State of Minnesota \ LEGISLATIVE COMMISSION ON PENSIONS AND RETIREMENT

TO: Members of the Legislative Commission on Pensions and Retirement

FROM: Ed Burek, Deputy Director

RE: Larger Public Pension Fund Investment Performance Overview

DATE: January 21, 2005

Introduction

This memo provides an overview of performance of Minnesota public defined benefit pension funds with more than $10 million in assets. These pension funds are:

1. The State Board of Investment (SBI), which manages the assets of the Minnesota State Retirement System (MSRS) plans, the Teachers Retirement Association (TRA), the Public Employees Retirement Association (PERA). The SBI is also authorized to manage police, paid fire, and volunteer fire plan assets through the SBI Supplemental Fund, if those associations choose to use that investment vehicle.
2. The Duluth Teachers Retirement Fund Association (DTRFA), the Minneapolis Teachers Retirement Fund Association (MTRFA), and the St. Paul Teachers Retirement Fund Association (SPTRFA), which invest the assets of the first class city teacher pension plans.
3. The Minneapolis Employees Retirement Fund (MERF).
4. The Minneapolis Fire Relief Association (MFRA) and the Minneapolis Police Relief Association (MPRA).
5. The Bloomington Fire Relief Association (BFRA), which is the state's largest volunteer fire plan.

Sources of the data for the pension funds are Commission staff files, Office of the State Auditor (OSA) reports, and from a recent request to the fund managers to provide rate of return data for the total portfolio and asset classes for the most recent years (calendar year 2002, 2003, and the first three quarters of 2004), and for the year-end 2003 asset mix.

To invest MSRS, PERA, and TRA assets, Minnesota Statutes requires the SBI to have one fund for the assets of active employees (the Basic Fund) and a separate fund to invest the retiree assets (the Post Fund). For the period covered here (beginning in 1994), these two funds were jointly managed using the same or similar investment managers and with a similar asset mix. For purposes of this memo, the Basic and Post Funds are combined and referred to as the SBI Combined Fund. Similarly, MERF under law has an arrangement similar to SBI. The two primary MERF funds are the Deposit Accumulation Fund for active employees, comparable to the SBI Basic Fund, and the MERF Retirement Benefit Fund, comparable to the SBI Post Fund. These MERF funds are also combined and referred to as the MERF Combined Fund.

Asset Mix

Table 1 provides asset mix information as of December 31, 2003, the last full year of the period under study. Pension funds tend to maintain a similar mix overtime. Thus, the December 31, 2003 asset mix of any given fund hopefully is an acceptable indicator of the asset mix the fund has used for the recent period.[1] This is supported by similar data from the last Commission staff review of pension performance for these funds. When pension fund investment returns were last examined in 2002, Commission staff requested information on the 2001 year-end asset mix. Although not shown below, that information indicated asset mixes for these funds very similar to those used at the end of 2003. The total percentages in debt-related investments (cash and bonds) in 2001 was typically within two percentage points of the percentages indicated below for 2003, supporting a conclusion that these pension funds maintain a fairly steady mix over time. If the portion of assets in debt-related asset classes is about the same, then the percentage devoted to the other broad asset group, various forms of equity, must also be about the same.

Comparing the 2003 asset mixes of the pension funds in Table 1 indicates that, overall, the mixes are similar across funds. The mix can be broadly divided into debt-related assets (cash and bonds) and equity-related assets. Within the debt-related assets, these pension funds typically have a minimal allocation to cash, one or two percent of the total portfolio, consistent with a general aim of minimizing cash investments (Bloomington is

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[1] One reservation, though, concerns the MFRA, which at its board meetings has indicated willingness to market time, to revise its asset mix in an effort to predict and benefit from the next hot asset class.

somewhat of an exception, holding 5.2 percent of its assets in cash-related investments). Any pension portfolio will have some cash, which can be called frictional cash, caused by incoming employer and employee contributions, retirements, or due to transfer of assets between investment accounts. The objective, though, is to promptly convert cash into other investment assets with higher long-term returns. The bulk of the debt-related assets are in bonds, approximately 25 to 30 percent of the portfolio. The remainder is held in various forms of equity. Within the broad equity group, pension funds may invest in domestic stocks, foreign stock, or miscellaneous "other" investments. Domestic stock is the largest component. Several of the pension funds have also chosen to hold some foreign stock. While investment consultants often recommend exposure to the foreign stock market, over the long term this strategy may not have much rate of return impact on the portfolio compared to holding only domestic stocks. The chief benefit of foreign stock investment is to provide some diversification. The Minneapolis Fire Relief Association and the Bloomington Fire Relief Association have chosen to hold no foreign stock, and instead have devoted all their equities to the domestic market.

The SBI, in its response to our information request, requested that the foreign equities portion of its portfolio be referred to as "international" stock rather than "foreign" stock. Perhaps this reflects a global asset class strategy. In recent years, some pension funds have begun investing part of their assets with managers who attempt to select the best stock investments from across the world, without distinction of whether any given company is a foreign company or a domestic United States company. Since these global portfolios may contain some domestic stocks, these portfolios may be more appropriately termed "international" or "global stock" portfolios, rather than foreign stock portfolios. Table 1 does not include a separate international stock category. The SBI's international stocks are included under foreign stock. Thus, the SBI's foreign stock may be slightly overstated in Table 1 and its domestic stock understated. The SBI also lists 8.9 percent of its assets as "Other." Some of these "other" investments are private equity (venture capital), further increasing its equity exposure, and some are "yield oriented investments" which are part of the Post Fund. For purposes of Table 1, these yield-oriented investments could be added to the bond class, increasing the bond asset class to be more consistent with the other pension funds. Other SBI investments in this miscellaneous "Other" category include oil and or gas investments and real estate, through real estate investment trusts (REITs) or other investment forms.

MERF reported a separate global asset class. In the table, this global asset class is added to its reported foreign stock, for a total of 25.5 percent of its assets in this category. Since some of these investments are domestic companies, this treatment somewhat understates MERF's domestic equity and overstates MERF's foreign stock exposure.

Table 1
Asset Mix
Calendar Year-End 2003

			Stock		
	Cash	Bonds	Domestic	Foreign	Other
SBI Combined	1.0%	22.9%	50.6%	16.6% [1]	8.9%
MERF Combined	1.5%	27.9%	39.7%	25.5%	5.4%
DTRFA	1.5%	27.4%	56.5%	12.6%	2.0%
MTRFA	2.0%	25.0%	57.0%	15.0%	1.0%
SPTRFA	0.0%	27.0%	52.2%	20.6%	0.2%
Minneapolis Fire	1.0%	30.0%	69.0%	0.0%	0.0%
Minneapolis Police	2.0%	30.0%	54.5%	13.2%	0.3%
Bloomington Fire	5.2%	30.6%	64.2%	0.0%	0.0%

[1] *Identified by the State Board of Investment as International Stock.*

Total Portfolio Returns

Table 2 indicates the annual time-weighted total portfolio returns for the reporting funds from 1994 through the third quarter of 2004, where available. Two of the pension funds, DTRFA and Bloomington Fire, did not provide the partial-year 2004 return. Since we do not have any 2004 return information from two of the pension funds, the table includes long-term average returns for three-, five-, and ten-year periods through 2003 (the last year for which we have data on all the funds).

