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Ohio Retirement Study Council

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OHIO RETIREMENT STUDY COUNCIL
Comparative Performance Study

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OHIO RETIREMENT STUDY COUNCIL

Comparative Performance Study

Period ending 12/31/03

Introduction

Evaluation Associates is pleased to present to the Council the most recent results of our ongoing, semi-annual comparative study of the performance of the five Ohio Statewide pension funds pursuant to Section 171.04 of the Revised Code. This is the tenth report we have prepared pursuant to this authority. The purpose of this comparative report is to provide the framework for dialogue with the retirement systems and to assist the Council in meeting its oversight responsibilities. This report reflects investment performance for all five retirement systems over the ten-year period beginning January 1, 1994 and ending December 31, 2003.

An important value of this type of report is its ability to provide an “apples to apples” comparison of the systems’ investment results. Such a comparison is possible, since all of the systems are subject to the same investment standards and restrictions and have been so from their inception. In light of the fact that rate of return calculations are extremely sensitive to time period differences, it is critical that any comparative study be done with a consistent time frame, as was done in this report.

As is common practice when examining pension fund results we make reference, throughout the report, to such things as quartile rankings and universe comparisons. The universes used for comparative purposes in the body of the report are those of the Wilshire Cooperative Universe Service. The comparisons are formulated by pooling data from a wide range of investment consulting firms and they provide a statistically valid measure of results relative to a large sample.

While the entire measurement period for this report, as mentioned above, is ten years, certain exhibits contained within the report reference shorter periods. When a shorter period is used for comparison purposes it is because that particular exhibit refers to a standard comparative reference period such as the past three or five years.

In order to put performance in the proper context, it is important to understand the historical evolution of the investment restrictions imposed on the funds by statute. Prior to 1993 and the passage of S.B. 43, the investment authority of the funds was severely limited. Only 35% of each fund’s assets could be invested in common stock and individual stock purchases were limited to domestic securities specified by a legal list. S.B. 43 expanded the legal list to include American Depository Receipts (ADRs), commingled stock investment funds, derivative instruments and real estate investment trusts (REITs). More importantly, the act permitted the funds to invest up to 50% of their total assets in U.S. stock and 10% in foreign stocks, bonds, and other obligations.

In March 1997, S.B. 82 abolished the legal list and adopted the “prudent person rule.” The funds’ investment authority under this act is expanded to allow any individual investment, so long as the overall portfolio is diversified. This allows for responses to changes in the economy and investment markets and reliance on professional investment managers and economic advisors to guide the decision making process. Along with this expansion of investment authority, however, comes the requirement of prudence and

diligence in the development of guidelines, benchmarks, and objectives, and importantly, mandates ongoing monitoring by those with fiduciary responsibility.

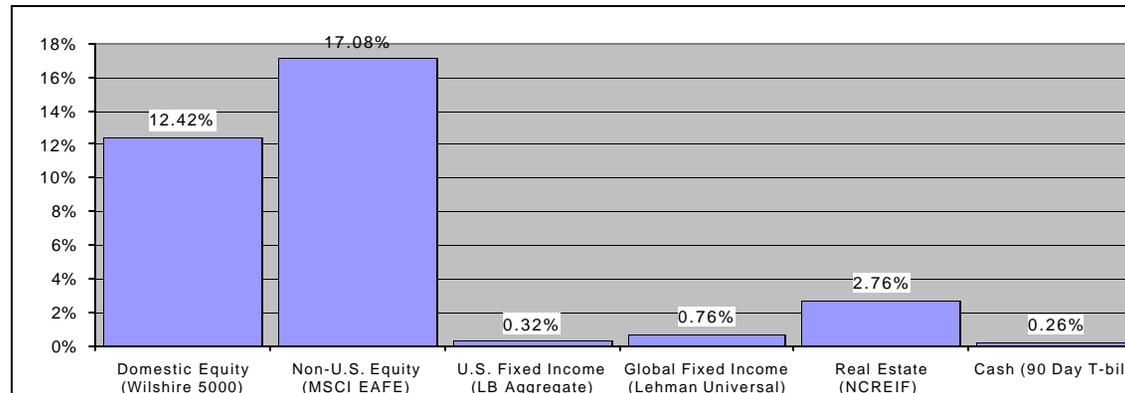
The majority of pension assets, in both the public and private sector, are managed with “prudent person” guidelines, which is to say largely without minimums or maximums placed on individual asset classes or securities. This approach, currently in place in the Ohio systems, is the optimal way to manage fund assets. It gives each fund the ability to develop an asset allocation strategy that is likely to maximize expected return while minimizing risk, all relative to the need to fund future obligations. Such an approach is fully consistent with the primary mandate of any pension fund – management that is in the best interest of plan participants.

Our findings may be summarized as follows:

- The six months ending 12/31/03, the period since our last report, was extremely positive for the systems. All experienced positive results, ranging from 14.17% (PERS) to 12.72% (SERS). All of the funds except OP&F outperformed their target policies for the period, with excess results ranging from 0.88% (HPRS) to 0.47% (SERS). All of the funds also ranked well above the median public retirement system in a broad universe of such funds. The top-performing funds for the six months were OP&F and PERS (8th percentile). The other funds ranged from the 10th percentile (HPRS) to the 22nd percentile (SERS).
- Longer term, OP&F, SERS and STRS have now outperformed their respective policy benchmarks for the past five years. PERS was essentially in line with its benchmark, while HPRS underperformed by 0.33%.
- The impact of the three years of negative returns from 2000 through 2002, while not entirely erased by this year’s good results has been significantly reduced. OP&F and SERS have 10-year returns that are above their actuarial interest rate assumption. STRS trails its current actuarial assumption by only three basis points, however it is outperforming its blended ten-year actuarial interest rate of 7.60% by 37 basis points. The HPRS and PERS performance is still below their actuarial interest rate, but the two funds have narrowed that spread significantly over the past twelve months.
- HPRS, which experienced the lowest return over the entire measurement period, continues to show signs of improvement. The fund’s 13.94% return over the past six months compares favorably to the 13.06% return for its policy benchmark. It is now also ahead of its benchmark for trailing one and three year periods.

Market Environment

The fourth quarter was a strong one for the capital markets, with all major asset classes posting gains. The best returns were in US and international stocks, with a 12.42% and 17.08% gain respectively. US fixed income returned 0.32% for the period, and real estate was up 2.76%. Cash returned .26%.



Median Fund Returns

The median fund in the Wilshire public fund database returned 8.05% in the fourth quarter and 20.39% in the trailing twelve months. A hypothetical fund with a 60% allocation to the Wilshire 5000 and a 40% allocation to the Lehman Brothers Aggregate Bond Index would have returned 7.58% for the quarter and 20.32% over the last year.

Universe Medians Performance Summary Periods ending December 31, 2003

	One Quarter	One Year	Three Years	Five Years	Ten Years
Fund Sponsor					
Public Fund Universe	8.05%	20.39%	2.81%	4.00%	8.66%
Corporate DB Universe	8.48%	21.63%	2.32%	4.44%	9.32%
Education Eleemosynary Universe	8.42%	21.77%	2.42%	4.90%	9.97%
Taft-Hartley Universe	6.58%	16.96%	2.93%	4.16%	8.14%
Balanced Funds	6.90%	17.29%	1.64%	3.75%	8.50%
Balanced Public Funds	7.42%	17.65%	2.61%	3.28%	N/A
60% Wilshire 5000 / 40% LB Aggregate	7.58%	20.32%	2.29%	3.56%	9.64%

Asset Allocation

- Comparison of Policy Asset Allocation
A well diversified asset allocation is the key investment decision that retirement fund Boards make based on risk tolerance, the pension liability structure and the funding costs of each fund. Asset allocation policy varies across funds for this reason.
- Total Fund Return vs. Policy Benchmark
Investment returns and the variation or volatility of returns are primarily determined by the policy asset allocation.
- Long Term Return
The primary objective of investment performance for each fund is to meet or exceed the respective policy benchmarks over a reasonable time period. Funds also seek to exceed the actuarial interest rate over a longer time horizon.
- Peer Rankings
In comparing rankings of fund performance in peer universes, asset allocation differences need to be considered.

Comparison of Policy Asset Allocation

	US Equity	Intl Equity	Fixed Income	Real Estate	Alternative Investment	Cash
HPRS	48.0%	15.0%	25.0%	12.0%	0.0%	0.0%
OP&F	48.0%	20.0%	23.0%	8.0%	1.0%	0.0%
PERS	46.0%	20.0%	23.0%	9.0%	1.0%	1.0%
SERS	46.0%	16.0%	23.0%	10.0%	3.0%	2.0%
STRS	45.0%	20.0%	23.0%	9.0%	2.0%	1.0%

Evaluating Funds

- The most appropriate benchmark for evaluating the performance of each of the Ohio funds is the blended index contained in their respective investment policy statements. The investment policy statement contains information about the investment objectives and investment constraints that are specific to each fund based upon such factors as the funds' liquidity needs and the age of the workforce they employ.
- There are two investment objectives: (1) a return that matches the cash flows of pension assets and liabilities and (2) the amount of risk the fund is willing and able to tolerate. These objectives are constrained by time horizon, liquidity needs, and government regulations.
- The investment policy statement guides the funds' asset allocation decisions. Asset allocation is very important because some studies show that 95% of the variance in returns is explained by this decision alone. Therefore, Ohio fund returns should be compared against returns from organizations with similar asset allocations.
- Performance of each of the Ohio funds should first be measured against each fund's own policy benchmark return (the return of the specified target policy mix), and secondarily, against the peer group.
- A comparison of the returns of the Ohio funds against one another is a valid exercise. It must be done, however, while keeping in mind any differences in the individual funds' policy allocations and the level of risk tolerance implied by those allocations.

Executive Summary

Total Fund Returns

The table below displays total fund results for all of the systems, comparing each fund's return to its own benchmark return. The tables that follow repeat the same comparison on an individual asset class basis.

Total Fund Return vs. Policy Benchmark						
Fund		<u>One Quarter</u>	<u>Two Quarters</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>
HPRS						
	Actual	9.98%	13.94%	25.30%	3.47%	3.39%
	Policy	9.10%	13.06%	23.83%	2.61%	4.25%
	Difference	0.88%	0.88%	1.47%	0.86%	-0.86%
OP&F						
	Actual	9.85%	14.16%	24.97%	2.69%	4.03%
	Policy	10.02%	14.68%	26.48%	1.83%	3.53%
	Difference	-0.17%	-0.52%	-1.51%	0.86%	0.50%
PERS						
	Actual	9.81%	14.17%	25.38%	2.21%	3.51%
	Policy	9.54%	13.63%	24.62%	1.96%	3.50%
	Difference	0.27%	0.54%	0.76%	0.25%	0.01%
SERS						
	Actual	8.85%	12.72%	22.93%	0.89%	3.51%
	Policy	8.39%	12.25%	22.22%	0.74%	3.01%
	Difference	0.46%	0.47%	0.71%	0.15%	0.50%
STRS						
	Actual	9.38%	13.51%	24.16%	1.18%	3.73%
	Policy	8.97%	12.81%	22.84%	1.26%	3.53%
	Difference	0.41%	0.70%	1.32%	-0.08%	0.20%

All returns are for periods ending 12/31/2003. Returns for periods longer than one year are annualized.

- HPRS: The six-month return for the total fund has outperformed the policy index by 88 basis points. Recent out-performance has helped the fund's tracking of its benchmark, however over the five-year period, the fund still trails its policy index by 0.86% annually.
- OP&F: OP&F trails its policy index by 0.52% for the last six months. Longer term, the fund is outperforming its policy index for the five-year period 0.50% annually.
- PERS: The six-month return for the total fund has outperformed the policy index by 0.54%. Over the three-year and five-year periods, the fund is outperforming its benchmark by 0.25% and 0.01% respectively on an annual basis.
- SERS: The six-month return for the total fund has outperformed its policy index return by 0.47%. Over the longer term, the fund has outperformed its policy index. For the three-year period, it leads the policy by 0.15% annually and for the five-year period the fund is outperforming its policy by 0.50% annually.
- STRS: The six-month return for the total fund outperformed its policy by 0.70%. The three-year return trails the policy by 0.08%, however the five-year return is outperforming the policy by 0.20%.

Domestic Equity Returns

Domestic Equity Return vs. Policy Benchmark						
<u>Fund</u>	<u>One Quarter</u>	<u>Two Quarters</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>	
HPRS						
Actual	14.89%	20.77%	37.58%	0.66%	-0.13%	
Policy	12.75%	17.45%	32.68%	-0.74%	1.99%	
Difference	2.14%	3.32%	4.90%	1.40%	-2.12%	
OP&F						
Actual	12.27%	16.44%	30.00%	-1.20%	1.91%	
Policy	12.42%	16.59%	31.64%	-2.47%	0.43%	
Difference	-0.15%	-0.15%	-1.64%	1.27%	1.48%	
PERS						
Actual	12.44%	16.31%	31.12%	-2.52%	-0.15%	
Policy	12.43%	16.27%	31.04%	-3.17%	-0.04%	
Difference	0.01%	0.04%	0.08%	0.65%	-0.11%	
SERS						
Actual	12.40%	16.71%	32.12%	-3.08%	0.65%	
Policy	12.43%	16.27%	31.04%	-3.09%	0.36%	
Difference	-0.03%	0.44%	1.08%	0.01%	0.29%	
STRS						
Actual	12.34%	15.93%	30.20%	-3.34%	-0.07%	
Policy	12.43%	16.20%	30.16%	-2.91%	0.48%	
Difference	-0.09%	-0.27%	0.04%	-0.43%	-0.55%	

All returns are for periods ending 12/31/2003. Returns for periods longer than one year are annualized.

The domestic equity markets posted very strong gains in the fourth quarter and results for each of the funds exceeded 12% for the quarter. On an absolute and relative basis, HPRS had the best results with a 14.89% return which exceeded its equity benchmark by 214 basis points. For the five-year period, OP&F has had the best absolute and relative results. The fund's domestic equity return of 1.91% is the highest of the funds and resulted in a 1.48% annual out-performance of its domestic equity policy return. Much of the relative underperformance of the HPRS total return that was seen on the previous page can be attributed to the poor domestic equity results for the five-year period.

Fixed Income Returns

Fixed Income Return vs. Policy Benchmark						
<u>Fund</u>		<u>One Quarter</u>	<u>Two Quarters</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>
HPRS						
	Actual	0.73%	1.30%	6.87%	8.61%	7.33%
	Policy	0.32%	0.17%	4.11%	7.57%	6.62%
	Difference	0.41%	1.13%	2.76%	1.04%	0.71%
OP&F						
	Actual	1.76%	2.69%	10.08%	9.20%	8.02%
	Policy*	1.52%	2.07%	8.99%	8.56%	7.21%
	Difference	0.24%	0.62%	1.09%	0.64%	0.81%
PERS						
	Actual	0.95%	1.20%	6.47%	8.15%	6.92%
	Policy	0.76%	0.84%	5.84%	8.13%	6.95%
	Difference	0.19%	0.36%	0.63%	0.02%	-0.03%
SERS						
	Actual	0.85%	0.90%	5.45%	8.47%	7.30%
	Policy	0.32%	0.17%	4.11%	7.57%	6.62%
	Difference	0.53%	0.73%	1.34%	0.90%	0.68%
STRS						
	Actual	1.10%	1.30%	6.94%	8.62%	7.28%
	Policy	0.76%	0.84%	5.84%	7.91%	6.72%
	Difference	0.34%	0.46%	1.10%	0.71%	0.56%

All returns are for periods ending 12/31/2003. Returns for periods longer than one year are annualized.

*This policy is an artificial composite benchmark created by EAI and is not the official benchmark used by OP&F.

Fixed income returns were positive for all of the funds for the fourth quarter. OP&F had the best second quarter return (+1.76%) followed by STRS (+1.10%), PERS (+0.95%), SERS (+0.85%), and HPRS (+0.73%). For the five-year period, OP&F again had the highest return (+8.02%). PERS had the lowest five-year return and was the only system in which the fixed income results did not exceed its policy return for the same period.

International Equity Returns

International Equity Return vs. Policy Benchmark						
<u>Fund</u>		<u>One Quarter</u>	<u>Two Quarters</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>
HPRS						
Actual		16.43%	22.57%	32.50%	-2.61%	2.46%
Policy		17.08%	26.59%	38.58%	-2.91%	-0.05%
Difference		-0.65%	-4.02%	-6.08%	0.30%	2.51%
OP&F						
Actual		16.72%	27.62%	39.60%	-2.14%	0.90%
Policy		17.11%	27.28%	41.40%	-0.97%	1.55%
Difference		-0.39%	0.34%	-1.80%	-1.17%	-0.65%
PERS						
Actual		16.61%	27.45%	40.72%	-1.53%	2.86%
Policy		17.00%	26.46%	39.42%	-2.65%	0.44%
Difference		-0.39%	0.99%	1.30%	1.12%	2.42%
SERS						
Actual		13.59%	21.80%	33.02%	-3.48%	1.27%
Policy		13.62%	21.94%	31.95%	-4.23%	0.78%
Difference		-0.03%	-0.14%	1.07%	0.75%	0.49%
STRS						
Actual		14.70%	25.00%	37.71%	0.49%	4.91%
Policy		14.30%	23.98%	35.13%	-1.83%	2.47%
Difference		0.40%	1.02%	2.58%	2.32%	2.44%

All returns are for periods ending 12/31/2003. Returns for periods longer than one year are annualized.

The international equity markets posted very strong gains in the fourth quarter. The international equity returns of all of the funds exceeded 13% for the quarter, however only STRS exceeded its international benchmark. OP&F had the best absolute results, returning a positive 16.61% while underperforming its policy by 39 basis points. Despite the positive double-digit gains, HPRS, PERS and SERS each underperformed their policy returns by 65, 39, and 3 basis points respectively. For the five-year period, STRS had the best absolute results 4.91%, but on a relative basis, HPRS exceeded its policy by the greatest margin (251 basis points).

Real Estate Returns

Real Estate Return vs. Policy Benchmark						
Fund		One Quarter	Two Quarters	One Year	Three Years	Five Years
HPRS						
	Actual	1.64%	3.37%	7.83%	7.72%	9.71%
	Policy	2.07%	3.74%	7.35%	6.42%	8.80%
	Difference	-0.43%	-0.37%	0.48%	1.30%	0.91%
OP&F						
	Actual	2.50%	6.97%	13.06%	10.16%	10.68%
	Policy	2.76%	4.78%	8.97%	5.02%	6.91%
	Difference	-0.26%	2.19%	4.09%	5.14%	3.77%
PERS						
	Actual	3.20%	6.54%	12.29%	8.79%	9.98%
	Policy	3.18%	5.84%	10.60%	8.81%	9.34%
	Difference	0.02%	0.70%	1.69%	-0.02%	0.64%
SERS						
	Actual	4.14%	8.05%	12.21%	5.70%	8.43%
	Policy	3.55%	7.24%	13.27%	8.77%	10.03%
	Difference	0.59%	0.81%	-1.06%	-3.07%	-1.60%
STRS						
	Actual	2.80%	5.29%	9.06%	6.44%	9.23%
	Policy	3.50%	6.32%	11.41%	8.03%	9.23%
	Difference	-0.70%	-1.03%	-2.35%	-1.59%	0.00%

All returns are for periods ending 12/31/2003. Returns for periods longer than one year are annualized.

Absolute real estate results for the five funds were all positive for the fourth quarter. SERS had the highest real estate return (+4.14%) followed by PERS (+3.20%), STRS (+2.80%), OP&F (+2.50%), and HPRS (+1.64%). For the five-year period, OP&F posted the best real estate return on an absolute and relative basis. The real estate portfolio returned a positive 10.68% for the five years and outperformed its policy return by 377 basis points annually. The policy returns for each of the funds varies greatly from quarter to quarter. This is due to the index selected and the method of reporting. For example, PERS includes a mortgage index and also reports their real estate returns with a one-quarter lag.

Alternative Asset Returns

Alternative Asset Return vs. Policy Benchmark						
<u>Fund</u>	<u>One Quarter</u>	<u>Two Quarters</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>	
HPRS						
Actual	N/A	N/A	N/A	N/A	N/A	N/A
Policy	N/A	N/A	N/A	N/A	N/A	N/A
Difference	N/A	N/A	N/A	N/A	N/A	N/A
OP&F						
Actual	-0.50%	-1.50%	-13.16%	-20.48%	1.80%	
Policy	17.75%	23.59%	6.28%	-5.92%	3.59%	
Difference	-18.25%	-25.09%	-19.44%	-14.56%	-1.79%	
PERS						
Actual	7.12%	17.98%	21.75%	-3.67%	8.58%	
Policy	4.17%	21.96%	29.65%	-9.52%	1.41%	
Difference	2.95%	-3.98%	-7.90%	5.85%	7.17%	
SERS						
Actual	1.11%	0.94%	-8.12%	-20.46%	2.52%	
Policy	4.73%	21.31%	27.43%	-4.80%	0.41%	
Difference	-3.62%	-20.37%	-35.55%	-15.66%	2.11%	
STRS						
Actual	4.93%	7.01%	9.14%	-8.31%	0.05%	
Policy	4.93%	7.01%	9.14%	N/A	N/A	
Difference	0.00%	0.00%	0.00%	N/A	N/A	

All returns are for periods ending 12/31/2003. Returns for periods longer than one year are annualized.

For the fourth quarter, PERS had the best absolute return (+7.12%) and relative results, outperforming its policy return by 295 basis points. For the five-year period, PERS had the best absolute and relative results, returning a positive 8.58% and beating the policy return by 7.17% annually. There is also a large amount of variation in the policies for alternative investments. STRS uses their actual alternative investment return as their policy return. OP&F, however, adds 5% annually to the Wilshire 5000 index to benchmark its alternative investment returns.

Long-Term Results vs. Targets

Long Term Return - 10 Years

	Actual Return	Benchmark Actual Return	Actuarial Interest Rate	Valuation Date
HPRS	6.95%	9.62%	8.00%	1/1/2004
OP&F	8.52%	8.26%	8.25%	1/1/2004
PERS	7.19%	7.76%	8.00%	1/1/2004
SERS	8.79%	8.87%	8.25%	7/1/2003
STRS	7.97%	8.47%	8.00%	7/1/2003

The table above provides a long-term look at how the systems are performing compared to their policy returns and also compared to their actuarial interest rate. On a relative basis, only OP&F has exceeded its policy return over the ten-year period. HPRS had the worst relative results over the observed period, however their recent performance has been strong and the gap between their actual return and the policy return has narrowed.

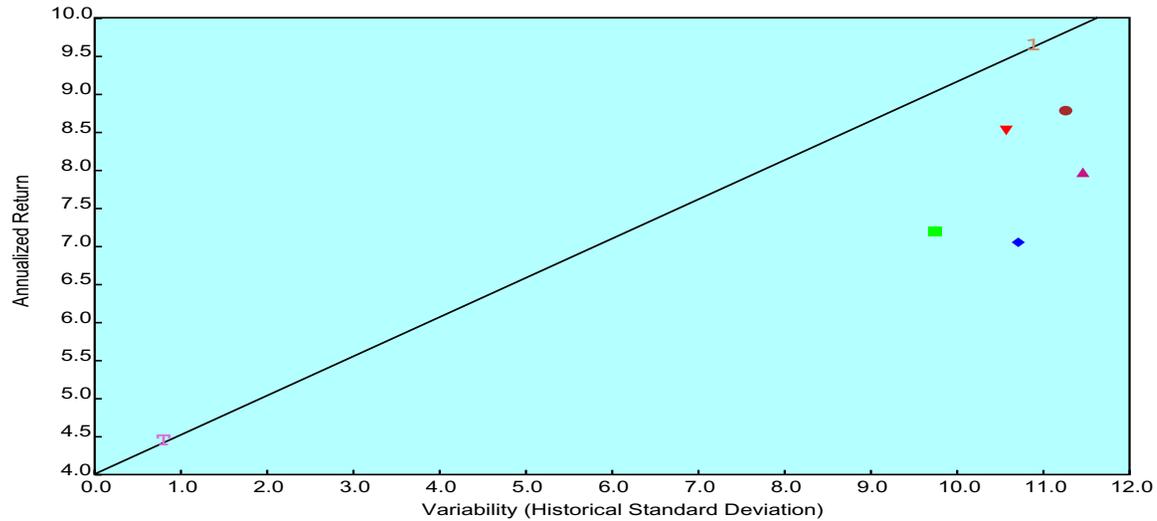
Universe Comparisons

Public Fund Universe Peer Rankings

	One Quarter	Two Quarters	One Year	Three Years	Five Years
HPRS	7	10	11	30	70
OP&F	7	8	12	53	47
PERS	7	8	10	63	70
SERS	28	22	29	78	68
STRS	16	15	14	71	62

The public funds universe in the Wilshire Co-operative consists of 165 federal, state and local funds. For the most recent quarter and year, all but SERS ranked in the top quartile. HPRS, OP&F and PERS had the best fourth quarter ranking, each placing in the 7th percentile while SERS had the lowest ranking placing in the 28th percentile. Over the longer term, the systems haven't fared as well. Only OP&F has outperformed the median over the five-year period. The other funds have ranked in the third quartile.

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/03

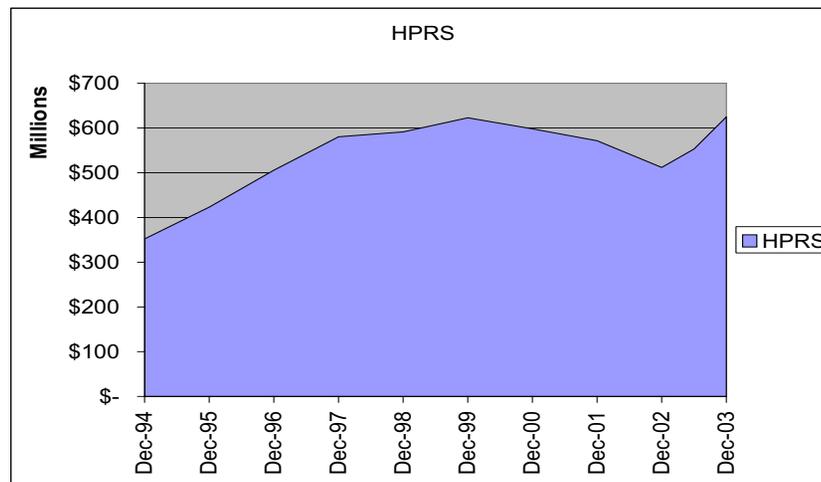


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.05	10.77	2.61	0.24
■ PERS	7.19	9.80	2.74	0.28
▼ OP&F	8.52	10.63	4.08	0.38
● SERS	8.78	11.32	4.33	0.38
▲ STRS	7.97	11.52	3.53	0.31
┌ 60/40 Index	9.64	10.93	5.19	0.48
┐ 91-Day Treasury Bill	4.44	0.84	0.00	0.00

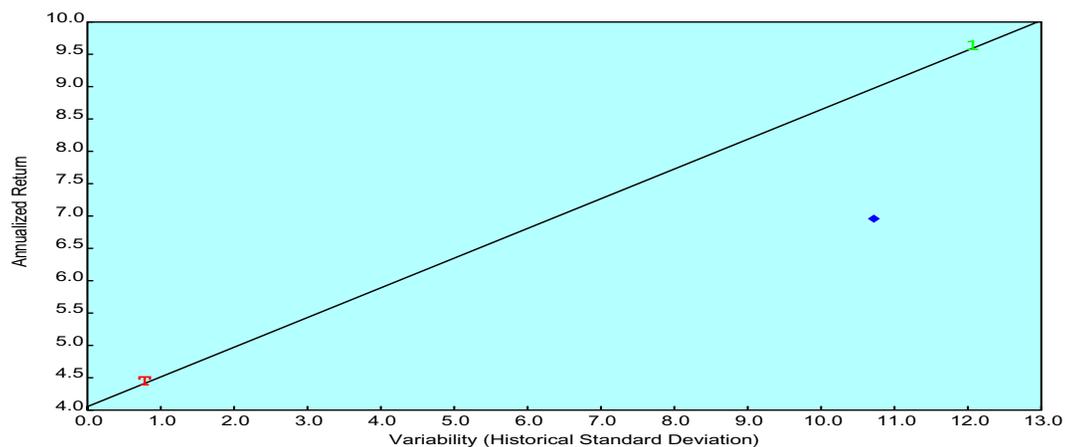
The Capital Market Line above plots the ten year returns of each of the five systems in risk/return space. The graph is created by connecting a line between the risk/return point of the 90 Day Treasury Bill (the theoretical risk-free rate) and a hypothetical portfolio composed of stocks and bonds. In this case that hypothetical portfolio is a 60%/40% Index made up of the Wilshire 5000 and the Lehman Brothers Aggregate Bond Index.

