54	4	13

Abbreviations:

Govt	Government
Agcy	Government agencies
Ind	Industrials
Util	Utilities
Fin	Financials
Tran	Transportation
Mtgs	Mortgages
Misc	Miscellaneous or other



Table 7.

**EXTERNAL ACTIVE BOND MANAGERS**  
**Five Year Quarterly Performance Summary**

	3Q85	4Q85	1Q86	2Q86	3Q86	4Q86	1Q87	2Q87	3Q87	4Q87
<b>Investment Advisers</b>										
Actual Portfolio	2.3%	6.3%	5.9%	0.9%	2.4%	2.7%	1.0%	-0.9%	-1.9%	5.1%
Benchmark Portfolio	2.0	7.7	7.9	1.1	2.5	3.3	1.3	-1.6	-2.8	5.8
<b>Lehman Management</b>										
Actual Portfolio	2.1	6.5	6.5	1.1	2.9	2.8	1.1	-1.6	-2.1	5.3
Benchmark Portfolio	2.2	6.8	6.9	1.4	2.3	2.9	1.5	-1.3	-2.1	5.2
<b>Miller Anderson</b>										
Actual Portfolio	4.3	8.7	4.2	0.2	2.2	10.3**	2.8	-1.6	-3.6	6.3
Benchmark Portfolio	2.0	7.7	7.9	1.1	2.5	3.3	1.3	-1.6	-2.8	5.8
<b>Morgan Stanley</b>										
Actual Portfolio	2.4	7.7	8.3	-1.3	3.1	4.5	2.9	-3.1	-0.5	4.8
Benchmark Portfolio	2.2	6.8	5.7	1.2	3.2	3.2	1.4	-1.1	-1.9	5.2
<b>Western Asset</b>										
Actual Portfolio	1.9	9.3	6.9	1.3	2.2	4.9	2.6	-3.4	-3.1	5.3
Benchmark Portfolio	2.0	7.5	7.6	1.1	2.4	3.2	1.3	-1.4	-2.7	5.6
<b>Aggregate Active*</b>										
Actual Portfolio	2.7	7.7	6.2	0.4	2.7	5.3	2.3	-2.3	-2.2	5.3
Benchmark Portfolio	2.1	7.3	7.1	1.2	2.6	3.2	1.4	-1.4	-2.4	5.5
<b>Market Index</b>										
Salomon Broad Investment Grade Bond Index	2.0	7.7	7.9	1.1	2.5	3.3	1.3	-1.6	-2.8	5.8

\* Aggregate Active performance numbers include returns of any managers retained during the time periods shown but subsequently terminated by the Board.

\*\* Performance reflects positive impact of pricing adjustment made during the quarter.

Table 7 Con't.

**EXTERNAL ACTIVE BOND MANAGERS****Five Year Quarterly Performance Summary**

	1Q88	2Q88	3Q88	4Q88	1Q89	2Q89	3Q89	4Q89	1Q90	2Q90
<b>Investment Advisers</b>										
Actual Portfolio	3.2%	1.1%	1.9%	0.6%	1.3%	9.8%	0.4%	4.2%	-2.7%	4.0%
Benchmark Portfolio	3.8	1.2	2.0	0.8	1.1	8.4	0.9	3.9	-1.2	3.7
<b>Lehman Management</b>										
Actual Portfolio	3.2	0.7	3.3	0.8	1.3	7.0	1.1	3.2	-0.5	3.2
Benchmark Portfolio	3.4	1.1	1.8	0.9	1.2	7.2	1.2	3.5	-0.4	3.4
<b>Miller Anderson</b>										
Actual Portfolio	3.6	1.5	1.9	1.6	1.4	4.4	0.4	3.4	-0.7	3.8
Benchmark Portfolio	3.8	1.2	2.0	0.8	1.2	7.9	1.0	3.7	-0.8	3.6
<b>Morgan Stanley</b>										
Actual Portfolio	3.1	0.4	1.8	0.3	1.1	6.8	1.5	3.3	-1.7	3.4
Benchmark Portfolio	3.8	1.2	1.7	0.3	1.1	7.1	1.2	3.6	-0.1	3.6
<b>Western Asset</b>										
Actual Portfolio	5.3	1.5	2.7	1.5	1.5	8.2	1.8	3.5	-1.4	3.7
Benchmark Portfolio	4.0	1.4	2.2	0.9	1.2	7.8	1.0	3.6	-0.4	3.7
<b>Aggregate Active*</b>										
Actual Portfolio	3.8	1.1	2.4	1.1	1.4	6.9	1.2	3.5	-1.3	3.7
Benchmark Portfolio	3.8	1.2	2.0	0.7	1.2	7.6	1.1	3.6	-0.5	3.6
<b>Market Index</b>										
Salomon Broad Investment Grade Bond Index	3.8	1.2	2.0	0.8	1.2	7.9	1.0	3.7	-0.8	3.6

