State Investment Performance

April 1991

Program Evaluation Division
Office of the Legislative Auditor
State of Minnesota

Program Evaluation Division

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Barbara Schmidt
Theresa Wagner

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Centennial Office Building, Saint Paul, Minnesota 55155 ● 612/296-4708

STATE OF MINNESOTA
OFFICE OF THE LEGISLATIVE AUDITOR
VETERANS SERVICE BUILDING, ST. PAUL, MN 55155 • 612/296-4708
JAMES R. NOBLES, LEGISLATIVE AUDITOR

April 11, 1991

Representative Ann Rest, Chair
Legislative Audit Commission

Dear Representative Rest:

In May 1990, the Legislative Audit Commission requested an evaluation of state investment performance. The State Board of Investment and its staff, working within certain legal guidelines, are responsible for investing assets currently valued at $16 billion, mostly representing public employee pensions.

The study found that, given current legal restraints, state investment performance has been mostly satisfactory. But an underinvestment in stocks has adversely affected the returns on Minnesota's statewide retirement funds and the Permanent School Fund. Statutory constraints on these funds need to be revised so that the Board can more fully maximize the earning power of these funds.

We received the full cooperation of the State Board of Investment and its staff. This report was researched and written by John Yunker with assistance from Bruce Williams.

Sincerely yours,

James R. Nobles
Legislative Auditor

Roger A. Brooks
Deputy Legislative Auditor

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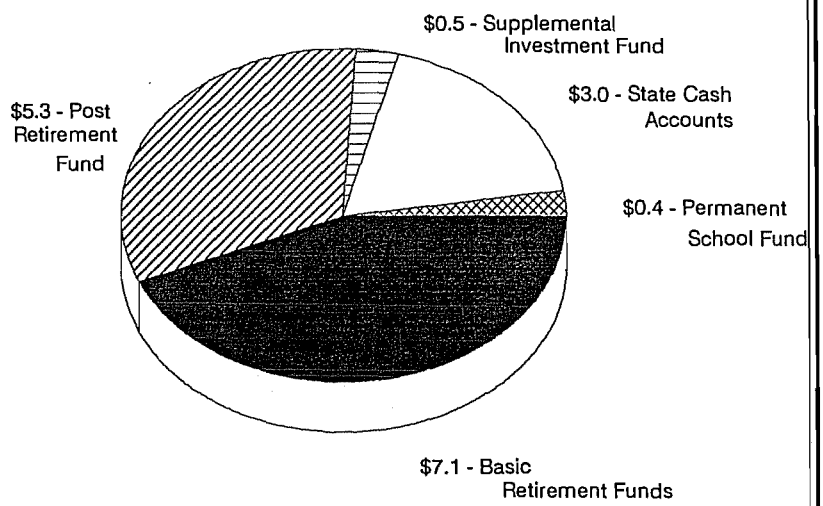
STATE INVESTMENT PERFORMANCE

Executive Summary

Investing money has become a major public sector enterprise in Minnesota and other states. The return on pension fund investments is a vital source of funding for public employee pensions. Over the last decade, the assets of state and local government employee pension funds have grown nationwide from under $200 billion to over $700 billion. In addition, the investment of state funds has become a significant source of revenue for state governments. In fiscal year 1990, investments produced over $200 million in income for the funding of state obligations in Minnesota. Managing all these investments is thus an important and complex job.

In Minnesota, the State Board of Investment (SBI) is responsible for investing the assets of the statewide public pension funds and various state government funds and accounts. SBI's investments are undertaken within a legal framework established by the Legislature. At the end of fiscal year 1990, the market value of SBI's portfolio was $16.3 billion, including $12.9 billion in pension assets, $3.0 billion in state government funds, and $0.4 billion in the Permanent School Fund.

Funds Invested by
the State Board of Investment,
End of FY 1990 (in billions)



Source: State Board of Investment.

This report examines the rates of return earned on funds under SBI's control over the last decade. We consider the impact of SBI's management, as well as legal and other constraints, on investment results. The report focuses on the following questions:

- **How does the state's investment performance compare to that of similar funds managed by others and to appropriate financial market indices?**

- **What changes, if any, are needed to improve the investment performance of the state's retirement funds, Permanent School Fund, and state government funds?**

- **Do the Board and its staff use appropriate benchmarks in evaluating their investment performance?**

In general, we found that the Board and its staff, along with the Investment Advisory Council, have done a good job in fulfilling their statutory and fiduciary responsibilities. SBI has restructured both the Basic Retirement Funds and the Supplemental Investment Fund and consequently improved their investment performance. In addition, SBI was among the first institutional investors to implement a performance-based fee system for compensating its external stock managers. Finally, SBI combined numerous cash accounts under its control into two large cash pools, thus improving the efficiency with which it managed the accounts.

However, statutory constraints restrict SBI's ability to maximize the earning power of the state's retirement funds and the Permanent School Fund by discouraging SBI from holding common stocks. Over the long run, these constraints are costing the Post Retirement Fund at least $35 million to $50 million annually and costing the Permanent School Fund between $3 million to $9 million per year. Statutory changes to the formula used to calculate post-retirement benefit increases and to the accounting restrictions governing the Permanent School Fund are needed so that SBI can increase its stock holdings and the state can benefit from sound long-term investment strategies.

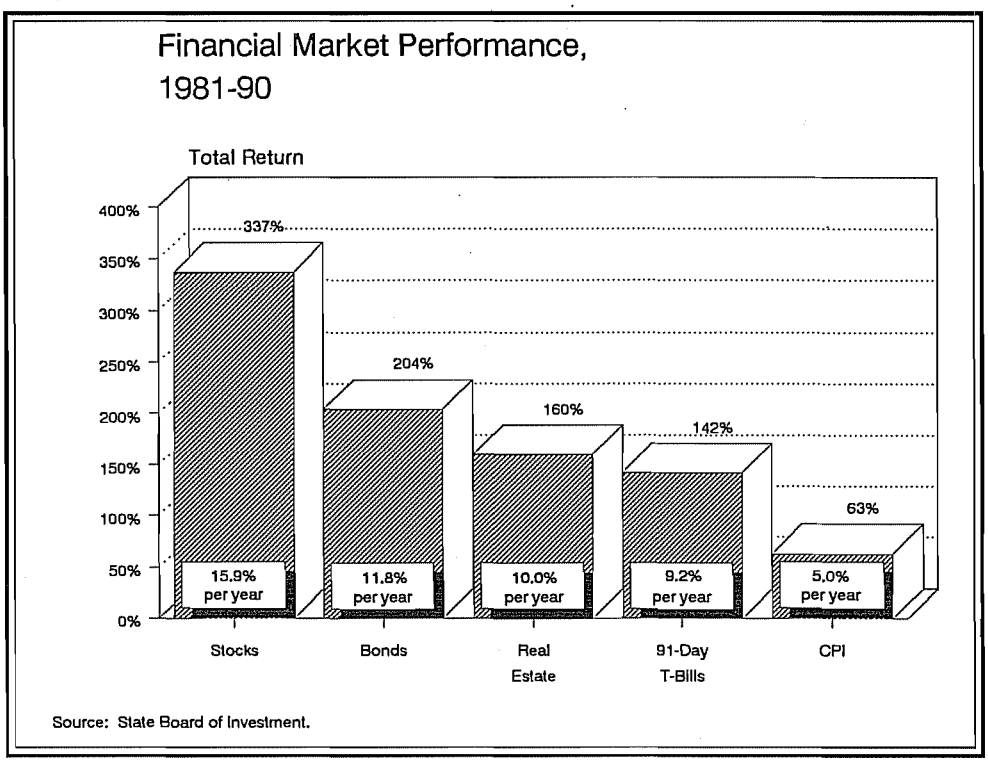
FINANCIAL MARKETS

To put SBI's investment performance in perspective, it is first necessary to review the general performance of financial markets over the last decade. In absolute terms, the 1980s was a good decade for investors.

- **In the 1980s, stock and bond markets both provided double-digit annual rates of return.**

United States stock markets had an average annualized return of 15.9 percent over the ten years ending June 30, 1990. Despite the stock market crash in

October 1987, annual stock returns still averaged 15.5 percent over the last five years — only slightly lower than stock returns in the early 1980s. Bond returns were lower than stock returns but also reached the double-digit level by averaging 11.8 percent per year. Real estate investments did well during the early 1980s but cooled off considerably in the last several years. Over the full decade, real estate investments had an average annual return of 10.0 percent. Even 91-day Treasury bills — one of the safest and most liquid investments — provided a return far in excess of the rate of inflation. T-bills returned 9.2 percent per year while inflation increased only 5.0 percent annually.



Returns on financial assets during the 1980s were high compared to historical averages but fairly consistent with historical spreads between stock and bond returns. Over the last 64 years, stocks have increased at an annual rate of 10.3 percent while bonds increased 5.2 percent annually. Inflation during the 1980s was lower than during the 1970s but still high compared to long-term historical averages. Over the last 64 years, the inflation rate averaged 3.0 percent.

BASIC AND POST RETIREMENT FUNDS

SBI's Responsibilities

To discuss SBI's performance, it is also necessary to understand Minnesota's atypical retirement fund structure. Unlike nearly all other states:

- **Minnesota law splits the assets of its public employee pension system into two funds (the Basic and Post Retirement Funds); and**

- **Minnesota law requires that each calendar year's post-retirement benefit increase be based on the realized earnings of the Post Retirement Fund for the previous fiscal year.**

Minnesota's two-fund pension system is different from most other systems.

In Minnesota, the Basic Retirement Funds serve as the accumulation pools for the pension contributions of employees and employers during the employees' working years. SBI has a 30 to 40 year time horizon over which to invest the assets of the Basic Funds and thus can focus on generating higher total returns through long-term appreciation in the market value of the assets it holds. The state has set contribution rates so that contributions, plus investment earnings averaging 8.5 percent annually on the Basic Funds, are expected to eliminate the funds' unfunded liability by the year 2020.

At the time of an employee's retirement, funds are transferred from the Basic Funds to the Post Retirement Fund in order to finance the retiree's expected retirement benefits. The Post Fund must earn an average of 5 percent annually in order to support the promised benefits. The Post Fund requires a different investment approach than the Basic Funds. Unlike the Basic Funds, the Post Fund has a shorter time horizon over which to invest and must pay benefits on an ongoing basis. Particularly restrictive on the fund's investment approach is the statutory formula for calculating permanent benefit increases. Retirees receive permanent benefit increases to keep up with inflation only to the extent that the fund's realized earnings exceed 5 percent in a given year. This statutory formula provides a disincentive for SBI to hold stocks in the Post Fund. Holding more stocks in the Post Fund would provide greater benefit increases over the long run, but benefit increases would be more volatile from year to year and would not likely be granted every year under the current formula.

Consequently, SBI has taken a very conservative approach with the Post Fund's investments. In order to guarantee a 3 percent annual benefit increase, SBI substantially lowered the proportion of the Post Fund invested in stocks as interest rates fell over the 1980s. Stock holdings, which were 43 percent of the fund's market value ten years ago, are now less than 10 percent of the Post Fund.

Investment Performance

Given the two funds' respective statutory purposes, SBI's performance in investing the Basic and Post Funds has been satisfactory. The Basic Funds did not perform well in the early 1980s but improved their performance over the last five years. For the five years ending June 30, 1985, the Basic Funds increased 13.0 percent annually compared to 14.8 percent for a composite of financial market indices. In addition, excluding alternative assets such as real estate and venture capital, the Basic Funds were outperformed by a majority

of the over 800 public and private pension funds reporting to Wilshire Associates' Trust Universe Comparison Service (TUCS).

SBI's restructuring of the Basic Funds has improved their performance.

However, the restructuring of the Basic Funds in 1983 and 1984 began to pay off in the second half of the decade.

- **Over the last five years, the performance of the Basic Funds matched that of its composite index and exceeded that of most other pension funds.**

For the five years ending June 30, 1990, the Basic Funds had an average gain of 13.0 percent annually, matching a composite of financial market indices. Excluding alternative assets, the Basic Funds gained 13.9 percent annually compared to 13.3 percent for the median pension fund performer. These comparisons may somewhat overstate how well the Basic Funds have performed over the last five years. If alternative assets had been more appropriately weighted in the composite index, the Basic Funds would have slightly underperformed the adjusted composite index. In addition, it could be argued that the Basic Funds should have outperformed the median pension fund performer by more than they did during this period since the Basic Funds held about 20 percent more stocks than the typical pension fund. Nevertheless, the performance of the Basic Funds was considerably improved over the early 1980s.

Given statutory constraints, the Post Fund performed well during the 1980s.

- **Over the last ten years, the Post Fund has averaged realized earnings of 12 percent annually and benefit increases of 7 percent annually, compared to an average inflation rate of 5 percent.**

The Post Fund performed well in the 1980s, but the 1990s will likely be different.

Such strong performance relative to the inflation rate was made possible by the high interest rates of the late 1970s and early 1980s and the significant gains realized on the fund's once substantial stock holdings. However:

- **Benefit increases are not likely to compare so favorably with inflation rates in the future unless investment strategy changes.**

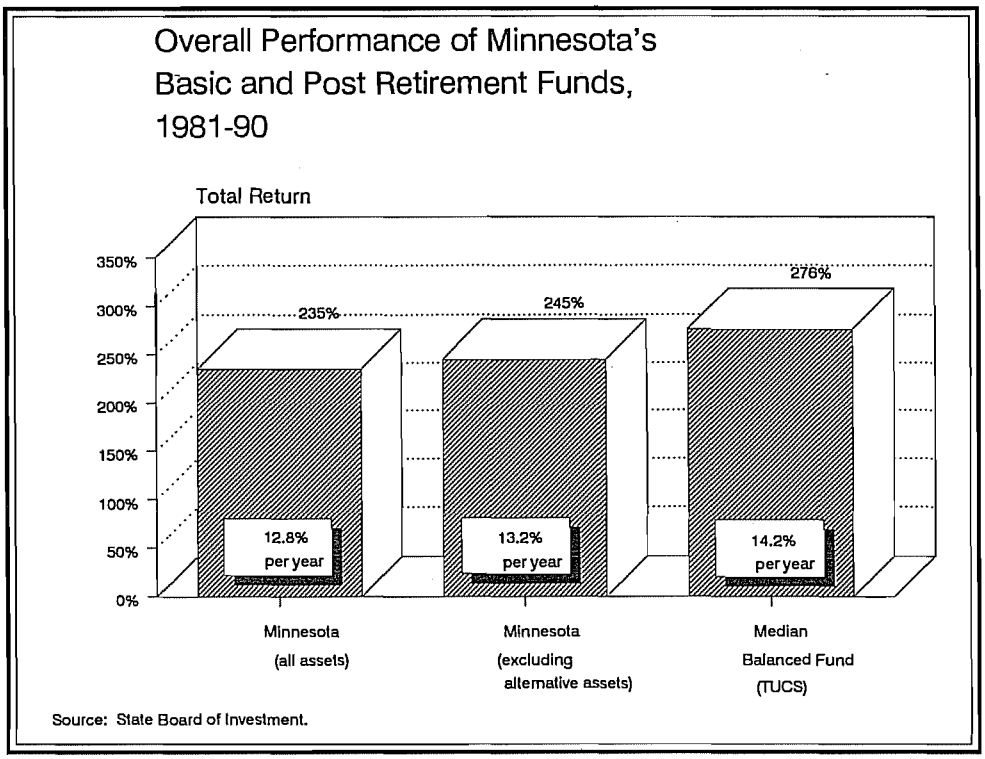
SBI staff estimate that benefit increases in the near future will likely range between 2.5 and 4.0 percent per year. The reduction in the fund's stock holdings, decreases in interest rates on bonds, and changes in the fund's cash flow will prevent the Post Fund from generating the large benefit increases retirees grew accustomed to in the 1980s.

Although the Basic and Post Funds have performed satisfactorily given their respective statutory purposes, it is clear that current law does not encourage SBI to maximize the long-term earning power of the Post Fund. To illustrate this point, it is instructive to compare the combined performance of Minnesota's two funds to that of other pension funds which are not generally subject to the same legal restrictions. Such a comparison shows that:

- **The overall rate of return for Minnesota's two retirement funds has been below that of a majority of other public and private pension funds.**

Excluding alternative assets, the combined Basic and Post Funds had an estimated 13.2 percent annual rate of return over the last ten years. The median performer among public and private pension funds reporting to TUCS gained an average of 14.2 percent annually. For the last five years, the difference in performance is smaller but the estimated rate of return on Minnesota's two funds still trailed the median performer among other pension funds. Minnesota's two funds gained 12.8 percent per year compared to 13.3 percent per year for the median performer. Among public funds reporting to TUCS, the median performer for the last five years gained 13.8 percent annually.

Together, Minnesota's two retirement funds underperformed most pension funds.

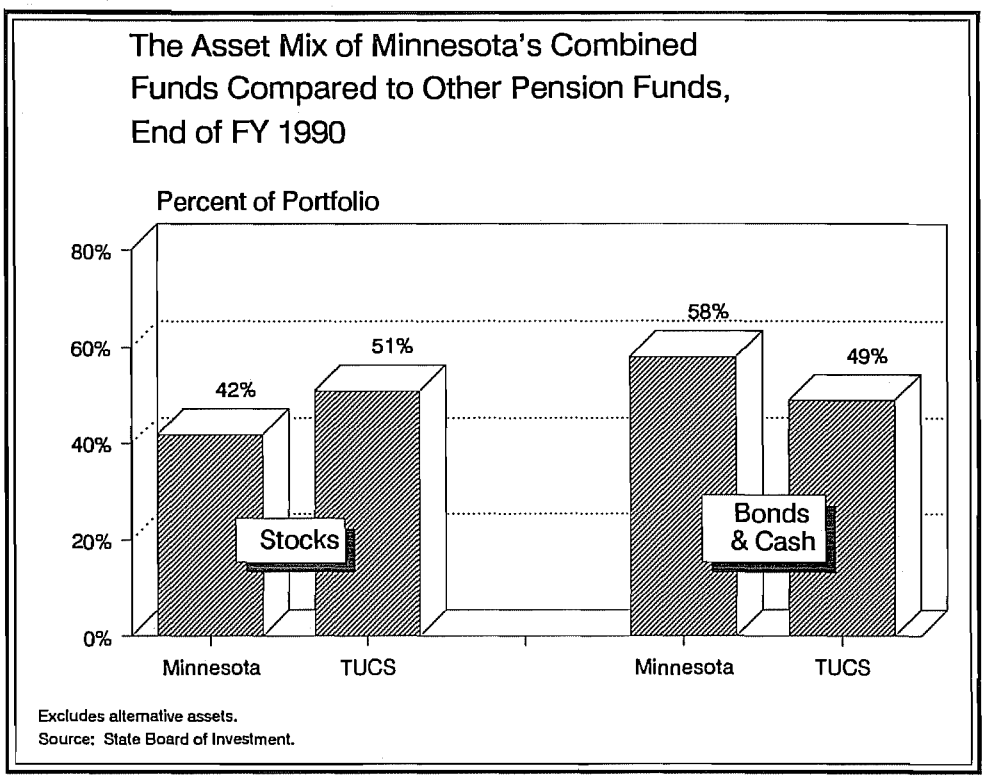


There are two reasons for Minnesota's lower rate of return. First:

- **Statutory constraints on the Post Fund, along with SBI's desire to grant at least a 3 percent benefit increase each year, have resulted in Minnesota's funds holding fewer stocks than most pension funds.**

Excluding alternative assets, Minnesota's pension funds had a combined asset mix of 42 percent stocks and 58 percent bonds and cash equivalents at the end of fiscal year 1990. The median asset mix for funds reported to TUCS was more aggressive: 51 percent stocks and 49 percent bonds and cash equivalents. Since stocks have outperformed bonds, Minnesota's more conservatively invested pension funds have underperformed the median pension fund nationwide.

Statutory constraints are adversely affecting the asset mix of the two funds.

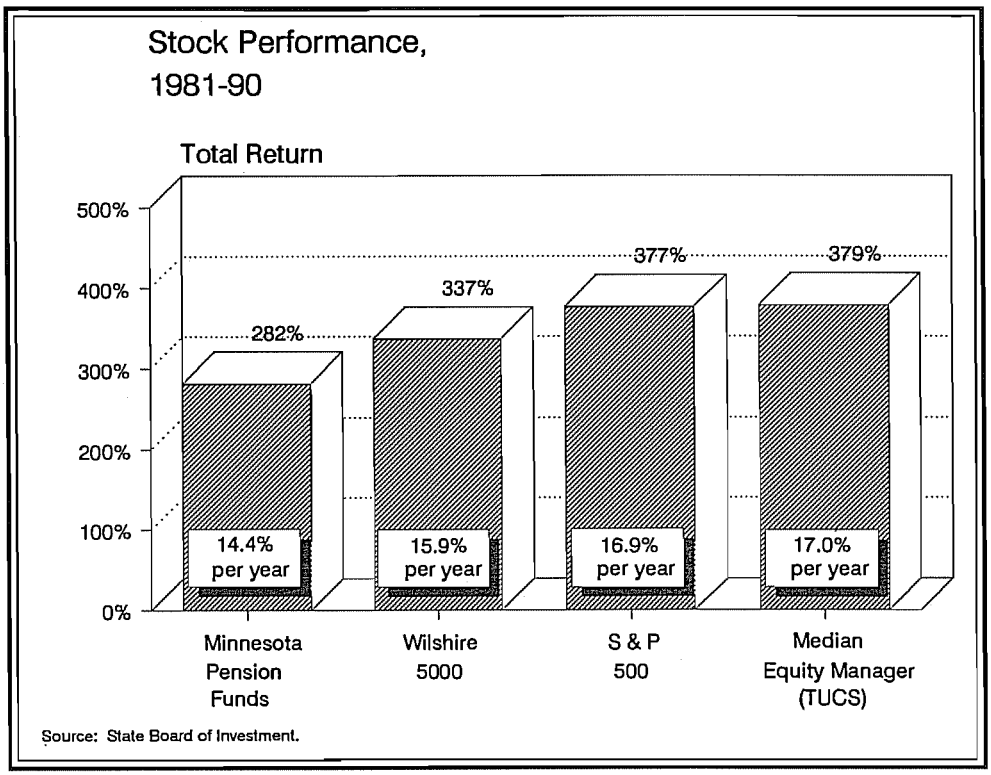


Second:

- **Minnesota's pension funds had lower stock performance than most other pension funds.**

The performance of stocks held by Minnesota's two funds lagged behind both the general stock market and the median performer among pension funds. Over the last ten years, SBI-held stocks increased 14.4 percent per year, compared to 15.9 percent for the Wilshire 5000 Equity Index, 16.9 percent for the Standard & Poor's 500 Stock Composite Index, and 17.0 percent for the median equity performer among pension funds.

The lower than average stock performance was partially offset by stronger than average bond performance. SBI-held bonds gained 12.0 percent per year compared to 11.8 percent for the Salomon Broad Investment Grade Bond Index and 11.4 percent for the median performer among pension fund bond portfolios.



Issues and Recommendations

In light of investment results over the last decade, the following questions are pertinent:

- **What should be done to change the underallocation to stocks that has occurred in the Post Retirement Fund?**

- **What can and should SBI do to improve the performance of its stock portfolio?**

Asset Mix

The current two-fund system, along with the existing benefit increase formula, has produced very good benefit increases for retirees during the 1980s. However, the system is unlikely to perform that well in the future and has two fundamental problems in the long run. Given current law and investment strategy for the Post Fund:

- **The two-fund system will result in lower long-term rates of return and consequently higher costs to taxpayers and active employees to finance a given benefit stream.**

- **Benefit increases will not keep up with inflation in future higher-inflationary periods.**

Most other pension systems have one fund, instead of two funds, and base benefit increases on inflation or provide automatic increases independent of investment performance. As a result, other systems are able to increase their stock holdings and their long-term rates of return.

Since this study did not focus on pension policy, we do not offer specific recommendations for changing Minnesota's two-fund system and its atypical benefit increase formula. However, we do recommend that:

- **The Legislature should examine alternative methods for determining post-retirement benefit increases, including options which combine the Basic and Post Retirement Funds.**

A modest increase in stock holdings would likely increase returns by $35 to $50 million annually.

The current benefit increase formula should be replaced with one that 1) permits SBI to modestly increase the allocation to stocks in the retirement funds, and 2) provides retirees with an annual increase which is more sensitive to the inflation rate. We estimate that a modest increase in stock holdings — up to the median level held by other public and private pension funds — would provide the retirement funds with $35 million to $50 million in additional funding annually over the long run. With care, a new system and formula could be devised so that:

- **The rate of benefit increases for current retirees would be as good or better than expected under the current system or than provided by most other states, and**

- **Some of the additional investment returns could be used to address other pension objectives.**

These other objectives may include higher initial pensions for future retirees, lower contribution rates for current employees or employers, or a reduction in the period of time before the various pension systems achieve full actuarial funding.

Stock Performance

SBI's lower than average stock performance has resulted primarily because the Basic Funds' stock portfolio has been more reliant on small, growth-oriented stocks than stock market indices and other pension funds. Although small capitalization stocks have substantially outperformed larger capitalization stocks since 1925, the last seven years have seen small capitalization stocks underperform the general stock market. Consequently, SBI's stock performance has trailed that of market indices and the majority of other pension funds, which are generally less reliant on small capitalization stocks.

After study by the Investment Advisory Council and its staff, the State Board of Investment decided in June 1990 to alter the stock portfolio of the Basic Retirement Funds. The portfolio had consisted of a Wilshire 5000 index fund, comprising 60 percent of the portfolio, and active manager accounts, comprising the remainder. In October 1990, SBI's passive stock manager began the

two-year process of changing the index fund into a "tilted" index fund. The tilted fund will be constructed so that, when combined with the stocks held by SBI's active managers, the overall exposure of the fund's stock portfolio will generally approximate the Wilshire 5000. The only significant difference between the performance of the stock portfolio and the Wilshire 5000 will be in how the active managers perform relative to the segments of the market in which they invest.

This new plan can be viewed as a compromise between SBI's current stock portfolio and that of most other pension funds. The new portfolio will eliminate the previous small stock bias relative to the Wilshire 5000. However, it will hold more small, growth-oriented stocks than most other pension funds, which have stock portfolios more closely tied to the S&P 500 and, consequently, to larger capitalization stocks. So, SBI's stock performance will be more reliant on small, growth-oriented stocks than most pension funds, but not any more so than the Wilshire 5000. In addition, the stock portfolio will continue to rely more on passive management than most public funds but will not go to the extreme of indexing the entire stock portfolio.

The Board needs to know whether its active stock manager program is working.

Since the success of this new strategy depends significantly on the ability of the active managers to add value to the stock portfolio, it is particularly important that the Board and others receive a clear indication of how the active stock manager group is doing relative to the alternative of passive management. In the past, SBI staff have not provided the Board with a clear comparison of the aggregate performance of the active stock manager group to the group's aggregate benchmark. Consequently, we recommend that:

- **SBI staff provide the Board on a regular basis with a clear comparison of the aggregate performance of the active stock manager group to the group's aggregate benchmark.**

Short-term results, whether favorable or unfavorable, should not be used to justify significant changes in the Basic Funds' stock strategy. However, over the long run, the Board and its staff need to track the overall success of active management in order to determine whether their strategy is working.

SUPPLEMENTAL INVESTMENT FUND

The $477 million Supplemental Investment Fund is structured much like a family of mutual funds, providing investment options for a number of public employee groups. The Fund consists of six different accounts with rather different investment objectives and asset mixes. Overall, we found that:

- **The performance of the Supplemental Investment Fund improved following the Board's restructuring of the fund in 1986.**

The performance of the four newer accounts is in line with market expectations. In addition, the Income Share Account's performance improved since

its stock portfolio was indexed to the Wilshire 5000 in 1988. The Growth Share Account has continued to underperform stock market indices because of its small stock bias, but will likely outperform market indices when small capitalization stocks once again lead the market.

PERMANENT SCHOOL FUND

In November 1984, Minnesota voters passed a constitutional amendment that removed investment restrictions on the stock and bond holdings of the Permanent School Fund from the Minnesota Constitution. Following passage of the amendment, SBI no longer had to restrict stock holdings to 20 percent of the fund or corporate bond holdings to 40 percent of the fund. In addition, the type of stocks and bonds that could be purchased was broadened.

However, instead of increasing stock holdings, the State Board of Investment (on the advice of SBI staff and with agreement from the Investment Advisory Council) eliminated stocks from the Permanent School Fund within one year of the amendment's passage. It is not entirely clear why stocks were eliminated from the fund. Staff advised the Board that the accounting restrictions still in place in statutes and in the Constitution were still too restrictive and that holding any stocks would produce unacceptable volatility in the earnings of the fund. In addition, it has been suggested that policymakers in the administration and the Legislature needed the predictable income that bonds would produce in order to balance the budget.

Whatever the reasons for eliminating stocks, the consequences for the Permanent School Fund have been unfortunate. While the stock market increased 15.5 percent annually over the last five fiscal years, the Permanent School Fund has returned only between 8.5 and 9.5 percent per year. Since 1985, the fund has been invested almost entirely in bonds. Since the bonds are generally held to maturity, the fund's principal source of earnings is the interest on the bonds. Those earnings have been used each year to reduce the amount of General Fund appropriations that are necessary to finance K-12 education.

