MINNESOTA STATE BOARD OF INVESTMENT MEETING

DECEMBER 18, 1986

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INVESTMENT ADVISORY COUNCIL MEETING

DECEMBER 17, 1986

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

MINUTES
STATE BOARD OF INVESTMENT
SEPTEMBER 3, 1986

The State Board of Investment met on Wednesday, September 3, 1986 at 8:30 A.M. in Room 118 of the State Capitol. Governor Rudy Perpich, Chair, Secretary of State Joan Anderson Growe, State Treasurer Robert W. Mattson, State Auditor Arne H. Carlson, and Attorney General Hubert H. Humphrey III were present.

The minutes of the June 12, 1986 Board meeting were unanimously approved.

EXECUTIVE DIRECTOR'S REPORT

Howard Bicker, Executive Director, reviewed the asset allocation and investment performance of the Basic Retirement Funds. He stated that the assets for the Basic Retirement Fund increased by 2.3% during the second quarter of the year, which brought the fiscal year 1986 asset growth to 23.7%. The asset growth was due entirely to an increase in value of securities, as retirements under the Rule of 85 raised net withdrawals for the second quarter to $55.8 million and $85.7 million for the fiscal year. Mr. Bicker stated that the asset mix for the Basic Retirement Funds was essentially unchanged for the quarter with a slight change due to market movements. The total rate of return for the funds was 3.5% for the second quarter bringing the investment results for the fiscal year 1986 to 26.2%. Excluding alternative investments, the Basic Retirement Funds were up 3.8% for the quarter and 29% for the year. Mr. Bicker reported that the equity component provided a 4.5% total rate of return for the second quarter, and 32.4% for the fiscal year. As a group, the equity managers slightly underperformed the market, but outperformed the median manager as measured by the TUCS universe for that period of time. He stated that the fixed income managers had a total rate of return of 0.4% for the quarter and 17.9% for the fiscal year. Due to the defensive nature of the managers, they underperformed the market for that period of time.

Mr. Bicker stated that the Post Retirement Fund continues to have significant positive cash flow due to retirements under the Rule of 85. The assets increased by 5.2% in value for the second quarter, primarily due to the large number of teachers that retired on June 30. Mr. Bicker stated that the asset mix showed a significant increase in cash on June 30 due to the major influx of retiree contributions on that day.

Mr. Bicker stated that the equity component of the Post Retirement Fund generated a negative 1.2% return for the quarter and a positive 19.5% for the year. The equity component underperformed the market due to the value approach utilized by the Fund's equity manager. The value style tends to underperform other approaches in strong markets. Conversely, in weak markets it will usually outperform other investment styles.

Mr. Bicker projected that the Post Retirement Fund will generate a retirement benefit increase in excess of 9.5% effective January 1, 1987.

In response to a question from Mr. Carlson concerning performance measurement in the Post Retirement Fund, Mr. Bicker stated that the equity component is a very risk-averse portfolio. He emphasized that the value approach used by the portfolio will follow broad market trends. However, its range of investment results will usually be narrower than the market as a whole. When the market rises, the value style gains will not be as high as other management styles. Similarly, when the market drops, investment performance will not fall as dramatically as other investment approaches.

Mr. Carlson stated the performance comparisons shown in the report indicate there are serious problems in the Post while, in reality, the Post Fund is functioning as it was designed. He suggested that staff and the Board's advisors review the performance benchmarks for the Post Fund to insure that the indices used are appropriate measures, given the stated objectives of the Fund. Mr. Bicker stated that such a review will take place.

In closing, Mr. Bicker stated the State Board of Investment now approaches $11 billion in total assets under management.

INVESTMENT ADVISORY COUNCIL REPORT

Judy Mares presented the Investment Advisory Council Report:

ADMINISTRATIVE AND ASSET ALLOCATION COMMITTEE

Ms. Mares stated that the Administrative and Asset Allocation Committees met jointly to discuss several matters. She stated that two items were reviewed concerning the 1987 Legislative Session. The Committee was briefed on the 1987-89 budget request and also discussed potential legislative proposals that will require statutory changes. Ms. Mares stated that a report will be made at the next Board meeting concerning the budget request and any legislative proposals.

Ms. Mares reported that due to legislation sponsored by the Board during the 1986 session, new investment options are now available to participants in the Supplemental Investment Fund. She stated that a revised prospectus has been distributed to all participants in the Fund. The new accounts available include a common stock index account, a money market account, and a new bond account. The new guaranteed investment contract option will become operational in November, 1986.

Ms. Mares stated that the Annual Investment Conference will not be held on November 17, contrary to the Committee report. Mr. Bicker stated that it was necessary to reschedule the conference due to scheduling conflicts.

EQUITY MANAGER COMMITTEE

Ms. Mares reported the matter of most concern to the Committee is the variation in performance among the equity managers. She stated growth managers performed extremely well and value oriented managers did not match the market. Ms. Mares stated that the most significant review of the period was that of the index fund manager. The manager of the SBI's index fund left Wilshire Associates recently. In light of that change, staff was requested to review the firm's commitment to maintain the index fund business. She reported that the firm has made a definite commitment, and at the present time there is no need to make any changes.

ALTERNATIVE INVESTMENT COMMITTEE

Ms. Mares stated that the Alternative Investment Committee is focusing on three different areas. In the venture capital area, aggressive commitments have been made over the past several years and the Committee has no recommendations to make at this time. She stated that in the real estate area, the Committee is recommending participation in two additional closed-end real estate funds. First, the Committee recommends a $20 million investment in Heitman Fund III. Previous investments have been made in two other Heitman Funds, I and II, and there is already a $50 million investment with that firm. Second, the Committee recommends a $30 million investment in Trust Company of the West Fund IV. The SBI presently has $40 million invested with TCW's Fund III. The Committee feels that now is a particularly opportune time to invest in new real estate, particularly in closed-end funds. Ms. Growe moved approval of commitments to those funds. The motion was approved unanimously.

Ms. Mares reported that the Alternative Investment Committee and staff are continuing to evaluate a proposal from the Apache Corporation. Ms. Mares stated that the Committee is also exploring the opportunities for investing in natural resources through the public equity market. The Committee will come back to the Board with a recommendation concerning this issue at a future Board meeting.

SOUTH AFRICA TASK FORCE

Jay Kiedrowski, Chairman of the South Africa Task Force Committee, reported that Phases 1 and 2 of the Board's resolution on South African investments have now been implemented. He stated that the Board's actively managed common stock portfolios no longer hold any non-Sullivan signatories as of August 31, 1986. He reported the Task Force is recommending that the Board consider expanding the implementation of the resolution to include the non-Sullivan signatories in the passive portfolio. The Task Force also recommended that the Board expand implementation of the resolution to include companies that act in a manner that directly supports apartheid. The Task Force had several recommendations on this issue: First, the Task Force must define what constitutes direct support to apartheid. Second, the State Board of Investment staff must review the active portfolios to determine the holdings that meet the criteria established. Finally, the Board should seek financial and legal advice regarding the possible divestiture of any of the companies meeting the definition established. In summary, Mr. Kiedrowski reported that the Board and Task Force are proceeding cautiously to implement the resolution, consistent with financial and legal advice given to the Board.

Mr. Mattson stated that Gary Norstrem, a member of the Investment Advisory council, was named City Treasurer of the Year by City and State Magazine. He recommended that a letter of congratulations be drafted for signature by the members of the Board.

The meeting was adjourned at 8:50 A.M.

Respectfully submitted,

Howard Bicker

Howard J. Bicker
Executive Director

AGENDA

INVESTMENT ADVISORY COUNCIL MEETING

Wednesday, December 17, 1986
2:00 P.M.

MEA Building-Conference Room "A"
41 Sherburne Avenue, Saint Paul

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B. Portfolio Statistics	B
3. Report from Investment Advisory Council Committees:	
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2. 1986 Annual Report	
3. Investment Conference	
4. Accounting System Contract	
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C. Equity Manager Committee	E
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EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT

Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

MINUTES
INVESTMENT ADVISORY COUNCIL
SEPTEMBER 2, 1986

The Investment Advisory Council met on Tuesday, September 2, 1986 at 2:00 P.M. in the MEA Building, St. Paul.

MEMBERS PRESENT: Henry Adams, Verona Burton, James Eckmann, Paul Groschen, Ken Gudorf, James Hacking, Jay Kiedrowski, Elton Erdahl, Malcolm McDonald, Judy Mares, Joe Rukavina, Ray Vecellio, Debbie Veverka, and Jan Yeomans.

MEMBERS ABSENT: Dick Hume, Gary Norstrem, and Mike Rosen

SBI STAFF: Howard Bicker, Jeff Bailey, Beth Lehman, Daralyn Peifer, John Griebenow, Harriet Balian, Charlene Olson.

The minutes of the June 3, 1986 meeting were approved.

EXECUTIVE DIRECTOR'S REPORT

Howard Bicker, Executive Director, first reviewed the asset allocation and investment performance of the Basic Retirement Funds. He stated that the assets for the Basic Retirement Fund increased by 2.3% during the second quarter of the year which brought the fiscal year 1986 asset growth to 23.7%. This was due entirely to an increase in value of securities, as retirements under the Rule of 85 raised net withdrawals for the second quarter to $55.8 million and $85.7 million for the fiscal year. Mr. Bicker stated that the asset mix for the Basic Retirement Funds was essentially unchanged for the quarter. He reported the total rate of return for the funds was 3.5% for the second quarter, bringing the investment results for the fiscal year 1986 to 26.2%. Excluding alternative investments, the Basic Retirement Funds were up 3.8% for the quarter and 29% for the year. Mr. Bicker reported that the equity component provided a 4.5% total rate of return for the second quarter and 32.4% for the fiscal year. As a group, the equity managers slightly underperformed the market, but outperformed the median managers as measured by the TUCS universe. He stated that the fixed income managers had a total rate of return of 0.4% for the quarter and 17.9% for the fiscal year. As a group, these managers slightly underperformed the market for the quarter and the year.

Mr. Bicker next summarized the performance of the Post Retirement Fund. The Fund continues to have significant positive cash flow due to retirements under the Rule of 85. Contributions increased the value of assets for the second quarter by 5.2%. Mr. Bicker stated there was a significant increase in cash assets on June 30 due to the major influx of retiree contributions on that day.

Mr. Bicker stated that the equity component of the Post Retirement Fund generated a negative 1.2% return for the quarter and a positive 19.5% for the year. These returns underperformed the market due to the value approach utilized by the Fund's equity manager. The value style tends to underperform other investment approaches in strong markets. It will also tend to outperform other approaches during weak markets.

Mr. Bicker projected that the benefit increase generated by the Post Retirement Fund will be in excess of 9.5% for the calendar year 1987. All retirees will receive the increase effective January 1, 1987.

In closing, Mr. Bicker stated that as of June 30, 1986 all assets under management at the State Board of Investment were slightly less than $11 billion.

ADMINISTRATIVE AND ASSET ALLOCATION COMMITTEES REPORT

Mr. McDonald stated that the Administrative and Asset Allocation Committees met together during the quarter. He reported the SBI intends to submit a same-level budget and will not request funding for any new programs during the 1987 legislative session.

Mr. McDonald reported there had been little direct input from the retirement systems concerning the staff paper on Post Retirement Fund benefit increases. In response, Mr. Groschen stated that both the Teachers Retirement and Minnesota State Retirement Systems feel that no action should be taken at this time. In addition, Mr. Hacking reported that the trustees of PERA held four town meetings from April through June. At each meeting, the group consensus was that no change in the current benefit increase formula should occur. PERA is also currently conducting two surveys and will report their results to the Board.

Mr. McDonald stated that a revised prospectus has been issued for the Supplemental Investment Fund and includes new investment options for participants. The new options include an equity index account, a money market account, and a new bond account. The new guaranteed investment contract option will become operational in November, 1986.

Mr. Bicker stated that the Annual Investment Conference will probably be changed from November, 1986 (as stated in the Committee report) to February or March, 1987, due to scheduling conflicts.

EQUITY MANAGER COMMITTEE

Ms. Veverka reported that there has been considerable variation between managers over the most recent quarter and year. However, she stated that when performance is compared to individual benchmarks, most of the managers have performed well. She noted that Waddell & Reed has been added to the "watch list" due to their relatively weak performance.

She also reported that staff completed its review of Wilshire Associates. Based on reports from SBI staff, the Committee feels personnel changes in the Wilshire organization will not adversely affect their management of the Board's index fund. As a result, the Committee recommends that no further action be taken at this time.

ALTERNATIVE INVESTMENT COMMITTEE REPORT

Mr. Gudorf reported that the Committee has two investments to recommend. He stated the Committee supports additional commitments in real estate to Heitman Advisory Corporation and Trust Company of the West. They recommend a $50 million commitment in closed-end funds, with a $20 million commitment to Heitman Fund III and $30 million to TCW Fund IV.

Mr. Gudorf stated the Committee has no recommendation in either the resource or venture capital areas, but is continuing to evaluate a proposal from Apache Corporation.

SOUTH AFRICA TASK FORCE

Jay Kiedrowski, Chairman of the South Africa Task Force Committee stated that Phases 1 and 2 of the Board's resolution on South African investments have now been implemented. The Task Force focused on the actively managed common stock portfolios during those phases. He reported the Task Force is now recommending that the Board consider expanding implementation of the resolution to include the passive portfolio. The Task Force also recommends that the Board expand implementation to include companies that operate in a manner directly supporting apartheid.

As a follow-up to the Task Force report, Mr. Kiedrowski reported that as of August 31, 1986, the SBI's actively managed stock portfolios no longer contain any company that is a non-Sullivan signatory. He closed by stating that the Board and Task

Force are continuing to move cautiously as they implement the resolution, consistent with the legal and financial advice they have received.

The meeting adjourned at 3:00 P.M.

Respectfully submitted,

Howard Bicker

Howard J. Bicker
Executive Director

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MINNESOTA STATE BOARD OF INVESTMENT

BASIC RETIREMENT FUNDS

QUARTERLY INVESTMENT REVIEW

SEPTEMBER 30, 1986

MINNESOTA STATE BOARD OF INVESTMENT

BASIC RETIREMENT FUNDS

THIRD QUARTER 1986

Summary

ASSETS

The market value of the Basic Retirement Funds' assets decreased by 4.8% during the third quarter 1986. The decline was the combined result of the poor performance of the common stock market and continued net withdrawals from the Funds. Withdrawals from the Basic Funds exceeded contributions by $23 million during the third quarter, bringing cumulative net withdrawals for calendar year 1986 to $74 million. The market values of the Basic Funds' assets for the 1986 year-to-date and the previous five calendar years are shown below.

Calendar Year		Market Value (millions)	Percent Change from Previous Period
1981		$2,148	+ 9.5
1982		2,806	+ 30.6
1983		3,129	+ 11.5
1984		3,265	+ 4.4
1985		4,030	+ 23.4
1986	1Q	4,463	+ 10.7
	2Q	4,564	+ 2.3
	3Q	4,345	- 4.8

ASSET MIX

The asset mix of the Basic Retirement Funds continued to move toward the long-term policy weights established by the Board. Most notably, the Board proceeded with the implementation of the Basic Funds' alternative equity investment program. As discussed in previous Quarterly Investment Summaries, the alternative equity segment of the Basic Funds' portfolio should reach its target weighting of 15% within the next year to two years as new alternative equity managers are selected and the funding schedules of the Board's current managers are completed.

Other minor asset mix shifts included a decrease in the common stock segment and a concomitant increase in the bond and cash segments of the portfolio. These changes reflected the poor relative performance of the common stock market and a decrease in the aggregate external active equity managers' allocation to common stocks.

The asset mix for the most recent two quarters and the year ending September 30, 1985 are presented below.

ASSET MIX

	9/30/85	6/30/86	9/30/86
Common Stocks	58.2%	62.2%	59.1%
Bonds	25.3	22.8	24.3
Cash Equivalents*	8.0	5.6	6.2
Alternative Equity Assets	8.5	9.4	10.4
	100.0%	100.0%	100.0%

*Includes cash uncommitted to long-term assets plus cash held by all external managers.

INVESTMENT RETURNS

The Basic Retirement Funds' total portfolio generated a -4.2% rate of return for the third quarter 1986. The third quarter performance brought investment results for the year ending September 30, 1986 to 23.4%. The Basic Funds' total portfolio excluding alternative equity assets produced a third quarter performance of -4.8% and a yearly return of 25.6%.

The negative investment results for the third quarter were attributable to the performance of the common stock segment of the Basic Funds' portfolio. The segment's third quarter return of -7.8% mirrored the disappointing performance of the common stock market. The remaining segments of the Basic Funds' portfolio produced modest positive returns.

On a relative basis, the Basic Funds' total portfolio underperformed its established benchmarks, the stock/bond composite and the TUCS median tax-exempt balanced portfolio. The underperformance relative to the TUCS median portfolio was due largely to the Basic Funds' more aggressive investment orientation, as evidenced by its greater-than-median weighting of common stocks.

Total portfolio and asset segment returns for the most recent quarter and year are presented below.

	Total Rate of Return	
	Third Quarter 1986	Year Ending 9/30/86
Common Stocks	-7.8%	29.2%
Bonds	2.7	17.6
Cash	1.6	7.5
Alternative Equity Assets	1.1	4.8
Total Fund (including alt. assets)	-4.2	23.4

EQUITY PERFORMANCE

The Basic Retirement Funds' active equity manager pool produced an aggregate third quarter rate of return of -8.6%. For the year ending September 30, 1986, the pool's performance was 26.8%. The common stock market was particularly volatile during the period, generating a -7.7% return for the quarter and a 30.4% return for the most recent year. The TUCS median managed equity portfolio's performance was -6.7% for the third quarter and 29.4% for the year.

The active manager pool failed to match the performance of either the market or the TUCS median equity portfolio. As in recent quarters, the individual performance results varied widely. Reversing the trend of previous quarters, however, the performance of the SBI's managers with a value/contrarian style exceeded that of managers with growth and rotational styles.

In aggregate, the active managers increased their holdings in the Technology, Energy, and Material and Services sectors of the market and reduced positions in the Consumer NonDurables and Financial sectors. The managers are now overweighted in the Consumer Durables, Financial, Transportation and Technology sectors and underweighted in the energy and utilities sectors.

Wilshire Associates, the index fund, tracked the performance of the Wilshire 5000. The passive fund produced a third quarter rate of return of -7.4% and an annual return of 30.4%.

Equity manager returns for the most recent quarter and year are presented below.

Total Portfolio Returns

	Third Quarter 1986	Year Ending 9/30/86
Fred Alger	-14.1%	32.6%
Alliance Capital	-11.8	31.2
Beutel Goodman	-4.2	21.9
BMI Capital	-9.4	26.9
Forstmann Leff	-10.8	34.3
Hellman Jordan	-10.4	22.9
IDS	-10.1	35.6
Investment Advisers	-8.9	27.0
Lieber & Company	-9.5	31.1
Peregrine Capital	-4.7	16.6
Waddell and Reed	-6.4	22.7
Internal Manager	-1.4	23.0
Total - External Active Managers	-8.6	26.8
Wilshire Associates (Index Fund)	-7.4	30.4
Wilshire 5000	-7.7	30.4

BOND PERFORMANCE

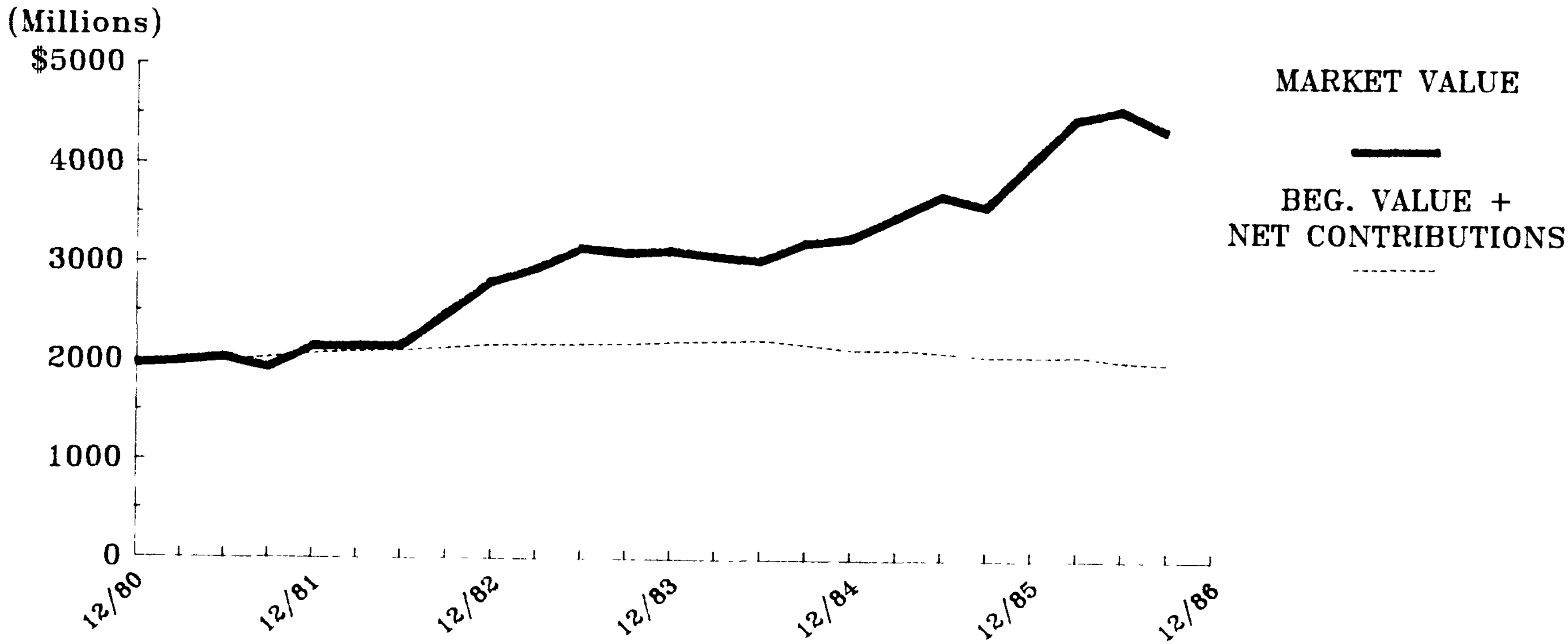
The third quarter performance for the Basic Retirement Funds' active bond manager pool was 2.7%. This performance brought the pool's results for the latest year to 17.9%. In aggregate, the bond managers' performance exceeded that of both the Salomon Brothers Broad Bond Index and the TUCS median managed fixed income portfolio for the quarter, although their performance trailed that of the benchmarks for the year. Several of the SBI managers benefitted from the improved performance of the mortgage sector of the bond market, which had significantly underperformed the Treasury and Corporate sectors during the first half of the year.

The Basic Retirement Funds' bond manager returns for the third quarter and latest year are displayed below.

	Total Portfolio Returns	
	Third Quarter 1986	Year Ending 9/30/86
Investment Advisers	2.4%	16.3%
Lehman Management	2.9	18.0
Miller Anderson	2.2	15.9
Morgan Stanley	3.1	18.7
Peregrine Capital	3.5	13.6
Western Asset	2.2	21.0
Total - External Managers	2.7	17.9
Salomon Brothers Broad Bond Index	2.5	20.4
TUCS Median Managed Fixed Income Portfolio	2.1	19.7

FIGURE 1

BASIC RETIREMENT FUNDS
ASSET GROWTH



PERIOD ENDING

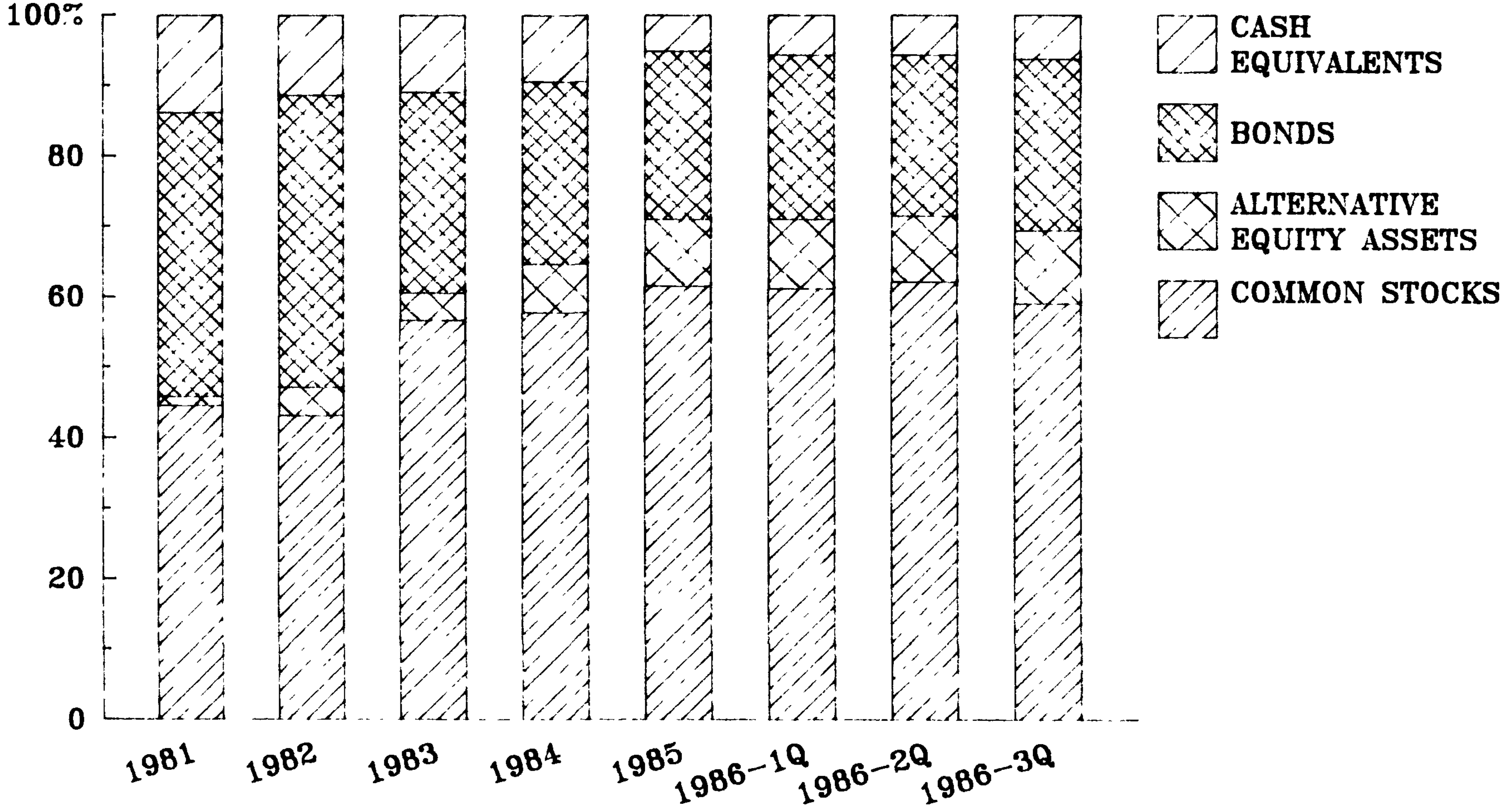
	12/80	12/81	12/82	12/83	12/84	12/85	9/86
BEGINNING VALUE	1,627 1	1,962 0	2,148 8	2,806 2	3,129 0	3,265 0	4,029 6
NET CONTRIBUTIONS	122 7	114 9	91.0	40 0	-77 6	-62 7	-73 8
INVESTMENT RETURN	212 2	71 9	566 4	282 8	213 6	827 3	389 3
ENDING VALUE	1,962 0	2,148 8	2,806 2	3,129 0	3,265 0	4,029 6	4,345 1

(MILLIONS OF DOLLARS)

FIGURE 2

BASIC RETIREMENT FUNDS

HISTORICAL ASSET MIX



PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

TABLE 1

BASIC RETIREMENT FUNDS

ASSET MIX

PERCENT OF MARKET VALUE
(End of Period Allocations)

	Common Stocks $Million	Common Stocks Percent	Bonds $Million	Bonds Percent	Cash* $Million	Cash* Percent	Real Estate $Million	Real Estate Percent	Resource Funds $Million	Resource Funds Percent	Venture Capital $Million	Venture Capital Percent
1981	959	44.6	865	40.3	297	13.8	20	0.9	8	0.4	-	-
1982	1,212	43.2	1,165	41.5	317	11.3	93	3.3	17	0.7	-	-
1983	1,773	56.7	892	28.5	342	10.9	101	3.2	21	0.7	-	-
1984	1,887	57.8	847	25.9	308	9.4	178	5.5	23	0.7	22	0.7
1985	2,481	61.6	961	23.8	204	5.1	288	7.1	47	1.2	49	1.2
1986 1Q	2,730	61.2	1,041	23.3	291	6.5	307	6.9	38	0.9	54	1.2
2Q	2,838	62.2	1,041	22.8	253	5.6	330	7.2	37	0.8	65	1.4
3Q	2,570	59.1	1,055	24.3	270	6.2	337	7.8	33	0.7	80	1.9

*Includes cash uncommitted to long-term assets plus cash held by all external managers.

TABLE 2

BASIC RETIREMENT FUNDS

ASSET MIX – ACTUAL vs. POLICY

PERCENT OF MARKET VALUE
(End of Period Allocations)

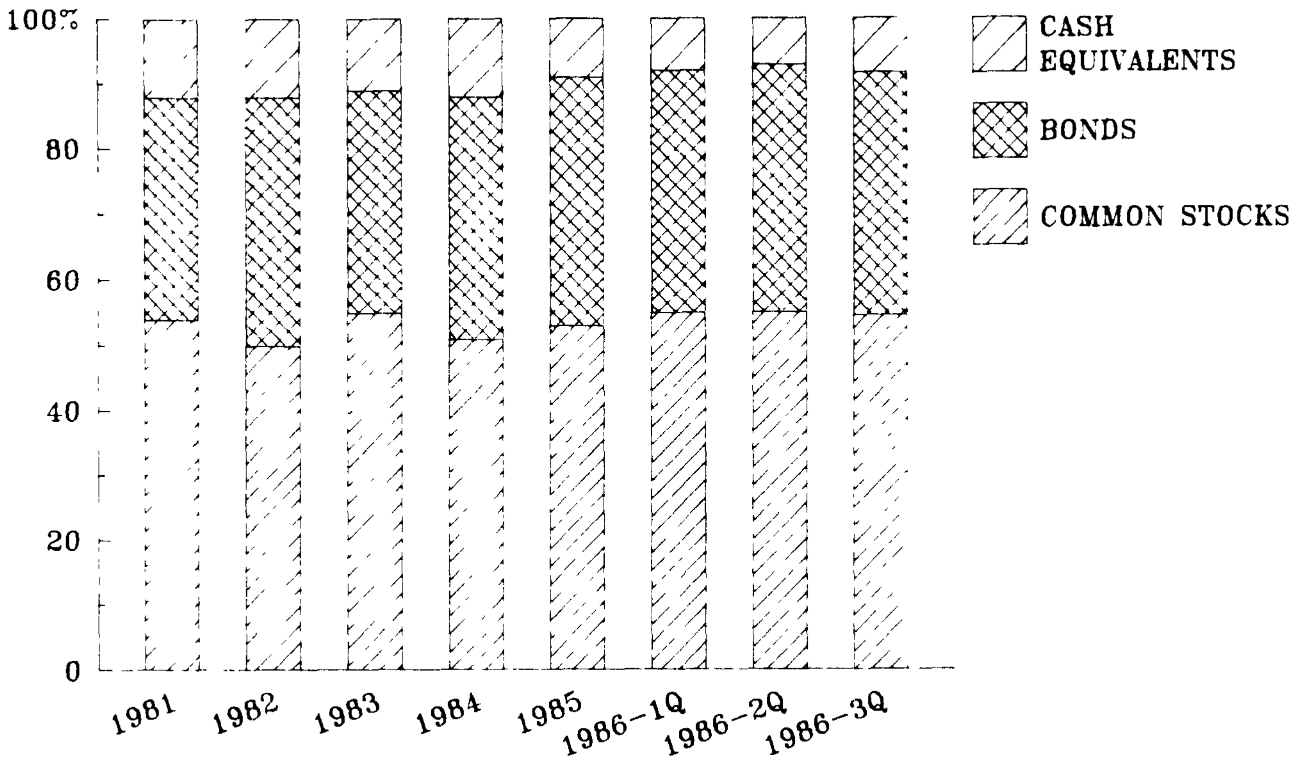
		Common Stocks*						Fixed Income***			Real Estate*			Resource Funds Venture Capital*		
		Passive Management			Active Management											
		Actual	Policy	Diff.	Actual	Policy	Diff.	Actual	Policy	Diff.	Actual	Policy	Diff.	Actual	Policy	Diff.
1983	1Q	0	40	-40	57.9	20	+37.9	38.3	25	+13.3	3.2	10	-6.8	0.6	5	-4.4
	2Q	0	40	-40	61.9	20	+41.9	34.5	25	+ 9.5	3.0	10	-7.0	0.6	5	-4.4
	3Q	0	40	-40	63.4	20	+43.4	32.8	25	+ 7.8	3.2	10	-6.8	0.6	5	-4.4
	4Q	43.5	40	+ 3.5	18.5	20	- 1.5	34.1	25	+ 9.1	3.2	10	-6.8	0.7	5	-4.3
1984	1Q	42.2	40	+ 2.2	17.8	20	- 2.2	35.7	25	+10.7	3.5	10	-6.5	0.8	5	-4.2
	2Q	41.7	40	+ 1.7	17.7	20	- 2.3	33.3	25	+ 8.3	5.5	10	-4.5	1.8	5	-3.2
	3Q	42.5	40	+ 2.5	17.9	20	- 2.1	32.6	25	+ 7.6	5.3	10	-4.7	1.7	5	-3.3
	4Q	42.1	40	+ 2.1	18.0	20	- 2.0	32.7	25	+ 7.7	5.5	10	-4.5	1.7	5	-3.3
1985	1Q	43.0	40	+ 3.0	18.3	20	- 1.7	31.4	25	+ 6.4	5.7	10	-4.3	1.6	5	-3.4
	2Q	43.2	40	+ 3.2	18.7	20	- 1.3	30.7	25	+ 5.7	5.6	10	-4.4	1.8	5	-3.2
	3Q	42.8	40	+ 2.8	18.8	20	- 1.2	29.5	25	+ 4.5	6.6	10	-3.4	2.3	5	-2.7
	4Q	44.6	40	+ 4.6	19.2	20	- 0.8	26.5	25	+ 1.5	7.2	10	-2.8	2.5	5	-2.5
1986	1Q	45.8	40	+ 5.8	20.0	20	0.0	25.1	25	+ 0.1	7.0	10	-3.0	2.1	5	-2.9
	2Q	43.7	40	+ 3.7	20.4	20	+ 0.4	26.3	25	+ 1.3	7.3	10	-2.7	2.3	5	-2.7
	3Q	41.9	40	+ 1.9	19.7	20	- 0.3	26.7	25	+ 1.7	8.4	10	-1.6	3.3	5	-1.7

*Includes cash held by external managers in the particular asset class.
**Includes cash uncommitted to long-term assets.