\* Aggregate Active performance numbers include returns of any managers retained during the time periods shown but subsequently terminated by the Board.

Table 8.

**EXTERNAL BOND MANAGERS**  
**Five Year Annualized Performance Summary**

	Year Ending 6/30/90		Two Years Ending 6/30/90		Three Years Ending 6/30/90		Five Years Ending 6/30/90	
	Actual Portfolio	Benchmark Portfolio	Actual Portfolio	Benchmark Portfolio	Actual Portfolio	Benchmark Portfolio	Actual Portfolio	Benchmark Portfolio
<b>Active Managers</b>								
Investment Advisers	6.0%	7.3%	9.9%	9.9%	9.1%	9.3%	9.7%	10.6%
Lehman Management	7.2	7.8	9.9	9.6	9.0	9.0	9.8	10.1
Miller Anderson	7.0	7.7	8.3	9.9	8.1	9.3	11.3	10.6
Morgan Stanley	6.7	8.5	8.4	9.5	8.2	9.2	9.9	10.2
Western Asset	7.8	8.1	11.1	10.2	10.4	9.6	11.5	10.6
<b>Semi-Passive Managers</b>								
Fidelity Management	7.9%	7.7%	9.9%	9.9%	Manager retained effective 7/1/88			
Lincoln Capital	7.6	7.7	9.9	9.9	Manager retained effective 7/1/88			
<b>Total Basic Retirement Funds' Bond Segment*</b>								
	7.5%	7.7%	9.8%	9.9%	9.1%	9.3%	10.5%	10.4%
<b>Capital Markets Data</b>								
Salomon BIG Index**	7.7%	—	9.9%	—	9.3%	—	10.6%	—
91 Day Treasury Bills	8.2	—	8.2	—	7.5	—	7.1	—
Inflation	4.7	—	4.9	—	4.6	—	3.8	—

\* Total segment performance numbers include returns of any managers retained during the time periods shown but subsequently terminated by the Board.

\*\*Salomon Broad Investment Grade Bond Index



Table 9.