It is clear that:

- **Eliminating stocks from the fund's portfolio has been detrimental to the Permanent School Fund's long-term growth as well as its ability to provide income in the long run.**

We estimate that, if the fund had held 50 percent stocks and the state had sacrificed approximately $9 million to $11 million in income over each of the last five years, the Permanent School Fund would have been approximately $115 million larger at the end of fiscal year 1990. The fund would thus be more capable of generating income during a severe budget crisis such as the one we are now experiencing.

Stocks would provide the Permanent School Fund with greater returns in the long run.

We estimate that, by not holding stocks, the state is losing $3 to $9 million annually over the long run. In order to achieve these higher returns, it will be necessary to forego some income during the time stock holdings increase in market value. Given the state's budget crisis, it would be very difficult to alter the fund's portfolio over the next biennium. But now is the time to plan for future changes. As with the Post Retirement Fund, it appears necessary to change the statutory restrictions governing the Permanent School Fund in order to bring about a change in investment strategy. Consequently, we recommend that:

- **SBI staff, along with the administration and the Legislature, should review the accounting restrictions placed on the fund and the desirability of changing the statutes and/or the Constitution so that stocks can be added to the portfolio once the budget crisis is over.**

CASH MANAGEMENT

SBI has the responsibility for investing more than 400 state agency accounts with the objective of providing competitive money market returns while preserving capital. Most of these accounts are combined into the Treasurer's Cash Pool, which had an average daily balance of $2.2 billion in fiscal year 1990.[1] In addition, SBI is responsible for investing the Trust Fund Pool, which consists of the cash balances of the retirement-related funds and the Permanent School Fund. The Trust Fund Pool had an average daily balance of $0.2 billion last year.

Performance of the cash pools appears to be satisfactory compared to the staff's performance target. Over the last three years, the Treasurer's Cash Pool returned 8.6 percent per year and the Trust Fund Pool averaged 8.3 percent, compared to the target of 7.5 percent for 91-day Treasury bills.

However:

- **SBI's performance target for cash portfolios, like that of many institutional investors, is inadequate.**

The target, 91-day Treasury bills, is not representative of SBI's cash portfolios and is too easy a target to beat. As of June 30, 1990, the Treasurer's Cash Pool held 40 percent commercial paper, 8 percent corporate notes, and only 19 percent Treasury securities. The Trust Fund Pool held 65 percent commercial paper and only 5 percent Treasuries. In addition, the two pools had average maturities of 213 and 111 days respectively. Consequently, the pools were invested in securities which are both riskier and longer in their maturities than 91-day Treasury bills. Generally, riskier and longer cash portfolios achieve higher yields than 91-day T-bills.

1 Appendix B of this report provides information on the funds invested by state agencies other than the State Board of Investment.

SBI needs a performance benchmark for its cash pools.

SBI is not alone in its need for an adequate performance measure for cash equivalents. Across the nation, development of such measures has been much slower than for stocks and bonds. However, a number of government units have developed and are using several methods worth considering. We recommend that:

- **SBI staff should investigate alternative cash performance measures and, preferably, develop a customized performance benchmark for cash equivalents.**

PERFORMANCE EVALUATION

SBI staff provide the Board and the Investment Advisory Council with quarterly and annual reports on investment performance. These reports are very useful and provide extensive data. In fact, the reports provide more information than many other pension plans provide in their annual reports.

However, these reports can be improved in a number of respects. In particular, we recommend that:

- **The composite index for the Basic Retirement Funds should be revised to reflect the inappropriateness of using the return on 91-day Treasury bills as a performance benchmark for cash equivalent assets.**

- **SBI staff should clearly compare the aggregate performance of active stock and bond manager groups to their respective aggregate benchmarks.**

- **SBI's annual report should compare the combined performance of the Basic and Post Funds to the median TUCS balanced fund, as a reminder of the effect of statutory constraints on the state's investment results.**

- **SBI's annual report should provide greater summary information on the characteristics of SBI's various bond portfolios, as well as on the characteristics of any benchmarks used to assess the performance of its bond portfolios.**

- **As required by law, SBI should provide information on the total returns for the Post Retirement Fund and the Permanent School Fund somewhere in its annual report.**

INTRODUCTION

In the late 1970s and early 1980s many legislators and other policymakers expressed concern about the rate of return earned on pension fund assets invested by the State Board of Investment (SBI). The Office of the Legislative Auditor, the State Auditor, a consulting firm, and various legislative committees studied SBI's investment performance and governance structure. As a result, in the early 1980s, the Legislature loosened a number of statutory restrictions on SBI's investments. In addition, SBI transferred the investment of a majority of pension assets, particularly stocks, from SBI staff to external money managers.

More recently, after some experience under the altered investment structure, legislators and others have raised questions about how well the changes have worked. As a result, the Legislative Audit Commission directed our office to conduct a study of SBI's investment performance. This report examines the impact of SBI's management, as well as legal and other constraints, on the rates of return earned on state pension fund assets, the Permanent School Fund, and various state cash accounts. The report specifically addresses the following questions:

- **How have SBI's investments performed since the changes of the early 1980s?**
- **How does the state's investment performance compare to that of similar funds managed by others and to appropriate financial market benchmarks?**
- **Has the strategy of hiring external money managers yielded the desired results?**
- **Should the conservative approach taken by SBI in investing the Post Retirement Fund and the Permanent School Fund be changed? If so, what statutory changes are necessary to facilitate changes in SBI's investment strategy?**
- **Do the Board and its staff use appropriate benchmarks in evaluating their investment performance?**

To answer these questions, we collected extensive data on the performance of SBI's investments and various financial markets over the last decade. We also

interviewed SBI staff, researched the literature on financial markets, and contacted other organizations with investment responsibilities similar to SBI.

Chapter 1 presents information on SBI's organizational structure and budget, the funds SBI is responsible for investing, the legal limitations placed upon SBI's investments, the investment strategies SBI employs with various funds, and the changes in SBI's responsibilities and strategies that occurred during the 1980s. Chapter 2 focuses on SBI's investment performance over the last decade and uses a variety of techniques to evaluate that performance. Finally, Chapter 3 considers the need for changes in statutes affecting SBI's investment strategies and offers a number of recommendations for improved accountability and performance.

Two appendices accompany the report. Appendix A provides detailed performance and management fee data on SBI's external managers. Appendix B provides information on funds invested by state agencies other than the State Board of Investment.

BACKGROUND

Chapter 1

The State Board of Investment (SBI) was created by the Constitution of the State of Minnesota to invest all state funds. The Board is assisted by a 25-person staff and a 17-member Investment Advisory Council. This chapter examines the following questions:

- **How are the Board, its staff, and the Investment Advisory Council organized and what are their respective responsibilities?**
- **What funds is the Board responsible for investing?**
- **What investment restrictions govern the Board's activities?**
- **What are the Board's investment objectives and strategy for each fund under its control?**
- **How has the Board chosen to manage each fund?**

ORGANIZATION AND RESPONSIBILITIES

Organization

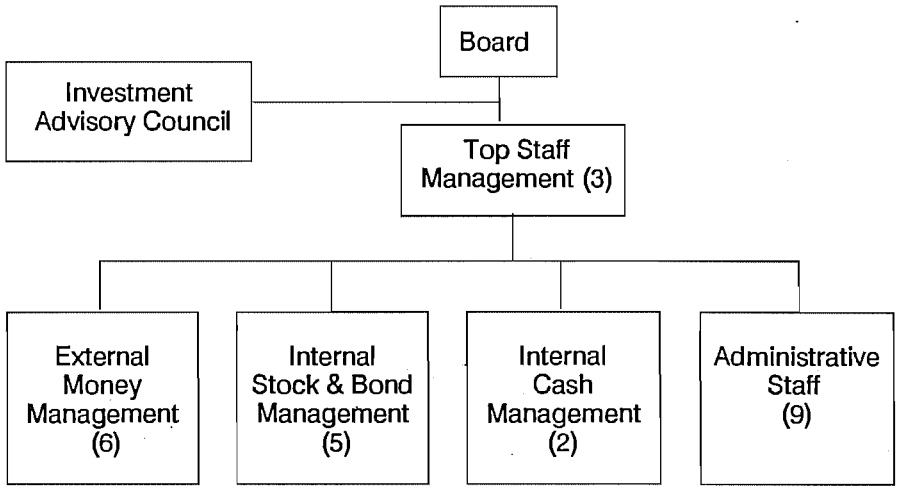
As directed by the Minnesota Constitution, the State Board of Investment consists of the Governor, the State Auditor, the State Treasurer, the Secretary of State, and the Attorney General.[1] State law clarifies that the Board's role is principally that of a policy maker and employer. As a policy maker, the Board is responsible for establishing all policies and procedures regarding the investment of the funds under its control. For example, the Board is required to adopt an investment policy statement for the retirement fund assets under its trusteeship. As an employer, it is responsible for hiring an executive director, and may hire investment advisors and consultants. The Board may also employ qualified private firms to invest and manage the assets of any fund for which the Board is responsible.

1 *Minnesota Constitution*, Article XI, Section 8,

The executive director is, in turn, required to plan, direct, coordinate, and execute administrative and investment functions in accordance with the Board's policies and state law. The executive director is responsible for hiring staff to perform investment or administrative functions and for reporting to the Board on all operations. State law requires the executive director to publish an annual report on the Board's activities. The report must provide rate of return data for each fund invested by the Board.

Currently, the Board has a staff of 25. As Figure 1.1 illustrates, the staff is organized into five groups: 1) top management, 2) external money management, 3) internal management of stocks and bonds, 4) internal management of cash equivalents, and 5) administrative staff.

Figure 1.1: Organizational Chart



Source: State Board of Investment.

For fiscal year 1991, the staff's budget is approximately $1.8 million. These staff costs are billed back to the funds under SBI's control. These charges amount to slightly more than 0.01% (or about one "basis point") of the market value of SBI-controlled funds. This staff budget does not include the costs of hiring external portfolio managers or consultants. Those additional costs are more substantial and have been assessed against the investment earnings of the appropriate funds since external managers were first retained.

The Board and its staff are assisted by a 17-member Investment Advisory Council. The Council advises the Board and its staff on investment-related matters. The Council consists of ten Board-appointed members experienced in finance and investment, the Commissioner of Finance, the executive directors of the three statewide retirement systems, and two active employees and one retiree covered by retirement funds invested by SBI and appointed by the Governor. The Council reviews investment results, as well as all proposed investment policies.

Responsibilities

As of June 30, 1990, the State Board of Investment had funds under its management totaling $16.3 billion. This figure is up dramatically from ten years ago when SBI-managed assets totaled $4.6 billion. The substantial increase is due both to very favorable investment markets during the 1980s and to cash flows into the funds.

Table 1.1 lists the funds under SBI management. These include retirement-related funds of $12.9 billion, state cash accounts of $3.0 billion, and the Permanent School Fund of $0.4 billion.[2] The retirement funds include the Basic Retirement Funds ($7.1 billion), the Post Retirement Investment Fund ($5.3 billion) and the Supplemental Investment Fund ($0.5 billion).

Table 1.1: Assets under SBI Control, End of FY 90

		Market Value
Basic Retirement Funds		$7.1 billion
Teachers Retirement Fund	$3,268 million	
Public Employees Retirement Fund	1,608 million	
State Employees Retirement Fund	1,408 million	
Public Employees Police and Fire Fund	595 million	
Highway Patrol Retirement Fund	105 million	
Correctional Employees Fund	69 million	
Police and Fire Consolidation Fund	43 million	
Judges Retirement Fund	3 million	
Post Retirement Investment Fund		5.3 billion
Supplemental Investment Fund		0.5 billion
Income Share Account	$245 million	
Growth Share Account	74 million	
Common Stock Index Account	10 million	
Bond Market Account	6 million	
Money Market Account	82 million	
Guaranteed Return Account	60 million	
State Cash Accounts		3.0 billion
Permanent School Fund		0.4 billion
Total Assets (on 6/30/90)		$16.3 billion

Source: State Board of Investment.

All SBI investments are governed by the prudent person standard, as well as other requirements imposed by state law.[3] The prudent person standard requires all members of the Board, staff, and Council to "act in good faith and exercise the degree of judgment and care, under circumstances then prevail-

2 In future years, SBI will be responsible for investing the relatively new Environment and Natural Resources Trust Fund. SBI will also be investing the assets of the Workers' Compensation Assigned Risk Plan effective May 1, 1991.

3 These investment restrictions are generally in *Minnesota Statutes*, Chapter 11A and Chapter 356A.

ing, which persons of prudence, discretion and intelligence exercise in the management of their own affairs, not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived therefrom."[4]

SBI investments are also subject to some specific legal restrictions.[5] State cash accounts must be invested only in debt obligations. These debt obligations may be government, corporate, bank, or certain other obligations but generally must meet specific quality restrictions. For example, government debt obligations purchased by SBI must be backed by the full faith and credit of the issuer or the issue must be rated among the top four quality rating categories by a nationally-recognized rating agency. Corporate obligations purchased by SBI must be rated among the top four quality categories, and commercial paper must be from corporations in the highest two quality categories.

Statutory investment limitations have become less restrictive.

In addition to such debt obligations, assets of retirement funds and the Permanent School Fund may be invested in corporate stocks and certain riskier alternative investments. SBI may purchase corporate stocks of any corporation organized under the laws of the United States or any of its states or Canada and any of its provinces, or any corporation listed on the New York or American Stock Exchanges. Investments may not exceed five percent of the shares of any corporation. Alternative investments include: 1) venture capital, 2) real estate, 3) regional or mutual funds, 4) resource investments, 5) debt obligations not specifically permitted by law, and 6) international securities. For the first four types of alternative investments, SBI's participation is limited to 20 percent of an investment vehicle. In addition, there must be at least four other unrelated owners of each investment. SBI's participation is generally restricted to limited partnerships, corporations, or certain types of funds.

Furthermore, statutes limit the percentage of a fund which can be invested in stocks or alternative assets. No more than 85 percent of a fund's market or book value, whichever is less, can be invested in alternative assets and stocks, adjusted for realized gains and losses. Alternative investments are themselves limited to no more than 35 percent of a fund's market value.

These limitations have changed over the last ten years. In fact:

- **Current investment limitations are much less restrictive than those in effect at the beginning of the 1980s.**

In 1980, alternative investments were not generally permitted, and a retirement fund could hold no more than 50 percent of its book value in stocks. In addition, most stocks had to be from companies which had paid dividends in each of the previous five years. These restrictions were loosened considerably in the early 1980s and loosened more in 1987 and 1988.

Prior to 1984, the Permanent School Fund was limited to no more than 20 percent stocks and 40 percent corporate bonds meeting certain quality standards. However, those restrictions were eliminated by a constitutional amendment

4 *Minn. Stat.*§11A.09.

5 *Minn. Stat.*§11A.24.

passed in November 1984. The Permanent School Fund is now subject to the same restrictions placed on retirement funds.

The Board has chosen to place some additional restrictions on its investments. For example, the Board does not purchase stocks of companies that derive more than 50 percent of their revenues from liquor or tobacco. In addition, since 1985, SBI has pursued a policy of "divestment through attrition" with respect to holdings of companies doing business in South Africa or Namibia. SBI staff expects that all remaining holdings of such companies in SBI's actively-managed stock portfolio will be eliminated by March 1, 1991.

INVESTMENT MANAGEMENT

The State Board of Investment has generally established investment objectives, a management structure, and an investment strategy for each fund under its control. In this section, we examine the current investment objectives, management structure, and strategy for each fund, as well as how they have changed over the past decade.

Basic Retirement Funds

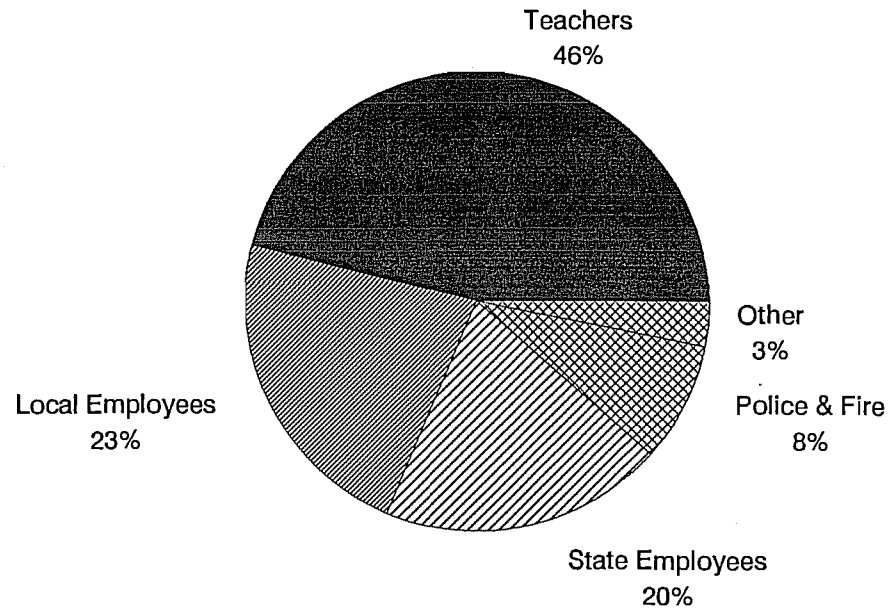
The Basic Retirement Funds consist of the pension assets of the currently working participants in eight statewide retirement funds. The Basic Funds serve as the accumulation pool for the pension contributions of public employees and employers during the employees' working years. At the time of retirement, adequate funds are transferred to the Post Retirement Investment Fund to pay a defined benefit pension for each retiree. As of June 30, 1990, about 250,000 active employees were participating in the Basic Funds, which had a market value of $7.1 billion. Figure 1.2 shows the composition of the Basic Funds by individual retirement funds.

Investment Objectives

The principal objective of the State Board of Investment with respect to the Basic Funds is to ensure that adequate funds are available to finance promised retirement benefits. The state has set employee and employer contribution rates so that contributions, plus investment earnings averaging at least 8.5 percent annually over time, will be sufficient. Consequently, SBI seeks to obtain a minimum annualized return of 8.5 percent.

SBI has a long investment time horizon since pension assets typically accumulate in the Basic Funds for an employee's 30 to 40 years of service. As a result, SBI seeks to take advantage of the greater returns offered by common stocks. To counter the short-term volatility of common stock returns, the Board also invests in other asset classes such as bonds and real estate.

Figure 1.2: Funds in the Basic Retirement Funds, FY 1990



Source: State Board of Investment.

The Board has established three specific long-term investment objectives for the Basic Funds. The Board expects that the Basic Funds will:

1. provide real returns,
2. exceed market returns, and
3. exceed median fund returns.

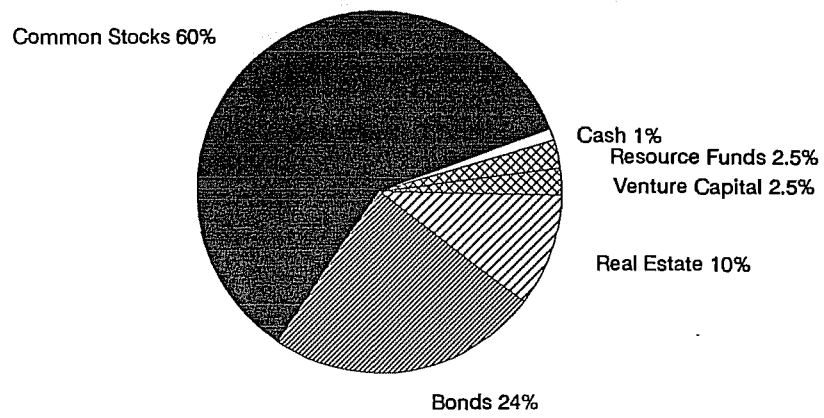
In particular, the Basic Funds are expected to generate total returns that are three to five percentage points greater than the inflation rate annually, when measured over a ten-year period. Over a five-year period, the Basic Funds should outperform a composite of market indices weighted according to SBI's long-term asset allocation policy. Furthermore, over a five-year period, the Basic Funds should outperform the median fund from a representative universe of public and private funds with a balanced portfolio of stocks and bonds.

Asset Mix

In accordance with these objectives, SBI has established policy targets for the asset classes held by the Basic Funds. As Figure 1.3 shows, the funds' desired asset mix is 60.0 percent domestic stocks, 24.0 percent domestic bonds, 10.0 percent real estate, 2.5 percent venture capital, 2.5 percent resource funds (oil and gas), and 1.0 percent cash equivalents.

The Board has approved the addition of international stocks to the Basic Funds. When an implementation plan is presented and approved, the Board

Figure 1.3: Asset Allocation Targets for the Basic Retirement Funds, 1990



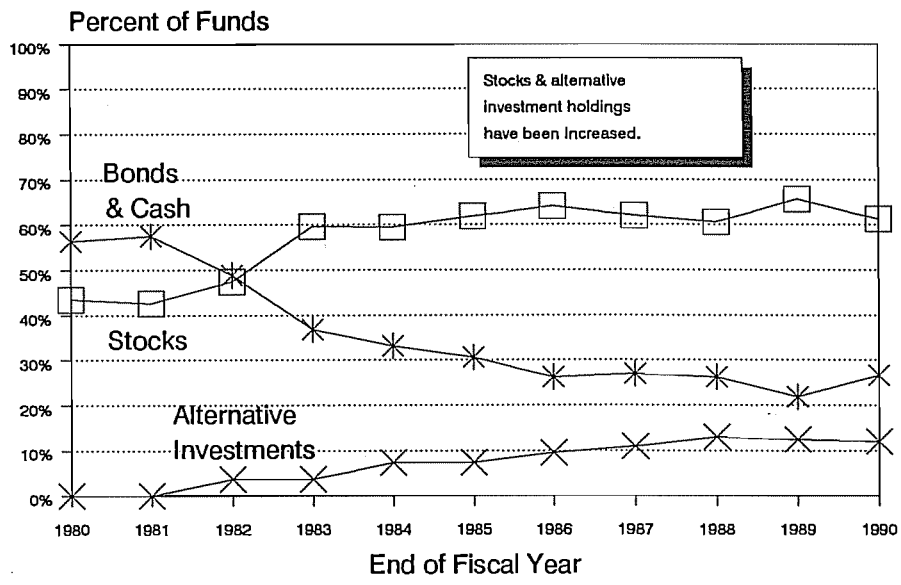
Source: State Board of Investment.

has indicated that 10 percent of the Funds will be allocated to international stocks and the domestic bond allocation will be lowered to 14 percent.

The Board does not attempt to "time" the markets for various asset classes by shifting the asset mix in response to changing financial market conditions. Instead, the Board attempts to keep the actual asset mix of the Basic Funds reasonably close to the targeted mix without incurring excessive transactions costs. The Board requires staff to review the actual asset mix monthly and to rebalance the funds' actual asset mix quarterly if an asset class is more than 10 percent off from its target. For example, if stocks become more than 66 percent or less than 54 percent of the funds' market value, then the asset mix must be rebalanced. For deviations in the 5 to 10 percent range, staff has discretion over rebalancing. Rebalancing of liquid asset classes (stocks, bond, and cash) can be accomplished quickly. However, rebalancing of illiquid asset classes (real estate, venture capital, and resource funds) takes more time because of the difficulty of raising cash from, or investing cash in, these asset classes. If an illiquid asset class is overweighted, new cash flow is withheld until the overweighting is corrected. In the case of underweightings, money is invested in the underweighted asset class as appropriate opportunities arise. Underweightings in venture capital are temporarily invested in stocks, while underweightings in real estate and resource funds are invested in bonds in the meantime.

The actual asset allocation mix has changed significantly since the beginning of the decade. As Figure 1.4 illustrates, stock holdings grew from 44 percent of the Basic Funds' market value at the end of fiscal year 1980 to 61 percent at the end of fiscal year 1990. Alternative investments (real estate, venture capital, and resource funds) were not held until fiscal year 1983 but now constitute 12 percent of the Funds' market value. These changes were the result of the significant statutory changes in 1981 that loosened a number of invest-

Figure 1.4: Changes in Asset Allocation for the Basic Retirement Funds, 1980-90



Source: State Board of Investment.

ment restrictions and the Board's subsequent reformulation of the Basic Funds' investment strategy and asset mix policy in 1983.

Table 1.2 shows that, over the last five years, the Basic Funds' asset mix has been relatively stable. Venture capital, though small as a part of the overall portfolio, has grown. Common stock holdings, largely due to relatively favorable financial markets, have generally remained above the 60 percent asset allocation target. First cash, and now bonds, were overweighted relative to their policy targets. This is in part due to the underweighting of real estate and resource funds, which was earlier offset by additional cash holdings and now is offset by additional bond holdings.

Table 1.2: Asset Mix of the Basic Retirement Funds, 1986-90

		Percent of Market Value (at end of FY)				
	Policy Target	1986	1987	1988	1989	1990
Common Stocks	60.0%	64.1%	62.1%	60.6%	65.7%	61.3%
Bonds	24.0	23.7	21.2	22.5	20.8	25.9
Real Estate	10.0	7.3	7.9	8.9	7.9	7.4
Venture Capital	2.5	1.4	1.8	2.6	2.9	3.4
Resource Funds	2.5	0.9	1.3	1.5	1.5	1.2
Unallocated Cash	1.0	2.6	5.7	3.9	1.2	0.8
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: State Board of Investment.

Management Structure

Along with changes in the Basic Funds' asset mix, the Board made significant changes to the management structure beginning in 1983. In particular:

- **The Board transformed the Basic Funds in 1983 from an internally-managed portfolio to one that is entirely managed by private, external managers.**

The Board restructured the Basic Funds in 1983 and 1984.

In transforming the management structure, the Board has also indexed a significant portion of the Basic Funds' stock and bond portfolios. Since fiscal year 1984, the Board has utilized a passive stock manager to index at least half of the Basic Funds' stock portfolio to the Wilshire 5000 Equity Index. Currently, 60 percent of the stock portfolio is passively managed. Since 1989, the Board has utilized two semi-passive bond managers to add incremental value to the Salomon Broad Investment Grade Index. Although these managers do not completely index their portfolios, their performance is expected to be very close to that of the Salomon Broad Index. About 50 percent of the Basic Funds' bond portfolio was invested by the two semi-passive managers at the end of fiscal year 1990. On an ongoing basis, at least half of the bond portfolio will be allocated to semi-passive managers. Overall:

- **About half of the Basic Funds is passively or semi-passively managed.**

As of June 30, 1990, the Basic Funds also had 11 active stock managers and 5 active bond managers.[6] SBI's alternative investments included 12 different real estate investments, 8 resource funds, and 16 venture capital investments.[7] Cash equivalents are invested in a short-term fund managed by State Street Bank and Trust, the Basic Funds' master custodian.

Post Retirement Investment Fund

The Post Retirement Investment Fund finances the monthly annuities paid to retired public employees covered by nine statewide pension plans.[8] Public employees covered by these plans are promised benefits based on their years of service and their "high five" average salaries. When an employee retires, an actuarially sufficient amount of funds (less a 5 percent discount) is transferred from the Basic Funds to the Post Fund in order to pay the retiree's fixed monthly annuity. The Post Fund must earn an average of 5 percent annually to support the promised benefits. To the extent that realized earnings of the Post Fund exceed 5 percent each year, eligible retirees receive a permanent benefit increase.

The Post Fund has grown considerably over the 1980s due to a substantial number of retirements and the resulting inflow of funds from the Basic Retirement Funds. As of June 30, 1990, the Post Fund had a market value of $5.3

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6 One of the active bond managers was subsequently terminated.

7 Since June 1990, SBI approved three additional real estate investments and three additional venture capital commitments.

8 The Post Fund includes the retired employees covered by the eight plans in the Basic Retirement Funds as well as the Legislators Retirement Plan.

billion covering over 60,000 participating retirees. The value of the fund is almost five times the value ten years earlier, when the fund's value was only $1.1 billion.

Investment Objectives

The Post Fund requires a different investment approach than the Basic Funds because of its shorter time horizon and the statutory formula for granting permanent benefit increases. Unlike the Basic Funds, the Post Fund does not simply accumulate and invest assets over a 30 to 40 year time period. The Post Fund must be able to pay benefits on an ongoing basis, as well as earn an average of five percent annually. The five percent does not have to be realized each and every year since the size of the fund and its generally favorable cash flow can permit the fund to pay promised benefits without realizing five percent in earnings each year.

However, unless the fund realizes earnings of at least five percent in a given fiscal year, no permanent benefit increase is paid to eligible retirees during the next calendar year. State law requires that benefit increases each year be based on the amount of realized earnings in excess of five percent. Realized earnings include interest and dividend income as well as the capital gains (or losses) on the sale of stocks, bonds, or other investments. As a result, unrealized increases in the market value of stocks and bonds have no immediate effect on benefit increases. Only in the year that securities are sold does the increase (or decrease) in market value affect benefit increases.