In general, the investment performance of all of the funds is impacted by troubled foreign and domestic stock markets in 2000, 2001, and 2002, which hurt total returns. Stock market returns in the domestic and foreign markets for the 2000 through 2002 period were strongly negative. The asset mix table indicates that large portions of these portfolios are held in equities, with a few funds (Minneapolis Fire and Bloomington Fire) using solely the domestic market, while the other pension funds divided their equities between domestic and foreign (or global) markets. In either case, weak returns during these years by the domestic and foreign markets stock markets strongly influenced the total portfolio returns of these pension funds, causing all of the pension funds to have negative total portfolio returns for 2000, 2001, and 2002. Negative bond returns in

1994 (another bad year for the pension funds), coupled with near zero stock returns in that year, caused several of the funds to have calendar year 1994 total portfolio returns that dipped into the negative range.

Viewing the ten-year period (1994-2003) as a whole, the ten-year returns indicate that the SBI Combined Fund had an average (annualized) return for the period of 8.94 percent per year. A few of the other funds (DTRFA, SPTRFA, and MFRA) had higher returns for the ten-year period. This is due in part to the performance of the DTRFA, SPTRFA, and MFRA during the difficult years of 2000 through 2002. The returns for these three pension funds were not as negative as the SBI's returns during that period, enhancing their relative ten-year performance. The DTRFA and SPTRFA also had very high 2003 returns, boosting their relative standings.

For the ten-year period as a whole, MERF had a return marginally below that of SBI. This reflects a substantial improvement in MERF investment performance in recent years, distancing it from the MERF investment scandals of the late 1980s and early 1990s. In recent years, MERF and its investment advisor have created an investment program that is expected to produce marginally higher returns than the SBI with less rate of return variability. The recent results suggest some success in this effort. For the recent three-year period, MERF's average return was 1.37 percent, compared to SBI's 0.76 percent. MERF's five-year return is also higher than SBI's.

Commission staff has long noted weak investment performance from MTRFA due to problems in its bond and stock portfolios. MTRFA returns are weak compared to its own benchmarks and also when compared to other pension funds. The MTRFA ten-year return is 7.36 percent, noticeably below that of the SBI and the Duluth and St. Paul teacher funds. The corresponding SBI return is nearly nine percent, while DTRFA and SPTRFA returns were comfortably above nine percent. Comparing the MTRFA annual returns to those of the SBI, the MTRA lost some ground in 1996 and 1998, and had a return well below SBI in 1997 (a 15.5 percent return for MTRFA compared to 21.5 percent for SBI). The MTRFA fared badly in the weak markets of 2000 through 2002, causing its total portfolio to have the lowest returns by far of any of the listed pension funds for the three-year period, particularly in 2000 and 2002. The MTRFA's most recent three-year return is negative, the only fund with a negative return except for the troubled Bloomington Fire fund. The MTRFA five-year return is also very low (1.64 percent), only about half that of the SBI fund for the same period.

The Minneapolis Police Relief Association (MPRA) is another fund with a history of weak investment performance. At times in the past, Commission staff has noted weak bond and stock returns from this fund compared to typical benchmarks. Its ten-year total portfolio return is 6.79 percent, lower than that of the MTRFA and lower than all of the pension funds except Bloomington Fire. Its returns for 1995 through 1999 indicate that this fund had lower returns in a few of those years than any of its peers, and was close to the bottom in 1996 and 1998. The MPRA has made an effort to revise its investment program and there are some encouraging signs. Its recent relative performance has improved due to suffering smaller losses in 2000 to 2002 than several of the other funds. Its five-year return is similar to SBI's, and its three-year return exceeds that of SBI, MERF, and MFRA. It remains to be seen how the MPRA will perform in more normal markets. Its 2003 return, 22.3 percent, is toward the bottom of the reported returns, and its 2004 partial-year return is low. This less than two-year period, however, is too short to draw any conclusions at this time.

Commission staff has long had reservations about the performance and management of the Bloomington Fire Relief Association (BFRA). This association divides its assets into an externally managed portion and a large internally managed portion. When the Commission staff requested investment return information during the early 1990s, the administrators had considerable difficulty providing returns computed on all of the association's assets, indicating that the administrators were unable to effectively assess the impact of their investment decisions. Commission staff also questioned whether this association was effectively controlling its asset mix. The Bloomington Fire Relief Association has chosen to invest portions of its assets with managers who hold a combination of stocks and bonds within a manager's portfolio. One problem with this approach is that the pension fund administrators may lose track of the portion of its overall portfolio that is devoted to bonds and stock, particularly if the individual managers are given discretion to move between bonds and stock at will. In addition, a manager rarely is equally adept at stock and bond investing – a manager might do reasonably well investing the stocks but be a poor bond investor, or vice versa.

When Commission staff last examined investment policy statements in 1998, the Bloomington Fire statement indicated no rate of return objectives beyond attaining a favorable absolute and relative rate of return consistent with the preservation of capital. The performance in the ensuing years fell short of those objectives. The absolute returns were not good, the fund did not do well relative to other large funds, and with the exception of the MTRFA, the relief association did not preserve capital as well as the other funds during the bad markets of 2000 to 2002. Bloomington Fire was not positioned to take full advantage of the good markets of the mid-1990s, and it was hammered in the bad markets of 2000 to 2002. The Bloomington Fire three-year return is the lowest in the group (-1.79 percent). Its five-year return year return is 0.61 percent, by far the lowest in the group, and its ten-year return is 6.11 percent, again the lowest in the group. The comparable SBI ten-year return was 8.94 percent, close to three full percentage points higher, while the DTRFA, SPTRFA, and MFRA returns were more than three full percentage points higher. The Bloomington Fire portfolio market value at the

end of 2003 was $92.1 million, according to a draft report from the Office of the State Auditor. An additional three percent return on a portfolio of that size amounts to $2.7 million per year.