FIGURE 3

TAX-EXEMPT BALANCED PORTFOLIO UNIVERSE

HISTORICAL ASSET MIX



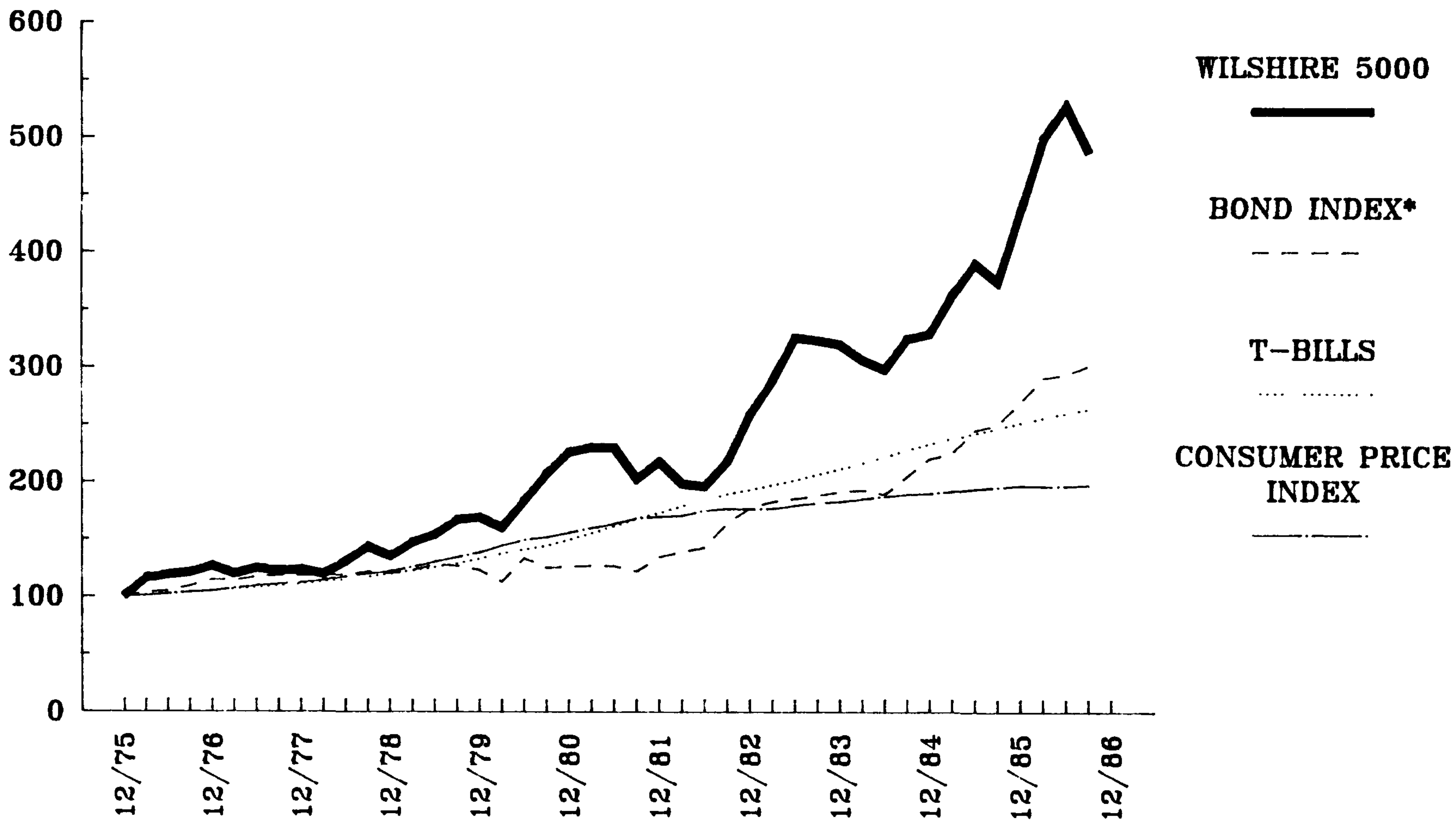
	1981	1982	1983	1984	1985	1986-1Q	1986-2Q	1986-3Q
COMMON STOCKS	51%	48%	52%	48%	50%	53%	54%	53%
BONDS	32	36	32	35	36	35	37	36
CASH EQUIVALENTS	12	12	10	11	9	8	7	8

PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

Figure 3 and the accompanying table depict the median asset class weightings held in Wilshire Associate's TUCS universe of balanced portfolios during the most recent three quarters and five calendar years. The figure and table are intended to give a perspective of the historical asset allocation of balanced tax-exempt corporate and public funds. The portfolios in the balanced universe differ in composition. Many of the portfolios are comprised of only common stocks, bonds, and cash equivalents. Other portfolios in the balanced universe contain alternative assets such as real estate and venture capital in addition to stocks and bonds.

FIGURE 4

PERFORMANCE OF CAPITAL MARKETS
CUMULATIVE RETURNS



*M.L. MASTER INDEX THROUGH 12/79
SALOMON BROAD INDEX 1/80–6/86

FIGURE 5

BASIC RETIREMENT FUNDS
INVESTMENT RETURNS

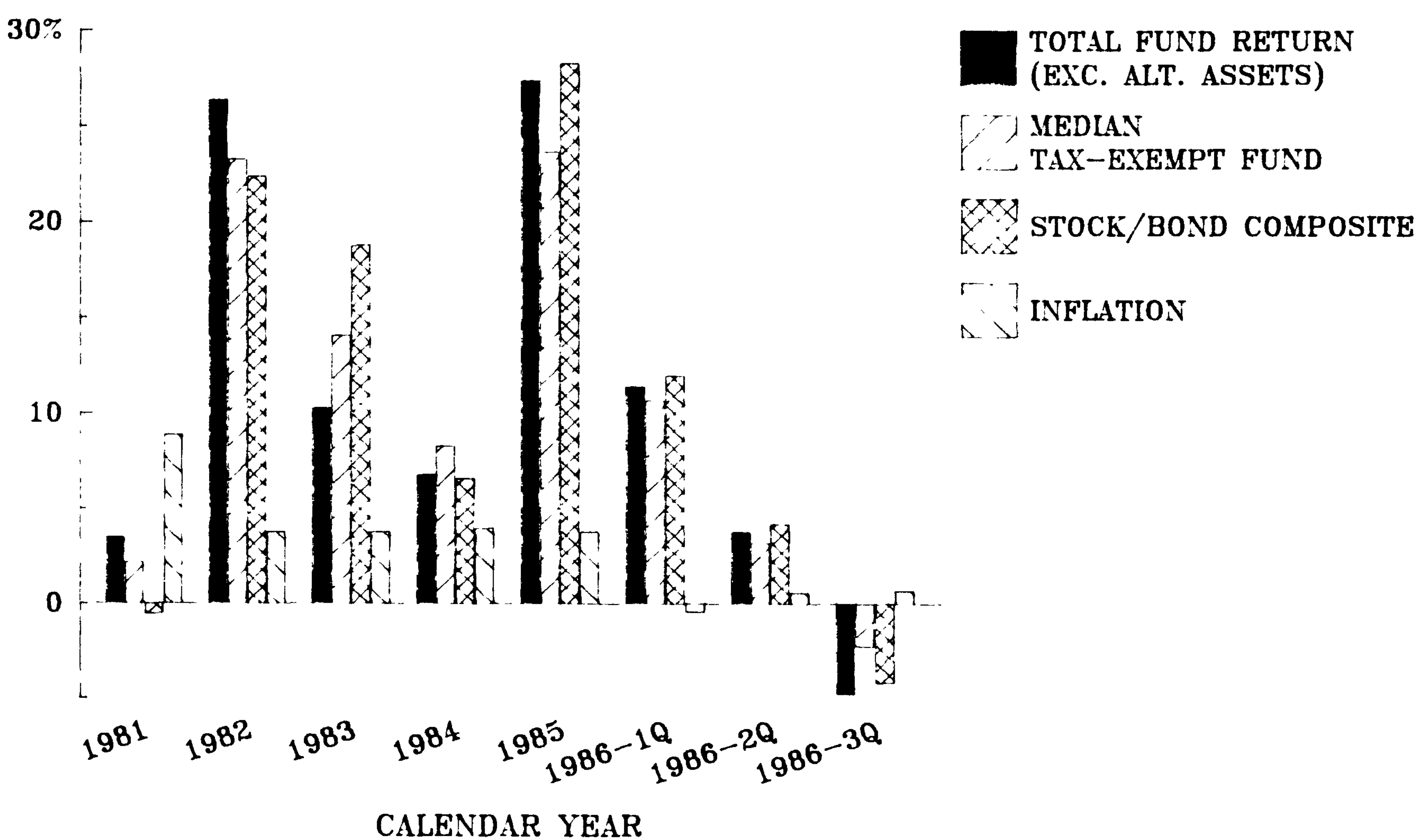


TABLE 3

BASIC RETIREMENT FUNDS

INVESTMENT RETURNS RELATIVE TO PERFORMANCE STANDARDS

Calendar Year		Total Fund Return (exc. alt. assets)	Median Tax-exempt Fund	Stock/Bond* Composite	Inflation	91 Day T-Bills	Total Fund Return (inc. alt. assets)
1980		12.4%	18.6%	18.5%	12.4%	12.7%	12.4%
1981		3.5	2.2	1.8	8.9	15.6	3.5
1982		26.4	23.3	24.4	3.9	11.7	25.7
1983		10.3	14.1	18.2	3.8	9.3	10.1
1984		6.8	8.3	6.9	4.0	10.4	6.9
1985		27.4	23.7	28.3	3.8	7.9	25.6
1986	1Q	11.4	10.7	11.8	-0.4	1.8	10.6
	2Q	3.8	3.2	4.2	0.6	1.6	3.5
	3Q	-4.8	-2.3	-4.2	0.7	1.4	-4.2
1 Year Through 9/30/86		25.6	24.0	26.4	1.8	6.8	23.4
3 Years Annualized Through 9/30/86		14.6	15.2	15.2	3.0	8.5	13.9
5 Years Annualized Through 9/30/86		18.0	18.5	19.6	3.4	9.5	17.4

*50/45/5 Wilshire 5000/Salomon Broad Bond Index/T-Bill Composite Through 12-31-82;
65/30/5 Wilshire 5000/Salomon Broad Bond Index/T-Bill Composite Thereafter

TABLE 4

BASIC RETIREMENT FUNDS

INVESTMENT RETURNS - DETAIL

CALENDAR YEAR		COMMON STOCKS		BONDS		ALTERNATIVE EQUITY ASSETS
		Basics	Wilshire 5000	Basics	Salomon Bond Index	Basics
1980		26.2%	33.7%	-0.1%	3.3%	-
1981		0.0	-3.6	2.0	7.0	-
1982		21.6	18.7	38.1	29.8	11.9
1983		12.7	23.5	9.3	7.8	7.4
1984		2.7	3.1	14.6	15.1	11.8
1985		31.4	32.6	21.4	21.8	6.8
1986	1Q	14.4	14.4	6.1	8.6	- 1.1
	2Q	5.1	5.8	0.4	1.1	1.9
	3Q	-7.8	-7.7	2.7	2.5	1.1
1 Year Through 9/30/86		29.2	30.4	17.6	20.4	4.8
3 Years Annualized Through 9/30/86		14.1	14.7	15.9	16.9	7.7
5 Years Annualized Through 9/30/86		16.7	19.2	21.5	19.9	N.A.

TABLE 5

BASIC RETIREMENT FUNDS

EQUITY MANAGER PERFORMANCE

TOTAL PORTFOLIO RETURNS

Managers	Third Quarter 1986	Year Ending 9/30/86	Two Years Ending 9/30/86 (Annualized)	Since Inception 3/1/83 (Annualized)
Fred Alger	-14.1%	32.6%	21.7%	14.0%
Alliance Capital	-11.8	31.2	26.4	15.0
Beutel Goodman	-4.2	21.9	18.0	15.7
BMI Capital	-9.4	26.9	17.1	5.5
Forstmann Leff	-10.8	34.3	26.3	16.2
Hellman Jordan	-10.4	22.9	19.1	11.8
IDS	-10.1	35.6	25.3	16.8
Investment Advisers	-8.9	27.0	18.7	13.5
Lieber & Company	-9.5	31.1	24.9	16.3
Peregrine Capital	-4.7	16.6	N.A.	N.A.
Waddell & Reed	-6.4	22.7	17.2	12.7
Internal Manager	-1.4	23.0	N.A.	N.A.
Total - External Active Managers	-8.6	26.8	20.5	12.3
Wilshire Associates (Index Fund)	-7.4	30.4	22.4	N.A.
Performance Standards				
Wilshire 5000	-7.7	30.4	22.5	17.0
Inflation	0.7	1.8	2.5	3.4

TABLE 6

BASIC RETIREMENT FUNDS

BOND MANAGER PERFORMANCE

TOTAL PORTFOLIO RETURNS

Managers	Third Quarter 1986	Year Ending 9/30/86	Since Inception 6/30/84 (Annualized)
Investment Advisers	2.4%	16.3%	23.5%
Lehman Management	2.9	18.0	21.0
Miller Anderson	2.2	15.9	19.3
Morgan Stanley	3.1	18.7	20.9
Peregrine Capital	3.5	13.6	17.8
Western Asset	2.2	21.0	24.2
Total - External Bond Managers	2.7	17.9	21.1
Performance Standards			
Salomon Brothers Broad Bond Index	2.5	20.4	23.1
TUCS Median Bond Manager	2.1	19.7	N.A.

MINNESOTA STATE BOARD OF INVESTMENT

POST RETIREMENT INVESTMENT FUND

QUARTERLY INVESTMENT REVIEW

SEPTEMBER 30, 1986

MINNESOTA STATE BOARD OF INVESTMENT

POST RETIREMENT INVESTMENT FUND

THIRD QUARTER 1986

Summary

ASSETS

The assets of the Post Retirement Investment Fund grew only 0.3% in market value during the third quarter. A lackluster bond market, poor stock market returns, and a miniscule flow of net new contributions combined to produce an insignificant increase in the Fund's asset value. End-of-period market values for the Post Retirement Investment Fund's assets for the latest three quarters and last five calendar years are shown below.

Calendar Year		Market Value (millions)	Percent Change from Previous Period
1981		$1,101	- 5.2
1982		1,523	+38.3
1983		1,803	+18.4
1984		2,246	+24.6
1985		3,107	+38.3
1986	1Q	3,476	+11.9
	2Q	3,658	+ 5.2
	3Q	3,670	+ 0.3

ASSET MIX

Cash equivalents declined as a percentage of the Post Retirement Investment Fund during the third quarter. Cash reserves had risen sharply at the end of the second quarter due to new contributions resulting from a surge in teacher retirements. The excess cash reserves were invested in the Fund's bond portfolio during the third quarter.

Common stocks continued to decline as a percentage of the Fund's assets. With the prevailing low level of interest rates, all new contributions must be placed in the Fund's dedicated bond portfolio to finance promised benefits and maintain the floor benefit increase. Thus, as the Fund grows common stocks come to represent a smaller portion of the Fund's total value.

The percentage of the Fund (at market value) invested in common stocks, bonds, and cash equivalents over the last two quarters and previous year is presented below.

ASSET MIX

	9/30/85	6/30/86	9/30/86
Common Stocks	23.4%	18.6%	16.1%
Bonds	70.9	67.2	77.3
Cash Equivalents	5.7	14.2	6.6
	100.0%	100.0%	100.0%

EQUITY PERFORMANCE

The Post Retirement Investment Fund's equity portfolio produced a -5.2% return during the third quarter. The equity portfolio's return outperformed both the Wilshire 5000 and the SBI external equity manager pool. However, for the latest year, the equity portfolio continues to trail the Wilshire 5000 and external equity manager pool.

The sector weightings of the Post Retirement Investment Fund's equity portfolio were not significantly altered during the quarter. The equity portfolio remains overweighted in the Capital Goods, Energy and Technology sectors, and underweighted in the Consumer Nondurables, Materials & Services, and Utilities sectors. Equity portfolio performance for the latest quarter and year are presented below.

	Third Quarter 1986	Year Ending 9/30/86
Equity Portfolio	-5.2%	21.1%
Wilshire 5000	-7.7	30.4

DEDICATED BOND PORTFOLIO

The dedicated bond portfolio was rebalanced at the beginning of the third quarter. Based upon actuarial estimates of the Post Retirement Investment Fund's liabilities, the Fund's bond holdings were adjusted through a series of bond trades. These adjustments were designed to ensure that the dedicated bond portfolio continues to produce cash flows sufficient to finance both promised benefits and an annual floor benefit increase.

The composition of the dedicated bond portfolio changed slightly as a result of the rebalancing. Changes in yield spreads since the last rebalancing had made corporate and Canadian bonds relatively more attractive. As a result, their representation in the portfolio was increased. While Treasury and Agency issues continue to dominate the portfolio, their weight was reduced from the previous rebalancing.

TABLE 7

POST RETIREMENT INVESTMENT FUND

DEDICATED BOND PORTFOLIO STATISTICS

SEPTEMBER 30, 1986

Value at Market	$2,249,466,668
Value at Par	$2,239,195,136
Average Coupon	10.02%
Current Yield	8.90%
Yield to Maturity	8.35%
Time to Maturity	12.69 Years
Average Duration	7.22 Years
Average Quality Rating	AA
Number of Issues	269

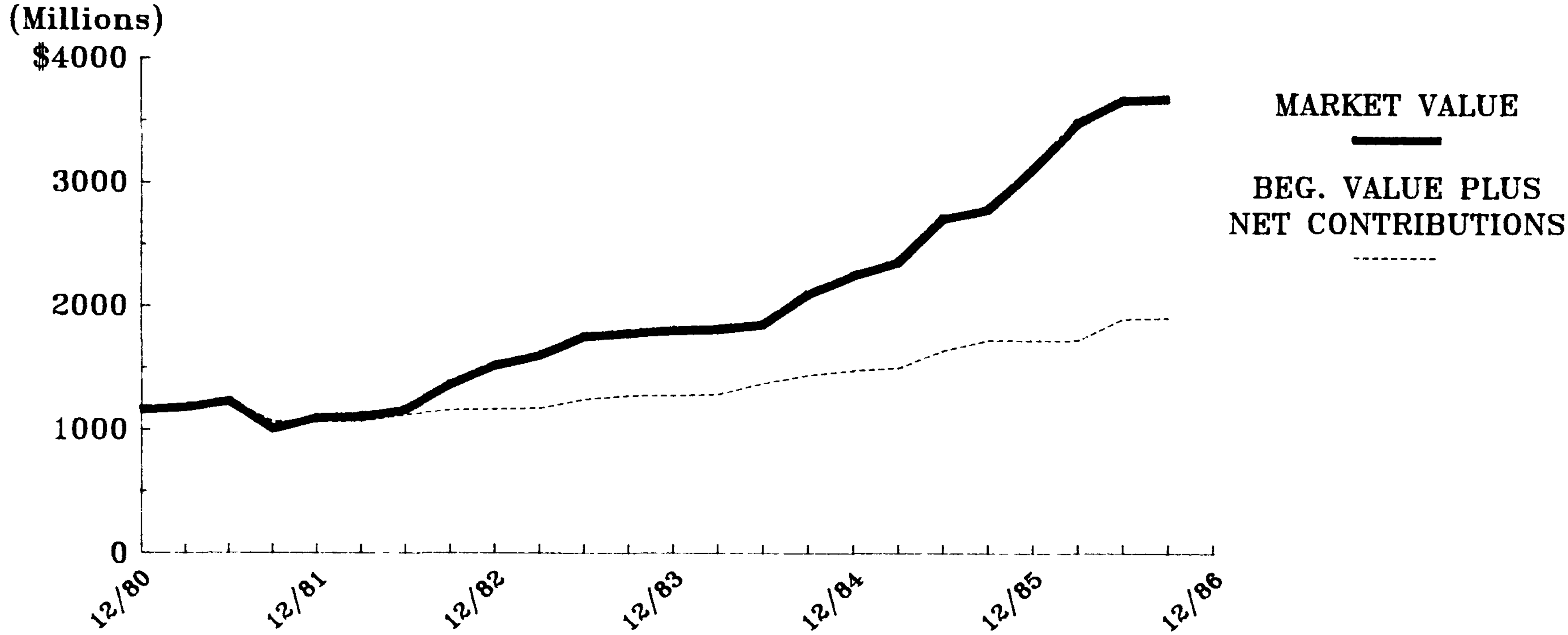
SECTOR WEIGHTINGS

Treasury	57.5%
Federal Agency	7.9
Industrial	9.9
Utilities	8.7
Finance	7.0
Transportation	1.0
Mortgages	0.0
Miscellaneous	8.0
	100.0%

FIGURE 6

POST RETIREMENT INVESTMENT FUND

ASSET GROWTH



PERIOD ENDING

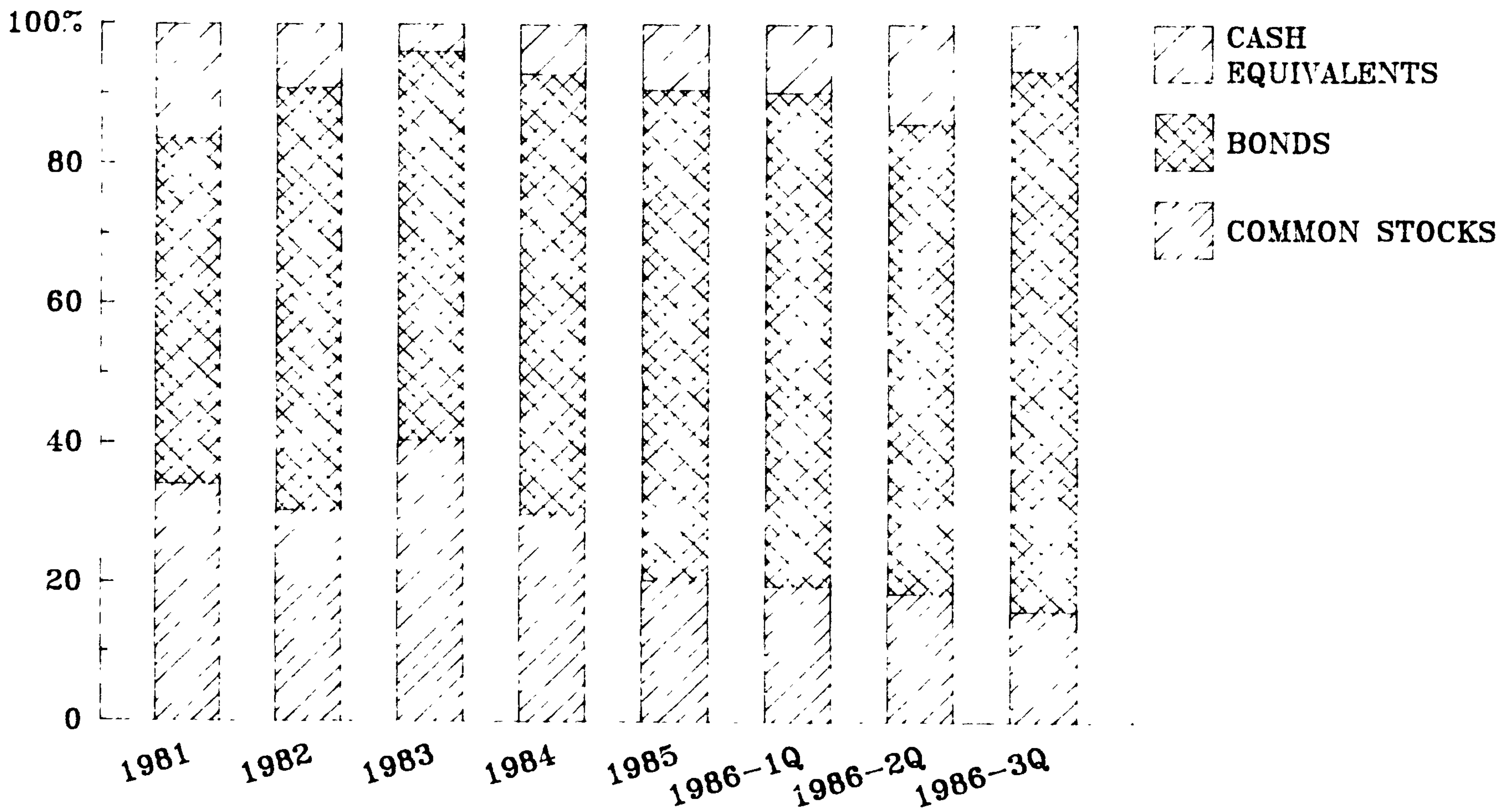
	12/80	12/81	12/82	12/83	12/84	12/85	9/86
BEGINNING VALUE	956.6	1,161.6	1,100.9	1,522.9	1,802.9	2,245.7	3,107.3
NET CONTRIBUTIONS	70.1	-97.8	102.6	109 1	201.0	238.9	182.6
INVESTMENT RETURN	125.9	37.1	319.4	170.8	241.8	622.7	380.4
ENDING VALUE	1,161.6	1,100.9	1,522.9	1,802.9	2,245.7	3,107.3	3,670.3

(MILLIONS OF DOLLARS)

FIGURE 7

POST RETIREMENT INVESTMENT FUND

HISTORICAL ASSET MIX



PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

TABLE 8

POST RETIREMENT INVESTMENT FUND

ASSET MIX

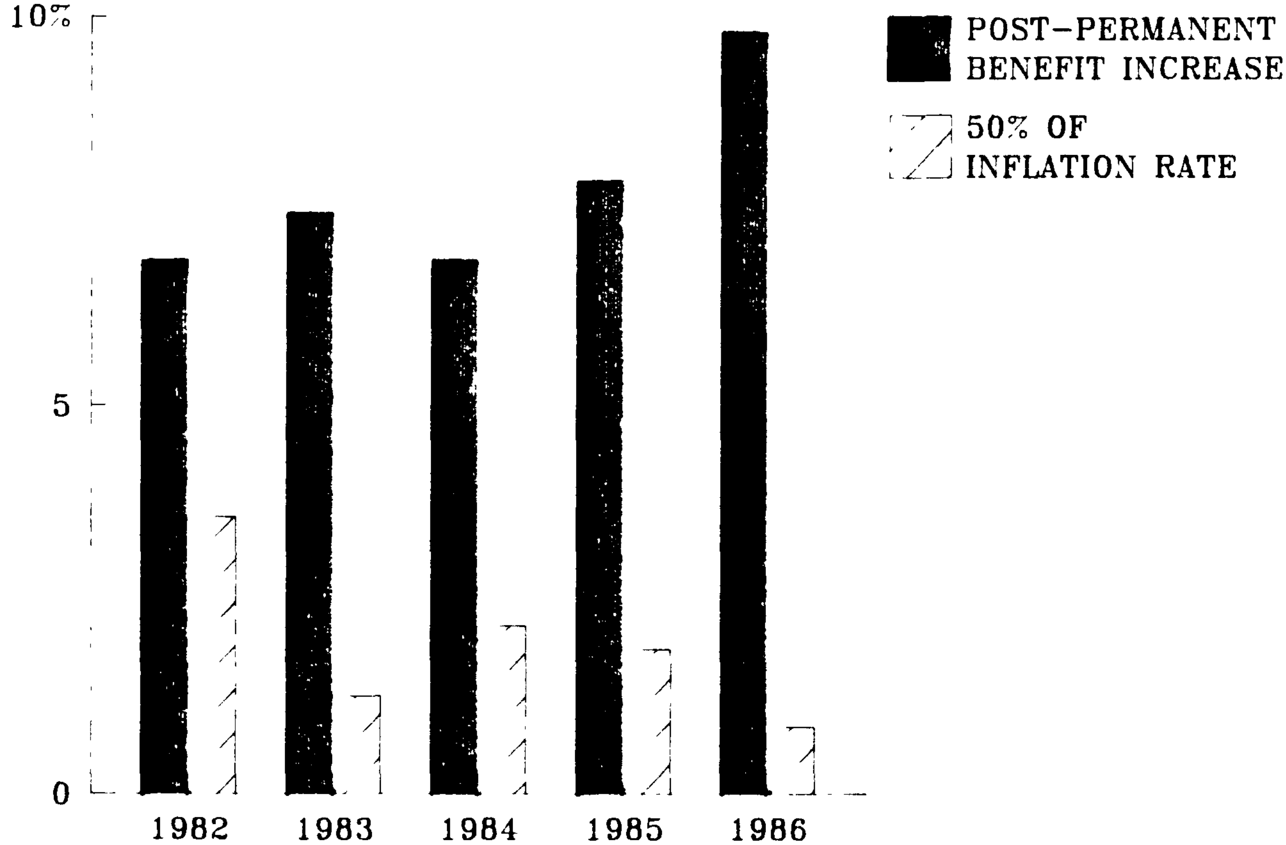
PERCENT OF MARKET VALUE

(End Of Period Allocations)

Calendar Year		Common Stocks $Million	Common Stocks Percent	Bonds $Million	Bonds Percent	Cash $Million	Cash Percent
1980		568.4	48.9	453.0	39.0	140.3	12.1
1981		376.0	34.2	545.5	49.5	179.4	16.3
1982		465.0	30.5	919.9	60.4	138.1	9.1
1983		730.3	40.5	1,002.1	55.6	69.8	3.9
1984		674.8	30.0	1,411.4	62.9	159.5	7.1
1985		636.5	20.5	2,182.5	70.2	288.3	9.3
1986	1Q	686.3	19.7	2,454.3	70.6	335.6	9.7
	2Q	681.0	18.6	2,457.1	67.2	519.6	14.2
	3Q	591.3	16.1	2,838.9	77.3	240.1	6.6

FIGURE 8

POST RETIREMENT INVESTMENT FUND
BENEFIT INCREASES VERSUS INFLATION



	FISCAL YEAR					(Annualized)	
	1982	1983	1984	1985	1986	3 YR.	5 YR.
BENEFIT INCREASE	6.9%	7.5%	6.9%	7.9%	9.8%	8.2%	7.8%
50%-INFLATION RATE	3.6	1.3	2.1	1.9	0.9	1.6	2.0

FIGURE 9

POST RETIREMENT INVESTMENT FUND

EQUITY SEGMENT RETURNS

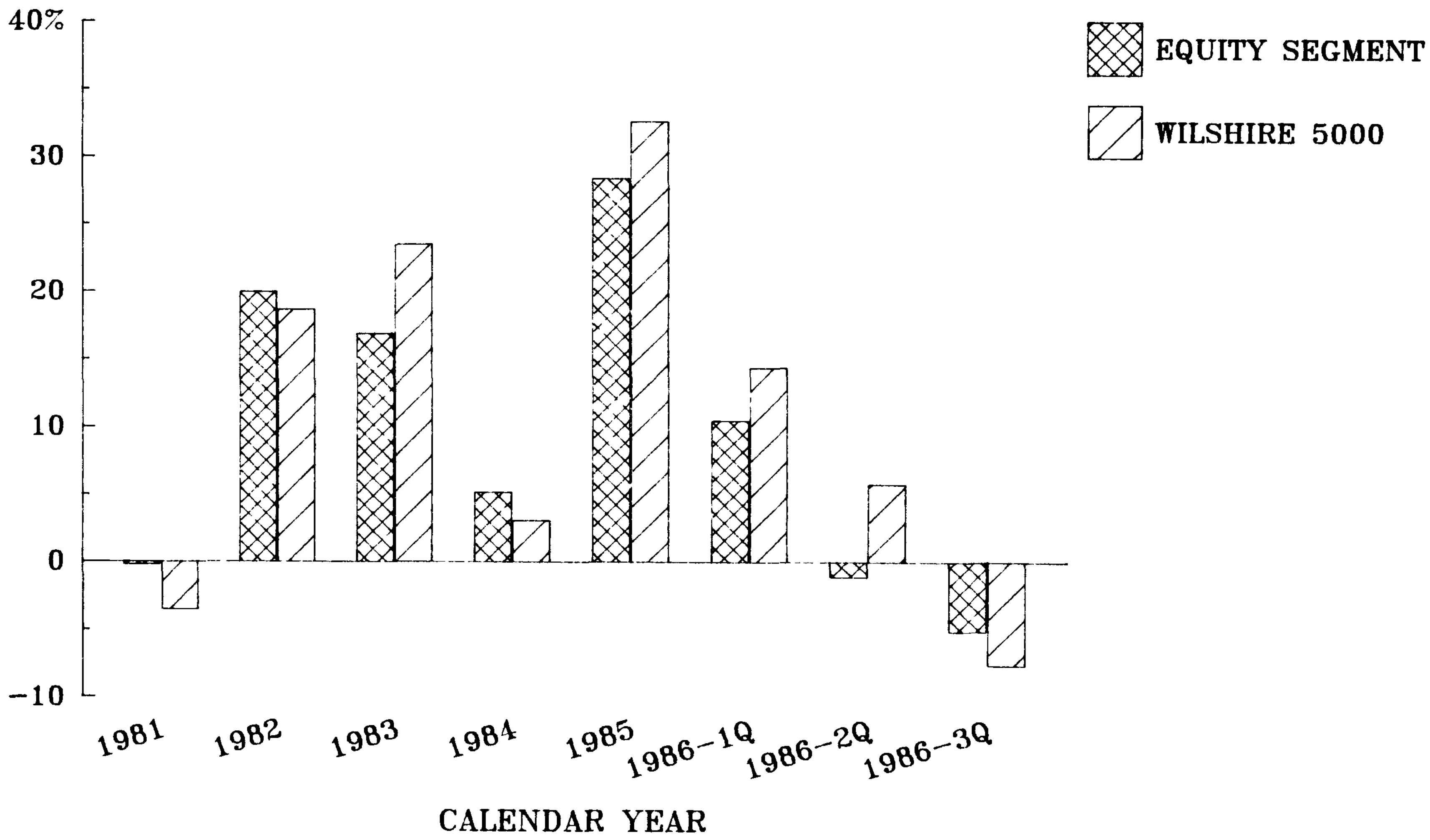


TABLE 9

POST RETIREMENT INVESTMENT FUND

EQUITY SEGMENT RETURNS

INVESTMENT RETURNS RELATIVE TO PERFORMANCE STANDARDS

		Total Returns	
		Post Retirement Fund	Wilshire 5000
1980		25.9%	33.7%
1981		-0.3	-3.6
1982		20.0	18.7
1983		16.9	23.5
1984		5.2	3.1
1985		28.4	32.6
1986	1Q	10.5	14.4
	2Q	-1.2	5.8
	3Q	-5.2	-7.7
1 Year Through 9/30/86		21.1	30.4
3 Years Annualized Through 9/30/86		11.9	14.7
5 Years Annualized Through 9/30/86		15.9	19.2

TABLE 10

POST RETIREMENT INVESTMENT FUND

EQUITY MANAGER DATA

September 30, 1986

SECTOR WEIGHTINGS

SECTORS	WEIGHTING INTERNAL MANAGER	WEIGHTING WILSHIRE 5000
Capital Goods	6.1%	4.4%
Consumer Durables	5.8	3.8
Consumer Nondurables	12.8	26.9
Energy	17.9	9.0
Financial	13.6	14.0
Materials & Services	6.8	12.1
Technology	26.1	12.4
Transportation	3.1	3.1
Utilities	7.6	14.3
		100.0%

QUARTER-END PORTFOLIO STATISTICS *

MANAGER	# OF STOCKS	EQUITY ALLOC.	MKT. VOLTY	DIVER.	YIELD	E/P	REL. RET.	P/B	5 YR EARN	MVAR	EVAR	SIZE	GROW	FINL
Internal Mgr.	119	100%	1.10	0.88	0.22	0.02	-0.72	-0.46	-0.22	0.14	0.05	0.07	0.22	0.19

* See Equity Manager Portfolio Statistics Glossary for definitions.