Thus, state law provides the State Board of Investment with the following dilemma:

- **Investing more in stocks would provide greater benefit increases over the long run, but more volatility in the increases and no guarantee of an increase each year.**

- **Investing more in bonds will provide lower benefit increases over the long run, but more stability and probably would result in some increase each year.**

Holding more stocks would probably result in greater benefit increases for retirees over the long run due to stocks' greater historical returns than bonds. However, much of the return to stocks comes from appreciation in their market value; and those returns vary considerably year to year. Since benefit increases are based solely on realized earnings, holding more stocks would result in more volatile benefit increases. In some years there might be no increase, while in other years retirees could see very substantial benefit increases. Holding more bonds would result in more stability since the interest realized on bonds is generally higher in percentage terms than the dividends realized on stocks. In addition, if mostly bonds are held, some benefit increase will be paid each year unless interest rates drop below five percent.

Faced with this choice, the Board has chosen the greater stability, though lower long-term returns, that bonds offer. Specifically:

- **The Board's objective for the Post Fund is to generate at least eight percent realized earnings each year so that retirees will receive a permanent benefit increase of at least three percent every year.**

Asset Mix

Less than 10 percent of the Post Fund is invested in stocks.

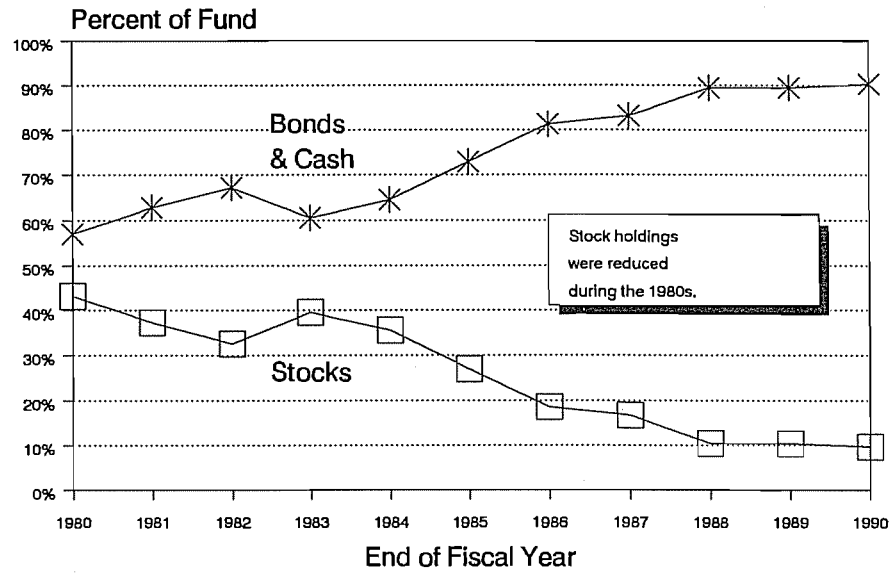
The Board has designed the asset mix of the Post Fund to generate the sizable, stable earnings stream necessary to accomplish the Board's objective. Consequently:

- **The Board invests the vast majority of the fund in high-quality bonds of various maturities.**

As of June 30, 1990, 84 percent of the fund's market value was in bonds, 10 percent in stocks, and 6 percent in cash equivalents. However, stocks have not always played such an insignificant role in the fund. Figure 1.5 illustrates that:

- **Stock holdings in the Post Fund were reduced substantially during the 1980s.**

Figure 1.5: Changes in Asset Allocation for the Post Retirement Fund, 1980-90



Source: State Board of Investment.

Stock holdings represented 43 percent of the fund's market value at the end of fiscal year 1980 and were still as high as 36 percent of the fund at the end of fiscal year 1984. In the last five years, however, stock holdings were reduced to under 10 percent of the fund.

The reduction in stock holdings occurred because of a substantial decline in interest rates during the mid-1980s. As interest rates fell, the fund's bonds generated less interest. Consequently, SBI staff reduced the stock share of the portfolio so that the fund could continue to generate a reasonably stable stream of realized income. Future interest rate declines will result in a further shrinking of the stock portfolio, while increases in interest rates will permit the fund to add more stocks.

The fund's bonds are in a dedicated bond portfolio. A dedicated bond portfolio is a collection of bonds designed to generate cash flows from interest earnings and principal repayments which match a particular stream of liabilities. The Post Fund's dedicated bond portfolio attempts to generate cash flows that match the Fund's need to pay benefits to retirees. The dedicated bond portfolio ensures that funds are available at the required times to meet promised benefit payments. It also generates enough interest to ensure at least a minimum benefit increase of three percent, provided that bond yields are at least eight percent annually. If bonds yield more than eight percent or stock investments do well, as happened in recent years, the fund is able to pay more than the three percent increase.

Generally, bonds in the portfolio are not sold before maturity. As a result, the fund does not realize any capital gain or loss on its bonds. The total earnings on its bond portfolio are limited to the interest realized on the bonds.

Management Structure

SBI staff manage virtually all of the Post Fund's assets. Staff invest the fund's stocks, bonds, and cash equivalents. The only external manager involved is responsible for improving the return on a portion of the small cash portfolio. This manager employs a low-risk strategy of simultaneously buying and selling stock index futures contracts.[9]

There are two reasons for relying almost exclusively on internal management given state law and the Board's chosen objective. First, management of a dedicated bond portfolio requires little turnover of assets and limited discretion in bond selection. As a result, internal management is cost effective. Second, due to the statutory formula governing benefit increases, the manager of the fund's stock portfolio must be concerned with generating dividend income and avoiding realized losses. Since most external investment managers do not normally manage portfolios under such constraints, SBI staff have managed the fund's stock portfolio. Using computer models, staff select stocks that are expected to have attractive, but not volatile, returns.

Supplemental Investment Fund

The $477 million Supplemental Investment Fund is a multipurpose investment program that offers a range of investment options to certain public employees. The fund serves the following purposes and employee groups:

- Investment manager for all the assets of the Unclassified Employees Retirement Plan.

9 Cash returns can be improved because of underlying mispricings of the contracts.

- Investment manager for assets of the supplemental retirement programs for state university and community college teachers and for Hennepin County employees.

- One investment option available to state employees participating in the Deferred Compensation Plan.

- External money managers for a portion of some local police and fire retirement plans.

Since the fund serves a number of different groups with diverse investment objectives, the fund is structured much like a family of mutual funds. Participants may divide their investments among the six accounts currently offered, subject to any statutory restrictions or rules established by the participating organizations. Like a mutual fund, participation in the Supplemental Fund is accomplished by purchasing or selling shares in each account.

The six current investment options are:

1. Income Share Account,
2. Growth Share Account,
3. Common Stock Index Account,
4. Bond Market Account,
5. Money Market Account, and
6. Guaranteed Return Account.

Each account serves a different purpose and, thus, has a different asset mix and management structure. Table 1.3 provides details on each account's size, purpose, long-term asset mix, and management structure. For the most part, the fund is invested by the same external managers who invest stocks, bonds, and cash equivalents for the Basic Retirement Funds. One exception is the bond portfolio in the Income Share Account, which is managed internally by SBI staff. The other exception is the Guaranteed Return Account, which is invested in three-year guaranteed investment contracts offered by major United States banks and insurance companies meeting specified quality criteria. The award of the contract by SBI is based on competitive bids received from qualified financial institutions.

Permanent School Fund

The Minnesota State Constitution created the Permanent School Fund as a long-term source of revenue for Minnesota's public schools. Proceeds from land sales, mining royalties, timber sales, and lakeshore and other leases are added to the fund. While the Department of Natural Resources generally manages the lands which generate additional principal for the fund, the State

Table 1.3: Objectives, Asset Mix, and Management Structure for Accounts in the Supplemental Investment Fund

Account	Market Value (End of FY 1990)	Objectives	Asset Mix	Management Structure
Income Share	$245 million	Maximum long-term rates of return consistent with limited short run return volatility	Stocks: 60% Bonds: 35% Cash: 5%	Stocks: External & Passive Bonds: Internal & Active Cash: External & Active
Growth Share	$74 million	Maximum capital appreciation (greater, but more volatile, returns than the Income Share Account)	Stocks: 95% Cash: 5%	Stocks: External & Active Cash: External & Active
Common Stock Index	$10 million	Match the performance of the United States stock market, as represented by the Wilshire 5000	Stocks: 100%	Stocks: External & Passive
Bond Market	$6 million	Exceed the performance of the bond market, as represented by the Salomon Broad Investment Grade Bond Index	Bonds: 100%	Bonds: External & Active
Money Market	$82 million	Preserve capital and earn competitive money market returns	Cash: 100%	Cash: External & Active
Guaranteed Return	$60 million	Provide participants with a fixed rate of return over a multi-year period with negligible risk to capital	Guaranteed Investment Contracts: 100%	Guaranteed Investment Contracts: External

Source: State Board of Investment.

Board of Investment is responsible for managing the assets of the fund once they are converted to cash.

The operation of the fund is governed by various statutory and constitutional restrictions. The Constitution requires that the principal of the fund remain

inviolate. In other words, only the income of the fund, not the principal, can be spent. Currently, the fund's income is used each year to offset the amount of General Fund appropriations necessary to finance state aid payments for elementary and secondary schools. During fiscal year 1990, investment income available for this purpose totaled $33 million.

Statutes further require that any net realized gains from stocks or bonds must be added to the principal. According to both statutes and the Constitution, however, any net realized losses must be subtracted from interest and dividend income before the income is distributed. Statutes also require that all interest and dividend income, net of realized losses, must be distributed in the year in which it is earned. Statutes permit any net realized loss from stock sales to be recovered from interest and dividend income over a five-year period. A net realized loss due to bond sales may be spread over a period reflecting the average remaining maturity of the bonds at the time of sale.[10]

SBI staff have argued that these legal accounting provisions constrain the management of the Permanent School Fund. Staff maintain that long run growth in its assets is "difficult to achieve without seriously reducing current spendable income and exposing the spendable income stream to unacceptable volatility."[11]

SBI eliminated stocks from the Permanent School Fund in 1985.

Consequently, the Board has decided to invest all of the fund's assets in fixed income securities. As of June 30, 1990, bonds represented 95 percent of the fund's market value, while cash equivalents accounted for the remaining 5 percent. The bond portfolio is very conservatively structured so as to avoid any significant risk due to changes in interest rates. SBI staff, who are responsible for investing all of the fund's assets, apply a buy-and-hold, laddered maturity approach to the bond portfolio. Staff have purchased bonds with uniformly staggered maturity dates and almost always hold the bonds to maturity. As a result:

- **The Permanent School Fund's portfolio has negligible capital risk but its return is limited to the interest on the bonds and short-term securities it holds.**

The fund has not always had such a conservatively structured portfolio. During the first half of the 1980s, the fund held about 20 percent common stocks. At that time, the Constitution limited stock holdings to no more than 20 percent of the fund and corporate bond holdings to 40 percent. In November 1984, Minnesota voters passed a Constitutional amendment that removed investment restrictions on the fund from the Minnesota Constitution. However:

- **Instead of increasing stock holdings, the State Board of Investment (on the advice of SBI staff and with the Investment Advisory Council's approval) eliminated stocks from the fund.**

Figure 1.6 shows that stocks were eliminated from the fund within one year of the amendment's passage.

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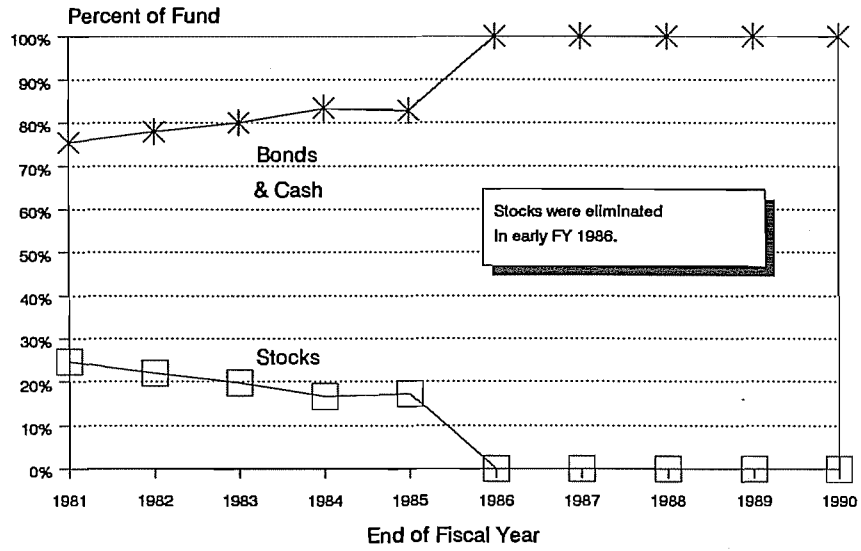
10 *Minn. Stat.* §11A.16. The *Minnesota Constitution,* Article XI, Section 8, requires that net realized losses be recovered from income, but is not specific about the period over which recovery can be spread.

11 Minnesota State Board of Investment, *1990 Annual Report,* 55.

Figure 1.6: Changes in Asset Allocation for the Permanent School Fund, 1981-90



Source: State Board of Investment.

State Cash Accounts

According to the Minnesota Constitution, the State Board of Investment is responsible for investing all state funds. As of June 30, 1990, state funds invested by SBI, other than retirement funds and the Permanent School Fund, totaled $3.0 billion. Table 1.4 shows that most of these funds are included in the $2.7 billion Treasurer's Cash Pool. Created in 1987, the Treasurer's Cash Pool contains the cash balances of numerous accounts necessary for the operation of state agencies. The pool combines these accounts so that SBI can more effectively manage and invest state agency funds. Among the larger accounts in the Treasurer's Cash Pool during fiscal year 1990 were the State's General Fund, the Trunk Highway Fund, the County State Aid Highway Fund, the Municipal State Aid Street Fund, and the Northeast Minnesota Economic Protection Trust Fund.

Table 1.4: State Cash Accounts, End of FY 1990

Account	Amount (in Millions)
Treasurer's Cash Pool	$2,655.3
Housing Finance Agency Accounts	183.3
Bond Proceeds and Refunding	64.7
Retirement Fund Assets Not Yet Certified for Investment	56.1
Debt Service Fund	25.2
Public Facilities Authority Bond Proceeds	15.7
Greater Minnesota Corporation	4.8
Master Lease	1.6
Total	$3,006.7

Source: State Board of Investment.

State cash accounts are invested by SBI staff. By law, these accounts must be invested in debt obligations. SBI's objective is to provide competitive money market returns while preserving capital. Consequently, the staff generally invests cash accounts in short-term, liquid, high-quality debt securities. These securities include commercial paper, United States Treasury and agency issues, repurchase agreements, bankers acceptances, and corporate notes. Table 1.5 shows that the Treasurer's Cash Pool had an average maturity of 213 days and held 40 percent commercial paper and 46 percent United States Treasury and agency issues as of June 30, 1990. During fiscal year 1990, the pool had an average daily balance of $2.2 billion.

Table 1.5: Statistics on the Treasurer's Cash Pool

Composition (on 6/30/90)	Percent
Commercial Paper	40.1%
U.S. Agencies	27.2
U.S. Treasuries	19.4
Corporate Notes	7.9
Repurchase Agreements	5.5
	100.0%
Average Maturity (on 6/30/90)	213 days
Average Daily Balance (FY 1990)	$2.2 billion

Source: State Board of Investment.

Summary

SBI is responsible for investing two large retirement funds, one multipurpose retirement fund, the Permanent School Fund, and various state cash accounts. All of the Basic Retirement Funds and most of the Supplemental Investment Fund are invested by external managers hired by the Board. The Permanent School Fund, state cash accounts, and virtually all of the Post Retirement Investment Fund are invested by SBI staff. Table 1.6 shows that 54 percent of the funds under SBI's control were managed internally as of June 30, 1990. However, internal management is primarily used for bonds and cash equivalents. More than 95 percent of the cash equivalents and 72 percent of the bonds are managed internally. On the other hand, all the alternative assets and 90 percent of the stocks are invested by external managers.

Overall, 42 percent of the assets held by SBI are invested in bonds. Another 31 percent is invested in common stocks, while 22 percent is in cash equivalents. The final 5 percent consists of the alternative assets held by the Basic Retirement Funds.

Finally, we note that approximately 23 percent of all the assets under SBI's control are passively or semi-passively managed. These assets are basically indexed to a financial market index and expected to perform much like the index. In addition, another 30 percent--namely, the bond portfolios in the Permanent School Fund and Post Retirement Investment Fund--are not actively managed in the classic sense. Bonds in these portfolios are generally held to maturity. These bond portfolios are not managed for total return but rely principally on interest alone to provide earnings.

Table 1.6: Market Value (in 1,000s) of Funds by Type of Investment, End of FY 1990

	Cash Equivalents		Bonds		Stocks		Alternative Assets		All Assets		
Fund	Internal	External	Internal	External	Internal	External	Internal	External	Internal	External	Total
Basic Retirement	$ 0	$57,383	$ 0	$1,840,395	$ 0	$4,357,920	$ 0	$844,609	$ 0	$7,100,307	$ 7,100,307
Post Retirement	312,337	0	4,512,159	0	514,033	0	0	0	5,338,529	0	5,338,529
Supplemental	0	103,413	79,144	66,495	0	227,629	0	0	79,144	397,537	476,681
Subtotal: Retirement Funds	$ 312,337	$160,796	$4,591,303	$1,906,890	$514,033	$4 ,585,549	$ 0	$844,609	$5,417,673	$7,497,844	$12,915,517
Percent of Retirement Funds	2.4%	1.2%	35.6%	14.8%	4.0%	35.5%	0.0%	6.5%	41.9%	58.1%	100.0%
Permanent School Fund	18,229	0	358,957	0	0	0	0	0	377,186	0	377,186
State Cash Accounts	3,006,778	0	0	0	0	0	0	0	3,006,778	0	3,006,778
TOTALS	$3,337,344	$160,796	$4,950,260	$1,906,890	$514,033	$4,585,549	$ 0	$844,609	$8,801,637	$7,497,844	$16,299,481
Percent of All Funds	20.5%	1.0%	30.4%	11.7%	3.1%	28.1%	0.0%	5.2%	54.0%	46.0%	100.0%

Source: State Board of Investment.

INVESTMENT PERFORMANCE

Chapter 2

In this chapter, we examine the investment performance of the funds and accounts under the State Board of Investment's control. In particular, we address the following questions:

- **How does SBI's investment performance compare to the general performance of financial markets during the 1980s?**

- **How does the state's investment performance compare to similar funds managed by others?**

In most instances, we utilize SBI's own established performance measures in evaluating investment performance. In several instances, however, we employ additional performance measures. This is particularly true for the Basic and Post Retirement Funds. Since most pension funds are not split into two funds, the best way to see the effect of the division of funds on investment results is to combine the two funds' performance and compare the combined performance to other pension funds.

In general, we found that the rates of return on Minnesota's combined retirement funds trailed those earned by other tax-exempt investors over the last ten years. However, Minnesota's relative performance improved in the last five years following SBI's restructuring of the Basic Retirement Funds.

In the 1980s, SBI's bond performance was adequate, but its stock performance trailed stock market indices and other investors due to the overweighting of small, growth-oriented stocks in its stock portfolio. Performance of the combined Basic and Post Funds, as well as the Permanent School Fund, also suffered due to an underallocation to stocks and an overallocation to bonds. Statutory constraints on the Post Retirement Fund and the Permanent School Fund were primarily responsible for this asset allocation problem.

FINANCIAL MARKETS IN THE 1980s

In absolute terms, the 1980s was a very good decade for investors.

- Stock and bond markets both provided double-digit annual rates of return during the 1980s.

United States stock markets, as represented by the Wilshire 5000 Equity Index, had an average annualized return of 15.9 percent over the ten-year period ending June 30, 1990. Bond returns, as represented by the Salomon Broad Investment Grade Bond Index (or Salomon BIG Index), were lower, averaging 11.8 percent per year. Real estate investments, as represented by the Wilshire Real Estate Index, did well during the early 1980s but cooled off considerably in the last several years. Over the full decade, real estate investments had an average annual return of 10.0 percent. Even 91-day Treasury bills--one of the safest and most liquid investments--provided a return far in excess of the rate of inflation. T-bills returned 9.2 percent per year while the inflation rate was only 5.0 percent annually. Table 2.1 shows the annual rates of return for various asset classes as well as annual inflation rates.[1]

Stocks were the best performing asset in the 1980s.

Figure 2.1 shows the effect of compounding these annual rates of return over the last 10 years. Stocks increased by 337 percent; bonds were up 204 percent; and 91-day Treasury bills returned 142 percent. In contrast, the Consumer Price Index (CPI) rose only 63 percent. This compounding means that $1.00 invested in stocks at the beginning of the period was worth $4.37 at the end. Similarly, $1.00 in bonds grew to $3.04, while $1.00 invested in T-bills rose to $2.42. The growth in the CPI indicates that goods and services which could be purchased for $1.00 during fiscal year 1980 cost $1.63 during fiscal year 1990.

Returns on financial assets during the 1980s were also high relative to historical trends. Over a 64-year period, stocks have increased at an annual rate of 10.3 percent while bonds increased 5.2 percent annually.[2] Falling interest rates, as well as a sustained period of economic growth, caused stocks and bonds to outperform their historical averages during the 1980s.

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1 All rates of return in this report are time-weighted and net of all external management fees, unless otherwise indicated. Time-weighted rates of return permit one to make straightforward performance comparisons among funds with different cash flows.

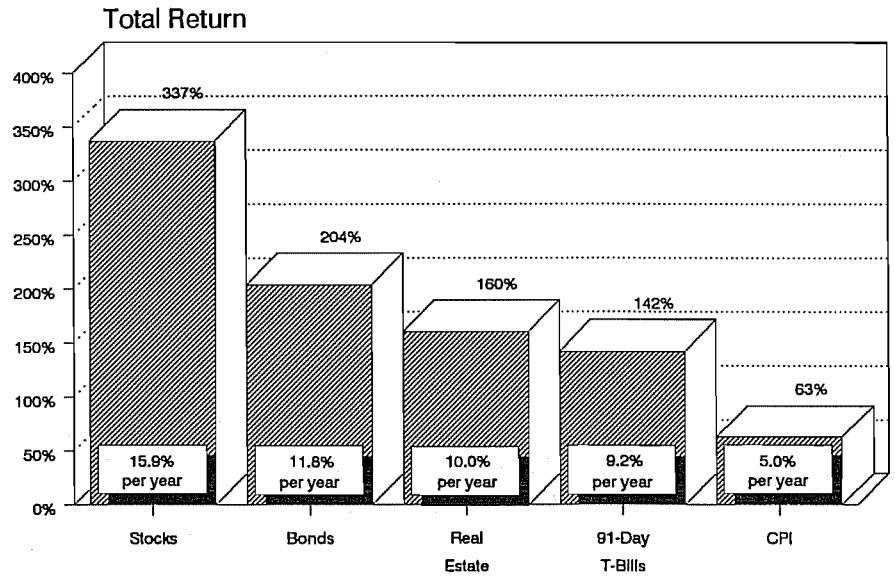
2 See Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: 1990 Yearbook*. Ibbotson Associates' stock index is based on the Standard and Poor's 500 Stock Index, while its bond index is based on the Salomon Long-Term High-Grade Corporate Bond Index. The Ibbotson results are for calendar years 1926 through 1989.

Table 2.1: Financial Market Performance, 1981-1990

Fiscal Year	Annual Rates of Return: Stocks: Wilshire 5000	Bonds: Salomon Broad Investment Grade Bond Index	Wilshire Real Estate Index	91-Day T-Bills	Consumer Price Index
1981	25.16%	-5.22%	16.08%	14.41%	10.41%
1982	-14.96	12.86	12.55	14.42	7.88
1983	66.52	29.73	10.45	9.20	5.05
1984	-8.69	1.78	14.99	10.06	4.12
1985	31.20	29.92	11.14	9.31	3.91
1986	35.26	19.87	8.71	7.27	2.88
1987	20.07	5.57	8.04	5.68	2.22
1988	-5.93	8.15	8.14	6.07	4.14
1989	19.49	12.22	7.64	8.21	4.62
1990	12.75	7.73	3.31	8.20	4.77
5-Year Periods					
FY 1981-85	16.25%	12.91%	13.02%	11.45%	6.26%
FY 1986-90	15.53	10.60	7.15	7.08	3.72
10-Year Period					
FY 1981-90	15.89%	11.75%	10.05%	9.24%	4.98%

Sources: State Board of Investment and United States Bureau of Labor Statistics.

Figure 2.1: Financial Market Performance, 1981-90



Source: State Board of Investment.

BASIC RETIREMENT FUNDS

Overall Performance

The very favorable financial markets of the last ten years enabled Minnesota's Basic Retirement Funds to earn double-digit rates of return. For fiscal years 1981 through 1990, the Basic Funds earned an annual return of 13.0 percent. As was true of the broader financial markets, the Basic Funds' best performing asset class was common stocks. The Basic Funds' stock portfolio gained 14.7 percent, while its bond portfolio rose 11.5 percent. Alternative assets, which were not held over the full 10-year period, did not perform as well. Over the last five years, SBI's real estate and venture capital investments gained 7.4 and 7.2 percent per year respectively, while its oil and gas investments lost an average of 2.2 percent annually.

The performance of the Basic Funds improved during the 1980s.

Table 2.2 compares the Basic Funds' rate of return to the three performance objectives established by the State Board of Investment. The table shows that:

- **The Basic Funds outpaced the rate of inflation by 8 percentage points over the last ten years.**
- **The Basic Funds' performance was below that of its composite index for the full 10-year period, but equaled the composite index's rate of return over the last five years.**
- **Excluding alternative assets, the Basic Funds did not perform as well as the average pension fund over the full 10-year period, but outperformed the average pension fund over the last five years.**

The Board's first objective is that the Basic Funds' performance should exceed the inflation rate by 3 to 5 percentage points over a 10-year period. The Basic Funds' 13 percent annual return exceeded the inflation rate of 5 percent by 8 percentage points.

The Board's second objective is that the Basic Funds' performance should exceed the return derived from a composite of market indices weighted according to SBI's policy targets for various asset classes. Currently, the composite index consists of: 1) the Wilshire 5000 stock index (60 percent weight); 2) the Salomon Broad Investment Grade (BIG) Bond Index (24 percent weight); 3) the return to 91-day Treasury bills (1 percent weight); 4) the Wilshire Real Estate Index (10 percent weight); 5) the actual return to SBI's venture capital investments (2.5 percent weight); and 6) the actual return to SBI's oil and gas investments (2.5 percent weight).[3] For the full 10-year period, the Basic Funds' 13.0 percent annual return fell short of the composite index's return of

3 The composite index shown in Table 2.2 used different weights over the 10-year period reflecting changes in SBI's asset allocation policy over the period. The actual returns for venture capital, oil, and gas investments are utilized in the composite index. Like other institutional investors, SBI has not yet found a suitable benchmark against which to measure its actual performance for these asset classes.

Table 2.2: Investment Performance of the Basic Retirement Funds, 1981-90

	Annual Rates of Return				
Fiscal Year	Basic Funds	Composite Index	Consumer Price Index	Basic Funds Excluding Alternative Assets	Median TUCS Balanced Fund
1981	7.13%	10.49%	10.41%	7.13%	12.02%
1982	1.95	-1.60	7.88	1.74	-0.53
1983	40.52	50.34	5.05	42.05	41.69
1984	-5.41	-3.51	4.12	-6.37	-2.25
1985	26.89	26.38	3.91	28.44	26.19
1986	26.20	25.64	2.88	28.91	25.26
1987	14.52	14.41	2.22	15.83	13.65
1988	-0.35	1.09	4.14	-0.80	1.33
1989	15.54	15.87	4.62	15.87	14.44
1990	10.67	9.56	4.77	11.84	9.97
Last 3 Years					
FY 1988-90	8.41%	8.67%	4.53%	8.72%	8.87%
5-Year Periods					
FY 1981-85	13.00%	14.79%	6.26%	13.24%	14.32%
FY 1986-90	12.99	13.03	3.72	13.93	13.30
10-Year Period					
FY 1981-90	13.00%	13.91%	4.98%	13.58%	14.17%

Sources: State Board of Investment and the United States Bureau of Labor Statistics.

13.9 percent. However, all of the shortfall came during the first half of the period when the composite index outgained the Basic Funds--14.8 percent annually compared to 13.0 percent. During the last five years, both the composite index and the Basic Funds gained 13.0 percent annually.

The Board's third objective is that the Basic Funds, excluding alternative assets, is expected to outperform the median return produced by a representative sample of other public and private pension and trust funds with a balanced asset mix of stocks and bonds. SBI compares the Basic Funds' performance to pension funds in the Wilshire Associates Trust Universe Comparison Service (TUCS), which includes returns from more than 800 public and private pension funds.[4] Alternative assets are excluded in the comparison since most funds reporting to TUCS do not report their returns on alternative assets. Table 2.2 shows that the Basic Funds' stock, bond, and cash investments underperformed the median TUCS fund during the first half of the 10-year period but outperformed the median fund during the second half of the period. Over the full period, SBI's return of 13.6 percent annually trailed the median pension fund's return of 14.2 percent.