Documents provided by the Bloomington Fire Relief Association indicate large shifts during calendar year 2003 within the total portfolio, as assets were shifted to different managers. There is nothing to indicate, though, that the association is reducing reliance on balanced managers. Money was moved from an internally managed balanced accounts or accounts, to two externally managed balanced accounts. Use of balanced managers may be a workable approach if the relief association board can obtain adequate information on the stock and bond performance within these accounts, and if the association can adequately control its asset mix while using this approach. At the beginning of 2003, $48.8 million (about 62 percent of the total portfolio) was in an internally managed balanced account. During the year, $36.9 million was withdrawn from that account and $30.4 million was added to the association's SBI Income Share Account, a balanced investment vehicle containing about 60 percent stock, 35 percent bonds, and five percent cash. Given this addition to the Income Share Account, by the end of the year the association had $70.6 million (about 77 percent of the association's total portfolio value) in that account. During the year, the association opened a new account with WCM Investment Management, again identified as a balanced account, and funded that account with $5.0 million. At the end of the year, over 90 percent of the association's assets were invested in various internally or externally managed balanced accounts.

The final portfolio represents the returns that could have been earned on a portfolio consisting of 40 percent bonds and 60 percent domestic stock. The bonds and stocks are invested in index funds matching the investment-grade bond market (the Lehman Aggregate Index) and the domestic stock market as a whole (the Wilshire 5000 Index). The asset mix in this benchmark portfolio is fairly conservative for a pension fund. The asset mix table indicates that the pension funds under study tend to hold between 60 and 70 percent of assets in various forms of equity investments, and sometimes more. This portfolio did well in the mid-1990s compared to most of the funds in the table, and it preserved capital well compared to the other funds in the 2000-2002, but lost some ground to other funds in 2003. Overall, this very simple portfolio, invested with no effort to beat the market, did very well. Its ten-year average return is 9.63 percent, higher than the SBI and comparable to the highest returns in the group. It five-year and three-year returns are also higher than several of the funds in the group.

This comparison of various pension fund returns to the indexed benchmark portfolio suggests that the extensive efforts made by some of the pension fund administrations to beat the markets and provide above average returns has had little positive effect, and may be harming results. It also illustrates that expecting returns comparable to those provided by the SBI is a reasonable standard. Although one might want to devise a strategy slightly more complicated than that reflected in the index portfolio, the SBI returns can be matched long term using very simple investment techniques.

Table 2
Total Portfolio Returns
Calendar Years 1994 Through September 30, 2004
with Multiple Year Returns Ending December 31, 2003

												Average (Annualized) Returns for Periods Ending 12/31/2003		
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 [1]	3-Year	5-Year	10-Year
SBI Combined Fund	-0.4%	25.5%	15.3%	21.5%	16.1%	16.5%	-2.8%	-6.0%	-11.6%	23.1%	3.9%	0.76%	2.98%	8.94%
MERF Combined Fund	1.2%	23.4%	12.9%	18.5%	15.7%	15.5%	-1.3%	-6.2%	-11.3%	25.2%	3.4%	1.37%	3.50%	8.66%
DTRFA	0.2%	25.5%	13.4%	15.5%	11.1%	29.4%	-1.6%	-4.7%	-12.8%	28.1%	--	2.11%	6.27%	9.51%
MTRFA	0.1%	25.0%	13.6%	15.5%	14.2%	21.5%	-6.0%	-7.7%	-16.2%	22.8%	1.8%	-1.70%	1.64%	7.36%
SPTRFA	0.3%	26.2%	12.6%	19.6%	12.0%	13.6%	-0.2%	-1.4%	-9.6%	27.0%	4.2%	4.22%	5.12%	9.39%
Minneapolis Fire	-1.8%	26.6%	14.0%	23.8%	21.9%	17.8%	-2.7%	-3.3%	-10.5%	19.6%	1.7%	1.16%	3.48%	9.76%
Minneapolis Police	-1.3%	20.6%	12.5%	12.7%	11.4%	11.1%	-2.0%	-4.1%	-10.1%	22.3%	1.8%	1.78%	2.80%	6.79%
Bloomington Fire	-9.1%	26.1%	12.5%	19.7%	13.8%	13.2%	-3.9%	-7.8%	-14.3%	19.9%	--	-1.79%	0.61%	6.11%
40% Bond/60% Stock	-1.3%	29.3%	14.1%	22.7%	17.5%	13.9%	-1.9%	-3.2%	-8.4%	20.6%	--	2.26%	3.62%	9.63%

[1] *The 2004 returns are partial year returns through September 30, 2004.*

Sources:
The 1994-1998 and 2001-2004 returns are as reported to the Commission staff by the pension fund administrators.
The 1998-2000 returns are as reported by the Office of the State Auditor.

Investment Performance: Estimation of Gain or Loss Due to Maintaining Pension Funds Separate from the State Board of Investment

The preceding section noted the rates of return earned by the pension funds in each year from 1994 through 2003 or 2004, and presented the ten-year average (annualized) returns of these funds, which effectively summarizes the performance for the ten year period (1994-2003) as a whole. Pension funds that provided a higher ten-year return than that of the SBI provided higher rates of asset growth due to investment returns than those generated by the SBI portfolio. On the other hand, plan members and contributors to pension funds that underperformed the SBI would have been better off if the SBI had managed the assets and set the asset mix. While these implications are clear from the investment return review, the dollar magnitude of these impacts is not apparent. This section provides a sense of the dollar magnitude of this relative performance by bringing into the analysis the dollars invested by the pension funds. A persistent underperformance of two percentage points per year may seem insignificant, but if a pension fund is investing $500 million, that shortfall amounts to $10 million per year.

Table 3 takes the value of assets in the given pension fund at the beginning of 1994 and computes the value of those assets at the end of 2003, assuming the assets grew over time at the rate indicated by the fund's ten-year annualized rate of return for the 1994-2003 period. The value of pension fund's assets are then computed as if the SBI had invested the assets, by taking the same 1994 asset value and applying the growth rate indicated by the SBI Combined Fund ten-year annualized return. If a pension fund matched the SBI's return the end value of the assets is the same, there is neither a gain nor a loss compared to having SBI invest the assets. If the pension fund underperformed SBI during the period, the pension fund would have been better off if SBI had invested the assets. The difference in the value of the final assets is shown as a loss in the table. If a pension fund had higher returns than SBI, the local management provided more investment growth and the amount is shown in the table as a gain.

The starting date for this analysis is 1994 because it was the first year for which it made sense to compute SBI Combined Fund returns. Due to a revised post-retirement adjustment procedure enacted in 1993, the SBI began investing the Post Fund for high investment returns subject to a prudent level of risk rather than investing the fund for high yields and realized gains. At that point, the SBI Basic Fund and the SBI Post Fund began to have similar assets mixes, investment objectives, and identical investment managers, and it made sense to think of the combination of the Basic and Post Fund as a single large pension fund, comparable in purpose to the single investment fund approach used by the first class city teacher fund associations and local police and fire funds included in the group under study.