**ALTERNATIVE ASSETS**

**Summary of Commitments  
As of June 30, 1990**

	<b>Total Fund Size (Millions)</b>	<b>SBI Incept Date</b>	<b>SBI Commitment</b>	<b>SBI Funded</b>	<b>SBI To Be Funded</b>	<b>Fund Description</b>
<b>Real Estate:</b>						
Aetna	\$1,573	Apr-82	\$40,000,000	\$40,000,000	\$0	Open End/Diversified
Equitable	\$3,613	Oct-81	\$40,000,000	\$40,000,000	\$0	Open End/Diversified
Prudential	\$3,560	Sep-81	\$40,000,000	\$40,000,000	\$0	Open End/Diversified
Heitman I	\$113	Aug-84	\$20,000,000	\$20,000,000	\$0	Closed End/Diversified
Heitman II	\$238	Nov-85	\$30,000,000	\$30,000,000	\$0	Closed End/Diversified
Heitman III	\$200	Jan-87	\$20,000,000	\$20,000,000	\$0	Closed End/Diversified
RREEF	\$773	Sep-84	\$75,000,000	\$75,000,000	\$0	Closed End/Diversified
State Street III	\$103	Sep-85	\$20,000,000	\$20,000,000	\$0	Closed End/Specialized
State Street IV	\$86	Sep-86	\$15,000,000	\$15,000,000	\$0	Closed End/Specialized
State Street V	\$82	Dec-87	\$15,000,000	\$15,000,000	\$0	Closed End/Specialized
TCW III	\$216	Aug-85	\$40,000,000	\$40,000,000	\$0	Closed End/Specialized
TCW IV	\$250	Nov-86	\$30,000,000	\$30,000,000	\$0	Closed End/Specialized
<b>Total Real Estate</b>			<b>\$385,000,000</b>	<b>\$385,000,000</b>	<b>\$0</b>	
<b>Resources:</b>						
AMGO I	\$144	Sep-81	\$15,000,000	\$15,000,000	\$0	Debt with Equity
AMGO II	\$36	Feb-83	\$7,000,000	\$7,000,000	\$0	Debt with Equity
AMGO IV	\$75	Jul-88	\$12,300,000	\$12,300,000	\$0	Debt with Equity
AMGO V	\$85	May-90	\$16,800,000	\$10,500,000	\$6,300,000	Debt with Equity
Apache I'	\$100	May-84	\$3,000,000	\$2,000,000	\$1,000,000	Debt with Equity
Apache III	\$190	Dec-86	\$30,000,000	\$30,000,000	\$0	Net Profits Interest
Morgan O&G	\$135	Aug-88	\$15,000,000	\$8,400,000	\$6,600,000	Debt with Equity
British Pet. Royalty	\$500	Feb-89	\$25,000,000	\$25,000,000	\$0	Royalty
<b>Total Resources</b>			<b>\$124,100,000</b>	<b>\$110,200,000</b>	<b>\$13,900,000</b>	

Table 9. Con't.

**ALTERNATIVE ASSETS****Summary of Commitments  
As of June 30, 1990**

	<b>Total Fund Size (Millions)</b>	<b>SBI Incept Date</b>	<b>SBI Commitment</b>	<b>SBI Funded</b>	<b>SBI To Be Funded</b>	<b>Fund Description</b>
<b>Venture Capital:</b>						
Allied	\$40	Sep-85	\$5,000,000	\$5,000,000	\$0	Later Stage
DSV	\$60	Apr-85	\$10,000,000	\$10,000,000	\$0	Early Stage
First Century	\$100	Dec-84	\$10,000,000	\$6,500,000	\$3,500,000	Early Stage
First Chicago	\$50	May-88	\$5,000,000	\$3,800,000	\$1,200,000	Secondary Interests
Golder Thoma	\$225	Oct-87	\$14,000,000	\$6,300,000	\$7,700,000	Later Stage
Inman/Bowman	\$44	Jun-85	\$7,500,000	\$5,300,000	\$2,200,000	Early Stage
KKR I	\$1,000	Mar-84	\$25,000,000	\$25,000,000	\$0	LBO
KKR II	\$2,000	Dec-85	\$18,400,000	\$18,400,000	\$0	LBO
KKR III	\$5,600	Oct-87	\$146,600,000	\$133,700,000	\$12,900,000	LBO
Matrix	\$70	Aug-85	\$10,000,000	\$10,000,000	\$0	Early Stage
Matrix II	\$80	May-90	\$10,000,000	\$1,000,000	\$9,000,000	Early Stage
Norwest	\$60	Jan-84	\$10,000,000	\$10,000,000	\$0	Early Stage
Summit I	\$93	Dec-84	\$10,000,000	\$10,000,000	\$0	Later Stage
Summit II	\$230	May-88	\$30,000,000	\$7,500,000	\$22,500,000	Later Stage
Superior	\$35	Jun-86	\$6,600,000	\$4,200,000	\$2,400,000	Early Stage - MN.
T. Rowe Price	—	Nov-87	\$1,100,000	\$1,100,000	\$0	IPO Manager
<b>Total Venture Capital</b>			<b>\$319,200,000</b>	<b>\$257,800,000</b>	<b>\$61,400,000</b>	