4 All the funds in TUCS have a master custodian. Funds without a master custodian are not included in TUCS.

These data suggest that the Basic Funds' performance was below par during the first half of the 1980s but met or exceeded its goals during the second half of the 1980s. This improvement in relative performance reflects the changes SBI made in the investment structure and asset mix of the Basic Funds during fiscal years 1983 and 1984.

These preliminary observations will be reexamined after reviewing the relative performance of the Basic Funds' stock, bond, cash, and alternative asset portfolios. We will then show that the Basic Funds' performance, although considerably improved over the last five years, may not have been as good as these three indicators suggest.

Performance of Asset Classes

Tables 2.3, 2.4, and 2.5 provide rate of return data for the Basic Funds' various asset classes. Table 2.3 shows that:

- **The Basic Funds' stock portfolio underperformed both the general domestic stock market and the average pension fund manager.**

The Basic Funds' stocks underperformed the stock market.

Over the full 10-year period, SBI's stock portfolio rose 14.7 percent annually while the Wilshire 5000 and the S&P 500 gained 15.9 percent and 16.9 percent per year respectively. The median stock return among pension fund managers reporting to TUCS was 17.0 percent. Although the average annual difference between SBI's rate of return and that of other pension fund managers is relatively small (2.3 percent), it is important to note that these differences, when compounded over a long period of time, become significant. Figure 2.2 shows that the median return earned by other pension fund managers amounted to a 379 percent increase over 10 years, while the Minnesota Basic Funds' stock portfolio gained 294 percent. The increases in the Wilshire 5000 and the S&P 500 were 337 percent and 377 percent respectively.

SBI's stock performance was somewhat improved during the second half of the 1980s, although it still trailed market indices and the median pension fund manager. From fiscal 1986 through 1990, the performance of the Basic Funds' stock portfolio trailed the Wilshire 5000 by 0.5 percent annually and the median TUCS fund by 0.8 percent annually. During the five previous years, SBI's rate of return lagged behind the Wilshire 5000 by an average of 1.9 percent annually and the median TUCS fund by 2.2 percent per year.

Table 2.4 shows that:

- **The Basic Funds' bond portfolio underperformed the domestic bond market, while slightly outperforming the average pension fund manager.**

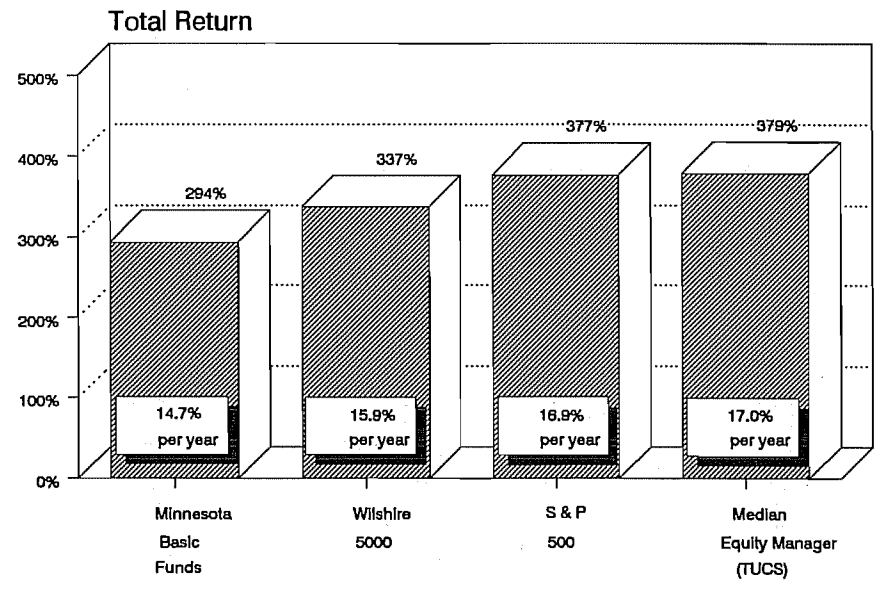
Over the last ten years, SBI's bond portfolio gained an average of 11.5 percent annually while the Salomon Broad Investment Grade (BIG) Bond Index increased 11.8 percent per year. The median bond return for pension fund managers was 11.4 percent.

Table 2.3: Performance of the Basic Funds' Stock Segment, 1981-90

Fiscal Year	Annual Rates of Return: Basic Funds' Stock Segment	Median TUCS Equity Fund	Wilshire 5000	S&P 500
1981	21.58%	23.65%	25.16%	20.47%
1982	-10.33	-8.67	-14.96	-11.42
1983	54.05	59.21	66.52	61.01
1984	-11.06	-8.50	-8.69	-4.60
1985	30.87	27.58	31.20	31.19
1986	33.77	33.07	35.26	35.83
1987	19.41	19.85	20.07	25.09
1988	-5.32	-4.17	-5.93	-6.90
1989	18.05	17.91	19.49	20.52
1990	12.91	12.43	12.75	16.27
Last 3 Years				
FY 1988-90	8.07%	8.82%	8.22%	9.27%
5-Year Periods				
FY 1981-85	14.35%	16.55%	16.25%	16.55%
FY 1986-90	15.05	15.84	15.53	17.26
10-Year Period				
FY 1981-90	14.70%	16.96%	15.89%	16.90%

Source: State Board of Investment.

Figure 2.2: Performance of the Basic Funds' Stock Portfolio, 1981-90



Source: State Board of Investment.

Table 2.4: Performance of the Basic Funds' Bond and Cash Segments, 1981-90

Fiscal Year	Annual Rates of Return: Basic Funds' Bond Segment	Median TUCS Bond Fund	Salomon BIG Bond Index	Basic Funds' Cash Segment	91-Day T-Bills
1981	-9.51%	-0.88%	-5.22%	NA	14.41%
1982	11.82	12.84	12.86	NA	14.42
1983	37.25	26.89	29.73	NA	9.20
1984	2.24	1.80	1.78	NA	10.06
1985	26.48	26.33	29.92	10.0%	9.31
1986	17.61	19.17	19.87	7.9	7.27
1987	7.94	5.83	5.57	7.0	5.68
1988	7.90	7.75	8.15	7.3	6.07
1989	12.07	11.90	12.22	9.1	8.21
1990	7.48	7.11	7.73	8.9	8.20
Last 3 Years					
FY 1988-90	9.13%	8.98%	9.35%	8.4%	7.49%
5-Year Periods					
FY 1981-85	12.42%	12.96%	12.91%	NA	11.45%
FY 1986-90	10.53	10.26	10.60	8.0	7.08
10-Year Period					
FY 1981-90	11.47%	11.43%	11.75%	NA	9.24%

Source: State Board of Investment.

As with stocks, SBI's relative bond performance improved during the second half of the 10-year period. The performance of the Basic Funds' bond portfolio trailed the Salomon BIG Index by 0.49 percent annually and the median pension fund manager by 0.54 percent annually for fiscal years 1981 through 1985. In the last five years, however, SBI's rate of return exceeded the median TUCS fund by 0.27 percent annually and trailed the Salomon BIG Index by only 0.07 percent per year.

Table 2.4 also provides data on the rate of return earned on the Basic Funds' cash equivalents. Over the last five years, the small cash segment of the Basic Funds earned an average rate of return of 8.0 percent. This rate of return compares favorably with the 7.1 percent annual return on 91-day Treasury bills earned over the same period. However, as we will examine later in this chapter in the section on cash management, the return on 91-day T-bills is not an appropriate benchmark for assessing cash management performance. Most cash portfolios, including SBI's, hold other cash equivalent assets that are riskier than 91-day T-bills. In addition, some cash portfolios have average maturities exceeding 91 days. As a result, many cash portfolios have returns exceeding that of 91-day T-bills.

Table 2.5 provides data on the returns to the Basic Funds' alternative investments. Rates of return are not available for the full 10-year period since SBI

Table 2.5: Performance of the Basic Funds' Alternative Investments, 1981-90

	Annual Rates of Return			
Fiscal Year	Venture Capital	Oil & Gas	Real Estate	Wilshire Real Estate Index
1981	NA	NA	NA	16.08%
1982	NA	NA	NA	12.55
1983	NA	NA	NA	10.45
1984	2.45%*	1.70%*	8.15%*	14.99
1985	2.93	4.34	8.84	11.14
1986	0.79	-15.62	9.08	8.71
1987	2.09	2.05	6.44	8.04
1988	8.97	15.63	7.28	8.14
1989	24.50	3.96	8.36	7.64
1990	1.38	-13.58	5.82	3.31
5-Year Period				
FY 1986-90	7.19%	-2.21%	7.39%	7.15%
6 Full Years				
FY 1985-90	6.47%	-1.14%	7.63%	7.80%

*Rates of return for the Basic Funds' alternative investments include only the last six months of FY 1984.

Source: State Board of Investment.

has not held these investments for the full period. The table shows that the Basic Funds' alternative investments have been weak performers relative to stocks and bonds over the last five years. SBI's real estate and venture capital investments gained 7.4 percent and 7.2 percent per year respectively, barely edging out the 7.1 percent increase for 91-day T-bills. SBI's oil and gas investments lost an average of 2.2 percent annually.

However, the relative performance of alternative investments over the last five years is not a cause for concern. First, the performance of SBI's alternative assets does not appear out of line with the performance of real estate, venture capital, and resource markets during this period of time. The return on SBI's real estate investments has generally been in line with the Wilshire Real Estate Index, an index of real estate funds available to pension fund managers.[5] In addition, the return of SBI's venture capital investments compares favorably with available venture capital indices.[6]

Second, both real estate and resource investments are held by the Basic Funds as a part of a diversification strategy designed to increase the Basic Funds'

5 SBI now uses the Wilshire Real Estate Index as a benchmark for the performance of its real estate investments.

6 SBI staff has investigated the availability of suitable benchmarks for the performance of its venture capital and resource investments and has found no comparable indices. Two of the available indices SBI rejected for venture capital are the First Chicago and Venture Capital 100 indices. Over the last five years, these indices gained 5.4 percent and 3.0 percent per year respectively, compared to 7.4 percent annually for SBI's venture capital investments.

long-term rate of return. These investments should not be expected to outperform stocks and bonds during good times for the stock and bond markets such as we have experienced over the last decade. During periods of weak stock and bond markets and high inflation, these alternative assets are likely to be strong performers and will help to increase the Basic Funds' rate of return.

Finally, the returns on alternative assets reflect, in part, the relative immaturity of SBI's holdings. Alternative investments such as SBI's are not generally expected to provide substantial returns in the first several years. Since SBI added many of these alternative investments in recent years, the low returns experienced over the last five years should not be surprising.

Analysis of Stock Returns

Of greatest significance to the Basic Funds' performance is the performance of its stock portfolio. Stocks are expected to comprise 60 percent of the Basic Funds' market value over the long run and, thus, will contribute significantly to the Basic Funds' rate of return.

The performance of SBI's stock portfolio, however, has been disappointing over the last decade. The stock portfolio's performance trailed that of the general stock market in the United States, as represented by the Wilshire 5000. In addition, SBI's stock portfolio underperformed those of most other pension funds, whose performance was better than the Wilshire 5000.

The primary reasons for the stock portfolio's underperformance are that:

- From fiscal year 1981 through most of fiscal year 1983, the Basic Fund's stock portfolio was unable to fully benefit from the superior performance of small company stocks; and

- Since 1983, the Basic Fund's stock portfolio has been overweighted with small, growth-oriented stocks, but the performance of such stocks has lagged the broader stock market in the last seven years.

During fiscal years 1981 and 1982 and much of 1983, the Basic Funds' stock portfolio underperformed the Wilshire 5000 because the portfolio was unable to fully benefit from the superior performance of small company stocks. SBI was prevented by law from holding more than five percent of a fund's book value in the stocks of companies not paying dividends over each of the previous five years. As a result, the internally-managed stock portfolio performed more like the S&P 500 than the Wilshire 5000 in the early 1980s.

In 1983, SBI began the process of converting from internal to external management of the stock portfolio, and thus creating a small stock bias. In March 1983, SBI transferred about one-third of its stock portfolio to a group of 11 active stock managers, who had generally favored small, growth-oriented stocks in the past. In December 1983, SBI transferred the remainder of its internally-managed stocks to a passive stock manager (Wilshire Associates). The passive manager attempts to match the performance of the Wilshire

5000, a group of stocks that is broadly representative of stock markets in the United States. As a result of these actions, the Basic Funds' stock portfolio became overweighted with small, growth-oriented stocks compared to the Wilshire 5000.

The relative performance of small stocks can best be illustrated by comparing the Frank Russell 1000 to the Frank Russell 2000, as shown in Table 2.6. The Frank Russell 1000 consists of the stocks of the 1000 largest companies in terms of total market capitalization in the domestic stock market, while the Frank Russell 2000 consists of the stocks of the 2000 next largest companies.[7] Over the full 10-year period, large stocks, as represented by the Frank Russell 1000, gained 16.1 percent per year. Small stocks, as represented by the Frank Russell 2000, gained 14.2 percent annually.

This relative underperformance of small stocks was not uniform throughout the entire decade. For fiscal years 1981 through 1983, small stocks significantly outgained large stocks, 33.6 percent annually compared to 19.6 percent. However, small stocks underperformed large stocks every year since then. For fiscal years 1984 through 1990, the Frank Russell 1000 rose an average of 14.7 percent annually, while the Frank Russell 2000 rose only 6.7 percent per year.

Table 2.6: Performance of Small and Large Capitalization Stocks, 1981-90

	Annual Rates of Return	
Fiscal Year	Frank Russell 1000	Frank Russell 2000
1981	20.84%	48.52%
1982	-13.32	-18.80
1983	63.44	97.50
1984	-7.31	-17.29
1985	32.45	20.83
1986	35.95	32.98
1987	20.97	8.99
1988	-6.14	-6.19
1989	20.32	12.73
1990	14.39	3.04
5-Year Periods		
FY 1981-85	16.02%	18.94%
FY 1986-90	16.27	9.57
10-Year Periods		
FY 1981-90	16.14%	14.16%
First 3 Years		
FY 1981-83	19.63%	33.55%
Last 7 Years		
FY 1984-90	14.68%	6.74%

Source: State Board of Investment.

7 Capitalization refers to the total market value of a company's stock.

The relative performance of small stocks can also be illustrated by comparing the performance of the Wilshire 5000 to the S&P 500. The S&P 500 is a group of stocks generally comprised of the 500 largest capitalization stocks in the domestic stock market. Since the Wilshire 5000 includes stocks in the S&P 500 plus all smaller domestic stocks, the Wilshire 5000 will tend to outperform the S&P 500 when small stocks outperform large stocks and will underperform the S&P 500 when small stocks underperform large stocks. For fiscal years 1981 through 1983, the Wilshire 5000 slightly outperformed the S&P 500 when small stocks performed strongly. For fiscal years 1984 through 1990, the performance of the Wilshire 5000 lagged behind that of the S&P 500. For the full ten-year period, the Wilshire 5000 gained 15.9 percent annually while the S&P 500 gained 16.9 percent per year.

The Basic Funds' stock portfolio resembled the S&P 500 during the first three years of the decade when the S&P 500 underperformed the Wilshire 5000. Then, for fiscal years 1984-90, the stock portfolio had a small stock bias relative to the Wilshire 5000. As a result, the Basic Funds' stock portfolio underperformed the Wilshire 5000, which in turn underperformed the S&P 500. Thus, the stock portfolio's underperformance relative to the Wilshire 5000 and the S&P 500 during the last ten years is largely explained by the portfolio's initial large stock bias during a period of strong small stock performance and its small stock bias during a period of weak small stock performance.[8]

SBI's stock underperformance was largely due to a small stock bias.

The performance of the Basic Funds' stock portfolio relative to other tax-exempt investors can also be explained by the portfolio's small stock bias. Over the last ten years, the median performer among stock portfolios reported to TUCS had a 17.0 percent annual increase. This performance was very close to the 16.9 percent annual increase in the S&P 500. Both exceeded the annual gain of 14.7 percent in the Basic Funds' stock portfolio. This result is due to the fact that a majority of pension fund managers (though a decreasing percentage of them) tend to focus on larger capitalization stocks. A majority of pension fund managers with passively-managed stock segments still index their holdings to the S&P 500. Thus, while SBI's portfolio has been overweighted since 1983 with small, growth-oriented stocks relative to the Wilshire 5000, most other pension fund managers had stock portfolios which were underweighted with such stocks relative to the Wilshire 5000.

Over the last seven years, the underperformance of the stock portfolio shows up most in the returns earned by the Basic Funds' active stock managers. As Table 2.7 illustrates, the active stock managers gained 11.8 percent annually over the seven full years active managers have been used by SBI. The performance of the active managers trailed the Wilshire 5000, which increased 13.8 percent over that period. In aggregate, the performance of the active

8 The switch to external management may also have cost the portfolio 1.0 to 1.5 percent of its principal during fiscal year 1983 and slightly less than 1.0 percent in fiscal year 1984. These costs include transactions costs incurred in selling and buying stocks and some opportunity costs incurred when part of the stock portfolio was temporarily in cash during a rising stock market in 1983. The magnitude of these costs, however, is insignificant compared to the portfolio's small stock bias in explaining the portfolio's underperformance.

Table 2.7: Performance of the Basic Funds' Active and Passive Stock Managers, 1983-1990

	Annual Rates of Return			
	Active Managers		Passive Managers	
Fiscal Year	Actual Return	Benchmark Return	Actual Return	Wilshire 5000
1981	NA	NA	NA	25.16%
1982	NA	NA	NA	-14.96
1983	11.69%*	NA	NA	66.52
1984	-13.07	-6.45	-5.86%**	-8.69
1985	30.28	29.50	31.61	31.20
1986	32.27	31.76	34.43	35.26
1987	17.55	19.45	20.22	20.07
1988	-4.26	-3.50	-5.71	-5.93
1989	13.89	16.11	19.40	19.49
1990	13.96	10.20	12.33	12.75
Last 3 Years				
FY 1988-90	7.51%	7.28%	8.14%	8.22%
Last 5 Years				
FY 1986-90	14.08%	14.21%	15.37%	15.53%
Last 6 Years				
FY 1985-90	16.63%	16.63%	17.93%	18.01%
Last 7 Years				
FY 1984-90	11.84	13.01%	NA	13.76%

*Covers only 3 months: April 1983 through June 1983.
**Covers only 7 months: December 1983 through June 1984.

Source: State Board of Investment.

managers also trailed that of their benchmark, which gained 13.0 percent annually.[9]

A reasonable argument can be made to throw out the first full year of experience with active stock managers. SBI and its staff were new to the business of hiring external managers in 1983 and have become better equipped in the selection of managers. If that first full year (fiscal year 1984) is omitted, then SBI's active stock managers have exactly met their benchmark. The performance of the active managers, as well as their benchmark return, was 16.6 percent annually over the last six years. This performance still trailed the performance of the passive stock manager (17.9 percent) and the Wilshire 5000

9 The benchmark return is representative of the return one would obtain if passively invested in those segments of the stock market in which the active managers invest. Thus, if the active managers' performance falls short of their aggregate benchmark return, it means that active management was inferior to passive management in those market segments during a particular period of time.

(18.0 percent) because of the overweighting of small, growth-oriented stocks in the active managers' portfolios. However, the data show that:

- **The overweighting of small stocks, and not active management itself, hurt SBI's stock performance over the last six years.**

SBI is gradually changing the Basic Funds' stock portfolio.

After study by its Advisory Council and staff, SBI recently decided to alter the Basic Funds' stock portfolio. SBI is retaining its active stock managers, but is altering its passively-managed index fund. The passive manager will be operating a "tilted" index fund, which will no longer perform like the Wilshire 5000. Instead, the tilted fund will be constructed so that, when combined with the active stock managers' benchmark portfolios, the overall market exposure of the Basic Funds' stock portfolio will generally approximate the Wilshire 5000. The only significant difference between the performance of the Basic Funds' stock portfolio and the Wilshire 5000 will be in how the fund's active managers perform relative to the segments of the market in which they invest.

In effect:

- **SBI has decided to eliminate its small stock bias relative to the Wilshire 5000 but retain active management on the belief that active management will provide better returns in some segments of the stock market.**

SBI will not be eliminating all of its small stock bias relative to most other pension funds. SBI's stock portfolio will behave much like the Wilshire 5000 while most other funds are not as broadly invested in small stocks as even the Wilshire 5000.

In Chapter 3, we will examine in greater detail SBI's decision to alter the Basic Funds' stock portfolio. In particular, we will examine the logic behind the continued use of active managers and the elimination of small stock bias relative to the Wilshire 5000.

Analysis of Overall Performance

Earlier we examined SBI's three performance goals for the Basic Funds. They are: 1) to beat the inflation rate by 3 to 5 percentage points, 2) to exceed the return from a composite index, and 3) to outperform the median TUCS balanced fund. We found that the performance of the Basic Funds exceeded the first goal by a wide margin, matched the return from SBI's composite index over the last five years but not over the full 10-year period, and exceeded the median return from TUCS balanced funds over the last five years but not over the full period.

In this section, we will examine these three performance goals in more detail. We discuss why the second goal is the most significant test of the Basic Funds' performance. In addition, we present data which show that the Basic Funds did not achieve the second goal even during the last five-year period.

The first goal is important in that, over the long run, the Basic Funds need to produce a rate of return in excess of the rate of increase in participants' salaries in order to pay projected pension costs.[10] To the extent that the rate of salary increases is related to the inflation rate, the Basic Funds must produce an average rate of return in excess of the inflation rate.

However, achieving this first goal is not a true test of performance. The Basic Funds exceeded the first goal during the 1980s because stock and bond markets were very favorable and the inflation rate was very low. The goal was achieved even though the Basic Funds' stock and bond portfolios underperformed the domestic stock and bond markets. Both the composite index and the average pension fund manager outperformed the Basic Funds during the 1980s, thus indicating that the Basic Funds performed well compared to inflation but not compared to the broader markets or other fund managers.

The third goal is a generally accepted performance target, but needs to be carefully interpreted when applied to Minnesota's retirement funds because of their atypical structure. Unlike most pension funds, Minnesota funds are split into two funds: one for the pension assets of active employees (the Basic Funds) and the other for the pension assets of retirees (the Post Fund). The Basic Funds hold most of the stocks and the Post Fund holds most of the bonds. Stocks now comprise 70 percent of the Basic Funds' market value, excluding alternative assets, while stocks are only 10 percent of the Post Fund's market value.

Most other pension funds are more balanced in their asset mix than Minnesota's Basic and Post Funds. Most funds combine the pension assets of both active employees and retirees into one fund. As a result, the asset mix of the typical pension fund reported to TUCS does not look like either of Minnesota's two funds. The median asset mix of funds reporting to TUCS is currently 51 percent stocks and 49 percent bonds and cash equivalents.

SBI chooses only to compare the Basic Funds' performance to the median performer among TUCS balanced funds. This sort of comparison will not tell much about how the Basic Funds performed since the results will be largely determined by general financial market conditions and not the Basic Funds' relative performance in various asset classes. When stock returns exceed bond returns, the Basic Funds should beat the median TUCS balanced fund. When stocks underperform bonds, the Basic Funds will underperform the median TUCS balanced fund. During the favorable conditions of the last five years, the Basic Funds outperformed the typical pension fund, even though the Basic Funds' stock portfolio underperformed the median TUCS stock manager by 0.79 percent annually. (See Table 2.8.)

A more appropriate comparison would be to compare the combined performance of Minnesota's Basic and Post Funds to the median TUCS balanced fund. This sort of comparison seems more reasonable since the typical pension fund reporting to TUCS serves the combined purposes served by Minnesota's two funds. Such a comparison should be made with the understanding, however, that the comparison reflects the effect of our unique fund structure, as well as the relative performance of various asset classes, on the combined rate of return.

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10 More specifically, the actuarial assumptions are that, over the long run, the rate of return will average 8.5 percent annually while public employees' salaries will increase 6.5 percent per year.

Table 2.8: Comparison of Basic Funds' Stock and Bond Performance to Benchmarks

	Annual Rates of Return			Annualized Difference Between Basic Funds' Stock Portfolio and:		Annual Rates of Return			Annualized Difference Between Basic Funds' Bond Portfolio and:	
Fiscal Year	Basic Funds' Stock Portfolio	Wilshire 5000	Median TUCS Stock Manager	Wilshire 5000	Median TUCS Stock Manager	Basic Funds' Bond Portfolio	Salomon BIG Bond Index	Median TUCS Bond Manager	Salomon BIG Bond Index	Median TUCS Bond Manager
5-Year Periods										
FY 1981-85	14.35%	16.25%	16.55%	-1.90%	-2.20%	12.42%	12.91%	12.96%	-0.49%	-0.54%
FY 1986-90	15.05	15.53	15.84	-0.48	-0.79	10.53	10.60	10.26	-0.07	+0.27
10-Year Periods										
FY 1981-90	14.70%	15.89%	16.96%	-1.19%	-2.26%	11.47%	11.75%	11.43%	-0.28%	+0.04%

Source: State Board of Investment.

The best performance test for the Basic Funds is the second SBI objective: a comparison to a composite index of market returns weighted according to the Basic Funds' long-term asset allocation weights. However, even this comparison needs to be done carefully. Table 2.8 shows that the Basic Funds' stock and bond portfolios both underperformed their respective benchmarks, the Wilshire 5000 and the Salomon BIG Index. Over the last five years, the stock portfolio underperformed the Wilshire 5000 by 0.48 percent per year. The bond portfolio underperformed the Salomon BIG Index by 0.07 percent per year.

These results appear inconsistent with our earlier observation that the Basic Funds equaled the performance of the composite index. It does not seem possible for the Basic Funds to beat its composite index when stock and bond portfolios comprising about 85 percent of the Funds' value failed to beat their market index benchmarks.

There are three reasons for this puzzling result. First, during most of this time, SBI staff included actual returns on alternative assets in the composite index, since they did not have appropriate market indices to use as benchmarks. Although this procedure would seem to be inconsequential, its use has biased the composite index downward. The returns on alternative assets are weighted according to their actual portfolio weights in calculating the Basic Funds' rate of return, but weighted according to their target weights in calculating the composite index. Over the last five years, alternative assets have comprised between 7 and 13 percent of the Basic Funds' market value but generally constituted 15 percent of the composite index.[11] Since the alternative assets have greatly underperformed stocks and bonds and are overweighted in the composite index, the net effect has been to unfairly reduce the composite index over the last five years.[12]

Table 2.9 provides a composite index that is based only on the Basic Funds' stock, bond, and cash portfolios. Alternative assets are excluded from both the composite index and the Basic Funds' return. The result is that:

- **The Basic Funds slightly underperformed the adjusted composite index over the last five years.**

During fiscal years 1986 through 1990, the Basic Funds (excluding alternative assets) had an average return of 13.9 percent versus 14.3 percent for the adjusted composite index. SBI's composite index, which includes alternative assets, showed a more positive result--namely, that the Basic Funds' performance matched the increase in the composite index.[13] Both composite indices show substantial improvement for the Basic Funds over the decade, but SBI's composite index shows more favorable performance in the last five years because it biases the composite index downward.

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11 In fiscal year 1986, alternative assets were 11.5 percent of the composite index. However, their actual portfolio weight was between 7 and 10 percent.

12 If alternative assets had outperformed stocks and bonds, the overweighting of alternative assets in the composite index would have had the opposite effect.

13 The adjusted composite index does not have any effect on the Basic Funds' relative performance during fiscal years 1981-85 since alternative assets were not generally overweighted in the composite index during that time period.

Table 2.9: Comparison of the Basic Funds' Performance to a Composite Index Excluding Alternative Assets, 1981-90

Fiscal Year	Annual Rates of Return: Basic Funds (Excluding Alternative Assets)	Annual Rates of Return: Composite Index (Excluding Alternative Assets)
1981	7.13%	10.49%
1982	1.74	-1.60
1983	42.05	50.34
1984	-6.37	-4.60
1985	28.44	28.97
1986	28.91	29.67
1987	15.83	16.15
1988	-0.80	-0.89
1989	15.87	17.21
1990	11.84	11.42
Last 3 Years		
FY 1988-90	8.72%	8.97%
5-Year Periods		
FY 1981-85	13.24%	15.00%
FY 1986-90	13.93	14.28
10-Year Period		
FY 1981-90	13.58%	14.64%

Source: State Board of Investment.

A second factor that biases the composite index downward is the use of the return on 91-day Treasury bills as a benchmark for cash equivalents. As commented earlier, the return on 91-day T-bills is not an appropriate benchmark for the cash portfolio. However, the effect of its use in SBI's composite index is limited. If cash had also been excluded from our composite index, the Basic Funds' relative performance would have decreased by about 0.04 percent annually over the last ten years.

A final factor affecting the Basic Funds' performance relative to SBI's composite index is that stocks were overweighted in the Basic Funds compared to the composite index over the last five years. The composite index weights stocks at 60 percent at the beginning of each three-month period. In actuality, stocks started the last five-year period at 62 percent of the Basic Funds' market value, went as high as 66 percent, and generally remained above 60 percent.[14] Since stocks were the best performing asset over the last five years, the Basic Funds' performance appears more favorable than if the composite were weighted just as are the Basic Funds.