MINNESOTA STATE BOARD OF INVESTMENT

SUPPLEMENTAL INVESTMENT FUND

- o INCOME SHARE ACCOUNT
- o GROWTH SHARE ACCOUNT
- o COMMON STOCK INDEX ACCOUNT
- o BOND MARKET ACCOUNT
- o MONEY MARKET ACCOUNT
- o GUARANTEED RETURN ACCOUNT

QUARTERLY INVESTMENT REVIEW

SEPTEMBER 30, 1986

MINNESOTA STATE BOARD OF INVESTMENT

SUPPLEMENTAL INVESTMENT FUND

THIRD QUARTER 1986

Summary

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

- o It functions as the investment manager for all assets of the Unclassified Employees Retirement Plan.

- o 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.

- o It is one investment vehicle offered to public employees as part of the state's Deferred Compensation Plan.

- o 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 14,000 individuals. On September 30, 1986 the market value of the entire fund was $339 million.

A wide diversity of investment goals exists among the Fund's participants. In order to meet those needs, the 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 the statutory requirements and rules established by the participating organizations. Participation in the Fund is accomplished through the purchase or sale of shares in each account.

As of the beginning of fiscal year 1987, participants in the Supplemental Investment Fund may select from among the following seven investment options:

- o Income Share Account (existing option) - an actively managed, balanced portfolio utilizing both common stocks and bonds

- Growth Share Account (existing option) - an actively managed, all common stock portfolio
- Common Stock Index Account (new option) - a passively managed, all common stock portfolio designed to track the performance of the entire stock market
- Bond Market Account (new option) - an actively managed, all bond portfolio that reflects changes in the market value of bonds
- Money Money Account (new option) - a portfolio utilizing short term, liquid debt securities
- Guaranteed Return Account (new option) - an option utilizing guaranteed investment contracts (GIC's), which offer a fixed rate of return for a specified period of time.
- Bond Account (existing option) - a portfolio of intermediate term debt securities that are bought and held to maturity. This option is available only to local police and firefighter retirement plans.

SUPPLEMENTAL INVESTMENT FUND

INCOME SHARE ACCOUNT

The primary investment objective of the Income Share Account is similar to that of the Basic Retirement Funds. The Account seeks to maximize long-term real rates of return, while limiting short-run portfolio return volatility.

To achieve this objective, the Income Share Account is invested in a balanced portfolio of common stocks and fixed income securities. The Account's target long-term asset allocation is 60% common stocks, 35% bonds, and 5% cash equivalents. Common stocks provide the potential for significant capital appreciation, while bonds provide a deflation hedge and portfolio diversification.

The investment management structure of the Income Share Account combines internal and external management. The SBI investment staff manages the entire fixed income segment of the Account's portfolio and approximately 80% of the common stock segment. The balance of the common stock portfolio is managed externally. The Account participates in the common stock segment of the Combined Investment Funds. Through its participation in the Funds, the Account utilizes the same external common stock managers as the Basic Retirement Funds.

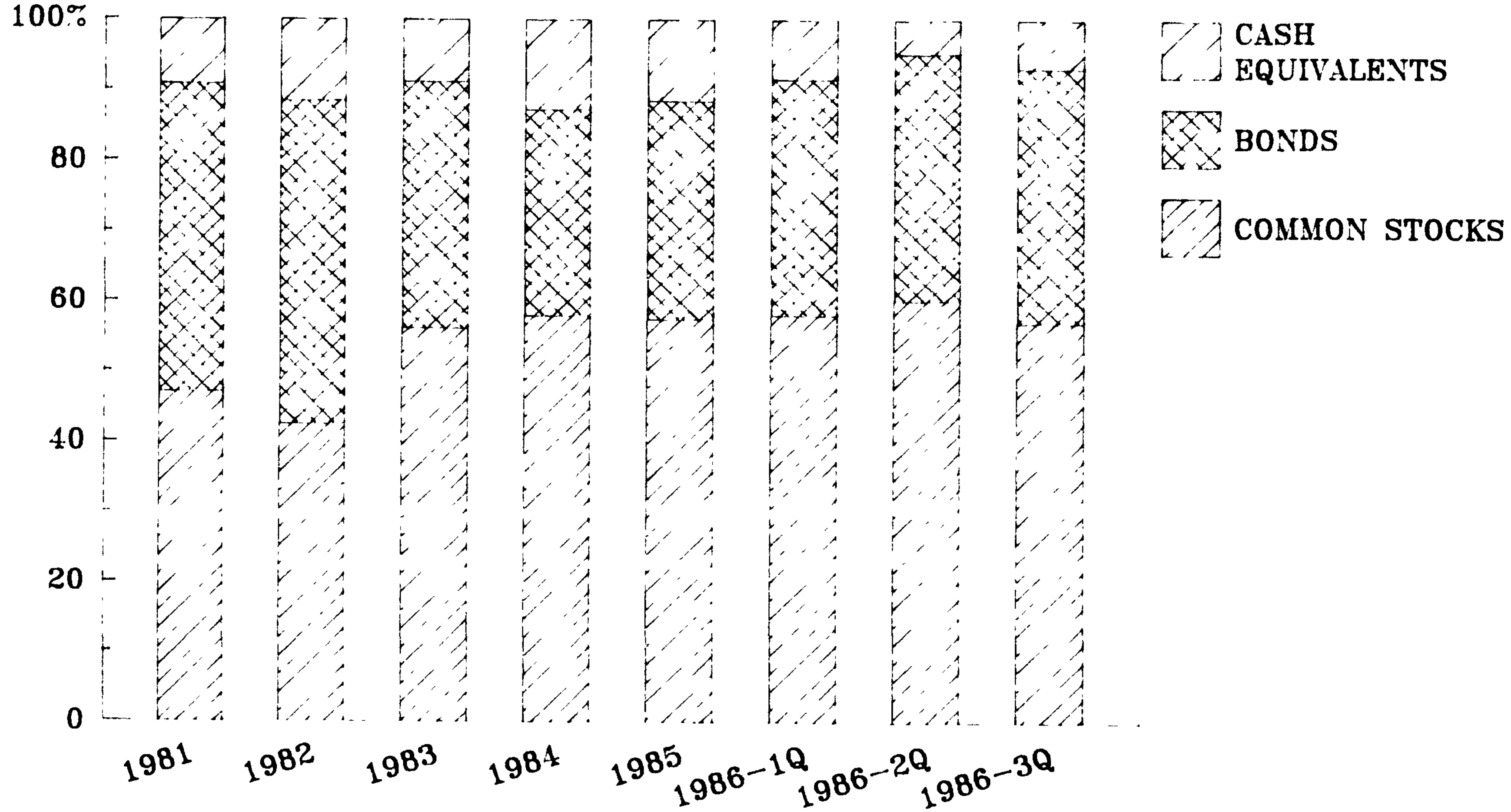
The September 30, 1986 market value of the Income Share Account was $177 million.

The Income Share Account's asset mix for the last three quarters and five calendar years is presented on pages 37 and 38.

Total account and asset segment performance is displayed on page 39. Individual external manager performance is presented on page 16.

FIGURE 10

SUPPLEMENTAL INVESTMENT FUND
(INCOME SHARE ACCOUNT)
HISTORICAL ASSET MIX



CALENDAR YEAR

PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

TABLE 11

SUPPLEMENTAL INVESTMENT FUND
(Income Share Account)
ASSET MIX

PERCENT OF MARKET VALUE
(End Of Period Allocations)

Calendar Year		Common Stocks $Million	Common Stocks Percent	Bonds $Million	Bonds Percent	Cash* $Million	Cash* Percent
1980		33.5	44.5	30.5	40.4	11.3	15.1
1981		35.9	47.1	33.4	43.8	7.0	9.1
1982		42.7	42.5	46.2	46.0	11.5	11.5
1983		63.5	56.2	39.6	35.0	9.9	8.8
1984		74.4	58.0	37.6	29.3	16.4	12.7
1985		92.8	57.5	50.0	31.0	18.5	11.5
1986	1Q	103.5	58.1	59.8	33.5	15.0	8.4
	2Q	108.0	60.2	62.7	35.0	8.6	4.8
	3Q	100.9	57.0	63.9	36.1	12.1	6.9

*Includes cash held by the external managers

TABLE 12

SUPPLEMENTAL INVESTMENT FUND

INCOME SHARE ACCOUNT

INVESTMENT PERFORMANCE

Total Returns

	THIRD QUARTER 1986	YEAR ENDING 9/30/86
Total Account	-2.7%	18.8%
Median Fund*	-2.3	24.0
Composite**	-3.7	25.9
Equity Segment	-6.3	20.6
Wilshire 5000	-7.7	30.4
Bond Segment	2.8	17.5
Salomon Broad Bond Index	2.5	20.4

* TUCS Median Balanced Portfolio

** 50/45/5 Wilshire 5000/Salomon Broad Bond Index/T-Bills Composite Through 12-31-82; 60/35/5 Composite Thereafter

SUPPLEMENTAL INVESTMENT FUND

GROWTH SHARE ACCOUNT

The Growth Share Account's principal investment objective is to generate above-average returns from capital appreciation. In order to attain this objective, the Growth Share Account's investment program focuses on common stocks. The long-run target asset allocation for the Account is 95% common stock, 5% cash equivalents. The small cash equivalents component represents the normal cash reserves held by the Account as a result of net contributions not yet allocated to stocks.

The management of the Growth Share Account's common stock portfolio is split equally between internal and external management. The SBI investment staff manages the internal component with a long-term value-oriented approach. The balance of the Growth Account's portfolio is managed by the Board's external active equity managers. As with the Income Share Account, the Growth Share Account's external equity component is achieved through its participation in the common stock segment of the Board's Combined Investment Funds.

The September 30, 1986 market value of the Growth Share Account was $73 million.

The historical asset mix for the account is displayed on pages 41 and 42.

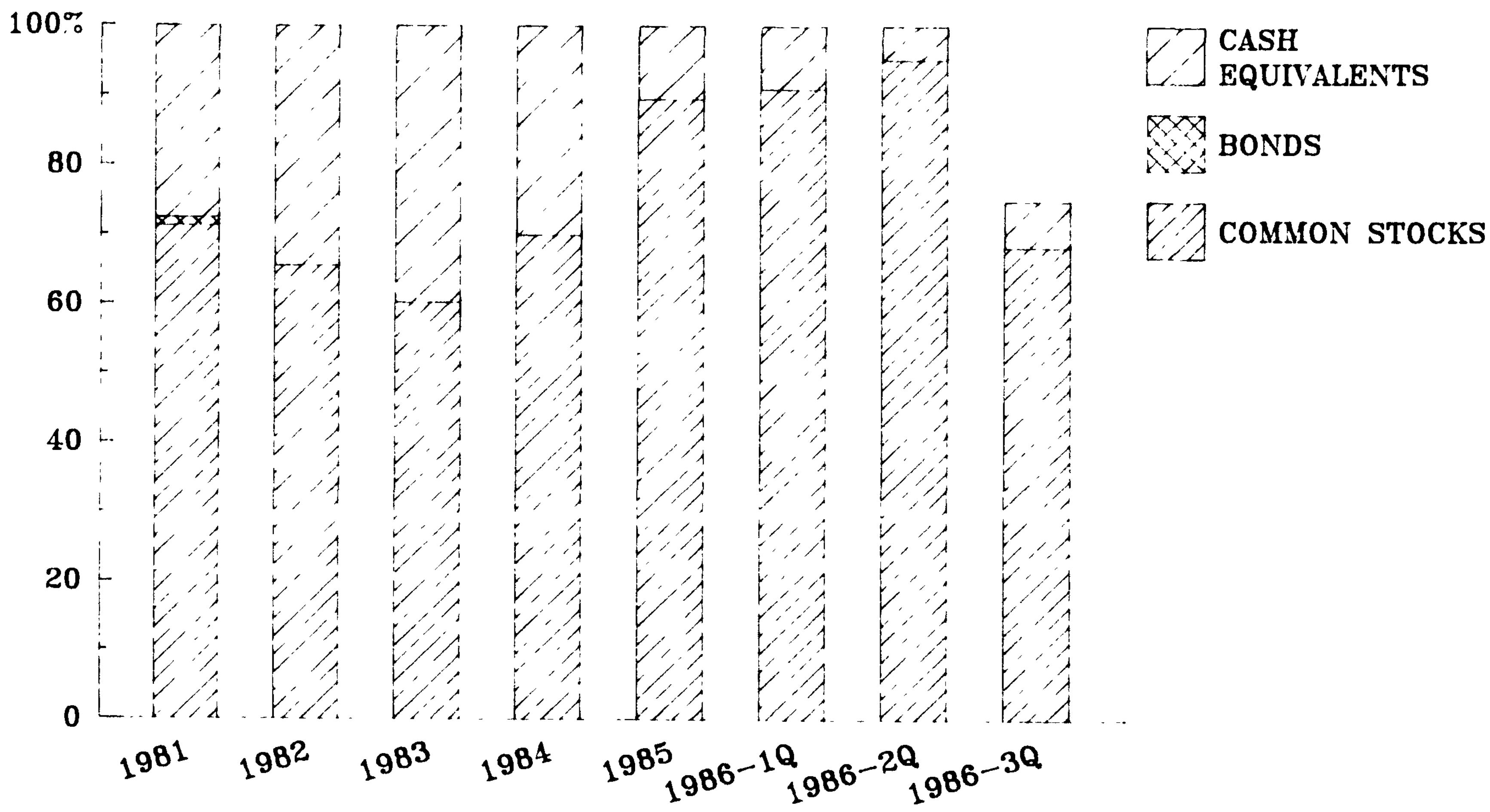
Total account and asset segment performance is presented on page 43. Individual common stock manager performance is listed on page 16.

FIGURE 11

SUPPLEMENTAL INVESTMENT FUND

(GROWTH SHARE ACCOUNT)

HISTORICAL ASSET MIX



CALENDAR YEAR

PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

TABLE 13

SUPPLEMENTAL INVESTMENT FUND
(Growth Share Account)

ASSET MIX

PERCENT OF MARKET VALUE
(End Of Period Allocations)

Calendar Year		Common Stocks $Million	Common Stocks Percent	Bonds $Million	Bonds Percent	Cash* $Million	Cash* Percent
1980		29.8	83.0	----	----	6.1	17.0
1981		28.8	71.3	0.5	1.2	11.1	27.5
1982		32.5	65.6	----	----	17.0	34.4
1983		33.7	60.3	----	----	22.2	39.7
1984		41.8	70.0	----	----	17.9	30.0
1985		65.8	89.5	----	----	7.7	10.5
1986	1Q	74.9	91.0	----	----	7.4	9.0
	2Q	75.0	95.2	----	----	3.8	4.8
	3Q	68.3	93.4	----	----	4.8	6.6

*Includes cash held by the external managers

TABLE 14

SUPPLEMENTAL INVESTMENT FUND

GROWTH SHARE ACCOUNT

INVESTMENT PERFORMANCE

Total Returns

	THIRD QUARTER 1986	YEAR ENDING 9/30/86
Total Account	-7.2%	22.2%
Median Fund*	-6.7	29.4
Composite**	-7.3	29.2
Equity Segment	-7.3	23.0
Wilshire 5000	-7.7	30.4

* TUCS Median Managed Equity Portfolio

** 95/5 Wilshire 5000/T-Bills Composite

SUPPLEMENTAL INVESTMENT FUND

COMMON STOCK INDEX ACCOUNT

The Common Stock Index Account is a new investment option for the participants in the Supplemental Investment Fund. The Index Account accepted contributions effective July 1, 1986. The September 30, 1986 market value of the Account was $214,000.

The investment objective of the Common Stock Index Account is to generate returns that match those of the common stock market. This objective is achieved through the Account's participation in the SBI's existing index fund.

The SBI's index fund is a passively-managed portfolio of over 1,300 different stocks. The fund is designed to track the performance of the Wilshire 5000, a broad-based equity market indicator. The Wilshire 5000 represents virtually the entire domestic common stock market.

The performance of the index fund is presented below. Only the third quarter 1986 performance data reflect the returns earned by the newly created Common Stock Index Account. Performance data prior to third quarter 1986 represent what the performance of the Common Stock Index Account would have been had it participated in the index fund during the time periods indicated.

Total Returns

CALENDAR YEAR	WILSHIRE ASSOCIATES (INDEX FUND)	WILSHIRE 5000
1984	3.2%	3.0%
1985	32.5	32.6
1986 1Q	14.0	14.4
2Q	5.4	5.8
3Q	-7.4	-7.7
1 Year Ending 9/30/86	30.4	30.4
2 Years Annualized Ending 9/30/86	22.4	22.5

SUPPLEMENTAL INVESTMENT FUND

BOND MARKET ACCOUNT

The Bond Market Account is another new investment option for the participants in the Supplemental Investment Fund. The Account accepted contributions effective July 1, 1986. The September 30, 1986 market value of the Account was $638,000.

The investment objective of the Bond Market Account is to earn a high rate of return by investing in fixed income securities. Account returns are generated in the form of interest income and capital appreciation. The Account invests primarily in high-quality, government and corporate bonds that have intermediate to long-term maturities, usually 3 to 20 years.

The entire Bond Market Account is invested externally. The Account participates in the bond component of the Combined Investment Funds. Through this participation, the Account uses the same six external bond managers as the Basic Retirement Funds.

The Board funded the external bond managers in early July, 1984. The six managers were selected for their blend of investment styles. Each of the managers emphasizes active investment decisions. However, the managers vary in their approach to interest rate anticipation, issue selection, and bond market sector weighting.

Performance of the bond component of the Combined Investment Funds is displayed below. Individual manager performance is presented on page 17.

As with the Common Stock Index Account, only the third quarter 1986 performance reflects the returns earned by the new Bond Market Account. The performance prior to third quarter 1986 represents what the performance of the Bond Market Account would have been had the account participated in the bond component of the Combined Investment Funds during the periods indicated.

Total Returns

	THIRD QUARTER 1986	YEAR ENDING 9/30/86	TWO YEARS ENDING 9/30/86
SBI Ext. Bond Manager Aggregate	2.7%	17.9%	19.3%
Salomon Broad Bond Index	2.5	20.4	21.2

SUPPLEMENTAL INVESTMENT FUND

MONEY MARKET ACCOUNT

The Money Market Account is essentially a new option for participants in the Supplemental Investment Fund. The Account was formerly called the Fixed Return Account. However, its name has been changed to more accurately reflect its new investment focus. The September 30, 1986 market value of the Account was $77 million.

The investment objective of the Money Market Account is to purchase short-term, liquid fixed income investments that pay interest at rates competitive with those available in the money markets.

The Money Market Account is invested entirely in high quality short-term investments such as U.S. Treasury Bills, bank certificates of deposit, repurchase agreements, and high grade commercial paper. The maximum maturity of these investments is three years.

The Money market Account is managed solely by State Street Bank and Trust Company of Boston, MA. State Street manages a major portion of the Board's cash reserves.

The first full quarter of performance for the Account under its new focus will be fourth quarter, 1986. The historical performance over the last two years for State Street's short-term account is presented below. This represents the investment returns that would have been generated by the Money Market Account had it been invested under the current approach for the time periods indicated.

Total Returns

	THIRD QUARTER 1986	YEAR ENDING 9/30/86	TWO YEARS ENDING 9/30/86 (ANNUALIZED)
Rate of Return (annualized)	6.5%	7.4%	8.0%

SUPPLEMENTAL INVESTMENT FUND

GUARANTEED RETURN ACCOUNT

The Guaranteed Return Account is a new investment option for participants in the Supplemental Investment Fund. The investment objectives of the Guaranteed Return Account are to protect investors from any loss of their original investment and to provide a fixed rate of return over a three year period.

The Guaranteed Return Account will be invested in guaranteed investment contracts (GIC's) offered by major U.S. insurance companies. Each year the Board will accept bids from insurance companies that meet the financial quality criteria defined by State statute. The insurance company offering the highest three-year GIC interest rate will be awarded the contract. That interest rate will then be offered to participants who make contributions to the Guaranteed Return Account over the following twelve months.

Final bidding on the 1986 GIC contract occurred during October, 1986. The bidding process is described in a staff report contained in the Fixed Income Manager Committee section of this quarterly report. Principal Mutual Life Insurance Company (formerly The Bankers Life of Iowa) submitted the winning bid of 7.72%.

The Guaranteed Return Account first accepted contributions in November, 1986.

MINNESOTA STATE BOARD OF INVESTMENT

MINNESOTA VARIABLE ANNUITY FUND

QUARTERLY INVESTMENT REVIEW

SEPTEMBER 30, 1986

MINNESOTA STATE BOARD OF INVESTMENT

MINNESOTA VARIABLE ANNUITY FUND

THIRD QUARTER 1986

Summary

The Minnesota Variable Annuity Fund is an investment option formerly offered to members of the Teachers' Retirement Association. The Fund was designed as an alternative to the regular teachers' retirement plan. The opportunity to enroll in the Fund is no longer offered to new Association members, although members enrolled prior to the cutoff date may retain their participation in the Fund and continue to make contributions. The September 30, 1986 market value of the Fund was $136 million.

The investment objective of the Minnesota Variable Annuity Fund is comparable to that of the Supplemental Investment Fund's Growth Share Account. The goal of the Variable Annuity Fund is to generate above-average capital appreciation. Like the Growth Share Account, the Variable Annuity Fund's long-term, policy asset allocation is 95% common stocks, 5% cash equivalents.

Management of the Variable Annuity Fund is split between internal and external management. The SBI staff provides a conservative value-oriented style of management, while the external managers complement the internal staff with a more aggressive investment approach. The Variable Annuity Fund utilizes the same pool of external common stock managers as the Basic Retirement Funds through participation in the equity component of the Combined Investment Funds.

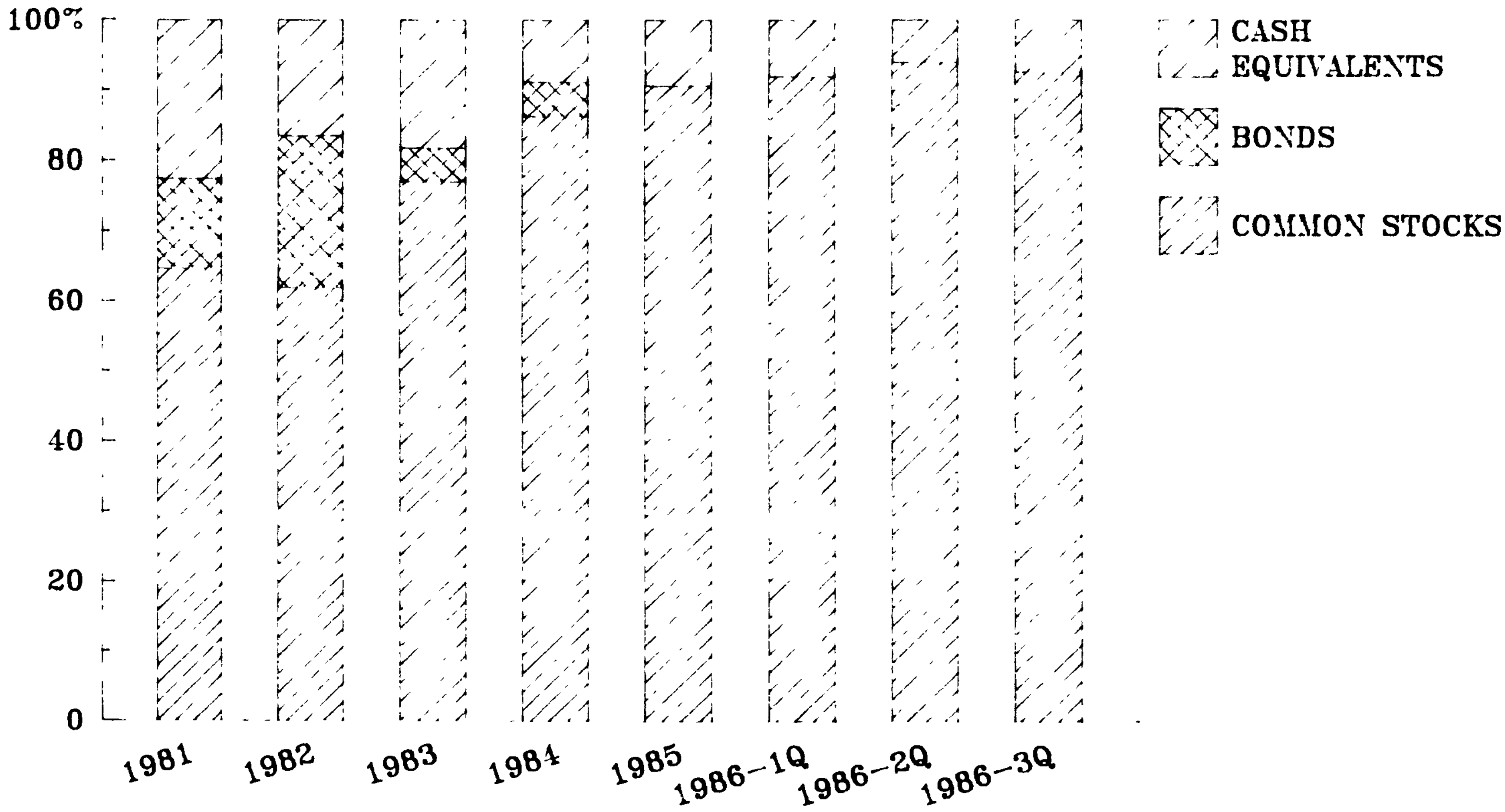
Historical asset allocation for the Minnesota Variable Annuity Fund is presented in the graph on page 51 and the accompanying table on page 52.

Total account and asset segment performance is presented in the table on page 53. Individual common stock managers performance is given on page 16.

FIGURE 12

MINNESOTA VARIABLE ANNUITY FUND

HISTORICAL ASSET MIX



PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

TABLE 15

MINNESOTA VARIABLE ANNUITY FUND
ASSET MIX

PERCENT OF MARKET VALUE
(End Of Period Allocations)

Calendar Year		Common Stocks $Million	Common Stocks Percent	Bonds $Million	Bonds Percent	Cash* $Million	Cash* Percent
1980		55.2	74.1	9.8	13.2	9.4	12.7
1981		49.6	64.8	9.7	12.7	17.2	22.5
1982		56.7	62.0	19.8	21.6	15.0	16.4
1983		78.9	77.0	5.0	4.8	18.7	18.2
1984		89.4	86.3	5.1	4.9	9.1	8.8
1985		116.8	90.7	---	---	12.0	9.3
1986	1Q	133.5	92.0	---	---	11.6	8.0
	2Q	138.9	94.0	---	---	8.8	6.0
	3Q	126.2	92.6	---	---	10.1	7.4

*Includes cash held by external managers

TABLE 16

MINNESOTA VARIABLE ANNUITY FUND

INVESTMENT PERFORMANCE

	Total Returns	
	THIRD QUARTER 1986	YEAR ENDING 9/30/86
Total Account	-7.3%	23.1%
Median Fund*	-6.7	29.4
Composite**	-7.3	29.2
Equity Segment	-7.4	23.6
Wilshire 5000	-7.7	30.4

* TUCS Median Managed Equity Portfolio

** 95/5 Wilshire 5000/T-Bills Composite

MINNESOTA STATE BOARD OF INVESTMENT

PERMANENT SCHOOL FUND

QUARTERLY INVESTMENT REVIEW

SEPTEMBER 30, 1986

MINNESOTA STATE BOARD OF INVESTMENT

PERMANENT SCHOOL FUND

THIRD QUARTER 1986

Summary

ASSETS

The assets of the Permanent School Fund rose 2.2% in market value during the third quarter. The increase was due entirely to the modest return earned on the Fund's bond portfolio, as net contributions for the quarter were slightly negative. End-of-period market values for the latest three quarters and last five calendar years are presented below.

Calendar Year		Market Value (Millions)	Percent Change From Previous Period
1980		$245	+ 1.7
1981		236	- 3.7
1982		286	+ 21.2
1983		290	+ 1.4
1984		308	+ 6.2
1985		350	+ 13.6
1986	1Q	359	+ 2.6
	2Q	365	+ 1.7
	3Q	373	+ 2.2

ASSET MIX

The assets of the Permanent School Fund are invested entirely in fixed income securities. As discussed in previous Quarterly Investment Reviews, the accounting restrictions under which the Fund must operate dictate that current income maximization be its primary investment goal. Common stocks are not a viable component of the Fund's long-run asset mix.

Cash equivalents declined as a percentage of the Fund's total value durng the third quarter. As interest rates rose in August purchases of bonds were made using the Fund's cash reserves.

The percentage of the Fund (at market value) invested in common stocks, bonds, and cash equivalents over the last two quarters and previous year is presented below.

ASSET MIX

	9/30/85	6/30/86	9/30/86
Common Stocks	2.1%	0.0%	0.0%
Bonds	66.8	65.4	75.8%
Cash Equivalents	31.1	34.6	24.2
	100.0%	100.0%	100.0%

BOND PORTFOLIO

The third quarter purchases of bonds for the Permanent School Fund were made primarily in the Agency and the Industrial sectors. The Fund remains concentrated in mortgages and Treasury and Agency issues. Relevant quarter-end statistics are shown on the following page.

TABLE 17

PERMANENT SCHOOL FUND

BOND PORTFOLIO STATISTICS

SEPTEMBER 30, 1986

Value at Market	$283,387,233
Value at Par	$270,643,648
Average Coupon	9.42%
Current Yield	9.01%
Yield to Maturity	8.30%
Time to Maturity	11.66 Years
Average Duration	4.48 Years
Average Quality Rating	AAA
Number of Issues	119

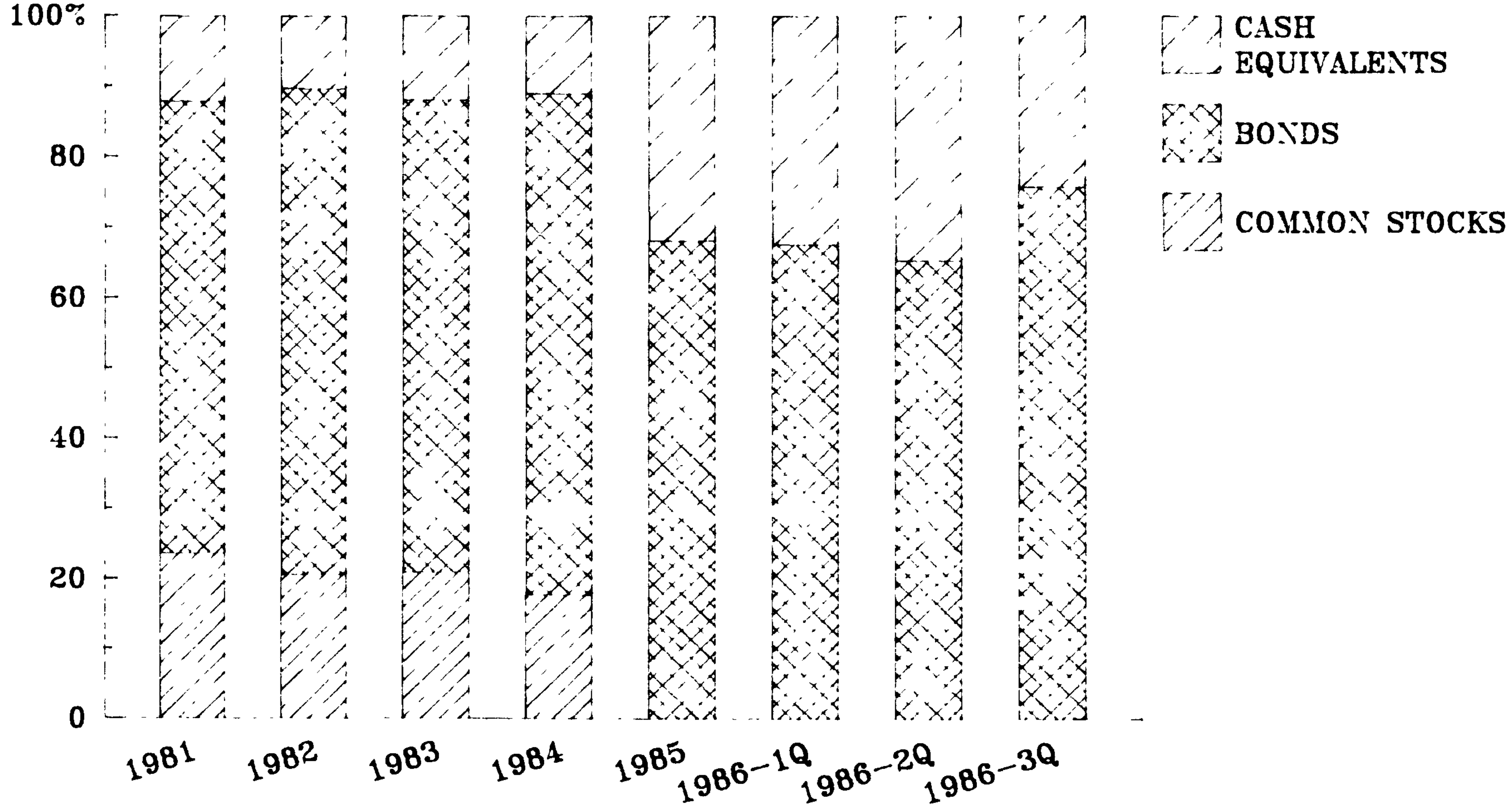
SECTOR WEIGHTINGS

Treasury	15.9%
Federal Agency	29.1
Industrial	11.5
Utilities	7.5
Finance	4.4
Transportation	3.6
Mortgages	26.6
Miscellaneous	1.4
	100.0%

FIGURE 13

PERMANENT SCHOOL FUND

HISTORICAL ASSET MIX



PERCENT OF MARKET VALUE
END OF PERIOD ALLOCATIONS

TABLE 18

PERMANENT SCHOOL FUND

ASSET MIX

PERCENT OF MARKET VALUE
(End Of Period Allocations)

Calendar Year		Common Stocks $Million	Common Stocks Percent	Bonds $Million	Bonds Percent	Cash $Million	Cash Percent
1980		63.9	26.1	169.3	69.2	11.6	4.7
1981		56.0	23.7	151.9	64.2	28.5	12.1
1982		59.1	20.7	197.6	69.0	29.5	10.3
1983		60.8	21.0	195.0	67.1	34.4	11.9
1984		54.9	17.8	219.4	71.2	33.8	11.0
1985		0.0	0.0	238.7	68.2	111.5	31.8
1986	1Q	0.0	0.0	243.5	67.7	116.0	32.3
	2Q	0.0	0.0	238.4	65.4	126.3	34.6
	3Q	0.0	0.0	282.8	75.8	90.1	24.2

APPENDIX

This appendix contains historical portfolio data pertaining to the SBI's external equity and fixed income managers from the inception of the SBI's accounts with these managers. Any revisions of portfolio data reported in previous quarterly reviews are contained in this appendix.