Highway Patrol Retirement System

HPRS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
US Equity					
Actual	14.89%	20.77%	37.58%	0.66%	-0.13%
Benchmark	12.75%	17.45%	32.68%	-0.74%	1.99%
Difference	2.14%	3.32%	4.90%	1.40%	-2.12%
Fixed Income					
Actual	0.73%	1.30%	6.87%	8.61%	7.33%
Benchmark	0.32%	0.17%	4.11%	7.57%	6.62%
Difference	0.41%	1.13%	2.76%	1.04%	0.71%
Intl. Equity					
Actual	16.43%	22.57%	32.50%	-2.61%	2.46%
Benchmark	17.08%	26.59%	38.58%	-2.91%	-0.05%
Difference	-0.65%	-4.02%	-6.08%	0.30%	2.51%
Real Estate					
Actual	1.64%	3.37%	7.83%	7.72%	9.71%
Benchmark	2.07%	3.74%	7.35%	6.42%	8.80%
Difference	-0.43%	-0.37%	0.48%	1.30%	0.91%



Quarterly Total Return Market Line Analysis
Periods from 12/93 to 12/03



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	6.95	10.79	2.50	0.23
┆ HPRS Total Policy (2)	9.62	12.12	5.17	0.43
▲ 91-Day Treasury Bill	4.44	0.84	0.00	0.00

Asset Mix			
	Actual	Target	Difference
	December 31, 2003		
US Equity	53.0%	48.0%	5.0%
Intl. Equity	14.2%	15.0%	-0.8%
Alternative Assets	0.0%	0.0%	0.0%
<i>Total Equity</i>	67.2%	63.0%	4.2%
Fixed Income	21.3%	25.0%	-3.7%
Real Estate	10.5%	12.0%	-1.5%
Short Term Investments	1.0%	0.0%	1.0%
<i>Total Debt</i>	32.8%	37.0%	-4.2%
	100.0%	100.0%	0.0%

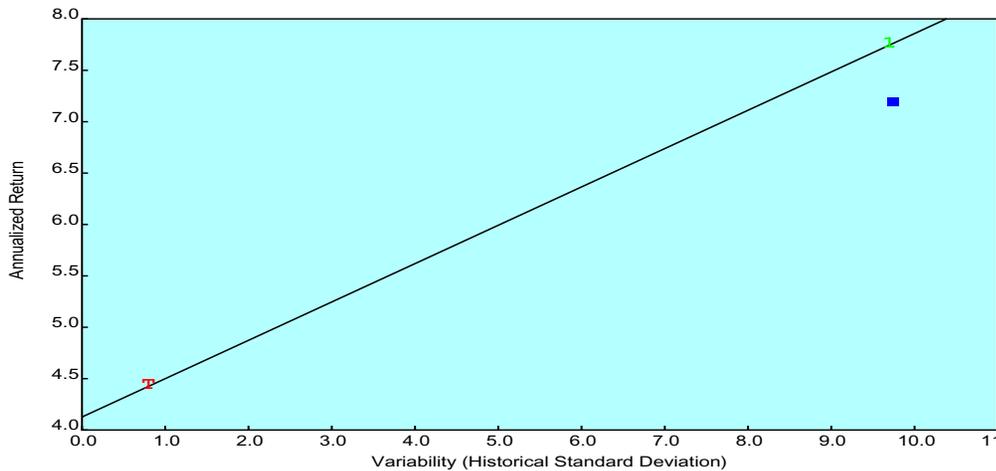
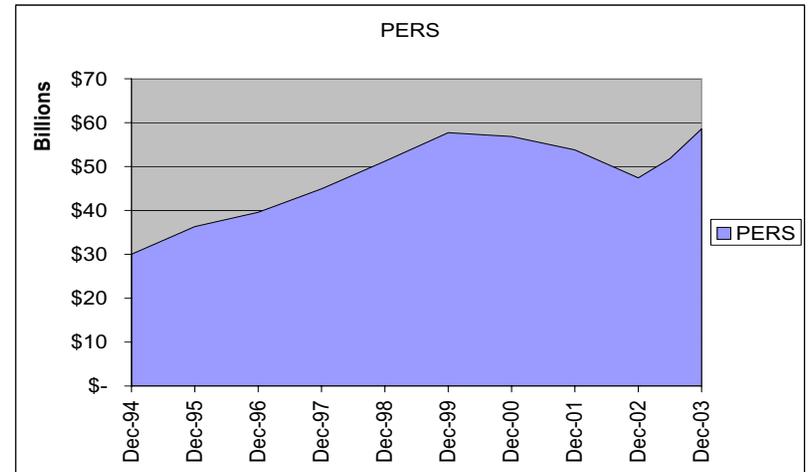
Characteristic Data

Assets @ 12-31-2003: \$ 624,906,145
 Actuarial Interest Rate: 8.00%
 Investment Staff Size: 1
 2002 Operating Costs: \$ 2,274,562
 As a % of assets: 0.444%

	Internal	External	Total
Active	1.4%	90.1%	91.5%
Passive	1.0%	7.5%	8.5%
Total	2.4%	97.7%	100.0%

Public Employees Retirement System

PERS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
US Equity					
Actual	12.44%	16.31%	31.12%	-2.52%	-0.15%
Benchmark	12.43%	16.27%	31.04%	-3.17%	-0.04%
Difference	0.01%	0.04%	0.08%	0.65%	-0.11%
Fixed Income					
Actual	0.95%	1.20%	6.47%	8.15%	6.92%
Benchmark	0.76%	0.84%	5.84%	8.13%	6.95%
Difference	0.19%	0.36%	0.63%	0.02%	-0.03%
Intl. Equity					
Actual	16.61%	27.45%	40.72%	-1.53%	2.86%
Benchmark	17.00%	26.46%	39.42%	-2.65%	0.44%
Difference	-0.39%	0.99%	1.30%	1.12%	2.42%
Real Estate					
Actual	3.20%	6.54%	12.29%	8.79%	9.98%
Benchmark	3.18%	5.84%	10.60%	8.81%	9.34%
Difference	0.02%	0.70%	1.69%	-0.02%	0.64%
Private Equity					
Actual	7.12%	17.98%	21.75%	-3.67%	8.58%
Benchmark	4.17%	21.96%	29.65%	-9.52%	1.41%
Difference	2.95%	-3.98%	-7.90%	5.85%	7.17%



■ PERS
▲ PERS Policy Index
▲ 91-Day Treasury Bill

Annualized Return	Variability	Reward	Sharpe Ratio
7.19	9.80	2.74	0.28
7.76	9.74	3.31	0.34
4.44	0.84	0.00	0.00

Asset Mix			
Actual			
	December 31, 2003	Target	Difference
US Equity	47.5%	46.0%	1.5%
Intl. Equity	21.3%	20.0%	1.3%
Alternative Assets	0.6%	1.0%	-0.4%
Total Equity	69.4%	67.0%	2.4%
Fixed Income	21.5%	23.0%	-1.5%
Real Estate	6.0%	9.0%	-3.0%
Short Term Investments	3.2%	1.0%	2.2%
Total Debt	30.7%	33.0%	-2.3%
	100.0%	100.0%	0.0%

Characteristic Data

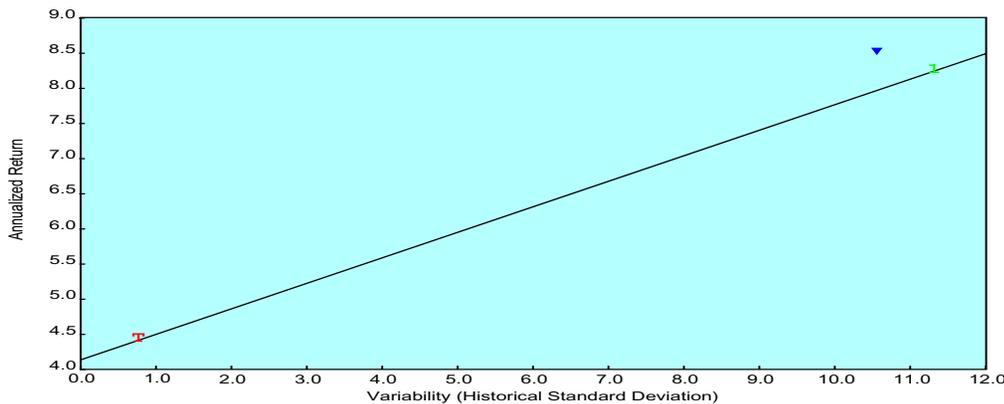
Assets @ 12-31-2003: \$ 58,583,782,000
 Actuarial Interest Rate: 8%
 Investment Staff Size: 56
 2002 Operating Costs: \$ 87,350,000
 As a % of assets: 0.173%

	Internal	External	Total
Active	28.2%	33.2%	61.4%
Passive	32.1%	6.5%	38.6%
Total	60.3%	39.7%	100.0%

Police & Fire Pension Fund

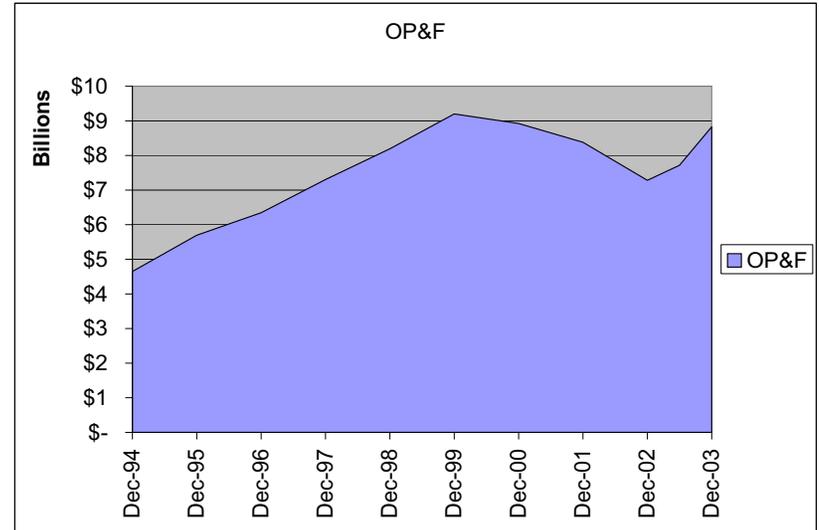
OP&F Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
US Equity					
Actual	12.27%	16.44%	30.00%	-1.20%	1.91%
Benchmark	12.42%	16.59%	31.64%	-2.47%	0.43%
Difference	-0.15%	-0.15%	-1.64%	1.27%	1.48%
Fixed Income					
Actual	1.76%	2.69%	10.08%	9.20%	8.02%
Benchmark*	1.52%	2.07%	8.99%	8.56%	7.21%
Difference	0.24%	0.62%	1.09%	0.64%	0.81%
Intl. Equity					
Actual	16.72%	27.62%	39.60%	-2.14%	0.90%
Benchmark	17.11%	27.28%	41.40%	-0.97%	1.55%
Difference	-0.39%	0.34%	-1.80%	-1.17%	-0.65%
Real Estate					
Actual	2.50%	6.97%	13.06%	10.16%	10.68%
Benchmark	2.76%	4.78%	8.97%	5.02%	6.91%
Difference	-0.26%	2.19%	4.09%	5.14%	3.77%
Private Equity					
Actual	-0.50%	-1.50%	-13.16%	-20.48%	1.80%
Benchmark	17.75%	23.59%	6.28%	-5.92%	3.59%
Difference	-18.25%	-25.09%	-19.44%	-14.56%	-1.79%

*This policy is an artificial composite benchmark created by EAI and is not the official benchmark used by OP&F.



▼ OP&F
 1 OP&F Policy Index
 T 91-Day Treasury Bill

Annualized Return	Variability	Reward	Sharpe Ratio
8.52	10.63	4.08	0.38
8.26	11.37	3.81	0.34
4.44	0.84	0.00	0.00



Asset Mix			
	Actual	Target	Difference
	December 31, 2003		
US Equity	48.3%	48.0%	0.3%
Intl. Equity	21.8%	20.0%	1.8%
Alternative Assets	1.2%	1.0%	0.2%
Total Equity	71.4%	69.0%	2.4%
Fixed Income	22.1%	23.0%	-0.9%
Real Estate	5.6%	8.0%	-2.4%
Short Term Investments	0.9%	0.0%	0.9%
Total Debt	28.6%	31.0%	-2.4%
	100.0%	100.0%	0.0%

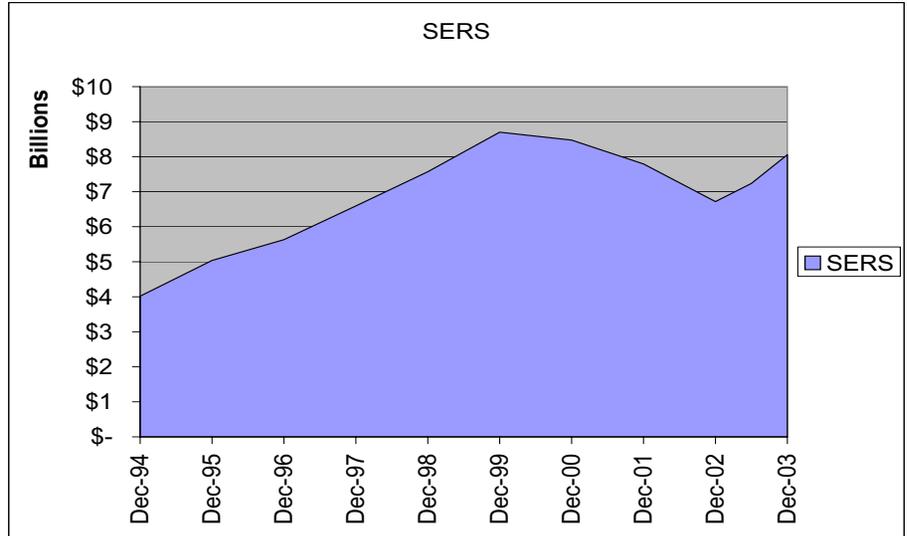
Characteristic Data

Assets @ 12-31-2003: \$ 8,826,909,000
 Actuarial Interest Rate: 8.25%
 Investment Staff Size: 16
 2002 Operating Costs: \$ 30,071,000
 As a % of asset: 0.386%

	Internal	External	Total
Active	0.0%	75.5%	75.5%
Passive	0.0%	24.5%	24.5%
Total	0.0%	100.0%	100.0%

School Employees Retirement System

SERS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
US Equity					
Actual	12.40%	16.71%	32.12%	-3.08%	0.65%
Benchmark	12.43%	16.27%	31.04%	-3.09%	0.36%
Difference	-0.03%	0.44%	1.08%	0.01%	0.29%
Fixed Income					
Actual	0.85%	0.90%	5.45%	8.47%	7.30%
Benchmark	0.32%	0.17%	4.11%	7.57%	6.62%
Difference	0.53%	0.73%	1.34%	0.90%	0.68%
Intl. Equity					
Actual	13.59%	21.80%	33.02%	-3.48%	1.27%
Benchmark	13.62%	21.94%	31.95%	-4.23%	0.78%
Difference	-0.03%	-0.14%	1.07%	0.75%	0.49%
Real Estate					
Actual	4.14%	8.05%	12.21%	5.70%	8.43%
Benchmark	3.55%	7.24%	13.27%	8.77%	10.03%
Difference	0.59%	0.81%	-1.06%	-3.07%	-1.60%
Private Equity					
Actual	1.11%	0.94%	-8.12%	-20.46%	2.52%
Benchmark	4.73%	21.31%	27.44%	-4.80%	0.42%
Difference	-3.62%	-20.37%	-35.56%	-15.66%	2.10%

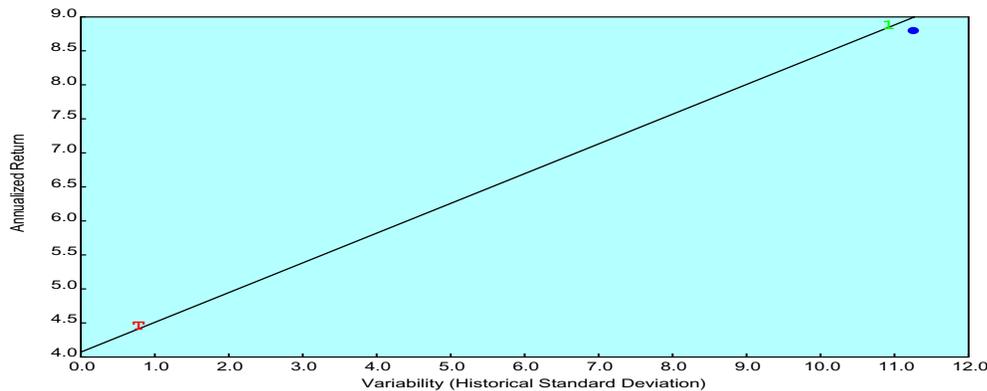


	Asset Mix		
	Actual	Target	Difference
US Equity	48.2%	46.0%	2.2%
Intl. Equity	18.2%	16.0%	2.2%
Alternative Assets	1.3%	3.0%	-1.7%
Total Equity	67.8%	65.0%	2.8%
Fixed Income	21.7%	23.0%	-1.3%
Real Estate	8.2%	10.0%	-1.8%
Short Term Investments	2.3%	2.0%	0.3%
Total Debt	32.2%	35.0%	-2.8%
	100.0%	100.0%	0.0%

Characteristic Data

Assets @ 12-31-2003: \$ 8,054,106,043
 Actuarial Interest Rate: 8.25%
 Investment Staff Size: 10
 2002 Operating Costs: \$ 26,046,000
 As a % of assets: 0.357%

	Internal	External	Total
Active	2.3%	58.4%	60.7%
Passive	0.0%	39.3%	39.3%
Total	2.3%	97.7%	100.0%

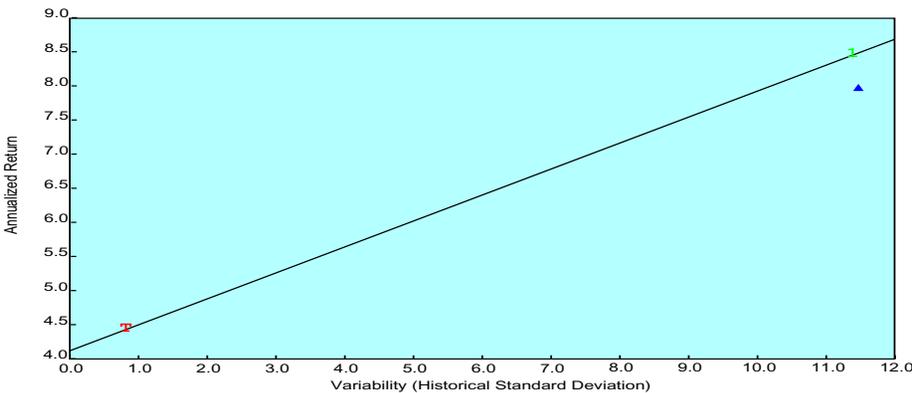
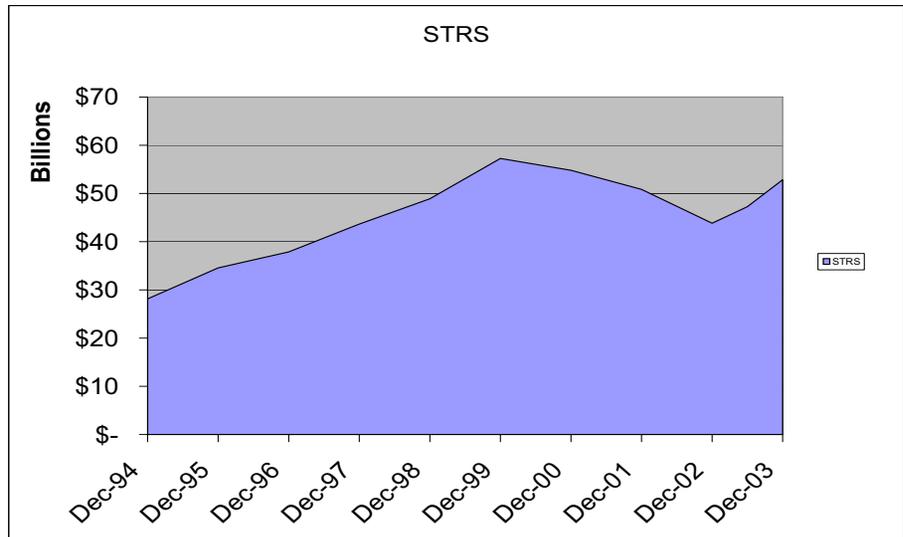


Annualized Return	Variability	Reward	Sharpe Ratio
8.79	11.32	4.34	0.38
8.87	10.97	4.42	0.40
4.44	0.84	0.00	0.00

● SERS
 ■ SERS Policy Index
 ▲ 91-Day Treasury Bill

State Teachers Retirement System

STRS Returns						
Portfolio		One Quarter	Two Quarters	One Year	Three Years	Five Years
US Equity						
Actual		12.34%	15.93%	30.20%	-3.34%	-0.07%
Benchmark		12.43%	16.21%	30.16%	-2.91%	0.48%
Difference		-0.09%	-0.28%	0.04%	-0.43%	-0.55%
Fixed Income						
Actual		1.10%	1.30%	6.94%	8.62%	7.28%
Benchmark		0.76%	0.84%	5.84%	7.91%	6.72%
Difference		0.34%	0.46%	1.10%	0.71%	0.56%
Intl. Equity						
Actual		14.70%	25.00%	37.71%	0.49%	4.91%
Benchmark		14.30%	23.98%	35.13%	-1.83%	2.47%
Difference		0.40%	1.02%	2.58%	2.32%	2.44%
Real Estate						
Actual		2.80%	5.29%	9.06%	6.44%	9.23%
Benchmark		3.50%	6.32%	11.41%	8.03%	9.23%
Difference		-0.70%	-1.03%	-2.35%	-1.59%	0.00%
Private Equity						
Actual		4.93%	7.01%	9.14%	-8.31%	0.05%
Benchmark		4.93%	7.01%	9.14%	N/A	N/A
Difference		0.00%	0.00%	0.00%	N/A	N/A



Annualized Return	Variability	Reward	Sharpe Ratio
7.97	11.52	3.53	0.31
8.47	11.42	4.02	0.35
4.44	0.84	0.00	0.00

▲ STRS
 ▲ STRS Policy Index
 ■ 91-Day Treasury Bill

Asset Mix

	Actual December 31, 2003	Target	Difference
US Equity	46.5%	45.0%	1.5%
Intl. Equity	21.7%	20.0%	1.7%
Alternative Assets	2.1%	2.0%	0.1%
<i>Total Equity</i>	<i>70.3%</i>	<i>67.0%</i>	<i>3.3%</i>
Fixed Income	18.3%	23.0%	-4.7%
Real Estate	8.9%	9.0%	-0.1%
Short Term Investments	2.5%	1.0%	1.5%
<i>Total Debt</i>	<i>29.7%</i>	<i>33.0%</i>	<i>-3.3%</i>
	100.0%	100.0%	0.0%

Characteristic Data

Assets @ 12-31-2003: \$ 52,845,202,683
 Actuarial Interest Rate: 8.00%
 Investment Staff Size: 122
 2002 Operating Costs: \$ 129,931,000
 As a % of assets: 0.274%

	Internal	External	Total
Active	62%	23%	85%
Passive	15%		15%
Total	77%	23%	100%

Ohio Retirement Study Council

Performance Summary Table
Periods Ending 12/31/03

Performance Summary Table
Periods Ending 12/31/03

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	10 Yrs	Incept Date	Incept Ret	Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	10 Yrs	Incept Date	Incept Ret		
HPRS										STRS											
Total Return	9.98	13.94	27.73	25.30	3.47	3.39	6.95	12/31/93	6.95	Total Return	9.38	13.51	27.23	24.16	1.18	3.73	7.97	12/31/93	7.97		
Equity	14.89	20.77	42.10	37.58	0.66	-0.12	6.88	12/31/93	6.88	Equity	12.34	15.93	34.61	30.20	-3.34	-0.07	9.22	12/31/93	9.22		
Fixed Income	0.73	1.30	4.55	6.87	8.62	7.33	7.15	12/31/93	7.15	Fixed Income	1.10	1.30	4.58	6.94	8.62	7.28	8.05	12/31/93	8.05		
Cash & Equiv	0.15	0.33	0.72	0.99	2.71	3.66		3/31/94	4.48	Cash & Equiv	0.27	0.54	0.84	1.17	2.32	3.76	4.42	12/31/93	4.42		
Real Estate	1.64	3.37	6.45	7.83	7.72	9.71	7.92	12/31/93	7.92	Real Estate	2.80	5.29	7.94	9.06	6.44	9.23	9.90	12/31/93	9.90		
International Equity	16.43	22.57	47.96	32.50	-2.61	2.46		3/31/95	5.23	International Equity	14.70	25.00	48.14	37.71	0.49	4.91	4.37	12/31/93	4.37		
										Other	4.93	7.01	10.07	9.14	-8.31	0.05	4.23	12/31/93	4.23		
PERS										Indices										Since	
Total Return	9.81	14.17	28.47	25.38	2.21	3.51	7.19	12/31/93	7.19	Russell 1000	12.26	15.63	33.83	29.91	-3.77	-0.13	10.99	12/31/93	10.99		
Equity	12.44	16.31	35.18	31.12	-2.51	-0.15	8.59	12/31/93	8.59	Russell 2000	14.53	24.92	54.17	47.25	6.27	7.13	9.47	12/31/93	9.47		
Fixed Income	0.95	1.20	4.39	6.47	8.14	6.90	7.37	12/31/93	7.37	Russell 3000	12.43	16.27	35.17	31.04	-3.09	0.36	10.77	12/31/93	10.77		
Cash & Equiv	0.27	0.55	0.85	1.15	2.27	3.69	4.56	12/31/93	4.56	Standard & Poors 500	12.19	15.15	32.88	28.69	-4.06	-0.59	11.06	12/31/93	11.06		
Real Estate	3.20	6.54	10.68	12.29	8.79	9.98	10.33	12/31/93	10.33	S&P 500 Equal Wtd	15.04	21.10	47.40	40.48	5.41	7.01	12.97	12/31/93	12.97		
International Equity	16.61	27.44	52.70	40.70	-1.51	2.85		12/31/95	3.36	S&P 600 Small Cap	14.77	22.90	47.34	38.80	8.08	9.67	11.44	12/31/93	11.44		
Other	7.23	18.32	20.88	22.17	-2.19	9.58		12/31/95	14.59	S&P MidCap 400	13.18	20.61	41.89	35.47	4.79	9.21	13.90	12/31/93	13.90		
										Wilshire 5000	12.42	16.59	35.83	31.64	-2.47	0.43	10.59	12/31/93	10.59		
OP&F										LB Aggregate	0.32	0.17	2.68	4.11	7.57	6.62	6.95	12/31/93	6.95		
Total Return	9.85	14.16	27.47	24.97	2.69	4.03	8.52	12/31/93	8.52	SB Broad Inv Grade	0.36	0.20	2.77	4.21	7.58	6.62	6.96	12/31/93	6.96		
Equity	12.27	16.44	34.94	30.00	-1.20	1.90	10.25	12/31/93	10.25	MSCI EAFE (Net)	17.08	26.59	50.98	38.58	-2.91	-0.05	4.47	12/31/93	4.47		
Fixed Income	1.76	2.69	7.12	10.08	9.20	8.06	7.52	12/31/93	7.52	MSCI Em Mkts Free (G	17.80	34.56	66.01	56.27	12.77	10.62	0.19	12/31/93	0.19		
Cash & Equiv	0.26	0.51	0.84	1.14	2.44	3.59		9/30/96	4.00	MSCI World Ex-US (Ne	17.00	26.46	50.76	39.42	-2.65	0.44	4.72	12/31/93	4.72		
Real Estate	2.50	6.97	9.22	13.06	10.16	10.68	10.70	12/31/93	10.70	LB Mortgage	0.93	1.44	2.12	3.06	6.65	6.55	6.89	12/31/93	6.89		
International Equity	16.72	27.62	51.53	39.60	-2.14	1.02		9/30/94	5.30	NCREIF	2.76	4.78	6.96	8.97	7.66	9.31	10.06	12/31/93	10.06		
Other	-0.50	-1.50	-6.02	-13.16	-20.48	1.80															
SERS																					
Total Return	8.85	12.72	26.04	22.93	0.89	3.51	8.79	12/31/93	8.79												
Equity	12.40	16.71	36.23	32.12	-3.08	0.65	10.66	12/31/93	10.66												
Fixed Income	0.85	0.90	3.84	5.45	8.47	7.30	7.14	12/31/93	7.14												
Cash & Equiv	0.23	0.45	0.73	1.01	2.85	4.26	4.79	12/31/93	4.79												
Real Estate	4.14	8.05	12.57	12.21	5.70	8.43	9.66	12/31/93	9.66												
International Equity	13.59	21.80	44.46	33.02	-3.48	1.27		12/31/94	5.54												
Other	1.11	0.94	-1.73	-8.12	-20.46	2.52	15.69	12/31/93	15.69												

The Summary Tables display each of the Systems' total fund and individual asset class returns as well as the returns for selected broad market indices over the measurement period.