**Summary**

<b>Real Estate</b>	<b>\$385,000,000</b>	<b>\$385,000,000</b>	<b>\$0</b>
<b>Resources</b>	<b>\$124,100,000</b>	<b>\$110,200,000</b>	<b>\$13,900,000</b>
<b>Venture Capital</b>	<b>\$319,200,000</b>	<b>\$257,800,000</b>	<b>\$61,400,000</b>
<b>Total Alternative Assets</b>	<b>\$828,300,000</b>	<b>\$753,000,000</b>	<b>\$75,300,000</b>

## TIME-WEIGHTED RATE OF RETURN

In measuring the performance of a manager or fund whose investment objective is to maximize the total value of an investment portfolio, the proper measuring tool is the time-weighted total rate of return. This performance measure includes the effect of income earned as well as realized and unrealized portfolio market value changes. In addition, the time-weighted total rate of return nets out the influence of contributions made to and distributions taken from the manager or fund. These are variables over which the manager or fund generally has no control.

The calculation of a portfolio's true time-weighted return requires that the portfolio be valued every time that there is a capital flow in or out. Because most portfolios are not valued that frequently, it is usually necessary to estimate the time-weighted total rates of return by approximating the required valuations.

In 1968, the Bank Administration Institute (BAI) commissioned a study, conducted by the University of Chicago, which considered desirable methods of estimating time-weighted returns. The BAI report is considered to be the definitive work in the field of performance measurement because of the academic reputations and thorough scientific efforts of its authors.

When monthly data are available, the BAI study recommends employing a technique called the linked internal rate of return (LIRR). State Street Bank, the SBI's performance measurement consultant, calculates the LIRR by solving the following equation for R:

$$VB \cdot (1+R) + \sum_{i=1}^n C_i \cdot (1+R)^{t_i} = VE$$

Where:

VB = Value of the fund at the beginning of the month

VE = Value of the fund at the end of the month

C<sub>i</sub> = Net cash flow on the i<sup>th</sup> day of the month

n = Number of cash flows in the month

R = Internal rate of return

t<sub>i</sub> = Time from cash flow i to the end of the period, expressed as a percentage of the total number days in the month

The internal rate of return, R, is a proxy for the true time-weighted return over the month. It approximates the interim valuations by assuming a uniform growth of the invested assets throughout the period.

The IRR's calculated for each month can be linked together to estimate the time-weighted return for a longer period. For example, given three consecutive monthly IRR's (R1, R2, and R3), the quarterly time-weighted return (TWRQ) is:

$$TWRQ = (1+R1) \cdot (1+R2) \cdot (1+R3) - 1$$



## BENEFIT INCREASE FORMULA

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.

## EXTERNAL STOCK AND BOND MANAGER FEES

### Total Payments for Fiscal Year 1990

#### Active Stock Managers (1)

Alliance Capital	\$ 2,007,928
BMI Capital	177,349
Concord Capital Management	507,020
Forstmann Leff Associates	355,089
Franklin Portfolio Associates	902,072
GeoCapital Corp.	95,809
IDS Advisory	616,851
Investment Advisers Inc.	263,484
Lieber & Company	1,293,578
Rosenberg Institutional Equity Management	698,512
Sasco Capital, Inc.	380,647
Waddell & Reed	783,924

#### Passive Stock Manager (2)

Wilshire Associates	\$ 318,810
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#### Active Bond Managers (2)