Table 3
Gain or Loss Compared to SBI Combined Fund
Calendar Years 1994-2003

	10-Year Annualized Return 1994-2003	1994 Assets	Gain or Loss Relative to the SBI Combined Portfolio Given 1994 Assets
	%	$ millions	$ millions
SBI Combined Fund	8.94%	$18,852.0	--
MERF Combined Fund	8.66%	$967.5	-$57.9
DTRFA	9.51%	$135.5	$17.1
MTRFA	7.36%	$541.1	-$173.2
SPTRFA	9.39%	$410.6	$40.7
Minneapolis Fire	9.76%	$177.5	$32.5
Minneapolis Police	6.79%	$288.9	-$122.9
Bloomington Fire	6.11%	$58.8	-$32.0
Total:			-$295.7

The difference between the SBI ten-year return and the MERF ten-year return is small, an average return of 8.94 percent for SBI compared to 8.66 percent for MERF. But MERF had a large asset base at the start of the period, $967.5 million, and that slight return difference has a noticeable impact, producing a noticeable loss due to MERF management. The comparison indicates that MERF generated $57.9 million less during the period than would have occurred if SBI had managed the portfolios. In contrast, the DTRFA returns exceeded SBI's. Given DTRFA's assets, the DTRFA generated $17.1 million more in assets that would have occurred if SBI had managed the portfolio. The MTRFA had weak performance relative to most other pension funds and relative to SBI, with a 7.36 return for the period compared to SBI's 8.94 percent return. Given MTRFA's asset base of $541.1 million, $173.2 million was lost compared to SBI management. The SPTRFA and MFRA both had higher returns than SBI, therefore both show gains compared to the expected results from SBI management. The MPRA, with its low 6.79 percent return, shows a sizable loss relative to SBI, $122.9 million. Finally, Bloomington Fire, with its 6.11 percent return and $58.8 million asset base in 1994, would

have been much better off if SBI had invested the portfolio and controlled the asset mix. The opportunity loss for the Bloomington fund was $32 million.

The total shortfall for the group as a whole is $295.7 million for the ten-year period, suggesting that it would have been far less costly if the state had managed the investments of all these funds. These are defined benefit plans. Not only did some of the shortfalls tend to lower post-retirement increases below those that would otherwise have been paid, but some of the shortfalls also added to contribution requirements and increased the state aid paid to these pension funds. The state provides direct state aid to MERF and to the MTRFA, and various amortization aids to the MPRA. The Bloomington Fire Relief Association is funded largely through state fire aid.

There is a need to raise some reservations even for those pension funds that had higher returns than the SBI, and thus show up as gains due to local management in the table. The returns were high, but there is a question about the level of risk being incurred to achieve those returns. For instance, analysis later in this memo indicates that DTRFA and SPTRFA results are strongly influenced by their stock market returns. These funds are not following a strategy to capture the market return provided by the broad stock market; rather, they are attempting to beat the markets. This has created years of below-average returns, followed by a year with a very high return boosting their long-term returns. The past success of these pension funds depended upon hitting an occasional home run. The question is whether it would be wiser to aim for more consistency, and hence a more certain outcome.

Asset Class Returns

This section provides information on recent domestic stock, foreign stock, and bond returns of the pension plans, focusing on the 1998-2003 period. This provides some indication of how the pension funds performed in these markets and helps explain the total portfolio returns discussed earlier.

1. Domestic Stock. Table 4 provides the domestic stock returns and the returns for two common stock indices, the Wilshire 5000 (which measures the return to the entire domestic stock market) and the S&P 500 (which is the return earned by 500 of the largest companies). The Wilshire 5000 Index is a commonly used benchmark for a broadly diversified stock portfolio, containing large-cap, mid-cap, and small-cap stocks in the same percentages as are found in the market. The S&P 500 Index is an appropriate benchmark for a stock portfolio that favors large-cap stocks. The Wilshire 5000 six-year annualized return was 3.9 percent. The comparable S&P 500 return was 3.8 percent for the period, indicating that stocks not found in the S&P 500 had slightly higher returns than the stock contained in the S&P 500.

   During parts of this period, certain pension funds (DTRFA, MERF, and MTRFA) invested some of their stock portfolio assets with enhanced index managers. An enhanced index manager attempts to beat the index, usually the S&P 500, by modest amounts. Rather than investing directly in the stocks that compose the S&P 500, enhanced indexing techniques typically use S&P 500 futures contracts and options to gain exposure to the equity market. Only a portion of the value of the investment is paid at the time of purchase. The remainder is invested in short-term debt instruments until needed to settle the future contracts. Given the nature of the futures market, the total return to the futures contracts plus the related debt investments will in general equal the S&P 500 return if the return on the debt investments equals the London Inter-Bank Offering Rate (LIBOR). The LIBOR rate is the interest rate charged on inter-bank loans. If the pension fund earns a return on the short-term debt investments that exceed the LIBOR rate, the pension fund should receive a total return on its enhance index investment account that exceeds the S&P 500 return.

   For decades, active stock managers have tried to select stocks to beat the stock indices, having little success. The strategy taken by these enhanced index managers is an effort to transform the game. Rather than trying to beat the stock market to provide a return above the stock index, success now depends on beating short-term debt market with cash/short-term debt investments prior to closing the stock market futures contracts.

   For several years DTRFA, MERF, and MTRFA had some success with enhanced index approaches. However, in 2002 MERF and MTRFA suffered considerable losses due to enhanced indexing. Both fired their enhanced index manager, Advanced Investment Management (AIM), after it was discovered that the firm was violating the investment guidelines placed on the accounts by the two pension funds, and AIM may also have violated state and federal law. A MERF press release indicates that AIM used techniques that highly leveraged the portfolio. Leverage adds to gains in a strong market, but will magnify losses in a down market. In MERF's case, losses due specifically to contract violations (actions AIM took in violation of the investment guidelines on the account), were estimated at $27 million. MTRFA also had significant losses. This experience with AIM reduced the returns to both of the pension funds in 2002, with both having domestic stock returns in that year well below the indexes.

Table 4
Domestic Stock Returns
Calendar Years 1998-2003

	1998	1999	2000	2001	2002	2003	6-Year Annualized
S&P 500	28.9%	21.1%	-9.1%	-11.9%	-22.1%	28.7%	3.8%
Wilshire 5000	23.4%	23.6%	-10.9%	-11.0%	-20.9%	31.6%	3.9%
SBI Combined Fund	23.5%	21.0%	-11.0%	-11.1%	-22.4%	31.0%	3.1%
MERF Combined Fund	23.4%	20.9%	-5.2%	-11.2%	-25.8%	31.5%	3.4%
DTRFA	18.2%	46.0%	-5.8%	-12.4%	-26.3%	43.5%	7.1%
MTRFA	22.0%	26.1%	-11.2%	-12.8%	-25.9%	29.6%	2.3%
SPTRFA	14.7%	17.0%	-3.6%	-3.4%	-21.5%	38.7%	5.3%
Minneapolis Fire	34.1%	29.6%	-5.1%	-6.2%	-23.8%	31.7%	7.6%
Minneapolis Police	21.2%	23.2%	-6.9%	-10.3%	-20.3%	30.3%	4.4%
Bloomington Fire	18.9%	18.5%	-6.2%	-12.1%	--	--	--

Typically, domestic stock is the largest asset class in a pension fund portfolio, generally accounting for 50 percent or more of total portfolio assets. Success in this market strongly influences the total portfolio return. Therefore, it is of great importance that pension fund administrators have a domestic stock program in place capable of capturing the return offered by the market (in other words, capable of matching the returns indicated by the indexes).