Ohio Retirement Study Council

INDEX DEFINITIONS

Russell 1000 – A large-cap index consisting of the 1000 largest companies in the Russell 3000 index, representing approximately 92% of the total market capitalization of the Russell 3000. As of June 2002, the average market capitalization was approximately \$11 billion; the median market capitalization was approximately \$3.5 billion. The smallest company in the index had an approximate market capitalization of \$1.3 billion.

Russell 2000 – A small-cap index consisting of the smallest 2000 companies in the Russell 3000 index, representing approximately 8% of the Russell 3000 total market capitalization. As of June, 2002, the average market capitalization was approximately \$490 million; the median market capitalization was approximately \$395 million. The largest company in the index had an approximate market capitalization of \$1.3 billion.

Russell 3000 – An index composed of 3000 large U.S. companies, as determined by market capitalization. This portfolio of securities represents approximately 98% of the investable U.S. equity market. As of June, 2002, the average market capitalization range of approximately \$309 billion to \$128 million.

Standard & Poor's 500 – An index that is a readily available, carefully constructed, market-value-weighted benchmark of common stock performance. Market-value-weighted means that the weight of each stock in the index, for a given month, is proportionate to its market capitalization (price times the number of shares outstanding) at the beginning of that month. Currently, the S&P Composite includes 500 of the largest stocks (in terms of stock market value) in the United States.

S&P 500 Equal Weighted – An index of the same stocks as those in the S&P 500, but with equal dollar investments in each issue.

S&P 600 Small Cap – An index designed to measure the performance of the small capitalization sector of the U.S. equities market. This index consists of 600 domestic stocks chosen for market size, liquidity, (bid-asked spread, ownership, share turnover and number of no trade days) and industry group representation.

S&P MidCap 400 – An index designed to measure the performance of the middle capitalization sector of the U.S. equities market. This market capitalization weighted index was created in June of 1991 and consists of 400 domestic stocks from the NYSE, NASDAQ and AMEX chosen for market size, liquidity and industry group representation.

Wilshire 5000 – An index that measures the performance of all U.S. headquartered equity securities with readily available price data. The market capitalized weighted index is comprised of approximately 6500 security returns with a breakdown of approximately 82% NYSE, 2% AMEX and 16% OTC.

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LB Aggregate – An index that includes fixed rate debt issues rated investment grade or higher by Moody’s Investor’s Service, Standard and Poor’s Corporation, or Fitch Investor’s Service, in that order. (It also includes Commercial Mortgage Backed Securities.) Bonds or securities included must be fixed rate, although it can carry a coupon that steps up or changes according to a predetermined schedule; must be dollar-denominated and nonconvertible; and must be publicly issued. All issues have at least one year to maturity with intermediate indices including bonds

SB Broad Investment Grade – An index that spans the “available” market for U.S. Treasury/agency securities, investment grade corporate bonds (BBB or better) and mortgage pass-through securities. There are 3787 individually priced securities included in the index on a market-weighted basis. It is designed to provide a reliable and fair benchmark for the bond manager.

MSCI EAFE – An index that measures the performance of the developed stock markets of Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland and the United Kingdom.

MSCI Emerging Markets Free – An index that measures the performance of the developing stock markets of Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Israel, Jordan, 50% of Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Portugal, Russia, South Africa, Sri Lanka (removed), 50% of Taiwan, Thailand, Turkey and Venezuela.

MSCI World Ex-US – An index that measures the performance of the stock markets of the following developed countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Norway Free, Portugal, Singapore, Singapore Free, Singapore/Malaysia, Spain, Sweden, Switzerland and the United Kingdom.

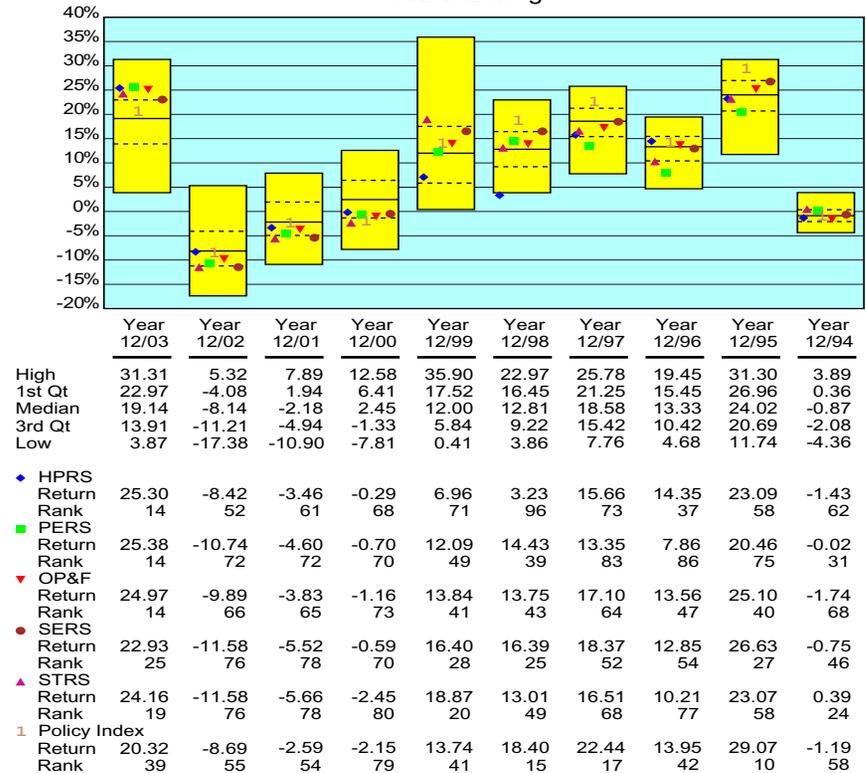
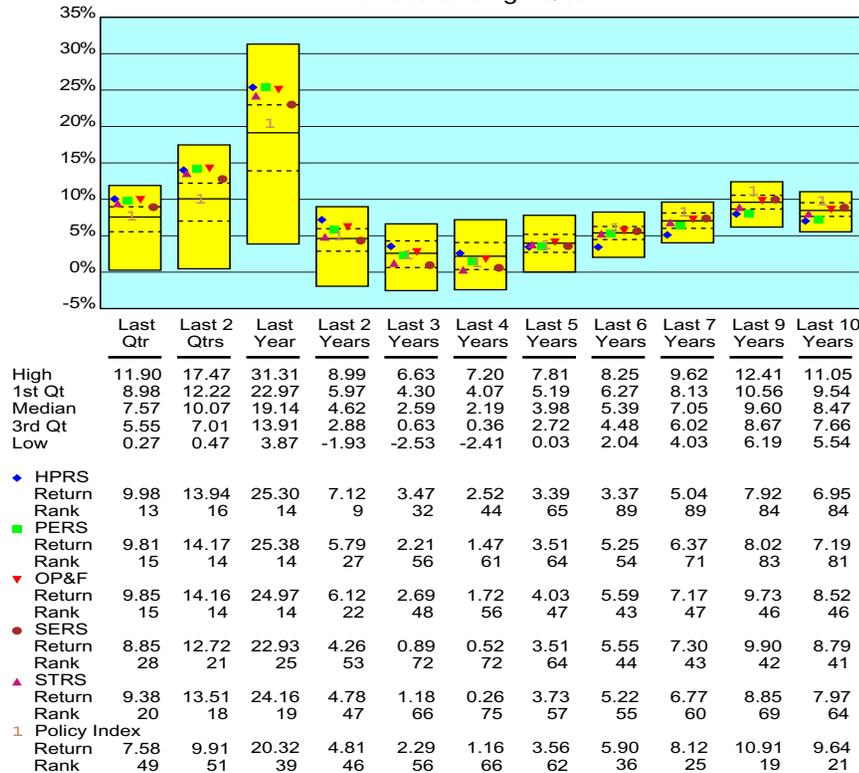
LB Mortgage-Backed – An index that includes 15 and 30 year fixed rate securities backed by mortgage pools of the Government National Mortgage Association (GNMA), Federal Home Loan Mortgage Corporation (FHLMC), and Federal National Mortgage Association (FNMA)

NCREIF Property – An unleveraged index of investment-grade, nonagricultural properties; apartment, industrial, office and retail. Each property’s market value is determined by real estate appraisal methodology, consistently applied.

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Cumulative Performance Comparison
Total Returns of Total Fund Portfolios
Periods Ending 12/03

Consecutive Performance Comparison
Total Returns of Total Fund Portfolios
Years Ending

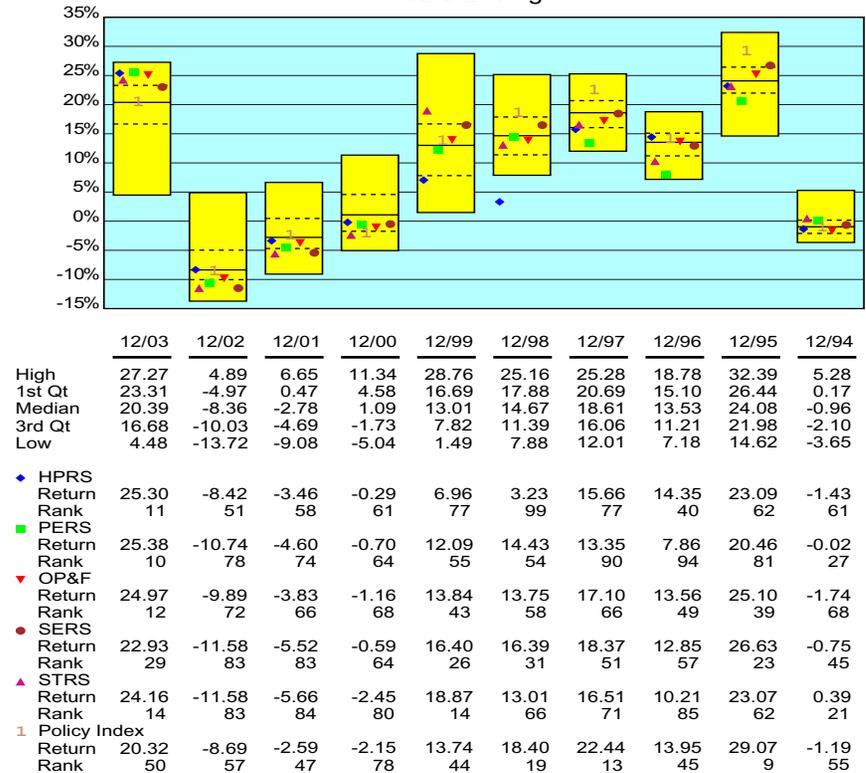
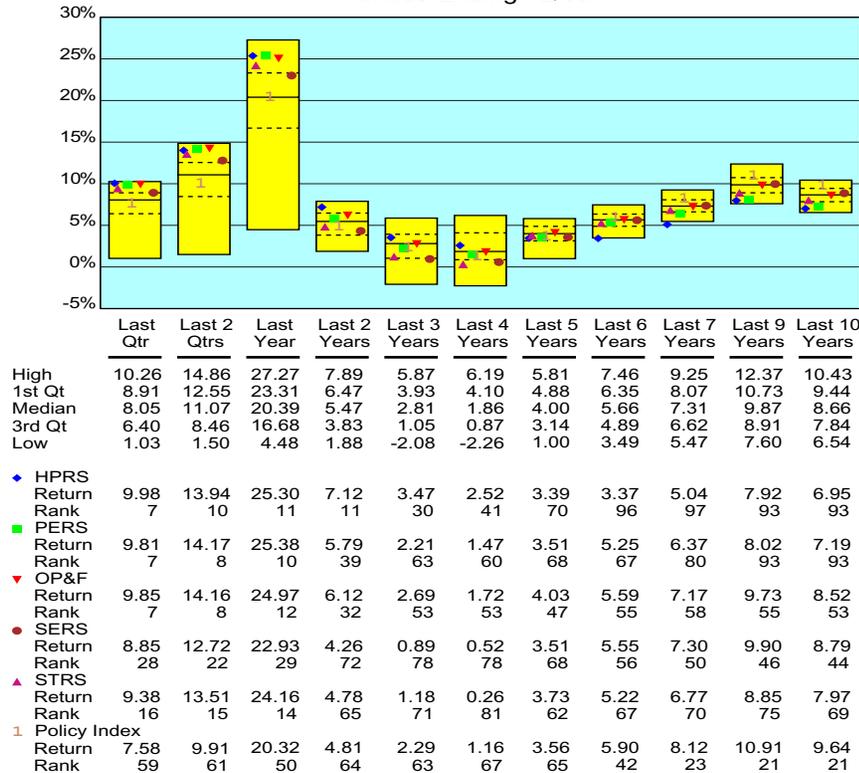


This page compares the Total Fund results to a broad universe of total funds - 1412 other funds, including those of public, corporate, and multi-employer pension plans and totaling \$863.7 Billion in assets - over a ten-year measurement period. Here and elsewhere in the report, the "floating bars" define the universe against which the performance is being compared. The top of the bar is the 5th percentile, the higher dotted line is the 25th percentile (bottom of the first quartile), the solid line is the median, the lower dotted line is the 75th percentile (bottom of the third quartile) and the bottom of the bar is the 95th percentile. The table just below the graph defines the quartile marks and the table below that displays each fund's return for that period and the relevant ranking in the universe. The numbers in the "rank" rows are percentile rankings. The last line in the bottom table is the return and rank of a hypothetical portfolio of 60% stocks (Wilshire 5000) and 40% bonds (Lehman Aggregate Bond Index). The graph on the left is a cumulative performance comparison with measurement periods that are annualized over the last ten years. The graph on the right is a consecutive performance comparison with twelve-month measurement periods ending 12/2003. The graph on the left shows that SERS has demonstrated the highest return for the ten-year period with an 8.78% per year return, which ranks the fund in the 41st percentile. The graph on the right shows that this ten-year ranking was achieved by above-median performance for 12 month periods ending 12/31 in 1994, 1995, 1998, 1999, and 2003.

Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of Total Fund Public Sponsors
Periods Ending 12/03

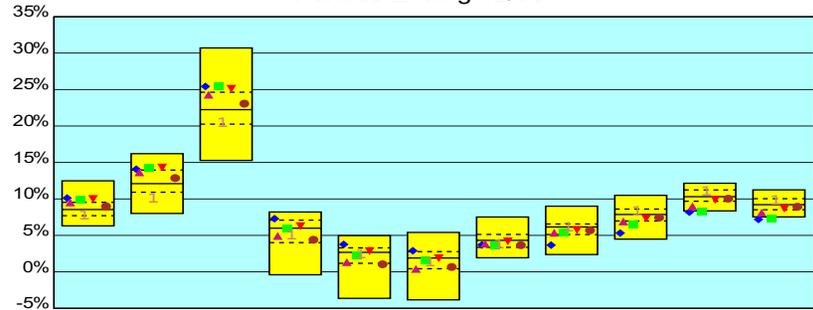
Consecutive Performance Comparison
Total Returns of Total Fund Public Sponsors
Years Ending



The graphs above compare the Total Fund results to a universe comprised solely of the 165 Public Retirement Systems in the universe. SERS and OP&F are the only Ohio funds to rank near the median return for this universe over the last ten years. SERS outperformed the median fund, ranking in the 44th percentile. OP&F placed in the 53rd percentile, STRS placed in the 69th percentile, and HPRS and PERS ranked in the 93rd percentile.

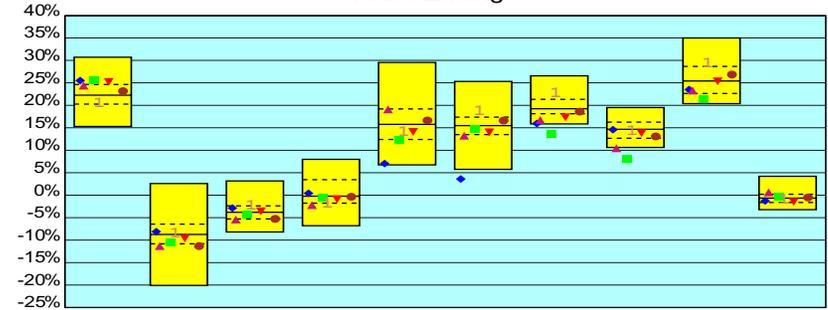
Ohio Retirement Study Council

Total Returns of Total Fund Portfolios
Total Market Value Over One Billion
Periods Ending 12/03



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	12.46	16.18	30.68	8.17	4.93	5.36	7.47	8.95	10.44	12.09	11.18
1st Qt	9.51	13.93	24.61	7.05	3.25	2.73	5.08	6.51	8.55	11.17	9.97
Median	8.52	12.07	22.22	5.95	2.63	1.85	4.27	6.10	7.81	10.25	9.15
3rd Qt	7.68	10.89	20.23	3.97	1.13	0.38	3.31	5.06	6.92	9.62	8.45
Low	6.28	7.98	15.25	-0.44	-3.68	-3.89	1.88	2.32	4.43	8.30	7.47
◆ HPRS Return Rank	9.98 11	13.94 23	25.29 18	7.15 21	3.62 16	2.75 22	3.55 67	3.52 94	5.18 94	8.05 99	7.05 100
■ PERS Return Rank	9.81 13	14.17 17	25.38 16	5.77 50	2.18 60	1.44 63	3.49 70	5.23 72	6.36 84	8.07 99	7.19 99
▼ OP&F Return Rank	9.85 11	14.16 17	24.97 19	6.12 43	2.69 45	1.72 56	4.03 52	5.59 62	7.17 65	9.73 66	8.52 72
● SERS Return Rank	8.85 41	12.72 37	22.93 39	4.26 68	0.89 77	0.52 72	3.51 70	5.55 65	7.30 62	9.90 55	8.79 58
▲ STRS Return Rank	9.38 31	13.51 31	24.16 27	4.78 63	1.18 70	0.26 77	3.73 65	5.22 72	6.77 77	8.85 88	7.97 90
1 60/40 Index Return Rank	7.58 77	9.91 83	20.32 70	4.81 63	2.29 57	1.16 68	3.56 67	5.90 60	8.12 40	10.91 32	9.64 36

Total Returns of Total Fund Portfolios
Total Market Value Over One Billion
Years Ending

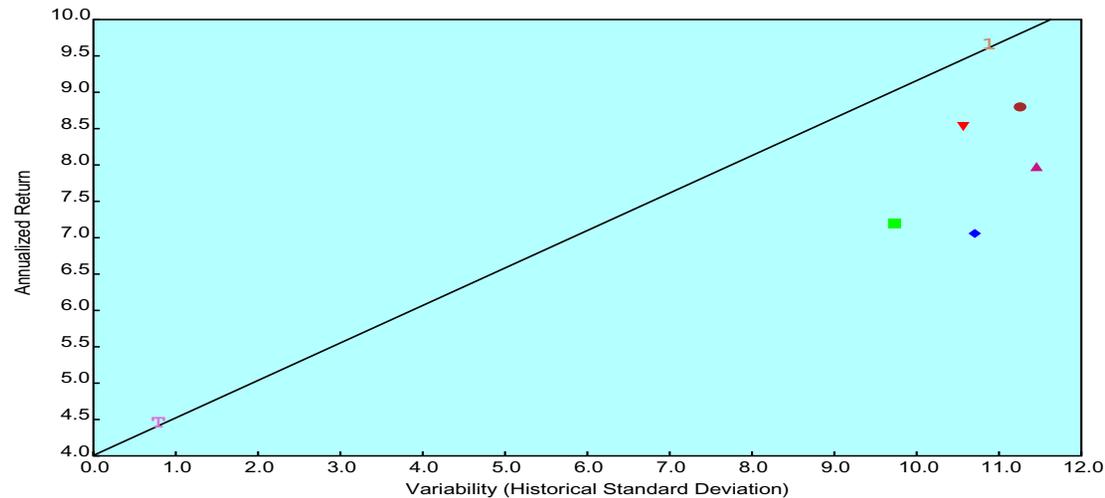


	12/03	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	30.68	-2.53	3.10	7.91	29.48	25.25	26.49	19.42	34.91	4.09
1st Qt	24.61	-6.51	-2.45	3.38	19.13	17.29	21.25	16.17	28.57	0.09
Median	22.22	-8.81	-3.88	-0.30	15.69	15.41	19.16	14.57	25.33	-0.77
3rd Qt	20.23	-10.89	-5.36	-1.86	12.33	13.41	18.05	12.57	22.55	-1.74
Low	15.25	-20.16	-8.26	-6.88	6.67	5.67	15.78	10.53	20.28	-3.34
◆ HPRS Return Rank	25.29 18	-8.36 41	-3.10 34	0.18 38	6.80 94	3.36 96	15.73 96	14.35 55	23.27 69	-1.50 66
■ PERS Return Rank	25.38 16	-10.77 70	-4.64 70	-0.75 52	12.09 75	14.43 57	13.35 99	7.86 99	21.14 88	-0.48 44
▼ OP&F Return Rank	24.97 19	-9.89 63	-3.83 47	-1.16 59	13.84 57	13.75 67	17.10 87	13.56 65	25.10 55	-1.74 75
● SERS Return Rank	22.93 39	-11.58 79	-5.52 77	-0.59 52	16.40 43	16.39 31	18.37 62	12.85 70	26.63 40	-0.75 47
▲ STRS Return Rank	24.16 27	-11.58 79	-5.66 79	-2.45 77	18.87 25	13.01 77	16.51 91	10.21 96	23.07 69	0.39 15
1 60/40 Index Return Rank	20.32 70	-8.69 43	-2.59 25	-2.15 77	13.74 60	18.40 10	22.44 14	13.95 57	29.07 17	-1.19 63

The charts above compare the total fund returns to a universe of large funds. This particular universe consists of 89 funds with total assets over one billion dollars. The combined assets of the 83 funds in this universe totals \$719.9 Billion. Results are similar to the Public Fund comparisons on the previous page.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis
Periods from 12/93 to 12/03

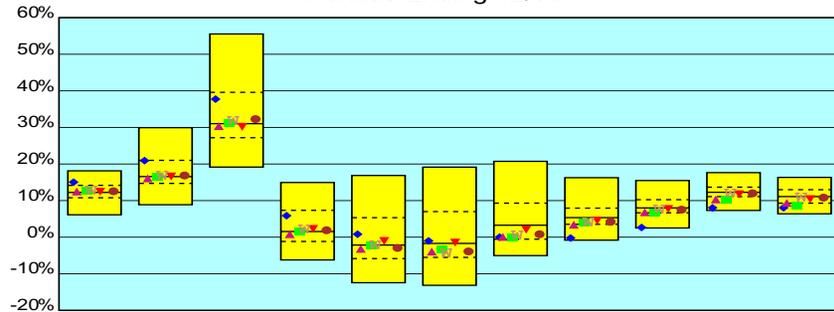


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.05	10.77	2.61	0.24
■ PERS	7.19	9.80	2.74	0.28
▼ OP&F	8.52	10.63	4.08	0.38
● SERS	8.79	11.32	4.34	0.38
▲ STRS	7.97	11.52	3.53	0.31
┌ 60/40 Index	9.64	10.93	5.19	0.48
■ 91-Day Treasury Bill	4.44	0.84	0.00	0.00

The graph above provides the first analysis of risk. The 10-year results of each Total Fund are displayed in risk-return space. The vertical axis shows the fund's return and the horizontal axis shows the fund's risk (defined as annualized quarterly standard deviation of returns) for the period. The diagonal line is the Capital Market Line, drawn by connecting the risk/return point of US T-bills (the theoretical risk-free rate) and the risk/return point of hypothetical 60% stock, 40% bond portfolio. This line is included because, theoretically, an investor could, using a combination of index funds and T-bills, have risk/return performance that is on the line. This analysis allows us to compare the funds to each other on a risk/return basis. For example, the two funds with the lowest return for the period were PERS and HPRS. PERS' low return was achieved with the lowest risk (volatility) while HPRS' return was achieved with the higher risk (volatility) of the two for the period. The Sharpe Ratio provides another tool for analysis. The number alone is not particularly meaningful, but when comparing two or more funds as is the case in this study, the higher Sharpe Ratio is the better risk-adjusted return.