14 At some points in time, stocks fell below 60 percent of the Basic Funds' market value. However, on average, stocks exceeded 60 percent over the last five years.

Since stocks are likely to outperform bonds and other assets over long periods of time, this factor will tend to work in SBI's favor. However, it will have the opposite effect if stocks are overweighted and the stock market returns are below those of other assets, or if stocks are underweighted and stock market returns are above those of other assets. Since SBI and its staff have some control over the asset mix through SBI's rebalancing policy, we have not adjusted for this factor.

POST RETIREMENT FUND

As we observed in Chapter 1, the Post Retirement Fund requires a different investment strategy than the Basic Funds due to the Post Fund's shorter time horizon and the statutory formula for determining post-retirement benefit increases. However, the State Board of Investment has chosen a particularly conservative approach to investing the Post Fund, which has resulted in the stock segment being reduced from 43 percent to 10 percent of the Fund's market value over the last ten years. The Board has chosen to forego the greater benefit increases that stocks would provide over the long run in order to reduce the volatility of benefit increases and guarantee some benefit increase each year.

The Post Fund performed well in the 1980s, but the 1990s are likely to be different.

Given SBI's investment strategy, the Post Retirement Fund has performed reasonably well. Table 2.10 shows that:

- **Over the last ten years, the Post Fund had realized earnings of 12.0 percent annually and provided benefit increases averaging 7.0 percent annually, while the average inflation rate was only 5.0 percent.**

Tables 2.11 and 2.12 provide data on the Post Fund's stock, bond, and cash segments. The bond and cash segments appear to have performed satisfactorily. The internally-managed stock segment has not done well compared to the S&P 500 and the Wilshire 5000 over the past five years.[15]

However:

- **The good performance of the Post Fund relative to inflation rates in the 1980s is not likely to continue into the 1990s unless investment strategy changes.**

During the 1980s, the Post Fund's performance benefited from three factors: 1) capital gains on its stock holdings, 2) relatively high interest rates earned on bonds purchased during the late 1970s and early 1980s, and 3) low inflation rates. As we enter the 1990s, these factors are unlikely to be present to the extent they were during the last ten years. The Post Fund's stock portfolio now

15 Tables 2.10, 2.11, and 2.12 all report some performance data based on total returns to the Post Fund or one of its asset classes. Although total return data are useful to review, total returns to the Fund and the bond segment will generally misrepresent the actual returns. Since SBI staff almost always hold bonds to maturity, the capital gains or losses on bonds, which are included in total return figures, are never realized. Since bonds gained significantly in value over the 1980s, total return figures reported overstate the actual or realized return on bonds.

Table 2.10: Post Retirement Fund's Realized Earnings and Total Return, 1981-90

	Annual Rates of Return			
Fiscal Year	Total Return	Realized Earnings*	Benefit Increase**	Consumer Price Index
1981	5.50%	12.4%	7.4%	10.41%
1982	3.17	11.9	6.9	7.88
1983	38.36	12.5	7.5	5.05
1984	-1.63	11.9	6.9	4.12
1985	30.57	12.9	7.9	3.91
1986	24.84	14.8	9.8	2.88
1987	5.10	13.1	8.1	2.22
1988	5.47	11.9	6.9	4.14
1989	17.35	9.0	4.0	4.62
1990	5.39	10.1	5.1	4.77
Last 3 Years				
FY 1988-90	9.26%	10.3%	5.3%	4.53%
5-Year Periods				
FY 1981-85	14.10%	12.3%	7.3%	6.26%
FY 1986-90	11.35	11.8	6.8	3.72
10-Year Periods				
FY 1981-90	12.72%	12.0%	7.0%	4.98%

*Realized earnings include interest, dividends, and net realized capital gains.

**Payable beginning January 1 of the following calendar year.

Source: State Board of Investment.

represents less than 10 percent of the Fund's market value. Even if the stock portfolio doubled in value and the capital gains were realized, benefits would only receive an extra 10 percent increase. Capital gains realized during the 1980s had a greater impact since stocks constituted a larger share of the Post Fund.

Interest rates have declined substantially since the late 1970s and early 1980s. As of June 30, 1990, the Post Fund's bond portfolio had a current yield at cost of only 8.4 percent. Absent any realized capital gains, the Post Fund would generate a benefit increase of 3 to 4 percent in the near term.

Finally, the inflation rate has shown signs of picking up. During the last half of calendar year 1990, the inflation rate was 6.1 percent on an annualized basis. Annual inflation rates have not been that high since 1982.

Consequently, the Post Fund is unlikely to see in the 1990s as good a performance relative to the inflation rate as it experienced during the 1980s. A committee of the Investment Advisory Council recognized this problem and staff from SBI and the retirement systems have developed an alternative to the current statutory formula for calculating post-retirement benefit increases. The

Table 2.11: Performance of the Post Fund's Stock Segment, 1981-90

	Annual Rates of Return			
Fiscal Year	Post Fund's Stock Segment	Post Fund's Benchmark	Wilshire 5000	S&P 500
1981	18.50%	NA	25.16%	20.47%
1982	-9.81	NA	-14.96	-11.42
1983	54.89	NA	66.52	61.01
1984	-9.32	NA	-8.69	-4.60
1985	33.88	NA	31.20	31.19
1986	19.43	NA	35.26	35.83
1987	15.65	NA	20.07	25.09
1988	-4.45	-5.45	-5.93	-6.90
1989	22.72	20.72	19.49	20.52
1990	3.00	5.73	12.75	16.27
Last 3 Years				
FY 1988-90	6.49%	6.47%	8.22%	9.27%
5-Year Periods				
FY 1981-85	14.98%	NA	16.25%	16.55%
FY 1986-90	10.78	NA	15.53	17.26
10-Year Period				
FY 1981-90	12.86%	NA	15.89%	16.90%

Source: State Board of Investment.

proposed formula would base benefit increases on a 5-year average of the Fund's total return rather than one year's realized earnings. The change would permit SBI to take advantage of the higher returns offered by stocks by smoothing out the volatility of stock returns through the 5-year averaging method. Under the proposal, SBI would allocate as much as 50 percent of the Post Fund to common stocks. In Chapter 3, we will examine the proposal in greater detail and will also review the mechanisms used in other state pension systems for providing post-retirement benefit increases.

BASIC AND POST FUNDS COMBINED

It is important to compare the performance of Minnesota's retirement funds to other public and private pension funds. However, as we noted earlier, Minnesota's retirement funds have a structure which is rare among pension funds. While most funds combine the retirement assets of both active employees and retirees into one fund, Minnesota splits the assets into two funds: the Basic Retirement Funds and the Post Retirement Fund.

Table 2.12: Total Return of Post Fund's Bond and Cash Segments, 1981-90

Fiscal Year	Annual Rates of Return: Post Fund's Bond Segment (Total Return)	Salomon BIG Bond Index	Post Fund's Cash Segment	Cash Enhancement Program	91-Day T-Bills
1981	-10.0%	-5.22%	NA	NA	14.41%
1982	10.19	12.86	NA	NA	14.42
1983	34.05	29.73	NA	NA	9.20
1984	2.84	1.78	NA	NA	10.06
1985	32.13	29.92	10.6%	NA	9.31
1986	29.09	19.87	8.2	NA	7.27
1987	3.15	5.57	7.1	NA	5.68
1988	7.01	8.15	7.4	8.35%	6.07
1989	16.87	12.22	8.8	8.65	8.21
1990	5.37	7.73	8.8	14.52	8.20
Last 3 Years					
FY 1988-90	9.63%	9.35%	8.3%	10.47%	7.49%
5-Year Periods					
FY 1981-85	12.55%	12.91%	NA	NA	11.45%
FY 1986-90	11.90	10.60	8.1	NA	7.08
10-Year Period					
FY 1981-90	12.23%	11.75%	NA	NA	9.24%

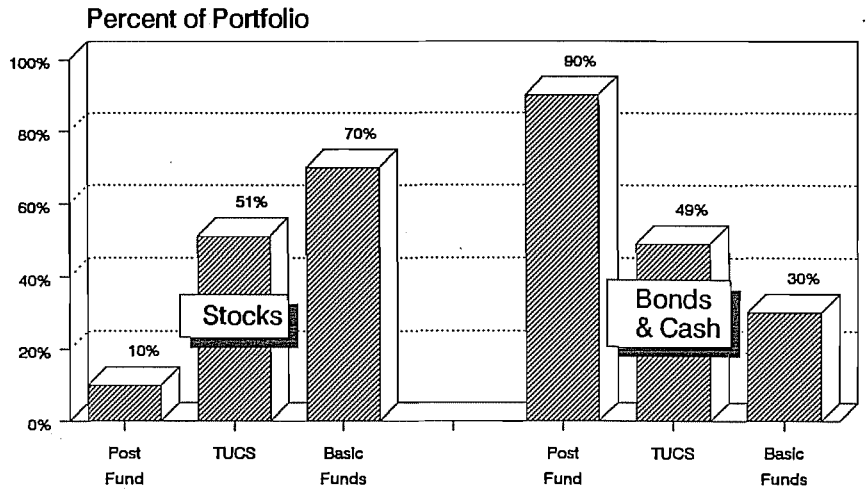
Source: State Board of Investment.

Minnesota's two funds serve quite different purposes and have very different asset mixes. The Basic Funds invest the retirement assets of active employees and hold 89 percent of the stocks held by the Basic and Post Funds combined. The Post Fund invests the assets used to pay benefits to retirees and holds 71 percent of the bonds held by the two funds.

In contrast, the typical pension fund serves both purposes out of one fund and consequently has a more balanced asset mix than either of Minnesota's funds. Figure 2.3 compares the asset mix of Minnesota's two funds to the median asset mix of balanced funds reported to TUCS. While 10 percent of the Post Fund and 70 percent of the Basic Funds (excluding alternative assets) were invested in stocks, the median allocation to stocks was 51 percent among TUCS balanced funds as of June 30, 1990.

As a result, the most appropriate comparison to other pension funds involves comparing the combined performance of Minnesota's Basic and Post Funds to the median performance of balanced funds reporting to TUCS. Comparing only the Basic Funds' performance (or the Post Fund's performance) to the median TUCS fund is inappropriate since the Basic Funds serve only one of

Figure 2.3: The Asset Mix of the Basic and Post Funds Compared to Other Pension Funds, End of FY 1990



Excludes alternative assets.
Source: State Board of Investment.

the two purposes served by most other funds. By combining the performance of Minnesota's two funds, one can compare funds serving similar purposes.[16]

Minnesota's retirement funds had lower rates of return than most pension funds.

SBI staff do not calculate the rates of return for the combined Basic and Post Funds. Consequently, we estimated the combined returns by weighting each fund's annual rate of return by the fund's market value at the beginning of each fiscal year.[17] Table 2.13 presents our results for the combined funds, as well as their combined stock and bond portfolios.

Overall, the data in Table 2.13 indicate that:

- **The performance of Minnesota's combined retirement funds trailed the median performer among other funds.**

Excluding alternative assets, Minnesota's combined rate of return was estimated to be 13.2 percent over the last 10 years, compared to 14.2 percent for the median TUCS balanced fund. For the last five years, Minnesota's combined rate of return was estimated to be 12.8 percent versus 13.3 percent for the median pension fund.

The underperformance of Minnesota's funds is due to two factors. First:

- **Minnesota's stock performance trailed that of most other pension fund managers.**

16 This comparison must be interpreted carefully, however, since Minnesota's funds are subject to statutory constraints not placed on other funds.

17 More frequent weighting, as would be done in calculating a true time-weighted rate of return, does not appear to change our results.

Table 2.13: Performance of the Combined Basic and Post Retirement Funds, 1981-90

	Estimated Annual Rates of Return						
Fiscal Year	Minnesota Retirement Funds	Minnesota Funds (Excluding Alternative Assets)	Median TUCS Balanced Fund	Minnesota Stock Portfolios	Median TUCS Equity Manager	Minnesota Bond Portfolios	Median TUCS Bond Manager
5-Year Periods							
FY 1981-85	13.4%	13.6%	14.3%	14.5%	16.6%	12.6%	13.0%
FY 1986-90	12.3	12.8	13.3	14.2	15.8	11.4	10.3
10-Year Period							
FY 1981-90	12.8%	13.2%	14.2%	14.4%	17.0%	12.0%	11.4%

Sources: State Board of Investment and Office of the Legislative Auditor's analysis.

Over the full 10-year period, the median TUCS equity fund gained 17.0 percent annually, while Minnesota's stock holdings had a 14.4 percent rate of return. To some extent, lower stock rates of return were offset by higher rates of return on bonds. The Minnesota funds had a 12.0 percent annual return on bonds compared to 11.4 percent for the median TUCS bond fund over the last 10 years.

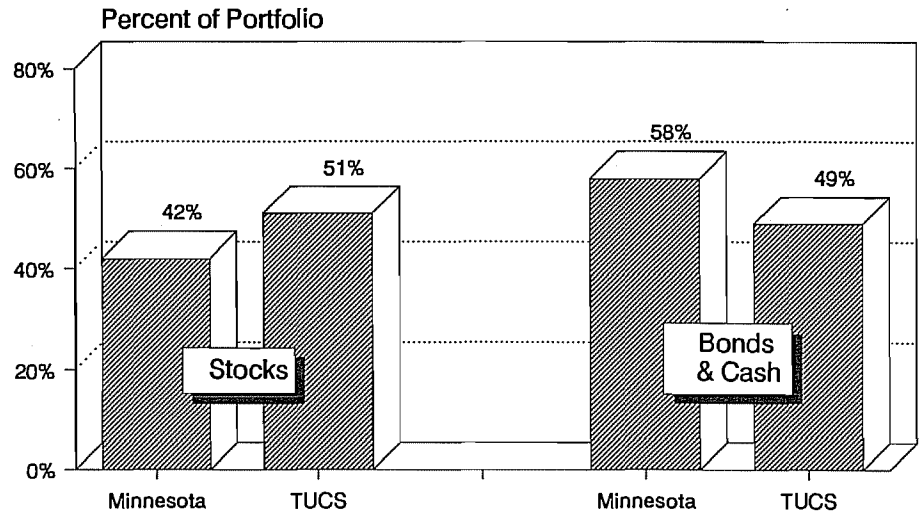
The second major factor affecting performance was asset mix. During the 1980s, stocks were the best performing financial asset. However:

- **Minnesota's combined retirement funds held fewer stocks and more bonds than the typical pension fund.**

Figure 2.4 shows that 42 percent of the market value of the combined Basic and Post Funds, excluding alternative assets, was in stocks and 58 percent was in bonds or cash equivalents on June 30, 1990. In contrast, the median asset allocation of TUCS balanced funds was 51 percent stocks and 49 percent bonds and cash equivalents.

The Basic and Post Funds hold fewer stocks than most pension funds.

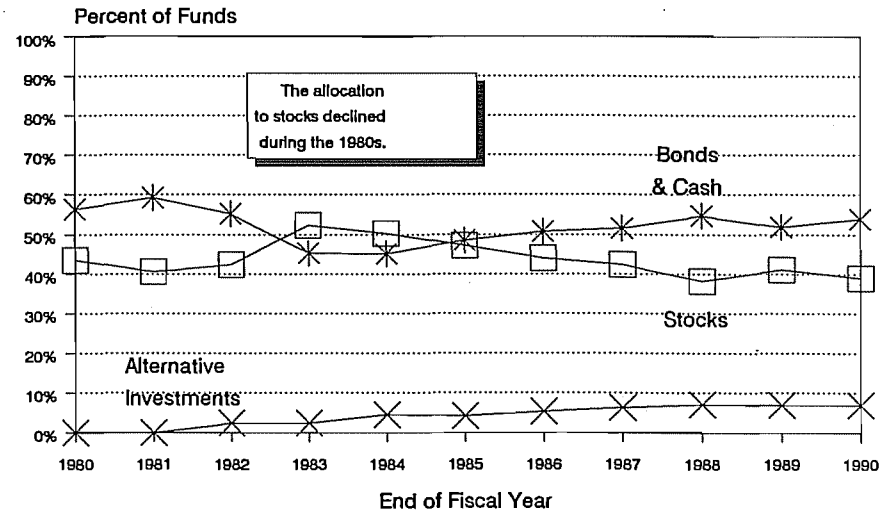
Figure 2.4: The Asset Mix of Minnesota's Combined Funds Compared to Other Pension Funds, End of FY 1990



Excludes alternative assets.
Source: State Board of Investment.

Figure 2.5 shows that the Basic and Post Funds increased their combined allocation to stocks in the early 1980s as SBI increased the stock allocation in the Basic Funds. However, as the Post Fund grew through retirements and interest rates fell, SBI substantially reduced the stock allocation in the Post Fund. The overall allocation to stocks fell below the level at which it started the decade.

Figure 2.5: Changes in Asset Allocation for the Combined Basic and Post Funds, 1980-90



Source: State Board of Investment.

We estimate that roughly half of the difference between the Minnesota funds' return and the median TUCS return over the last five years was due to lower rates of return earned by SBI. The other half of the underperformance was due to Minnesota's underallocation to stocks.

In large part, the underallocation to stocks is due to Minnesota's atypical retirement fund structure and its unique statutory formula for determining post-retirement benefit increases. As a result, that portion of the funds' underperformance is not attributable to the State Board of Investment or its staff, but is a consequence of the constraints under which they operate.

SUPPLEMENTAL INVESTMENT FUND

The Supplemental Investment Fund functions much like a family of mutual funds. Participants may allocate their investments among six investment options, subject to statutory restrictions and rules established by participating organizations. Each of the six different accounts has different investment objectives and asset mixes and must be evaluated separately.

The performance of the six accounts is assessed below. Overall, we found that:

- **The performance of the four newer accounts is in line with expectations.**

- **The Growth Share Account and the Income Share Account have underperformed their benchmarks due to sub-par stock performance, although the Income Share Account's performance has been satisfactory since its stock portfolio was indexed to the Wilshire 5000 in 1988.**

Income Share Account

The Income Share Account's long-term asset mix is 60 percent stocks, 35 percent bonds, and 5 percent cash. Since April 1988, its stock segment has been passively managed by Wilshire Associates, who attempt to match the performance of the Wilshire 5000. Prior to that, most of the stock segment was actively managed with a combination of internal and external management. The bond segment is managed by SBI staff, who attempt to beat the performance of the Salomon BIG Bond Index. The cash segment is invested by State Street Bank and Trust Company, the same cash manager used by the Basic Retirement Funds.

Table 2.14 reviews the performance of the income share account over the last ten years. It shows that:

- **The Income Share Account underperformed both its composite index and the median TUCS balanced fund over the last five-year and ten-year periods.**

Table 2.14: Performance of the Income Share Account, 1981-90

	Annual Rates of Return						
Fiscal Year	Income Share Account	Composite Index*	Median TUCS Balanced Fund	Income Share Stock Segment	Wilshire 5000	Income Share Bond Segment	Salomon BIG Bond Index
3-Year Period							
FY 1988-90	9.1%	9.1%	8.9%	8.1%	8.2%	9.6%	9.4%
5-Year Periods							
FY 1981-85	13.7%	15.1%	14.3%	15.2%	16.2%	13.4%	12.9%
FY 1986-90	11.7	13.8	13.3	12.4	15.5	10.5	10.6
10-Year Period							
FY 1981-90	12.7%	14.5%	14.2%	13.8%	15.9%	11.9%	11.8%

*The composite index is based on the following asset mix of stocks, bond, and cash: 50/45/5 through December 31, 1982, and 60/35/5 thereafter.

Source: State Board of Investment.

Over the decade, the composite index gained 14.5 percent annually, the median TUCS balanced fund gained 14.2 percent annually, and the Income Share Account increased 12.7 percent per year. As Table 2.14 shows:

- **The principal reason for the Income Share Account's sub-par performance is its poor stock performance.**

Bond performance was satisfactory. The performance of the bond segment was slightly better than that of the Salomon BIG Bond Index over the last ten years. The stock segment, however, underperformed the Wilshire 5000 over the decade. The account's stock segment gained 13.8 percent annually compared to 15.9 percent for the Wilshire 5000.

The performance of the Income Share Account has improved.

Table 2.14 also shows that:

- **Indexing the stock segment has improved the relative performance of the Income Share Account over the last three years.**

For fiscal years 1988 through 1990, the Income Share Account matched the performance of its composite index and edged out the performance of the median TUCS balanced fund. Switching to passive management of the stock segment has been a positive development for the account and bodes well for its future performance.

Growth Share Account

The Growth Share Account's long-term asset mix is 95 percent stocks and 5 percent cash. Currently, the stock segment is invested by the same external managers who actively manage stocks for the Basic Retirement Funds. Over the decade, SBI has used a combination of external and internal management. The cash segment is invested by the same external cash manager used by the Basic Funds.

Table 2.15 shows that:

- **The performance of the Growth Share Account has lagged significantly behind a composite index of market returns and the median TUCS equity fund.**

Over the last ten years, the Growth Share Account had an annual rate of return of 12.8 percent. The composite index and the median TUCS equity fund increased 16.0 and 17.0 percent per year respectively. As Table 2.15 also shows:

- **The principal cause of the Growth Share Account's substandard performance is its poor stock performance relative to the Wilshire 5000.**

In the last ten years, the Wilshire 5000 increased by 15.9 percent annually, while the account's stock segment grew by only 12.7 percent per year.

Table 2.15: Performance of the Growth Share Account, 1981-90

Fiscal Year	Annual Rates of Return: Growth Share Account	Composite Index*	Median TUCS Equity Fund	Growth Share Stock Segment	Wilshire 5000
3-Year Period					
FY 1988-90	7.2%	8.3%	8.8%	7.5%	8.2%
5-Year Periods					
FY 1981-85	13.4%	16.8%	16.6%	12.7%	16.2%
FY 1986-90	12.3	15.2	15.8	12.6	15.5
10-Year Period					
FY 1981-90	12.8%	16.0%	17.0%	12.7%	15.9%

*The composite index consists of 95 percent stocks (Wilshire 5000) and 5 percent cash (91-day T-Bills).

Source: State Board of Investment.

The future performance of the Growth Share Account will depend primarily on how well small, growth-oriented stocks do compared to the broader market represented by the Wilshire 5000. The stock segment is currently managed by the same group of active managers who invest the active component of the Basic Funds' stock segment. As we observed earlier, the Basic Funds' stock portfolio has underperformed the Wilshire 5000 because these active managers have a small stock bias and small capitalization stocks have underperformed large stocks since 1984. Unlike the Basic Funds, the Growth Share Account does not have a passively-managed index fund in its stock segment. As a result, the account is even more dependent on the performance of small, growth-oriented stocks.

The small stock bias of the Growth Share Account, though not beneficial to participants in recent times, can be justified in light of choices available to participants in the Supplemental Investment Fund. The Growth Share Account offers participants in the Fund the option of investing in small, growth-oriented stocks, while the Common Stock Index Fund provides participants the option of indexing their investments to the performance of the Wilshire 5000. The two accounts thus provide options both for those who prefer an aggressive approach primarily relying on small stocks and for those who believe that a more broadly-based stock index will perform better in the long run.

Common Stock Index Account

The Common Stock Index Account is invested entirely in passively-managed stocks. The account is managed by Wilshire Associates, who seek to track closely the performance of the Wilshire 5000. The account's returns may vary slightly from the returns of the index due to management fees, new contributions, or tracking error. The account has been in operation since July 30, 1986.

Table 2.16 shows that:

- **The Common Stock Index Account has met its objective of matching the performance of the Wilshire 5000.**

Since inception, the account's annualized rate of return of 13.2 percent has slightly exceeded the 13.1 percent return from the Wilshire 5000.

Bond Market Account

The Bond Market Account is invested entirely in investment-grade bonds with intermediate to long maturities. The account is actively managed by the same external bond managers used by the Basic Retirement Funds.[18] These managers are expected to produce returns in excess of the bond market, as represented by the Salomon BIG Bond Index. The account has been in operation since July 30, 1986.

Table 2.16 shows that:

- **The Bond Market Account has exceeded its objective.**

Since inception, the account had an annualized rate of return of 8.7 percent. That performance exceeded the 8.3 percent annual return from the Salomon BIG Index. All of the superior performance came in the account's first eleven months of operation. Over the last three years, the account returned 9.1 percent annually compared to 9.3 percent for the Salomon BIG Index.

Table 2.16: Performance of the Common Stock Index, Bond Market, and Money Market Accounts, 1986-90

	Annual Rates of Return					
Time Periods	Common Stock Index Account	Wilshire 5000	Bond Market Account	Salomon BIG Bond Index	Money Market Account	91-Day T-Bills
3-Year Period						
FY 1988-90	8.1%	8.2%	9.1%	9.3%	8.5%	7.5%
Since Inception						
7/30/86 thru 6/30/90 (3 years, 11 months)	13.2	13.1	8.7	8.3	8.0	7.0

Source: State Board of Investment.

18 Only the Basic Funds' active bond managers invest the account. The Basic Funds' semi-passive bond managers do not participate in the management of the Bond Market Account.

Money Market Account

The Money Market Account invests only in short-term, liquid debt securities. Its objective is to earn competitive money market returns while preserving capital. The account is managed by the same external cash manager used by the Basic Retirement Funds. The account has been in operation since July 30, 1986.

Table 2.16 shows that the Money Market Account has earned an annualized rate of return of 8.0 percent since inception. This return exceeds the 7.0 percent annual return for 91-day Treasury bills over the same period. However, the Money Market Account and other SBI cash pools tend to have riskier portfolios than a fund consisting only of 91-day T-bills. Consequently, the Money Market Account should be expected to beat the return on 91-day T-bills. SBI lacks an adequate benchmark for use in assessing the account's performance.

Guaranteed Return Account

The Guaranteed Return Account offers participants a fixed rate of return for a period of up to three years. The account is invested entirely in guaranteed investment contracts offered by major United States banks and insurance companies. Each year, SBI solicits bids from qualified financial institutions and generally awards the contract to the institution bidding the highest three-year interest rate. Participants investing over the next year receive that interest rate until the contract's expiration date.

SBI desires to maximize the three-year interest rate within the constraint of permitting bids only from financial institutions meeting financial quality criteria set by state law. SBI uses a competitive bidding process in order to obtain the best returns offered in the market.

Table 2.17 lists the guaranteed investment contracts awarded in the five years since the account's inception. Although there is no readily available means of evaluating the rates obtained by SBI, the table shows that the annual return provided by each guaranteed investment contract has exceeded the return on

Table 2.17: Guaranteed Investment Contracts

Period of Contract	Annual Rates of Return	Annual Rates of Return on 3-Year Treasury Notes	Excess Over 3-Year Treasury Notes
November 1, 1986 - October 31, 1989	7.72%	6.60%	1.22%
November 1, 1987 - October 31, 1990	8.45	7.94	0.51
November 1, 1988 - October 31, 1991	9.01	8.37	0.64
November 1, 1989 - October 31, 1992	8.40	7.81	0.59
November 1, 1990 - October 31, 1993	8.765	7.925	0.84

Source: State Board of Investment.

three-year Treasury notes at time of bid by 0.5 percent to 1.2 percent per year. The premium paid by the contracts reflects the somewhat greater risk of contracts versus Treasury notes. According to SBI staff, however, the risk of contract default is small due to the financial quality criteria applied to bidders.

PERMANENT SCHOOL FUND

The internally managed Permanent School Fund is invested primarily in investment-grade bonds. Since September 1985, the Fund has not held stocks. As of June 30, 1990, 95 percent of the Fund's market value was in bonds and 5 percent was in cash equivalents.

SBI staff use a buy-and-hold, laddered maturity approach in managing the bond portfolio. Virtually all bonds are held to maturity. To minimize exposure to interest rate changes, the portfolio contains bonds with uniformly staggered maturity dates.

For performance purposes, this means that the Fund rarely realizes any capital gains or losses. The almost exclusive source of investment return is the interest earned on bonds and cash equivalents. As a result, data on total returns (as we have used in this report for most funds) is not an accurate indicator of the Fund's performance. Over the last ten years, bonds have experienced considerable capital gains. However, since the Permanent School Fund never realizes such gains, total return data would overstate the Fund's performance during the 1980s.[19]

Perhaps the best indicator of the Permanent School Fund's performance would be the annual interest on bonds and cash equivalents as a percentage of the Fund's value at cost. These data are not regularly compiled and reported by SBI staff. However, Table 2.18 provides a variety of data that enable one to gain insight into the Fund's performance. Based on these data and discussions with SBI management, we estimate that:

- **The annualized return to the Permanent School Fund over the last five years was between 8.5 and 9.5 percent.**

Furthermore, the return was probably in the upper half of this range.

Over the same period, the Wilshire 5000 gained 15.5 percent annually and the S&P 500 gained 17.3 percent annually. As a result:

- **By eliminating its stock portfolio in the fall of 1985, SBI sacrificed considerable future returns for the Permanent School Fund in favor of more current income.**

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19 Total return data suggest that the Fund's bond portfolio performed better than SBI's other bond portfolios. Over the last ten years, the bond portfolio had a total return of 12.3 percent compared to 11.8 percent for the Salomon BIG Index. From fiscal years 1981 through 1985, the Fund's stock portfolio gained 15.8 percent annually compared to 16.2 percent for the Wilshire 5000.