The SBI under-performed somewhat for the six-year period as a whole. Its six-year return is 3.1 percent, which is below the indexes. For the period, SBI would have produced a higher return if it had adopted a simple index-matching strategy. SBI also holds some venture capital investments, which are lumped into its "other" asset class in this presentation. These venture capital and other miscellaneous investments are expected over time to have higher returns than the domestic stock market. Assuming this was the case during this period, the return from these miscellaneous equity investments would have served to mask within the total portfolio return some underperformance in the domestic stock portfolio.

MERF performance was marginally better, although it lagged the indices for the period as a whole. MERF did well in 2000, with a return of -5.2 percent; in contrast, the S&P 500 return was -9.1 percent in 2000, and the Wilshire 5000 return was -10.9 percent. In that same year, the SBI Combined Fund stock return was -11.0 percent. In large part due to the 2000 return, and despite a large loss in 2002 (in part due to problems with its AIM enhanced index investment, discussed above), MERF had a higher return for the six-year period as a whole than the SBI.

The DTRFA is characterized by a high average return and high variability, and warrants further exploration by the Commission. The DTRFA is following a path considerably different than that of most other pension funds. The DTRFA return for the period is 7.1 percent, which is considerably in excess of the indices, but the returns are highly variable from year to year. In a few years the DTRFA hit a home run; in other years it had the lowest return in the group. Compared to the indices and to most other pension funds in the table, the DTRFA 1998 return is very low, the 1999 return is very high (approximately twice that of the index returns in that year), low in 2002 (lower by far than either index and lower than any other fund), and very high in 2003. Commission staff has no explanation for this pattern of DTRFA returns, and can only note a possibility. DTRFA has some investments that can be considered to be venture capital and DTRFA may be including venture capital investments within its domestic stock returns. Perhaps this accounts for some of the variability and some of the high returns. Venture capital investments should be captured within the total portfolio return computation, but inclusion in the usual domestic stock class would lead to distorted comparisons relative to the indices and other pension funds.

MTRFA returns for the six-year period as a whole are the lowest of the group and are below the indices by unacceptable amounts. MTRFA domestic equity performance is a significant contributor to MTRFA's low total portfolio returns. MTRFA domestic stock returns lost ground in 1998, particularly relative to the S&P 500, but did well in 1999. However, during the bad years of 2000 to 2002, the MTRFA tended to lose more than the indices and more than most of the other pension funds (particularly in 2002), in part due to the AIM enhanced index investment.

The STPTRA is another pension fund worthy of further study. Its six-year stock return is high, 5.3 percent, which is considerably above the indices. Again, this strong stock return helps to explain the total portfolio returns noted in other sections. Like the DTRFA, the SPTRFA stock returns do not behave like the indices, although the returns are not quite as variable as those of the DTRFA are. The SPTRFA 1998 domestic stock return is 14.7 percent, well below the Wilshire 5000 return in that year and barely half that of the S&P 500, which produced a 28.9 percent return. The 1999 return is again very low compared to the indices, and is lower than any other pension fund in the group. Thus, for the first two

years of this period the SPTRFA performed very poorly relative to the indices and to other pension funds. The SPTRFA's strength came from losses during 2000 to 2002 that were modest compared to the indices and to most other funds, and to a very strong 2003 return. A stock portfolio that was defensive, designed to shield the fund in a downturn, could explain the 1998 through 2002 results, but it would not explain the high 2003 return. It would be useful to find out more about the investment approaches SPTRFA is using.

The MFRA had the highest stock returns in the group, with a 7.6 percent annualized return for the period. The 1998 and 1999 returns were strong, and MFRA did well during the down markets of 2002 and 2001.

The MPRA did surprising well. It lost ground to the indices in 1998, but held its ground well thereafter, and lost less than the indices in 2000 through 2002. For the period as a whole, MPRA's return was 4.4 percent, comfortably above the indices and higher than the SBI. MPRA's pre-1998 performance, which is not shown here, harmed the fund, as it consistently underperformed in those years.

After reviewing the 2002 and 2003 rate of return information provided by the Bloomington Fire Relief Association, Commission staff concludes that the information should not be presented here because the stock return data are faulty, being based on only a small fraction of the stocks actually held by the fund. Staff requested the returns for the total portfolio, and for the bond, domestic stock, and foreign stock asset classes. The response provided by Bloomington is attached, consisting of sheets created for the fund by the Office of the State Auditor (OSA) for purposes of OSA reports. The sheets do not include several of the requested returns, and some that are included are faulty. The OSA sorted through the association's investments and provides the resulting asset mix in the upper right corner of the attachment. At the end of 2003, about two-thirds of the portfolio (64.2 percent) is equities, 30.6 percent is bonds (fixed income), and the remainder is cash. On the lower portion of the sheet, the OSA computed the returns for the association's various investments. The computed return on "domestic equities" is 31.0 percent. However, this return is based on a small, separately managed equity account, reflecting only a small portion of the association's equities. That return was computed on an equity account worth only $1.625, which represents only 1.7 percent of the association's $92.1 million in total assets. The asset mix table on the same sheet indicated that 64.2 percent of the association's assets are equities. The bulk of the association's equities are buried within four balanced investment accounts, which contain a mix of equity and bonds within each account. It would be improper to assume that the return computed on very small portion of the association's equities is an adequate indicator of the unknown return earned on the association entire domestic equity holdings. There is no computed bond return; like the stocks, the bonds are buried within these balance accounts. The information on the OSA data sheet for 2002 has the same shortcomings. It is possible that Bloomington Fire Relief Association data already in Commission staff's database for earlier years is also faulty.

2. Foreign Stock. The foreign stock returns reported by the pension fund administrators are shown in Table 5. Along with these returns, results are provided for the Europe, Australia, and Far East (EAFE) Index, a commonly used foreign stock return index. The six-year index return is 3.1 percent. An emerging markets index is also provided, since the SBI has some exposure to these under-developed markets and some other pension funds may also. The emerging markets are subject to extreme swings. Despite a 66.4 percent return in 1999, and a 56.3 percent return in 2003, the emerging market index return for the six-year period as a whole was only 3.6 percent. Comparing the six-year returns for these two foreign stock indices to the domestic stock indices in the Table 4 indicates that the returns in foreign markets were lower for the six-year period than the domestic market returns. Exposure to the foreign markets during this period was likely to lower the total portfolio's return, compared to an all-domestic stock portfolio, unless the pension fund's foreign stock portfolio succeeded in beating the average return in the foreign markets.