Investment Advisers Inc.	\$ 193,144
Lehman Management	244,130
Miller, Anderson & Sherrerd	352,852
Morgan Stanley Capital Management	233,061
Western Asset Management	359,864

#### Semi-Passive Bond Managers(3)

Fidelity Management Trust	\$ 342,542
Lincoln Capital Management	299,036

- (1) Active stock managers are compensated on a performance-based fee formula. Fees earned may range from zero to twice the manager's base fee, depending on the manager's performance relative to an established benchmark.
- (2) The passive stock manager and active bond managers are compensated based on a specified percentage of assets under management.
- (3) The semi-passive bond managers are compensated on a performance-based fee formula. Fees earned may range from 5 to 10 basis points of assets under management, depending on the manager's performance relative to an established benchmark.

## COMMISSIONS AND TRADING VOLUME

### By Broker for Fiscal Year 1990

Broker	Stock \$ Volume	Stock \$ Commissions	Bond \$ Volume	Bond \$ Commissions	Short Term \$ Volume
Abel/Noser Corp.	\$ 13,205,666	\$ 34,621	\$ 0	\$ 0	\$ 0
Adams Harkness & Hill	1,494,985	3,698	0	0	0
Adler, Coleman & Co.	374,100	516	0	0	0
Allison-Williams	0	0	17,512,363	62,500	0
Alpha Management, Inc.	3,003,952	5,268	0	0	0
American Express Credit	0	0	0	0	36,400,000
American National Bank	0	0	470,239	0	0
Arbour Securities, Inc.	0	0	2,143,125	0	0
Arnhold & S. Bleichroeder	852,902	1,100	0	0	0
Associates Corp. of N.A.	0	0	10,000,000	0	76,010,000
Autranet	44,383,276	53,728	45,380,366	0	0
Bank of America	0	0	0	0	3,000,000
Bank of NY Securities Inc.	0	0	5,000,000	0	30,183,000
Bankers Discount Corp.	0	0	0	0	376,010,000
Bankers Trust	0	0	0	0	50,900,000
Barclays American Corp.	0	0	0	0	24,800,000
Bateman Eichler	40,075	35	0	0	0
Baum George K. & Co.	5,145,238	5,755	0	0	0
Bear Stearns & Co.	171,750,091	219,550	113,581,327	0	0
Bernstein, Sanford & Co.	25,949,182	36,305	6,622,891	0	0
Birr, Wilson & Co.	98,076	180	0	0	0
Blunt Ellis & Loewi	459,371	1,938	0	0	0
Brandt (Robert) & Co.	9,164,800	18,948	0	0	0
Brean Murray	40,430,233	92,449	0	0	0