EQUITY MANAGER PORTFOLIO STATISTICS GLOSSARY

In the following pages, summary descriptions of the individual equity managers' investment philosophy, risk characteristics, and performance data are displayed. Some of the statistics presented are technical in nature. This glossary is designed to aid in understanding the terms that are introduced.

The first five portfolio characteristics listed in the glossary are presented in the Quarterly Investment Review and Appendix on an absolute basis. The remaining portfolio statistics are reported relative to the stock market. The purpose of presenting these statistics in a relative fashion is to "normalize" them, or remove the impact of market-wide changes on the characteristics of a manager's portfolio. In calculating the relative values, the stock market is represented by the 1000 largest capitalization companies in the Wilshire 5000. The managers' portfolio characteristics are reported in standard deviation units relative to the average or mean of these 1000 companies. Thus, a positive (negative) value for a portfolio characteristic indicates a value higher (lower) than the market average.

# of Stocks	- number of different issues held in the manager's stock portfolio.
Qtr. Port. Turnover	- the manager's total equity asset sales during the quarter divided by the average value of the manager's equity assets over the quarter.
Equity Allocation	- percent of the manager's total portfolio invested in common and preferred stocks and convertible securities.
Diversification (R2)	- extent to which a manager's equity holdings statistically resemble the stock market. Low (high) diversification portfolios will experience returns which are not well (are well) correlated with those of the market. By definition, the market has a diversification measure of 1.0. The less a portfolio is diversified, the lower will be its diversification measure (referred to as R-squared). The SBI's managers are required, over the long-term, to hold portfolios with diversification levels less than .85.

Market Volatility (Equity Beta)	- degree to which the returns on the manager's stock portfolio are sensitive to movements in the stock market's return. By definition the market has a market volatility measure (referred to as beta) of 1.0. Portfolios with values greater (less) than 1.0 have above (below) average sensitivity to market moves. The SBI's managers are required, over the long-term to hold portfolios with market volatility levels above 1.10. This measure does not include the impact of cash holdings on total portfolio volatility.
Price Variability (MVAR)	- risk related to the historical variability of the prices of stocks in the manager's portfolio. The more variable are the portfolio's securities' prices, the more risky is the portfolio. Items such as current stock price, twelve month price range, trading volume, and beta make up this measure.
Earnings Variability (EVAR)	- risk related to the variability of the earnings of those companies owned in the manager's portfolio. The more variable are the companies' earnings, the more risky is the portfolio. Items such as variance of accounting earnings, variance of cash flow, occurrence of extraordinary accounting items, and the correlation of companies' earnings with U.S. corporate earnings make up this measure.
12-Month Relative Return (REL RET)	- the return on the stocks currently in the manager's portfolio over the last twelve months less the return on the S&P 500.
Price-to-Book Ratio (P/B)	- the market value of the manager's portfolio divided by the latest available annual book value.
5 Year Earnings Growth (5 YR. EARN.)	- the annualized growth of the average earnings per share of the manager's portfolio over the latest five fiscal years.

Size and Immaturity (SIZE)	- Risk related to the size and maturity of the companies held in the portfolio. The smaller and younger the companies, the more risky is the portfolio. Items such as total assets, market capitalization, gross plant/book value ratio, and company age make up this measure.
Growth (GROW)	- risk related to the growth orientation of companies owned by the manager. The more growth-oriented are the companies, the riskier is the portfolio. Items such as dividend yield, E/P ratio, and growth in total assets make up this measure.
Earnings-to-Price Ratio (E/P)	- the weighted average trailing four quarter earnings per share of the manager's common stock portfolio divided by the weighted average price per share of the manager's common stock portfolio.
Dividend Yield (YIELD)	- indicated annual dividend of the manager's stock portfolio divided by the portfolio market value.
Financial Leverage (FINL)	- risk related to the extent to which companies held in the portfolio have used debt to finance their operations. The more leveraged are the companies, the riskier is the portfolio. Items such as debt/asset ratio, current asset/current liability ratio, and uncovered fixed charges make up this ratio.
Industry Sector Overweightings	- those sectors of the economy in which the manager has invested a significantly larger percentage of the portfolio than is represented by the stock market.
Industry Sector Underweightings	- those sectors of the economy in which the manager has invested a significantly smaller percentage of the portfolio than is represented by the stock market.

TABLE A-1

EXTERNAL EQUITY MANAGERS

PORTFOLIO STATISTICS RELATIVE TO BENCHMARK PORTFOLIOS

QUARTER-END PORTFOLIO STATISTICS *

MANAGER		# OF STOCKS	EQUITY ALLOC.	MKT. VOLTY	DIVER.	YIELD	E/P	REL. RET.	P/B	5 YR EARN	MVAR	EVAR	SIZE	GROW	FINL
GROWTH MANAGERS															
Fred Alger	(A)	42	88	1.28	0.91	-0.58	-0.19	0.44	0.56	0.03	0.84	0.32	0.40	0.49	-0.10
	(B)	720	95	1.20	N.A.	-0.38	0.00	-0.05	0.42	0.49	0.47	0.03	0.29	0.49	-0.12
Alliance	(A)	38	99	1.21	0.91	-0.50	0.00	0.20	0.64	0.35	0.44	-0.14	-0.12	0.64	-0.25
	(B)	367	95	1.27	N.A.	-0.48	-0.07	-0.18	0.22	0.46	0.64	0.06	0.61	0.64	-0.06
SMALL GROWTH MANAGERS															
BMI Capital	(A)	30	97	1.31	0.89	-0.85	-0.35	0.14	-0.03	-0.28	0.78	0.49	1.50	1.07	-0.11
	(B)	806	95	1.33	N.A.	-0.59	-0.07	-0.09	0.43	0.38	0.85	0.18	1.34	0.86	-0.20
Lieber & Co.	(A)	113	99	1.31	0.89	-0.32	0.15	0.06	-0.02	0.24	0.44	0.10	1.44	0.52	-0.27
	(B)	1,286	95	1.31	N.A.	-0.46	-0.01	-0.21	0.07	0.19	0.65	0.14	1.77	0.81	-0.32
Waddell & Reed	(A)	68	78	1.14	0.94	0.10	0.13	0.03	-0.13	-0.17	0.38	0.07	0.00	0.02	-0.06
	(B)	N.A.	80	1.35	N.A.	0.06	0.20	-0.36	-0.21	0.19	0.24	-0.06	1.15	0.29	0.01
ROTATIONAL MANAGERS															
Forstmann Leff	(A)	36	51	1.53	0.85	-0.82	-0.02	0.44	0.43	0.44	1.33	0.59	1.08	1.07	-0.12
	(B)	1,455	70	1.22	N.A.	-0.16	0.15	-0.21	0.08	0.15	0.46	0.06	0.66	0.46	-0.01
Hellman Jordan	(A)	35	96	1.34	0.90	-0.70	-0.02	0.22	0.30	-0.21	0.87	0.07	-0.18	0.89	-0.06
	(B)	N.A.	100	1.09	N.A.	0.16	0.09	N.A.	-0.05	0.03	0.13	-0.02	0.04	0.07	-0.03
IDS	(A)	45	95	1.19	0.92	-0.18	0.10	0.58	0.35	0.32	0.45	0.22	0.18	0.23	-0.03
	(B)	N.A.	100	1.09	N.A.	0.16	0.09	N.A.	-0.05	0.03	0.13	-0.02	0.04	0.07	-0.03
IAI	(A)	34	77	1.12	0.94	-0.39	-0.17	0.27	0.34	0.07	0.31	0.06	0.00	0.35	-0.09
	(B)	N.A.	100	1.09	N.A.	0.16	0.09	N.A.	-0.05	0.03	0.13	-0.02	0.04	0.07	-0.03
VALUE MANAGERS															
Beutel Goodman	(A)	26	95	1.20	0.87	0.09	-0.31	-0.68	-0.68	-0.35	0.33	0.48	0.38	0.09	0.35
	(B)	412	95	1.18	N.A.	0.04	0.04	-0.56	-0.38	-0.15	0.17	0.13	0.99	0.04	0.10
Peregrine Cap.	(A)	184	83	1.12	0.86	0.47	0.00	-1.06	-0.66	-0.26	0.07	0.06	0.50	0.12	0.11
	(B)	1,206	90	1.13	N.A.	0.17	0.05	-0.69	-0.49	-0.17	0.09	0.13	0.76	0.17	0.05
Composite Active Ext. Managers		532	87	1.21	0.96	-0.23	-0.04	-0.03	0.05	-0.02	0.47	0.17	0.25	0.42	0.01
Index Fund Manager		1,351	100	1.05	0.98	0.21	0.08	-0.12	-0.04	-0.02	0.05	-0.05	0.01	0.02	-0.02
Composite All Basic Eq. Managers		1,484	95	1.10	0.97	0.08	0.06	-0.09	-0.01	-0.02	0.17	0.01	0.08	0.13	-0.01

(A) - Actual Portfolio
(B) - Benchmark Portfolio

TABLE A-2

EXTERNAL EQUITY MANAGERS

SECTOR WEIGHTINGS RELATIVE TO BENCHMARK PORTFOLIOS

SECTOR WEIGHTINGS

MANAGER		CAPITAL GOODS	CONSUMER DURABLES	CONSUMER NONDURABLES	ENERGY	FINANCIAL	MAT. & SERVICES	TECHNOLOGY	TRANS- PORTATION	UTILITIES
GROWTH MANAGERS										
Fred Alger	(A)	1.9%	3.7%	49.6%	---%	12.8%	4.6%	18.8%	8.7%	---%
	(B)	2.9	2.0	42.2	0.6	9.2	16.7	21.8	3.7	0.9
Alliance	(A)	3.0	3.9	42.5	---	24.2	4.7	13.0	8.7	---
	(B)	4.2	2.4	33.0	0.9	17.0	14.5	23.7	4.2	---
SMALL GROWTH MANAGERS										
BMI Capital	(A)	10.2	8.1	38.7	---	13.1	12.4	17.5	---	---
	(B)	5.3	4.6	37.7	1.6	6.9	17.8	21.4	4.2	0.5
Lieber & Company	(A)	2.3	7.4	25.5	2.4	42.7	9.2	6.4	2.8	1.2
	(B)	6.4	5.5	26.2	1.9	20.3	15.5	19.0	3.0	2.1
Waddell & Reed	(A)	2.9	8.5	21.7	12.4	12.9	14.6	18.9	6.6	1.5
	(B)	5.1	3.6	30.0	4.6	14.9	11.2	9.3	2.9	18.4
ROTATIONAL MANAGERS										
Forstmann Leff	(A)	---	10.4	28.8	---	19.0	17.2	18.9	5.7	---
	(B)	3.8	3.6	30.0	4.3	17.4	14.4	13.5	4.1	8.9
Hellman Jordan	(A)	---	6.4	25.6	---	33.5	8.1	23.3	3.2	---
	(B)	4.5	4.0	28.8	7.8	14.0	12.4	12.6	3.0	12.9
IDS	(A)	2.3	1.2	29.7	8.2	10.4	23.4	5.8	5.0	14.0
	(B)	4.5	4.0	28.8	7.8	14.0	12.4	12.6	3.0	12.9
Investment Advisers	(A)	5.2	---	33.0	2.9	7.6	28.6	14.7	8.0	---
	(B)	4.5	4.0	28.8	7.8	14.0	12.4	12.6	3.0	12.9
VALUE MANAGERS										
Beutel Goodman	(A)	2.7	4.4	11.1	4.2	24.6	23.4	19.4	5.9	4.1
	(B)	8.8	4.9	25.5	8.3	13.1	22.1	11.4	5.8	---
Peregrine Capital	(A)	8.6	8.0	16.8	9.6	10.7	13.7	14.8	5.5	12.2
	(B)	8.1	3.4	17.8	9.8	13.5	15.1	13.4	4.8	14.2
Composite External Managers		3.2	5.1	27.7	6.5	17.3	13.4	15.7	5.9	5.2
Index Fund Manager		4.7	3.9	26.4	8.8	13.2	12.6	12.7	3.1	14.6
Composite All Basic Managers		4.3	4.2	26.8	8.2	14.4	12.9	13.6	3.9	11.9
Wilshire 5000		4.4	3.8	26.9	9.0	14.0	12.1	12.4	3.1	14.3

(A) - Actual Portfolio
(B) - Benchmark Portfolio

TABLE A-3

EXTERNAL EQUITY MANAGERS

PERFORMANCE RELATIVE TO BENCHMARK PORTFOLIOS

Managers	Third Quarter 1986		Year Ending 9/30/86		Two Years Ending 9/30/86 (Annualized)	
	Actual Portfolio	Normal Portfolio	Actual Portfolio	Normal Portfolio	Actual Portfolio	Normal Portfolio
Fred Alger	-14.1%	-10.3%	32.6%	27.9%	21.7%	20.4%
Alliance Capital	-11.8	-9.9	31.2	27.0	26.4	17.9
Beutel Goodman	-4.2	-4.3	21.9	29.0	18.0	23.2
BMI Capital	-9.4	-12.0	26.9	25.7	17.1	18.6
Forstmann Leff	-10.8	-5.6	34.3	22.7	26.3	17.3
Hellman Jordan	-10.4	-7.7	22.9	30.4	19.1	22.5
IDS	-10.1	-7.7	35.6	30.4	25.3	22.5
Investment Advisers	-8.9	-7.7	27.0	30.4	18.7	22.5
Lieber & Company	-9.5	-10.9	31.1	26.7	24.9	20.1
Peregrine Capital	-4.7	-4.0	16.6	25.6	N.A.	N.A.
Waddell & Reed	-6.4	-8.2	22.7	16.5	17.2	12.3
Internal Manager	-1.4	-6.4	23.0	31.1	N.A.	N.A.
Total - External Active Managers	-8.6	N.A.	26.8	N.A.	20.5	N.A.
Wilshire Associates (Index Fund)	-7.4	N.A.	30.4	N.A.	22.4	N.A.
Performance Standards						
Wilshire 5000	-7.7		30.4		22.5	
Inflation	0.7		1.8		2.5	

TABLE A-4

EXTERNAL EQUITY MANAGERS

PORTFOLIO STATISTICS HISTORICAL SUMMARY

MANAGER NAME	DATE	QTR. PORT. T/O	EQUITY ALLOC.	R2	EQUITY BETA	MVAR	EVAR	REL RET	P/B	5 YR EARN	SIZE	GROW	E/P	YIELD	FINL
AVG. EXT. MANAGERS	9/30/86	26	87	0.90	1.25	0.55	0.21	0.04	0.10	0.04	0.47	0.50	-0.06	-0.33	-0.05
	6/30/86	25	91	0.90	1.28	0.70	0.26	0.09	0.12	0.01	0.45	0.49	-0.06	-0.36	-0.07
	3/31/86	29	92	0.88	1.25	0.66	0.30	-0.04	0.07	0.02	0.41	0.41	-0.53	-0.27	0.08
	12/31/85	29	90	0.89	1.23	0.55	0.29	0.03	0.04	-0.02	0.43	0.33	-0.34	-0.23	0.14
	9/30/85	27	82	0.83	1.23	0.53	0.27	-0.29	0.04	0.07	0.41	0.31	-0.15	-0.25	0.07
	6/30/85	24	90	0.83	1.23	0.55	0.14	-0.23	0.07	0.20	0.46	0.27	-0.07	-0.18	-0.02
	3/31/85	33	90	0.82	1.23	0.53	0.02	-0.26	0.06	0.21	0.54	0.13	-0.01	-0.17	0.03
	12/31/84	24	86	0.81	1.25	0.56	0.08	-0.13	0.17	0.03	0.73	0.23	-0.03	-0.32	0.05
	9/30/84	33	84	0.82	1.26	0.56	0.09	-0.10	0.17	0.05	0.72	0.22	-0.08	-0.28	0.04
	6/30/84	27	81	0.81	1.29	0.36	0.04	-0.25	0.13	0.01	0.79	0.19	-0.02	-0.29	0.14
	3/31/84	25	83	0.82	1.25	0.38	0.03	-0.10	0.13	0.01	0.60	0.20	-0.15	-0.26	0.08
	12/31/83	36	84	0.80	1.23	0.44	0.07	-0.03	0.07	-0.19	0.80	0.26	-0.31	-0.27	0.06
	9/30/83	32	85	0.82	1.29	0.64	0.07	0.32	0.21	-0.12	0.89	0.34	-0.40	-0.36	-0.02
	6/30/83	27	85	0.81	1.29	0.68	0.00	0.30	0.11	-0.10	0.75	0.35	-0.44	-0.34	0.00
FRED ALGER	9/30/86	38	88	0.91	1.28	0.84	0.32	0.44	0.56	0.03	0.40	0.49	-0.19	-0.58	-0.10
	6/30/86	21	94	0.92	1.31	0.88	0.35	0.74	0.40	0.09	0.02	0.39	-0.04	-0.56	-0.01
	3/31/86	40	98	0.91	1.29	0.94	0.48	0.31	0.23	0.12	-0.17	0.45	-0.40	-0.54	0.19
	12/31/85	28	95	0.90	1.25	0.69	0.45	0.11	0.13	0.25	0.14	0.19	0.02	-0.45	0.25
	9/30/85	28	95	0.83	1.23	0.64	0.33	-0.07	0.16	0.31	0.32	0.33	-0.17	-0.42	0.08
	6/30/85	41	92	0.79	1.23	0.77	0.39	-0.07	0.32	0.48	0.26	0.53	-0.05	-0.55	0.05
	3/31/85	36	96	0.85	1.27	0.84	0.24	0.03	0.39	0.69	0.05	0.38	-0.23	-0.64	0.08
	12/31/84	16	95	0.86	1.19	0.48	0.05	0.03	0.35	0.10	0.26	0.10	0.03	-0.47	-0.09
	9/30/84	20	94	0.86	1.22	0.44	0.14	0.10	0.34	0.00	0.42	-0.01	-0.04	-0.44	-0.08
	6/30/84	16	93	0.86	1.22	0.11	-0.01	0.06	0.06	-0.21	0.45	-0.13	-0.21	-0.31	0.07
	3/31/84	19	91	0.86	1.19	0.14	0.04	-0.13	0.08	-0.34	0.46	-0.12	-0.40	-0.32	-0.00
	12/31/83	23	95	0.88	1.18	0.38	0.08	0.26	-0.04	-0.37	0.31	-0.05	-0.50	-0.32	0.05
	9/30/83	27	91	0.88	1.24	0.75	0.22	0.44	0.20	-0.23	0.43	0.03	-0.46	-0.32	0.15
	6/30/83	8	94	0.88	1.33	1.29	0.30	0.51	0.23	-0.37	0.74	0.35	-0.76	-0.46	0.22

MANAGER NAME	DATE	QTR. PORT. T/O	EQUITY ALLOC.	R2	EQUITY BETA	MVAR	EVAR	REL RET	P/B	5 YR EARN	SIZE	GROW	E/P	YIELD	FINL
ALLIANCE CAPITAL	9/30/86	13	99	0.91	1.21	0.44	-0.14	0.20	0.64	0.35	-0.12	0.64	0.00	-0.50	-0.26
	6/30/86	11	98	0.89	1.21	0.88	0.35	0.30	0.75	0.48	-0.19	0.68	-0.02	-0.50	-0.26
	3/31/86	17	94	0.85	1.24	0.53	0.11	0.48	0.88	0.36	-0.10	0.57	-0.46	-0.49	0.09
	12/31/85	7	96	0.83	1.23	0.52	0.13	0.23	1.06	0.43	-0.14	0.56	-0.44	-0.54	0.00
	9/30/85	15	89	0.73	1.24	0.53	0.15	0.09	0.99	0.54	-0.02	0.64	-0.50	-0.61	-0.08
	6/30/85	7	95	0.76	1.21	0.52	0.03	0.04	0.96	0.66	0.08	0.68	-0.30	-0.56	-0.06
	3/31/85	10	96	0.76	1.19	0.48	-0.12	0.10	0.74	0.73	0.15	0.63	-0.27	-0.55	-0.20
	12/31/84	8	92	0.73	1.30	0.56	0.09	0.03	0.82	0.51	0.26	0.85	-0.29	-0.73	-0.15
	9/30/84	13	88	0.72	1.34	0.53	0.15	-0.02	0.72	0.52	0.33	0.83	-0.28	-0.65	-0.09
	6/30/84	8	92	0.73	1.39	0.46	0.13	-0.27	0.78	0.45	0.48	0.78	-0.40	-0.73	-0.04
	3/31/84	12	92	0.72	1.38	0.68	0.13	0.13	0.71	0.46	0.50	0.65	-0.47	-0.72	-0.04
	12/31/83	14	92	0.72	1.37	0.65	0.31	0.18	0.78	0.14	0.45	0.72	-0.50	-0.72	0.06
	9/30/83	22	87	0.75	1.41	1.02	0.21	0.45	0.44	0.29	0.43	0.60	-0.33	-0.67	0.00
	6/30/83	17	91	0.77	1.35	0.93	0.14	0.38	0.03	0.03	0.34	0.48	-0.72	-0.53	-0.04
BEUTEL GOODMAN	9/30/86	13	95	0.87	1.20	0.33	0.48	-0.68	-0.68	-0.35	0.38	0.09	-0.31	0.09	0.35
	6/30/86	10	90	0.89	1.20	0.22	0.54	-0.79	-0.67	-0.28	0.23	0.07	-0.41	0.10	0.28
	3/31/86	22	87	0.85	1.15	0.37	0.64	-0.66	-0.64	-0.33	0.19	0.23	-0.94	0.06	0.12
	12/31/85	18	89	0.83	1.22	0.30	0.58	-0.58	-0.61	-0.74	0.63	0.13	-0.88	0.25	0.35
	9/30/85	5	99	0.81	1.26	0.47	0.47	-0.40	-0.32	-0.52	0.90	0.12	-0.73	0.09	0.26
	6/30/85	6	94	0.83	1.24	0.55	0.22	-0.27	-0.26	-0.64	0.96	0.27	-0.55	-0.02	0.37
	3/31/85	14	93	0.83	1.18	0.38	-0.25	-0.38	-0.25	-0.71	1.19	0.14	-0.43	0.06	0.24
	12/31/84	8	94	0.81	1.19	0.27	-0.15	-0.41	-0.42	-0.87	1.14	0.04	0.21	0.06	0.63
	9/30/84	10	93	0.81	1.21	0.31	-0.17	-0.10	-0.41	-0.81	1.28	0.10	0.23	0.08	0.59
	6/30/84	11	92	0.79	1.18	0.05	-0.29	0.19	-0.44	-0.89	1.32	0.07	0.02	-0.05	0.58
	3/31/84	12	98	0.79	1.16	0.16	-0.19	0.27	-0.41	-0.85	1.34	0.01	-0.42	-0.04	0.37
	12/31/83	15	95	0.74	1.08	0.21	-0.08	0.22	-0.42	-0.61	1.18	0.03	-0.72	0.05	0.24
	9/30/83	6	99	0.75	1.14	0.35	0.03	-0.17	-0.50	-0.75	1.16	0.04	-0.91	0.05	0.25
	6/30/83	7	79	0.75	1.07	0.49	-0.00	-0.41	-0.43	-0.39	0.92	0.11	-0.15	-0.02	0.34
BMI CAPITAL	9/30/86	7	97	0.89	1.31	0.78	0.49	0.14	-0.03	-0.28	1.50	1.07	-0.35	-0.85	-0.11
	6/30/86	20	95	0.90	1.37	1.10	0.31	0.23	0.23	-0.14	1.60	0.95	-0.08	-0.84	-0.17
	3/31/86	17	97	0.86	1.33	0.98	0.43	-0.13	0.37	0.03	1.48	0.96	-1.06	-0.59	0.08
	12/31/85	5	95	0.85	1.27	0.74	0.35	-0.30	0.22	0.13	1.14	0.59	-0.80	-0.40	-0.01
	9/30/85	28	28	0.72	1.40	0.89	0.32	-0.78	0.48	0.67	1.47	0.74	-0.42	-0.71	-0.25
	6/30/85	10	98	0.75	1.22	0.80	0.17	-0.52	0.80	1.06	1.42	0.63	-0.14	-0.56	-0.38
	3/31/85	2	99	0.55	1.26	0.84	0.10	-0.66	1.13	1.04	1.49	0.23	-0.20	-0.61	-0.33
	12/31/84	13	87	0.74	1.33	0.78	0.34	-0.20	1.05	0.56	1.41	0.11	-0.24	-0.57	-0.18
	9/30/84	29	82	0.75	1.33	0.78	0.17	-0.44	0.83	0.63	1.17	-0.05	0.01	-0.44	-0.23
	6/30/84	6	99	0.79	1.33	0.63	0.17	-0.37	0.67	0.32	1.51	0.22	-0.24	-0.48	-0.16
	3/31/84	18	95	0.80	1.32	0.77	0.20	-0.53	0.72	0.31	1.86	0.36	-0.40	-0.47	-0.14
	12/31/83	14	98	0.81	1.29	1.02	0.26	0.26	0.58	0.08	1.60	0.48	-0.52	-0.49	0.01
	9/30/83	19	99	0.81	1.34	1.04	0.20	0.54	0.64	0.09	1.66	0.50	-0.34	-0.48	0.01
	6/30/83	0	96	0.80	1.31	1.14	0.02	0.55	0.28	0.10	1.61	0.43	-0.25	-0.41	-0.07

MANAGER NAME	DATE	QTR. PORT. T/O	EQUITY ALLOC.	R2	EQUITY BETA	MVAR	EVAR	REL RET	P/B	5 YR EARN	SIZE	GROW	E/P	YIELD	FINL
FORSTMANN-LEFF	9/30/86	60	51	0.85	1.53	1.33	0.59	0.44	0.43	0.44	1.08	1.07	-0.02	-0.82	-0.12
	6/30/86	71	85	0.88	1.49	1.26	0.51	0.29	0.37	0.35	0.87	0.93	-0.04	-0.72	-0.25
	3/31/86	83	89	0.88	1.37	0.91	0.35	0.16	0.10	-0.35	0.64	0.59	-0.77	-0.39	0.27
	12/31/85	78	88	0.91	1.35	0.94	0.36	0.48	0.06	-0.38	0.03	0.45	-0.44	-0.46	0.35
	9/30/85	108	70	0.88	1.27	0.64	0.24	0.13	0.10	-0.42	0.00	0.25	-0.48	-0.43	0.25
	6/30/85	27	77	0.89	1.22	0.83	0.17	0.16	0.15	0.08	-0.20	0.35	-0.07	-0.33	0.09
	3/31/85	55	69	0.89	1.19	0.67	0.07	-0.15	-0.04	0.13	-0.03	0.16	0.14	-0.18	0.02
	12/31/84	12	87	0.84	1.22	0.39	-0.06	-0.14	-0.07	-0.44	0.39	-0.06	-0.01	-0.10	0.08
	9/30/84	40	83	0.86	1.26	0.49	0.03	-0.20	-0.25	-0.43	0.25	-0.17	-0.23	-0.09	0.14
	6/30/84	31	54	0.81	1.26	0.14	0.01	-0.27	-0.21	-0.22	0.16	0.07	-0.08	-0.16	0.15
	3/31/84	34	71	0.82	1.17	0.13	-0.04	-0.11	-0.14	-0.21	0.17	0.05	-0.18	-0.10	0.15
	12/31/83	41	81	0.70	1.10	0.02	-0.11	-0.25	-0.03	-0.25	-0.12	-0.03	-0.15	-0.07	0.05
	9/30/83	46	83	0.72	1.14	0.10	-0.12	-0.09	0.09	-0.34	0.03	0.19	-0.45	-0.21	-0.12
	6/30/83	52	93	0.70	1.08	0.34	-0.22	-0.01	0.07	-0.04	0.03	0.11	-0.17	-0.22	-0.17
HELLMAN JORDAN	9/30/86	20	96	0.90	1.34	0.87	0.07	0.22	0.30	-0.21	-0.18	0.89	-0.02	-0.70	-0.06
	6/30/86	15	99	0.89	1.34	0.80	0.15	0.12	0.16	-0.29	-0.07	0.95	-0.02	-0.57	0.00
	3/31/86	35	97	0.88	1.26	0.79	0.34	0.26	0.06	0.19	-0.16	0.83	-0.71	-0.48	0.09
	12/31/85	36	95	0.93	1.14	0.32	0.23	-0.13	-0.17	0.04	-0.13	0.39	-0.22	-0.22	0.25
	9/30/85	36	96	0.89	1.07	0.26	0.09	-0.49	-0.29	-0.06	-0.54	0.03	0.02	0.00	0.27
	6/30/85	38	89	0.89	1.10	0.29	-0.04	-0.27	-0.21	-0.12	-0.47	-0.07	0.18	0.15	0.07
	3/31/85	52	81	0.88	1.13	0.28	-0.12	-0.20	-0.28	-0.07	-0.24	0.00	-0.07	0.06	0.30
	12/31/84	36	82	0.86	1.21	0.59	0.25	-0.36	-0.35	-0.36	0.15	0.12	0.14	-0.09	0.30
	9/30/84	10	80	0.84	1.22	0.64	0.38	-0.17	-0.26	-0.45	0.22	0.16	-0.08	0.05	0.33
	6/30/84	34	61	0.87	1.25	0.28	0.21	-0.34	-0.29	-0.33	0.10	0.10	-0.10	0.16	0.52
	3/31/84	30	58	0.87	1.16	0.25	0.15	0.03	-0.41	-0.22	0.01	0.19	-0.05	0.25	0.30
	12/31/83	43	51	0.74	1.23	0.16	0.09	-0.19	-0.23	-0.26	0.25	0.18	0.07	0.45	0.26
	9/30/83	57	47	0.77	1.34	-0.12	0.23	0.23	-0.11	-0.36	0.35	0.24	-0.23	0.05	0.15
	6/30/83	38	56	0.77	1.30	0.79	0.20	0.63	0.16	-0.36	-0.27	0.42	-0.94	-0.44	0.24
IDS ADVISORY	9/30/86	28	95	0.92	1.19	0.45	0.22	0.58	0.35	0.32	0.18	0.23	0.10	-0.18	-0.03
	6/30/86	28	91	0.93	1.19	0.54	0.17	0.54	0.46	0.25	0.09	0.22	0.06	-0.23	-0.08
	3/31/86	16	92	0.91	1.20	0.53	0.21	0.44	0.50	0.34	0.11	0.29	-0.11	-0.22	0.11
	12/31/85	19	93	0.88	1.18	0.55	0.30	0.19	0.55	0.35	0.24	0.28	-0.12	-0.21	0.16
	9/30/85	21	98	0.86	1.15	0.37	0.28	-0.02	0.30	0.34	0.07	0.22	-0.17	-0.15	0.06
	6/30/85	13	98	0.87	1.11	0.37	0.21	0.17	0.16	0.41	-0.02	0.16	0.00	0.04	0.03
	3/31/85	39	87	0.85	1.08	0.24	-0.06	0.10	0.07	0.43	-0.09	-0.06	0.18	0.18	0.10
	12/31/84	21	89	0.83	1.05	0.04	-0.10	0.16	0.12	0.23	-0.07	-0.07	0.11	0.25	0.07
	9/30/84	40	92	0.89	1.08	0.17	-0.12	0.17	0.28	0.31	0.08	-0.04	0.19	0.23	0.03
	6/30/84	42	87	0.85	1.04	-0.08	-0.15	0.28	0.54	0.31	0.28	-0.11	0.18	0.21	0.17
	3/31/84	41	82	0.80	1.09	0.11	-0.01	0.23	0.15	0.19	0.17	-0.13	0.28	0.14	0.04
	12/31/83	45	89	0.86	1.17	0.24	0.23	0.27	0.15	-0.15	0.43	0.22	-0.34	-0.13	0.14
	9/30/83	79	86	0.86	1.24	0.64	0.20	0.29	0.26	-0.06	0.60	0.43	-0.46	-0.40	-0.10
	6/30/83	42	94	0.81	1.30	-0.92	-0.08	-0.26	0.17	-0.01	0.16	0.48	-0.51	-0.37	-0.11