Table 5
Foreign Stock Returns
Calendar Years 1998-2003

	1998	1999	2000	2001	2002	2003	6-Year Annualized
EAFE	20.0%	27.0%	-14.2%	-21.4%	-15.9%	38.6%	3.1%
Emerging Markets	-25.3%	66.4%	-30.6%	-2.6%	-6.0%	56.3%	3.6%
SBI Combined Fund	11.4%	33.2%	-14.3%	-19.8%	-13.6%	38.2%	3.3%
MERF Combined Fund	15.3%	34.2%	-16.5%	-20.0%	-12.5%	35.1%	3.4%
DTRFA	11.1%	44.1%	-17.3%	-19.3%	-15.9%	30.1%	2.6%
MTRFA	9.3%	42.4%	-11.7%	-16.2%	-16.9%	37.8%	4.7%
SPTRFA	9.2%	31.7%	-4.4%	-11.6%	-5.8%	39.7%	8.1%
Minneapolis Police	--	--	--	--	-15.8%	35.4%	--

Pension funds do have some success in beating EAFE. Part of that success stems from foreign stock managers who successfully predict which countries to avoid due to market instability or political turmoil within the given country. SBI and MERF produced returns for the six-year period that exceeded EAFE.

The DTRFA six-year return was below EAFE, and well below DTRFA's domestic stock return. For this six-year period, the DTRFA's diversification into foreign stock reduced its total portfolio return, further emphasizing the importance of the DTRFA domestic stock returns in producing above average total portfolio returns. The MTRFA actually faired well in the foreign market. The highest return was earned by the SPTRFA, helping to explaining its total portfolio rankings.

3. Bonds. The bond returns submitted by the pension funds appear in Table 6. The index for this market is the Lehman Aggregate Bond Index, which is an index showing the return to the domestic investment-grade bond market. A fairly high percentage of pension fund bond portfolios beat the index, at least over longer periods. One reason is that bond managers have been successful at predicting sectors of the fixed income market, which are likely to outperform other sectors, and have positioned the portfolio accordingly. At times this has required under-weighting or over-weighting mortgage-backed securities, government bonds, or corporate bonds, and shifting between different quality ranges. Managers have also had some success in predicting interest rate movements, and have revised the duration of the portfolio to take advantage of the related bond price increases or decreases.

   Some pension funds invest portions of the portfolio in below investment-grade bonds, commonly referred to as junk bonds. The Legislature gave the SBI statutory authority to invest in junk bonds in 1994. The Legislature attempted to keep all other pension funds out of the junk bond market, but the effort was not successful. The MTRFA is also authorized to invest in junk bonds, although it is unlikely that was intended by the Legislature. During the same 1994 Legislative Session, a post-retirement adjust provision was enacted for the MTRFA. The language inadvertently included a reference to Section 11A.24, the SBI investment authority provision, which had been revised during the session to include junk bond investing, rather than to a newly enacted investment authority provision (Section 356A.06, Subdivision 7), which was intended for the non-SBI plans and which did not include junk bond authority. The wording of the new Section 356A.06, Subdivision 7, was comparable to SBI's investment authority provision before it was amended to allow junk bond investing. More recently, MERF and various other pension funds have contended that they have authority to invest in junk bonds under an interpretation of Section 356A.06, Subdivision 7, paragraph (g), a miscellaneous "other investments" provision. The provision states that in addition to investments authorized elsewhere in the subdivision, the covered pension funds may invest in regional funds and mutual funds, venture capital, resource investments, and various other specified investments. Some pension fund administrators have chosen to interpret this paragraph as permitting junk bond investing providing that the junk bonds are held through a mutual fund arrangement.

   Junk bonds are predicted to have higher returns over time than investment grade bonds. Therefore, a pension fund that invests a portion of its assets in junk bonds should outperform the Lehman Aggregate Index. In practice, however, adding junk bonds to a portfolio has proven to be troublesome. One administrative problem is that pension fund administrators and their investment performance consultants have not systematically studied the impact of junk bonds on their portfolios. The bond portfolio benchmark is generally not revised following the decision to add junk bonds. If the bond portfolio benchmark was appropriate for the portfolio before adding junk bonds, and if the board decides to add junk bonds based on an argument that junk bonds should enhance the return, then presumably some upward adjustment in the benchmark is appropriate given the expected effect of those junk bonds. Typically, however, there is no change in the benchmark. The benchmark before the change is a vague statement to modestly outperform the Lehmann Aggregate, and the benchmark after the change remains the same – to modestly outperform the Lehman Aggregate, which indicates an underlying accountability problem. The board is either unwilling or unable to hold itself accountable. If the board has no effective mechanism for determining whether its junk bond program is working as intended, then the board should never have authorized the program. In Table 6, SBI, MERF, and MTRFA used junk bonds during the period under study, and a few other funds may have as well. The MTRFA retained a manager specifically to run a junk bond portfolio. The manager's performance was very disappointing, and the MTRFA abandoned its junk bond program after several years of dismal results. SBI and MERF use a different approach, allowing one or more bond managers to invest in junk bonds on an opportunistic basis. This makes it harder to determine the impact of these holdings. These managers may hold some junk bonds when the manager's reading of the situation is that junk bonds will enhance returns. At other times, the manager may hold no junk bonds. When viewing the manager's performance long term, perhaps the return is above the Lehman Aggregate. This result is due to some combination of movements between private and public sector securities, duration changes, quality changes within the investment-grade market, and occasional exposure to junk bonds. The question is whether the manager demonstrated skill in deciding when to invest in the below investment-grade market. The pension fund needs to sort out the impact of this effect from the other contributing factors. Even with a return in excess of the Lehman Aggregate, the junk bond exposure may have detracted from the result. Commission staff is not aware that SBI or MERF attempts to systematically study whether its junk bond exposure is adding or detracting from its program.

   The SBI is not providing bond returns that closely match the Lehman Aggregate on a yearly basis. Calendar year 2000 is the only year where the returns were very close. In other years, the SBI either underperformed or over performed the Lehman by a large amount, considering that these are bond returns.

The 2002 SBI return was low, 8.9 percent, compared to the 10.3 percent Lehman return. Without the strong SBI return in 2003, 5.7 percent compared to 4.1 percent for the Lehman, SBI would have under performed the Lehman for the period as a whole. For the six-year period, the annualized Lehman return was 7.0 percent, while the SBI return was 7.2 percent. It is not apparent that junk bond exposure is having a positive impact. This modest level of out-performance is an amount expected from pension funds that do not use junk bonds. The DTRFA, for instance, which to the best of our knowledge does not use junk bonds, provided a 7.5 percent six year annualized bond return, comfortably higher than SBI's.