Bridge Trading Co.	51,326,585	71,517	0	0	0
Broadcorn Capital	135,436,447	223,617	0	0	0
Brophy, Gaston	0	0	23,017,633	0	0
Brown (Alex) & Sons, Inc.	13,829,227	20,529	0	0	0
Brown Bros. Harriman	563,250	480	0	0	0
Brown Brosche	0	0	10,130,398	0	0
BT Securities Corp.	0	0	0	0	50,000,000
BTSEC-BT Securities	0	0	2,326,967	0	0
Cantor Fitzgerald	98,545,080	174,672	0	0	0
Capital Inst. Services	24,580,283	45,286	72,031,954	0	0
Carl Marks & Co.	4,100	10	0	0	0
Carroll McEntee & McGinley	0	0	41,295,906	0	0
Charles Schwab & Co., Inc.	35,641,508	46,928	0	0	0
Chase Manhattan Bank	0	0	0	0	7,176,000
Chemical Bank New York	0	0	0	0	11,300,000
Citibank	0	0	16,221,063	0	1,000,000
Citicorp	0	0	36,455,159	0	40,000,000
Citicorp Sec. Markets, Inc.	0	0	88,762,844	0	9,700,000
CL Glazer Inc.	3,427,892	5,378	0	0	0
Cleary Gull Reiland	1,155,000	2,450	0	0	0
County Securities	15,959,136	23,245	0	0	0
Cowen & Co.	27,871,202	23,137	0	0	0
CRT Govt. Securities Ltd.	0	0	46,551,630	0	3,670,757,000
Cyrus J. Lawrence	28,378,356	37,987	10,331,250	0	0
D.W. Taylor	0	0	22,431	0	0
Dain Bosworth, Inc.	8,005,878	4,782	1,222,604	0	0
Daiwa Sec. America	122,013	301	125,649,014	5,000	398,000,000
Daniels & Bell	3,692,929	5,172	0	0	0
Dean Witter Reynolds	13,118,026	17,880	96,460,452	0	6,366,600,000
Deere (John) Capital Corp.	0	0	0	0	51,270,000
Dillon Read	2,050,013	364	171,510,902	0	6,459,120,000
Discover Credit Corp.	0	0	0	0	55,400,000
DLJ Fixed Income	0	0	118,510,741	0	0
Dominion Sec. H & P	0	0	0	0	2,600,000
Donaldson Lufkin	1,124,250	2,960	38,990,721	40,000	0
Drexel Burnham Lambert	20,167,994	33,881	510,571,117	0	7,709,212,000
Edwards A.G. & Sons	1,683,830	2,560	9,325,737	0	0
Ernst & Co.	47,368,906	64,524	0	0	0
Execution Services Inc.	11,872,572	10,808	0	0	0
Factset Data	3,182,800	2,910	0	0	0
Fahnestock & Co.	1,419,067	2,160	0	0	0
FBS Investment Services Inc.	0	0	4,517,955	0	0
Federal Reserve Mpls.	0	0	44,536,900	0	0
Financial Clearing	1,100,250	1,190	0	0	0
First Albany	1,502,699	2,088	0	0	0
First Bank Nat'l. Assoc.	133,292,285	186,826	247,115,658	703	11,495,000
First Boston Corp.	8,035,693	8,866	187,610,255	46,250	1,294,708,000