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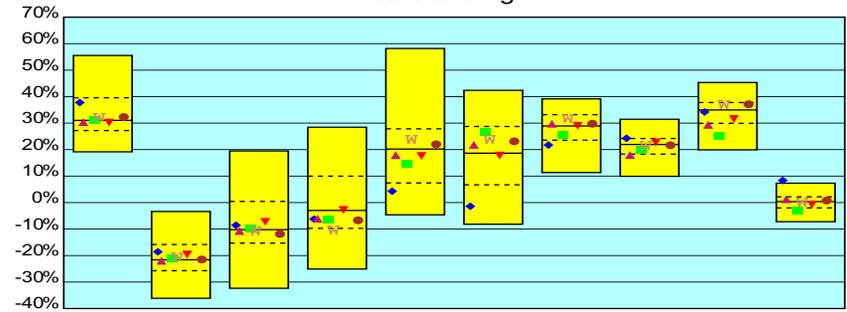
Cumulative Performance Comparison
Total Returns of Equity Portfolios
Periods Ending 12/03



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	18.13	29.93	55.53	14.94	16.86	19.14	20.73	16.26	15.48	17.64	16.34
1st Qt	14.16	21.00	39.59	7.34	5.33	6.99	9.30	7.94	10.25	13.67	12.98
Median	12.23	16.56	31.03	1.55	-2.15	-1.70	3.27	5.34	8.00	12.27	11.10
3rd Qt	10.78	14.70	27.19	-1.17	-5.85	-5.52	-0.55	3.52	6.67	11.09	9.29
Low	6.12	8.87	19.16	-6.22	-12.44	-13.15	-5.03	-0.81	2.52	7.31	6.39

◆ HPRS Domestic Equity	Return	14.89	20.77	37.58	5.72	0.66	-1.16	-0.13	-0.37	2.50	7.87	7.90
	Rank	16	26	29	29	38	49	68	94	95	93	88
■ PERS Domestic Equity	Return	12.44	16.31	31.12	1.54	-2.52	-3.54	-0.15	3.84	6.68	9.98	8.60
	Rank	47	52	49	50	51	57	69	65	74	84	85
▼ OP&F Domestic Equity	Return	12.27	16.44	30.00	2.10	-1.20	-1.64	1.90	4.36	7.55	11.57	10.25
	Rank	49	51	56	46	46	49	58	58	59	66	67
● SERS Domestic Equity	Return	12.40	16.71	32.12	1.74	-3.08	-4.04	0.65	4.06	7.38	11.84	10.66
	Rank	48	48	45	48	54	59	64	61	65	62	58
▲ STRS Domestic Equity	Return	12.34	15.93	30.20	0.67	-3.34	-4.09	-0.07	3.26	6.66	10.17	9.22
	Rank	49	56	55	55	56	60	68	78	75	81	76
W Wilshire 5000	Return	12.42	16.59	31.64	2.07	-2.47	-4.64	0.43	3.94	7.47	11.84	10.59
	Rank	47	49	47	46	51	63	64	62	62	62	59

Consecutive Performance Comparison
Total Returns of Equity Portfolios
Years Ending



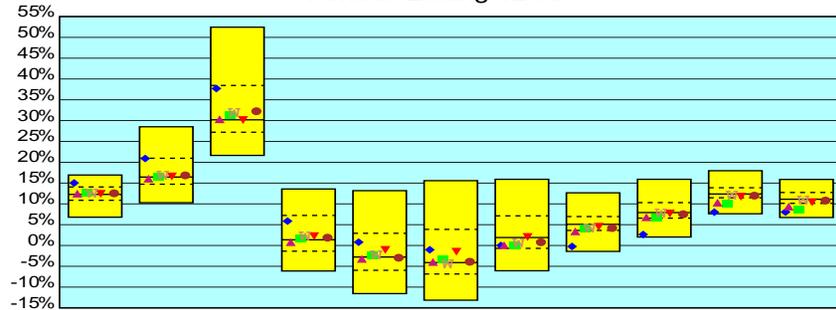
	Year 12/03	Year 12/02	Year 12/01	Year 12/00	Year 12/99	Year 12/98	Year 12/97	Year 12/96	Year 12/95	Year 12/94
High	55.53	-3.36	19.49	28.45	58.17	42.38	39.15	31.45	45.34	7.31
1st Qt	39.59	-15.83	0.43	9.98	27.84	28.73	33.20	24.19	37.78	2.18
Median	31.03	-21.59	-10.22	-2.97	20.19	18.64	28.91	21.93	34.96	0.37
3rd Qt	27.19	-25.71	-15.31	-9.73	7.41	6.71	23.56	18.30	29.92	-2.01
Low	19.16	-36.13	-32.35	-25.08	-4.62	-8.16	11.33	9.91	19.92	-7.22

◆ HPRS Domestic Equity	Return	37.58	-18.76	-8.74	-6.41	4.11	-1.59	21.54	24.10	34.02	8.19
	Rank	29	35	46	57	80	86	81	25	55	4
■ PERS Domestic Equity	Return	31.12	-21.37	-10.15	-6.55	14.64	26.33	25.41	19.84	24.95	-3.12
	Rank	49	48	49	57	61	36	68	65	89	83
▼ OP&F Domestic Equity	Return	30.00	-19.81	-7.47	-2.97	17.41	17.57	28.81	22.54	31.38	-0.95
	Rank	56	39	42	50	55	52	51	44	68	64
● SERS Domestic Equity	Return	32.12	-21.66	-12.04	-6.87	21.81	22.96	29.59	21.48	36.94	0.61
	Rank	45	50	62	58	38	41	47	53	36	47
▲ STRS Domestic Equity	Return	30.20	-22.16	-10.90	-6.28	17.75	21.64	29.58	17.81	29.17	1.08
	Rank	55	58	52	57	55	43	47	77	77	42
W Wilshire 5000	Return	31.64	-20.86	-10.96	-10.87	23.56	23.45	31.28	21.20	36.47	-0.06
	Rank	47	44	52	78	32	40	38	55	40	55

The exhibits above, and those on the next two pages, focus on US Equity results. The analysis is similar to the Total Fund analysis, except that now the comparisons are to a broad equity universe (above) and to the equity returns of Public Funds (page 9). When compared to equity portfolios in the broad equity universe (above), for the past 10 years OP&F and SERS have placed in the third quartile while HPRS, PERS, and STRS have placed in the fourth quartile. Over the past two years, four of the five funds have placed above the median portfolio (HPRS, PERS, OP&F and SERS) while only HPRS has outperformed the Wilshire 5000 index over the same period. The exhibit on the right displays performance by twelve-month periods ending December 31st. This exhibit highlights the fact that the long-term underperformance of the HPRS fund can be significantly explained by its bottom-quartile equity results in 1997, 1998, and 1999. Since then, results have rebounded nicely.

Ohio Retirement Study Council

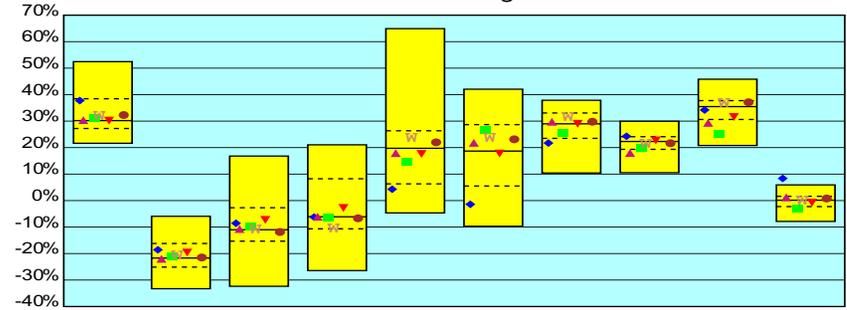
Cumulative Performance Comparison
Total Returns of Public Equity Portfolios
Periods Ending 12/03



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	16.93	28.52	52.45	13.57	13.17	15.57	15.90	12.65	15.90	17.96	15.87
1st Qt	14.06	20.96	38.45	7.22	2.93	3.87	7.12	6.95	10.30	13.87	12.73
Median	12.27	16.44	30.19	1.37	-2.77	-4.11	1.91	5.08	7.91	12.37	11.11
3rd Qt	10.86	14.72	27.21	-1.37	-5.96	-6.85	-0.69	3.62	6.57	11.46	10.12
Low	6.80	10.28	21.64	-6.13	-11.56	-13.14	-6.07	-1.42	2.03	7.62	6.72

◆ HPRS Domestic Equity	Return	14.89	20.77	37.58	5.72	0.66	-1.16	-0.13	-0.37	2.50	7.87	7.90
	Rank	14	25	26	28	37	39	64	93	93	94	90
■ PERS Domestic Equity	Return	12.44	16.31	31.12	1.54	-2.52	-3.54	-0.15	3.84	6.68	9.98	8.60
	Rank	47	50	45	47	47	47	64	66	73	87	83
▼ OP&F Domestic Equity	Return	12.27	16.44	30.00	2.10	-1.20	-1.64	1.90	4.36	7.55	11.57	10.25
	Rank	50	50	52	44	42	41	50	57	66	74	70
● SERS Domestic Equity	Return	12.40	16.71	32.12	1.74	-3.08	-4.04	0.65	4.06	7.38	11.84	10.66
	Rank	48	45	39	46	50	49	58	60	68	67	62
▲ STRS Domestic Equity	Return	12.34	15.93	30.20	0.67	-3.34	-4.09	-0.07	3.26	6.66	10.17	9.22
	Rank	49	54	49	54	52	49	63	79	73	85	81
W Wilshire 5000	Return	12.42	16.59	31.64	2.07	-2.47	-4.64	0.43	3.94	7.47	11.84	10.59
	Rank	47	46	43	44	46	53	59	62	66	67	63

Consecutive Performance Comparison
Total Returns of Public Equity Portfolios
Years Ending



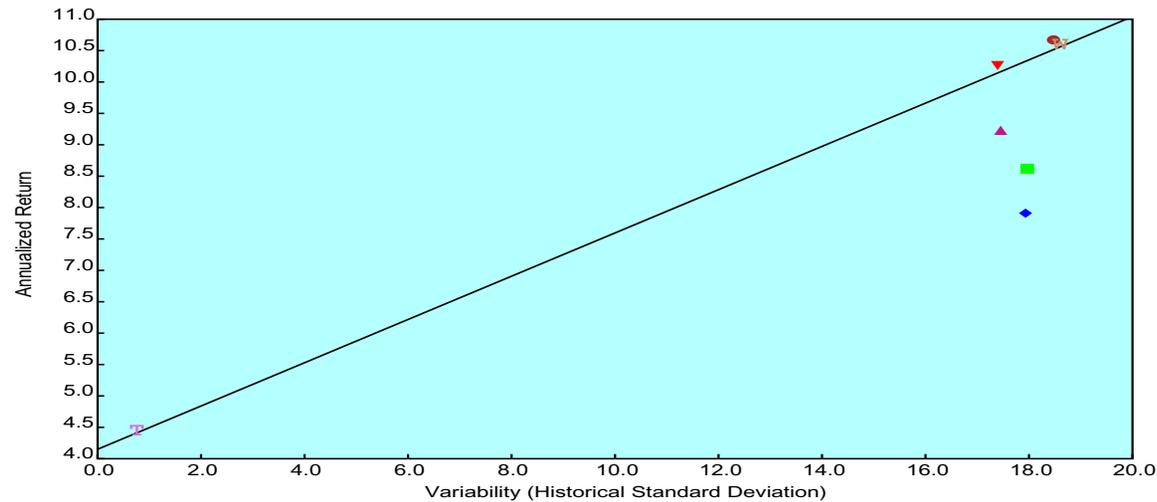
	12/03	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	52.45	-5.93	16.80	21.05	64.91	42.05	37.87	29.94	45.82	5.92
1st Qt	38.45	-16.20	-2.70	8.24	26.36	28.68	33.07	24.12	37.74	1.62
Median	30.19	-21.69	-11.00	-6.11	19.74	18.68	28.98	22.31	35.48	0.13
3rd Qt	27.21	-25.11	-15.33	-10.65	6.31	5.50	23.49	19.34	30.62	-2.26
Low	21.64	-33.27	-32.35	-26.42	-4.66	-9.69	10.41	10.53	20.80	-7.86

◆ HPRS Domestic Equity	Return	37.58	-18.76	-8.74	-6.41	4.11	-1.59	21.54	24.10	34.02	8.19
	Rank	26	33	41	50	79	85	80	25	58	2
■ PERS Domestic Equity	Return	31.12	-21.37	-10.15	-6.55	14.64	26.33	25.41	19.84	24.95	-3.12
	Rank	45	46	46	51	61	34	67	70	89	82
▼ OP&F Domestic Equity	Return	30.00	-19.81	-7.47	-2.97	17.41	17.57	28.81	22.54	31.38	-0.95
	Rank	52	38	37	43	56	52	51	48	71	62
● SERS Domestic Equity	Return	32.12	-21.66	-12.04	-6.87	21.81	22.96	29.59	21.48	36.94	0.61
	Rank	39	49	62	52	36	42	45	57	37	44
▲ STRS Domestic Equity	Return	30.20	-22.16	-10.90	-6.28	17.75	21.64	29.58	17.81	29.17	1.08
	Rank	49	59	49	50	55	44	46	81	79	39
W Wilshire 5000	Return	31.64	-20.86	-10.96	-10.87	23.56	23.45	31.28	21.20	36.47	-0.06
	Rank	43	42	49	75	30	40	37	60	41	52

The comparisons above compare the domestic equity returns of the five Ohio public funds to the domestic equity returns of all of the public funds in the Wilshire universe. Over the past twelve months, the domestic equity results of the five systems have ranged from the 26th percentile (HPRS) to the 52nd percentile (OP&F). Over the past five years, OP&F had the highest return and ranking (1.90% and 50th percentile). OP&F and SERS were the only funds to outperform the Wilshire 5000 Index over the same five-year period. Two-year results are somewhat better with all of the funds near or above the median. Only HPRS & OP&F, however, have outperformed the Wilshire 5000 Index.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/03



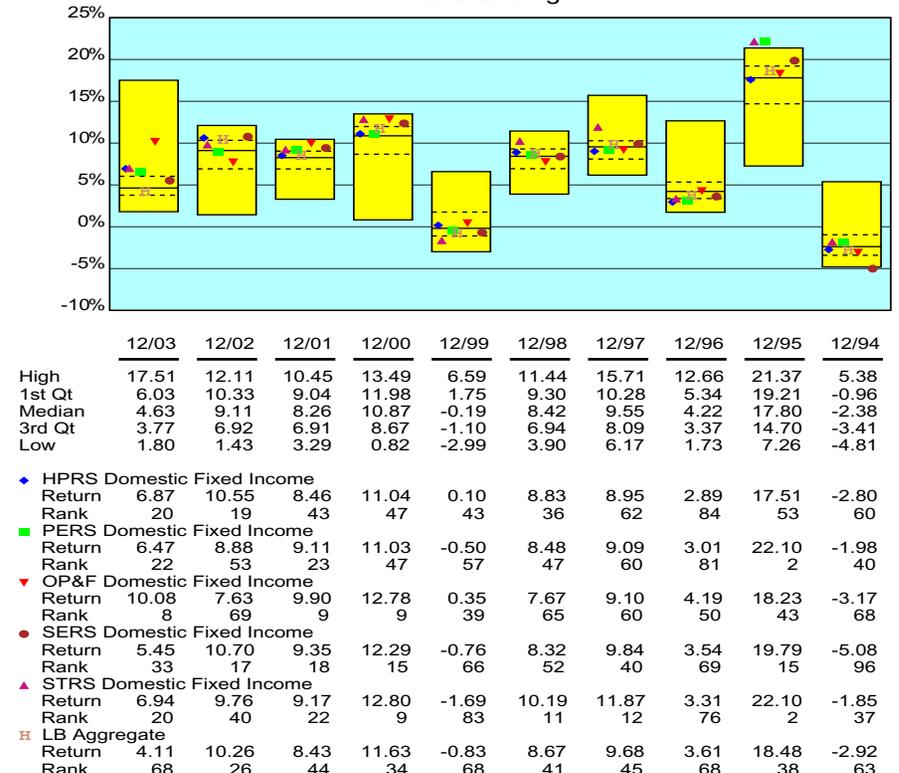
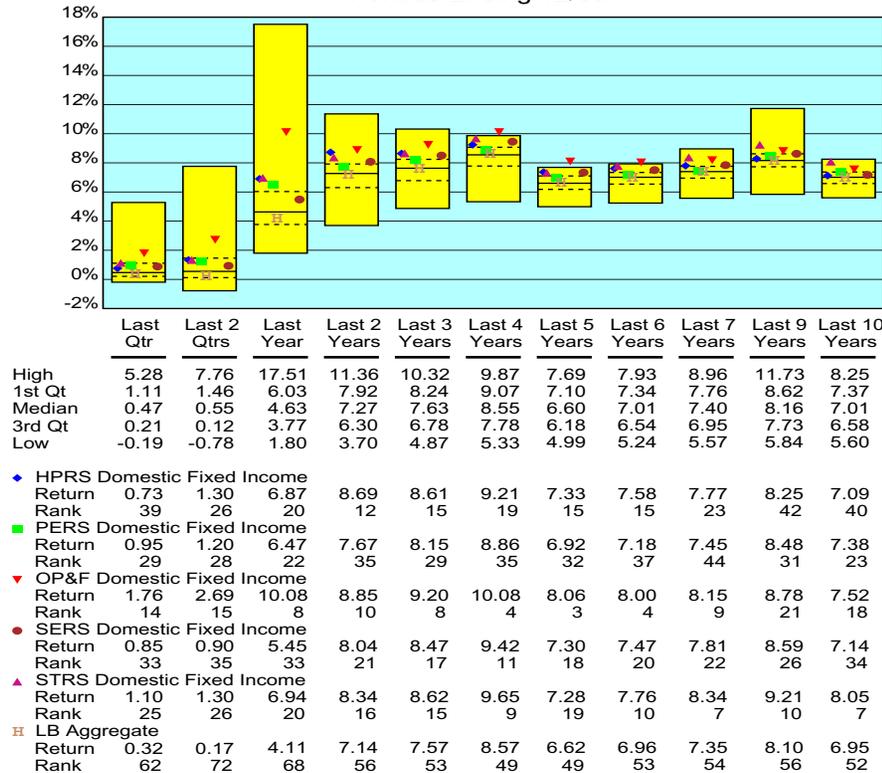
	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Equity	7.90	18.04	3.45	0.19
■ PERS Domestic Equity	8.60	18.08	4.15	0.23
▼ OP&F Domestic Equity	10.25	17.50	5.81	0.33
● SERS Domestic Equity	10.66	18.58	6.22	0.33
▲ STRS Domestic Equity	9.22	17.56	4.78	0.27
W Wilshire 5000	10.59	18.69	6.15	0.33
T 91-Day Treasury Bill	4.44	0.84	0.00	0.00

This is a risk -return analysis of domestic equity portfolios for all of the funds. The Capital Market Line is drawn, this time, between T-bills and the Wilshire 5000, the proxy for the total US stock market. As noted on the Capital Market Line exhibit on page 7, a Sharpe Ratio is calculated, providing a means of comparing returns adjusted for risk. SERS, OP&F, & STRS have enjoyed the best risk-adjusted equity results over the ten year period. SERS and OP&F had “above the line” risk-adjusted equity results with Sharpe Ratios equal to the broad-market Wilshire 5000 index.

Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of Fixed Income Portfolios
Periods Ending 12/03

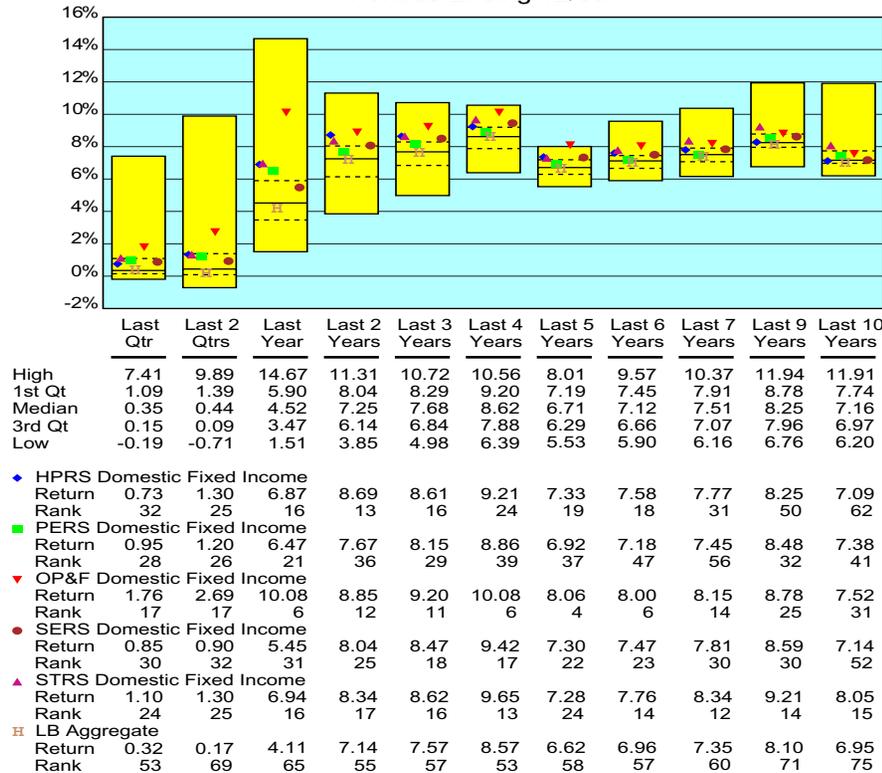
Consecutive Performance Comparison
Total Returns of Fixed Income Portfolios
Years Ending



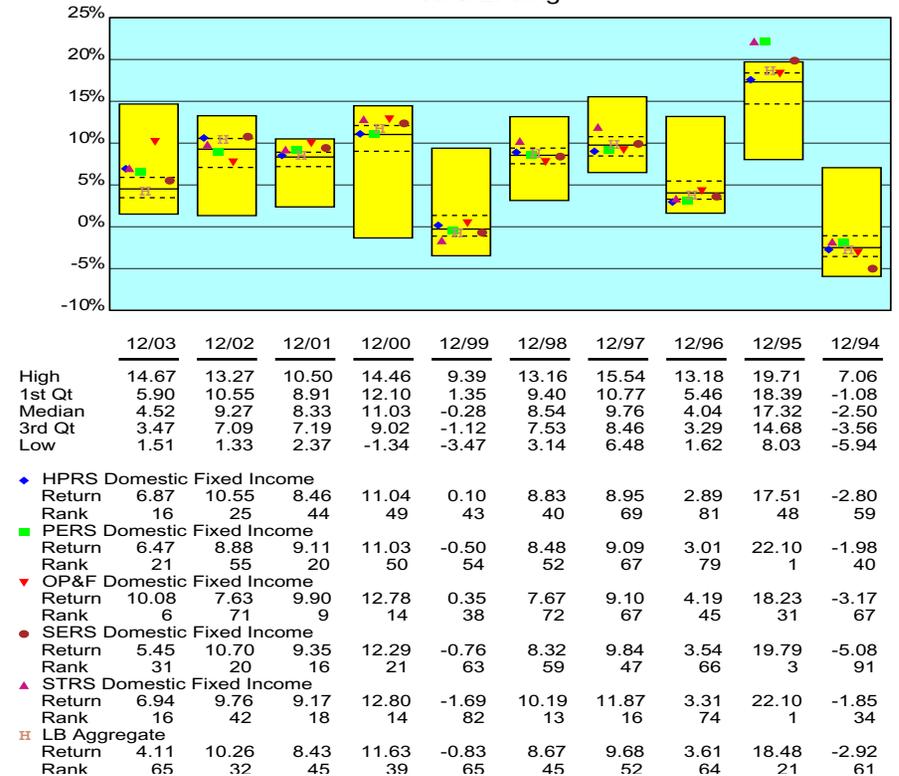
The exhibits above, and those on the next two pages, compare the fixed income results of the five funds to that of a broad fixed income universe consisting of all of the fixed income accounts in the Wilshire Co-op. Over the past ten years, all five of the fund's fixed income results are above the median. Over the last twelve months, HPRS, PERS, OP&F, and STRS placed in the top quartile, while SERS placed in second quartile. The graph on the right provides an analysis of the performance of twelve-month periods ending December 31st. The chart shows, for example, that STRS ten-year cumulative return was spurred by very strong performance in the twelve month periods ending December 31 in 1995, 1997, 1998, 2000, 2001 and 2003.

Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of Public Fixed Income Portfolios
Periods Ending 12/03



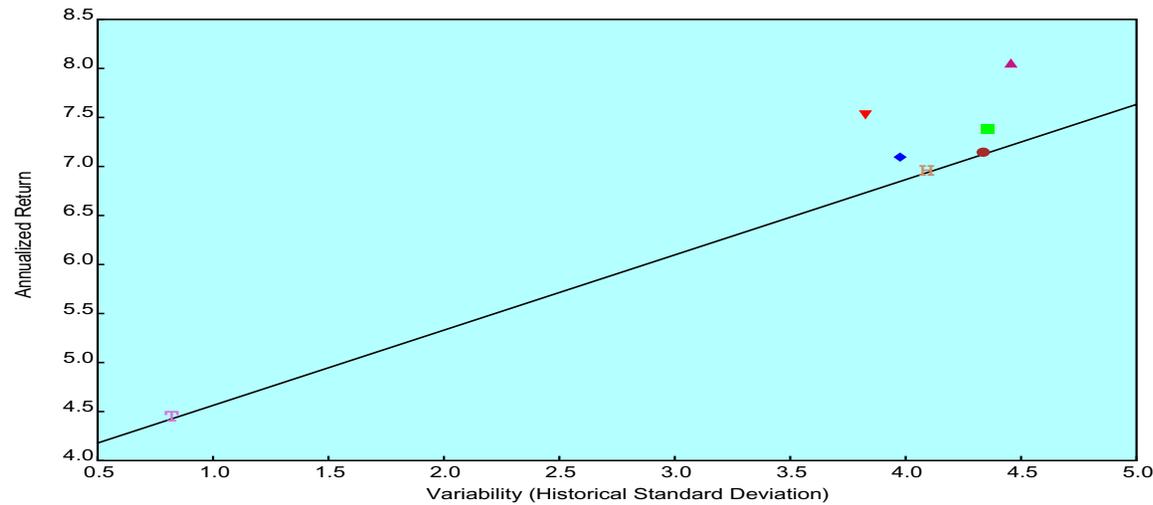
Consecutive Performance Comparison
Total Returns of Public Fixed Income Portfolios
Years Ending



The exhibits above compare the fixed income results of the five funds to that of the fixed income returns of the 167 public funds in the Wilshire universe. The analysis is similar to page 9. STRS has had the best performance over the past ten years (15th percentile), while HPRS has had the worst fixed income performance over the same measurement period (62nd percentile). All five of the funds outperformed the LB Aggregate Bond Market index for the same period.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/03

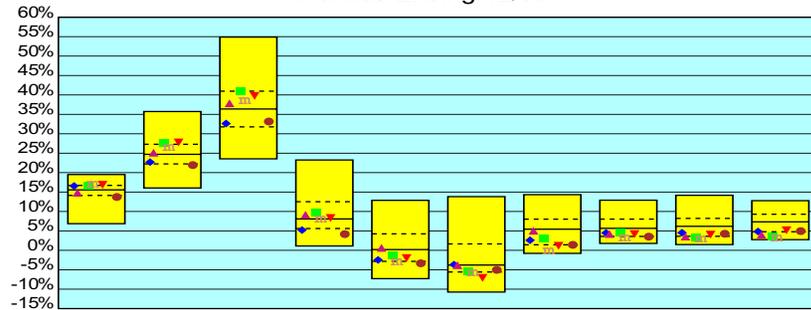


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Fixed Income	7.09	4.00	2.65	0.66
■ PERS Domestic Fixed Income	7.38	4.38	2.94	0.67
▼ OP&F Domestic Fixed Income	7.52	3.85	3.08	0.80
● SERS Domestic Fixed Income	7.14	4.36	2.69	0.62
▲ STRS Domestic Fixed Income	8.05	4.48	3.60	0.80
⊠ LB Aggregate	6.95	4.11	2.50	0.61
Ⓜ 91-Day Treasury Bill	4.44	0.84	0.00	0.00

The risk-return analysis above shows that all five of the funds' fixed income portfolios have enjoyed risk-adjusted returns (as measured by their Sharpe Ratios) greater than the bond market as defined by the Lehman Aggregate Index.