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INVESTMENT ADVISERS	9/30/86	12	77	0.94	1.12	0.31	0.06	0.27	0.34	0.07	0.00	0.35	-0.17	-0.39	-0.09
	6/30/86	22	82	0.94	1.17	0.55	-0.04	0.40	0.28	0.06	-0.03	0.28	-0.16	-0.44	-0.10
	3/31/86	13	84	0.95	1.12	0.48	0.10	0.07	0.02	-0.03	-0.11	0.40	-0.57	-0.29	0.02
	12/31/85	32	83	0.93	1.14	0.39	0.18	-0.22	0.04	-0.01	-0.12	0.29	-0.27	-0.24	0.02
	9/30/85	4	95	0.92	1.15	0.45	0.18	-0.40	-0.12	0.07	-0.02	0.28	0.02	-0.25	0.03
	6/30/85	10	90	0.90	1.17	0.60	0.10	-0.33	-0.26	0.14	-0.17	0.12	0.18	-0.19	-0.08
	3/31/85	28	89	0.91	1.17	0.51	0.05	-0.33	-0.26	0.16	0.08	-0.02	0.43	-0.11	-0.06
	12/31/84	9	97	0.88	1.19	0.39	-0.12	-0.20	-0.34	-0.15	0.09	-0.08	0.43	-0.01	0.04
	9/30/84	21	88	0.86	1.21	0.40	-0.13	-0.21	-0.23	-0.00	0.12	0.02	0.45	-0.02	0.06
	6/30/84	8	98	0.89	1.21	0.11	-0.23	-0.28	-0.22	0.09	0.08	0.02	0.48	0.00	0.21
	3/31/84	21	92	0.89	1.17	0.05	-0.22	-0.36	-0.17	0.14	0.14	0.07	0.25	-0.14	0.22
	12/31/83	16	89	0.86	1.13	0.06	-0.15	-0.30	-0.16	-0.05	0.01	0.15	-0.09	-0.17	0.17
	9/30/83	8	89	0.87	1.13	0.16	-0.15	-0.20	-0.03	-0.03	0.03	0.19	0.01	-0.20	0.09
	6/30/83	7	78	0.89	1.08	0.28	-0.16	-0.12	0.01	-0.13	-0.10	0.17	-0.38	-0.09	-0.01
LIEBER & COMPANY	9/30/86	11	99	0.89	1.31	0.44	0.10	0.06	-0.02	0.24	1.44	0.52	0.15	-0.32	-0.27
	6/30/86	7	99	0.90	1.32	0.59	0.12	0.12	0.05	0.15	1.50	0.55	0.14	-0.36	-0.33
	3/31/86	14	99	0.86	1.31	0.63	0.02	-0.06	0.03	0.16	1.49	0.48	0.00	-0.38	-0.27
	12/31/85	12	97	0.85	1.30	0.53	0.07	-0.01	0.04	0.27	1.56	0.48	0.02	-0.39	-0.21
	9/30/85	6	98	0.80	1.30	0.54	0.12	-0.04	0.03	0.35	1.64	0.50	-0.10	-0.40	-0.31
	6/30/85	14	96	0.80	1.27	0.55	0.04	-0.17	0.03	0.40	1.83	0.36	-0.05	-0.35	-0.43
	3/31/85	19	99	0.81	1.24	0.65	0.03	0.04	0.09	0.35	1.79	0.17	-0.02	-0.35	-0.21
	12/31/84	14	85	0.79	1.34	0.78	0.12	-0.25	0.03	0.39	1.94	0.48	-0.05	-0.47	-0.17
	9/30/84	17	87	0.80	1.31	0.74	0.07	-0.28	0.05	0.49	1.99	0.51	0.01	-0.48	-0.18
	6/30/84	10	95	0.81	1.33	0.76	0.05	-0.37	0.13	0.52	1.99	0.42	-0.02	-0.48	-0.10
	3/31/84	0	93	0.85	1.37	0.65	0.00	-0.16	0.18	0.57	1.99	0.45	0.03	-0.46	-0.12
	12/31/83	9	00	0.83	1.24	0.63	-0.01	0.30	-0.06	0.28	1.93	0.29	0.12	-0.38	-0.07
	9/30/83	9	97	0.83	1.30	0.85	-0.03	0.47	-0.09	0.17	1.92	0.22	0.18	-0.29	-0.10
	6/30/83	2	92	0.84	1.26	0.90	-0.11	0.43	-0.11	-0.00	1.94	0.18	0.04	-0.27	-0.20
PEREGRINE CAPITAL	9/30/86	50	83	0.86	1.12	-0.07	0.06	-1.06	-0.66	-0.26	0.50	0.12	0.00	0.47	0.17
	6/30/86	37	90	0.79	1.18	0.09	0.27	-1.28	-0.75	-0.52	0.62	0.17	-0.06	0.56	0.22
	3/31/86	47	84	0.76	1.19	0.19	0.16	-1.53	-0.73	-0.41	0.73	0.20	-0.31	0.51	0.19
	12/31/85	53	82	0.81	1.21	0.26	0.18	-1.31	-0.77	-0.55	0.88	0.10	-0.54	0.33	0.27
	9/30/85	9	80	0.82	1.22	0.53	0.37	-1.26	-0.63	-0.36	0.36	0.15	-0.33	0.22	0.24
	6/30/85	58	75	0.78	1.48	0.25	0.00	-1.46	-0.60	-0.45	1.06	0.07	-0.34	0.27	-0.13
	3/31/85	49	89	0.79	1.41	0.32	0.07	-1.28	-0.53	-0.48	1.01	-0.07	-0.09	0.27	0.02
	12/31/84	37	87	0.81	1.37	1.11	0.39	-0.05	0.72	0.27	1.88	0.76	-0.79	-0.96	-0.11
	9/30/84	61	97	0.81	1.36	1.10	0.43	0.10	0.89	0.22	1.70	0.83	-0.82	-0.95	-0.17
	6/30/84	26	89	0.83	1.39	0.77	0.37	-0.59	0.49	0.23	1.45	0.71	-0.55	-0.77	-0.09
	3/31/84	66	87	0.82	1.28	0.76	0.26	-0.30	0.82	0.31	1.29	0.77	-0.59	-0.67	-0.07
	12/31/83	92	83	0.87	1.23	0.66	0.16	0.12	0.41	0.12	1.32	0.74	-0.59	-0.69	-0.09
	9/30/83	56	85	0.87	1.27	0.96	0.09	0.85	0.85	0.09	1.22	0.77	-0.83	-0.75	-0.22
	6/30/83	95	80	0.88	1.23	0.70	-0.11	0.45	0.33	0.06	1.05	0.46	-0.42	-0.40	-0.13

MANAGER NAME	DATE	QTR. PORT. T/O	EQUITY ALLOC.	R2	EQUITY BETA	MVAR	EVAR	REL RET	P/B	5 YR EARN	SIZE	GROW	E/P	YIELD	FINL
WADDELL & REED	9/30/86	38	78	0.94	1.14	0.38	0.07	0.03	-0.13	-0.17	0.00	0.02	0.13	0.10	-0.06
	6/30/86	35	79	0.93	1.28	0.74	0.08	0.28	0.02	-0.04	0.30	0.23	-0.02	-0.35	-0.02
	3/31/86	20	88	0.93	1.29	0.87	0.42	0.22	-0.07	-0.19	0.36	0.11	-0.51	-0.16	0.11
	12/31/85	36	75	0.91	1.27	0.76	0.36	0.10	-0.12	0.02	0.48	0.22	-0.02	-0.20	0.15
	9/30/85	41	50	0.85	1.24	0.53	0.37	-0.02	-0.24	-0.13	0.36	0.15	0.17	-0.09	0.24
	6/30/85	34	74	0.79	1.19	0.55	0.21	0.14	-0.31	0.17	0.26	-0.17	0.41	0.11	0.27
	3/31/85	51	78	0.82	1.26	0.62	0.23	-0.12	-0.39	0.09	0.49	-0.09	0.43	0.01	0.34
	12/31/84	39	52	0.75	1.29	0.78	0.10	0.00	-0.05	0.05	0.54	0.27	0.13	-0.30	0.12
	9/30/84	76	35	0.76	1.27	0.53	0.07	-0.01	-0.04	0.08	0.35	0.22	0.21	-0.20	0.02
	6/30/84	81	21	0.52	1.56	0.71	0.22	-0.74	-0.05	-0.16	0.89	-0.03	0.72	-0.60	0.24
	3/31/84	35	31	0.74	1.31	0.43	0.03	-0.13	-0.12	-0.22	0.61	-0.08	0.28	-0.35	0.23
	12/31/83	103	31	0.72	1.36	0.86	0.03	-0.49	-0.23	-1.07	1.42	0.09	-0.24	-0.46	-0.14
	9/30/83	9	73	0.73	1.41	1.31	-0.06	0.75	0.58	-0.24	1.98	0.56	-0.56	-0.69	-0.35
	6/30/83	38	75	0.74	1.48	1.51	0.00	1.11	0.49	-0.03	1.86	0.71	-0.53	-0.54	-0.05

TABLE A-5

EXTERNAL EQUITY MANAGERS

SECTOR WEIGHTING HISTORICAL PROFILE

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	EQUITY SECTOR WEIGHTS: CAP GDS	CONS DUR	CONS NDUR	ENER	FINL	MAT & SERV	TECH	TRAN	UTIL
AVG. EXT. MANAGERS	9/30/86	---	3.6	5.6	29.4	3.6	19.2	14.5	15.6	5.5	3.0
	6/30/86	---	3.7	5.5	30.7	2.4	21.0	13.3	14.6	5.3	3.3
	3/31/86	---	2.8	5.5	25.6	5.1	20.7	13.4	14.6	6.4	5.8
	12/31/85	---	3.0	6.2	24.1	7.4	19.1	13.0	14.5	7.4	5.3
	9/30/85	---	2.8	6.6	27.5	4.2	18.4	12.7	16.8	7.6	3.4
	6/30/85	---	2.2	6.6	29.3	3.1	20.0	10.9	17.3	7.6	3.0
	3/31/85	---	2.4	6.8	26.4	3.6	17.5	11.4	22.2	6.8	3.0
	12/31/84	---	2.4	8.0	26.4	2.3	15.5	11.2	23.9	6.6	4.0
	9/30/84	---	2.9	7.9	27.9	3.8	14.1	9.6	26.3	4.8	2.7
	6/30/84	---	4.0	7.6	28.6	4.2	12.5	10.9	23.4	5.4	3.4
	3/31/84	---	5.2	7.6	24.0	5.7	13.2	13.3	22.7	5.1	3.1
	12/31/83	---	6.0	6.4	23.5	3.0	12.2	15.1	24.0	6.3	3.5
	9/30/83	---	3.6	5.9	28.9	3.1	12.8	13.5	24.2	5.7	2.4
	6/30/83	---	3.7	6.1	30.2	3.6	15.1	11.7	21.2	5.8	2.5
	3/31/83	---	2.8	4.3	30.6	3.6	15.2	11.4	23.5	4.9	3.8
FRED ALGER	9/30/86	96,875,274	1.9	3.7	49.6	---	12.8	4.6	18.8	8.7	---
	6/30/86	112,733,180	1.9	7.5	52.9	---	11.6	6.2	15.8	4.0	---
	3/31/86	103,958,164	1.7	8.2	46.5	---	17.4	5.9	18.7	1.6	---
	12/31/85	86,744,768	1.7	11.7	38.7	---	18.2	3.1	17.0	6.6	2.9
	9/30/85	73,092,544	---	10.3	44.4	2.4	14.1	3.1	14.5	8.4	2.8
	6/30/85	63,144,042	---	17.6	36.0	1.4	9.3	3.5	15.7	16.6	---
	3/31/85	57,886,615	5.2	14.3	28.8	3.7	7.8	1.8	24.8	13.6	---
	12/31/84	54,018,782	5.2	16.1	36.1	---	4.1	7.9	25.2	5.4	---
	9/30/84	53,908,974	9.3	15.4	33.7	---	0.8	11.4	23.5	6.0	---
	6/30/84	49,936,760	14.0	8.0	30.7	---	3.8	11.5	29.5	2.6	---
	3/31/84	51,737,228	13.3	4.3	28.8	---	3.4	18.3	31.9	---	---
	12/31/83	55,644,200	13.2	6.6	21.7	---	6.4	18.1	33.9	---	---
	9/30/83	56,169,879	5.7	6.8	26.9	---	8.4	23.3	29.0	---	---
	6/30/83	58,138,999	4.9	8.5	35.0	3.5	8.2	18.0	21.9	---	---
	3/31/83	51,420,548	1.4	7.5	37.0	---	9.0	22.0	23.1	---	---

EQUITY SECTOR WEIGHTS

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	CAP GDS	CONS DUR	CONS NDUR	ENER	FINL	MAT & SERV	TECH	TRAN	UTIL
ALLIANCE CAPITAL	9/30/86	97,177,251	3.0	3.9	42.5	---	24.2	4.7	13.0	8.7	---
	6/30/86	110,202,737	2.3	3.6	49.1	---	28.1	---	9.8	7.1	---
	3/31/86	104,093,860	2.4	4.5	46.6	---	30.2	2.5	8.2	5.6	---
	12/31/85	87,252,311	---	4.6	45.6	---	29.2	---	14.3	6.3	---
	9/30/85	74,094,296	---	7.5	52.0	---	21.8	---	11.1	7.6	---
	6/30/85	65,072,829	---	8.7	49.9	2.2	14.3	---	12.7	8.9	3.3
	3/31/85	58,738,405	---	9.9	47.9	2.4	12.6	---	15.8	8.0	3.4
	12/31/84	52,332,767	---	8.7	48.8	---	10.2	---	20.6	8.1	3.7
	9/30/84	51,653,441	---	8.8	49.7	---	9.6	---	19.3	9.2	3.5
	6/30/84	48,457,996	---	8.1	51.6	---	6.9	---	23.5	9.9	---
	3/31/84	47,427,119	---	8.3	48.0	2.7	5.6	---	25.1	10.4	---
	12/31/83	52,725,699	0.8	7.5	45.3	---	6.8	2.4	24.2	13.1	---
	9/30/83	52,945,082	2.8	5.4	45.9	---	9.2	---	24.6	12.1	---
	6/30/83	57,538,354	2.2	4.7	42.3	---	8.2	7.5	22.7	12.4	---
	3/31/83	51,037,067	---	3.5	49.9	2.7	6.7	3.6	23.5	10.0	---
BEUTEL GOODMAN	9/30/86	86,368,324	2.7	4.4	11.1	4.2	24.6	23.4	19.4	5.9	4.1
	6/30/86	90,128,302	3.4	5.3	9.3	4.0	20.3	23.3	19.0	11.0	4.4
	3/31/86	90,652,277	4.2	4.2	9.2	3.8	18.6	22.9	20.9	11.5	4.6
	12/31/85	79,304,850	3.9	3.8	9.0	2.8	28.2	22.1	18.2	12.0	---
	9/30/85	70,821,795	2.7	3.7	15.7	---	26.0	24.0	16.6	11.3	---
	6/30/85	75,450,430	2.8	---	12.8	---	30.4	23.1	19.1	11.7	---
	3/31/85	70,177,266	2.1	---	19.2	---	28.4	33.1	13.6	3.6	---
	12/31/84	63,402,269	8.8	---	13.8	---	32.2	33.8	11.4	---	---
	9/30/84	60,461,938	6.5	---	14.0	---	37.1	35.6	6.8	---	---
	6/30/84	55,295,358	9.3	---	21.1	---	30.4	32.4	6.7	---	---
	3/31/84	56,896,258	8.9	---	18.6	---	27.2	39.3	6.0	---	---
	12/31/83	57,233,781	9.8	---	20.2	---	11.2	46.2	5.4	7.2	---
	9/30/83	55,416,939	8.8	---	22.0	---	13.1	43.5	4.7	8.0	---
	6/30/83	54,835,808	11.0	---	18.5	---	17.4	42.4	---	10.6	---
	3/31/83	50,442,256	---	---	15.7	---	15.4	52.1	---	16.8	---
BMI CAPITAL	9/30/86	62,163,502	10.2	8.1	38.7	---	13.1	12.4	17.5	---	---
	6/30/86	68,576,473	8.5	6.4	43.4	---	19.8	2.9	19.1	---	---
	3/31/86	64,120,062	6.8	7.7	38.4	4.6	20.9	3.6	18.0	---	---
	12/31/85	54,452,525	9.9	4.0	32.2	14.6	19.3	4.3	12.3	3.4	---
	9/30/85	49,026,413	10.4	3.4	37.8	---	6.0	4.0	28.9	9.6	---
	6/30/85	9,759,880	5.4	9.7	34.9	---	5.7	4.0	30.3	9.9	---
	3/31/85	9,851,108	7.1	9.0	37.6	---	---	6.8	35.9	3.7	---
	12/31/84	9,015,974	6.5	5.8	40.0	---	---	7.4	35.9	4.4	---
	9/30/84	8,820,740	4.6	13.4	42.6	---	---	4.1	31.3	3.9	---
	6/30/84	8,533,642	3.2	16.4	37.4	---	---	11.5	31.5	---	---
	3/31/84	8,366,038	4.3	12.7	39.3	---	---	17.8	25.9	---	---
	12/31/83	9,784,767	7.4	12.1	28.4	---	6.6	19.0	26.4	---	---
	9/30/83	10,420,827	7.6	11.2	37.1	---	6.4	18.6	19.2	---	---
	6/30/83	11,285,353	7.9	12.7	44.2	---	9.8	15.9	9.5	---	---
	3/31/83	10,081,983	10.6	8.1	35.3	---	12.3	22.0	11.8	---	---

EQUITY SECTOR WEIGHTS

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	CAP GDS	CONS DUR	CONS NDUR	ENER	FINL	MAT & SERV	TECH	TRAN	UTIL
FORSTMANN-LEFF	9/30/86	85,396,871	---	10.4	28.8	---	19.0	17.2	18.9	5.7	---
	6/30/86	95,703,997	2.6	6.6	25.2	---	22.4	13.2	23.7	5.2	1.1
	3/31/86	87,886,861	1.3	4.0	18.1	---	34.7	17.4	10.1	8.1	6.3
	12/31/85	73,996,082	1.4	7.9	25.7	2.1	25.2	22.1	8.9	6.7	---
	9/30/85	63,626,068	---	9.7	41.6	6.6	20.9	6.4	12.1	2.8	---
	6/30/85	66,383,632	1.1	7.4	40.1	---	25.1	10.3	11.0	5.1	---
	3/31/85	61,436,421	2.5	9.8	25.7	---	25.5	14.7	17.4	4.4	---
	12/31/84	55,396,358	1.4	10.5	30.9	---	23.3	15.1	13.3	5.5	---
	9/30/84	53,550,733	4.5	4.6	32.5	---	21.5	14.5	18.9	3.6	---
	6/30/84	51,218,131	3.7	3.6	40.2	---	7.0	10.3	24.3	7.2	3.7
	3/31/84	52,083,507	7.6	3.0	37.0	---	6.0	14.5	23.1	6.0	2.8
	12/31/83	55,421,154	5.7	13.6	35.5	5.8	3.9	8.4	18.7	5.3	3.1
	9/30/83	55,775,736	---	14.6	52.3	3.3	4.5	5.3	15.1	4.8	---
	6/30/83	56,471,479	---	12.7	61.4	---	2.7	7.2	11.7	4.3	---
	3/31/83	51,390,160	2.1	4.7	50.7	5.9	4.7	10.3	17.4	4.2	---
HELLMAN JORDAN	9/30/86	74,466,800	---	6.4	25.6	---	33.5	8.1	23.3	3.2	---
	6/30/86	83,097,338	---	9.3	24.8	---	32.7	10.7	20.1	2.4	---
	3/31/86	82,829,526	---	12.1	22.3	2.2	29.8	13.6	18.4	1.7	---
	12/31/85	71,819,754	---	8.8	20.1	9.4	23.5	18.7	15.2	2.9	1.4
	9/30/85	60,551,842	---	5.6	17.1	6.9	26.9	17.2	13.8	4.7	7.7
	6/30/85	64,181,384	3.9	3.5	23.0	7.0	26.0	15.5	7.5	3.5	10.0
	3/31/85	59,732,797	1.3	---	21.9	5.9	25.3	13.6	16.1	6.7	9.2
	12/31/84	54,923,168	1.3	6.1	19.5	1.1	19.8	17.1	20.3	9.2	5.7
	9/30/84	52,497,049	1.5	10.7	11.3	0.8	14.0	15.3	29.3	12.0	5.0
	6/30/84	47,929,367	1.8	12.4	13.8	1.2	16.4	21.2	12.6	11.1	9.6
	3/31/84	49,895,127	---	12.4	19.5	6.4	15.7	15.7	4.3	8.8	17.2
	12/31/83	50,182,761	---	14.8	30.0	6.0	16.5	10.4	2.1	3.0	17.2
	9/30/83	50,713,576	---	15.0	47.4	---	19.5	3.5	3.3	4.7	6.5
	6/30/83	52,402,164	---	3.8	23.3	---	35.9	---	24.8	---	12.2
	3/31/83	49,541,253	---	---	15.1	---	33.4	4.6	27.2	---	19.7
INVESTMENT ADVISERS	9/30/86	78,677,066	5.2	---	33.0	2.9	7.6	28.6	14.7	8.0	---
	6/30/86	86,330,923	8.2	---	33.0	1.0	9.6	26.5	13.2	8.6	---
	3/31/86	82,520,514	5.6	3.3	20.6	2.3	9.6	23.8	18.8	13.4	2.6
	12/31/85	73,389,199	4.0	6.6	15.7	3.0	12.6	18.5	24.4	12.2	2.9
	9/30/85	61,953,366	3.2	6.5	8.3	2.9	15.9	20.2	28.3	12.8	1.8
	6/30/85	66,785,302	3.4	8.8	6.5	3.2	18.8	17.1	29.0	13.2	---
	3/31/85	62,742,678	3.4	6.0	6.1	2.8	16.3	19.9	32.9	12.6	---
	12/31/84	58,967,426	3.3	6.4	13.6	5.9	20.5	19.2	19.9	10.8	0.6
	9/30/84	55,807,710	3.7	7.2	21.5	6.9	21.0	13.1	20.2	5.6	0.8
	6/30/84	50,388,386	5.5	5.9	26.3	6.2	18.8	9.1	20.6	3.7	3.9
	3/31/84	51,864,720	5.8	5.4	30.2	8.9	21.5	7.7	15.6	3.9	1.0
	12/31/83	54,533,402	6.3	6.3	25.0	5.8	21.9	9.7	15.7	6.1	3.2
	9/30/83	53,819,067	5.8	6.2	30.6	6.0	13.4	9.1	18.3	7.1	3.5
	6/30/83	54,812,985	6.5	6.6	24.7	11.7	9.7	9.8	16.9	10.3	3.9
	3/31/83	50,748,987	6.5	9.1	26.0	10.2	7.3	15.0	17.7	5.0	3.2

EQUITY SECTOR WEIGHTS

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	CAP GDS	CONS DUR	CONS NDUR	ENER	FINL	MAT & SERV	TECH	TRAN	UTIL
IDS ADVISORY	9/30/86	87,085,769	2.3	1.2	29.7	8.2	10.4	23.4	5.8	5.0	14.0
	6/30/86	96,881,914	---	---	42.4	3.1	16.4	15.8	6.5	5.0	10.8
	3/31/86	90,164,763	---	1.7	32.6	1.1	17.7	15.6	8.9	12.1	10.2
	12/31/85	76,939,408	---	1.9	31.7	2.6	14.9	10.4	13.9	13.2	11.4
	9/30/85	64,292,295	3.0	2.2	27.1	5.1	13.6	12.7	13.9	12.7	9.7
	6/30/85	68,295,847	3.0	4.8	27.7	8.4	13.4	7.2	11.7	8.5	15.1
	3/31/85	62,021,800	---	5.2	27.5	9.8	11.0	7.3	14.0	7.7	17.6
	12/31/84	57,153,006	1.8	4.6	29.5	3.7	7.6	3.7	16.9	7.2	25.0
	9/30/84	55,468,185	3.4	6.6	25.4	7.6	7.9	5.6	19.6	4.6	19.4
	6/30/84	50,278,968	---	5.3	27.6	8.1	6.8	7.6	19.2	4.8	20.6
	3/31/84	50,085,955	4.8	10.1	12.4	9.6	8.7	14.3	15.2	9.5	15.4
	12/31/83	54,006,960	4.9	7.6	18.0	---	8.8	19.0	26.1	6.0	9.6
	9/30/83	54,334,602	---	4.1	24.3	3.4	6.0	19.7	33.8	5.4	3.4
	6/30/83	57,561,715	4.2	12.0	30.5	4.5	4.2	6.7	33.7	4.3	---
	3/31/83	50,689,028	5.4	9.2	30.7	5.4	9.8	6.4	26.3	---	6.6
LIEBER & COMPANY	9/30/86	40,257,595	2.3	7.4	25.5	2.4	42.7	9.2	6.4	2.8	1.2
	6/30/86	44,505,476	1.7	7.3	22.4	3.1	41.8	10.3	7.5	3.7	2.1
	3/31/86	40,102,680	2.1	7.4	21.4	3.5	38.4	12.3	9.0	4.0	2.0
	12/31/85	35,197,559	1.8	8.7	20.1	3.5	34.3	11.9	12.2	5.4	2.0
	9/30/85	30,715,520	1.6	7.0	21.9	4.5	32.6	14.3	11.8	5.1	1.2
	6/30/85	31,313,770	2.1	7.8	21.4	4.6	30.3	16.0	11.0	5.5	1.2
	3/31/85	29,544,589	2.9	8.0	25.3	6.1	28.9	15.1	8.9	3.5	1.3
	12/31/84	26,473,866	3.2	5.3	27.0	3.2	24.2	18.4	15.3	3.4	---
	9/30/84	25,807,665	2.9	3.8	33.0	4.1	22.4	16.8	14.8	2.2	---
	6/30/84	23,927,529	2.6	3.3	34.8	3.5	21.1	16.7	15.3	1.8	0.8
	3/31/84	24,261,218	3.6	6.4	32.3	4.9	17.3	16.8	16.3	1.8	0.7
	12/31/83	11,159,936	7.7	4.5	33.7	3.5	16.7	22.3	6.1	5.6	---
	9/30/83	11,016,060	6.5	3.5	31.0	4.7	18.0	25.4	5.4	5.5	---
	6/30/83	11,233,248	6.4	5.0	33.3	5.0	16.5	23.9	3.3	6.6	---
	3/31/83	10,063,917	8.3	---	23.1	3.9	11.6	41.0	5.6	6.4	---
PEREGRINE CAPITAL	9/30/86	84,825,995	8.6	8.0	16.8	9.6	10.7	13.7	14.8	5.5	12.2
	6/30/86	89,051,403	8.0	6.7	9.6	15.2	8.1	15.7	13.6	5.0	18.1
	3/31/86	87,406,272	7.4	5.5	15.6	16.2	5.3	15.7	14.8	3.8	15.8
	12/31/85	82,085,372	9.1	6.3	15.1	17.8	5.3	19.1	11.2	3.3	12.7
	9/30/85	72,758,648	8.3	8.5	18.3	12.6	4.5	15.7	18.0	3.0	11.2
	6/30/85	29,610,673	0.2	---	51.4	4.2	12.4	2.9	24.0	2.7	2.3
	3/31/85	27,145,424	---	2.3	44.2	6.3	9.2	6.2	28.0	1.9	1.9
	12/31/84	25,188,312	---	2.3	37.5	2.7	3.9	9.8	37.7	4.1	1.9
	9/30/84	25,685,954	---	3.7	38.0	0.6	2.3	11.9	39.7	1.3	2.4
	6/30/84	24,546,941	2.8	5.5	31.2	5.8	1.0	9.3	38.9	4.3	1.3
	3/31/84	10,385,041	3.6	4.4	23.1	8.5	1.1	7.2	45.5	5.4	1.1
	12/31/83	11,215,761	2.5	1.6	25.5	1.2	3.2	6.0	51.8	1.7	6.6
	9/30/83	11,816,270	1.2	---	31.6	3.3	2.0	8.4	46.1	1.4	5.8
	6/30/83	12,126,921	4.8	---	36.4	5.2	8.9	4.8	33.0	2.9	3.3
	3/31/83	10,417,512	7.0	1.8	47.1	4.2	13.5	---	20.1	6.3	---

EQUITY SECTOR WEIGHTS

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	CAP GDS	CONS DUR	CONS NDUR	ENER	FINL	MAT & SERV	TECH	TRAN	UTIL
WADDELL & REED	9/30/86	91,162,262	2.9	8.5	21.7	12.4	12.9	14.6	18.9	6.6	1.5
	6/30/86	97,376,898	4.4	7.8	26.0	0.4	20.7	21.7	12.4	6.6	---
	3/31/86	95,498,169	4.3	7.3	13.0	2.9	23.3	24.9	16.9	7.3	---
	12/31/85	82,027,227	4.6	7.7	17.0	5.4	15.2	25.9	15.0	9.1	---
	9/30/85	74,328,144	2.0	7.7	18.8	5.1	19.7	22.5	15.6	5.2	3.3
	6/30/85	29,531,769	---	11.8	14.5	2.5	21.1	18.4	13.3	6.1	12.4
	3/31/85	27,604,382	---	12.8	11.9	2.7	21.5	15.8	16.3	7.9	11.2
	12/31/84	26,234,116	---	14.0	18.7	---	18.8	2.7	25.5	1.0	19.3
	9/30/84	25,856,251	1.4	13.9	28.0	3.3	14.3	0.5	30.9	1.6	6.1
	6/30/84	25,495,564	---	29.0	25.7	---	15.7	---	17.8	11.8	---
	3/31/84	25,833,644	5.2	32.1	21.4	---	25.0	---	11.7	4.5	---
	12/31/83	11,409,742	12.8	32.4	---	---	33.9	---	20.9	---	---
	9/30/83	12,042,511	5.8	13.4	22.5	---	5.1	---	38.2	15.0	---
	6/30/83	12,464,478	5.7	13.2	29.2	3.3	5.0	---	31.1	12.5	---
	3/31/83	10,013,713	5.5	13.8	15.5	2.5	29.1	---	27.2	6.4	---
WILSHIRE 500	9/30/86	---	4.4	3.8	26.9	9.0	14.0	12.1	12.4	3.1	14.3
	6/30/86	---	4.5	4.0	28.8	7.8	14.0	12.4	12.6	3.0	12.9
	3/31/86	---	4.8	4.7	27.0	8.0	14.1	11.8	13.4	3.3	12.9
	12/31/85	---	4.8	4.2	25.7	10.5	12.9	11.4	14.2	3.3	13.0
	9/30/85	---	4.7	4.1	26.2	10.6	12.3	11.4	14.0	3.4	13.3
	6/30/85	---	4.8	4.0	26.3	11.2	12.2	10.8	13.6	3.6	13.5
	3/31/85	---	4.9	3.9	25.3	13.0	11.4	10.9	14.4	3.3	12.9
	12/31/84	---	5.4	9.9	23.0	13.5	9.9	10.6	13.2	3.7	10.8
	9/30/84	---	5.2	4.3	24.9	13.2	10.3	11.5	15.5	2.9	12.2
	6/30/84	---	5.3	4.0	25.7	13.5	9.6	11.7	15.6	2.9	11.7
	3/31/84	---	5.4	3.9	23.6	16.1	9.8	12.1	15.3	2.9	11.1
	12/31/83	---	5.5	4.2	24.0	14.5	9.5	12.2	16.3	2.8	11.1
	9/30/83	---	5.2	4.0	24.3	14.8	9.4	11.8	16.3	2.9	11.3
	6/30/83	---	5.3	3.9	24.9	15.0	9.3	11.6	16.3	2.9	10.9
	3/31/83	---	5.1	3.5	25.2	14.6	9.8	12.3	14.9	2.9	11.8

TABLE A-6

EXTERNAL EQUITY MANAGERS

HISTORICAL PERFORMANCE SUMMARY

	3Q 86	2Q 86	1Q 86	4Q 85	3Q 85	2Q 85	1Q 85	4Q 84	3Q 84	2Q 84	1Q 84	4Q 83	3Q 83	2Q 83
FRED ALGER														
Equity	-14.7	9.0%	21.2%	20.0%	-4.7%	10.1%	7.3%	0.2%	8.3%	-4.1%	-8.1%	-1.0%	-3.5%	13.9%
Total Fund	-14.1	8.5	19.8	18.7	-4.6	9.1	7.2	0.2	8.0	-3.5	-7.0	-0.9	-3.4	13.1
ALLIANCE CAPITAL														
Equity	-11.9	6.1	20.0	19.2	-3.6	11.5	13.1	1.3	7.1	2.2	-11.2	-0.6	-8.7	14.3
Total Fund	-11.8	5.9	19.3	17.8	-3.3	10.8	12.2	1.3	6.6	2.2	-10.1	-0.4	-8.0	12.7
BEUTEL GOODMAN														
Equity	-4.8	-0.9	15.7	12.5	-9.0	8.1	12.1	5.1	10.1	-2.8	-0.7	3.5	3.4	13.9
Total Fund	-4.2	-0.6	14.3	12.0	-8.6	7.5	10.7	4.9	9.3	-2.8	-0.6	3.3	1.1	8.7
BMI CAPITAL														
Equity	-9.7	7.2	18.6	19.4	-9.9	-0.7	10.5	2.3	3.6	2.1	-14.4	-6.0	-7.8	14.4
Total Fund	-9.4	7.0	17.8	11.1	-2.4	-0.9	9.3	2.2	3.4	2.0	-14.5	-6.1	-7.7	11.9
FORSTMANN-LEFF														
Equity	-16.0	10.1	20.8	21.5	-5.4	9.4	12.6	3.7	7.5	-2.8	-8.3	-1.0	-1.7	11.2
Total Fund	-10.8	8.9	18.8	16.3	-4.2	8.1	10.9	3.4	4.6	-1.7	-6.0	-0.6	-1.2	9.9
HELLMAN JORDAN														
Equity	-10.7	0.4	16.1	19.4	-5.9	9.5	10.0	4.3	8.6	-4.8	-3.1	-0.9	-9.5	10.0
Total Fund	-10.4	0.3	15.3	18.6	-5.6	7.5	8.7	4.6	9.5	-3.9	-0.6	-1.0	-3.2	5.8
IDS ADVISORY														
Equity	-10.6	8.1	18.2	20.5	-5.9	10.7	9.2	3.2	11.4	0.0	-8.4	-0.9	-6.6	14.3
Total Fund	-10.1	7.5	17.2	19.7	-5.9	10.1	8.5	3.0	10.3	0.4	-7.3	-0.6	-5.6	13.6
INVESTMENT ADVISERS														
Equity	-11.1	5.3	14.7	20.5	-7.8	7.1	6.6	5.8	11.3	-3.0	-5.8	1.5	-2.9	11.6
Total Fund	-8.9	4.6	12.4	18.5	-7.2	6.4	6.4	5.7	10.7	-2.8	-4.9	1.3	-1.8	8.0
LIEBER & COMPANY														
Equity	-9.5	11.8	13.8	15.2	-1.7	6.3	13.8	2.9	8.9	-1.3	-10.2	1.7	-2.4	16.6
Total Fund	-9.5	11.0	13.9	14.6	-1.9	6.0	11.6	2.6	7.9	-1.4	-7.3	1.3	-1.9	11.6
PEREGRINE CAPITAL														
Equity	-5.7	2.1	7.7	15.5	0.4	10.7	9.5	-2.1	5.3	-3.2	-8.8	-6.0	-3.6	19.6
Total Fund	-4.7	1.9	6.5	12.8	-1.9	9.1	7.8	-1.9	4.7	-2.7	-7.4	-5.1	-2.6	16.4
WADDELL & REED														
Equity	-8.3	2.4	19.7	18.4	-5.4	8.7	8.1	0.7	-1.6	-10.3	-14.0	-9.3	-4.7	30.2
Total Fund	-6.4	2.0	16.4	10.4	-2.0	7.0	5.2	1.5	1.4	-1.3	-2.2	-5.3	-3.0	24.0
SBI AGGREGATE														
Equity	-1.4	5.0	16.6	17.7	-5.7	8.8	9.5	2.4	8.0	-2.7	-7.5	-1.5	-5.6	12.1
Total Fund	-8.6	4.5	15.2	15.2	-4.5	8.0	8.4	2.4	7.2	-2.2	-5.9	-1.2	-4.5	10.5
MARKET INDICES														
Wilshire 5000	-7.7	5.8	14.4	16.8	-4.3	7.5	10.3	1.3	9.2	-2.8	-4.2	-1.0	-0.9	13.0
S&P 500	-7.0	6.0	14.1	17.3	-4.1	7.4	9.2	1.8	9.7	-2.5	-2.4	0.4	-0.1	11.1
91 Day T-Bills	1.4	1.6	1.8	1.8	1.9	1.9	2.1	2.3	2.7	2.6	2.4	2.3	2.4	2.2

BOND MANAGER PORTFOLIO STATISTICS GLOSSARY

Like the preceding equity manager portfolio statistics glossary, this bond manager portfolio statistics glossary is designed to define terminology used in evaluating a bond manager's investment philosophy, risk characteristics and performance data.