Table 2.18: Statistics on the Permanent School Fund, 1986-90

Fiscal Year	Market Value at Start of Year	Investment Income	Rates of Return at Year's End: Current Yield	Current Yield at Cost	Average Duration at Year's End
1986	$337.0 million	$27.0 million	NA	NA	4.6 years
1987	365.0	31.2	NA	NA	6.6
1988	361.0	33.7	9.33%	9.35%	7.9
1989	357.8	33.3	8.81	9.29	7.4
1990	384.6	33.0	9.00	9.22	7.2
1991	377.2	NA	NA	NA	NA

Source: State Board of Investment.

For example, consider what might have happened if SBI had taken advantage of the constitutional amendment passed by voters in November 1984. Table 2.19 shows a hypothetical scenario for the Fund had it been invested in 50 percent stocks and 50 percent bonds at the beginning of fiscal year 1986. The scenario assumes that the stocks have a rate of return equal to that of the Wilshire 5000, that the bonds earn 9.5 percent interest annually, and that stocks pay no dividends. The results show that, by sacrificing half the current income over the last five years, the stock portfolio would have more than doubled and the Fund would be 53 percent larger. If enough stocks were sold at the end of the five-year period to restore the bond portfolio to its actual size, the Fund would be able to generate as much income in years after fiscal year 1990 under the scenario as under the actual portfolio. In addition, under the scenario, the fund would have a stock portfolio slightly more than half the size of the actual bond portfolio. The present value of the cash flow from the scenario would be 16 percent larger than the present value of the actual cash flow after five years.

Alternatively, we could assume that stocks pay an average dividend of 3 percent. Then, with a portfolio of 50 percent stocks, the Fund would have been about $115 million larger at the end of fiscal year 1990 at a sacrifice of $9 to $11 million in income over each of the last five years.

Table 2.19: Alternative Strategies for the Permanent School Fund, 1986-90

	Actual portfolio (100% Bonds)			Hypothetical Portfolio (50% Stocks & 50 % Bonds)*		
	Market Value at End of Year			Market Value at End of Year		
Fiscal Year	Stocks	Bonds	Annual Income	Stocks	Bonds	Annual Income
1985	0	100.00	NA	50.00	50.00	NA
1986	0	100.00	9.50	67.63	50.00	4.75
1987	0	100.00	9.50	81.20	50.00	4.75
1988	0	100.00	9.50	76.39	50.00	4.75
1989	0	100.00	9.50	91.28	50.00	4.75
1990	0	100.00	9.50	102.91	50.00	4.75

*Assumes all stock returns are capital gains and not dividends.

Of course, investing in stocks involves some risk. The favorable stock markets of the last five years should not be expected to occur in every five-year period. For example, for fiscal years 1978-82, the stock market was flat. Sacrificing some income in order to hold bonds would not have been worthwhile during that period.[20]

Stocks would provide the Permanent School Fund with greater returns in the long run.

However, as we observed earlier, stock returns have exceeded bond returns by about five percent annually when measured over a long period of time. Consequently, given time, stocks will likely outperform bonds by a considerable margin. We estimate that, by continuing not to hold stocks, the state is losing $3 to $9 million annually over the long run. Thus:

- **Sacrificing some current bond income by purchasing stocks would likely provide the Permanent School Fund and the state with more income in the long run.**

As presently invested, the Fund (absent any cash inflows earned from physical assets managed by the Department of Natural Resources) will not grow in value and will decline over time in real value with inflation.

In Chapter 3, we will examine the accounting restrictions which, according to SBI staff, unduly constrain the Fund's investment strategy. We will consider what changes, if any, are needed in the laws governing the Permanent School Fund.

CASH MANAGEMENT

SBI is responsible for the investment of a number of cash pools and accounts. SBI has chosen a mix of internal and external management for cash equivalents under its control. As we discussed earlier, a number of retirement-related accounts are invested by external managers. State Street Bank and Trust Company invests the Supplemental Fund's Money Market Account and cash segments of the Basic Retirement Funds, the Supplemental Fund's Income Share Account, and the Supplemental Fund's Growth Share Account. BEA Associates manages a small cash enhancement program for the Post Retirement Fund.

SBI staff invest all other cash accounts. These accounts include: 1) the Trust Fund Pool, 2) the Treasurer's Cash Pool, and 3) miscellaneous state agency accounts which cannot be commingled. The Trust Fund Pool includes the cash segments of the Post Retirement Fund and the Permanent School Fund and the cash balances of retirement-related accounts which have not yet been certified for investment as part of the Basic, Post, or Supplemental Funds. The Treasurer's Cash Pool includes the cash balances of the Invested Treasurer's Cash and other accounts necessary for the operation of state agencies. These two pools were established late in fiscal year 1987 in order to reduce the record keeping and number of transactions required in managing hundreds of

20 The long-term investor would have been rewarded in fiscal year 1983, when stocks increased more than 60 percent.

separate accounts. SBI staff felt a large pool would also generate higher rates of return because of increased investment flexibility for staff.

Previously in this chapter, we examined the returns on externally managed accounts. In this section, we focus on the returns on internally managed cash accounts, particularly the Treasurer's Cash Pool and the Trust Fund Pool. Our comments on the two cash pools, however, are generally applicable to all cash accounts under SBI's control. Our general conclusions are that:

- **SBI does not have an adequate benchmark for evaluating the performance of its cash investments.**

- **SBI uses a performance benchmark (the return on 91-day on Treasury bills) which is easily beaten.**

Table 2.20 provides information on the rates of return earned by the Treasurer's Cash Pool and Trust Fund Pool. Over the last three years, the Treasurer's Cash Pool earned an annualized return of 8.6 percent while the Trust Fund Pool earned 8.3 percent annually. The rate of return for both pools exceeded the 7.5 percent on 91-day Treasury bills.[21]

Table 2.20: Rates of Return on the Treasurer's Cash Pool and Trust Fund Pool, 1988-90

	Annual Rates of Return		
Fiscal Year	Treasurer's Cash Pool	Trust Fund Pool	91-Day T-Bills
1988	8.0%	7.4%	6.1%
1989	8.7	8.8	8.2
1990	9.0	8.8	8.2
3-Year Period			
FY 1988-90	8.6%	8.3%	7.5%

Source: State Board of Investment.

However, as Table 2.21 shows, the two pools are unlike 91-day T-bills in their portfolio composition and average maturities. On June 30, 1990, the Treasurer's Cash Pool had an average maturity of 213 days. Its portfolio included commercial paper (40 percent), corporate notes (8 percent), repurchase agreements (6 percent), and various government agency securities (27 percent), as well as some United States Treasury securities (19 percent).

The average maturity of the Trust Fund Pool was shorter (111 days), although it exceeded that of 91-day T-bills. The Trust Fund Pool, however, was even less invested in Treasury or government agency securities. Only 5 percent of its portfolio was in Treasuries and 12 percent was in agency securities. The

21 Over the same period, the externally managed cash segments of the Basic and Supplemental Funds earned an annual return of 8.4 percent.

Table 2.21: Characteristics of the Treasurer's Cash Pool and Trust Fund Pool, 1990

	Treasurer's Cash Pool	Trust Fund Pool
Composition (on 6/30/90)		
Commercial Paper	40.1%	64.6%
Repurchase Agreements	5.5	17.1
Corporate Notes	7.9	1.5
U.S. Government Agencies	27.2	11.7
U.S. Treasuries	19.4	5.1
	100.0%	100.0%
Average Maturity (on 6/30/90)	213 days	111 days
Average Daily Balance (during FY 90)	$2.2 billion	$0.2 billion
Balance (on 6/30/90)	$2.655 billion	$0.332 billion
High Balance (during FY 90)	$2.666 billion	$0.332 billion
Low Balance (during FY 90)	$1.922 billion	$0.110 billion

Source: State Board of Investment.

bulk of the portfolio was in commercial paper (65 percent). An additional 17 percent was in repurchase agreements.

SBI needs a performance benchmark for its cash pools.

Generally, a cash manager can obtain greater rates of return in three ways: 1) placing funds in more risky types of investments, 2) lengthening the average maturity of a fund, or 3) placing funds in lower quality instruments within a given type of investment. Treasury bills are the safest type of investment since they are backed by the full faith and credit of the United States government. Commercial paper, on the other hand, is a short-term promissory note written by a corporation and backed by the corporation's general credit rating. Commercial paper represents more of a risk of default than a Treasury bill and thus commands a higher rate of return in financial markets. Table 2.22 shows how rates on commercial paper can differ from those on T-bills.

Lengthening the maturity of a portfolio is another way of increasing the rate of return. Most of the time, it takes a higher interest rate to attract funds for a longer period of time.[22]

Finally, one can obtain a higher rate of return by selecting lower quality instruments among investments of a given type. For example, lower rated commercial paper has a greater risk of default than higher rated paper. Consequently, the lower rated paper generally must pay a higher interest rate. SBI has limited discretion in this area. Commercial paper held by SBI must be rated in the highest two quality categories.

22 At times, however, the yield curve can become "inverted." Because of expectations of falling interest rates, securities of shorter maturities may sometimes have to pay higher rates than do securities with longer maturities.

Table 2.22: Average Rates on Commercial Paper and Treasury Bills

Calendar Year	3-Month Commercial Paper	3-Month Treasury Bills
1987	6.82%	5.82%
1988	7.66	6.69
1989	8.99	8.12

Source: Monthly Federal Reserve Bulletin, September 1990.

The Treasurer's Cash Pool has increased its rate of return relative to 91-day Treasury bills by lengthening its average maturity and selecting some more risky types of cash investments. The Trust Fund Pool has increased its rate of return primarily through selecting more risky type of investments, particularly commercial paper. Both pools are accepting some additional, though limited, risk in order to increase their rates of return. However, SBI staff continue to use the return on 91-day T-bills as a performance benchmark for these internally managed cash pools, as well as the externally managed portfolios under SBI's control. In Chapter 3, we will examine available options for evaluating cash management.

ISSUES AND RECOMMENDATIONS

Chapter 3

In this chapter, we examine the major performance issues identified in Chapter 2. In particular, we address the following questions:

- **What, if anything, should be done regarding the underperformance of stocks in the Basic Retirement Funds?**
- **What statutory changes are needed to correct the underallocation to stocks in the combined Basic and Post Retirement Funds?**
- **Are legal changes needed and desirable in order to reintroduce stocks into the portfolio of the Permanent School Fund?**
- **How can SBI improve the methods it uses to evaluate its investment performance?**

Overall, we found SBI's plan for addressing its stock performance to be reasonable. However, it is a very complicated way to achieve a result that may not differ much from what a fully indexed stock portfolio would achieve.

We also found that the statutory formula used for computing post-retirement benefit increases needs to be changed. The current formula causes lower than average investment performance in the long run and is not well designed to provide cost of living adjustments. The current budget crisis makes it difficult to implement any immediate changes in the Permanent School Fund's portfolio. However, in the long run, stocks should be reintroduced into the Fund's portfolio. The lack of stocks is a drag on the Fund's performance and runs counter to the intent of the constitutional amendment passed in 1984. Finally, we conclude that SBI needs to improve some of the methods it uses to evaluate the performance of the Basic and Post Retirement Funds and its cash portfolios.

STOCK PERFORMANCE

In Chapter 2, we found that the Basic Funds' stock portfolio underperformed the Wilshire 5000 and the stock portfolios of most other pension funds. The primary reason for SBI's underperformance was the portfolio's overweighting of small, growth-oriented stocks during a period in which such stocks underperformed the rest of the stock market. Although this small stock bias showed up primarily in the holdings of the Basic Funds' active stock managers, it was not active management itself that hurt performance. The active managers as a group generally equaled the performance of stocks in the segments of the market in which they invested.

After considerable study by the Investment Advisory Council and SBI staff, SBI decided in June 1990 to gradually eliminate the small stock bias in the Basic Funds' stock portfolio relative to the Wilshire 5000. SBI retained its active managers but began implementing changes in its passively managed stock index fund. The passive manager will be operating a "tilted" index fund constructed so that the performance of the entire stock portfolio will approximate the Wilshire 5000. The stock portfolio's performance will vary from the Wilshire 5000 to the extent that the active managers' performance is different from that of the parts of the stock market in which they invest.

SBI's decision is responsive to the market conditions of the last seven years. The new portfolio eliminates the small stock bias relative to the Wilshire 5000 but retains active management. The drag on the Basic Funds' stock performance has been its overweighting of small, growth-oriented stocks not active management per se.

The decision does not, however, eliminate differences between the Basic Funds' stock portfolio and those of most pension funds. Generally, the stock portfolios of other pension funds have been designed around the S&P 500. Their stock portfolios have performed more like the S&P 500 than the Wilshire 5000. Thus, the Basic Funds' new stock portfolio represents a compromise. The new portfolio will still be more reliant on small, growth-oriented stocks than most other pension funds, but not as overweighted with such stocks as was the old portfolio.

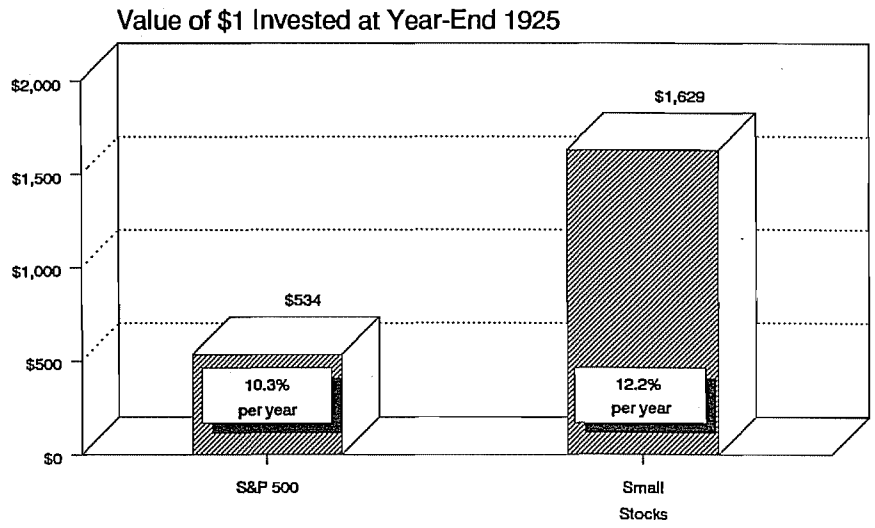
SBI's new stock portfolio can be criticized from two perspectives. First, the old stock portfolio can be defended on the basis of the significantly larger returns produced by small stocks in the long run. Figure 3.1 shows that, over the past 64 years, small company stocks have significantly outperformed large company stocks. Small company stocks had an annualized rate of return of 12.2 percent over the period, compared to 10.3 percent for stocks in the S&P 500. With compounding, this means that $1 invested in small company stocks at year-end 1925 grew to $1,629 by year-end 1989. In contrast, one dollar invested in the S&P 500 Index grew to $534.[1]

The superior performance of small company stocks has not, however, occurred uniformly over this period. In fact, as Figure 3.2 shows, the relative performance of small stocks is characterized by long periods of either overper-

1 A dollar invested in long-term high-grade corporate bonds would be worth $25. Bonds returned 5.2 percent annually.

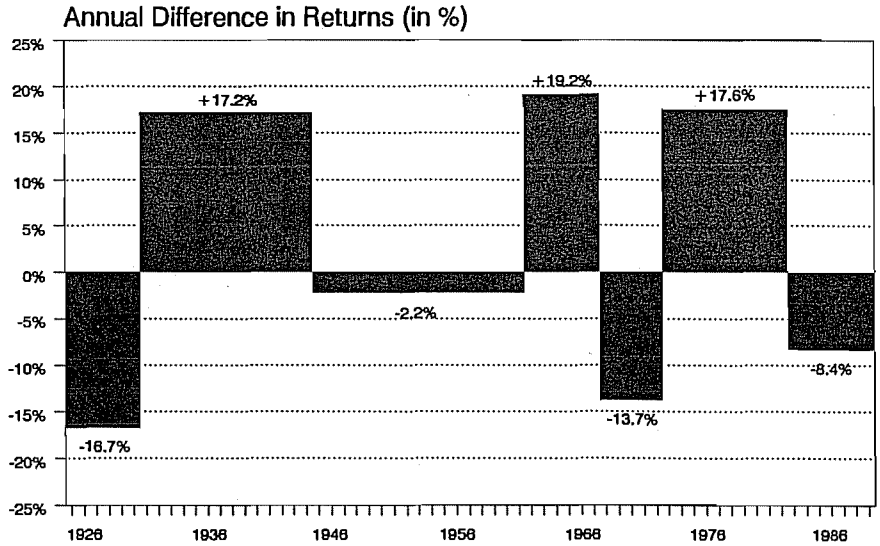
formance or underperformance. The last seven years have seen small stocks underperform large stocks. However, prior to that period, we had a decade of substantial overperformance for small stocks.

Figure 3.1: Performance of Small Capitalization Stocks Relative to the S&P 500, 1926-1989



Source: Ibbotson Associates.

Figure 3.2: Trends in the Performance of Small Capitalization Stocks Relative to the S&P 500, 1926-1989



Source: Ibbotson Associates.

Furthermore, some market watchers have suggested that small company stocks are due for a substantial increase in prices. They suggest that small stocks have become undervalued compared to large stocks. Indeed, from the end of October 1990 to the end of February 1991, an index of over-the-counter stocks (the NASDAQ industrial index) gained 37 percent, compared to 24 percent for the S&P 500. Whether this bodes well for small stocks in the future, or is just a temporary movement, remains to be seen.

The thrust of this criticism is that SBI needs to show more patience. There are sometimes long periods of time over which small stocks underperform the market. However, a patient investor who sticks with small company stocks will be rewarded when small stocks again outperform the market.

A second criticism of the new SBI stock portfolio is that it is a very complicated way of achieving roughly the same result as a completely indexed portfolio. As Table 3.1 shows, the return on a stock portfolio that is completely indexed to the Wilshire 5000 would fall within 0.53 percentage points above or below the return on the Wilshire 5000 about 68 percent of the time. The benchmark return on the new portfolio with an active management segment and a tilted index fund will fall within 0.59 percentage points above or below the return on the Wilshire 5000 about 68 percent of the time. The actual return on the new portfolio will differ from the benchmark return if the performance of active managers differs from their aggregate benchmark return. Critics suggest that, over the long run, active management is not likely to produce results different from their aggregate benchmark. Consequently, in their view, the new portfolio is likely to produce about the same results as a fully indexed portfolio.

Table 3.1: Expected Variability of Benchmark Returns Relative to the Wilshire 5000

Basic Funds' Stock Portfolio Benchmarks	Difference in Return Relative to the Wilshire 5000*	
New Portfolio:		
• Active Managers' Benchmarks	± 3.20%	
• Tilted Index Fund	± 1.40	
Combined		± 0.59%
Old Portfolio:		
• Active Managers' Benchmarks	± 3.20%	
• Index Fund	± 0.53	
Combined		+ 1.43%
Alternative Portfolio:		
• Index Fund Only	± 0.53%	± 0.53%

*This difference represents one standard deviation either side of the return to the Wilshire 5000. In other words, 68 percent of the time the portfolio's benchmark return is expected to be within this range.

Source: State Board of Investment.

Those favoring a completely indexed and passively managed stock portfolio also suggest that the state could save the pension funds millions of dollars in management fees paid annually to the Basic Funds' active stock managers. As Table 3.2 shows, the management fees paid to active stock managers are considerably higher than those paid to the Funds' passive stock manager, even though the passive stock manager has a larger portfolio.

Table 3.2: Active and Passive Stock Manager Fees, 1988-90

	1988	1989	1990	Total
Active Stock Managers				
Fees	$ 3,991,919	$ 4,106,961	$ 8,082,263	$ 16,181,143
Assets*	1,312,570,241	1,142,773,663	1,612,839,000	4,068,182,904
Fee %	0.304%	0.359%	0.501%	0.398%
Passive Stock Manager				
Fees	$ 259,478	$ 312,482	$ 318,810	$ 890,770
Assets*	2,173,917,304	2,386,626,337	2,759,675,000	7,320,218,641
Fee %	0.012%	0.013%	0.012%	0.012%

*Value of assets under management at end of previous fiscal year.

Source: State Board of Investment.

Thus, SBI's new stock portfolio can be criticized from two very different perspectives. The first perspective is that the old stock portfolio will prove superior in the long run because small company stocks will ultimately demonstrate their proven long-run superiority. The second perspective is that SBI's new portfolio does not go far enough. Active management is unlikely to outperform passive management in the long run. Consequently, SBI should index the entire stock portfolio.

These criticisms revolve around two key issues:

- Will small company stocks outperform the stock market in the future?
- Will active management produce results superior to those provided by passive management?

Unfortunately, there are no clear answers to these questions. Returns to small company stocks have historically exceeded market returns, but their relative performance has been characterized by long periods of overperformance or underperformance. Whether the historical pattern of relative performance will continue in the future is uncertain.

The relative merits of active versus passive management have been studied and debated for years. Evidence to support both sides of the debate has been produced. For many years, the predominant view was that active management could not consistently beat passive management. Some more recent studies have challenged that view. We think it is fair to say that this issue is unresolved.

The new stock portfolio is a reasonable compromise.

In light of the evidence, we conclude that the Basic Funds' new stock portfolio is reasonable. Relative to the options discussed above, the new portfolio has the advantage of avoiding extreme positions on the small versus large stock and active versus passive management issues. The new portfolio moves SBI from a somewhat extreme position among pension funds on the former issue. The portfolio will no longer be overweighted in small stocks relative to the Wilshire 5000, but will still be more reliant than most funds on small stocks. On the second issue, the new portfolio also avoids taking an extreme position--namely, indexing the entire portfolio. Given the state of knowledge, it may be unwise to totally index the portfolio. As Table 3.3 shows, a greater share of SBI's stock portfolio is already indexed compared to other public pension funds.

Table 3.3: Management Structures Used by Public Pension Funds

Stocks	Median Mix	Range*	
Active	87%	All Active	18
Passive	13	All Passive	0
		Mix	29
Bonds			
Active	100%	All Active	30
Passive	0	All Passive	2
		Mix	15
Stocks & Bonds			
Internal	60%	All Internal	14
External	40	All External	13
		Mix	20

*Includes 47 public funds from 37 states.

Source: 1989 SBI Survey.

In addition, based on the track record of the last six years, it does not appear that passive management would necessarily save millions of dollars in management fees going to active stock managers. As we saw in Chapter 2, rates of return (net of fees) for the Funds' active stock managers equaled their benchmark returns over the last six years. The benchmark returns represent what passive management would have produced in those segments of the stock market in which the active managers invest.

ASSET MIX IN THE RETIREMENT FUNDS

A second principal source of the underperformance of Minnesota's retirement funds is an underallocation to stocks. Excluding alternative assets, the combined Basic and Post Retirement Funds held 42 percent stocks on June 30, 1990. The median TUCS balanced fund held 51 percent stocks.

The primary reason for Minnesota's underallocation to stocks is the state's relatively uncommon pension system. Unlike nearly all other states, Minnesota has a separate fund (the Post Retirement Fund) out of which retirement benefits are paid and a statutory formula that bases post-retirement benefit increases on the fund's earnings. Most states do not have a separate fund and do not explicitly base benefit increases on investment performance.

The benefit increase formula used in Minnesota requires each calendar year's benefit increase to be based on the Post Fund's realized earnings from the previous fiscal year. The rate of benefit increase equals the excess of realized earnings over earnings of five percent, divided by the required reserves as determined by the state's actuary. Realized earnings include interest and dividend income as well as the capital gains (or losses) on the sale of stocks, bonds, or other investments. Unrealized increases or decreases in the market value of securities have no effect on benefit increases.

Investing more of the Post Fund in stocks would likely provide greater benefit increases over the long run. However, given the existing formula, there would be more volatility in benefit increases and no guarantee of a benefit increase each year. SBI staff estimate that, if the Post Fund held 30 percent stocks and 70 percent bonds, there would be a 12 percent chance of there being no benefit increase in a given year and a 49 percent chance of the benefit increase being less than three percent.[2]

Faced with this trade-off, SBI has accepted the greater stability, though lower long-term returns, that bonds offer in order to guarantee retirees a benefit increase of at least three percent each year. Consequently, as interest rates on bonds have fallen, SBI devoted an increasing share of the Post Fund to bonds in order to fulfill this goal. Stock holdings fell from 43 percent to 10 percent of the fund's market value over the last ten years.

The Post Fund performed well compared to inflation in the 1980s. The fund produced benefit increases averaging 7 percent, while inflation averaged 5 percent. However:

- **The reduction in stock holdings is likely to be detrimental to the Post Fund's earnings and post-retirement benefit increases in the long run.**

SBI staff estimate that future benefit increases under the existing formula are likely to range from 2.5 to 4.0 percent per year. The reduction in stock holdings, decreases in interest rates on bonds, and changes in the fund's cash flow

2 These estimates are based on a bond yield of 9.0 percent, a stock dividend yield of 3.5 percent, and an annual stock turnover rate of 40 percent. Lower yields, a higher stock turnover rate, or higher stock holdings, would increase the probability of either no benefit increase or a less than three percent benefit increase.

are likely to limit benefit increases to levels well below those experienced in the 1980s. In addition, inflation rates in the 1990s may exceed those of the 1980s.

Future benefit increases are likely to range between 2.5 and 4.0 percent annually.

After study by an Investment Advisory Council committee, staff from SBI and the major retirement systems developed a proposal to change the current benefit increase formula. The proposal would base benefit increases on two factors: 1) the inflation rate, and 2) investment performance. Retirees would receive a benefit increase equal to 100 percent of the inflation rate up to 3.5 percent per year. In addition, retirees would receive an investment-based adjustment, if investment performance allows.

At the end of each year, the market value of the Post Fund would be compared to the required reserves, including the additional reserves needed to support the inflation adjustment, as well as the five percent required earnings. If the result is positive, one-fifth of the difference would be distributed to retirees in the form of a benefit increase for each of the next five years. If the result is negative, no investment-based adjustment would be made. The negative balance would be carried forward to future years until the combination of past and current returns is positive. In no case would the inflation adjustment be reduced because of investment performance.

The proposal attempts to address the two main problems with the current formula. These problems are:

- **The current formula does not maximize the earning power of the Post Fund's assets.**

- **The current formula is not inflation sensitive.**

The proposal tries to maximize the fund's earning power by basing the investment-based adjustment on the fund's total return, including unrealized capital gains and losses. To smooth out the annual variation in stock returns, the proposed formula calculates the investment-based adjustment using a five-year average of the fund's returns. These features would permit the Post Fund to hold up to 50 percent stocks.

The proposal also guarantees an annual benefit increase equal to the inflation rate up to a maximum of 3.5 percent. This feature makes benefit increases somewhat sensitive to inflation. It also provides a further smoothing of the variation in investment returns by guaranteeing some increase each year, unless there is no inflation.

The proposal has much to offer retirees. For example:

- **The proposed formula would likely provide benefit increases at least as large as the current formula for the next few years.**

Under most inflation forecasts, the proposed formula would provide at least a 3.5 percent benefit increase. The current formula is likely to provide benefit increases in the 2.5 to 4.0 percent range over the next few years. In addition:

- **The proposed formula would likely provide retirees with higher benefit increases in the long run through the increased returns provided by stocks.**

Assuming a 5 percent spread between annual stock and bond returns, the proposed formula could provide benefit increases averaging 2 percent per year higher than the current formula. This estimate assumes a Post Fund which is half stocks and half bonds under the proposed formula. Table 3.4 shows the estimated difference in benefit increases under the current and proposed formulas.[3]

Table 3.4: Projected Returns from Alternative Post Fund Portfolios

	Proposed Formula (50% Stocks/50% Bonds)	Current Formula (10% Stocks/90% Bonds)
Assumed Return to Stocks	13.0%	13.0%
Assumed Return to Bonds	8.0	8.0
Annual Return to Post Fund	10.5%	8.5%
Less 5% Required Earnings	-5.0	-5.0
Estimated Annual Benefit Increase	5.5%	3.5%

Obviously, investing more in stocks entails more risk since stock returns are more variable than bond returns. However, much of the risk would be borne by the state, particularly at the outset. The guaranteed inflation-based adjustment would limit the risk for retirees. Additional risk for the state would require a more careful planning and monitoring of the fund's returns, particularly if stock returns become depressed for a prolonged period of time. According to SBI staff, however, even prolonged stock market slumps, such as experienced in the 1970s, would not jeopardize the financial ability of the fund to pay benefits.

3 We used a five percent spread between stock and bond returns because this spread reflects the actual spread observed in stock and bond markets since 1925. SBI staff has used a 3.5 percent spread, which is based on the spread observed during the 1970s and 1980s. Using this alternative assumption, benefit increases would average 1.4 percent higher under the proposed formula than under the current formula.