# COMMISSIONS AND TRADING VOLUME

## By Broker for Fiscal Year 1990

Broker	Stock \$ Volume	Stock \$ Commissions	Bond \$ Volume	Bond \$ Commissions	Short Term \$ Volume
First Chicago Corp.	\$ 0	\$ 0	\$ 0	\$ 0	\$ 75,000,000
First Manhattan Company	25,325,229	48,210	0	0	0
First Nat'l. Bank Chicago	0	0	2,000,000	0	118,567,696
Ford Financial Services	0	0	0	0	72,480,000
Fourteen Research Corp.	5,343,490	7,833	0	0	0
Fox Pitt Kelton Inc.	195,000	0	0	0	0
Furman Selz Mager	1,454,322	2,500	0	0	0
Gartner Group	0	0	863,389	0	0
General Electric Capital Corp.	0	0	0	0	265,888,000
General Electric Financial Serv.	0	0	0	0	46,800,000
General Motors Acceptance	0	0	20,000,000	0	36,000,000
Gerard Klaver Madison	791,974	1,260	0	0	0
Gintelco, Inc.	7,536,359	14,116	0	0	0
Goldman Sachs & Co.	89,573,935	86,962	1,468,531,793	153,328	180,000,000
Goodrich Securities	5,686,774	9,250	0	0	0
Gordon Haskett & Co.	5,483,419	0	0	0	0
Greenwich Capital Markets, Inc.	0	0	189,809,361	0	4,013,085,000
Gruntal & Co.	3,051,174	5,710	0	0	0
Heller Financial, Inc.	0	0	0	0	359,630,000
Herzog Heine Geduld	8,121,341	4,160	0	0	0
Household Finance	0	0	0	0	10,000,000
I/JL Capital Markets Group	2,917,304	3,040	0	0	0
Impact Securities Co.	1,245,954	2,226	0	0	0
Income Reinvestment	23,202,177	0	454,916	0	0
Instinet	323,766,470	412,528	0	0	0
Institutional	0	0	3,667,386	0	0
ITT Financial	0	0	3,000,000	0	0
ITT Financial Sec. Inc.	0	0	0	0	30,000,000
J.C. Bradford & Co.	294,300	720	0	0	0
J.P. Morgan & Co.	0	0	27,999,145	0	33,480,000
J.P. Morgan Securities Inc.	0	0	4,549,800	0	0
Jefferies & Co.	212,380,118	308,111	0	0	0
Jones & Assoc.	10,669,341	19,740	0	0	0
Josephthal & Co.	195,305	160	0	0	0
Keefe Bruyette & Woods	1,285,825	2,496	0	0	0
Kidder Peabody	27,101,755	136,618	197,763,585	25,000	2,378,107,838
Kuhn Loeb & Company.	0	0	95,469	0	0
Lazard Freres & Co.	1,100,335	315	0	0	0
Lehman Govt. Securities	0	0	310,176,784	0	2,005,511,000
Lewco Securities, Inc.	39,281,193	67,158	0	0	0
Lieber & Company	77,449,572	159,487	21,876	93	0
Lipper Analytical Dist.	1,818,420	4,524	0	0	0
Louis Pauls & Co.	0	0	66,116,469	0	0
Lynch, Jones & Ryan	11,999,691	19,877	0	0	0
Mabon Nugent & Co.	4,992,450	7,330	0	0	0
Manufacturers Hanover Sec. Corp.	0	0	0	0	28,750,000
Manufacturers Hanover Trust	0	0	0	0	1,000,000
Marquette National Bank	0	0	35,006,250	0	23,596,000
McDonald & Company	281,231	700	0	0	0
Merrill Lynch PF&S	123,220,233	186,529	1,091,134,470	31,250	4,055,960,771
Mesirow & Company	3,721,934	8,476	0	0	0
Midland Canadian Corp.	0	0	87,299,097	0	0
Midwest Discount Securities	512,833	780	0	0	0
Montgomery Securities	49,669,998	62,254	1,200,000	0	0
Moore, Schley & Cameron	3,082,484	7,272	0	0	0
Moran & Co.	492,245	0	0	0	0
Morgan Guaranty	596,846,358	517,100	711,201,657	0	35,747,914
Morgan Kegan Inc.	218,625	0	0	0	0
Morgan Stanley & Co.	22,521,572	29,210	390,617,935	0	0
National Financial	1,194,640	4,782	0	0	0
NCNB Texas National	1,771,275	0	0	0	0
Neuberger & Berman	15,211,228	22,615	0	0	0
New York & Foreign Sec.	130,800	80	0	0	0
Newbridge Securities	198,000	0	0	0	0
Newhard Cooke & Co.	7,157,238	6,426	0	0	0
Nomura Securities Int'l.	3,586,682	4,756	75,399,607	0	6,925,000
Norwest Bank Mpls.	0	0	0	0	54,995,000
Norwest Investment Services Inc.	0	0	0	0	96,609,000
Oppenheimer & Co.	25,101,545	38,155	0	0	0
Oscar Grussman	936,919	2,464	0	0	0
Paine Webber J & C	67,690,521	99,288	85,475,695	0	10,961,806