Qtr. Port. Turnover	-	the manager's total bond sales during the quarter divided by the average value of the manager's bond portfolio over the quarter.
# of Issues	-	the number of different bond issues held in the manager's portfolio.
Bond Allocation	-	the percent of the manager's total portfolio invested in bonds.
Coupon	-	the annual interest payment received on the manager's total portfolio stated as a percent of the portfolio's face value.
Current Yield	-	the annual interest payment produced by the manager's total portfolio stated as a percent of the portfolio's market value.
Yield to Maturity	-	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.
Duration	-	a measure of the average life of the total portfolio. Duration is a weighted average maturity whereby 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.
Term to Maturity	-	also 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.

Quality Weightings	- 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.
Sector Weightings	- refers to the sectors of the bond market in which the manager has positioned his/her bond portfolio.
TUCS Median	- the median manager within a subsample of the TUCS universe that is restricted to fixed income managers investing in portfolios with quality and duration characteristics similar to those that are required of the SBI's bond managers.

TABLE A-7

EXTERNAL FIXED INCOME MANAGERS

PORTFOLIO STATISTICS HISTORICAL SUMMARY

MANAGER NAME	DATE	QUARTER PORTFOLIO T/O	# OF BONDS	BOND ALLOCATION	COUPON	CURRENT YIELD	YIELD TO MAT.	AVERAGE QUALITY	DURATION	TERM TO MAT.
AVG. EXT. MGRS.	9/30/86	19	41	99	9.5	9.2	9.3	AAA	5.0	10.6
	6/30/86	47	40	96	9.8	9.3	9.0	AAA	4.6	10.0
	3/31/86	41	39	96	10.3	9.6	8.8	AAA	4.5	12.3
	12/31/85	41	33	95	10.5	10.0	9.6	AAA	4.4	8.7
	9/30/85	22	34	96	10.7	10.6	10.6	AAA	4.3	8.7
	6/30/85	48	29	95	10.4	10.2	10.4	AAA	4.5	8.5
	3/31/85	37	25	91	10.3	10.8	11.5	AAA	4.2	8.2
	12/31/84	38	22	93	10.3	10.8	11.4	AAA	4.5	8.8
	9/30/84	54	29	88	10.1	11.1	12.3	AAA	4.3	8.8
INVESTMENT ADV.	9/30/86	5	22	98	9.4	8.6	8.5	AAA	3.5	4.4
	6/30/86	9	21	96	9.6	8.8	8.3	AAA	3.3	4.1
	3/31/86	17	22	95	9.9	8.9	8.2	AAA	3.3	4.2
	12/31/85	10	16	95	9.4	8.8	8.7	AAA	3.4	4.3
	9/30/85	30	18	99	9.7	9.3	9.9	AAA	3.8	5.1
	6/30/85	50	17	99	8.4	8.1	10.1	AAA	4.7	6.2
	3/31/85	19	13	99	8.7	9.3	11.7	AAA	4.9	8.9
	12/31/84	25	10	99	8.4	9.3	11.5	AAA	5.6	12.1
	9/30/94	10	7	100	9.0	10.8	12.6	AAA	6.4	15.2
LEHMAN MGMT.	9/30/86	31	44	98	10.2	9.4	8.2	AAA	4.4	8.6
	6/30/86	16	48	97	10.8	9.8	8.3	AAA	4.0	8.1
	3/31/86	28	54	97	11.0	9.7	8.3	AAA	4.0	8.5
	12/31/85	40	32	89	11.1	10.2	9.2	AAA	3.7	6.5
	9/30/85	24	35	95	11.4	10.9	10.2	AAA	3.9	6.6
	6/30/85	49	27	92	11.4	10.8	9.9	AAA	3.8	6.3
	3/31/85	43	24	85	11.6	11.4	11.0	AAA	3.6	5.6
	12/31/84	44	19	85	11.6	11.4	10.8	AAA	3.3	5.3
	9/30/84	62	15	82	11.2	11.5	12.2	AAA	3.7	6.5
MILLER ANDERSON	9/30/86	15	68	99	9.3	9.3	9.8	AA	5.6	12.5
	6/30/86	57	60	97	9.4	9.3	9.5	AA	5.2	11.6
	3/31/86	73	37	92	10.5	9.7	8.8	AA	4.4	11.4
	12/31/85	71	42	99	10.4	9.9	9.6	AA	5.3	9.6
	9/30/85	23	52	98	9.6	10.2	10.6	AA	5.0	9.7
	6/30/85	75	48	95	9.3	10.0	10.4	AA	4.6	9.3
	3/31/85	35	41	92	9.0	10.0	11.1	AA	3.7	7.4
	12/31/84	50	43	99	9.1	10.1	11.3	AA	3.9	7.3
	9/30/84	83	59	71	9.8	11.1	11.9	AAA	3.3	6.7

MANAGER NAME	DATE	QUARTER PORTFOLIO T/O	# OF BONDS	BOND ALLOCATION	COUPON	CURRENT YIELD	YIELD TO MAT.	AVERAGE QUALITY	DURATION	TERM TO MAT.
MORGAN STANLEY	9/30/86	9	14	100	8.4	8.7	8.9	AAA	5.3	10.7
	6/30/86	89	13	100	8.6	8.9	9.1	AAA	5.4	10.8
	3/31/86	62	20	100	9.4	9.0	8.7	AAA	5.4	19.9
	12/31/85	58	17	100	10.4	10.1	9.9	AAA	5.0	10.6
	9/30/85	18	20	100	11.2	11.1	11.0	AAA	4.4	9.8
	6/30/85	38	17	100	11.4	10.8	10.5	AAA	5.0	9.7
	3/31/85	62	16	85	11.1	11.3	11.5	AAA	3.8	7.3
	12/31/84	30	12	100	11.5	11.5	11.5	AAA	5.3	9.4
	9/30/84	105	20	99	8.6	8.9	12.5	AAA	3.7	5.3
PEREGRINE	9/30/86	14	56	97	10.3	9.8	11.3	AA	4.5	11.0
	6/30/86	12	51	97	10.8	10.2	9.8	AA	4.3	9.7
	3/31/86	10	54	98	11.2	10.3	9.4	AA	4.1	11.0
	12/31/85	18	51	98	11.5	10.8	10.4	AA	3.7	9.3
	9/30/85	20	43	96	11.6	11.2	11.0	AA	3.3	7.8
	6/30/85	15	35	98	11.2	10.8	10.5	AA	3.4	7.6
	3/31/85	13	28	100	11.1	11.3	11.5	AA	3.7	7.6
	12/31/84	39	25	96	10.5	10.9	11.3	AA	3.5	7.5
	9/30/84	17	21	93	10.6	11.7	12.5	AA	3.6	7.6
WESTERN ASSET	9/30/86	38	40	100	9.6	9.1	9.0	AA	6.4	16.4
	6/30/86	97	48	90	9.3	9.0	9.0	AA	5.6	15.7
	3/31/86	58	48	95	9.8	9.8	9.3	AA	5.5	18.9
	12/31/85	47	40	87	10.3	10.1	10.0	AA	5.2	11.9
	9/30/85	19	34	89	10.7	11.0	11.1	AA	5.6	13.0
	6/30/85	58	29	84	10.5	10.7	10.8	AA	5.4	12.1
	3/31/85	52	28	87	10.4	11.5	12.1	AA	5.3	12.2
	12/31/84	39	24	80	10.6	11.4	11.8	AA	5.2	11.3
	9/30/84	49	19	80	11.3	12.3	12.8	AA	4.8	11.3

TABLE A-8

EXTERNAL FIXED INCOME MANAGERS
SECTOR WEIGHTING HISTORICAL PROFILE

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	QUALITY WEIGHTINGS AAA	AA	A	BAA	OTHER	SECTOR WEIGHTINGS GOVT	AGCY	ZERO	IND	UTIL	FIN	TRAN	MTGS	MISC	CASH
AVG. EXT. MGRS.	9/30/86	---	76	6	12	3	3	29	3	2	11	2	9	1	39	3	1
	6/30/86	---	78	6	10	3	3	28	6	3	9	2	10	1	37	3	4
	3/31/86	---	79	6	9	3	3	35	2	2	9	2	9	0	34	3	4
	12/31/85	---	80	5	8	2	5	35	3	2	6	2	9	0	35	3	5
	9/30/85	---	81	5	8	1	5	33	3	2	7	2	9	0	39	1	4
	6/30/85	---	81	6	6	3	4	34	1	4	5	4	9	0	36	1	5
	3/31/85	---	78	10	6	2	4	27	5	4	5	6	12	0	31	1	9
	12/31/84	---	77	12	7	2	2	33	8	4	2	8	12	0	24	1	7
	9/30/84	---	79	12	7	2	0	30	10	7	3	8	9	1	19	1	12
INVESTMENT ADV.	9/30/86	40,731,041	78	8	14	0	0	45	5	12	23	0	13	0	0	0	2
	6/30/86	39,301,944	81	8	11	0	0	34	18	12	23	0	10	0	0	0	4
	3/31/86	38,938,391	84	8	8	0	0	52	0	12	25	0	6	0	0	0	5
	12/31/85	36,766,845	96	4	0	0	0	68	0	12	8	0	7	0	0	0	5
	9/30/85	34,573,707	96	4	0	0	0	70	0	13	9	0	7	0	0	0	1
	6/30/85	33,794,148	96	4	0	0	0	62	0	23	10	0	4	0	0	0	1
	3/31/85	30,942,776	85	15	0	0	0	53	0	18	11	13	4	0	0	0	1
	12/31/84	30,397,636	74	26	0	0	0	52	0	18	0	25	4	0	0	0	1
	9/30/84	27,932,974	72	28	0	0	0	59	0	10	0	31	0	0	0	0	0
LEHMAN MGMT.	9/30/86	229,994,337	80	6	12	0	2	53	0	0	14	8	7	0	16	0	2
	6/30/86	223,483,722	89	4	6	1	0	60	0	0	11	2	7	0	18	0	3
	3/31/86	220,998,995	89	4	6	1	0	65	2	0	9	0	6	0	15	0	3
	12/31/85	207,462,430	89	5	6	0	0	51	10	0	7	2	7	0	12	0	11
	9/30/85	194,774,253	87	6	7	0	0	54	12	0	9	2	7	0	11	0	5
	6/30/85	190,808,742	91	5	4	0	0	64	8	0	5	2	4	0	9	0	8
	3/31/85	177,383,853	95	3	2	0	0	65	13	0	2	0	2	0	3	0	15
	12/31/84	173,831,628	98	0	2	0	0	64	13	0	3	0	0	0	5	0	15
	9/30/84	162,737,117	96	1	2	0	0	60	13	5	4	0	0	0	0	0	18
MILLER ANDERSON	9/30/86	222,348,832	72	3	5	6	14	24	0	0	6	0	6	0	61	2	1
	6/30/86	217,656,629	71	5	4	5	15	25	0	0	2	0	8	0	60	2	3
	3/31/86	217,291,031	74	0	5	5	16	45	0	0	2	0	8	0	37	0	8
	12/31/85	208,552,908	71	0	6	4	19	45	0	0	2	0	8	0	44	0	1
	9/30/85	191,849,284	68	1	9	4	18	24	0	0	5	0	9	0	60	0	2
	6/30/85	183,857,869	69	3	8	4	16	19	0	2	5	0	12	0	57	0	5
	3/31/85	173,961,916	54	13	11	2	20	2	0	4	7	0	27	0	52	0	8
	12/31/84	169,696,156	55	17	14	5	9	0	0	7	5	0	36	0	51	0	1
	9/30/84	159,574,376	81	12	5	2	0	0	0	0	2	0	17	0	52	0	29

MANAGER NAME	DATE	TOTAL PORTFOLIO MARKET VALUE	QUALITY WEIGHTINGS AAA	AA	A	BAA	OTHER	SECTOR WEIGHTINGS GOVT	AGCY	ZERO	IND	UTIL	FIN	TRAN	MTGS	MISC	CASH
MORGAN STNALEY	9/30/86	229,631,966	100	0	0	0	0	35	0	0	0	0	0	0	65	0	0
	6/30/86	222,763,940	100	0	0	0	0	33	9	0	0	0	0	0	58	0	0
	3/31/86	225,686,690	100	0	0	0	0	41	0	0	0	0	0	0	59	0	0
	12/31/85	208,381,895	100	0	0	0	0	42	0	0	0	0	0	0	58	0	0
	9/30/85	193,513,567	100	0	0	0	0	41	0	0	0	0	0	0	59	0	0
	6/30/85	188,907,479	100	0	0	0	0	49	0	0	0	0	0	0	51	0	0
	3/31/85	173,106,782	100	0	0	0	0	38	9	0	0	0	0	0	38	0	15
	12/31/84	170,547,941	100	0	0	0	0	74	18	0	0	0	0	0	8	0	0
	9/30/84	159,109,110	100	0	0	0	0	45	27	27	0	0	0	0	0	0	1
PEREGRINE	9/30/86	108,237,995	49	14	32	2	3	0	0	0	12	0	26	0	47	13	2
	6/30/86	104,606,143	48	19	31	0	2	0	0	0	9	0	30	0	41	17	3
	3/31/86	104,370,666	48	18	32	0	2	0	0	0	9	0	31	0	40	17	2
	12/31/85	100,139,659	55	13	29	0	3	0	0	0	5	0	29	0	48	16	2
	9/30/85	95,186,493	61	12	25	0	2	0	0	0	4	2	31	0	52	7	4
	6/30/85	92,417,709	56	15	20	7	2	0	0	0	4	5	33	0	49	7	2
	3/31/85	86,259,088	55	23	19	3	0	3	0	0	0	5	38	0	47	7	0
	12/31/84	84,387,890	65	13	18	4	0	6	7	0	0	5	30	0	48	0	4
	9/30/84	79,887,650	58	14	24	4	0	12	7	0	10	0	31	0	33	0	7
WESTERN ASSET	9/30/86	244,004,935	75	2	11	11	1	16	13	2	9	7	4	4	43	2	0
	6/30/86	238,657,259	80	2	8	9	1	13	9	3	7	7	2	4	45	0	10
	3/31/86	235,514,306	76	4	5	14	1	7	9	3	12	9	2	1	52	0	5
	12/31/85	220,363,561	73	5	8	7	7	5	8	1	15	9	2	1	48	0	11
	9/30/85	201,666,058	74	6	5	4	11	11	3	0	14	10	0	1	49	0	12
	6/30/85	197,929,627	73	9	4	8	6	10	0	0	8	15	0	1	51	0	15
	3/31/85	181,426,695	76	9	4	7	4	4	11	0	8	16	0	1	47	0	13
	12/31/84	177,328,832	69	15	7	5	4	3	11	0	6	19	2	2	33	4	20
	9/30/84	165,957,816	68	15	9	5	3	4	16	0	3	18	4	5	26	4	20

TABLE A-9

EXTERNAL FIXED INCOME MANAGERS

HISTORICAL PERFORMANCE SUMMARY

	3Q 1986	2Q 1986	1Q 1986	4Q 1985	3Q 1985	2Q 1985	1Q 1985	4Q 1984	3Q 1984
INVESTMENT ADVISERS									
Fixed Income	2.5%	0.9%	6.2%	6.5%	2.5%	9.4%	1.9%	8.8%	11.8%
Total Fund	2.4	0.9	5.9	6.3	2.3	9.2	1.8	8.8	11.8
LEHMAN MANAGEMENT									
Fixed Income	3.0	1.2	6.7	6.9	2.1	8.7	2.0	7.7	9.6
Total Fund	2.9	1.1	6.5	6.5	2.1	7.6	2.1	6.8	8.7
MILLER ANDERSON									
Fixed Income	2.2	0.2	4.4	8.8	4.4	6.0	2.5	7.5	7.7
Total Fund	2.2	0.2	4.2	8.7	4.4	5.7	2.5	6.3	6.7
MORGAN STANLEY									
Fixed Income	3.1	-2.1	8.2	7.7	2.5	9.3	1.5	7.3	6.1
Total Fund	3.1	-1.3	8.3	7.7	2.4	9.1	1.5	7.2	6.3
PEREGRINE CAPITAL									
Fixed Income	3.6	0.2	4.3	5.4	3.1	7.3	2.3	6.0	7.7
Total Fund	3.5	0.2	4.2	5.2	3.0	7.1	2.2	5.6	6.9
WESTERN ASSET									
Fixed Income	2.3	0.9	7.4	10.7	1.9	10.7	2.4	8.0	11.8
Total Fund	2.2	1.3	6.9	9.3	1.9	9.1	2.3	6.8	10.8
SBI FIXED INCOME AGGREGATE									
Fixed Income	2.8	1.7	6.4	8.1	2.8	8.5	2.1	7.5	8.8
Total Fund	2.7	0.4	6.2	7.7	2.7	7.8	2.1	6.8	8.1
MARKET INDEX									
Salomon Broad Bond Index	2.5	1.1	7.9	7.8	2.0	8.9	2.2	7.5	8.6

Tab B

PORTFOLIO STATISTICS

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
COMPOSITION OF STATE INVESTMENT PORTFOLIO'S BY TYPE OF INVESTMENT
MARKET VALUE SEPTEMBER 30, 1986

	CASH AND SHORT TERM SECURITIES	BONDS		STOCKS		ALTERNATIVE ASSETS	TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL		
BASIC RETIREMENT FUNDS:							
TEACHERS RETIREMENT FUND	$ 38,463	$ -0-	$434,151	$ -0-	$1,080,151	$206,026	$1,758,791
	2.19%	0.00%	24.69%	0.00%	61.41%	11.71%	100%
PUBLIC EMPLOYEES RETIRE. FUND	20,335	-0-	305,118	-0-	759,302	144,794	1,229,549
	1.65%	0.00%	24.82%	0.00%	61.75%	11.78%	100%
STATE EMPLOYEES RETIRE. FUND	19,229	-0-	228,525	-0-	568,727	108,446	924,927
	2.08%	0.00%	24.71%	0.00%	61.49%	11.72%	100%
PUBLIC EMP. POLICE & FIRE FUND	7,695	-0-	88,345	-0-	219,923	41,924	357,887
	2.15%	0.00%	24.69%	0.00%	61.45%	11.71%	100%
HIGHWAY PATROL RETIRE. FUND	769	-0-	17,181	-0-	30,565	20,470	68,985
	1.11%	0.00%	24.91%	0.00%	44.31%	29.67%	100%
JUDGES RETIREMENT FUND	558	-0-	1,137	-0-	2,740	523	4,958
	11.26%	0.00%	22.93%	0.00%	55.26%	10.55%	100%
POST RETIREMENT FUND	240,131	2,838,861	-0-	591,301	-0-	-0-	3,670,293
	6.54%	77.35%	0.00%	16.11%	0.00%	0.00%	100%
MINNESOTA SUPPLEMENTAL FUNDS:							
INCOME SHARE ACCOUNT	10,763	63,889	-0-	90,584	11,651	-0-	176,887
	6.08%	36.12%	0.00%	51.21%	6.59%	0.00%	100%
GROWTH SHARE ACCOUNT	674	-0-	-0-	37,177	35,255	-0-	73,106
	0.92%	0.00%	0.00%	50.85%	48.23%	0.00%	100%
FIXED RETURN ACCOUNT	76,620	-0-	-0-	-0-	-0-	-0-	76,620
	100%	0.00%	0.00%	0.00%	0.00%	0.00%	100%
BOND ACCOUNT	152	11,421	-0-	-0-	-0-	-0-	11,573
	1.31%	98.69%	0.00%	0.00%	0.00%	0.00%	100%
COMMON STOCK INDEX ACCOUNT	60	-0-	-0-	-0-	154	-0-	214
	28.04%	0.00%	0.00%	0.00%	71.96%	0.00%	100%
BOND MARKET ACCOUNT	146	-0-	492	-0-	-0-	-0-	638
	22.88%	0.00%	77.12%	0.00%	0.00%	0.00%	100%
GUARANTEED RETURN ACCOUNT	-0-	-0-	-0-	-0-	-0-	-0-	-0-
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MINNESOTA VARIABLE ANNUITY	1,533	-0-	-0-	62,062	72,717	-0-	136,312
	1.12%	0.00%	0.00%	45.53%	53.35%	0.00%	100%
TOTAL RETIREMENT FUNDS	$ 417,128	$2,914,171	$1,074,949	$781,124	$2,781,185	$522,183	$8,490,740
	4.91%	34.32%	12.66%	9.20%	32.76%	6.15%	100%

PERMANENT SCHOOL FUND	90,128 24.17%	282,773 75.83%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	372,901 100%
TREASURERS CASH	640,061 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	640,061 100%
TRANSPORTATION FUNDS	421,755 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	421,755 100%
STATE BUILDING FUNDS	73,524 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	73,524 100%
HOUSING FINANCE AGENCY	172,519 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	172,519 100%
MINNESOTA DEBT SERVICE FUND	124,362 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	124,362 100%
MISCELLANEOUS ACCOUNTS	224,521 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	224,521 100%
TACONITE AREA ENVIR. PROTECTION	8,674 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	8,674 100%
N.E. MINNESOTA PROTECTION	41,523 100%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	-0- 0.00%	41,523 100%
GRAND TOTAL	$2,214,195 20.95%	$3,196,944 30.24%	$1,074,949 10.17%	$781,124 7.39%	$2,781,185 26.31%	$522,183 4.94%	$10,570,580 100%

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
NET CASH FLOW AVAILABLE FOR INVESTMENT

For period of
July 1, 1986 - September 30, 1986

Teachers Retirement Fund	$ (8,800,000.00)
Public Employees Retirement Fund	(13,500,000.00)
State Employees Retirement Fund	(2,270,000.00)
Public Employees Police & Fire	1,500,000.00)
Highway Patrol Retirement Fund	192,000.00
Judges Retirement Fund	(690,000.00)
Post Retirement Fund	9,074,879.00
Supplemental Retirement Fund - Income	2,490,944.54
Supplemental Retirement Fund - Growth	35,526.75
Supplemental Retirement Fund - Fixed	(1,472,607.46)
Supplemental Retirement Fund - Bond	64,795.33
Supplemental Retirement Fund - Index	216,290.84
Supplemental Retirement Fund - Bond Mkt.	630,350.67
Supplemental Retirement Fund - Guaranteed	-0-
Minnesota Variable Annuity Fund	$ (661,266.53)
Total Retirement Funds Net Cash Flow	$ (13,189,086.86)
Permanent School Fund	(281,736.62)
Total Net Cash Flow	$ (13,470,823.48)

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT

TRANSACTION AND ASSET SUMMARY
RETIREMENT FUNDS

	Net Transactions				Asset Summary (at market)			
	Bonds (000,000)	Stocks (000,000)	Total	Cash Flow	Short-term % of Fund	Bonds % of Fund	Equity % of Fund	Total (000,000) (at market)
June 1984	5	(38)	(33)	119	8.7	36.5	54.8	5187
July	151	29	180	34	5.8	40.5	53.7	5247
August	(6)	(16)	(22)	24	6.2	38.4	55.4	5598
September	16	(6)	10	14	6.3	39.0	54.7	5652
October	19	32	51	31	5.8	39.7	54.5	5748
November	(7)	(19)	(26)	18	6.5	40.1	53.4	5760
December	91	(71)	20	12	6.3	41.2	52.5	5864
January 1985	(5)	131	126	20	4.3	42.0	53.7	6188
February	30	(5)	25	27	4.3	41.2	54.5	6177
March	(1)	5	4	26	4.6	41.7	53.7	6213
April	(79)	17	(62)	23	5.9	40.7	53.4	6260
May	(13)	(41)	(54)	32	6.9	40.4	52.7	6602
June	284	118	402	408	6.8	41.2	52.0	6801
July	84	68	153	40	5.2	41.8	53.0	6812
August	79	4	83	30	4.3	43.3	52.4	6867
September	32	(10)	22	31	4.6	44.6	50.8	6751
October	50	52	102	26	3.3	44.8	51.9	6986
November	(29)	(22)	(51)	41	4.4	43.1	52.5	7299
December	(3)	(76)	(79)	16	5.5	43.1	51.4	7583
January 1986	(7)	13	6	13	5.5	42.9	51.6	7618
February	36	(8)	28	34	5.3	42.9	51.8	8049
March	1	(3)	(2)	27	5.4	42.9	51.7	8429
April	(3)	(131)	(134)	20	7.3	42.9	49.8	8384
May	(2)	8	6	44	7.7	40.8	51.5	8450
June	226	326	552	625	8.3	41.4	50.3	8715
July	175	2	177	33	6.8	44.8	48.4	8488
August	147	59	206	39	4.6	45.5	49.9	8884
September	14	(67)	(53)	(48)	4.9	47.0	48.1	8490

Tab C

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 9, 1986

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

FROM: Administrative Committee

SUBJECT: Committee Report

The Administrative Committee met to review several items:

1) Post Retirement Benefit Increase

The benefit increase effective January 1, 1987 will be 9.792%.

2) 1986 Annual Report

Board and IAC members received a draft of the 1986 annual report in November. It has been sent to the printer and should be available for distribution in January 1987.

3) Investment Conference

The Board's fifth investment conference has been re-scheduled for Wednesday, February 18, 1987. Invitations will be issued during early January 1987.

4) Accounting System Contract

The Committee reviewed the response to the Board's Request For Proposal (RFP) for its computerized accounting and portfolio management system. A copy of the staff report is attached to this committee report.

The Committee recommends that a four year contract be approved with Compensation and Capital at the rate of $162,000 per year.

5) 1987 Legislative Package

The Committee reviewed several proposals for statutory changes to the Board's investment authority. The proposals recommended by the Committee are attached to this Committee Report.

The Committee recommends that the Board support these proposals and seek legislative approval for all the changes discussed in the attachments.

6) Schedule of Board and IAC Meetings for 1987

The schedules for the quarterly meeting of the Board and the IAC for 1987 are included attachments to this Committee Report.

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 9, 1986

TO: Members, Administrative Committee

FROM: SBI Staff

SUBJECT: Recommendations on Accounting/Portfolio Management System Contract

The Board's contract for a computerized accounting and portfolio management system will expire June 30, 1987. After issuing a Request For Proposal (RFP) and evaluating the responses, staff recommend the Board sign a new contract with Compensation and Capital, the current vendor. The contract should be written for four years at a cost of $162,000 per year.

The RFP process and evaluation are summarized below:

In September 1986, the Board published an advertisement in the State Register announcing the Board's intention to rebid the contract. Staff sent detailed RFP's to fifteen firms, ten who responded to the advertisement and five others known to the SBI staff to provide similar services. Two firms submitted formal responses:

Compensation and Capital (current vendor)
Shaw Data Systems

The Compensation and Capital proposal would continue the current system and update communication equipment and system hardware. It would also add new software to improve the management reports generated by the system. It is staff's judgment that their proposal meets the Board's RFP for both accounting and portfolio management.

The Shaw Data proposal outlined a system that would meet most of the Board's portfolio management needs but would require substantial modification (and additional costs) to adequately meet the Board's accounting requirements. Specific concerns include: 1) lack of an integrated general ledger system; 2) lack of software to support a securities lending program; 3) inability to produce transaction tickets in a timely manner; 4) extra fees to maintain adequate, on-line transactions history; and 5) inability to provide performance reports tied to the Board's combined or pooled investment fund structure. As a result, the cost of the Shaw Data proposal would be substantially higher than the proposal submitted by Compensation and Capital.

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT

Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 8, 1986

TO: Members, Administrative Committee

FROM: SBI Staff

SUBJECT: Proposed Statutory Changes for the 1987 Legislative Session

We have prepared several potential statutory changes for your review. A rough draft of the necessary language changes and a section by section summary are attached. The changes can be highlighted as follows:

1) Change sign-off provisions on forms required for the Board's certificate of deposit program.

The Board operates a certificate of deposit (CD) program in which it purchases CD's from Minnesota financial institutions. The documents used to execute the program are considered contracts and purchase agreements under current statute. As a result, the Board is currently required to obtain signatures and to file documents irrelevant to the administration of the program.

2) Remove the three year maturity limit on investments for state cash accounts.

Currently, State cash accounts must be invested in debt obligations with maturities of three years or less. Recent changes in federal tax law may make this provision disadvantageous. In the future, SBI may need to purchase debt obligations with longer maturities to avoid penalties on arbitrage earnings.

3) <u>Increase the limit on equity investments to no more than 85% of the value of a fund and increase the limit on alternative investments to no more than 35% of the value of a fund.</u>

   Under current statute, investments in stocks and alternative investments cannot exceed 75% of a fund's value. The Board's present asset allocation policy for the Basic Retirement Funds has reached this limit with a target of 60% in common stock and 15% in alternative investments. Increasing the limits on total equity investments and alternative investments will offer the Board increased investment flexibility in future asset allocation decisions.

   If this change is adopted, the IAC and the Board would continue to set appropriate asset allocation targets for each fund through the normal investment management process.

4) <u>Add authority to purchase high-yield debt obligations as an alternative investment</u>.

   Currently, the Board may invest in high quality corporate bonds (BAA or better) and unrated corporate obligations that meet fairly narrow restrictions. With the proposed change, the Board could purchase other, high-yield debt securities as an alternative investment.

5) <u>Add authority to purchase foreign securities as an alternative investment.</u>

   Currently the Board's investments are limited to U.S. and Canadian securities. The ability to make selected investments in foreign securities may allow the Board to enhance investment returns without adding to investment risk.

   If the change is adopted, the IAC and the Board would determine when and where the authority would be used through its normal asset allocation process.

Attachment

State Board of Investment
Proposed Statutory Changes
1987 Legislative Session

Section by Section Summary

SECTION 1. GOVERNMENT OBLIGATIONS

- o Deletes reference to fixed income securities so that variable rate debt securities can be purchased.
- o Adds requirement that issues are backed by the full faith and credit of the issuer or are rated among the top four quality categories by a nationally recognized rating agency.
- o Removes language made unnecessary by the new quality restrictions added to the subdivision.

SECTION 2. CORPORATE OBLIGATIONS

- o Removes language made unnecessary by the amendment in Section 5.

SECTION 3. OTHER OBLIGATIONS

- o Deletes obsolete requirement concerning bankers acceptances and adds a new requirement to insure the quality of the investment.
- o Removes extraneous language concerning certificates of deposit and inserts provisions to insure the quality of certificates purchased by the Board.
- o Exempts the Board from certain administrative procedures when it purchases certificates of deposit.
- o Deletes extraneous language concerning commercial paper and adds authority to purchase commerical paper that is ranked in the second highest quality rating category.

SECTION 4. CORPORATE STOCK

- Increases the "cap" on equity investments from 75% to 85% of the value of a fund.

SECTION 5. OTHER INVESTMENTS

- Increases the "cap" on alternative investments from 20% to 35% of the value of a fund.
- Adds high yield debt obligations as an authorized investment subject to certain restrictions.
- Adds foreign securities as an authorized investment subject to certain restrictions.

SECTION 6. ADDITIONAL INVESTMENT PROVISIONS

- Allows cash accounts to purchase any debt obligation rather than limiting the investments to maturities of three years or less.

PROPOSED STATUTORY CHANGES
1987 LEGISLATIVE SESSION

BE IT ENACTED BY THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 1986, Section 11A.24 subdivision 2 is amended to read:

Subd. 2. **Government obligations.** The state board may invest funds in governmental bonds, notes, bills mortgages and other ~~fixed obligations~~ evidences of indebtedness provided the issue is backed by the full faith and credit of the issuer or the issue is rated among the top four quality rating categories by a nationally recognized rating agency. These obligations may include~~, including~~ guaranteed or insured issues of (a) the United States, its agencies, its instrumentalities, or organizations created and regulated by an act of Congress; (b) Canada and its provinces, provided the principal and interest is payable in United States dollars; (c) the states and their municipalities, political subdivisions, agencies or instrumentalities~~, where backed by the state's full faith and credit of the issuer or if the issuer has not been in default in payments of principal or interest within the past ten years or in the case of revenue bonds the obligor has been completely self-supporting for the five prior years~~; (d) The International Bank of Reconstruction and Development, the International American Development Bank, the Asian Development Bank, the African Development Bank, or any other United States Government sponsored organization of which the United States is a member, provided the principal and interest is payable in United States dollars ~~and the issues are rated in the highest quality category by a nationally recognized rating agency~~.