Overall, the proposed formula is an improvement over the current formula, although all the additional benefits would go to retirees. Some additional risk would be assumed by taxpayers and active employees. Active employees would not benefit until retirement.[4]

As a result, we considered how other states determine post-retirement benefit increases for three groups of public employees: 1) state government employees, 2) local government employees, and 3) teachers. Only three states, including Minnesota, use a formula based on investment experience to determine post-retirement benefit increases. This group represents only 7 percent of the 85 statewide retirement plans in the 50 states. As Table 3.5 shows, the largest group of plans are those which base post-retirement benefit increases on increases in the Consumer Price Index. About 44 percent of all plans have an inflation-based adjustment. Another 29 percent of all plans provide ad hoc adjustments. Finally, 20 percent have automatic annual adjustments.[5]

Table 3.5: Post-Retirement Benefit Increases, 1990

Benefit Increase Method	State Employee Plans		Local Employee Plans		State Teacher Plans		All Plans	
	#	%	#	%	#	%	#	%
CPI-Based	22	44%	19	43%	24	48%	37	44%
Ad Hoc Payments	14	28	13	30	14	28	25	29
Automatic Annual Increase	11	22	9	20	9	18	17	20
Investment Experience	3	6	3	7	3	6	6	7
Total	50	100%	44	100%	50	100%	85	100%

Source: Wisconsin Retirement Research Committee.

Benefit increases in most other states have been about 3 percent annually.

Increases under the CPI-based and automatic increase systems are, however, quite modest. Most CPI-based systems either provide a benefit increase of less than 100 percent of the inflation rate or set a maximum annual increase, such as three percent.[6] We estimated the rates of increase for the more than 50 plans which are CPI-based or have automatic increases. We used the inflation rates of the 1980s to calculate the post-retirement benefit increases for CPI-based systems. Table 3.6 and Figure 3.3 show that the median estimated benefit increase would be just under 3.0 percent per year during a period with inflation averaging 5.0 percent annually. None of the CPI-based or automatic increase plans would have provided an average annual increase exceeding 5.0 percent. In contrast, the Minnesota formula provided increases averaging 7.0 percent during the 1980s.

4 In the event of a prolonged period of extremely poor fund performance, it is possible that public employees and employers would have to increase their pension contributions.

5 Wisconsin Retirement Research Committee, *1990 Comparative Study of Major Public Employee Retirement Systems*, Staff Report No. 79, December 1990, 13-16.

6 In addition, increases under some plans are lump sum increases based on a retiree's original benefit and are not compounded over time.

Table 3.6: Estimated Post-Retirement Benefit Increases, 1981-90*

Average Annualized Increase	CPI-Indexed Plans: All Plan Types		State Employee		Local Employee**		Teacher	
4.1-5.0%	6	17%	3	14%	2	11%	4	17%
3.1-4.0%	8	22	5	23	6	33	6	25
2.1-3.0%	20	56	12	55	8	44	12	50
1.1-2.0%	1	3	1	5	1	6	1	4
0.0-1.0%	1	3	1	5	1	6	1	4
Total	36	100%	22	100%	18	100%	24	100%

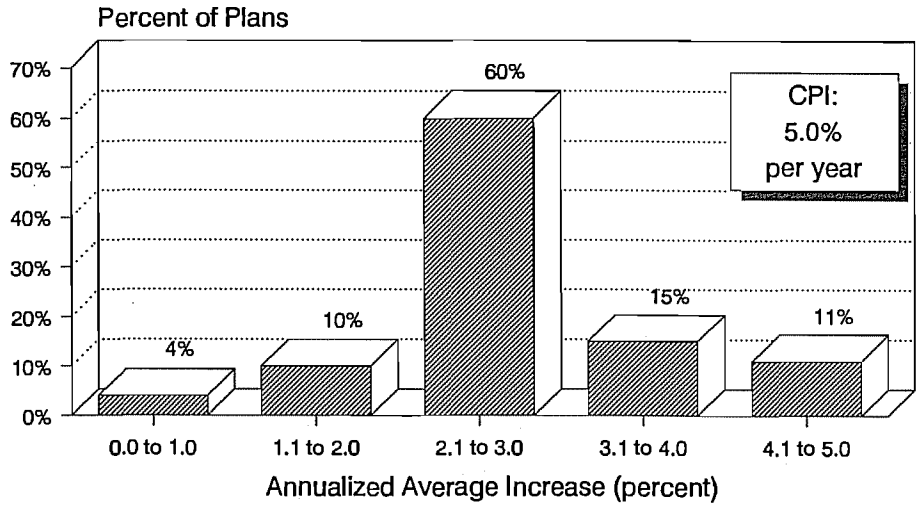
Average Annualized Increase	Automatic Increase Plans: All Plan Types		State Employee**		Local Employee**		Teacher	
4.1-5.0%	0	0%	0	0%	0	0%	0	0%
3.1-4.0%	0	0	0	0	0	0	0	0
2.1-3.0%	11	69	8	80	5	63	6	67
1.1-2.0%	4	25	2	20	3	38	2	22
0.0-1.0%	1	6	0	0	0	0	1	11
Total	16	100%	10	100%	8	100%	9	100%

*Based on current benefit increase formula and inflation rates for FY 1981-90.

**One plan in each of these categories provided insufficient information upon which to estimate benefit increases.

Source: Wisconsin Retirement Research Committee.

Figure 3.3: Estimated Benefit Increases for Other Public Pension Plans, 1981-90



Includes plans with CPI-based or automatic increase formulas (52 of 85 surveyed plans)

This comparison suggests that:

- **During the 1980s, the current Minnesota formula increased post-retirement benefits faster than was the case in most other states.**

For Minnesota public employees who retired during the 1980s, the current formula has provided fairly generous benefit increases. The rates of increase have exceeded the inflation rate as well as the rates of increase for retirees in other states. For those who retired during the mid-1970s or earlier, the relatively high rates of benefit increases in the 1980s make up for the relatively low rates of increase received in the 1970s, when the predecessor to the Post Fund operated under a different formula and under less favorable market conditions.

Under the current formula, rates of benefit increase for both groups of Minnesota retirees are likely to be about comparable to those in most other states in the next few years. The estimated 2.5 to 4.0 percent increase for Minnesota retirees is roughly comparable to expected increases in other states under current laws. The proposed formula, however, would likely permit the more generous benefit increases of the 1980s to continue into the 1990s. The proposal would provide Minnesota retirees with at least a 3.5 percent increase (assuming an inflation rate of at least 3.5 percent) and an additional investment-based adjustment, if performance allows.

It could be argued that a continued higher rate of benefit increase after retirement is justified because it compensates for the lower than average pensions obtained by Minnesota public employees. Table 3.7 shows that, for the three large groups of public employees, the starting pension in Minnesota is about 85 percent of the median for comparable plans in other states. This comparison assumes employees in all states have the same salaries and years of ex-

Table 3.7: Initial Pensions for Public Employees, 1990

	State Government Employees	Local Government Employees	Public School Teachers
Minnesota Pension	$16,360	$16,360	$16,360
Median Pension Among All States*	$19,100	$19,790	$19,100
Minnesota Rank	32 of 37	27 of 30	29 of 34
Minnesota Pension as % of National Median	86%	83%	86%

*The comparison excludes plans without Social Security coverage. Initial pensions were calculated based on 30 years of service, an age of 65 at retirement, a final salary of $40,000, and salary increases of five percent annually in the years prior to retirement.

Source: Wisconsin Retirement Research Committee.

perience and calculates the initial pension received by employees in each state.[7]

Minnesota's lower than average public pensions, however, appear to be largely due to the lower than average pension contributions made by public employees and employers. Table 3.8 shows that current pension contribution rates in Minnesota are 70 percent of the national median for state employees, 73 percent of the national median for local government employees, and 90 percent for teachers.[8]

In addition, maintaining a higher rate of benefit increases to compensate for lower than average initial pensions may run counter to good pension policy. It seems more reasonable to provide adequate pensions at the time of retirement and then maintain the adequacy of that initial pension through a well-designed benefit adjustment formula.

Overall, this information suggests that, rather than fund higher rates of increase for retirees, at least some of the additional funds available due to a greater allocation to stocks should be used to accomplish other objectives. A portion of the additional investment returns could be used to increase the starting pensions for future retirees, reduce the period over which the various pension funds' unfunded liability is reduced to zero, or reduce contribution levels.

Table 3.8: Current Pension Contribution Rates for Public Employees, 1990

	State Government Employees			Local Government Employees			Public School Teachers		
	Employer	Employee	Total	Employer	Employee	Total	Employer	Employee	Total
Current Contribution Rates									
-Minnesota	4.29%	4.15%	8.44%	4.48%	4.23%	8.71%	8.14%	4.5%	12.64%
-National Median	7.5	4.7	12.0	7.1	5.0	12.0	8.14	6.0	14.0
Minnesota Rank	36 of 38	22 of 38	35 of 38	29 of 31	21 of 31	28 of 31	18 of 35	26 of 35	23 of 35
Minnesota Rate as a % of National Median	57%	88%	70%	63%	85%	73%	100%	75%	90%

Source: Wisconsin Retirement Research Committee.

7 A comparison to public pensions in other states is not the only, or the best, standard by which to judge benefit adequacy. Benefit adequacy studies prepared for the Minnesota Legislative Commission on Pensions and Retirement generally compare the pension income (including Social Security benefits) of Minnesota retirees to their after-tax income just prior to retirement. These studies do not reach the same conclusions one would reach simply by comparing public pensions in Minnesota to those in other states. Pensions can be adequate in replacing pre-retirement income and still be less than those provided by other states.

8 Employer contributions made on behalf of Minnesota teachers include a regular rate of 4.5 percent of salary and an additional contribution of 3.64 percent to amortize the Teacher Retirement Fund's unfunded actuarial accrued liability. We were unable to determine how Minnesota's ranking might change if the 3.64 percent portion and its counterparts in other states were excluded from the comparison.

There are at least three different ways to use a portion of the increased investment returns for another purpose. These options are:

1. Combine the Basic and Post Funds into one fund and apply a formula slightly less generous than the proposed one to the performance of the single fund;

2. Combine the Basic and Post Funds into one fund and devise a new formula not dependent on investment performance; and

3. Apply the proposed formula to the Post Fund using a higher discount rate and a lower cost of living adjustment.

The first two options would involve scrapping the current system of dividing retirement funds into two funds. With one combined fund--like most states have--the Legislature could then devise a post-retirement benefit increase mechanism better than the current formula but not as generous as the proposed formula. The first option could include both an inflation-based adjustment and an investment-based adjustment as under the proposed formula. The second could involve an inflation-based adjustment or automatic increase mechanism as most other states use. However, the second option would not include an investment-based adjustment.

The third option would maintain a separate Post Fund and utilize the proposed formula, but increase the discount rate used when transferring funds from the Basic Funds to the Post Fund. Currently, when an employee retires, an actuarially sufficient amount of funds (less a 5 percent discount) is transferred from the Basic Funds to the Post Fund in order to pay a retiree's benefits. The Post Fund must earn an average of 5 percent annually to support the promised benefits, and any additional realized earnings provide permanent benefit increases.

By increasing the discount rate to 5.5 percent, for example, the Legislature could use part of the Post Fund's additional expected earnings for other purposes. The Post Fund should be able to earn more due to the change in its investment policy. Retirees would receive permanent benefit increases according to the proposed formula with two exceptions. The cost of living adjustment would have a maximum of 3.0 percent instead of 3.5 percent. In addition, investment returns in excess of 5.5 percent, instead of 5.0 percent, would be used to provide retirees with an investment-based adjustment in addition to the CPI-based adjustment. The additional 0.5 percent retained by the Basic Funds could be used to fund higher initial pensions for future retirees, reduce the period it will take to fully fund the various pension funds, or reduce contribution levels.

It is beyond the scope of this study to evaluate these various options for determining post-retirement benefit increases or to suggest how additional investment returns from a new formula should be used. However, it is clear from this study that the current formula needs to be changed. The current formula fails to maximize the earning power of Minnesota's retirement funds. A new formula is needed so that SBI can focus more on maximizing the funds' total return and less on guaranteeing a minimum level of realized earnings each year. A well-designed formula and system could potentially provide greater investment returns of up to two percent per year on the monies currently in the Post Fund. Even a modest overall increase in stock holdings--up to the

median level held by other public and private pension funds--would provide the retirement funds with $35 million to $50 million in additional funding annually over the long run.

We recommend that:

A modest increase in stock holdings would likely increase returns by $35 to $50 million annually.

- **The Legislature should examine alternative methods for determining annual post-retirement benefit increases, including options which combine the Basic and Post Retirement Funds.**

- **The Legislature should replace the current statutory formula for determining post-retirement benefit increases with a formula that permits SBI to maximize the earning power of the retirement funds and is more inflation-sensitive.**

PERMANENT SCHOOL FUND

In earlier chapters, we saw that:

- Despite the 1984 passage of a constitutional amendment permitting greater investment flexibility, the State Board of Investment eliminated stocks from the Permanent School Fund's portfolio.

- Eliminating stocks was a costly decision for the state because the stock market has more than doubled in value over the last five years.

Stocks, which had been 20 percent of the fund's portfolio prior to the constitutional amendment, were eliminated from the portfolio by September 1985. The decision was based on SBI staff advice as well as an apparent desire by policymakers to maximize current income in order to help balance the state's budget.

SBI staff advised the Board that the accounting restrictions remaining in statutes and the Constitution were still too restrictive. Staff said that long run growth of assets through the holding of stocks would be "difficult to achieve without seriously reducing current spendable income and exposing the spendable income stream to unacceptable volatility."[9]

Based on advice from staff of the Attorney General's Office, SBI staff believed that the needed investment flexibility could not be achieved without additional statutory and constitutional changes. According to SBI staff, key legislators were not receptive to the changes recommended by SBI staff.

9 See Minnesota State Board of Investment, *1985 Annual Report*, 47, as well as subsequent annual reports.

Figure 3.4 lists the provisions of the Minnesota Constitution and Minnesota Statutes which affect the operation and investment of the Permanent School Fund. The key provisions affecting investment policy are that:

- The principal of the fund cannot be expended.
- If the fund has net realized capital gains, they must be added to the principal.
- If the fund has net realized capital losses, they must be subtracted in equal installments from interest and dividends earned over a multi-year period.
- All interest and dividends (net of any capital losses recovered) must be distributed annually.

Clearly, holding stocks requires the fund to sacrifice some income at least temporarily, because stock dividends are generally lower than interest on bonds. Stock dividends are likely to average about three percent, compared to about nine percent on the fund's current bond portfolio. Thus, selling bonds and buying stocks would initially reduce the annual income generated by the fund. However, over the long run, stocks would grow in value relative to bonds. As some of these stocks were sold at a gain, bonds could eventually be purchased in sufficient amounts so that the fund's annual income would equal or exceed that from an all-bonds investment approach.

If stocks are held, some variability in income must also be accepted under existing law. This variability would arise in two ways. First, the level of income can be reduced if realized capital losses exceed realized capital gains in a given fiscal year. Statutes require that any net capital losses be recovered from income over a multi-year period. The period is equal to five years, if the net losses are due to sales of stocks at a loss. The recovery period is the average period prior to maturity remaining on bonds at the time of their sale, if the sale of the bonds resulted in the net capital loss.

A second source of variability would be on the upside. As stocks increased in value relative to bonds, they could be sold at a gain and converted to bonds in order to increase income. However, because the return on stocks is variable, the amount of time it would take to restore the bond portfolio to its size prior to the purchase of stocks is uncertain. As we showed in Chapter 2, it would have required just five years (1986-90) of sacrificing income in order to generate stock gains sufficient to restore the original level of income and still have a substantial stock portfolio. During periods of poorer stock market performance, it could take substantially longer.

We do not believe that the legal limitations on the fund are so restrictive that stocks cannot be held. We believe SBI staff has overstated the case against holding stocks. Generally, staff has not recognized that net realized capital losses can be recovered from income over a multi-year period--up to five years for stock losses. In addition, staff has not pointed out that, after a period of lower income, gains on stocks can be used to buy bonds and help restore the original level of income. Finally, the argument that no stocks should

Figure 3.4: Restrictions on the Permanent School Fund

Type of Restriction	Constitution*	Statutes**
Expenditure of the Fund's Principal	Prohibits expenditure of the principal.	NA
Definition of the Fund's Principal	NA	The principal consists of the proceeds from land sales and leases plus the net realized capital gains derived from the investment of these proceeds.
Income Distribution	Net interest and dividends must be distributed to school districts in a manner prescribed by statutes.	Each fiscal year's net income and dividends are transferred to the School Endowment Fund, from which they are distributed to school districts in proportion to the number of students in average daily membership.
Net Capital Losses	Net realized capital losses must be subtracted from the interest and dividends earned thereafter.	Net realized capital losses must be recovered in equal installments from interest and dividends over a period equal to: 1) five years, if the sale of stocks resulted in the loss; or 2) the average period prior to maturity remaining on debt securities sold, if the sale of debt securities sold, if the sale of debt securities resulted in the loss.
Investment Goals	Secure the maximum return consistent with the maintenance of the perpetuity of the fund.	NA
Investment Restrictions	NA***	Same as for retirement funds. (Stocks, bonds, cash equivalents, and alternative investments permitted.)

**Minnesota Constitution*, Article XI, Section 8.

**Primarily *Minn. Stat.*§11A.16. See also *Minn. Stat.* §124.08 and 124.09.

***Prior to passage of the constitutional amendment in November 1984, the fund could not have more than 20 percent stocks and 40 percent corporate bonds. In addition, the constitution imposed certain financial quality on the stocks and bonds held by the fund. The remainder of the fund had to be invested in United States Treasury or agency securities guaranteed in full by the United States, or the bonds of Minnesota or other states. These restrictions were removed by the 1984 amendment.

be held fails to recognize that, prior to the constitutional amendment which allowed more stocks to be held, 20 percent of the fund's portfolio was in stocks.

Staff has correctly advised the Board and others that a longer-term approach, including investment in stocks, would better meet the fund's needs. Under the current approach, spendable income cannot grow over time.[10] Due to inflation, the real value of the fund and its annual income will decline over time. However, after their initial attempt, neither the staff nor the Board has pursued any statutory changes which might help to smooth out the variability in income.

Figure 3.5 outlines some available options for the fund. These options range from no change in the fund's legal restrictions to a complete removal of restrictions from the statutes and the Constitution. In all cases, we assume

10 Income will grow only if interest rates on bonds increase or if there are net proceeds coming into the fund from the trust fund lands managed by the Department of Natural Resources.

that the goal is to stimulate the fund's long-term growth through the holding of equities.

The first option involves no change in the fund's legal restrictions. As pointed out earlier, holding stocks under current law would require an initial sacrifice of income. A balanced portfolio of 50 percent stocks and 50 percent bonds would likely require the fund to sacrifice one-third of its income, or about $11 million, in the first year.[11] The original level could only be restored when stocks have incurred sufficient capital gains. Then, enough stocks could be sold and bonds purchased so that the original level of annual income was reached. At the same time, some stocks would continue to be held so that the fund could continue to grow over the long run.

This first option requires a sacrifice of income until sufficient capital gains have occurred. The length of the period of lower income will depend on movements in stock market prices. If this option had been used in 1985, the period could have been as short as five years. However, if future stock returns are not as good as they have been over the last five years, the period would be longer.

The second option involves removing the statutory requirement that realized capital gains be added to the fund's principal. Removing this restriction would permit future net realized capital gains to be used to offset the loss in income in those years when capital losses are realized. Relative to the first option, Option #2 would permit SBI to achieve greater stability in future annual income. As capital gains are realized, they would serve as a reserve to smooth out the income stream in any future year in which net capital losses are realized.

The third option is similar to Option #2, but would also permit SBI to use net capital gains realized in the past as an initial buffer against future stock losses. In 1985, SBI staff estimated that approximately $35 million in net capital gains had been realized since 1974. Relative to Option #2, this option would provide better insurance against the possibility of losses occurring shortly after the fund adds stocks to its holdings. In addition, the reserve of past capital gains could be used to lessen the initial loss of income. According to SBI staff, access to this reserve, as well as the ability to expend future net realized gains, would permit removal of the fund's deferred loss adjustment.[12] Instead of recovering net realized losses from income over a multi-year period, net realized losses could be recovered from income in the year the losses are taken. The reserve would be available to offset the resulting loss in income.

The fourth option would be to remove the existing restrictions from both the Constitution and statutes. The fund's principal, defined as the net proceeds from land sales and leases, would remain inviolate and could not be expended. Otherwise, the fund would basically operate like an endowment fund. An annual spending target could be set as a percentage of the fund's market value.

If the fund's current income exceeds the target, the excess could be reinvested and thus used to increase the size of the fund's assets. If income falls short of

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11 This estimate is based on a stock dividend rate of three percent and a bond interest rate of nine percent. Sacrificing two-thirds of the fund's income on one-half of its portfolio results in an overall lowering of income by one-third.

12 SBI Staff Position Paper, *Permanent School Fund Needs and Objectives-Part II*, August 1985.

Figure 3.5: Options for the Permanent School Fund

Option	Required Law Changes	Advantages	Disadvantages
#1	None	• Can be implemented without any law changes. • Long-term growth in stock holdings should ultimately permit the fund to restore the current level of income.	• Initial reduction in income. • Period of time before original level of income can be restored depends on performance of stock markets. • Continued income variation in years in which net capital losses are realized. Net realized gains must be added to the fund's principal.
#2	Prospective redefinition of the fund's principal: • Permit future net realized capital gains to be expended.	• Requires minimal law changes. • Additional stability in future income streams.	• Initial reduction in income. • Additional stability depends on accumulating some net realized capital gains before net capital losses are realized.
#3	Retroactive redefinition of the fund's principal: • Permit future and past net realized capital gains to be expended. Change deferred yield adjustment: • Reduce multi-year period for offsetting income with net realized capital losses to one year.	• Increased ability to focus on maximizing the fund's total return, rather than current income. • Provides a buffer to smooth out the income stream from the start. • Requires law changes but probably no constitutional amendment.	• Retroactive redefinition of principal could be legally challenged. • Potential for raiding the reserve of past realized capital gains needs to be addressed.
#4	Retroactive redefinition of the fund's principal: • Permit future and past net realized capital gains to be expended. Endowment fund principles: • Remove language regarding calculation and disribution of net interest and dividends. • Add language on setting of spending targets. Constitutional Amendment: • Remove requirement that net realized capital losses must be recovered from interest and dividends. • Remove required distribution of net interest and dividends (so that spending targets can be set higher or lower).	• Greatest ability to focus on maximizing the fund's total return. • Provides a buffer to smooth out the income stream from the start.	• Requires a constitutional amendment. • Retroactive redefinition of principal could be legally challenged. • Potential for raiding the reserve of past realized capital gains needs to be addressed. • Spending targets need to be realistically set.

the target, past realized capital gains could be used to meet the annual target. Realistically set targets would permit the fund to grow over time and produce increasing levels of revenue to support elementary and secondary education. Relative to Option #3, this option would permit the fund to more easily operate like an endowment fund and focus on maximizing the fund's total return. Option #4 would remove the constitutional requirements that all current income be expended and that net realized capital losses be recovered from income before income is distributed to school districts. Distributions would be determined by spending targets.[13]

From an investment standpoint, each successive option is an improvement. Option #4 provides SBI with the greatest investment flexibility and the best legal framework for focusing on maximizing the fund's total return, instead of just the fund's current income. However, as we move from Option #1 to Option #4, there is an increasing difficulty in achieving change. Option #4 would be particularly difficult to achieve since it would require passage of another constitutional amendment. Both Option #3 and Option #4 could be legally challenged, since they involve a retroactive redefinition of the fund's principal. Realized net capital gains have thus far been considered by statute to be part of the fund's principal. Options #3 and #4 would amend the statutes and permit past gains to be expended.

In addition, as more investment flexibility is provided, there is an increasing need to ensure that the flexibility will not be used inappropriately. It is necessary that spending targets be set appropriately and not abruptly increased to meet the needs of a budget crunch or the desire to fund some other program out of the state's General Fund. This is a concern because the income of the Permanent School Fund is currently used to reduce the level of General Fund expenditures necessary to fund elementary and secondary education. The Permanent School Fund's income does not necessarily support additional spending for education but can be used to supplant General Fund revenue, which is then used to support non-educational programs. During a budget crisis, the accumulated realized capital gains of the Permanent School Fund could be inappropriately used to relieve pressure on the General Fund. Such a "raid" on the Permanent School Fund would be counterproductive. The Permanent School Fund would not then be able to grow over the long run.

We conclude that:

Stocks should be added to the fund by fiscal year 1994.

- **A change in the Permanent School Fund's investment strategy is needed. Without stocks, the fund's financial assets will not grow.**

The fund's growth will be limited to any net proceeds available from land sales and leases.

The current state budget crisis makes it difficult to implement any immediate changes in the Permanent School Fund's portfolio. Unless state revenue forecasts change dramatically, the state will need all the current income the fund can generate over the next two years. This time could be productively

13 In 1985, SBI staff identified Option #4 as their preferred method for operating the Permanent School Fund.

used to plan changes in the fund's portfolio which would occur beginning in fiscal year 1994. We recommend that:

- **The State Board of Investment and its staff should review the accounting restrictions placed on the fund and the desirability of changing the statutes and/or the Constitution so that stocks can be added to the portfolio once the budget crisis is over.**

- **SBI should seek legal advice from the Attorney General's Office regarding the advisability of redefining the fund's principal to exclude past realized capital gains.**

- **The Board and its staff should work with the Legislature and the administration in reviewing various options and developing any proposals for statutory or constitutional changes.**

Currently, the Permanent School Fund Advisory Committee reviews the Department of Natural Resources' management of the fund's physical assets. The committee consists of four legislators, the commissioner of education, and two school superintendents.[14] This group has heard updates from SBI staff on the fund's current income, but is not charged with reviewing its investment strategy. This committee may be an appropriate group to assist SBI in developing and reviewing proposed changes.

The Legislature and the administration may also wish to consider changing how the proceeds of the Permanent School Fund are used. One of the possible reasons why a short-term investment approach has been taken is the lack of any direct link between the fund's investment returns and higher levels of education spending. The fund's income provides additional revenue for the State's General Fund which can be indirectly shifted to other programs. A more direct link between investment returns and educational programs might help to provide support for a long-term investment approach.

Our review of the fund has been limited to its investment performance. Consequently, we do not necessarily endorse a change in how the fund's income is used. Holding stocks would likely improve the fund's long-term growth regardless of how the fund is used. We think, however, that a review of possible uses of the fund could be helpful in providing support for a long-term investment approach.

PERFORMANCE EVALUATION

SBI staff provide the State Board of Investment and the Investment Advisory Council with quarterly and annual reports on investment performance. These reports are very useful and provide extensive data. The reports include more performance information and comparisons than provided by many other pension plans.

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14 Minn. Stat. §120.84.

However, these reports can be improved in a number of key respects. First, we recommend that:

- **The Board and its staff should reconsider how the Basic Funds' composite index is calculated.**

There are two items which merit consideration. First, because SBI does not have an adequate performance benchmark for cash equivalent assets, SBI should discontinue using the returns on 91-day Treasury bills in calculating the composite index. The actual return on cash assets should be used in the composite index until an adequate benchmark is developed.

Second, the Board and its staff should reconsider how alternative assets are weighted in the composite index. Since alternative assets are illiquid, SBI's rebalancing policy requires underweightings of venture capital to be invested in stocks and underweightings of real estate and resource funds to be invested in bonds. Overweightings of alternative assets result in reductions of stock or bond holdings until the desired asset allocation weights are once again achieved. Thus, policy recognizes the difficulty of maintaining the desired asset allocation for alternative assets, but the calculation of the composite index does not reflect the policy. We suggest that SBI and its staff consider supplementing the composite index with an adjusted composite index which reflects SBI's asset allocation policy.

Second, we recommend that:

- **The performance of the combined Basic and Post Retirement Funds should be compared to the median TUCS balanced fund.**

This comparison makes at least as much sense as the comparison currently made. Currently, SBI only compares the Basic Funds' performance to that of the median TUCS balanced fund. That comparison is not as useful because most other pension funds have one fund serving the dual purpose split between Minnesota's Basic and Post Funds. In Minnesota, about 90 percent of the stocks are in the Basic Fund and 70 percent of the bonds are in the Post Fund. Most other pension funds have only one fund with a more balanced asset mix than either of Minnesota's funds. Comparing only the Basic Fund, and not the Post Fund, to the median TUCS balanced fund is consistent with SBI's objectives for each fund. However, this practice essentially sets up a performance standard which is likely to be beaten over the long run since stock returns have historically exceeded bond returns.

The additional comparison we recommend must be made with the recognition that it measures more than just SBI's performance in investing the retirement funds. It is also a measure which reflects the cost of the current statutory formula for post-retirement benefit increases and its consequent investment strategy. Such a comparison would serve as a constant reminder of the effects of the formula on the performance of Minnesota's statewide retirement funds.

Third, we recommend that:

- **SBI staff should clearly compare the aggregate performance of active stock managers to their aggregate benchmark.**

The Board needs to know whether its active manager programs are working.

The comparison should include the performance and benchmarks for all active managers employed over the relevant periods of time (one year, three years, and five years). In the past, figures provided by staff have either excluded managers no longer employed by SBI or combined the aggregate performance and benchmark for the active managers with those for the passive stock managers. In order to properly assess the performance of active management relative to passive management, all active managers must be included. In addition, the performance of active stock managers should be assessed separately from, as well as combined with, that of passive managers.