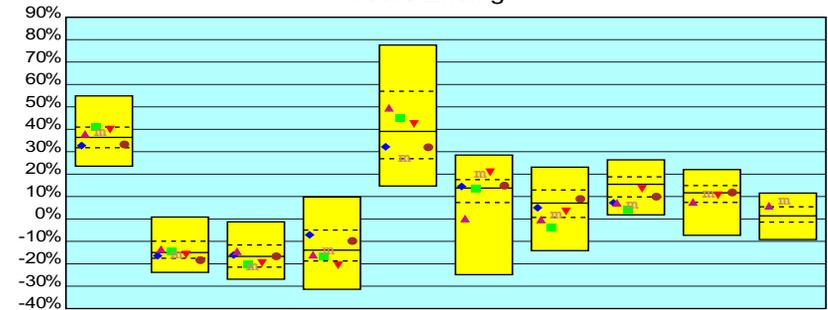
Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of International Equity Portfolios
Periods Ending 12/03



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	19.51	35.73	54.89	23.25	12.87	13.82	14.33	12.90	14.16	12.78
1st Qt	16.71	27.30	40.97	12.51	4.24	1.65	8.02	8.22	9.29	9.29
Median	15.56	24.71	36.38	8.08	0.19	-3.79	5.44	5.66	6.18	7.33
3rd Qt	14.13	22.24	31.78	5.61	-2.84	-5.58	1.43	3.58	3.61	4.78
Low	6.86	16.05	23.55	1.12	-7.29	-10.74	-0.78	1.78	1.48	2.75
◆ HPRS Intn'l Equity										
Return	16.43	22.57	32.50	5.08	-2.61	-3.82	2.46	4.34	4.40	4.71
Rank	30	71	70	79	72	50	69	64	65	79
■ PERS Intn'l Equity										
Return	16.61	27.45	40.72	9.63	-1.53	-5.58	2.86	4.52	3.27	3.35
Rank	27	24	26	34	65	75	68	61	80	93
▼ OP&F Intn'l Equity										
Return	16.72	27.62	39.60	8.18	-2.14	-7.24	1.02	4.04	3.90	5.02
Rank	24	22	29	47	70	87	77	68	72	72
● SERS Intn'l Equity										
Return	13.59	21.80	33.02	4.03	-3.48	-5.17	1.27	3.38	4.13	4.81
Rank	81	80	61	84	79	69	76	76	72	73
▲ STRS Intn'l Equity										
Return	14.70	25.00	37.71	9.02	0.49	-3.96	4.91	4.07	3.41	3.85
Rank	66	44	40	39	40	51	56	68	78	90
■ MSCI EAFE (Net)										
Return	17.08	26.59	38.58	7.93	-2.91	-5.86	-0.05	3.04	2.85	3.25
Rank	19	30	33	51	76	78	88	82	90	93

Consecutive Performance Comparison
Total Returns of International Equity Portfolios
Years Ending

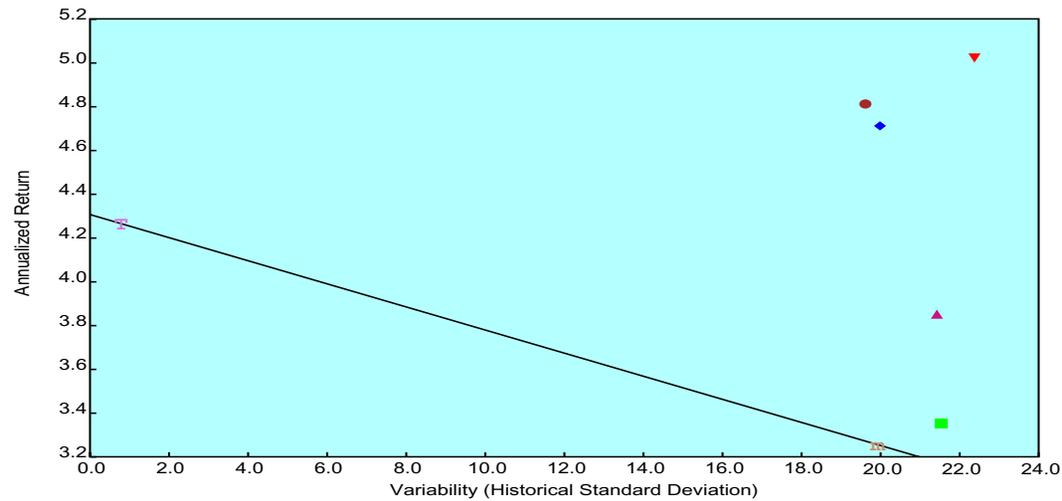


	12/03	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	54.89	0.84	-1.30	9.78	77.58	28.50	23.10	26.36	22.02	11.54
1st Qt	40.97	-9.93	-11.60	-4.96	56.97	17.54	12.93	18.79	14.89	5.42
Median	36.38	-15.00	-16.72	-13.92	39.05	13.78	7.06	15.46	11.66	1.38
3rd Qt	31.78	-17.54	-21.50	-18.74	26.87	7.32	0.66	9.84	7.37	-1.41
Low	23.55	-23.84	-26.89	-31.39	14.69	-24.86	-14.14	1.84	-7.29	-9.18
◆ HPRS Intn'l Equity										
Return	32.50	-16.66	-16.34	-7.35	31.94	14.24	4.76	6.96		
Rank	70	66	47	31	61	47	58	85		
■ PERS Intn'l Equity										
Return	40.72	-14.60	-20.54	-16.77	44.85	13.23	-3.94	3.94		
Rank	26	46	70	62	41	53	85	93		
▼ OP&F Intn'l Equity										
Return	39.60	-16.17	-19.93	-20.98	42.10	20.55	3.08	13.21	10.29	
Rank	29	62	67	81	44	13	64	63	64	
● SERS Intn'l Equity										
Return	33.02	-18.64	-16.91	-10.08	31.73	14.63	8.69	9.71	11.56	
Rank	61	83	50	40	62	45	44	75	51	
▲ STRS Intn'l Equity										
Return	37.71	-13.69	-14.63	-16.17	49.38	-0.03	-0.47	6.97	7.37	5.65
Rank	40	41	42	59	36	83	77	84	75	22
■ MSCI EAFE (Net)										
Return	38.58	-15.94	-21.45	-14.16	26.97	19.97	1.77	6.05	11.22	7.76
Rank	33	59	74	51	74	16	70	90	55	15

The exhibits on this page and the one on the next page analyze the International Equity results of the five funds. Comparisons beyond eight years are not meaningful, since two of the funds have not had allocations to this asset class for that length of time. For the eight-year period ending 12/31/2003, all of the funds have had International Equity results that are below the median international equity portfolio in our universe. On an absolute basis, these range from 3.35% (PERS) to 5.02% (OP&F). PERS had the best International Equity return for the most recent twelve months followed by OP&F.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis
Periods from 12/95 to 12/03

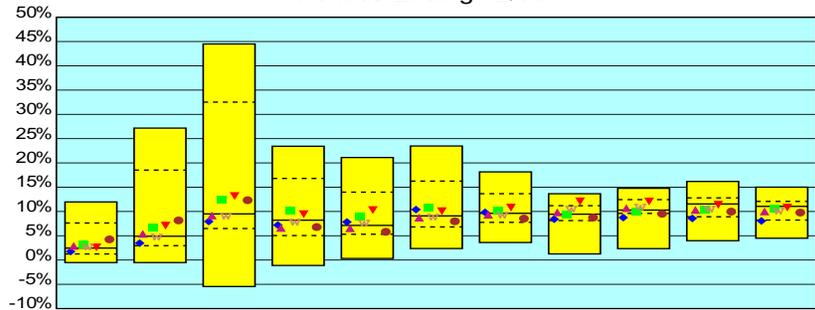


	Annualized Return	Variability	Reward
◆ HPRS Intn'l Equity	4.71	20.11	0.45
■ PERS Intn'l Equity	3.35	21.65	-0.91
▼ OP&F Intn'l Equity	5.02	22.50	0.76
● SERS Intn'l Equity	4.81	19.74	0.54
▲ STRS Intn'l Equity	3.85	21.55	-0.42
■ MSCI EAFE (Net)	3.25	20.03	-1.01
⌘ 91-Day Treasury Bill	4.26	0.88	0.00

On a risk-return basis, for the eight years that all five funds have international equity data, the results are quite disparate. The international equity returns of all of the funds outperformed the MSCI EAFE (Net) Index. Only three (HPRS, OP&F, and SERS), however, outperformed the T-Bill return for the measurement period.

Ohio Retirement Study Council

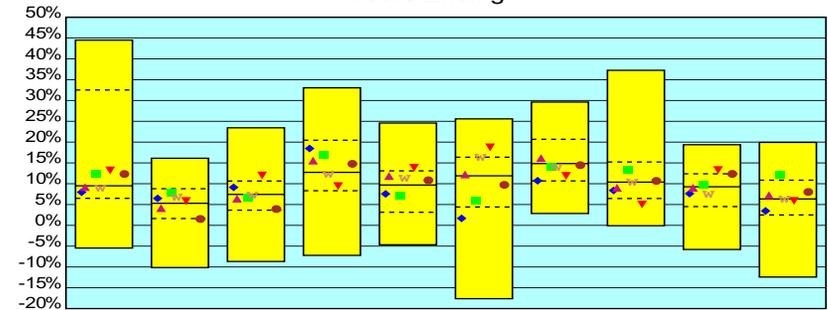
Cumulative Performance Comparison
Total Returns of Real Estate Portfolios
Periods Ending 12/03



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	11.96	27.17	44.49	23.43	21.11	23.48	18.15	13.65	14.77	16.18	15.01
1st Qt	7.63	18.52	32.52	16.80	13.98	16.25	13.66	11.19	12.44	12.80	12.07
Median	2.46	4.90	9.50	8.21	7.13	9.09	9.62	9.44	10.29	11.55	11.05
3rd Qt	1.25	2.96	6.49	5.04	5.31	6.82	7.76	8.13	9.60	8.91	8.23
Low	-0.52	-0.52	-5.45	-1.12	0.32	2.37	3.61	1.26	2.35	3.98	4.49

◆ HPRS Real Estate	Return	1.64	3.37	7.83	7.09	7.72	10.28	9.71	8.30	8.63	8.46	7.94
	Rank	70	71	67	65	45	35	49	72	84	80	75
■ PERS Real Estate	Return	3.20	6.54	12.29	9.98	8.79	10.74	9.98	9.27	9.94	10.25	10.43
	Rank	39	35	33	37	37	34	42	56	57	65	58
▼ OP&F Real Estate	Return	2.50	6.97	13.06	9.32	10.16	9.94	10.68	11.97	11.94	11.26	10.70
	Rank	46	34	33	39	34	36	36	11	25	55	58
● SERS Real Estate	Return	4.14	8.05	12.21	6.68	5.70	7.87	8.43	8.63	9.42	9.86	9.66
	Rank	32	33	34	66	68	67	62	65	75	65	63
▲ STRS Real Estate	Return	2.80	5.29	9.06	6.51	6.44	8.62	9.23	9.71	10.59	10.21	9.90
	Rank	41	44	54	68	63	58	55	46	48	65	63
⚡ NCREIF	Return	2.76	4.78	8.97	7.85	7.66	8.79	9.31	10.43	10.92	10.47	10.06
	Rank	41	60	54	52	45	56	54	35	46	65	63

Consecutive Performance Comparison
Total Returns of Real Estate Portfolios
Years Ending



	12/03	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	44.49	16.12	23.43	33.04	24.58	25.58	29.62	37.25	19.37	19.93
1st Qt	32.52	8.80	10.65	20.45	13.09	16.37	20.67	15.22	12.38	10.85
Median	9.50	5.30	7.43	12.73	9.69	11.90	14.84	10.38	9.27	6.34
3rd Qt	6.49	1.64	3.64	8.32	3.14	4.41	10.67	6.45	4.51	2.50
Low	-5.45	-10.14	-8.68	-7.21	-4.66	-17.62	2.85	-0.09	-5.80	-12.42

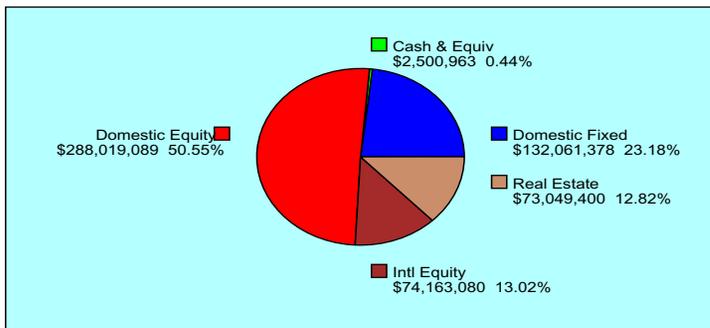
◆ HPRS Real Estate	Return	7.83	6.35	9.00	18.34	7.43	1.55	10.59	8.25	7.50	3.34
	Rank	67	44	37	27	61	78	75	64	65	71
■ PERS Real Estate	Return	12.29	7.72	6.44	16.79	7.01	5.77	14.03	13.19	9.56	12.09
	Rank	33	36	58	32	63	73	54	32	46	17
▼ OP&F Real Estate	Return	13.06	5.71	11.84	9.29	13.71	18.61	11.75	4.89	13.14	5.74
	Rank	33	48	20	72	23	14	66	82	22	53
● SERS Real Estate	Return	12.21	1.41	3.79	14.65	10.70	9.60	14.33	10.55	12.23	7.89
	Rank	34	79	74	39	44	62	53	48	26	39
▲ STRS Real Estate	Return	9.06	4.01	6.30	15.43	11.73	12.11	16.04	8.91	8.90	7.12
	Rank	54	63	58	36	35	49	45	57	54	44
⚡ NCREIF	Return	8.97	6.73	7.29	12.24	11.40	16.24	13.90	10.31	7.54	6.39
	Rank	54	42	50	55	41	25	54	50	64	49

The exhibits above evaluate the real estate returns for the five funds. For the ten-year cumulative period, OP&F and PERS had real estate performance that outperformed the NCREIF benchmark. Returns for the past twelve month period show OP&F ahead of the other funds in this asset class with a 13.06% return vs. 8.97% for the NCREIF real estate index. We have not included a risk/return analysis for real estate. While institutional investors in real property compute and report quarterly returns, these returns are based on appraisals and are not appropriately compared with other investments which actually trade on a daily basis. An annualized quarterly standard deviation of returns for real estate is, in our judgement, a meaningless number.

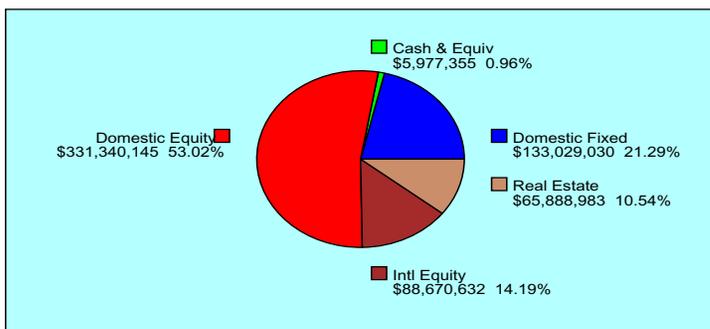
Highway Patrol Retirement System

Asset Allocation
HPRS

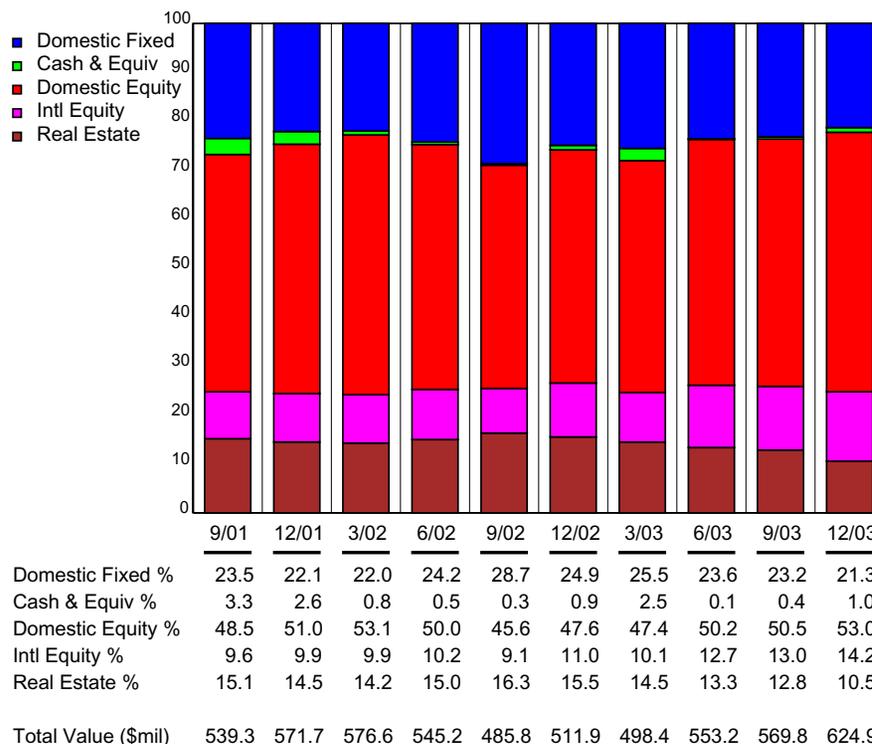
September 30, 2003 \$569,793,910



December 31, 2003 \$624,906,145



Asset Allocation
HPRS



This is the first page devoted to the analysis of the Ohio Highway Patrol Retirement System's asset allocation. The chart on the left displays the fund's asset allocation over the last two quarters of 2003. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

Highway Patrol Retirement System

HPRS

Quarter Ending 12/31/2003

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	Mar-94	Dec-95	50.00	LB Aggregate
			50.00	Standard & Poors 500
	Mar-96	Dec-97	50.00	Standard & Poors 500
			40.00	LB Aggregate
			5.00	MSCI EAFE (Net)
			5.00	NCREIF
	Mar-98	Sep-99	40.00	Standard & Poors 500
25.00			LB Aggregate	
15.00			Russell 2000	
10.00			MSCI EAFE (Net)	
Dec-99	Dec-00	10.00	NCREIF	
		40.00	Standard & Poors 500	
		20.00	Russell 2000	
		20.00	LB Aggregate	
Mar-02	Dec-02	10.00	MSCI EAFE (Net)	
		10.00	NCREIF	
		20.00	LB Aggregate	
		20.00	Russell 2500	
Mar-03	Dec-03	40.00	Standard & Poors 500	
		16.00	Russell 2500	
		25.00	LB Aggregate	
		15.00	MSCI EAFE (Net)	
		12.00	NCREIF	

HPRS' custom policy index is listed above. The chart tracks the fund's change in asset allocation strategy over the past ten years.

Highway Patrol Retirement System

Performance Overview

HPRS

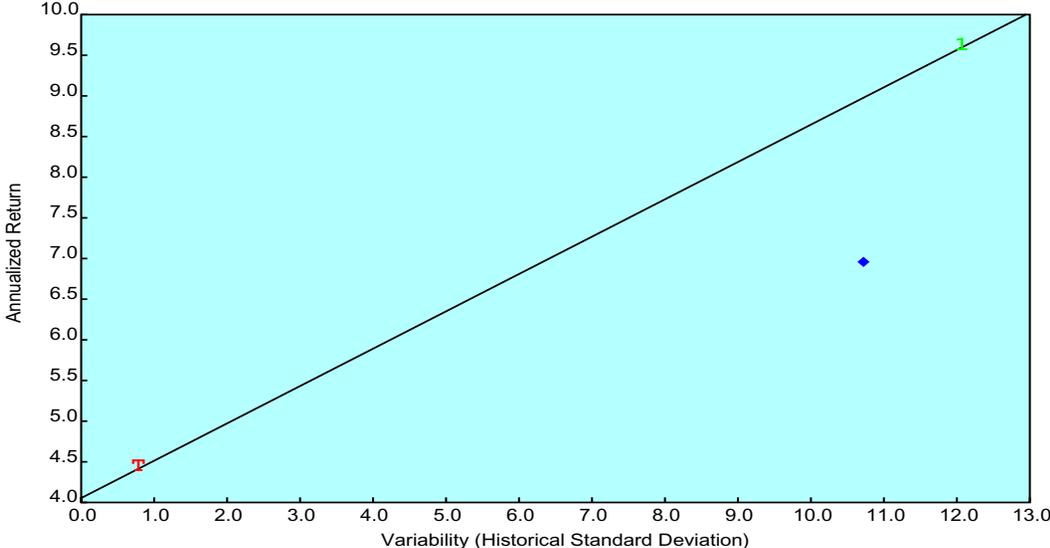
Returns for Periods Ending December 31, 2003

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	9.98	13.94	27.73	25.30	3.47	3.39	6.95
Policy Index Return	9.10	13.06	26.81	23.83	2.61	4.25	9.62
Domestic Equity Return	14.89	20.77	42.10	37.58	0.66	-0.13	7.90
Equity Segment Median Return	12.48	16.76	36.38	31.67	-2.67	2.14	11.09
Wilshire 5000	12.42	16.59	35.83	31.64	-2.47	0.43	10.59
Int'l Equity Return	16.43	22.57	47.96	32.50	-2.61	2.46	
Int'l Equity Segment Median Return	15.57	24.65	47.04	36.70	0.28	5.47	
MSCI EAFE (Net)	17.08	26.59	50.98	38.58	-2.91	-0.05	4.47
Domestic Fixed Return	0.73	1.30	4.55	6.87	8.61	7.33	7.09
Fixed Income Segment Median Return	0.37	0.41	3.02	4.47	7.66	6.66	7.06
LB Aggregate	0.32	0.17	2.68	4.11	7.57	6.62	6.95
Cash Return	0.15	0.33	0.72	0.99	2.71	3.66	
Real Estate Return	1.64	3.37	6.45	7.83	7.72	9.71	7.94
NCREIF	2.76	4.78	6.96	8.97	7.66	9.31	10.06

Over the entire ten year period, the fund's total return is trailing its policy index by 2.67% annually. This is due almost entirely to its domestic equity returns, which lagged the broad market as defined by the Wilshire 5000 by 2.69% annually. The most recent twelve months, however, show that HPRS has outperformed its policy index by a substantial margin.

Highway Patrol Retirement System

OHIO RETIREMENT STUDY COUNCIL
 Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/03



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	6.95	10.79	2.50	0.23
┆ HPRS Total Policy (2)	9.62	12.12	5.17	0.43
┆ 91-Day Treasury Bill	4.44	0.84	0.00	0.00

This risk-return chart above differs from those earlier in the report in that it will measure a system’s risk-adjusted returns to a Capital Market Line drawn by connecting the risk/return point of US T-bills and the risk return point of HPRS’ own policy index. The calculation of the Sharpe Ratio shows that on a risk-adjusted basis, the fund has fallen well short of the risk adjusted return of its policy index.

Highway Patrol Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	31.90%	S & P 500	32%	-0.10%
Sm/Mid Cap Equity	18.32%	Russell 2500	16%	2.32%
Fixed Income	23.56%	LB Aggregate	25%	-1.44%
Intl. Equity	12.74%	MSCI EAFE (Net)	15%	-2.26%
Real Estate	13.34%	NCREIF	12%	1.34%
Short Term	0.15%		0%	0.15%

December 31, 2003

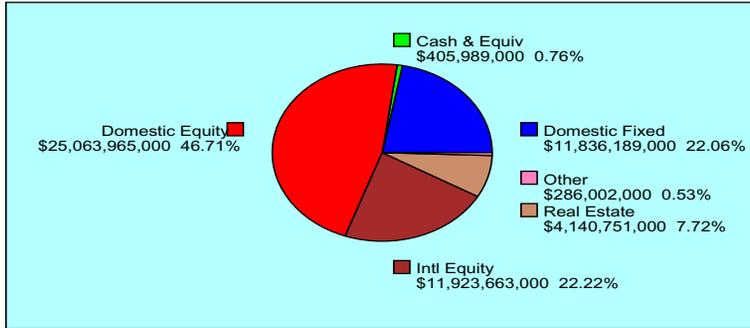
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	33.10%	S & P 500	32%	1.10%
Sm/Mid Cap Equity	19.92%	Russell 2500	16%	3.92%
Fixed Income	21.29%	LB Aggregate	25%	-3.71%
Intl. Equity	14.19%	MSCI EAFE (Net)	15%	-0.81%
Real Estate	10.54%	NCREIF	12%	-1.46%
Short Term	0.96%		0%	0.96%

As of the end of the fourth quarter, the HPRS fund is underweight in fixed income and real estate while being overweight in domestic equities.

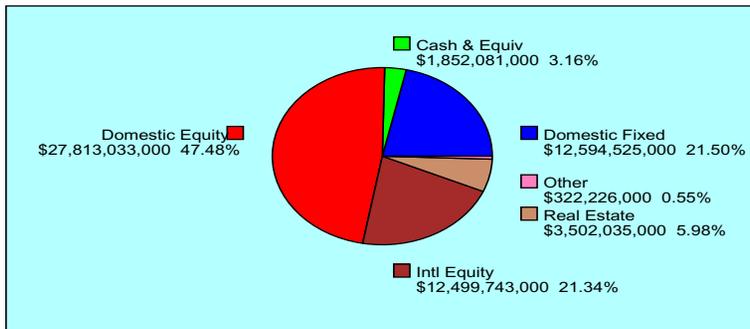
Public Employees Retirement System

Asset Allocation
PERS

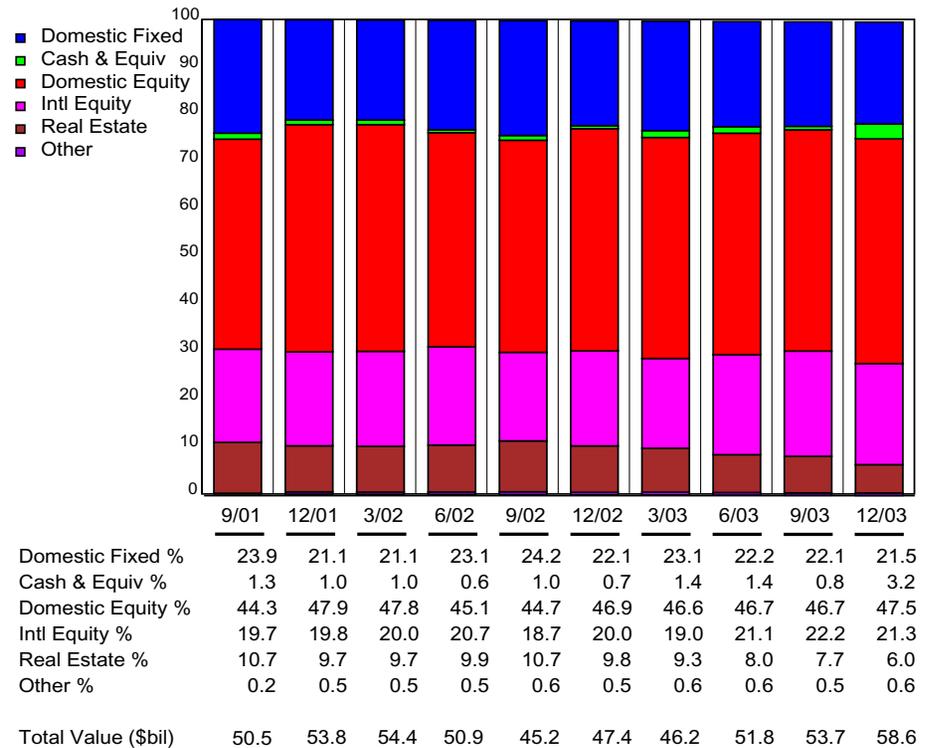
September 30, 2003 \$53,656,559,000



December 31, 2003 \$58,583,643,000



Asset Allocation
PERS



This page is devoted to the analysis of the Ohio Public Employees Retirement System's asset allocation. The chart on the left displays the fund's asset allocation over the last two quarters of 2003. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

Public Employees Retirement System

Custom Benchmark Specification

PERS

Quarter Ending 12/31/2003

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	Mar-94	Jun-95	68.00	SB Broad Inv Grade
			17.00	Standard & Poors 500
			8.00	91-Day Treasury Bill
			7.00	NCREIF
	Sep-95	Dec-95	59.00	SB Broad Inv Grade
			26.00	Standard & Poors 500
			8.00	NCREIF
			6.00	91-Day Treasury Bill
			1.00	MSCI EAFE (Net)
	Mar-96	Dec-96	62.50	SB Broad Inv Grade
			23.00	Standard & Poors 500
			8.00	NCREIF
			4.50	91-Day Treasury Bill
			2.00	MSCI EAFE (Net)
	Mar-97	Dec-97	56.50	SB Broad Inv Grade
			27.00	Standard & Poors 500
			8.00	NCREIF
			4.50	91-Day Treasury Bill
			4.00	MSCI EAFE (Net)
	Mar-98	Dec-98	51.00	SB Broad Inv Grade
30.50			Standard & Poors 500	
8.00			NCREIF	
6.00			MSCI EAFE (Net)	
4.50			91-Day Treasury Bill	

Custom Benchmark Specification

PERS

Quarter Ending 12/31/2003

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Dec-98	Dec-98	51.00	SB Broad Inv Grade
			30.50	Russell 3000
			6.00	MSCI World Ex-US (Net)
			4.80	NCREIF
			4.50	91-Day Treasury Bill
			1.60	NAREIT
	Mar-99	Mar-99	45.40	SB Broad Inv Grade
			35.00	Standard & Poors 500
			7.60	MSCI World Ex-US (Net)
			6.60	NCREIF
			2.20	NAREIT
			2.20	Giliberto-Levy Mortgage
	Jun-99	Jun-99	40.10	SB Broad Inv Grade
			35.00	Standard & Poors 500
			12.90	MSCI World Ex-US (Net)
			6.60	NCREIF
			2.20	NAREIT
			2.20	Giliberto-Levy Mortgage
			1.00	91-Day Treasury Bill

The charts above and on the following page track PERS asset allocation policy index over the last ten years. The current policy index is located on page 24 in the chart on the right.