Sec. 2. Minnesota Statutes 1986, Section 11A.24 subdivision 3 is amended to read:

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

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

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

~~(c) for unrated obligations, the corporation shall have issued other similar securities rated according to clause (b) or: (i) the consolidated net pretax earnings of corporations other than banks and finance corporations shall have been on average for the preceding five years at least three times the annual interest charges on total funded debt applicable to that period; or (ii) the consolidated net pretax earnings of banks and finance corporations shall have been on average for the preceding five years at least 2.4 times the annual interest charges on total funded debt applicable to that period.~~

Sec. 3. Minnesota Statutes 1986, Section 11A.24 subdivision 4 is amended to read:

Subd. 4. **Other obligations.** The state board may invest funds in bankers acceptances, certificates of deposit, commercial paper, mortgage participation certificates and pools, repurchase agreements and reverse repurchasing agreements, guaranteed investment contracts, and savings accounts if they conform to the following provisions:

(a) bankers acceptances of United States banks shall be limited to those ~~eligible for purchase by the Federal Reserve System~~ issued by banks rated in the highest four quality categories by a nationally recognized rating agency;

(b) certificates of deposit shall be limited to those issued by United States banks and savings institutions ~~that meet the collateral requirements established in section 9.031, unless sufficient volume is unavailable at competitive interest rates. In that event, noncollateralized certificates of deposit may be purchased from United States banks and savings institutions that are rated in the highest quality category by a nationally recognized rating agency~~ that are rated in the highest four quality categories by a nationally recognized rating agency or whose certificates of deposit are fully insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation. Sections 16A.58 and 16B.06 shall not apply to certifications of deposit and collateralization agreements executed by the state board;

(c) commercial paper shall be limited to those issued by United States corporations or their Canadian subsidiaries~~,~~ shall be ~~of the highest quality and mature in 270 days or less~~ rated in the highest two quality categories by a nationally recognized rating agency;

(d) mortgage participation or pass through certificates evidencing interests in pools of first mortgages or trust deeds on improved real estate located in the United States where the loan to value ratio for each loan as calculated in accordance with section 61A.28, subdivision 3 does not exceed 80 percent for fully amortizable residential properties and in all other respects meets the requirements of section 61A.28, subdivision 3. In addition the state board may purchase from the Minnesota housing finance agency all or any part of any pool of residential mortgages, not in default, which has previously been financed by the issuance of bonds or notes of the agency. The state board may also enter into a commitment with the agency, at the time of any issue of bonds or notes, to purchase at a specified future date, not exceeding 12 years from the date of the issue, the amount of mortgage loans then outstanding and not in default, which have been or purchased from the proceeds of the bonds or notes. The state board may charge reasonable fees for any such commitment, and may agree to purchase the mortgage loans at a price such that the yield thereon to the state board will, in its judgment, be comparable to that available on similar mortgage loans at the date of the bonds or notes. The state board may also enter into agreements with the agency for the investment of any portion of the funds of the agency for such period, with such withdrawal privileges, and at such guaranteed rate of return, if any, as may be agreed between the state board and the agency;

(e) collateral for repurchase agreements and reverse repurchase agreements shall be limited to letters of credit and securities in this section;

(f) guaranteed investment contracts shall be limited to those issued by insurance companies rated in the top four quality categories by a nationally recognized rating agency;

(g) savings accounts shall be limited to those fully insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation.

Sec. 4. Minnesota Statutes 1986, Section 11A.24 subdivision 5 is amended to read:

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

(a) the aggregate value of corporate stock investments, as adjusted for realized profits and losses, shall not exceed ~~75~~ <u>85</u> percent of the market or book value, whichever is less, of a fund, less the aggregate value of investments according to subdivision 6;

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

Sec. 5. Minnesota Statutes 1986, Section 11A.24 subdivision 6 is amended to read:

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

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

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

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

(4) Resource investment through limited partnerships, private placements and corporations~~.~~;

(5) Debt obligations not subject to subdivision 3; and

(6) Foreign equity securities and debt obligations.

(b) The investments authorized in clause (a) may only be made if they conform to the following provisions:

(1) the aggregate value of all investments made according to clause (a) shall not exceed ~~20~~ 35 percent of the market value of the fund for which the state board is investing;

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

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

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

Sec. 6. Minnesota Statutes 1986, Section 11A.25 is amended to read:

When investing assets of any funds or accounts specifically made subject to this section or not otherwise referred to in section 11A.01 to 11A.25, all securities shall be debt obligations ~~maturing within three years of the date of purchase~~ and shall conform to the applicable provisions of section 11A.24.

Sec. 7. Effective Date.

Sections 1 to 6 are effective the day following enactment.

1987 Quarterly Meeting Schedule
State Board of Investment

The State Board of Investment meets on the first Wednesday of the calendar quarter. The schedule for 1987 is:

Wednesday, March 4, 1987
Wednesday, June 3, 1987
Wednesday, Sept. 2, 1987
Wednesday, Dec. 2, 1987

The SBI, The Executive Council and the Land Exchange Board will meet consecutively on the days listed above between 8:00 A.M. and 12:00 P.M.

1987 Quarterly Meeting Schedule
Investment Advisory Council

The Investment Advisory Council meets on the first Tuesday of the calendar quarter. The schedule for 1987 is:

Tuesday, March 3, 1987
Tuesday, June 2, 1987
Tuesday, Sept. 1, 1987
Tuesday, Dec. 1, 1987

All meetings will begin at 2:00 P.M.

Tab D

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT

Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 9, 1986

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

FROM: Asset Allocation Committee

SUBJECT: Committee Report

The Committee reviewed the staff position paper on investment policy for the Basic Retirement Funds. With minor modifications, the Committee endorsed the concepts presented in Part I of the proposed investment policy statement. The staff position paper regarding investment policy accompanies the Committee's report.

The Committee concurs with staff that a formal statement of investment policy is important to the effective management of the Basic Retirement Funds. The Committee will review the future parts of the investment policy statement relating to asset mix, investment management structure, and performance evaluation as staff prepares these positions papers.

BASIC RETIREMENT FUNDS INVESTMENT POLICY

PART I

Staff Position Paper
December 1986

EXECUTIVE SUMMARY

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

The paper is divided into four parts:

- o Part One discusses investment objectives and risk tolerance.
- o Part Two focuses on long-run asset mix.
- o Part Three deals with investment management structure.
- o Part Four examines performance evaluation.

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

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

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

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

The first and third objectives are best achieved through a minimum risk policy. The second objective is best achieved through a maximum return policy. The appropriate investment policy for the Basic Funds will depend on the relative emphasis that the Board places on each objective. Currently, the Basic Funds are managed under a policy which is oriented toward maximum return.

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

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

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

This report concludes with the first part of the recommended investment policy statement for the Basic Retirement Funds. Staff recommends that the securitization of promised benefits be the primary objective of the Basic Funds. However, the Board should actively seek to reduce pension costs and/or increase benefits by adopting an aggressive investment policy. It should view its tolerance for short-run risks as being relatively high. Such a policy will produce a wide range of short-run performance results, some perhaps quite disappointing. The future pay-off from such a policy, however, can be very great.

OVERVIEW

NEED TO REVIEW CURRENT POLICY

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

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

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

Given these developments, staff believes that it is appropriate to review the investment program applied to the Basic Funds. In this position paper, staff makes specific recommendations regarding how that program should be refined so that the Basic Funds remain responsive to their financial environment in the years ahead. An important product of this paper is a recommended formal investment policy statement for the Basic Retirement Funds.

SCOPE OF THE POSITION PAPER

This position paper is divided into four parts:

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

The first part of the study, dealing with investment objectives and risk tolerance, is contained in this report.

Parts two, three, and four will be presented to the Board in separate reports at its future meetings. Each part of the position paper concludes with a recommended statement of the Board's investment policy regarding the specific issues under discussion. The aggregation of these statements represents staff's recommended investment policy statement for the Basic Retirement Funds.

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

DEFINING AN INVESTMENT POLICY STATEMENT

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

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

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

PART I: INVESTMENT OBJECTIVES AND RISK TOLERANCE

WHAT ARE THE BASIC RETIREMENT FUNDS?

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

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

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

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

As employer and employee contributions are received by the retirement systems, the money is turned over to the SBI for investment on behalf of the various retirement plans. The SBI invests these pension assets in a single fund named the Basic Retirement Funds. Thus, the Basic Funds are composed of the pension assets of currently employed participants in the six statewide pension plans. As long as a participating public employee is working, his employer/employee contributions are invested in the Basic Funds. When the public employee retires, his retirement assets are transferred out of the Basic Retirement Funds to the Post Retirement Investment Fund.

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

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

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

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

PENSION FUND OBJECTIVES AND INVESTMENT POLICY

In developing an investment policy for any pension fund, the starting point should be an identification of the fund's objectives. Unfortunately, this simple advice is often overlooked. Phrases such as "earning the highest return without incurring undue risk" frequently serve as the sole statement of a pension fund's goals. This is clearly inadequate. Most pension funds, such as the Basic Retirement Funds, actually have a number of similar objectives. It is the relative emphasis that they place on achieving those objectives that implicitly differentiates one fund from another.

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

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

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

Securing promised benefits through the minimum risk policy is very expensive relative to alternative policies. If the plan sponsor were to abandon the minimum risk policy of investing only in risk-free assets, the expected long-run return to the pension fund would be higher. Over the years, the capital markets have rewarded investors in risky assets in direct proportion to the short-run volatility of returns on those assets. With a higher expected return on invested assets, the plan sponsor could chose to reduce contributions and/or increase benefits. In the extreme, the plan sponsor could place all of the pension fund's assets in the highest risk investible asset class (e.g., common stocks). The pension fund's expected long-run return would be the highest possible. Therefore, contributions to the pension fund could be reduced (or benefits increased) to the lowest (highest) level possible. This policy of focusing on achieving the highest expected returns for the pension fund will be referred to as the "maximum return policy."

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

To summarize, the objectives pursued by a pension fund are in conflict. The fund's primary goal, securing promised benefits, and a secondary goal, reducing short-run return volatility, are best fulfilled by a minimum risk policy. The fund's other secondary goal, lowering expected costs and/or raising expected benefits, is best achieved through a maximum return policy.

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

CURRENT INVESTMENT POLICY

The 1983 staff report recommended an aggressive investment policy. The asset mix target adopted by the Board in 1983 is skewed toward common stocks, a relatively high risk asset class.

In fact, the allocation to equity assets is at the highest level permitted by statute. The Board's current policy asset allocation for the Basic Retirement Funds is shown in Table 2.

TABLE 2
Basic Retirement Funds
Current Policy Asset Allocation

Equity Assets		75.0%
Common Stocks	60.0	
Real Estate	10.0	
Venture Capital	2.5	
Resource Funds	2.5	
Fixed Income Assets		25.0
TOTAL		100.0%

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

LINKING INVESTMENT POLICY AND BENEFIT POLICY

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

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

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

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

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

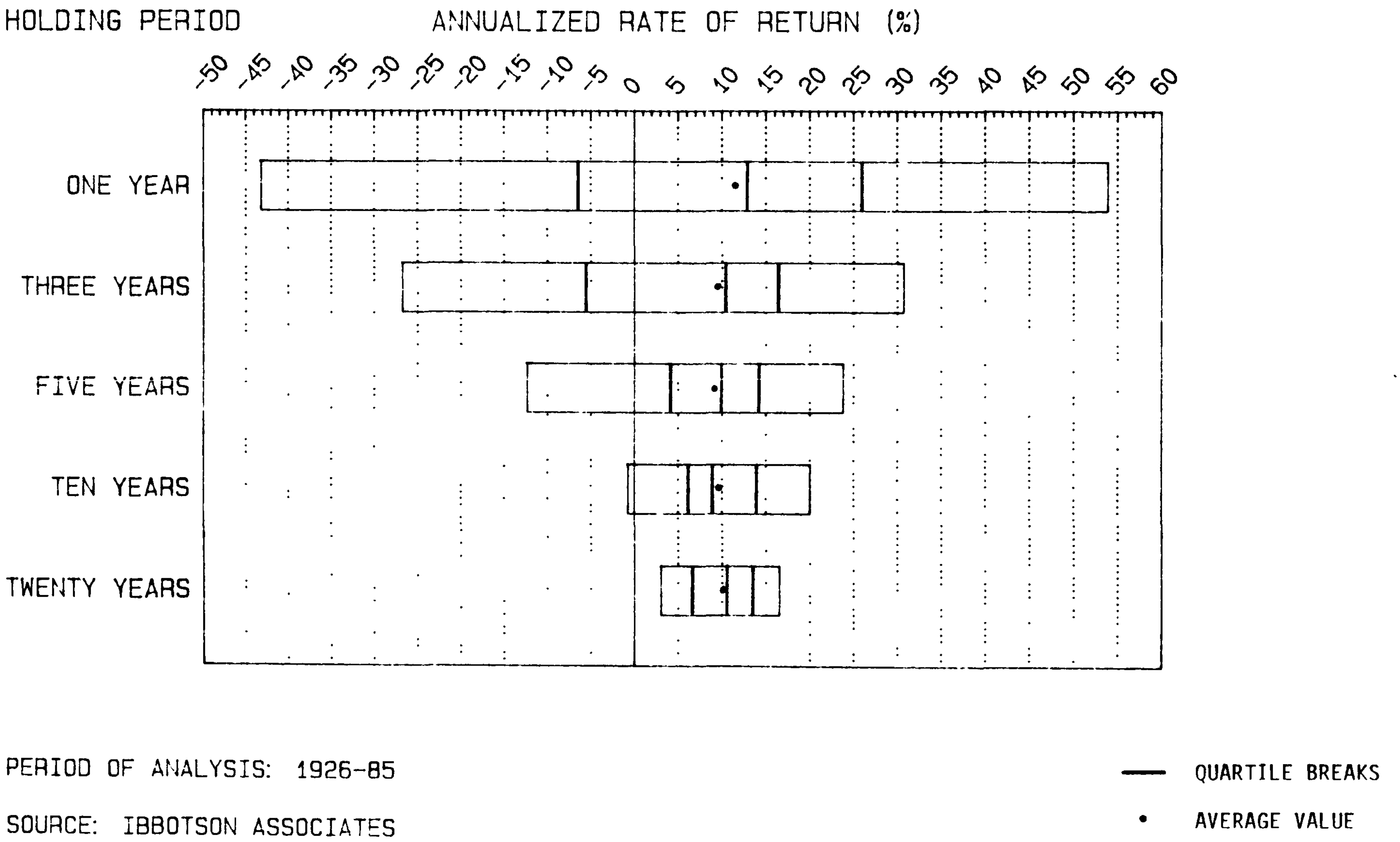
SHORT-TERM RISK TOLERANCE

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

For a large pension plan, such as the Basic Retirement Funds, the most aggressive, feasible investment policy would entail a 100% commitment to common stocks. Historical experience indicates that this investment policy would produce the highest long-run returns possible. Yet over short intervals (e.g., a quarter, a year, or even two-to-three years), such an aggressive investment policy has the potential to yield extremely poor results. Would the Board be comfortable with a two-year cumulative performance result of -37.2%? This result would have happened with a 100% commitment to common stocks as recently as 1973-74. On the other hand, the Board should recognize that there has <u>never</u> been a 20-year period in which a 100% commitment to common stock would have generated a negative return. This data includes periods that encompass the Great Depression.

The range of annualized results from a 100% commitment to common stocks over 1,3,5,10 and 20 year periods is shown in Figure 1. Note that common stocks are very volatile in the short-run. The range of results for one-year holding periods is -43.3% to 54.0%. In contrast, as the holding period lengthens, the range of results narrows. For the 20-year holding period,

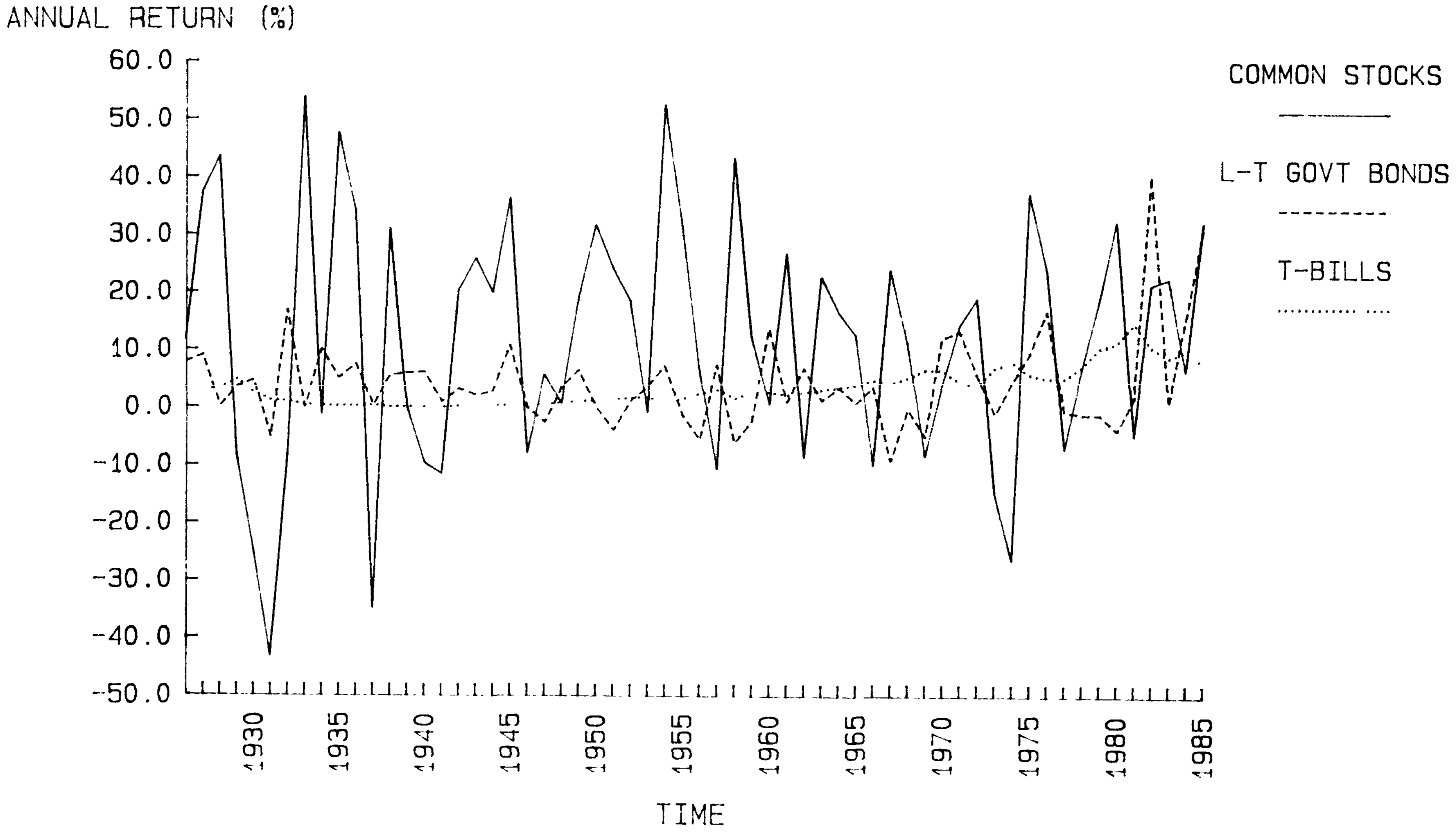
FIGURE 1
COMMON STOCKS HISTORICAL RETURNS
ALTERNATIVE HOLDING PERIODS



PERIOD OF ANALYSIS: 1926-85

SOURCE: IBBOTSON ASSOCIATES

FIGURE 2
ASSET CLASS HISTORICAL RETURNS
1926 - 1985



SOURCE: IBBOTSON ASSOCIATES

annualized stock returns range from 2.9% to 16.6%. Yet despite the narrowing in the range of returns, the annualized average return, as the holding period increases, remains roughly the same, around 10%.

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

If the Board is to follow a less aggressive investment policy than the maximum return policy, it must determine the extent to which long-run returns are to be sacrificed in exchange for reduced short-run volatility. This is a difficult decision. A pension plan, such as the Basic Retirement Funds, has liabilities that are very long-term in nature. Ideally, its investment policy should be similarly long-term. But it is human nature to focus on the short-term. Board members and staff have effective time horizons considerably shorter than the 20-30 year horizon of the Basic Funds' liabilities. Decisions regarding the amount of acceptable short-run risk naturally will reflect these considerations.

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

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

RECOMMENDED INVESTMENT POLICY STATEMENT: PART I

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

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

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

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

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

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

FOOTNOTES

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

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

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

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

Tab E

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 10, 1986

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

FROM: Equity Manager Committee

SUBJECT: Committee Report

The Committee reviewed a staff proposal to implement a low risk financial futures program. The Committee agrees with staff that the proposed enhanced cash strategies offer potentially attractive incremental returns while incurring minimal additional risk. The Committee recommends that the Board approve the use of the proposed financial futures strategies for the Post Retirement Investment Fund. A copy of the staff position paper describing the proposed financial futures program accompanies this Committee report.

The Committee also reviewed the recent performance of the Board's equity managers. The Committee can find no reason for immediate action regarding the managers. The Committee will await staff recommendations regarding possible revisions of the equity manager program in 1987.

ENHANCED CASH STRATEGIES
USING FINANCIAL FUTURES

Staff Position Paper
December 1986

EXECUTIVE SUMMARY

Trading in the financial futures markets has expanded dramatically in recent years. This popularity is due largely to the fact that financial futures offer investors the ability to rapidly and cost-effectively implement a number of investment strategies.

The SBI's use of financial futures has been quite limited. This position paper proposes low risk investment strategies utilizing stock index futures contracts. The proposed program will provide the Board with a conservative introduction to financial futures.

A stock index futures contract is an obligation to deliver cash based upon the movement in the value of a particular stock market index. The buyer of a stock index futures contract participates in stock price moves in the same way as would a direct owner of the stocks in the market index.

Institutional investors use stock index futures in several different ways, including index fund management, market timing, portfolio insurance, and mispricing strategies. It is this last use of stock index futures that is the focus of this paper.

Staff proposes three low risk stock index futures investment strategies referred to as "enhanced cash" strategies. These strategies are designed to improve the rate of return earned on cash equivalents. Each strategy entails low risk because each strategy holds a hedged position. That is, stock index futures contracts are simultaneously bought and sold, thereby eliminating market risk. The underlying mispricings between the contracts represent the source of returns to the enhanced cash strategies. Details of the three strategies are presented in the body of the paper.

Staff proposes that the enhanced cash strategies be applied to the Post Retirement Investment Fund. The Fund relies on a high current level of income to finance benefit increases. With the sharp decline in interest rates that have occurred over the last few years, the ability of the Fund to pay out benefit increases has diminished. If the return on the Fund's cash reserves can be boosted in a low risk manner, the Fund's beneficiaries will benefit directly.

Staff proposes a $100 million commitment to the enhanced cash program. The program should be run by an external manager specializing in the management of financial futures. Staff recommends that the manager be compensated through a performance fee based upon the demonstrated ability of the manager to add value to the return on the Fund's short-term fixed income investments.

I. INTRODUCTION

The financial futures market offers investors the ability to implement a variety of investment strategies quickly and at a low cost. As a result, the volume of trading in financial futures has grown rapidly in recent years. Institutional investor participation likewise has increased significantly as the market's liquidity and depth have grown.

The SBI's use of financial futures has been quite limited up to this point. The Board's only financial futures investments have been through one of its active equity managers, who has used stock index futures as a tool to carry out market timing decisions. The primary reason for this low level of activity has been a general lack of familiarity with these investment instruments on the part of the SBI staff and the Board's managers.

Staff believes it is important that the Board become comfortable with the use of financial futures in a broad range of investment programs. The purpose of this paper is to propose to the Board an investment strategy that utilizes financial futures in a very low risk fashion. Staff believes that in the initial phases of financial futures investments the Board should take a cautious approach. As the Board's familiarity with financial futures increases, it may choose to pursue higher return, higher risk investment strategies.

Part II of this paper provides a brief overview of stock index financial futures. Stock index futures are a type of financial futures and are central to the investment strategy proposed in this paper. Part III describes the concepts behind the proposed financial futures investment strategies. Part IV discusses the risks associated with each of these strategies. Part V explains why these strategies are well-suited for the Post Retirement Investment Fund. Finally, Part VI contains specific staff recommendations regarding implementation of the proposed strategies.

II. BRIEF DESCRIPTION OF STOCK INDEX FUTURES

A stock index futures contract is an obligation to deliver cash based upon the movement in the value of particular stock market index over a specified period of time. If the stock market index goes up in value, the seller of the futures contract pays the buyer, and vice versa if the stock market index goes down in value. The buyer of a stock index futures contract participates in movements of the value of the stocks in the index, just as a direct owner of those stocks would participate. The seller of a stock index futures contract experiences just the opposite effect of moves in stock values as would the owner of the stocks in the index. As a result, ownership of futures contracts inherently is no more risky than is the ownership of common stocks directly. It is the particular investment strategies applied to stock index futures that can make their purchase or sale either risky or conservative.

Trading of stock index futures has grown rapidly in the four years since the inception of the first contracts. The growth of stock index futures trading has been so strong that frequently the daily total dollar trading in stock index futures surpasses the direct dollar trading in common stocks. This large volume of trading is clear testimony to the widespread acceptance of stock index futures trading as a convenient, low cost means of transacting in common stock portfolios. As the liquidity and depth of the stock index futures market has grown, so too has institutional investor participation increased. Large institutional investors, including pension funds, routinely buy and sell stock index futures to accomplish a number of objectives.

Institutional investors utilize stock index futures in several different ways, including:

- Index fund management. In lieu of directly owning the stocks which compose a particular index (e.g., S&P 500), an investor can own the futures contract on that index.

- Market timing strategies. An investor can quickly increase or decrease his equity exposure by buying or selling stock index futures. This strategy avoids the expense and delay involved in selling the individual stocks held by the investor.

- Portfolio insurance. By appropriately buying and selling futures contracts based on movements in the value of the investor's portfolio, the investor can "insure" that the portfolio's return will not fall below a certain pre-specified level.

- Mispricing strategies. Misvaluations among various stock index futures contracts frequently arise. At a very low risk, nimble investor can take advantage of these misvaluations by simultaneously buying the undervalued futures contracts and selling the overvalued futures contracts. It is this last stock index futures investment strategy which is the focus of this report.

There are five stock market indices upon which futures contracts are traded. These indexes are:

- S&P 500
- NYSE Composite
- Value Line Composite
- S&P 100
- Major Market Index

These indexes are similar in the sense that the movements in their values are all highly correlated to long-run movements in the overall stock market. However, the differences in the composition of the indexes are significant enough to cause sizable differences in performance over the short-run. For example, the S&P 100 represents large capitalization, highly liquid issues. The Value Line Index, on the other hand, is dominated by smaller capitalization, less popular issues. The appropriate contract for an investor to use will depend upon the investor's specific investment strategy. Nevertheless, the S&P 500 contract is by far the most heavily traded futures contract.

Without going into detail, several aspects of stock index futures contracts are worthy of mention. The first point is the fact that stock index futures contracts settle only in cash. No stocks ever change hands. Depending upon which way the stock index moves, the buyer compensates the seller (or vice versa) in cash based on a standard formula. The precise formula for computing how much the seller owes the buyer (or vice versa) depends upon the specific contract being traded. Most stock index futures contract terms specify that cash delivery will equal $500 times the difference between the futures contract's price at the time of purchase and the final contract settlement price. The final settlement price is equal to the stock market index's value at the close of trading on the expiration date of the futures contract, assuming that the futures contract is held to expiration. Otherwise, the final settlement price is the price of the futures contract when sold.

The second aspect of stock index futures is that they are issued with specific expiration dates. The expiring months are March, June, September, and December. The actual expiration days vary slightly among the four types of contracts. At any time there are six contracts outstanding for each index. The contract expiration dates are staggered every three months and extend up to eighteen months. As each contract expires, trading begins in a new contract.

The third aspect of stock index futures (and common to other types of financial futures) is that buyers and sellers are required to make a small good faith deposit at the time of the initial transaction. This deposit is adjusted daily based upon the movement of the stock market index. The initial deposit can be made in the form of Treasury bills. The interest on the Treasury bills is retained by the depositor. Thus, the initial deposit results in no lost income to the depositor. The daily adjustments to the initial deposit, on the other hand, are made in cash. These adjustments represent the gains or losses incurred daily on the futures positions outstanding as the market value of the futures contract changes.

The fourth aspect of stock index futures (again common to other types of financial futures) is that all trading is done with a third party. Buyers and sellers of futures contracts do not trade directly. Rather, each financial futures exchange has a clearing corporation that acts as a guarantor of all trades. The clearing corporation serves as a buyer to every seller and a seller to every buyer. Investors need not be concerned with the identity or creditworthiness of the opposing party in a trade because the clearing corporation stands behind all trades.

III. ENHANCED CASH STRATEGIES

Staff proposes that the Board implement three low risk stock index futures investment strategies. These strategies are designed to improve the rate of return earned on cash equivalents. Staff believes that it is possible to exceed money market interest rates by 200 to 300 basis points (i.e., two to three percentage points) annually while assuming little additional risk. The use of stock index futures to achieve this improved return on cash equivalents will be referred to as enhanced cash strategies.

In general, an enhanced cash strategy involves the purchase and simultaneous sale of two different stock index futures contracts. These purchase/sale combinations are designed to capture a perceived mispricing between the two different futures contracts. At the same time, these positions are designed to insulate (or hedge) the investment from changes in the stock prices that underlie the futures contracts. By both buying and selling two different index futures contracts, an investor has no net exposure to broad movements in stock prices. He both wins and loses if stock prices go up or down. On the other hand, the mispricings that exist between the two contracts is expected to provide the investor with a small, but positive, incremental return that adds to the return on the investor's cash equivalents holdings.

The three cash enhancement strategies proposed by staff are called the calendar spread, the inter-market spread, and the hedged put.

The calendar spread strategy involves the sale (or purchase) of a futures contract with the closest (near) expiration date and simultaneous purchase (or sale) of a futures contract on the same stock market index, but with a later (far) expiration date. The theoretical difference between the prices of the far and near contracts can be precisely calculated. Specifically, if "fairly" valued, the price difference should equal the difference between the risk-free interest (e.g., Treasury bill interest rate) and the dividend yield of the stock market index, calculated for the period of time between the two expiration dates.

Occasionally, this price differential (referred to as the spread) moves away from its "fair" value. If the spread is too low, this implies that the far contract is undervalued relative to near contract. In this case, the calendar spread strategy calls for buying the far contract and selling the near contract. Just the opposite transactions would occur if the spread were too high.

These deviations from "fair" value, or mispricings, occur because of supply and demand imbalances in the market for futures contracts. An investor that is forced to transact immediately may be willing to buy at a premium or sell at a discount relative to the futures contract's "fair" value. Market participants will not allow this situation to persist. In time the actions of traders seeking to capitalize on these mispricings will move prices back to normal. A return to equilibrium allows the hedged position of the calendar spread strategy to be closed-out at a profit.

The inter-market spread strategy is established by the purchase of a stock index futures contract on one stock index and the simultaneous sale of a stock index futures contract on a different stock index. The expiration date of both futures contracts is the same. As with the calendar spread strategy, an inter-market spread strategy attempts to capitalize on the mispricings of stock index futures contracts relative to one another. The theoretical "fair" value of the inter-market spread is calculated by taking the difference between the current prices of the underlying stock indexes, less the difference in the dividend yields for those indexes over the life of the futures contracts.

As discussed above, on occasion the actions of investors, particularly those requiring instant liquidity, can create a temporary supply/demand imbalance in the futures market. This imbalance can cause the price of one stock index futures contract temporarily to depart from its "fair" relationship with the price of another stock index futures contract. Futures contract traders will move to eliminate this mispricing. The inter-market spread strategy calls for buying the stock index futures contract which is selling "cheap" and selling the stock index futures contract which is selling "rich." A return to a "fair" spread between the prices of the two futures contracts will allow the hedged position of the inter-market spread strategy to be closed out at a profit.

The hedged put strategy is more complicated than the other two strategies. Nevertheless, it involves a purchase/sale combination that produces a low risk investment designed to benefit from futures contract mispricings. The hedged put strategy requires the purchase of a put option on the S&P 500 index and the simultaneous sale of a "synthetic" put on the same stock market index. A put is the right, but not the obligation, to sell a financial asset at a predetermined price. The "synthetic" put is created from appropriate combinations of S&P 500 stock index futures and holdings of cash equivalent.

The rationale underlying the hedged put strategy is that investors constructing portfolio insurance positions cause futures prices to trade out of line with their "fair" value. Portfolio insurance is an investment strategy designed to protect a portfolio from falling below a certain minimum value, while at the same time only moderately restricting the portfolio's upside potential. Portfolio insurance has become extremely popular among institutional investors in the last two years. Most portfolio insurance is implemented through appropriately adjusted positions in stock index futures contracts and cash equivalents.

A portfolio insurance program requires that stock index futures positions be adjusted based upon movements in the stock market. These stock index futures transactions must be carried out quickly if a portfolio insurance program is to be effective. This demand for immediate liquidity may cause significant temporary mispricings of stock index futures. It is these mispricings that present the opportunity for the hedged put strategy to be successful.

The hedged put strategy "sells" portfolio insurance to anxious buyers. Because portfolio insurance works by creating "synthetic" put options through positions in stock index futures contracts, the hedged put strategy calls for selling these "synthetic" puts, or taking the opposite positions in the portfolio insurers' futures contracts. As stock market moves cause portfolio insurers to adjust their stock index futures positions, the hedged put strategy accomodates these shifts by making opposite adjustments of its own.

The sale of "synthetic" puts to portfolio insurers is hedged by the simultaneous purchase of actual put options on stock market indexes. This step removes market risk, but permits the strategy to benefit from the stock index futures mispricing that portfolio insurers may cause.

IV. ENHANCED CASH STRATEGY RISKS

The enhanced cash strategies discussed in the previous section are designed to be utilized in conjunction with a portfolio of cash equivalents. The combined set of investments are expected to produce a return which exceeds that of a traditional short-term investment fund (STIF) by roughly 200 to 300 basis points per year. This incremental return, however, cannot be guaranteed. The possibility exists that the enhanced cash strategies will not add value to the STIF investments. Further, it is possible, although unlikely, that the enhanced cash strategies may perform poorly enough to detract from the STIF returns. This section examines the risk that the enhanced cash strategies may fail to produce the expected positive returns. This risk is examined from two perspectives: the risk associated with the three individual enhanced cash strategies; and, the risk of the enhanced cash strategies in aggregate.

In general, the risk of any of the enhanced cash strategies underperforming the STIF return over a given year are minimal. Each strategy entails simultaneously buying and selling stock market exposure. These strategies, therefore, are hedged in the sense that market risk is neutralized. Whether the broad stock market moves up or down will not have a material influence on the returns produced by these strategies. With the strategies insulated from market risk, what remains is the risk that the perceived mispricings from which the strategies are attempting to profit may never be corrected or that the mispricing opportunities are lost due to unforeseen forces impacting the specific futures contract prices involved in the strategies.