Fourth, we recommend that:

- **SBI staff should clearly compare the aggregate performance of active bond managers to their aggregate benchmark.**

This recommendation applies the same logic to active bond managers as was applied above to active stock managers. As with stocks, the most comprehensive performance measure for the bond segment of the Basic Funds is one which includes the performance of both active and passive managers. The additional comparison we recommend would permit the Board and others to assess the performance of the active manager group apart from that of the passive managers.

Fifth, we recommend that:

- **SBI should provide total return information for the Post Retirement Fund and Permanent School Fund somewhere in its annual report.**

- **SBI should provide additional information on the characteristics of its bond portfolios in its annual report.**

This information is required by *Minn. Stat.* §11A.07, Subd. 4, clause (7) and is necessary to provide a complete perspective on the performance of these funds and various bond portfolios. Without total return information, it is possible to conclude that performance is superior, while the opposite is true. For example, a bond portfolio could produce high levels of current income by holding junk bonds but could have depreciated considerably in value. While this is not likely to be the case for SBI, it is wise to require such information to be reported.[15] Information on bond portfolio characteristics should, at a minimum, include the portfolio's composition by type of bond, its average maturity, and the quality distribution of bonds. Comparisons should be made to the characteristics of the Salomon Broad Investment Grade Bond Index, which is used as a performance benchmark for some of SBI's bond portfolios.

Finally, we recommend that:

- **SBI staff should research alternative ways of assessing its cash management performance and, preferably, develop a performance benchmark for cash equivalents.**

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15 Since these funds are not currently managed for total return, the recommended information could be supplied in an appendix to the report.

A number of methods for assessing cash performance are currently being used by some public agencies investing cash equivalents. These include:

- Comparisons to the rate of return on institutional money market funds as compiled by an outside source such as IBC/Donoghue or Lipper;
- Comparisons to Treasury securities of comparable maturities;
- Use of a Buyers Risk Index (BRIX) to assess relative performance risk;[16] and
- Comparisons to a customized performance benchmark.

A customized performance benchmark is needed for SBI's cash pools.

The last approach offers the most promise. The City of Tallahassee, Florida, has developed a method of evaluating cash performance much like the composite indices SBI uses for the various retirement funds under its control. Tallahassee's composite performance index for cash equivalents can also be customized to suit the restrictions and goals faced by other managers.[17] We recommend that SBI staff initially focus its attention on this approach since it would yield the best performance indicator of the available approaches.

If it is not possible to develop a customized benchmark, SBI staff should at least provide information on the characteristics and relative performance of its cash portfolios. This should include information on the average maturity, composition by type of cash investment, quality distribution, and average daily balance for each cash portfolio. Relative performance data would include information on returns to Treasury securities of comparable maturities (not just 91-day T-bills), returns to commercial paper of comparable quality and maturity, and returns on institutional money market funds.

16 Paul V. Shantic and Robert R. Buyers, "Hidden Risk: Problems in Local Agency Portfolios," *Government Finance Review,* August 1990, 13-16.

17 Robert B. Inzer and Linda B. Smith, *Portfolio Management: Integration of Investment Policy and Performance Review and Evaluation,* City of Tallahassee, Florida (1989).

EXTERNAL MANAGERS' PERFORMANCE AND FEES

Appendix A

Table A.1: Performance of Active Stock Managers, 1983-90

	Annual Rates of Return											
	Alliance		Forstmann		IAI		IDS		Lieber*		Waddell*	
Fiscal Year	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark
1983	15.16% (4 Mo)	NA	13.05% (4 Mo)	NA	9.68% (4 Mo)	NA	15.18% (4 Mo)	NA	12.36% (4 Mo)	NA	24.66% (4 Mo)	NA
1984	-15.74	-7.04% (6 Mo)	-8.99	-4.33% (6 Mo)	-8.06	-6.44% (6 Mo)	-12.56	-6.44% (6 Mo)	-9.32	-8.53% (6 Mo)	-11.27	-7.99%
1985	34.20	28.29	29.16	23.72	32.52	30.42	35.68	30.42	30.89	25.79	15.34	19.76
1986	43.96	32.21	44.17	25.94	29.27	34.22	41.86	34.22	42.13	35.54	28.38	25.57
1987	23.61	17.17	12.27	14.84	18.09	19.60	19.27	19.60	7.17	9.90	19.29	21.30
1988	-.80	-9.72	-1.27	-1.54	-4.91	-4.30	-9.47	-4.05	-3.93	-3.75	.86	-1.80
1989	19.22	16.00	10.44	14.85	15.24	18.35	13.71	18.74	14.75	13.12	10.57	11.99
1990	23.55	14.79	7.55	10.52	15.67	14.49	24.24	11.30	5.23	2.16	15.03	8.91
3-Year Period												
FY 1988-90	13.46	6.32	5.45	7.71	8.21	9.04	8.54	8.23	5.07	3.61	8.65	6.19
5-Year Period												
FY 1986-90	21.06	13.24	13.68	12.57	14.11	15.79	16.69	15.27	12.06	10.63	14.46	12.78
6-Year Period												
FY 1985-90	23.16	15.62	16.12	14.35	16.99	18.11	19.66	17.67	15.00	13.02	14.61	13.91

* Not used in the Basic Funds until July 1985.

Table A.1: Performance of Active Stock Managers, 1983-90 (Continued)

	Annual Rates of Return											
	Concord		Franklin		Rosenberg		Sasco		Geocapital		Beutel	
Fiscal Year	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark
1983	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.70% (4 Mo)	NA
1984	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	.90	-6.27% (6 Mo)
1985	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36.37	32.63
1986	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16.28	32.25
1987	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17.09	24.56
1988	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-1.53	.35
1989	6.77% (3 Mo)	8.44% (3 Mo)	9.68% (3 Mo)	8.41% (3 Mo)	8.70% (3 Mo)	8.20% (3 Mo)	7.39% (3 Mo)	6.18%	NA	NA	NA	NA
1990	9.36	7.21	7.45	5.42	11.38	11.27	3.44	6.41	5.98% (3 Mo)	6.09% (3 Mo)	NA	NA
3-Year Period												
FY 1988-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5-Year Period												
FY 1986-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6-Year Period												
FY 1985-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A.1: Performance of Active Stock Managers, 1983-90 (Continued)

	Annual Rates of Return											
	Hellman Jordan		Peregrine*		BMI*		Loomis Sayles		Siebel		Herbert Smith	
Fiscal Year	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark
1983	5.73% (4 Mo)	NA	21.43% (4 Mo)	NA	12.89%	NA	10.09% (4 Mo)	NA	12.96% (4 Mo)	NA	6.37% (4 Mo)	NA
1984	-8.48	-6.44%	-16.70	NA	-24.40	-9.92% (6 Mo)	-20.71	NA	-12.11	NA	-19.48	NA
1985	33.82	30.42	20.64	NA	14.39	25.03	25.48	NA	26.95	NA	20.07	NA
1986	29.47	34.22	20.16	27.91%	36.42	36.68	NA	NA	NA	NA	NA	NA
1987	23.12	19.60	18.25	19.79	20.65	13.86	NA	NA	NA	NA	NA	NA
1988	-18.17 (6 Mo)	-16.08 (6 Mo)	-7.06 (9 Mo)	-7.47 (9 Mo)	-5.31	-5.71	NA	NA	NA	NA	NA	NA
1989	NA	NA	NA	NA	8.66	16.22	NA	NA	NA	NA	NA	NA
1990	NA	NA	NA	NA	-5.46 (7 Mo)	9.22 (7 Mo)	NA	NA	NA	NA	NA	NA
3-Year Period												
FY 1988-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5-Year Period												
FY 1986-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6-Year Period												
FY 1985-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

*Not used in the Basic funds until July 1985.

Table A.1: Performance of Active Stock Managers, 1983-90 (Continued)

	Annual Rates of Return								
	Trustees & Investors		Internal: SBI Staff		Fred Alger		All Active Stock Managers		
Fiscal Year	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Aggregate Return	Aggregate Benchmark	Wilshire 5000
1983	15.26% (4 Mo)	NA	NA	NA	16.42% (4 Mo)	NA	11.69% (3 Mo)	NA	66.52%
1984	-23.39	NA	NA	NA	-14.05	-8.25% (6 Mo)	-13.07	-6.45%	-8.69
1985	18.32	NA	NA	NA	26.37	26.83	30.28	29.50	31.20
1986	NA	NA	18.38%	32.10%	47.23	35.27	32.27	31.76	35.26
1987	NA	NA	26.25	24.77	7.16	20.11	17.55	19.45	20.07
1988	NA	NA	-11.57 (9 Mo)	-7.57 (9 Mo)	-9.05	-4.45	-4.26	-3.50	-5.93
1989	NA	NA	NA	NA	-6.05 (6 Mo)	1.30 (6 Mo)	13.89	16.11	19.49
1990	NA	NA	NA	NA	NA	NA	13.96	10.20	12.75
3-Year Period									
FY 1988-90	NA	NA	NA	NA	NA	NA	7.51%	7.28%	8.22%
5-Year Period									
FY 1986-90	NA	NA	NA	NA	NA	NA	14.08%	14.21%	15.53%
6-Year Period									
FY 1985-90	NA	NA	NA	NA	NA	NA	16.63%	16.63%	18.01%

Source: State Board of Investment.

Table A.2: Performance of Active Bond Managers, 1985-90

	Annual Rates of Return														
	Lehman		Miller		Western		IAI		Morgan		Northwest		All Active Bond Managers		
Fiscal Year	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	Aggregate Return	Aggregate Benchmark	Salomon BIG Bond Index
1985	27.25%	26.64%	22.59%	29.98%	31.96%	28.33%	35.21%	29.98%	25.96%	29.94%	23.23%	28.35%	27.10%	28.71%	29.92%
1986	17.12	18.28	18.38	19.82	20.58	19.22	16.30	19.82	17.92	16.82	13.18	19.22	17.58	18.52	19.87
1987	5.22	5.46	13.99	5.58	6.22	5.60	5.19	5.58	7.37	6.75	7.25	5.58	7.95	5.82	5.57
1988	7.20	7.74	7.77	8.15	9.07	8.33	7.44	8.15	7.89	8.55	7.59	8.67	7.94	8.17	8.15
1989	12.71	11.41	9.61	12.20	14.49	12.43	14.00	12.62	10.13	10.50	NA	NA	12.10	11.90	12.22
1990	7.16	7.82	6.99	7.72	7.77	8.08	5.96	7.33	6.65	8.54	NA	NA	7.10	7.77	7.73
3-Year Period															
FY 1988-90	8.99	8.98	8.12	9.34	10.41	9.61	9.08	9.34	8.22	9.19	NA	NA	9.02	9.26	9.35
5-Year Period															
FY 1986-90	9.80	10.13	11.27	10.58	11.50	10.63	9.69	10.58	9.92	10.18	NA	NA	10.47	10.35	10.60
6-Year Period															
FY 1985-90	12.53	12.66	13.08	13.60	14.68	13.40	13.58	13.60	12.44	13.25	NA	NA	13.08	13.21	12.60

Source: State Board of Investment.

Table A.3: Performance of Semi-Passive Bond Managers and Passive Stock Manager, 1984-90

	Annual Rates of Return					
	Semi-Passive Bond Managers				Passive Stock Manager	
Fiscal Year	Fidelity	Lincoln	Total	Salomon BIG Bond Index	Wilshire Associates	Wilshire 5000
1984	NA	NA	NA	NA	-5.86%*	-8.69%
1985	NA	NA	NA	NA	31.61	31.20
1986	NA	NA	NA	NA	34.43	35.26
1987	NA	NA	NA	NA	20.22	20.07
1988	NA	NA	NA	NA	-5.71	-5.93
1989	12.03%	12.16%	12.10%	12.22%	19.40	19.49
1990	7.91	7.64	7.80	7.73	12.33	12.75
2-Year Period						
FY 1989-90	9.95	9.88	9.92	9.95	15.81	16.07
3-Year Period						
FY 1988-90	NA	NA	NA	NA	8.14	8.22
6-Year Period						
FY 1985-90	NA	NA	NA	NA	17.93	18.01

*Covers only 7 months: December 1983 through June 1984.

Source: State Board of Investment.

Table A.4: Alternative Investments, November 1990

	Inception Date	Commitment (in Millions)	Funded Commitment (in Millions)	Market Value of Funded Commitment (in Millions)	Cash Distributions (in Millions)	Unfunded Commitment (in Millions)	Internal Rate of Return	Measurement Period*
Real Estate								
Aetna	4/82	$ 40.0	$ 40.0	$ 64.9	$ 0.0	$ 0.0	7.4%	7.9 Years
Equitable	10/81	40.0	40.0	78.5	0.0	0.0	9.3	8.6
Heitman I	8/84	20.0	20.0	21.7	10.3	0.0	11.8	5.4
Heitman II	11/85	30.0	30.0	36.0	7.7	0.0	11.4	4.1
Heitman III	1/87	20.0	20.0	21.2	2.8	0.0	8.5	3.0
Prudential	9/81	40.0	40.0	37.5	36.4	0.0	7.8	8.8
RREEF	9/84	75.0	75.0	81.9	14.6	0.0	6.2	6.2
State Street III	9/85	20.0	20.0	22.5	0.0	0.0	2.9	4.3
State Street IV	9/86	15.0	15.0	16.1	0.0	0.0	2.4	3.3
State Street V	12/87	15.0	15.0	16.9	0.0	0.0	7.1	2.1
TCW III	8/85	40.0	40.0	49.8	9.5	0.0	10.3	4.6
TCW IV	11/86	30.0	30.0	35.6	2.1	0.0	9.8	3.3
Real Estate Totals		$385.0	$385.0	$482.5	$83.3	$ 0.0		
Resource (Oil & Gas)								
AMGO I	9/81	$ 15.0	$ 15.0	$ 4.8	$ 3.0	$ 0.0	-10.3%	7.8 Years
AMGO II	2/83	7.0	7.0	6.0	1.6	0.0	1.9	6.4
AMGO IV	7/88	12.3	12.3	12.3	0.7	0.0	7.4	1.7
AMGO V	5/90	16.8	10.5	10.5	0.0	6.3	0.0	0.3
Apache I	5/84	3.0	2.0	2.0	0.7	1.0	15.9	6.2
Apache III	12/86	30.0	30.0	20.9	20.3	0.0	13.6	3.5
Morgan O&G	8/88	15.0	8.4	9.3	0.0	6.6	12.0	1.4
British Pet.	2/89	25.0	25.0	28.0	2.7	0.0	23.7	1.0
Resource Totals		$124.1	$110.2	$ 93.8	$29.1	$ 13.9		
Venture Capital								
Allied	9/85	$ 5.0	$ 5.0	$ 4.9	$ 1.3	$ 0.0	7.7%	4.8 Years
DSV	4/85	10.0	10.0	11.3	0.0	0.0	2.7	5.2
First Century	12/84	10.0	6.5	6.2	2.0	3.5	9.6	5.1
First Chicago	5/88	5.0	4.3	4.2	0.4	0.7	10.7	1.9
First Chicago II	7/90	20.0	0.0	0.0	0.0	20.0	0.0	0.0
Golder Thoma	10/87	14.0	6.3	5.9	0.0	7.7	-4.3	2.7
IAI Ventures II	7/90	10.0	1.0	1.0	0.0	9.0	0.0	0.0
Inman/Bowman	6/85	7.5	5.3	4.5	0.0	2.2	-4.5	5.1
KKR I	3/84	25.0	25.0	26.6	40.4	0.0	26.8	6.3
KKR II	12/85	18.4	18.4	32.3	7.3	0.0	23.0	4.5
KKR III	10/87	146.6	133.7	134.2	7.6	12.9	3.2	2.7
Matrix	8/85	10.0	10.0	11.2	2.0	0.0	8.9	4.9
Matrix II	5/90	10.0	1.0	1.0	0.0	9.0	0.0	0.2
Norwest	1/84	10.0	10.0	8.2	2.5	0.0	1.7	5.5
Summit I	12/84	10.0	10.0	9.4	4.2	0.0	9.3	5.3
Summit II	5/88	30.0	12.0	11.2	0.6	18.0	-2.8	1.9
Superior	6/86	6.6	4.2	3.7	0.0	2.5	-5.4	3.8
T. Rowe Price	11/87	1.1	1.1	0.0	1.3	0.0	32.4	2.6
Zell/Chilmark	7/90	30.0	0.0	0.0	0.0	30.0	0.0	0.0
Venture Capital Totals		$379.3	$263.7	$275.9	$69.6	$115.5		
				Summary				
Real Estate Totals		$385.0	$385.0	$482.5	$83.3	$0.0		
Resource Totals		124.1	110.2	93.8	29.1	13.9		
Venture Capital Totals		379.3	263.7	275.9	69.6	115.5		
GRAND TOTALS		$888.4	$758.9	$852.2	$182.0	$129.4		

*All figures are updated after each manager's annual review session.

Source: State Board of Investment.

Table A.5: External Stock and Bond Manager Fees, 1988-90

	Fiscal Year			
	1988	1989	1990	3-Year Total
Active Stock Managers				
Alliance Capital	$ 1,020,571	$ 1,186,498	$ 2,007,928	$ 4,214,997
Lieber & Company	382,457	909,874	1,293,578	2,585,909
Waddell & Reed	553,450	441,386	783,924	1,778,760
Forstmann Leff Asset	366,997	457,390	355,089	1,179,476
Franklin Portfolio Associates	NA	160,931	902,072	1,063,003
Rosenberg Institutional Equity Mgmt.	NA	192,120	698,512	890,632
IDS Advisory	120,651	153,031	616,851	890,533
BMI Capital	344,825	240,785	177,349	762,959
Investment Advisers, Inc.	230,750	231,676	263,484	725,910
Concord Capital Management	NA	180,341	507,020	687,361
Sasco Capital, Inc.	NA	104,617	380,647	485,264
Beutel Goodman	450,139	NA	NA	450,139
Peregrine Capital	281,529	NA	NA	281,529
Hellman Jordan	212,174	NA	NA	212,174
GeoCapital Corporation	NA	NA	95,809	95,809
Fred Alger Management	28,376	(151,688)	NA	(123,312)
Active Stock Total	$ 3,991,919	$ 4,106,961	$ 8,082,263	$16,181,143
Passive Stock Managers				
Wilshire Associates	$ 259,478	$ 312,482	$ 318,810	$ 890,770
Passive Stock Total	$ 259,478	$ 312,482	$ 318,810	$ 890,770
Active Bond Managers				
Miller, Anderson & Sherrerd	$ 508,623	$ 326,396	$ 352,852	$ 1,187,871
Western Asset Management	363,262	296,809	359,864	1,019,935
Lehman Management	487,627	221,303	244,130	953,060
Morgan Stanley Capital Management	416,684	212,100	233,061	861,845
Investment Advisers, Inc.	87,559	98,247	193,144	378,950
Peregrine Capital	233,090	NA	NA	233,090
Active Bond Total	$ 2,096,845	$ 1,154,855	$ 1,383,051	$ 4,634,751
Semi-Passive Bond Managers				
Fidelity Management Trust	NA	$ 192,684	$ 342,542	$ 535,226
Lincoln Capital Management	NA	206,623	299,036	505,659
Semi-Passive Bond Total	NA	$ 399,307	$ 641,578	$ 1,040,885
Grand Total*	$ 6,348,242	$ 5,973,605	$10,425,702	$22,747,549

*All these external managers are used in the Basic Retirement Funds and all, except the semi-passive bond managers, are used in the Supplemental Investment Fund.

Source: State Board of Investment.

INVESTMENTS OF OTHER STATE AGENCIES AND ORGANIZATIONS

Appendix B

This appendix provides summary information on cash and investments under the management and control of state agencies other than SBI, some quasi-public agencies, and insurance-related associations created by Minnesota law.[1] Table B.1 provides information on the cash and investments of state agencies other than SBI and several quasi-public entities such as the Minnesota State Historical Society, the State Agricultural Society (State Fair), and the Agricultural Utilization Research Institute. Table B.2 provides summary information on insurance-related associations created by Minnesota statutes to provide various types of insurance or reinsurance.

Table B.1 shows that approximately $1.2 billion in cash and investments was under the control of state agencies or entities other than SBI as of June 30, 1990. Of this amount, about $330 million was under the control of insurance companies operating the non-SBI options for employees participating in the state's deferred compensation program. Of the remaining $0.9 billion, two-thirds (or $0.6 billion) is technically under the control of the Minnesota Housing Finance Agency (MHFA). These funds include the proceeds from bond sales and loan repayments and are invested by a bank trustee with the agency's direction. Generally, bond covenants require these funds to be invested by a trustee.[2] Of the remaining $0.3 billion in Table B.1, the majority involves either student activity funds or various bond or loan funds. Some of the latter funds are, like MHFA's investments, under the control of a trustee as a result of bond covenants.

Table B.2 provides a listing of the cash and investments under the control of various insurance-related associations. Recent financial figures suggest that about $330 million is invested by these associations. Of this amount, $272 million constitute the assets of the Workers' Compensation Assigned Risk Plan. As of May 1, 1991, SBI will be responsible for investing the plan's assets. The remaining $58 million includes about $44 million under the control of the Minnesota Insurance Guaranty Association and $14 million invested by nine other associations. The composition and responsibilities of the ten association boards are generally different from that of the Workers' Compensation As-

1 Investments of the University of Minnesota, local governments, and local retirement funds are not covered in this appendix.

2 SBI is responsible for investing MHFA program funds and controlled about $183 million in MHFA funds as of June 30, 1990.

signed Risk Plan Review Board. Generally, a majority of the board members of these associations are appointed by association members or the Governor. All the members of the Workers' Compensation Assigned Risk Plan Review Board are appointed by the Commissioner of the Department of Commerce. In addition, the boards of these ten associations are generally responsible for securing administrative assistance on matters including investments, subject to the Commissioner's approval. In the case of the Workers' Compensation Assigned Risk Plan, the Commissioner was responsible for issuing administrative and investment contracts, subject only to the review of the board. As a result, the other ten associations appear to have a better system of checks and balances to provide oversight of such matters as investments.[3]

Initially, we had hoped to review in some detail the performance of the various state agencies and other entities responsible for investments. This effort proved to be beyond the limits of the resources available to this study. However, our limited review suggests that the vast majority of funds invested outside SBI are probably invested in a reasonable fashion. The bulk of the investments involve cash equivalents and fixed income securities and appear to be invested so as to maximize the rate of return while retaining sufficient liquidity of the funds and assuring safety of the principal.[4]

In some limited instances, we believe a more detailed review of investment practices may be useful. These instances generally involve the use of low-interest savings or checking accounts sometimes handling reasonably large amounts of funds. Evaluating each of these instances would require a review of each agency's cash flow requirements, banking arrangements, and other constraints.

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3 Part of the problem with the Workers' Compensation Assigned Risk Plan--and the reason investment authority was transferred to SBI by the 1990 Legislature--was the degree of control the Commissioner could exercise over contracts. See Office of the Legislative Auditor, *Review of Investment Contract for Workers' Compensation Assigned Risk Plan* (April 1990).

4 Only about $500,000 is invested in stocks.

Table B.1: Cash and Investments of State Agencies and Other Quasi-Public Entities

Agency/Fund	Description	Amount	Agency/Fund Total
Housing Finance Agency	Bond sale proceeds and loan repayments	$603,182,000	$603,182,000
Deferred Compensation	Non-SBI options controlled by insurance	330,333,951	330,333,951
Higher Education Coordinating Board	Loan Capital Fund	51,622,483	
	Student Educational Loan Fund	20,818,856	
	Bad Debt Reserve	7,706,687	
			80,148,026
Public Facilities Authority	Hospital Equipment Loan Program	63,337,950	63,337,950
State Universities	Revenue Bond Fund	42,423,694	
	Activities Funds	10,914,986	
			53,338,680
Higher Education Facilities Authority	Operating Fund (Restricted)	22,722,000	
	General Bond Reserve	2,589,000	
	Operating Fund (Unrestricted)	1,040,470	
			26,351,470
Agricultural and Economic Development Board	Small Business Development Loan Program	17,540,062	
	Agricultural Resources Loan Program	5,388,009	
	Minnesota Plan	633,416	
			23,561,488
Community Colleges	Activities Funds	6,593,164	6,593,164
State Armory Building Commission	Bond proceeds, loan repayments, and revenue from armory sales	5,389,783	5,389,783
State Lottery	Gross revenues awaiting expenses and monthly payout to state	4,335,861	4,335,861
Agricultural Utilization Research Institute	Funds received from the Greater Minnesota Corporation	2,170,000	2,170,000
State Supreme Court*	Interest on Lawyers Trust Account (IOLTA)	2,000,000 (estimate)	2,000,00
Minnesota State Historical Society**	Advances from state appropriation, interest from advances awaiting repayment to state, and various operating funds	1,681,288	1,681,288
Fund 40	Various debt service funds	509,070	509,070
Fund 30	Various federal funds	405,075	405,075
State Agricultural Society (State Fair)	Operating funds	300,000 (estimate)	300,000
Master Lease I	Reserves kept to close out existing contracts	261,839	261,839
Unemployment Compensation	Bank balances on hand for benefit payments	76,790	76,790
Greater Minnesota Corporation ***	Stock transferred from the Department of Trade and Economic Development	10,200	10,200
Grand Total			$1,203,986,635

*Does not include district court funds prior to their transfer to the state.
**Under an agreement with the Department of Finance, the Minnesota State Historical Society reimburses the state for interest earned on appropriations advanced monthly to the society by the state.
***Now under SBI's management.

Source: Department of Finance and various agencies.

Table B.2: Cash and Investments of Insurance-Related Associations

Association	Cash and Investments (in millions)	Valuation Date
Workers' Compensation Assigned Risk Plan*	$271.9	1/31/91
Minnesota Insurance Guaranty Association	44.5	12/31/89
Minnesota Comprehensive Health Association	3.9	12/31/89
Workers' Compensation Self-Insurance Security Fund	2.0	3/18/91
Minnesota Joint Underwriters Association	1.8	2/28/91
Minnesota Assigned Claims Bureau	1.7	12/31/89
Minnesota Property Placement Facility	1.3	12/31/89
Minnesota Life and Health Insurance Guaranty Association	1.2	12/31/89
Minnesota Medical Malpractice Association**	0.9	2/28/91
Minnesota Liquor Liability Assigned Risk Plan***	0.9	2/28/91
Minnesota Automobile Insurance Plan	0.1	12/31/89
Total	$330.2	

*Under SBI's management as of May 1, 1991.

**Administered by the Minnesota Joint Underwriters Association.

***Merged with the Minnesota Joint Underwriters Association.

SELECTED PROGRAM EVALUATIONS

Insurance Regulation, January 1986	86-01
Tax Increment Financing, January 1986	86-02
Fish Management, February 1986	86-03
Deinstitutionalization of Mentally Ill People, February 1986	86-04
Deinstitutionalization of Mentally Retarded People, February 1986	86-05
Management of Public Employee Pension Funds, May 1986	86-06
Aid to Families with Dependent Children, January 1987	87-01
Water Quality Monitoring, February 1987	87-02
Financing County Human Services, February 1987	87-03
Employment and Training Programs, March 1987	87-04
County State Aid Highway System: Follow-Up, July 1987	87-05
Minnesota State High School League, December 1987	87-06
Metropolitan Transit Planning, January 1988	88-01
Farm Interest Buydown Program, January 1988	88-02
Workers' Compensation, February 1988	88-03
Health Plan Regulation, February 1988	88-04
Trends in Education Expenditures, March 1988	88-05
Remodeling of University of Minnesota President's House and Office, March 1988	88-06
University of Minnesota Physical Plant, August 1988	88-07
Medicaid: Prepayment and Postpayment Review - Follow-Up, August 1988	88-08
High School Education, December 1988	88-09
High School Education: Report Summary, December 1988	88-10
Statewide Cost of Living Differences, January 1989	89-01
Access to Medicaid Services, February 1989	89-02
Use of Public Assistance Programs by AFDC Recipients, February 1989	89-03
Minnesota Housing Finance Agency, March 1989	89-04
Community Residences for Adults with Mental Illness, December 1989	89-05
Lawful Gambling, January 1990	90-01
Local Government Lobbying, February 1990	90-02
School District Spending, February 1990	90-03
Local Government Spending, March 1990	90-04
Administration of Reimbursement to Community Facilities for the Mentally Retarded, December 1990	90-05
Pollution Control Agency, January 1991	91-01
Nursing Homes: A Financial Review, January 1991	91-02
Teacher Compensation, January 1991	91-03
Game and Fish Fund, March 1991	91-04
Greater Minnesota Corporation: Organizational Structure and Accountability, March 1991	91-05
State Investment Performance, April 1991	91-06
Sentencing and Correctional Policy, forthcoming	
State Contracting, forthcoming	

Evaluation reports can be obtained free of charge from the Program Evaluation Division, Centennial Building, 1st Floor South, Saint Paul, Minnesota 55155, 612/296-4708.