Public Employees Retirement System

Custom Benchmark Specification

PERS

Quarter Ending 12/31/2003

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-99	Mar-02	36.10	SB Broad Inv Grade
			35.00	Standard & Poors 500
			16.90	MSCI World Ex-US (Net)
			6.60	NCREIF
			2.20	NAREIT
			2.20	Giliberto-Levy Mortgage
			1.00	91-Day Treasury Bill
	Mar-02	Mar-02	34.30	S&P 1500
			31.80	SB Broad Inv Grade
			18.90	MSCI World Ex-US (Net)
			5.70	NCREIF
			3.00	Russell 3000
			2.30	91-Day Treasury Bill
			1.90	NAREIT
	Jun-02	Sep-02	34.70	S&P 1500
			29.20	SB Broad Inv Grade
			19.30	MSCI World Ex-US (Net)
			5.80	Russell 3000
			5.58	NCREIF
			1.86	NAREIT
			1.86	Giliberto-Levy Mortgage
1.50	91-Day Treasury Bill			
0.20	Standard & Poors 500			

Custom Benchmark Specification

PERS

Quarter Ending 12/31/2003

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-02	Sep-02	44.70	Russell 3000
			25.60	SB Broad Inv Grade
			19.70	MSCI World Ex-US (Net)
			5.46	NCREIF
			1.82	NAREIT
			1.82	Giliberto-Levy Mortgage
			0.70	91-Day Treasury Bill
			0.20	Standard & Poors 500
			Dec-02	Dec-02
	23.00	SB Broad Inv Grade		
	20.00	MSCI World Ex-US (Net)		
	5.40	NCREIF		
	1.80	NAREIT		
	1.80	Giliberto-Levy Mortgage		
	Mar-03	Dec-03	46.00	Russell 3000
			23.00	Lehman Universal
			20.00	MSCI World Ex-US (Net)
			8.10	NCREIF
			0.90	Wilshire Real Estate Securities
			1.00	91-Day Treasury Bill
	1.00	Russell 3000 + 3%		

Public Employees Retirement System

Performance Overview

PERS

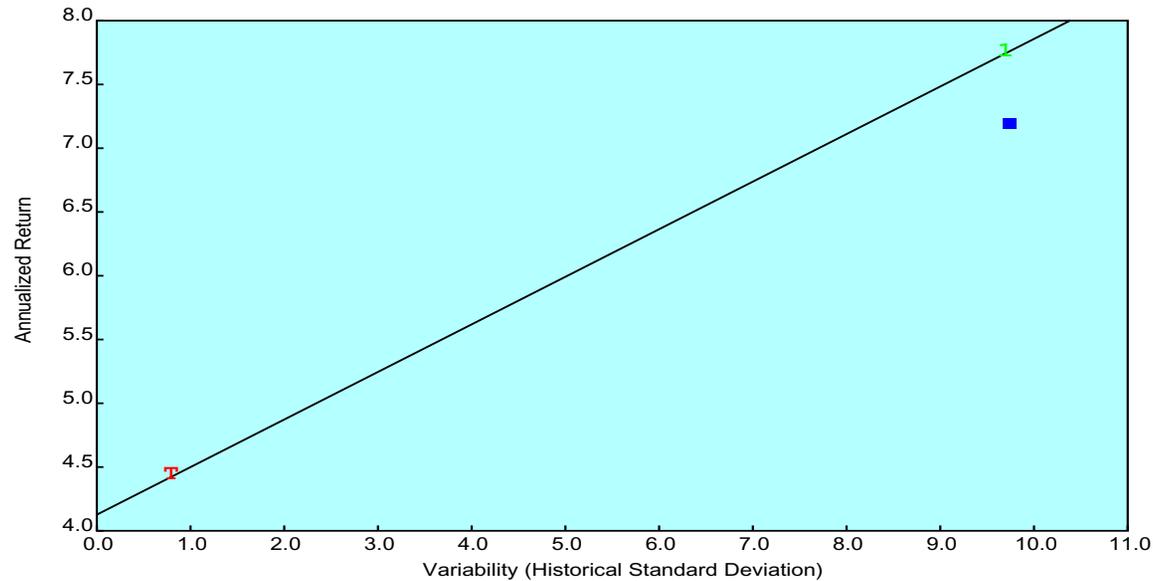
Returns for Periods Ending December 31, 2003

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	9.81	14.17	28.47	25.38	2.18	3.49	7.19
Policy Index Return	9.54	13.63	27.50	24.62	1.96	3.50	7.76
Domestic Equity Return	12.44	16.31	35.18	31.12	-2.52	-0.15	8.60
Equity Segment Median Return	12.48	16.76	36.38	31.67	-2.67	2.14	11.09
Wilshire 5000	12.42	16.59	35.83	31.64	-2.47	0.43	10.59
Int'l Equity Return	16.61	27.45	52.73	40.72	-1.53	2.86	
Int'l Equity Segment Median Return	15.57	24.65	47.04	36.70	0.28	5.47	
MSCI EAFE (Net)	17.08	26.59	50.98	38.58	-2.91	-0.05	4.47
Domestic Fixed Return	0.95	1.20	4.39	6.47	8.15	6.92	7.38
Fixed Income Segment Median Return	0.37	0.41	3.02	4.47	7.66	6.66	7.06
LB Aggregate	0.32	0.17	2.68	4.11	7.57	6.62	6.95
Cash Return	0.27	0.55	0.85	1.15	2.27	3.69	4.56
Real Estate Return	3.20	6.54	10.68	12.29	8.79	9.98	10.33
NCREIF	2.76	4.78	6.96	8.97	7.66	9.31	10.06
Other Return	7.12	17.98	20.52	21.75	-3.67	8.58	

Over the past ten year period, PERS has trailed its policy index by 0.57% annually. During the same period, PERS' US Equity results trailed the broad market Wilshire 5000 index by 1.99% annually. Over the past twelve months, the fund has outperformed the policy index. Underperformance from domestic equity has been balanced by stronger performance from fixed income, international equity and real estate.

Public Employees Retirement System

Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/03



	Annualized Return	Variability	Reward	Sharpe Ratio
■ PERS	7.19	9.80	2.74	0.28
1 PERS Policy Index	7.76	9.74	3.31	0.34
T 91-Day Treasury Bill	4.44	0.84	0.00	0.00

The Capital Market Line in this graph is drawn by connecting the risk/return point of US T-bills and the risk/return point of PERS' own policy index. On an absolute and risk-adjusted basis, the PERS total fund return underperformed the policy index over the ten year period, with risk similar to the custom benchmark.

Public Employees Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.70%	S&P 1500	47.0%	-0.30%
Fixed Income	22.20%	SB Broad Inv Grade	23.0%	-0.80%
Intl. Equity	21.10%	MSCI ACWI	20.0%	1.10%
Real Estate	8.00%	PERS Custom Index	9.0%	-1.00%
Private Equity	0.60%	S&P 500	0.6%	0.00%
Short Term	1.40%	3 Month T-Bill	0.4%	1.00%

December 31, 2003

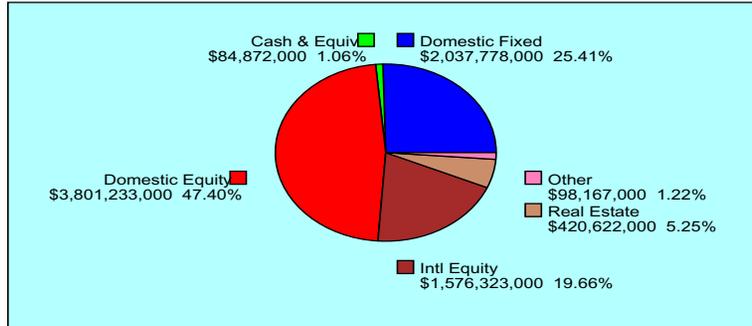
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	47.50%	S&P 1500	46.0%	1.50%
Fixed Income	21.50%	SB Broad Inv Grade	23.0%	-1.50%
Intl. Equity	21.30%	MSCI ACWI	20.0%	1.30%
Real Estate	6.00%	PERS Custom Index	9.0%	-3.00%
Private Equity	0.60%	S&P 500	1.0%	-0.40%
Short Term	3.20%	3 Month T-Bill	1.0%	2.20%

As of the end of the fourth quarter, PERS is overweight in domestic equity, international equity and cash, and underweight in fixed income and real estate.

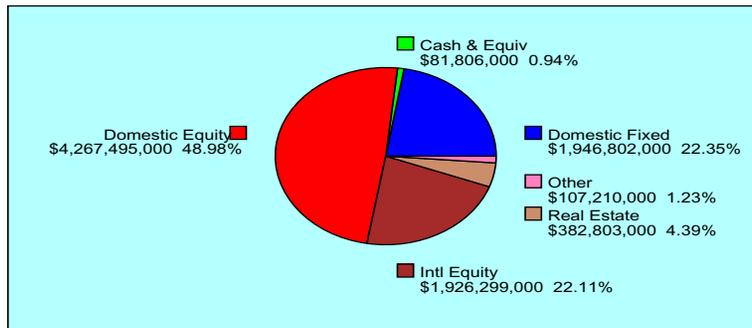
Police & Fire Pension Fund

Asset Allocation
OP&F

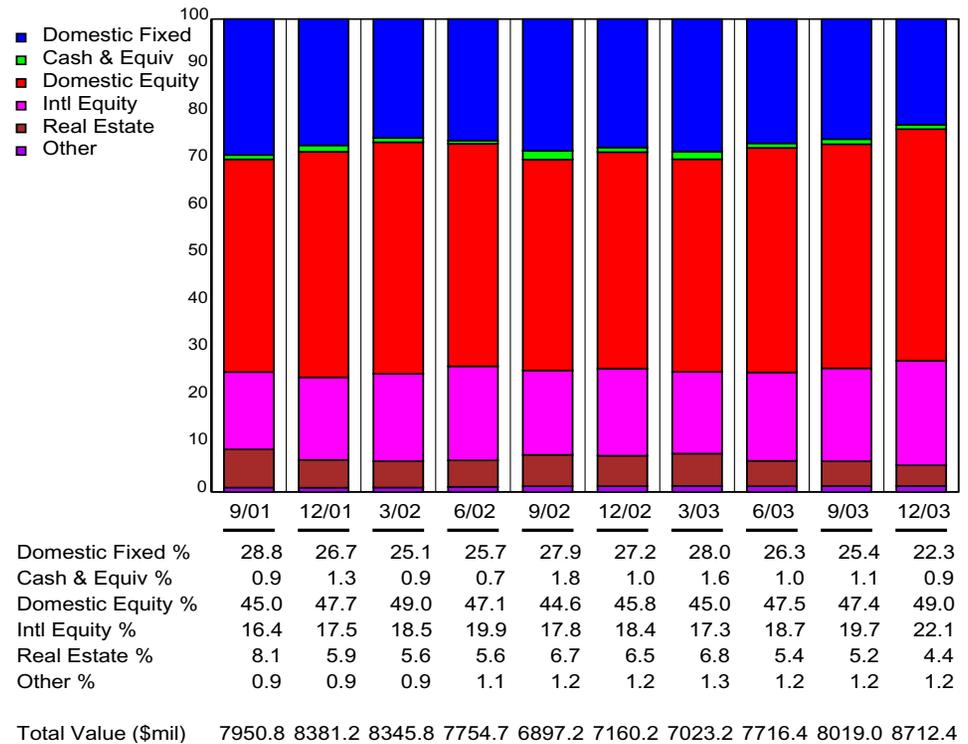
September 30, 2003 \$8,018,995,000



December 31, 2003 \$8,712,415,000



Asset Allocation
OP&F



This is the first page devoted to the analysis of the Ohio Police & Fire Pension Fund's asset allocation. The chart on the left displays the fund's asset allocation over the last two quarters of 2003. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

Police & Fire Pension Fund

Custom Benchmark Specification
Police and Fire
Quarter Ending 12/31/03

Custom Benchmark Specification
Police and Fire
Quarter Ending 12/31/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	Mar-94	Sep-97	41.50	Wilshire 5000
			39.50	LB Aggregate
			10.00	MSCI EAFE (Net)
			9.00	Wilshire RE Funds
	Dec-97	Dec-00	42.00	Wilshire 5000
			35.00	LB Aggregate
			10.00	MSCI EAFE (Net)
			8.00	Wilshire RE Funds
			5.00	MSCI Em Mkts Free (Gross)
	Mar-01	Jun-01	48.00	Wilshire 5000
			18.00	LB Aggregate
			17.00	MSCI EAFE (Net)
			8.00	Wilshire RE Funds
			5.00	First Boston High Yield
			3.00	MSCI Em Mkts Free (Gross)
	Sep-02	Mar-02	1.00	S&P + 5%
48.00			Wilshire 5000	
18.00			LB Aggregate	
17.00			MSCI EAFE (Net)	
8.00			Wilshire RE Funds	
5.00			First Boston High Yield	
3.00			MSCI Em Mkts Free (Gross)	
1.00	Wilshire 5000 + 5%			

Label	Quarter Start	Quarter End	Percent	Description		
Policy Index (cont.)	Jun-02	Dec-03	48.00	Wilshire 5000		
			18.00	LB Aggregate		
			17.00	MSCI EAFE (Net)		
			8.00	NCREIF		
			5.00	First Boston High Yield		
			3.00	MSCI Em Mkts Free (Gross)		
			1.00	Wilshire 5000 + 5%		

OP&F's custom policy index is listed above. The chart tracks the fund's change in asset allocation strategy over the past ten years. The current policy index is listed in the table on the right.

Police & Fire Pension Fund

Performance Overview OP&F

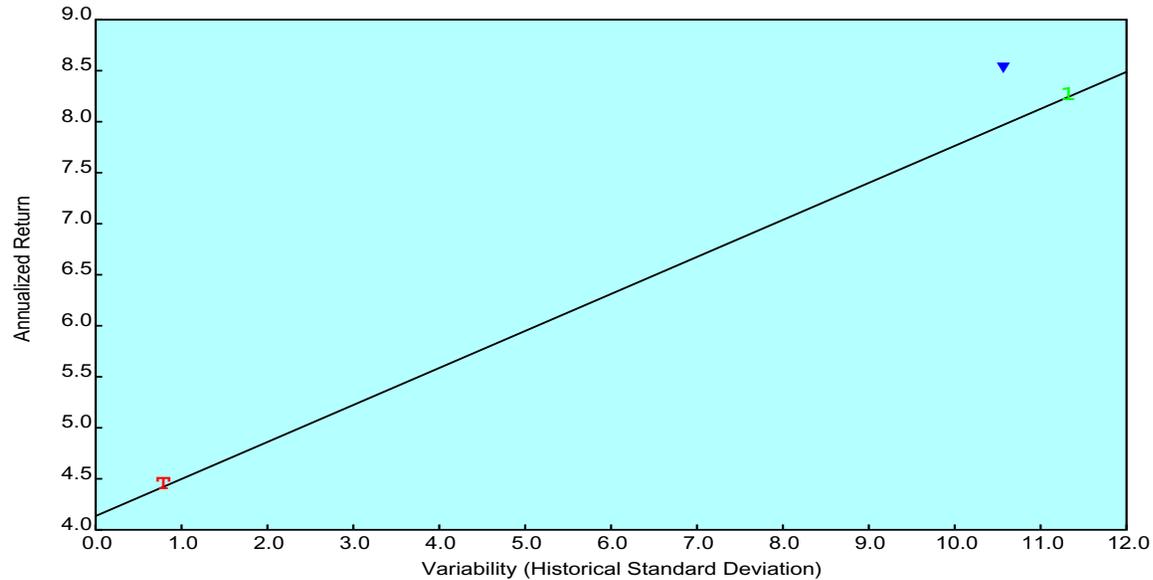
Returns for Periods Ending December 31, 2003

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	9.85	14.16	27.47	24.97	2.69	4.03	8.52
Policy Index Return	10.02	14.48	29.33	26.48	1.83	3.53	8.26
Domestic Equity Return	12.27	16.44	34.94	30.00	-1.20	1.90	10.25
Equity Segment Median Return	12.48	16.76	36.38	31.67	-2.67	2.14	11.09
Wilshire 5000	12.42	16.59	35.83	31.64	-2.47	0.43	10.59
Int'l Equity Return	16.72	27.62	51.53	39.60	-2.14	1.02	
Int'l Equity Segment Median Return	15.57	24.65	47.04	36.70	0.28	5.47	
MSCI EAFE (Net)	17.08	26.59	50.98	38.58	-2.91	-0.05	4.47
Domestic Fixed Return	1.76	2.69	7.12	10.08	9.20	8.06	7.52
Fixed Income Segment Median Return	0.37	0.41	3.02	4.47	7.66	6.66	7.06
LB Aggregate	0.32	0.17	2.68	4.11	7.57	6.62	6.95
Cash Return	0.26	0.51	0.84	1.14	2.44	3.59	
Real Estate Return	2.50	6.97	9.22	13.06	10.16	10.68	10.70
NCREIF	2.76	4.78	6.96	8.97	7.66	9.31	10.06
Other Return	-0.50	-1.50	-6.02	-13.16	-20.48	1.80	

The chart above is a performance overview for the total fund and all of its asset classes over the past ten years. Over the entire ten year period, the fund's total return has outperformed its policy index by 0.26% annually. The most recent twelve months show that OP&F has underperformed its policy index by 1.51%. The domestic equity return has underperformed the broad market Wilshire 5000 Index by 1.64% in the last twelve months.

Police & Fire Pension Fund

Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/03



	Annualized Return	Variability	Reward	Sharpe Ratio
▼ OP&F	8.52	10.63	4.08	0.38
┌ OP&F Policy Index	8.26	11.37	3.81	0.34
└ 91-Day Treasury Bill	4.44	0.84	0.00	0.00

The Capital Market Line in this graph is drawn by connecting the risk/return point of US T-bills and the risk/return point of OP&F's own policy index. The OP&F total fund return has outperformed the policy index on an absolute and risk-adjusted basis over the last ten years.

Police & Fire Pension Fund

Asset Allocation Actual vs. Benchmark June 30, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.78%	Wilshire 5000	48%	-1.22%
Fixed Income	18.98%	Lehman Aggregate	18%	0.98%
High Yield Bonds	6.92%	CSFB High Yield	5%	1.92%
Intl. Equity Comp.	18.41%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	-1.59%
Real Estate	6.80%	NCREIF	8%	-1.20%
Venture Capital	1.17%	Wilshire 5000 Lagged + 5%	1%	0.17%
Short Term	0.90%	3 Month T-Bill	0%	0.90%

December 31, 2003

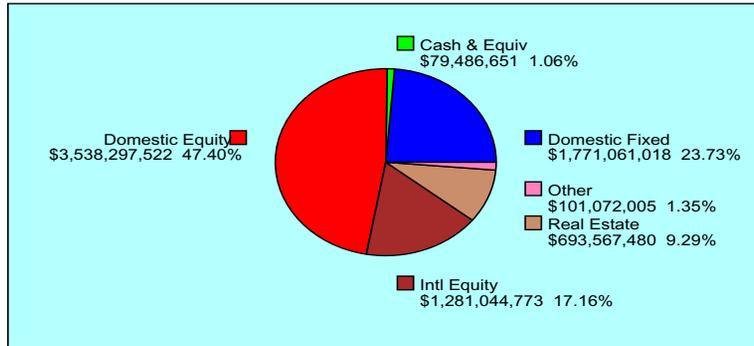
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	48.30%	Wilshire 5000	48%	0.30%
Fixed Income	15.36%	Lehman Aggregate	18%	-2.64%
High Yield Bonds	6.69%	CSFB High Yield	5%	1.69%
Intl. Equity Comp.	21.80%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	1.80%
Real Estate	5.60%	NCREIF	8%	-2.40%
Venture Capital	1.20%	Wilshire 5000 Lagged + 5%	1%	0.20%
Short Term	0.90%	3 Month T-Bill	0%	0.90%

As of the end of the fourth quarter, the OP&F fund has been overweight in high yield, international equity and cash, while being underweight in core fixed income and real estate.

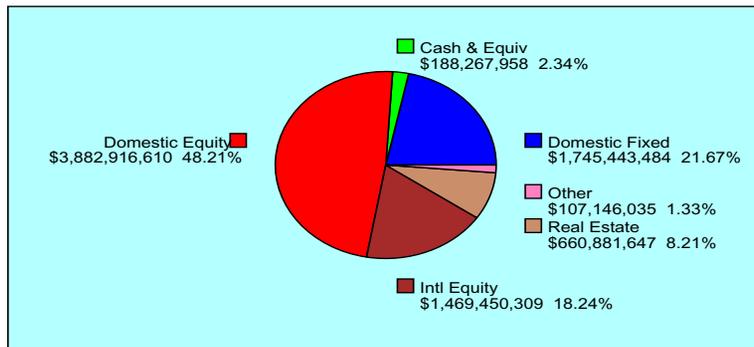
School Employees Retirement System

Asset Allocation
SERS

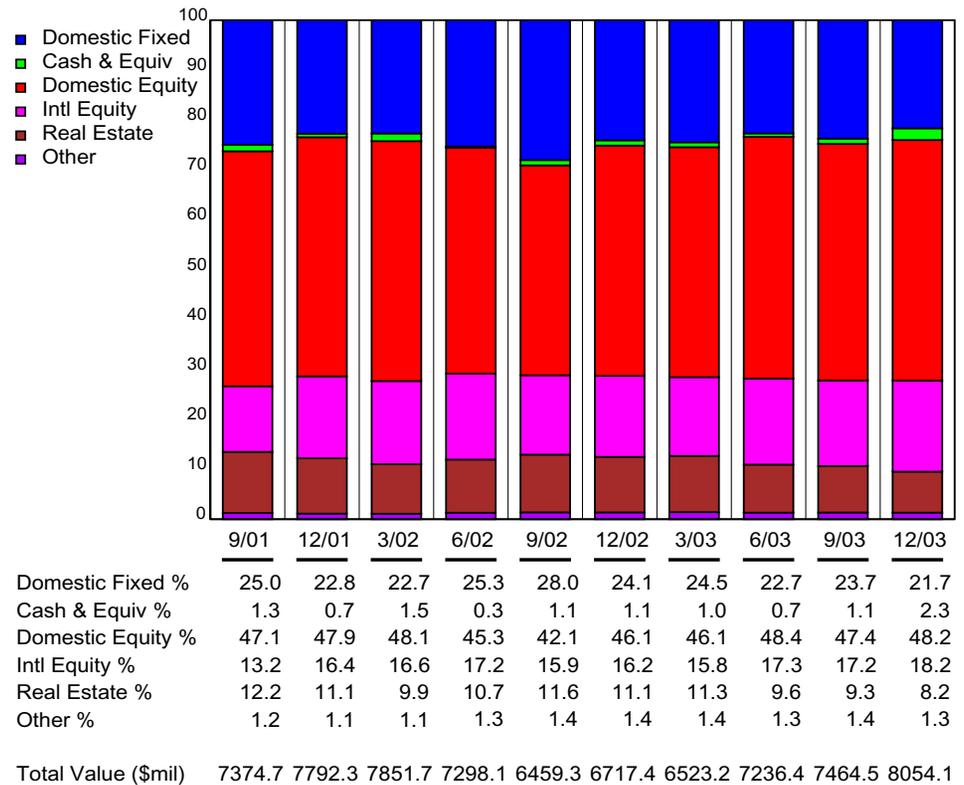
September 30, 2003 \$7,464,529,449



December 31, 2003 \$8,054,106,043



Asset Allocation
SERS



This page is devoted to the analysis of the Ohio School Employees Retirement System's asset allocation. The chart on the left displays the fund's asset allocation over the last two quarters of 2003. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

School Employees Retirement System

Custom Benchmark Specification
SERS
Quarter Ending 12/31/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	Mar-94	Sep-94	45.00	Standard & Poors 500
			28.00	ML Domestic Master Bond Idx
			10.00	MSCI EAFE (Net)
			10.00	NCREIF Classic Ppty Idx (1 Qtr arrear)
			5.00	Citigroup 30 Day T-Bill
			2.00	S&P 500 + 5%
	Dec-94	Dec-94	45.00	Standard & Poors 500
			28.00	ML Domestic Master Bond Idx
			10.00	MSCI EAFE 50% Hedged
			10.00	NCREIF Classic Ppty Idx (1 Qtr arrear)
			5.00	Citigroup 30 Day T-Bill
			2.00	S&P 500 + 5%
	Mar-95	Jun-95	45.00	Russell 3000
			28.00	ML Domestic Master Bond Idx
			10.00	MSCI EAFE 50% Hedged
			10.00	NCREIF Classic Ppty Idx (1 Qtr arrear)
			5.00	Citigroup 30 Day T-Bill
			2.00	S&P 500 + 5%
	Sep-95	Mar-97	45.00	Russell 3000
			28.00	LB Aggregate
10.00			MSCI EAFE 50% Hedged	
10.00			NCREIF Classic Ppty Idx (1 Qtr arrear)	
5.00			Citigroup 30 Day T-Bill	
2.00			S&P 500 + 5%	
Jun-97	Jun-97	45.00	Russell 3000	
		28.00	LB Aggregate	
		15.00	MSCI EAFE 50% Hedged	
		10.00	NCREIF Classic Ppty Idx (1 Qtr arrear)	
		1.00	Citigroup 30 Day T-Bill	
		1.00	S&P 500 + 5%	

Custom Benchmark Specification
SERS
Quarter Ending 12/31/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-97	Jun-99	45.00	Russell 3000
			28.00	LB Aggregate
			14.50	MSCI EAFE 50% Hedged
			0.50	MSCI Em Mkts Free
			10.00	NCREIF
			1.00	Citigroup 30 Day T-Bill
	Sep-99	Dec-99	45.00	Russell 3000
			28.00	LB Aggregate
			14.00	MSCI EAFE 50% Hedged
			1.00	MSCI Em Mkts Free
			10.00	NCREIF
			1.00	Citigroup 30 Day T-Bill
	Mar-00	Jun-01	48.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI EMF + EAFE 50% Hdg + Canada 50% Hdg
			10.00	NCREIF
			1.00	S&P 500 + 5%
			2.00	Citigroup 30 Day T-Bill
	Sep-01	Jun-02	47.00	Russell 3000
			23.00	LB Aggregate
16.00			MSCI EMF + EAFE 50% Hdg + Canada 50% Hdg	
10.00			NCREIF	
2.00			Private Equity (0% return arrears switch)	
2.00			Citigroup 30 Day T-Bill	
Sep-02	Dec-03	46.00	Russell 3000	
		23.00	LB Aggregate	
		16.00	MSCI EMF + EAFE 50% Hdg + Canada 50% Hdg	
		10.00	80% NCREIF (arrears), 20% NAREIT	
		3.00	S&P 500 + 3%	
		2.00	Citigroup 30 Day T-Bil	

SERS' custom policy index is listed above. The chart tracks the fund's change in asset allocation strategy over the past ten years. The current policy index is listed in the bottom box of the table on the right.