## COMMISSIONS AND TRADING VOLUME

### By Broker for Fiscal Year 1990

Broker	Stock \$ Volume	Stock \$ Commissions	Bond \$ Volume	Bond \$ Commissions	Short Term \$ Volume
Penney J.C. Funding Corp.	\$ 0	\$ 0	\$ 0	\$ 0	\$ 10,000,000
Pershing	21,519,567	25,443	46,536,420	0	0
Pforzheimer Carl H.	541,200	1,327	0	0	0
Piper Jeffray & Hopwood	13,043,178	17,930	0	0	0
Pittsburgh National Bank	0	0	0	0	20,000,000
PNC Securities Inc.	0	0	0	0	31,000,000
Prescott Ball & Turban	2,576,743	5,331	0	0	0
Prudential	40,630,202	61,211	176,997,745	0	0
Prudential Bache Securities	8,133,532	18,446	174,969,171	0	0
Rauscher Pierce Refsnes	1,684,534	3,058	0	0	0
Raymond James & Associates	3,914,850	7,350	0	0	0
Republic Nat'l. Bank N.Y.	0	0	0	0	25,000,000
Reynders Gray & Co.	694,200	3,204	0	0	0
Robert Fleming	2,355,624	1,620	0	0	0
Robertson Colman & Stephens	3,277,770	0	0	0	0
Robinson-Humphrey Co.	9,648,887	16,050	0	0	0
Rochdale Securities Corp.	925,498	2,000	0	0	0
Roulston & Company	893,995	2,209	463,497	0	0
Salomon Brothers	40,880,371	63,275	1,827,904,665	21,250	2,548,873,768
San Jacinto	183,750	0	0	0	0
Sanwa-BGK	0	0	24,220,891	0	0
Sears Roebuck Acceptance	0	0	0	0	274,151,000
Securities Settlement Corp.	18,127,643	20,080	0	0	35,200,000
Security Pacific Bank	0	0	0	0	45,000,000
SEI Funds Evaluation	23,600,329	41,636	0	0	0
Shawmut Bank of Boston	0	0	2,553,707	0	0
Shearson Lehman Hutton	61,313,343	83,324	1,886,524,871	106,250	36,233,176
Smith Barney & Company	35,949,749	58,971	35,605,667	0	2,027,595,000
State Board of Investment	3,830,787	0	30,146,281	0	0
Stechler Associates	0	0	60,535,608	0	0
Stephens, Inc.	0	0	2,374,088	0	0
Sutro & Company, Inc.	2,388,027	2,935	0	0	0
The Chicago Corp.	273,900	220	0	0	0
Toronto Domin	0	0	0	0	168,479,830
Tucker Anthony & R.L. Day, Inc.	3,991,640	6,240	0	0	0
UBS Securities	7,578,690	5,258	14,876,427	0	0
UBS-DB Corporation	0	0	2,854,332	0	0
Volpe & Covington	569,875	0	0	0	0
W.H. Newbold Son & Co.	1,476,000	1,968	0	0	0
W.E. Pollock & Co., Inc.	0	0	7,000,000	0	0
Wagner Stott & Co.	64,018,323	97,213	0	0	0
Wall Street Clearing	3,499,818	9,718	0	0	0
Warburg S.G.	8,125,896	19,411	0	0	0
Weeden & Company	57,980,802	96,660	0	0	0
Wertheim Schroder & Co. Inc.	637,250	1,000	0	0	0
Wessels, Arnold & Henderson	7,093,229	9,245	0	0	0
Westinghouse Credit	0	0	0	0	417,000
Westpac Pollock, & Co.	0	0	112,916,491	0	0
Westinghouse Securities Corp.	0	0	0	0	40,000,000
Wheaton First Securities, Inc.	805,969	1,400	0	0	0
William Blair & Co.	3,489,496	4,164	0	0	0
Wilshire Associates	165,923	545	0	0	0
Yamaichi Intl. (Amer), Inc.	0	0	0	0	330,400,000
Broker Unavailable*	306,817,769	66,640	390,730,729	0	1,059,255,990
<b>All Brokers Combined</b>	<b>\$ 3,585,757,340</b>	<b>\$ 4,557,087</b>	<b>\$ 11,673,474,874</b>	<b>\$ 491,623</b>	<b>\$ 47,326,341,790</b>

\* Includes transactions where broker data was incomplete.

\*\* Totals may not add due to rounding.





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