MERF provided the highest return in the group, a six-year annualized return of 7.7 percent. The 1998-2001 returns are fairly close to the index, except for 1999, when MERF outperformed the index by a comfortable margin. The 2002 and 2003 returns depart noticeably from the index. MERF underperformed the index by nearly a percentage point in 2002, but had a very high return in 2003, 9.0 percent compared to 4.1 percent for the index. This final year is responsible for much of MERF's out-performance of the index for the six-year period as a whole. Commission members may wish to ask MERF to explain the cause of the 2003 return. Junk bond exposure had some influence, positive or negative. Probably the more important factor is a decision by MERF to devote portions of its portfolio to Treasury inflation indexed securities. These generally are not found, at least in any great proportion, in the portfolios of other pension funds.

The MTRFA returns for the six-year period are very low, with a 4.9 percent annualized return, far lower than any other pension fund in the group. Thus, weak performance in the bond market contributed to the MTRFA's low total portfolio returns. The 1999 bond return is very high, but the fund noticeably underperformed the investment-grade market in every other year. A large contributing factor was significant junk bond exposure. MTRFA retained a junk bond manager who invested a large portfolio. Several of these years were bad years in the junk bond market. Even if this manager had performed as expected, the MTRF bond portfolio would have under-performed the return offered in the investment-grade market. In addition, the manager considerably under-performed the junk bond benchmark the MTRFA used for that manager, further harming the MTRFA bond returns. MTRFA has since abandoned the junk bond market.

The SPTRFA six-year return is 7.0, matching the six-year Lehman return. Over the long term this may be deemed adequate, although many pension fund bond portfolios comfortably outperform the Lehman Aggregate by a few tenths of a percent.

The MFRA six-year annualized return is 6.8 percent, marginally below the index. Long term, this may represent a performance problem.

The MPRA also has a 6.8 percent annualized bond return. However, there are indications that the MPRA is improving its performance in this market as well as in the domestic stock market. The somewhat below average six-year annualized MPRA bond return is due to weak performance in 1998 through 2000. The returns for 2001-2003 exceed the Lehman in each year.

Six-year returns can not be computed for Bloomington Fire because they did not provide bond returns for 2002 and 2003. For the earlier years, the 1999 return is well above average and the reported returns for the other years are weak, noticeably below the Lehman Aggregate.

Table 6
Bond Returns
Calendar Years 1998-2003

	1998	1999	2000	2001	2002	2003	6-Year Annualized
Lehman Aggregate Bond Index	8.7%	-0.8%	11.6%	8.4%	10.3%	4.1%	7.0%
SBI Combined Fund	8.3%	-0.5%	11.7%	9.3%	8.9%	5.7%	7.2%
MERF Combined Fund	8.5%	0.2%	11.2%	8.4%	9.4%	9.0%	7.7%
DTRFA	8.7%	-1.8%	11.8%	8.8%	12.3%	6.0%	7.5%
MTRFA	4.4%	3.7%	7.2%	5.8%	4.3%	3.9%	4.9%
SPTRFA	9.2%	-1.5%	11.6%	9.1%	9.6%	4.5%	7.0%
Minneapolis Fire	8.9%	-1.2%	11.2%	8.9%	9.5%	4.1%	6.8%
Minneapolis Police	7.4%	-0.6%	10.4%	8.6%	10.6%	4.8%	6.8%
Bloomington Fire	8.0%	1.1%	10.6%	6.7%	--	--	--

Conclusion

The total portfolio investment returns were reviewed for the State Board of Investment and for the larger Minnesota public pension funds over the most recent ten-year period (1994-2003), and asset class returns in

recent years. These pension fund organizations are capable of providing comparable returns – they invest in the same markets and have similar asset mixes, with the SBI being perhaps marginally more aggressive in its equity exposure. Some pension funds have chosen to divide their equities between domestic and foreign markets, and possibly some minimal amounts of venture capital, while others have not.

While the pension funds could be providing comparable returns, that has not occurred. SBI has performed reasonably well over the ten-year period, largely due to being well diversified and by avoiding large mistakes. Within given markets, SBI does not stray far from average. In the domestic stock market, its performance perhaps has been marginally below average compared to the benchmarks. Its bond performance is solid, marginally beating the Lehman Aggregate, as expected, and it marginally exceeds EAFE in the foreign markets.

A few of the other pension funds have not been as consistent and have made harmful errors. The MPRA had investment problems in the early years included here, but is showing signs of improved performance. The MTRFA made significant mistakes and seriously under-performed in the domestic stock and bond markets. The MTRFA had trouble with an enhanced stock index investment manager that considerably harmed its 2002 return, but it was far from the only problem with the MTRFA domestic stock investment program. Stock returns were weak for several years for reasons unrelated to the enhanced index manager. An MTRFA decision to devote a significant portion of its bond portfolio to junk bonds caused harm. This occurred over a few year period which proved to be bad years for junk bond investing, and the MTRFA chose the wrong manager, who significantly underperformed the MTRFA's junk bond benchmark index, further adding to the poor performance. The junk bond program has now been terminated. The Bloomington Fire investment program is weak. The total portfolio returns for this fund should be reliable. Those returns indicate that Bloomington Fire had the weakest long-term performance of any of the pension funds included here. To run a sound investment program, Bloomington Fire plan administrators need good investment performance information, and they need to know how to use that information to make decisions. The inability of the administration to provide quality information when requested suggests that the organization lacks the information it needs to effectively administer their program. The Bloomington Fire Relief Association has $92 million as of the end of 2003, which is not an insignificant amount of money. Mistakes are costly.

After presenting the 1994 to 2003 total portfolio returns, the information was used to demonstrate the loss or gain that occurred over this period by not having the SBI invest all of these portfolios. A few pension funds (DTRFA, SPTRFA, and MFRA) had higher returns than SBI; therefore, in these cases there was a gain due to having the local pension fund. The MTRFA, MERF, MPRA, and Bloomington Fire, however, had lower returns than the SBI. The loss due to these funds was sizable, more than outweighing the gains from the other funds. For the group as a whole, nearly $300 million in additional assets would have been generated if the SBI invested all these portfolios.