School Employees Retirement System

Performance Overview

SERS

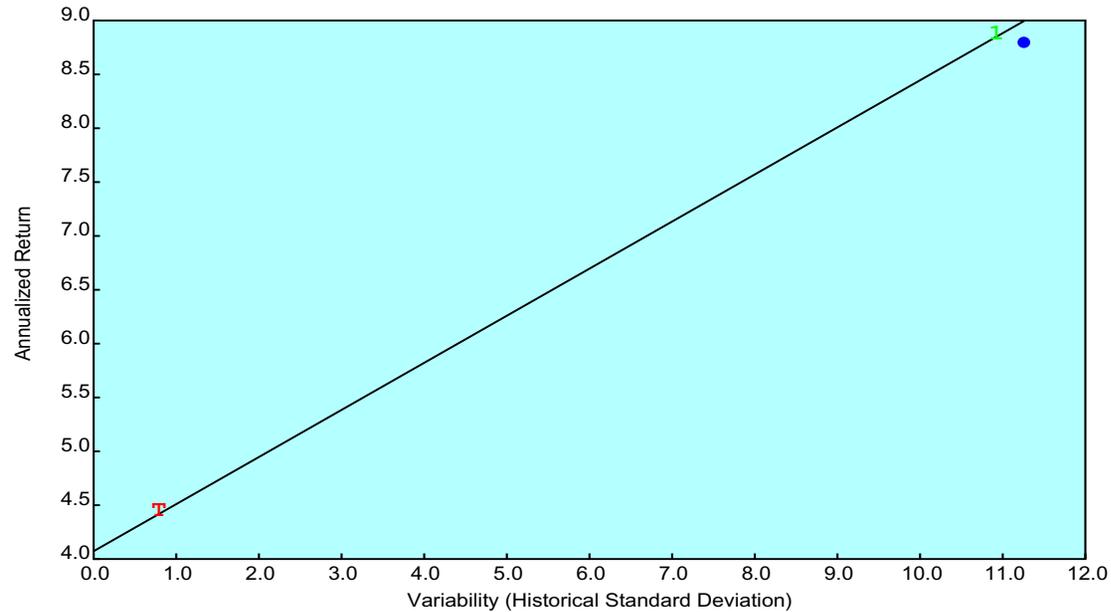
Returns for Periods Ending December 31, 2003

	<u>Last Quarter</u>	<u>Last 2 Quarters</u>	<u>Last 3 Quarters</u>	<u>Last Year</u>	<u>Last 3 Years</u>	<u>Last 5 Years</u>	<u>Since 1st Qtr 94</u>
Total Return	8.85	12.72	26.04	22.93	0.89	3.51	8.79
Policy Index Return	8.39	12.25	24.70	22.22	0.73	3.01	8.87
Domestic Equity Return	12.40	16.71	36.23	32.12	-3.08	0.65	10.66
Equity Segment Median Return	12.48	16.76	36.38	31.67	-2.67	2.14	11.09
Wilshire 5000	12.42	16.59	35.83	31.64	-2.47	0.43	10.59
Int'l Equity Return	13.59	21.80	44.46	33.02	-3.48	1.27	
Int'l Equity Segment Median Return	15.57	24.65	47.04	36.70	0.28	5.47	
MSCI EAFE (Net)	17.08	26.59	50.98	38.58	-2.91	-0.05	4.47
Domestic Fixed Return	0.85	0.90	3.84	5.45	8.47	7.30	7.14
Fixed Income Segment Median Return	0.37	0.41	3.02	4.47	7.66	6.66	7.06
LB Aggregate	0.32	0.17	2.68	4.11	7.57	6.62	6.95
Cash Return	0.23	0.45	0.73	1.01	2.85	4.26	4.79
Real Estate Return	4.14	8.05	12.57	12.21	5.70	8.43	9.66
NCREIF	2.76	4.78	6.96	8.97	7.66	9.31	10.06
Other Return	1.11	0.94	-1.73	-8.12	-20.46	2.52	15.69

The chart above is a performance overview for the total fund and all of its asset classes over the past ten years. Over the entire observed period, the fund's total return is trailing its policy index by 0.08% annually. The most recent twelve months show that SERS has outperformed its policy index by 0.71%.

School Employees Retirement System

Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/03



	Annualized Return	Variability	Reward	Sharpe Ratio
● SERS	8.79	11.32	4.34	0.38
1 SERS Policy Index	8.87	10.97	4.42	0.40
T 91-Day Treasury Bill	4.44	0.84	0.00	0.00

The Capital Market Line in this graph is drawn by connecting the risk/return point of US T-bills and the risk/return point of SERS' own policy index. The SERS total fund return has slightly underperformed the policy index on an absolute and risk-adjusted basis over the last ten years.

School Employees Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	47.40%	Russell 3000	46%	1.40%
Fixed Income	23.73%	LB Aggregate	23%	0.73%
Intl. Equity	17.16%	MSCI ACWI ex US	16%	1.16%
Real Estate	9.29%	NCREIF	10%	-0.71%
Venture Capital	1.35%	S&P 500 + 3%	3%	-1.65%
Short Term	1.06%	Salomon 30 Day CD	2%	-0.94%

December 31, 2003

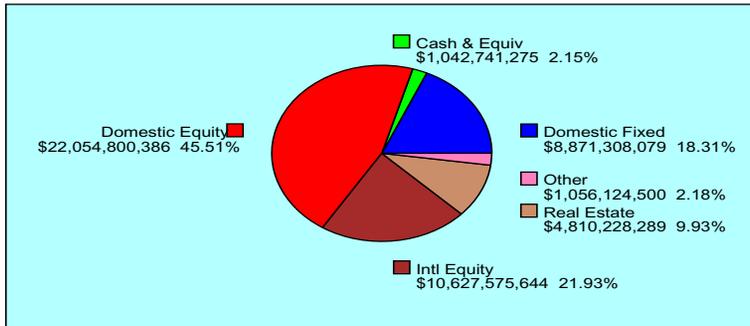
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	48.21%	Russell 3000	46%	2.21%
Fixed Income	21.67%	LB Aggregate	23%	-1.33%
Intl. Equity	18.24%	50% MSCI EMF + 50% EAFE 50% Hdg	16%	2.24%
Real Estate	8.21%	Custom RE (1 Qtr arrears)	10%	-1.79%
Venture Capital	1.33%	S&P 500 + 3%	3%	-1.67%
Short Term	2.34%	Salomon 30 Day CD	2%	0.34%

As of the end of the fourth quarter, the SERS fund has been overweight in domestic and international equity and underweight in fixed income and real estate.

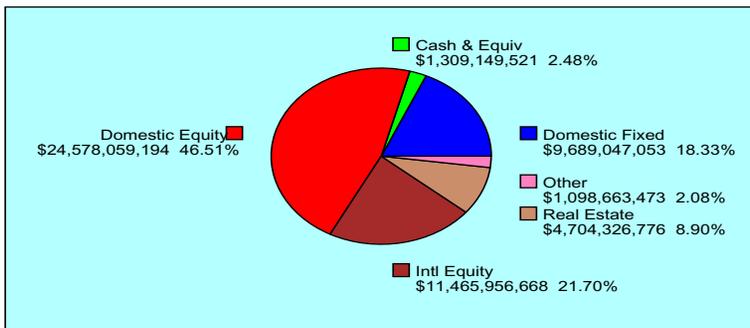
State Teachers Retirement System

Asset Allocation
STRS

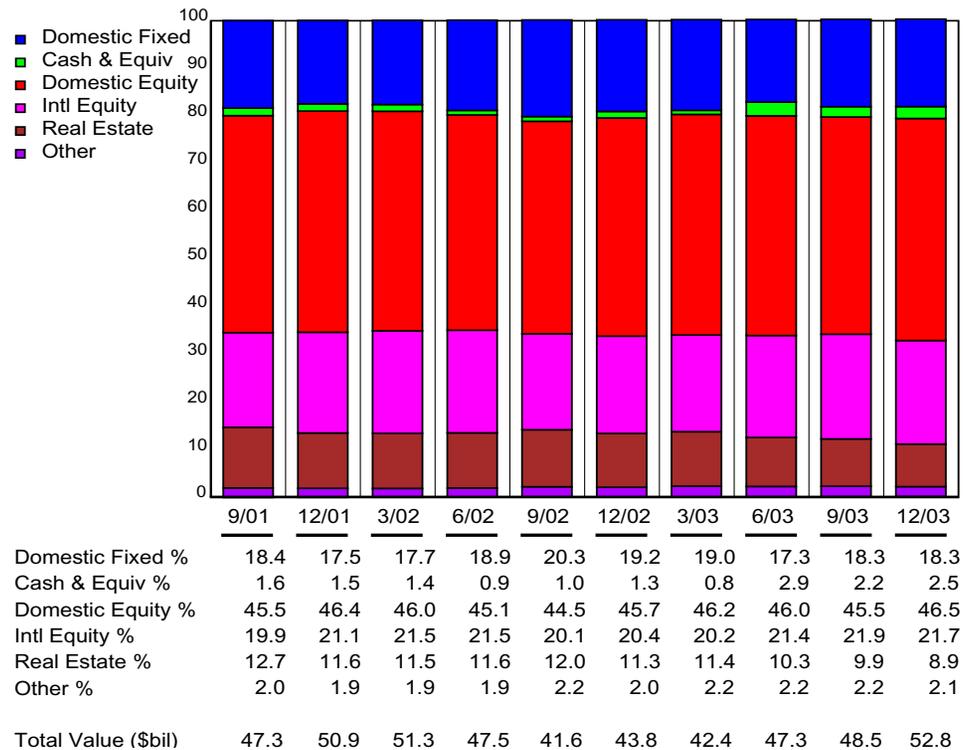
September 30, 2003 \$48,462,778,173



December 31, 2003 \$52,845,202,685



Asset Allocation
STRS



This page is devoted to the analysis of the Ohio State Teachers Retirement System's asset allocation. The chart on the left displays the fund's asset allocation over the last two quarters of 2003. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

State Teachers Retirement System

Custom Benchmark Specification

STRS

Quarter Ending 12/31/03

Custom Benchmark Specification

STRS

Quarter Ending 12/31/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	Mar-94	Dec-94	40.00	Standard & Poors 500
			45.00	Lehman Govt./Corp.
			9.00	STRS NCREIF Hybrid
			2.25	MSCI EAFE (Net)
			0.75	MSCI Em Mkts Free (Gross)
			3.00	91-Day Treasury Bill
	Mar-95	Dec-95	46.00	Standard & Poors 500
			35.00	LB Aggregate
			9.00	STRS NCREIF Hybrid
			6.00	MSCI EAFE (Net)
			2.00	MSCI Em Mkts Free (Gross)
	Mar-96	Dec-96	45.00	Standard & Poors 500
			35.00	LB Aggregate
			9.00	STRS NCREIF Hybrid
			6.75	MSCI EAFE (Net)
			2.25	MSCI Em Mkts Free (Gross)
	Mar-97	Jun-97	45.00	Standard & Poors 500
			34.00	LB Aggregate
			9.00	STRS NCREIF Hybrid
			6.00	MSCI EAFE (Net)
4.00			MSCI Em Mkts Free (Gross)	
		2.00	91-Day Treasury Bill	

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (Cont.)	Sep-97	Dec-97	45.00	Standard & Poors 500
			24.00	LB Aggregate
			12.00	MSCI EAFE (Net)
			9.00	STRS NCREIF Hybrid
			8.00	MSCI Em Mkts Free (Gross)
			2.00	91-Day Treasury Bill
	Mar-98	Sep-98	45.00	S&P 1500
			24.00	LB Aggregate
			12.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
			8.00	MSCI Em Mkts Free (Gross)
	Dec-98	Sep-00	45.00	S&P 1500
			24.00	LB Aggregate
			14.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
			6.00	MSCI Em Mkts Free (Gross)
	Dec-00	Jun-02	45.00	S&P 1500
			25.00	Lehman Universal
			15.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
5.00			MSCI Em Mkts Free (Gross)	
		1.00	91-Day Treasury Bill	

STRS' custom policy index is listed above and on page 40. The chart tracks the fund's change in asset allocation strategy over the past ten years.

State Teachers Retirement System

Custom Benchmark Specification

STRS

Quarter Ending 12/31/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-02	Mar-03	45.00	S&P 1500
			23.00	Lehman Universal
			15.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
			5.00	MSCI Em Mkts Free (Gross)
			2.00	Alt. Investment Actual Return
	1.00	91-Day Treasury Bill		
	Mar-03	Jun-03	45.00	S&P/Russell Hybrid*
			23.00	Lehman Universal
15.00			MSCI EAFE 50% Hedged	
9.00			STRS NCREIF Hybrid	
5.00			MSCI Em Mkts Free (Gross)	
2.00			Alt. Investment Actual Return	
1.00	91-Day Treasury Bill			
Jun-03	Dec-03	45.00	Russell 3000*	
		23.00	Lehman Universal	
		15.00	MSCI World ex US 50% Hedged	
		9.00	STRS NCREIF Hybrid	
		5.00	MSCI Em Mkts Free (Gross)	
		2.00	Alt. Investment Actual Return	
1.00	91-Day Treasury Bill			

*The S&P/Russell hybrid was in effect for domestic equity from April 2003 through July 2003

The page above is a continuation of the previous page. The current STRS policy index is listed above.

State Teachers Retirement System

Performance Overview

STRS

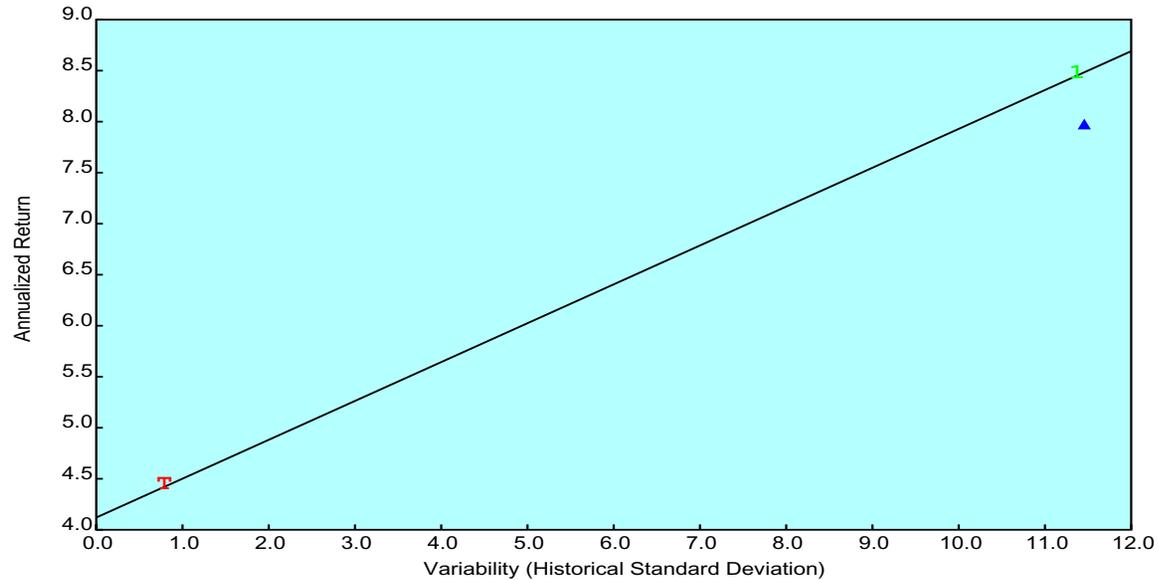
Returns for Periods Ending December 31, 2003

	<u>Last Quarter</u>	<u>Last 2 Quarters</u>	<u>Last 3 Quarters</u>	<u>Last Year</u>	<u>Last 3 Years</u>	<u>Last 5 Years</u>	<u>Since 1st Qtr 94</u>
Total Return	9.38	13.51	27.23	24.16	1.18	3.73	7.97
Policy Index Return	8.97	12.81	26.16	22.84	1.26	3.53	8.47
Domestic Equity Return	12.34	15.93	34.61	30.20	-3.34	-0.07	9.22
Equity Segment Median Return	12.48	16.76	36.38	31.67	-2.67	2.14	11.09
Wilshire 5000	12.42	16.59	35.83	31.64	-2.47	0.43	10.59
Int'l Equity Return	14.70	25.00	48.14	37.71	0.49	4.91	4.37
Int'l Equity Segment Median Return	15.57	24.65	47.04	36.70	0.28	5.47	
MSCI EAFE (Net)	17.08	26.59	50.98	38.58	-2.91	-0.05	4.47
Domestic Fixed Return	1.10	1.30	4.58	6.94	8.62	7.28	8.05
Fixed Income Segment Median Return	0.37	0.41	3.02	4.47	7.66	6.66	7.06
LB Aggregate	0.32	0.17	2.68	4.11	7.57	6.62	6.95
Cash Return	0.27	0.54	0.84	1.17	2.32	3.76	4.42
Real Estate Return	2.80	5.29	7.94	9.06	6.44	9.23	9.90
NCREIF	2.76	4.78	6.96	8.97	7.66	9.31	10.06
Other Return	4.93	7.01	10.07	9.14	-8.31	0.05	4.23

The exhibit above is a performance overview for the total fund and all of its asset classes over the past ten years. Over the entire observed period, the fund's total return is trailing its policy index by 0.50% annually. Domestic equity returns lagged the broad market as defined by the Wilshire 5000 by 1.37% annually. The most recent twelve months show that STRS has outperformed its policy index by 1.37%. Over the last twelve months domestic and international equity have trailed the broad market indexes for their respective asset classes, while fixed income and real estate have outperformed the respective broad market indexes.

State Teachers Retirement System

Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/03



	Annualized Return	Variability	Reward	Sharpe Ratio
▲ STRS	7.97	11.52	3.53	0.31
1 STRS Policy Index	8.47	11.42	4.02	0.35
T 91-Day Treasury Bill	4.44	0.84	0.00	0.00

The Capital Market Line in this graph is drawn by connecting the risk/return point of US T-bills and the risk/return point of STRS' own policy index. The STRS total fund return has underperformed the policy index on an absolute and risk-adjusted basis over the last ten years.

State Teachers Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.00%	S&P/Russell Hybrid	45%	1.00%
Fixed Income	17.30%	Lehman Universal	23%	-5.70%
Intl. Equity	21.40%	Intl. Hybrid Benchmark	20%	1.40%
Real Estate	10.30%	NCREIF Adjusted	9%	1.30%
Venture Capital	2.20%	Alt. Inv. Actual Return	2%	0.20%
Short Term	2.90%	3 Month T-Bill	1%	1.90%

December 31, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.51%	Russell 3000	45%	1.51%
Fixed Income	18.33%	Lehman Universal	23%	-4.67%
Intl. Equity	21.70%	Intl. Hybrid Benchmark	20%	1.70%
Real Estate	8.90%	NCREIF Adjusted	9%	-0.10%
Venture Capital	2.08%	Alt. Inv. Actual Return	2%	0.08%
Short Term	2.48%	3 Month T-Bill	1%	1.48%

As of the end of the fourth quarter, the STRS fund is underweight in fixed income and overweight in domestic equity, international equity, and cash.

Appendix: Ohio Bureau of Workers' Compensation

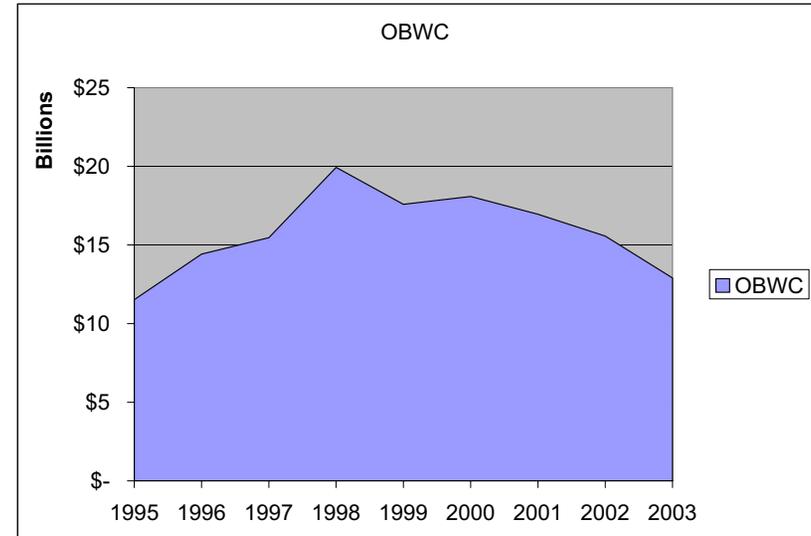
The following eight pages compare the investment results of the five Ohio pension funds along with the investment results of the Ohio Bureau of Workers' Compensation fund. The results of this comparison further emphasize the asset allocation decision and its effect on investment performance. Over the past five years, the decision to be overweight in domestic and international equity has been a costly one. The broad domestic and international equity market have been essentially flat over the five-year period while the broad fixed income market has posted gains of 6.62% as defined by the LB Aggregate Index. Each of these funds have at least 85% of their assets invested in these three major asset classes, so the asset allocation decision is material.

Over the five-year period, the BWC fund has outperformed all five of the Ohio pension funds. When the individual asset class results are observed, however, there is no indication that this outperformance is a result of exemplary investment results of the individual asset classes. Domestic equity results are below the median for all six funds over the five year-period. The BWC fixed income portfolio has performed well over the same measurement period, however that has been the case for each of the five retirement funds. International equity results are similar. BWC began investing internationally in the third quarter of 2001, and over the past three years, the international returns have placed in the 50th percentile.

The conclusion that can be drawn is that the objectives of the five pension funds are very different from the BWC fund and therefore the investment results are difficult to compare. Asset allocation has been the most important factor behind the performance of the BWC fund compared to the five pension funds. This asset allocation decision is a result in the differences in the obligations of each of these funds. Pension plans have longer investment horizons than do workers' compensation funds, which allows them to invest more aggressively. As a result, the BWC fund has performed well relative to the Ohio pension funds over the last five years which included three years of negative domestic equity markets, while the pension funds have posted more modest gains. In periods of strong equity markets, as was the case in 2003, the pension funds should perform better than the BWC fund.

Ohio Bureau of Workers' Compensation

OBWC Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
US Equity					
Actual	11.24%	15.22%	27.79%	-5.52%	0.49%
Benchmark	12.18%	15.15%	28.69%	-4.06%	-0.59%
Difference	-0.94%	0.07%	-0.90%	-1.46%	1.08%
Fixed Income					
Actual	0.96%	1.04%	6.12%	7.94%	7.06%
Benchmark	0.32%	0.17%	4.11%	7.57%	6.62%
Difference	0.64%	0.87%	2.01%	0.37%	0.44%
Intl. Equity					
Actual	15.80%	24.50%	35.76%	0.08%	N/A
Benchmark	17.08%	26.59%	38.58%	-2.91%	N/A
Difference	-1.28%	-2.09%	-2.82%	2.99%	N/A

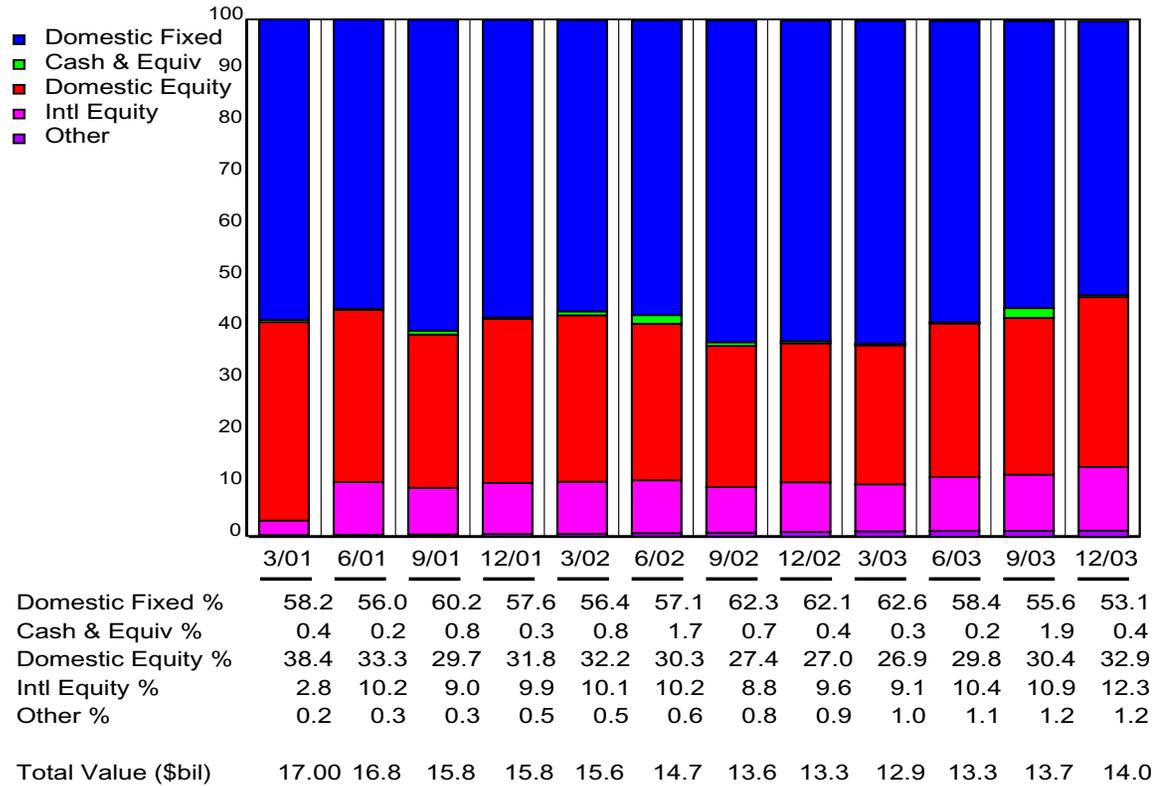


Asset Mix			
	Actual	Target	Difference
	December 31, 2003		
US Equity	32.9%	26.0%	6.9%
Intl. Equity	12.3%	11.0%	1.3%
Alternative Assets	1.2%	3.0%	-1.8%
<i>Total Equity</i>	46.5%	40.0%	6.5%
Fixed Income	53.1%	57.0%	-3.9%
Real Estate	0.0%	0.0%	0.0%
Short Term Investments	0.4%	3.0%	-2.6%
<i>Total Debt</i>	53.5%	60.0%	-6.5%
	100.0%	100.0%	0.0%

	Internal	External	Total
Active	0.0%	100.0%	100.0%
Passive	0.0%	0.0%	0.0%
Total	0.0%	100.0%	100.0%

Appendix: Ohio Bureau of Workers' Compensation

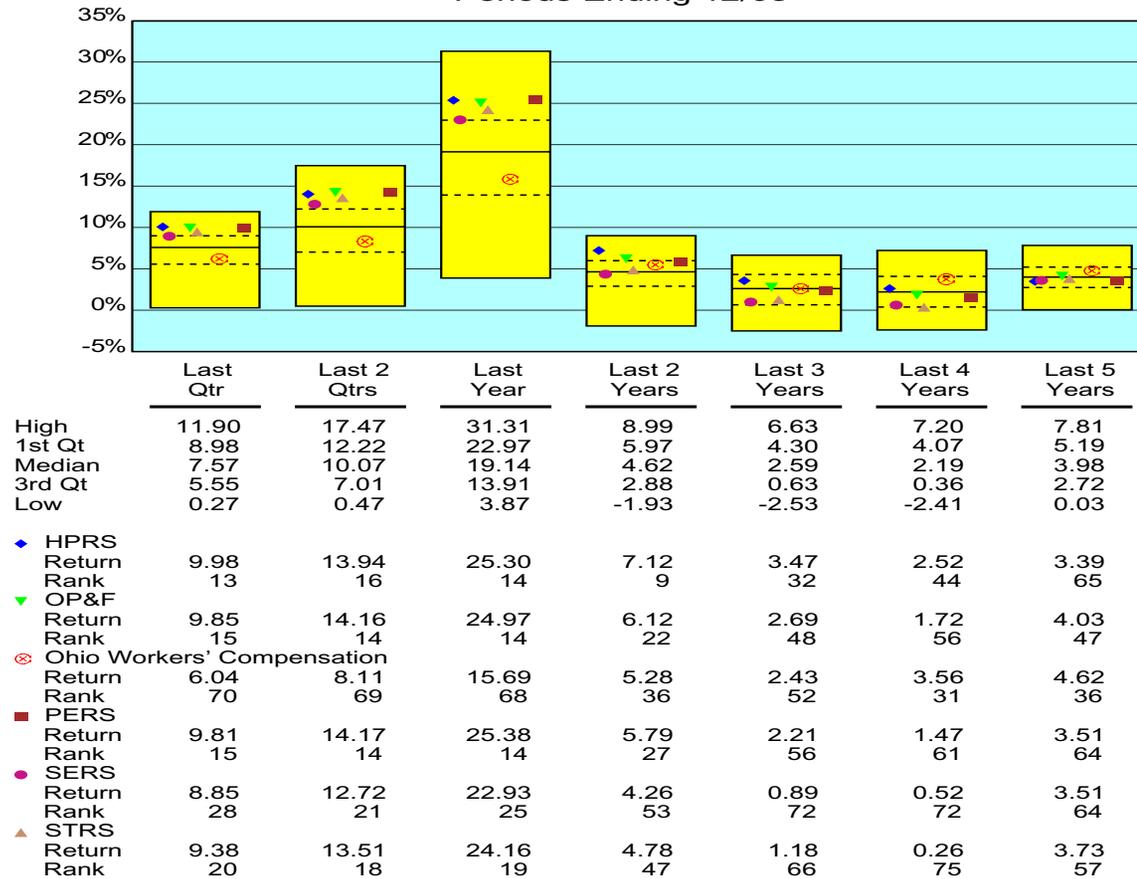
Asset Allocation Ohio Workers' Compensation



The chart above lists the asset allocation of the Ohio Bureau of Workers' Compensation fund for the last twelve quarters. Compared to the five Ohio retirement funds, the Bureau of Workers' Compensation fund has maintained a much higher fixed income mandate, with allocations typically between fifty and sixty percent. Over the same period, the five Ohio retirement funds have targeted their fixed income allocations at 23% to 25%.