With respect to the calendar spread strategy, there are two primary sources of risk. The first source is related to changes in short-term interest rates. The "fair" value of the spread between the prices of the near and far contracts is a function of short-term interest rates. If those rates change, it will affect the "fair" value of the spread and perhaps upset the mispricing strategy, if the change is significant enough and in the "wrong" direction.

The second source of risk in the calendar spread strategy is the possibility of abrupt changes in stock prices or price expectations that might move the value of the spread in a direction opposite that anticipated by the strategy. For example, what if abrupt changes in stock prices occur close to or on the expiration day of the near contract? Because the near contract's price always equals the value of the stock market index on expiration date, its price will reflect the move in stock prices. But if investors expect a large abrupt stock price change to quickly reverse itself, the far contract's price may remain unchanged, despite the move in stock prices. This situation could adversely affect the "fair" value of the spread between the near and far contracts.

With respect to the inter-market spread strategy, the primary source of risk is that the two stock market indexes underlying the futures contracts bought and sold may fail to track each other well. If the stock market index whose futures contract is bought performs considerably worse than the stock market index whose futures contract is sold, the "fair" value of the spread between the two futures contract prices may collapse, reducing or eliminating profit opportunities from positions taken earlier.

With respect to the hedged put strategy, the primary risk is related to the level of market volatility. The more volatile is the stock market, the more frequently portfolio insurers are required to adjust their futures contract position. Because it is these adjustments that produce the profit opportunities for the hedged put strategy, the more volatile is the stock market the more profitable is the strategy. If the stock market were to remain relatively flat for an extended period, mispricing opportunities sufficient to recover the costs of buying stock index puts and selling "synthetic" puts might not occur.

While the risks associated with these three enhanced cash strategies are real, their magnitude is not large. The strategies would be taken only if spread mispricings are quite large and the source of the mispricings is well understood. Therefore, the adverse events discussed above would have to be unusually large to wipe out the profit opportunities available from the mispricings. Further, with the calendar spread and inter-market spread strategies, the time that the hedged positions are in place normally is very short. Thus, the chances of adverse events happening in the short period of time in which these strategies are in place is not great.

More importantly, however, when viewed from a total portfolio perspective, the "package" of enhanced cash strategies is even less risky than the individual strategies themselves. This is due to the diversification effect of utilizing all three strategies in the portfolio. That is, the odds of any one strategy performing poorly are small. The odds of all three strategies jointly performing poorly are much smaller. The factors that affect the risk of each strategy are largely unrelated. The chance of several unrelated, low probability, adverse events occuring is quite small.

Further, the risk of the enhanced cash strategies in the total portfolio is further reduced because the strategies are implemented a number of times over the course of a year. Small positions, relative to the total portfolio, are taken each time one of the strategies is used. Thus, while it is possible that one strategy during one of its applications may perform poorly, the chances of all three strategies consistently performing poorly during their numerous applications over a year is extremely low.

At worst, experience indicates that the use of enhanced cash strategies could result in a cash return which underperforms the STIF return by 150 basis points during a year. This is merely an opportunity cost. The strategies entail almost zero risk of suffering absolute losses from a total portfolio perspective. Given that the expected return of the strategies is 200 to 300 basis points above the STIF return, and could run higher, the risk of these strategies appears very acceptable.

V. APPLICABILITY TO THE POST RETIREMENT INVESTMENT FUND

The enhanced cash strategies discussed in the previous section are well-suited for the conservative, high current income investment policy applied to the Post Retirement Investment Fund.

The Fund has two primary investment objectives:

- o Produce earnings on investments sufficient to finance benefits promised retirees.
- o Generate additional (excess) earnings which permit benefit increases that compensate, to some degree, for inflation.

The first objective is achieved through the investment of Fund assets in a dedicated bond portfolio. The dedicated bond portfolio is a collection of various maturity, high quality bonds that generates cash flows just sufficient to meet promised retiree benefits.

The second objective is attained through two strategies. The first strategy invests additional Fund assets in the dedicated bond portfolio so as to ensure a minimum 3% annual benefit increase. The second strategy invests most of the Fund's remaining assets in common stocks. Common stocks provide a long-term source of growing earnings to the Fund, which fixed income assets cannot produce.

Approximately 75% of the Post Retirement Investment Fund's assets are currently invested in the dedicated bond portfolio. Another 20% of the Fund's assets are invested in common stocks. The remaining 5% of the Fund's assets are targeted for investment in liquid short-term fixed income securities. These cash equivalents play two roles in the Fund's asset mix. Most importantly, they provide a source of liquidity in the Fund to meet immediate cash outflow needs. The liquidity of cash equivalents also permits the Fund to more quickly react to profitable investment opportunities. Cash equivalents, whose yields are very interest rate sensitive, also provide a degree of inflation protection should interest rates and inflation rates rise.

The enhanced cash strategies are designed to augment the returns produced by the Post Retirement Investment Fund's short-term fixed income holdings. With the sharp declines in interest rates experienced over the last two years, the Fund's potential to produce excess earnings has declined considerably. If, as expected, the enhanced cash strategies produce higher yields than the traditional short-term investments, the additional earnings will flow straight to eligible retirees in the form of benefit increases. At the same time, the assets committed to the enhanced cash strategies will continue to serve the same roles in the Fund's portfolio as do the traditional cash equivalents. That is, the enhanced cash strategies will be low risk investments that provide the Fund with liquidity and inflation protection.

VI. STAFF RECOMMENDATION

Staff recommends that the Board approve the investment of $100 million of the Post Retirement Investment Fund in an enhanced cash program. The program would be designed to increase the rate of return earned on the Fund's cash equivalent holdings.

Staff believes that the proposed enhanced cash strategies are most effectively implemented by an external money manager. Staff does not have the expertise in-house to actively invest in financial futures. External management firms, who specialize in the trading of financial futures, can provide the Board with a thorough understanding of the market and can offer sophisticated trading capabilities.

The role of the enhanced cash manager would be two-fold. First, the manager could invest some, or all, of the assigned assets in short-term securities. Second, and more importantly, the manager would search for opportunities in the stock index futures market to implement the enhanced cash strategies. A small portion of the program's assets would serve as the initial good faith deposit when futures are either bought or sold. These assets would also finance any required changes in that initial deposit.

It should not be expected that the manager would be continually engaged in stock index futures investments. Mispricing opportunities are not always present. Further, they usually last only a very short time. Once the mispricings have been corrected by the market, the manager would withdraw from the financial futures market. Over the course of a year, it is likely that anywhere from twenty to thirty opportunities to implement the enhanced cash strategies will arise. These opportunities are expected, on average, to last one to three weeks. Nevertheless, the profits available from these limited, brief mispricing opportunities are expected to supply the 200 to 300 basis point incremental return over the return offered by a traditional short-term investment fund (STIF).

Certain investment restrictions should be placed on the enhanced cash manager. The first constraint should be that the manager's short-term fixed income investments can be made in only those short-term securities authorized by Minnesota Statutes. This constraint will put the manager on an equal footing with a typical STIF and allow the manager to demonstrate his ability to add value to the STIF's investments. The second constraint should specify the particular financial futures instruments in which the manager will be allowed to invest. Specifically, the manager should be permitted to invest in all exchange-listed stock index futures, stock index options, and options on stock index futures. The third constraint should limit the position size that can be taken by the manager in any one of the three strategies. As discussed earlier, a reasonable downside risk target for the enhanced cash strategies would be to underperform the STIF's return by no more than 150 basis points. By definition, no one strategy or combination of strategies at any point in time can exceed, in terms of dollar hedged exposure, the $100 million assigned to the enhanced cash strategy program. Furthermore, because the hedged put strategy is relatively more risky than the other two strategies, it will be limited to no more than 40% of the total program without prior approval.

The assets assigned to the enhanced cash program should be transferred to a custodian bank designated by the manager, with prior review by SBI staff. The custodian bank is responsible for a number of administrative activities associated with futures trading. The activities must be carried out efficiently if the enhanced cash program is to be effective.

Staff recommends that a performance-based fee arrangement be used to compensate the enhanced cash manager. The structure of the enhanced cash program is well-suited to a performance fee. An unambiguous and measurable benchmark is available through the STIF maintained by State Street bank, the Board's custodian bank. The manager's performance also is easily measured. All of the manager's investments are liquid and daily marked to market. Thus, the ability of the manager to add value to the benchmark will be readily apparent.

Staff recommends that the performance fee structure used for the enhanced cash program be a symmetrical fulcrum fee. This fee structure would be similar to that applied to the Board's equity managers. Specifically, typical current fees charged by managers offering enhanced cash strategies are .25% of assets under management. Staff recommends that this .25% fee be used as the base fee in the performance fee structure. If the manager should produce the expected 200 basis point incremental return (net of all investment expenses except the management fee) above the STIF return, then the manager would receive the .25% base fee. For performance above or below this 200 basis point expected incremental return, the excess returns would be split 1:14 with the manager. If the manager outperformed the STIF return by 550 basis points, he would receive a total fee of .50%. If the manager should underperform the STIF by 150 basis points, he would receive no fee at all. Total fees would be capped at a minimum of zero and a maximum of .50%.

Tab F

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT

Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 10, 1986

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

FROM: Fixed Income Manager Committee

SUBJECT: Committee Report

The Fixed Income Committee met to review and consider the following items:

1) Manager Performance

The Committee reviewed the performance of the Board's group of external fixed income managers. The performance of Peregrine Capital Management has been weak and will receive special attention in future quarters. The Committee also feels the objectives and structure of the entire bond manager group should be comprehensively reviewed before the end of the fiscal year. A summary of the staff's recent meetings with the Board's bond managers accompanies this report.

2) GIC Bid Process

The Committee reviewed the bidding process used to select a manager for the Guaranteed Return Account of the Supplemental Investment Fund. A summary of the process is included as a attachment to this report. The GIC was awarded to Principal Mutual Life (formerly Bankers Life of Iowa) at a rate of 7.72%.

3) Rebalancing the Dedicated Bond Portfolio

The Post Retirement Fund's dedicated bond portfolio must be rebalanced periodically to insure that the portfolio meets its objectives. For the last two years, the Board has contracted with Bankers Trust Company to provide the computer support necessary to accomplish the rebalancing.

The Committee recommends that the contract with Bankers Trust be extended for one year at a cost of $100,000.

BOND MANAGER UPDATE INTERVIEWS
SUMMARY NOTES

I. STAFF COMMENTS AND RECOMMENDATIONS

Despite third quarter results to the contrary, the performance of the Board's fixed income managers continues to lag the performance of the overall market. As mentioned in previous reports this is due primarily to the conservative approach undertaken by the majority of the Board's fixed income managers. Usually, this conservative approach results in underperformance during periods of falling rates and superior performance when rates are flat or rising.

Staff recommends that no action be taken at this time with respect to the Board's fixed income managers. Before the end of the current fiscal year staff intends to provide the Board with comprehensive recommendations regarding the future of the bond manager program. In formulating recommendations, staff will focus on issues such as the role of bond management in the Basic Retirement Funds, passive versus active management, bond manager investment styles, and the appropriate number of managers.

II. RECENT MEETING DATES

MANAGER	DATE OF MEETING
Investment Advisers	November 24
Lehman Management	December 5
Miller Anderson, Sherrerd	December 3
Morgan Stanley	November 24
Peregrine Capital	November 26
Western Asset	December 3

III. ORGANIZATION

Only one significant organizational change occurred since the last semi-annual meetings. Western Asset Management has successfully disassociated itself from First Interstate Bancorporation. Western Asset is now owned by Legg Mason, a Wall Street investment house. Staff views the sale as positive for the firm's continued successful operation. Western Asset has a revenue sharing arrangement with Legg Mason which permits Western to operate its bond management business virtually unconstrained.

IV. ASSETS UNDER MANAGEMENT

	JUNE 30, 1984		MARCH 1986		SEPTEMBER 1986	
	NUMBER	MARKET VALUE (MILL.)	NUMBER	MARKET VALUE (MILL.)	NUMBER	MARKET VALUE (MILL.)
Investment Advisers	48	$ 275	62	$ 713	66	$ 924
Lehman Management	36	3,000	43	4,700	40	5,000
Miller Anderson	37	2,184	52	4,749	57	5,211
Morgan Stanley	29	1,040	55	3,700	65	4,158
Peregrine Capital	5	170	5	278	5	306
Western Asset	30	1,599	28	2,400	30	2,800

Account growth at the Board's fixed income managers has slowed in recent quarters. Assets under management increased primarily due to strong investment results.

Despite increasing the limit on minimum account size, Morgan Stanley continues to increase rapidly the number of accounts under management. Staff is concerned about the possible administrative burdens of this growth.

V. STAFF

Investment Advisers recently added a portfolio manager in its fixed income area. This addition was prompted primarily by the growth in the number of fixed income accounts managed. This addition should ease the administrative burdens of the Board's portfolio manager at IAI.

VI. INVESTMENT APPROACH

Staff continues to review the investment style of each manager. One objective of the style review is to facilitate the design of benchmark or normal portfolios. Some managers, Western Asset and Lehman in particular, have taken their own initiative in this matter, while others have not. Another more important objective of the style review is to assess whether the manager's style is desirable from the standpoint of meeting the Board's objectives. This factor will figure prominently in any future recommendations to the Board regarding the structure of the bond manager program.

December 10, 1986

TO: IAC Fixed Income Committee

FROM: SBI Staff

SUBJECT: Initial Offering of the Guaranteed Return Account (GIC)

During the 1986 legislative session, the Legislature authorized the addition of a Guaranteed Return Account (GIC) as a new option for the Minnesota Supplemental Investment Fund (reference: Minnesota State Statutes, Section 11A.24, subd. 4). Within the Supplemental Investment Fund, the Deferred Compensation Plan was designated by the Minnesota State Retirement System to offer the GIC investment option.

In March 1986, a prospectus was written for Supplemental Fund participants explaining the new investment options, including the GIC. In the prospectus, basic characteristics of the GIC were outlined as follows:

- Fixed interest rate for three years. No blending of rates in later years.

- Contributions to the GIC can be made during the first year of its three year term.

- Withdrawals from the GIC during its three-year term are permitted only in the cases of job separation, retirement, or severe financial hardship.

Before the GIC bidding process could begin, major issues needed to be addressed including:

- What additional restrictions, guidelines or terms should be considered for the GIC?

- What quality standards should be applied to screen potential GIC bidders?

- What should be a reasonable schedule for the GIC bidding process?

Throughout July, various institutional investors that utilize GIC's were asked for recommendations regarding the SBI's proposed GIC program. Representatives from 3M, Honeywell, Dayton Hudson, West Publishing and the States of New York, Wisconsin and Connecticut provided useful information.

In addition, State Street Bank, as an adjunct to their master trustee relationship with the SBI, offered to assist the SBI in GIC selection.

Information obtained from the institutional investors and State Street Bank helped address the implementation issues identified earlier:

- An additional restriction was placed on the GIC option. Past contribution elections would be required by October 1 with the GIC bidding and issuer selection to occur in late October. This restriction was designed to produce a higher rate for the GIC by providing insurance company bidders with knowledge of the largest component of cash flow to the GIC, past contributions. The major drawback was that Deferred Compensation participants had to elect past contribution transfers before the GIC interest rate was known.

- Standard and Poor's AAA insurance company rankings were chosen as the primary screening mechanism for GIC bidders. State statutes, which allowed consideration of the top four quality categories of a nationally recognized rating agency, were too liberal in defining a manageable and highly qualified subset of insurance company bidders.

- The actual schedule for the 1986 GIC bidding process is presented on the next page.

AUGUST 1986

- Attorney General's office (Steve Buffington) approved speciman GIC contracts and bidding procedure.
- National Benefits, Ochs Agency and MSRS are briefed on the new GIC option.
- Information-gathering for the GIC bidding specifications begins.

SEPTEMBER 1986

- MSRS sends out a letter to Deferred Compensation participants outlining GIC option restrictions and transfer procedures (9/9/86).

OCTOBER 1986

- Deferred Compensation participant elections for past contribution transfers to the GIC are due (10/1/86).
- Bidding specifications are sent out to insurance company bidders (10/14/86).
- Written preliminary proposals are due from insurance companies (10/24/86).
- Bidding day for GIC contracts at the SBI. The winning bidder was Principal Mutual Life Insurance Company (10/29/86).
- One-page contract binder received from Principal Mutual (10/30/86).

NOVEMBER 1986

- Contract year begins for the GIC (11/1/86).
- Contract binder signed, and money wired to Principal Mutual (11/5/86).

ATTACHMENTS

(1) GIC bidding day review.

(2) Bidding results spreadsheet.

(3) Companies invited to,but not bidding.

GIC BIDDING DAY REVIEW

As outlined in the GIC bidding specifications, indicative, but not binding, interest rate bids from insurance companies were required on October 24, 1986. Binding bids were required on October 29, 1986 by 10:30 A.M. Negotiations with high bidders, and the acceptance of a final bid by the SBI, occurred in the early afternoon on October 29, 1986.

Actual events on October 29, 1986 are as follows:

INITIAL BIDS 8:00 A.M.-10:30 A.M.

Bids were phoned in to the SBI from the insurance companies. In general, most were the same or slightly higher than the indicative bids received on October 24, 1986. Bids ranged between 6.90% and 8.10%. At this point, the higher bids were from Principal Mutual Insurance Company (7.65%), Hartford (7.70%), Executive Life (8.10%) and Capital Holding (8.43% for the lump sum, indexed rate for the first year flow).

DISCUSSION AND NEGOTIATION 10:30 A.M.-1:00 P.M.

Executive Life had a Triple A Standard and Poor's ranking, and the highest bid for the entire GIC contract. However, their underlying investment portfolio was controversial given the aggressive management style and large investments in junk bonds.

Capital Holdings bid a very attractive rate on the lump sum from past contributions. However, for the cash flow from future contributions, they bid an indexed rate with a 6% floor. The SBI had communicated to Deferred Compensation participants that all money deposited in the GIC would earn the same rate.

Principal Mutual and Hartford were very close in their bids and quality ratings. Unlike Capital Holding and Executive Life, no problems were identified that would exclude their bids from consideration.

Unless one of the low bidders decided to significantly increase their bid, it appeared that Hartford and Principal Mutual would be the final contenders for the GIC contract. Both companies were informed of their status and told that any adjusted bids would be accepted for only a short period of time.

FINAL BID 1:00 P.M.-2:00 P.M.

Hartford responded with no increase in their original bid of 7.70%. Finally, Principal Mutual offered the high bid of 7.72% or seven basis points above their previous bid. Principal Mutual was then chosen for the SBI's 1986 GIC contract.

	INDICATIVE BIDS (10/24/86)				FIRST BID (10/29/86)	FINAL BID (10/29/86)
COMPANY NAME	AMOUNT ($ MILLIONS)	3 YEAR GROSS RATE	EXPENSES	NET RATE	NET RATE	NET RATE
Travelers	$4.5 (max. $42,000/ monthly flows)	7.71%	.26%	7.45%	---	---
Principal (Bankers Life)	4.5	7.65	.10	7.55	7.65	7.72 (expense cut to .03%)
Metropolitan	4.5	7.00	.15	6.85	6.90	---
General American	4.5	7.37	.28	7.09	---	---
Aetna	4.5 (max. $300,000/ year flows)	7.02	.10	6.92	6.98	---
State Mutual	4.2 .3	7.60 6.55	.35 .80	7.25 5.75	7.25 7.25	--- ---
Hartford	4.5	8.05	.35	7.70	---	---
Capital Holding	4.5 .3	--- ---	0 0	8.43 indexed/ 6% floor	--- ---	--- ---
Executive Life	4.5	8.10	.20	7.90	8.10	---
Pacific Mutual	4.5	---	0	7.50	7.36	---
Washington Square	4.3	7.64	.17	7.47	7.55	---
John Hancock	4.5	7.33	.26	7.07	7.19	---
Mutual Benefit	4.5 par non-par	7.25/6.80 7.05	.33 .33	6.92/6.47 6.72	--- ---	--- ---
Mony	4.5	7.20	.26	6.94	---	---
3-Year Treasuries (10/29/86)	---	---	---	6.66	6.53	6.53

COMPANIES NOT BIDDING (reasons)

Lincoln National (Benefits sensitive)

Allstate (Money Market Fund competition)

Provident National (Non-qualified)

Prudential (Too small)

New England Life (Non-qualified)

Mass Mutual (Future contribution uncertainty)

Connecticut Mutual (Non-qualified)

CNA (Non-qualified)

New York Life (Unspecified)

Great Western (Competition with their product)

Minnesota Mutual (Benefits sensitive)

Equitable (Too small)

Transamerica (Non-qualified)

Tab G

November 18, 1986

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

FROM: Alternative Investment Committee

SUBJECT: Alternative Investment Strategy

As a strategy to increase overall portfolio diversification and provide a hedge against inflation, the Investment Advisory Council's Asset Allocation Committee has recommended that 15% or $675 million of the $4.5 billion Basic Retirement Fund be allocated to alternative investments. Alternative investments include real estate, venture capital and resource investments where Minnesota State Board of Investment (SBI) participation is limited to commingled funds or other pooled vehicles.

STRATEGY FOR INVESTMENTS

VENTURE CAPITAL

The venture capital investment strategy is to establish and maintain a broadly diversified venture capital portfolio comprised of investments that provide diversification by industry type, stage of corporate development and location.

To date, the SBI has committed to ten commingled venture capital funds for a total commitment of $143.5 million. These commitments substantially complete the SBI's current venture capital asset allocation.

During the last quarter, the Alternative Investment Committee met with and conducted annual review sessions with five of the SBI's venture capital managers: DSV, Matrix, Inman-Bowman, Allied and Superior. The focus of the review session was on organizational/staff changes, and cash positions and funding schedules. No significant problems were identified.

In general, it is too early in the investment cycles of the partnerships to meaningfully evaluate investment performance. However, all of the venture managers are investing at a disciplined pace and are following the investment strategies they outlined for us at their initial interviews.

REAL ESTATE

The real estate investment strategy involves three steps. The first calls for investment of 30-40% of the real estate portfolio in diversified open-end commingled funds. The second step calls for investment of 30-40% of the real estate portfolio in diversified closed-end commingled funds. The third step calls for investment of 20-30% of the real estate portfolio in less diversified, more focused (specialty) commingled funds.

Currently, the SBI has committed $370.0 million to eleven commingled real estate funds. These commitments, and projected investments (subject to Board approval) in follow-on funds with existing managers, will substantially complete the SBI's real estate investment strategy and allocation.

RESOURCE FUNDS

The strategy for resource investment requires that investments be made in oil and gas partnerships that focus investment in conservative, lower risk type investments (i.e., proved producing properties and royalties diversified geographically and/or geologically).

Currently, the SBI has committed $67.5 million to four commingled oil and gas funds. The Alternative Investment Committee is considering ways of completing the SBI's remaining resource allocation.

The Alternative Investment Committee and staff recommend an additional $30 million oil and gas investment with Apache. This investment would finance the acquisition of certain oil and gas properties from Occidental Petroleum Company. The SBI will receive a net profits interest in the financed properties. The Alternative Investment Committee and staff have conducted an extensive review of Apache, including interviews of key Apache staff members.

ALTERNATIVE INVESTMENT MANAGER INFORMATION
ANNUAL REVIEW SUMMARY

FUND NAME:	Allied Capital
FUND NAME:	Allied Venture Partnership
CONTACT:	David Gladstone
ACCOUNT INCEPTION:	September, 1985
SBI CURRENT INVESTMENT (COST):	$1,655,565
SBI CURRENT INVESTMENT (MARKET VALUE):	$1,655,565
SBI TOTAL COMMITMENT:	$5,000,000

INVESTMENT DESCRIPTION: Allied Venture Partnership was formed in September 1985 and has a ten year term. Based in Washington D.C., the fund will focus 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 publicly-owned venture capital corporation formed in 1958.

DSV IV PORTFOLIO COMPOSITION

# OF PORTFOLIO COMPANIES	MARKET VALUE PORTFOLIO COMPANIES
10	$3,505,571

LOCATION	
East:	66%
Midwest:	32
South:	2
West:	0

STAGE OF DEVELOPMENT	
Early Stage	0%
Expansion Stage	85
Mezzanine Stage	0
Leveraged Buyouts	15

INDUSTRY:	
Computer-related	0%
Medical/Healthcare	0
Consumer-related	19
Communications	0
Industrial/Machinery	81

ALTERNATIVE INVESTMENT MANAGER INFORMATION
ANNUAL REVIEW SUMMARY

FUND NAME:	Matrix II Management Company
FUND NAME:	Matrix Partners II
CONTACT:	Mike Humphreys
ACCOUNT INCEPTION:	August, 1985
SBI CURRENT INVESTMENT (COST):	$4,000,000
SBI CURRENT INVESTMENT (MARKET VALUE):	$3,861,000
SBI TOTAL COMMITMENT:	$10,000,000

INVESTMENT DESCRIPTION: Matrix Partners II 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 partners have offices in Boston, San Jose, and San Francisco.

DSV IV PORTFOLIO COMPOSITION

# OF PORTFOLIO COMPANIES	MARKET VALUE PORTFOLIO COMPANIES
11	$11,144,152

LOCATION	
East:	36%
Midwest:	0
South:	0
West:	64

STAGE OF DEVELOPMENT	
Early Stage	55%
Expansion Stage	45
Mezzanine Stage	0
Leveraged Buyouts	0

INDUSTRY:	
Computer-related	60%
Medical/Healthcare	22
Consumer-related	0
Communications	18
Industrial/Machinery	0

ALTERNATIVE INVESTMENT MANAGER INFORMATION
ANNUAL REVIEW SUMMARY

FUND NAME:	Data Science Ventures
FUND NAME:	DSV Partners IV
CONTACT:	Rob Hillas
ACCOUNT INCEPTION:	April, 1985
SBI CURRENT INVESTMENT (COST):	$7,000,000
SBI CURRENT INVESTMENT (MARKET VALUE):	$7,132,832
SBI TOTAL COMMITMENT:	$10,000,000

INVESTMENT DESCRIPTION: DSV Partners IV 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's primary office is located in Princeton, New Jersey. However, the firm opened a new California office in 1986. 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.

DSV IV PORTFOLIO COMPOSITION

# OF PORTFOLIO COMPANIES	MARKET VALUE PORTFOLIO COMPANIES
6	$2,919,181

LOCATION	
East:	87%
Midwest:	0
South:	0
West:	13

STAGE OF DEVELOPMENT	
Early Stage	100%
Expansion Stage	0
Mezzanine Stage	0
Leveraged Buyouts	0

INDUSTRY:	
Computer-related	52%
Medical/Healthcare	19
Consumer-related	0
Communications	29
Industrial/Machinery	0

ALTERNATIVE INVESTMENT MANAGER INFORMATION
ANNUAL REVIEW SUMMARY

FUND NAME:	Investment Advisers, Inc. IAI Venture Capital Group
FUND NAME:	Superior Ventures
CONTACT:	Mitch Dann
ACCOUNT INCEPTION:	June, 1986
SBI CURRENT INVESTMENT (COST):	$1,661,250
SBI CURRENT INVESTMENT (MARKET VALUE):	$1,661,250
SBI TOTAL COMMITMENT:	$6,000,000

INVESTMENT DESCRIPTION: 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.

DSV IV PORTFOLIO COMPOSITION

# OF PORTFOLIO COMPANIES	MARKET VALUE PORTFOLIO COMPANIES
3 portfolio companies	$1,400,000
1 venture capital partnership	

LOCATION		STAGE OF DEVELOPMENT	
East:	0%	Early Stage	34%
Midwest:	100	Expansion Stage	66
South:	0	Mezzanine Stage	0
West:	0	Leveraged Buyouts	0

INDUSTRY:	
Computer-related	29%
Medical/Healthcare	5
Consumer-related	0
Communications	0
Industrial/Machinery	66

ALTERNATIVE INVESTMENT MANAGER INFORMATION
ANNUAL REVIEW SUMMARY

FUND NAME:	Inman & Bowman Management
FUND NAME:	Inman & Bowman
CONTACT:	Kirk Bowman
ACCOUNT INCEPTION:	June, 1985
SBI CURRENT INVESTMENT (COST)	$1,875,000
SBI CURRENT INVESTMENT (MARKET VALUE):	$1,794,956
SBI TOTAL COMMITMENT:	$7,500,000

INVESTMENT DESCRIPTION: Inman & Bowman 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, Inman and Bowman work closely with Rainier Venture Partners, a small Washington venture firm. They expect to make several co-investments with Rainier in the Pacific Northwest. The partnership has a ten year term.

DSV IV PORTFOLIO COMPOSITION

# OF PORTFOLIO COMPANIES	MARKET VALUE PORTFOLIO COMPANIES
6	$4,574,625

LOCATION	
East:	0%
Midwest:	0
South:	0
West:	100

STAGE OF DEVELOPMENT	
Early Stage	50%
Expansion Stage	50
Mezzanine Stage	0
Leveraged Buyouts	0

INDUSTRY:	
Computer-related	67%
Medical/Healthcare	33
Consumer-related	0
Communications	0
Industrial/Machinery	0

ALTERNATIVE EQUITY INVESTMENTS

FUND	COMMITMENT (millions)	FUNDED (millions)	INCEPTION DATE	FUND SIZE (millions)	TYPE/ STRATEGY
REAL ESTATE:					
Equitable	$ 40.0	$ 40.0	10/81	$3124.0	Open end diversified
Aetna	40.0	40.0	4/82	1664.0	Open end diversified
Prudential	40.0	40.0	9/81	5316.0	Open end diversified
RREEF	75.0	47.0	4/84	773.0	Closed end diversified
Heitman I	20.0	20.0	6/84	113.0	Closed end diversified
Heitman II	30.0	30.0	10/85	238.0	Closed end diversified
Heitman III	20.0	0.0	11/86	200.0	Closed end diversified
TCW I	40.0	40.0	7/85	216.0	Closed end specialized investment vehicle
TCW II	30.0	3.0	9/86	250.0	Closed end specialized investment vehicle
State Street I	20.0	20.0	7/85	103.0	Closed end specialized investment vehicle
State Street II	15.0	5.0	7/86	86.0	Closed end specialized investment vehicle
Total:	$370.0	$284.0			
Target:	($450 Million or 10% of Basic Retirement Funds)				
VENTURE CAPITAL:					
Norwest	$ 10.0	$ 10.0	1/84	$ 60.0	Hi-tech early stage MN/OR/AZ offices
KKR I	25.0	25.0	3/84	1000.0	Lo-tech mature NY/CA offices
KKR II	50.0	19.0	12/85	2000.0	Lo-tech mature NY/CA offices
Summit	10.0	7.5	12/84	93.0	Hi-tech later stage MA office
First Century	10.0	2.5	12/84	100.0	Hi-tech early stage NY/CA offices
DSV	10.0	7.0	4/85	60.0	Hi-tech early stage NJ/CA offices
Matrix	10.0	4.0	7/85	70.0	Hi-tech early stage MA/CA offices
Inman/Bowman	7.5	2.0	6/85	44.0	Hi-tech early stage CA office
Allied	5.0	1.6	7/85	40.0	Lo-tech later stage DC office
Superior Venture	6.0	1.5	6/86	35.0	Hi-tech early stage MN office
Total:	$143.5	$ 80.1			
Target:	($112.5 Million or 2.5% of Basic Retirement Funds)				
RESOURCE:					
Amgo I	$ 15.0	$ 15.0	7/81	$ 144.0	Debt with royalty or equity
Amgo II	7.0	7.0	2/83	36.0	Debt with royalty or equity
Apache I	22.5	0.5	5/84	150.0	Debt with royalty or equity
Apache II	23.0	22.4	10/85	180.0	Debt with royalty or equity
Total:	$ 67.5	$ 42.5			
Target:	($112.5 Million or 2.5% of Basic Retirement Funds)				

Tab H

EXECUTIVE DIRECTOR
HOWARD J. BICKER

STATE OF MINNESOTA
STATE BOARD OF INVESTMENT
Room 105, MEA Building
55 Sherburne Avenue
Saint Paul 55155
296-3328

December 10, 1986

TO: Members, State Board of Investment

FROM: South Africa Task Force

SUBJECT: Task Force Report

1) Divestment Legislation

At its meeting on December 8, 1986, the South Africa Task Force voted to recommend that the State Board of Investment propose legislation requiring the Board to divest holdings in companies that do business in South Africa.

Specifically, the Task Force recommends that the legislation contain the following provisions:

a) The Board's authority to invest in stocks would be amended as follows:

   o it would prohibit investment in a corporation with operations in South Africa, or a corporation that owns 10% or more of a subsidiary or affiliate with operations in South Africa, provided the entity employs more than 25 people in the country. (The 10% criterion is based on the IRRC definition of direct investment. The employee criterion is taken from the Federal Anti Apartheid Act of 1986.)

   o the divestment program would take place in stages.

      - no new or additional investment in the stock of any company that meets the above definition after July 1, 1987.
      - liquidation of securities over three years, one third in 1988, 1989, and 1990.

   o the Board would be required to provide the legislature with a list of corporations that would be affected by the restriction.

- o divestment would be abandoned if the federal government terminates the sanctions embodied in the Anti Apartheid Act of 1986. The federal act terminates sanctions against South Africa if certain steps are taken to dismantle Apartheid.

b) A provision would be added to indemnify the Board, its staff and investment managers for their implementation of the divestment program.

c) A statement of legislative intent would be added regarding the purpose of the divestment program.

d) The Board's fiduciary responsibility would be amended to clearly state that the divestment action is not a violation of the prudent person standard.

2) Update on Shareholder Activity

In addition to its recommendations regarding legislation, the Task Force is continuing its implementation of the Board's resolution on companies doing business in South Africa. During the last quarter, implementation has focused on shareholder activity.

The Task Force has directed staff to proceed to file shareholder resolutions with companies in the passive portfolio/index fund that have not yet signed the Sullivan Principles. To date, four resolutions calling for companies to sign the Sullivan Principles have been filed: Allied Signal, Diamond Shamrock, Hughes Tool and Lubrizol. Staff will file one additional resolution within the next two months. The resolution for Allied Signal was subsequently withdrawn because the company notified the SBI that it had signed the Sullivan Principles after the Board filed its resolution.

Resolutions have not been filed with the remaining nine non-signators in the index fund for the following reasons:

- o Three companies are required to implement a code of conduct under the Federal Anti Apartheid Act of 1986 that is equivalent to the Sullivan Principles.

- o The SBI has not held stock in three companies for a full year before the filing deadline. This is a requirement of the Securities and Exchange Commission (SEC).

- o The filing deadlines passed for three companies because they hold their annual meetings in the fall rather than the spring. Resolutions for these companies can be considered in the future.