For those funds that did have higher total portfolio returns than SBI for the 1994 through 2003 period, review of the asset class returns raised some questions about whether these funds are taking an acceptable level of risk or, alternatively, whether the relative performance of these funds is sustainable. The domestic stock returns drive the DTRFA, SPTRFA, and MFRA total portfolio returns because domestic stock is by far the largest asset class. The DTRFA domestic stock returns are unusually variable, with several years of low performance (as indicated by comparison to a reasonable index) with an occasional very high return. Without the occasional home run, the relative performance of this pension fund would be much different. There is a somewhat similar pattern with the SPTRFA returns. Finally, although the MFRA has been a strong performer for several years, Commission staff has long had reservations about the investment strategies used by this fund. This pension fund is a market timer; it is willing to make extensive revisions in the nature of its portfolios in response to perceived opportunities. Studies have demonstrated that to gain long term by a market timing approach, the investor needs to be right about 80 percent of the time. Most pension plan administrators do not like those odds, and instead maintain a steady hand on the asset mix. The Commission may wish to further investigate the investment strategies used by the DTRFA, SPTRFA, and MFRA.

APPENDIX

A. Definition of Concepts

1. **Time-Weighted Rate of Return**. A time-weighted rate of return measures the return earned on assets invested for the entire period. By filtering out the effects on return caused by a board's decisions to give additional assets to a manager during a period under study, or a board's decision to withdraw assets from a manager to cover benefit checks or other operating expenses, the time-weighted rate of return procedure removes the impact of events over which the investment manager has no control. For comparisons among investment managers, among funds, or to compare fund or manager performance to returns offered by the market, time-weighted returns are the accepted industry standard. In investment manager presentations, use of time-weighted rates of return rather than other forms of returns are required by Association of Investment Management and Research (AIMR) presentation standards and by the Securities and Exchange Commission (SEC). Minnesota law mandates the use of time-weighted rates of return for public pension fund performance reviews.

   Most individuals familiar with mutual funds have used time-weighted rate of return information, although they may not be aware of it because the returns were not identified by the formal name. Mutual funds commonly report returns to shareholders for the various investment portfolios offered by the mutual fund family. In presenting these returns, the report may include a comment indicating that the returns reflect the growth rate (positive or negative) of a single $1,000 investment made at the start of the period. Any other uniform assumed starting value could have been used, since there would be no impact on the computed return. This is a description of time-weighted returns, although the technical term was not used. Since the returns were computed using the time-weighted methodology, the returns can be compared to the time-weighted returns of any similar investment offering.

2. **Annualized Returns**. To review long-term performance, it is often useful to summarize several years of annual returns by computing multi-year average returns. The process is called "annualizing." If a fund had a 3.2 percent time-weighted rate of return in the first year, a 22 percent return in the second year, and a 6.5 percent return in the third, it can be shown that this variable three-year stream produces the same asset growth as a constant 10.3 percent return in each year. This 10.3 percent return is the three-year annualized return, summarizing the three-year performance of the fund. Annualized returns can be computed for any time-period and can be compared between funds. Mutual funds commonly report returns for one-, five-, and ten-year periods. The one-year return is the time-weighted return for the most recent year, while the five-and ten-year returns are multi-year, time-weighted annualized returns. Since annualized returns are a form of average returns, we will use the terms "annualized returns" and "average returns" interchangeably in this memo.

3. **Index Returns**. Rates of return can be computed for the stock, cash, bond, and real estate markets, for portions of those markets, or for any asset grouping being followed. The market segment being followed is the index, the return on those assets is the index return. For instance, the Wilshire 5000 is a commonly used stock index. The Wilshire 5000 Index includes all domestic stocks for which daily prices are available, weighted by market value. The name comes from the company that compiles the index and from the approximate number of companies initially included. At the present time, there are actually over 7,000 stocks incorporated into the Wilshire 5000.

4. **Benchmarks**. Pension plan boards expect a certain level of investment performance from each asset class and from the total portfolio. These performance objectives are often called "benchmarks" and they serve as a target or dividing line between performance deemed acceptable and performance that is not. For stocks, pension boards often use the Wilshire 5000 Index. Long-term stock returns that approximate or exceed the Wilshire 5000 return reflect acceptable performance, while returns below the benchmark suggest a need for further review and possible remedial action. Pension investment administrators typically adopt several benchmarks for use by their fund, one or more indices for each manager, each asset class, and for the total fund. The expectation is that the manager, asset class, and total portfolio performance will equal or exceed the respective benchmark. Indices and average returns for comparable managers or total portfolios are commonly used benchmarks.

B. Indices Used in this Report

As in previous Commission staff summaries of time-weighted rate of return report results, the tables in this memo include indices for comparison purposes. The indices used are those chosen by the pension fund association, as noted in the investment policy statement or other fund document.

The asset class indices that appear most often are:

- 90-Day Treasury Bill Return. The 90-Day Treasury Bill return indicated the returns available on cash equivalent investments.

- Wilshire 5000 Index. The Wilshire 5000 is the return earned on all domestic stocks for which daily price quotes are available.

- S&P 500 Index. The S&P 500 is the stock return earned by the roughly 500 largest traded companies.

- Lehman Brothers Aggregate Bond Index. The Lehman Brothers Aggregate Bond Index is the return earned on all domestic investment grade bonds, treasury and agency securities, and mortgage obligations with maturities greater than one year.

The Wilshire 5000 and the S&P 500 are stock indices. If a pension board concludes that it is not prudent to try to predict which portion of the stock market (large-caps, mid-caps, or small-caps) will provide the best returns in any given year, then a reasonable action is to hold a stock portfolio broadly diversified across these value segments. The stock benchmark which is most appropriate given that investment strategy is the Wilshire 5000, since it is a market-weighted index covering small-cap, mid-cap, and large-cap stocks. The S&P 500 Index reflects the return to certain large-cap stocks, a subset of the total stock market, although the companies included in that index do account for about 70 percent of the total stock market value.

Like the Wilshire 5000, which covers the broad stock market, the Lehman Brothers Aggregate Bond Index (generally referred to as the Lehman Aggregate) includes the broadest coverage of debt securities generally consistent with permissible police, paid fire, and volunteer fire funds investment authority laws. The Lehman Aggregate includes all investment-grade bond and mortgage securities. Use of this index is reasonable and conservative since it is consistent with broad diversifying within the investment-grade fixed income market and does not require predicting which portion of the fixed income market (short, middle, or long maturities; or bonds versus mortgage securities) will have the most desirable returns during the period under study. Rather, the index weights bonds and mortgage securities, and the various maturities, in the same proportion as they exist in the investment-grade fixed income market.

For assessing the adequacy of total portfolio results, it is possible to compare returns between funds or fund groups. Pension fund administrators should also be comparing their fund's total portfolio return to the total portfolio return that results from the target asset mix, assuming each asset class meets its benchmark. For their own internal reviews, fund administrators would use the benchmarks and target asset mix specified in the fund's investment policy statement, which every fund is required by law to have. If the actual total portfolio return is less than the total portfolio return resulting from the target asset mix and the asset class benchmark returns, the shortfall can be traced to departures of the actual asset mix from the target mix, or asset class under performance, or a combination of the two.