Appendix: Ohio Bureau of Workers' Compensation

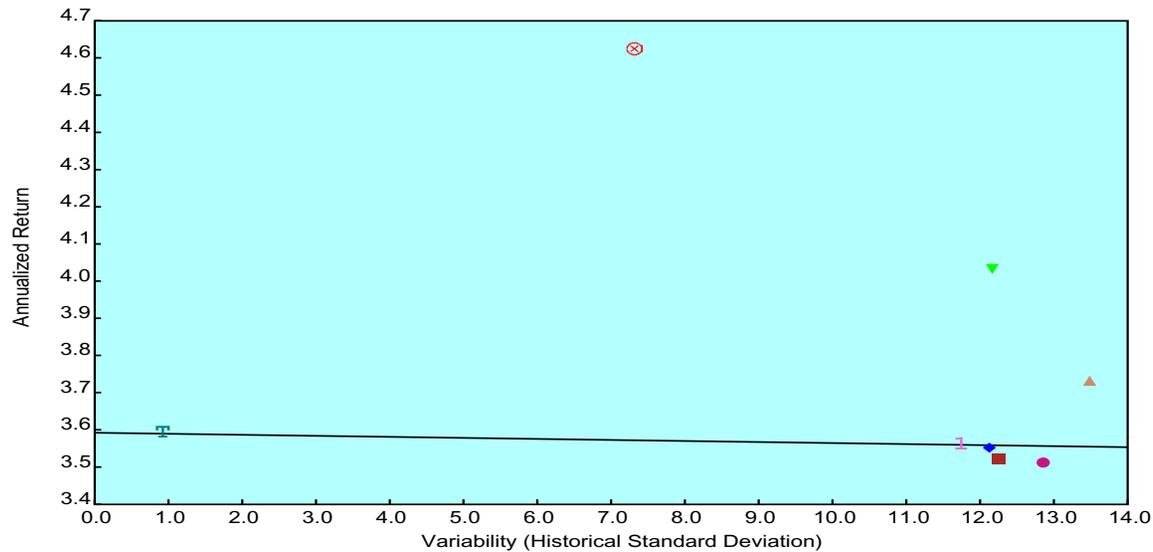
Cumulative Performance Comparison
Total Returns of Total Fund Portfolios
Periods Ending 12/03



The exhibit above compares the total performance of the five Ohio pension funds plus the Ohio Workers' Compensation fund. The effects of asset allocation are made very clear on this page. For the five-year period, the higher allocation to fixed income has protected the BWC fund from the down equity markets in 2000, 2001 and 2002 and the fund has outperformed all five of the Ohio retirement funds. Over the last twelve months, the opposite is true. The higher equity allocations of the five retirement funds have allowed them to capture a larger portion of the strong gains of the domestic and international equity markets in 2003 and as such have outperformed the BWC fund by a significant margin.

Appendix: Ohio Bureau of Workers' Compensation

Quarterly Total Return Market Line Analysis Periods from 12/98 to 12/03

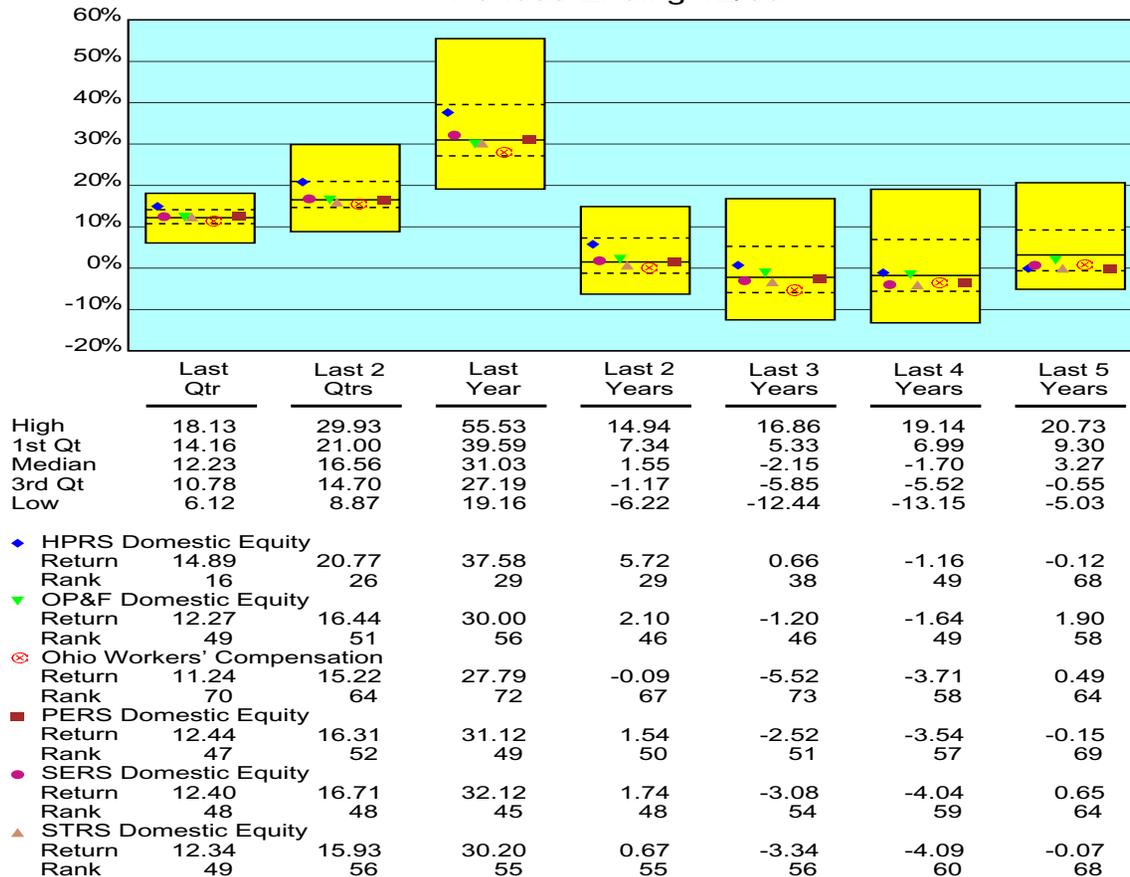


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	3.55	12.20	-0.04	-0.00
▼ OP&F	4.03	12.24	0.45	0.04
⊗ Ohio Workers' Compensation	4.62	7.36	1.03	0.14
■ PERS	3.52	12.33	-0.07	-0.01
● SERS	3.51	12.93	-0.08	-0.01
▲ STRS	3.73	13.56	0.14	0.01
■ 60/40 Index	3.56	11.80	-0.03	-0.00
T 91-Day Treasury Bill	3.59	0.98	0.00	0.00

The capital market line above compares the risk-adjusted returns of the six Ohio funds over the last five years. On an annualized basis, the BWC fund has produced the highest return and the lowest variability over the last five years.

Appendix: Ohio Bureau of Workers' Compensation

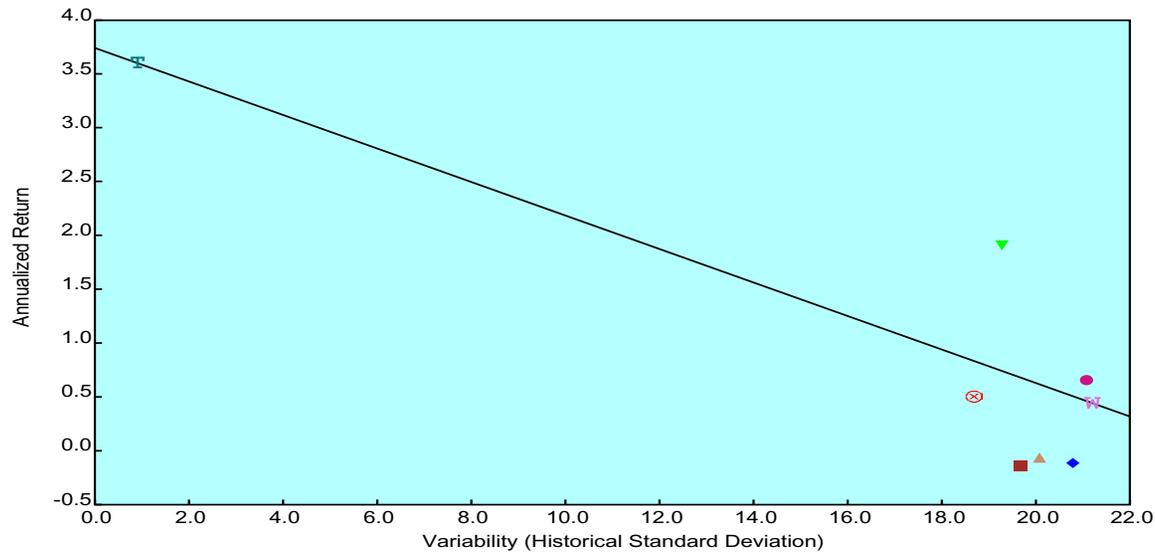
Cumulative Performance Comparison
Total Returns of Equity Portfolios
Periods Ending 12/03



The chart above compares the domestic equity performance of all six of the Ohio funds. Over the last five years, all six funds have third quartile performance. More recently, the equity results of the five retirement systems have outperformed the equity results of the BWC fund.

Appendix: Ohio Bureau of Workers' Compensation

Quarterly Total Return Market Line Analysis Periods from 12/98 to 12/03

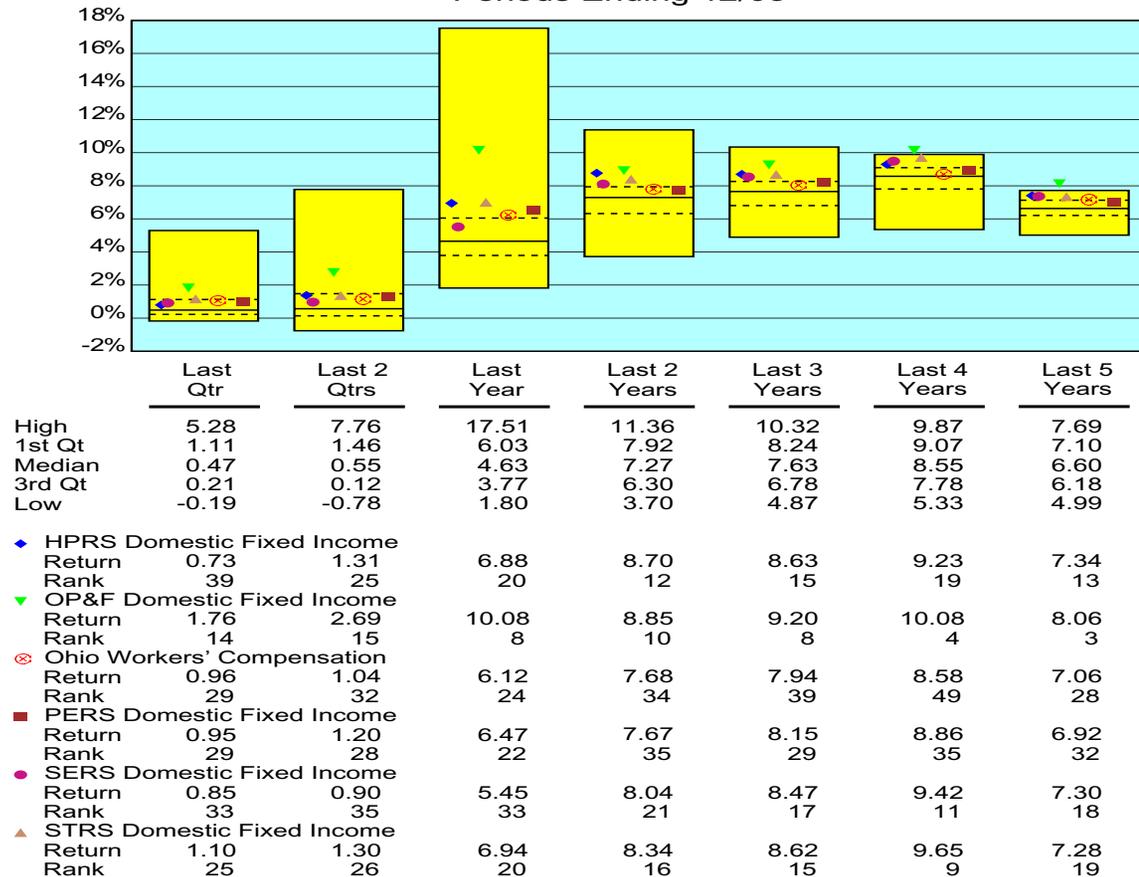


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Equity	-0.12	20.90	-3.71	-0.18
▼ OP&F Domestic Equity	1.90	19.39	-1.68	-0.09
⊗ Ohio Workers' Compensation	0.49	18.75	-3.10	-0.17
■ PERS Domestic Equity	-0.15	19.79	-3.74	-0.19
● SERS Domestic Equity	0.65	21.19	-2.94	-0.14
▲ STRS Domestic Equity	-0.07	20.19	-3.66	-0.18
W Wilshire 5000	0.43	21.29	-3.16	-0.15
T 91-Day Treasury Bill	3.59	0.98	0.00	0.00

The chart above displays the domestic equity results of the six Ohio funds in risk/return space. Over the last five years, the domestic equity results of all six funds have underperformed T-Bills resulting in the downward-sloping capital market line.

Appendix: Ohio Bureau of Workers' Compensation

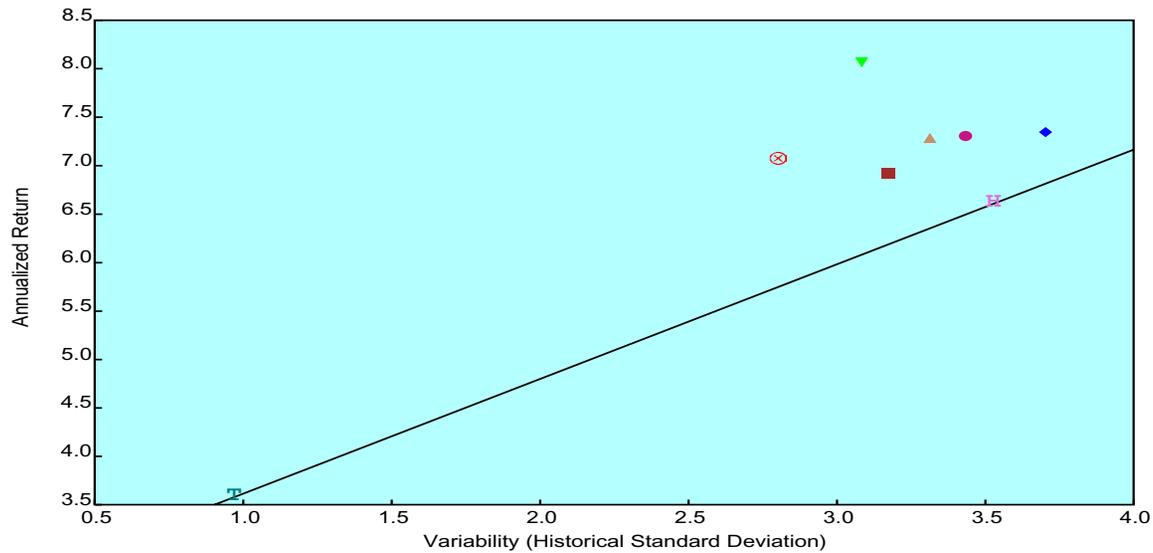
Cumulative Performance Comparison
Total Returns of Fixed Income Portfolios
Periods Ending 12/03



The fixed income results of the six Ohio funds are displayed above. Over the last five years, all funds have performed well, placing in the first quartile or high in the second quartile. These results hold true in the near-term as well. Over the last twelve months, only SERS did not place in the top quartile.

Appendix: Ohio Bureau of Workers' Compensation

Quarterly Total Return Market Line Analysis Periods from 12/98 to 12/03

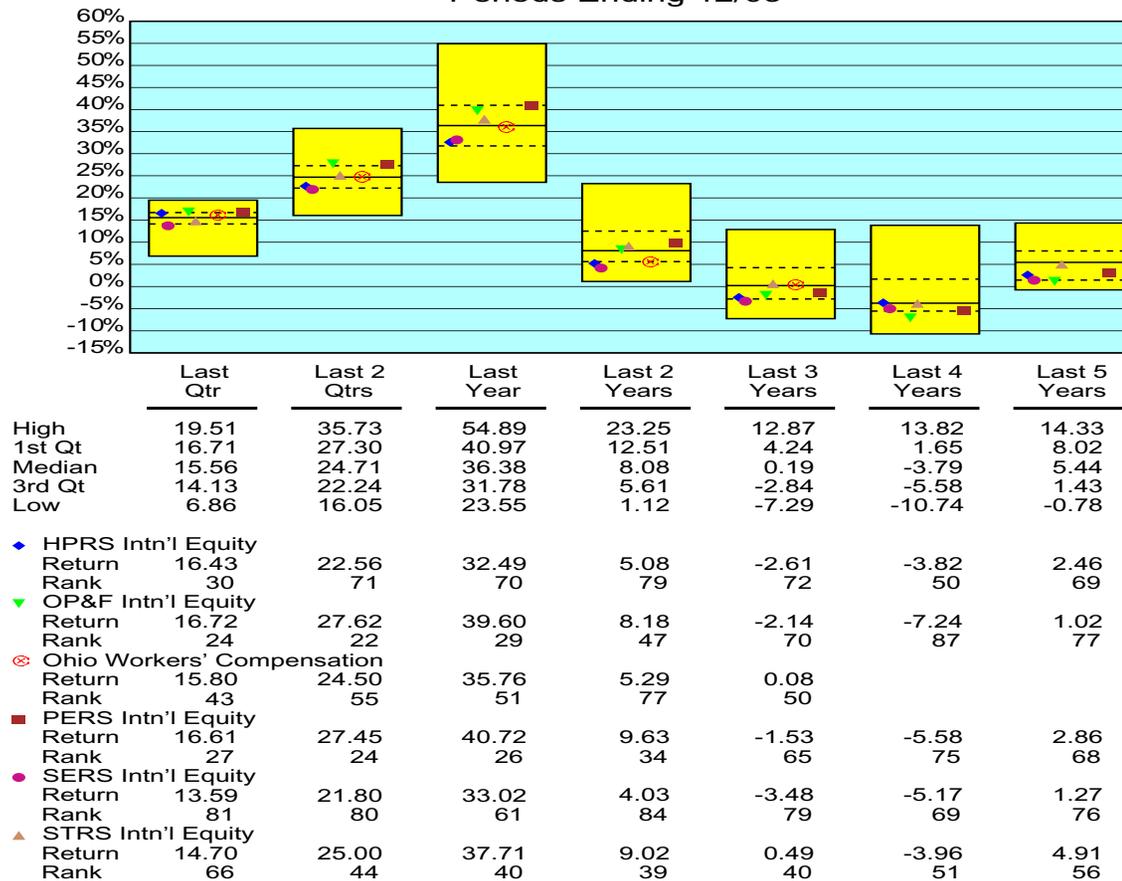


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Fixed Income	7.34	3.72	3.75	1.01
▼ OP&F Domestic Fixed Income	8.06	3.10	4.47	1.44
⊗ Ohio Workers' Compensation	7.06	2.81	3.48	1.24
■ PERS Domestic Fixed Income	6.92	3.19	3.33	1.05
● SERS Domestic Fixed Income	7.30	3.45	3.71	1.08
▲ STRS Domestic Fixed Income	7.28	3.33	3.69	1.11
⊠ LB Aggregate	6.62	3.54	3.03	0.86
■ 91-Day Treasury Bill	3.59	0.98	0.00	0.00

The chart above displays the fixed income results of the six Ohio funds in risk/return space. All six of the funds had “above the line” fixed income results, with risk-adjusted returns exceeding the broad market LB Aggregate Index.

Appendix: Ohio Bureau of Workers' Compensation

Cumulative Performance Comparison
Total Returns of International Equity Portfolios
Periods Ending 12/03



The chart above displays the international equity results of the six Ohio funds. The BWC fund does not have a full five-year return history for their international equity segment, however the international returns have displayed median performance for the one-year and three-year periods.

Appendix: Estimated Effect of Investment Performance on Assets

Pursuant to legislative request, this analysis was conducted in order to estimate lost earnings for each of the five Ohio pension funds over the past five years as a result of below-average investment performance. In order to allow for a relevant comparison of investment performance, a custom universe of large public funds with similar asset allocations to the five Ohio funds was created. Eight organizations in addition to the five Ohio funds contributed the investment data that formed the universes that were used for comparison. These organizations were identified in the January 26th issue of Pension & Investment as large public funds (over \$5 Billion) with total equity allocations above 65%. Investment returns for the past six years were gathered, the universe created, and the percentile breaks in the universe were identified. The percentile breaks, the 25th percentile and the median in particular, were then used in conjunction with each of the systems' Comprehensive Annual Financial Reports to create a growth-of-assets chart. HPRS, PERS, and OP&F operate on a January 1 plan year, while SERS and STRS operate on a July 1 plan year. The most recent financial reports for the January 1 plans were for the year ending December 31, 2002 and the most recent financials for the July 1 plans were for the year ending June 30, 2003. Each of the fund's performance was ranked against the created universe for annualized and annual periods. The assets of the funds were also grown at different rates of return to estimate what the market value of each pension fund would be at the end of a five-year period given actual, 25th percentile, median and 60% equity/40% fixed income passive management performance.

An addendum to this report will be created as soon as 2003 financials become available for HPRS, PERS, and OP&F in order to include the positive results of investment returns in 2003. The passive management analysis will also be updated. The passive management returns will represent the return for each system's policy benchmark. This would provide actual passive performance as opposed to the 60% equity/40% fixed income indexing that was done for this report. This method of indexing is not representative of the systems' asset allocation and would require them to change their current asset allocation and lower their long-term actuarial rate of return on assets.

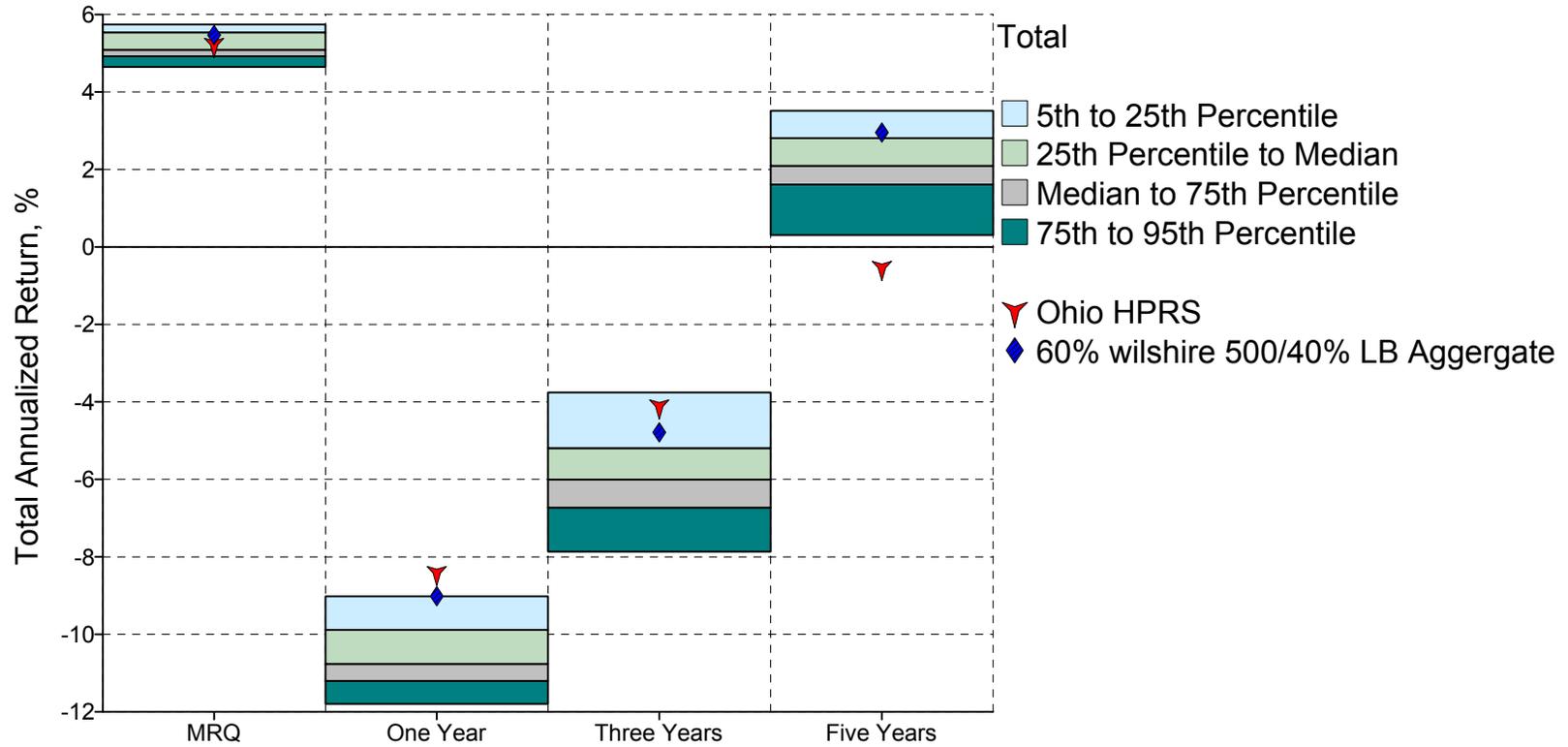
The graph for each system charts the growth of assets under four scenarios: actual performance, 60% equity/40% fixed income passively managed performance, 25th percentile performance, and median performance. The actual performance and passive performance numbers were arrived at by using twelve-month returns for each of the years in the measurement period, which results in a growth-of-assets line that jumps from point to point. The 25th percentile and median performance is calculated by establishing an excess return between actual results and the results of the 25th percentile and median over the five-year annualized period and applying the excess return to the reported annual results of each system. The growth-of-assets lines created by this method results in straight-line growth. This same method was used for each of the five funds and the results will be summarized in the following pages. We would like to stress that these results are estimates and though the results will not exactly reflect the impact of higher investment returns on the assets of the fund, the results can be used to gauge the improved financial position that higher investment returns could have had on the funds.

Highway Patrol Retirement System

The first two pages plot the HPRS returns against the custom universe that was created for this study. Over the five-year period, HPRS has demonstrated bottom quartile performance. For the most recent quarter, one-year, and three-year periods, the results have improved and the fund has placed above the median for those periods. Page B5 estimates the growth of assets given the corresponding rates of return. At the beginning of 1998, the market value of the HPRS fund was \$588,684,363. Applying different investment returns could result in the following findings. At the end of the five-year period, the market value of the fund is \$532,287,857 using the reported calendar year returns to grow the assets. Had HPRS achieved 25th percentile results, the ending value of assets could have been \$632,759,849, a difference of \$100,471,991 or 18.88% of assets. Had the fund experienced median results, assets could have grown to \$610,328,050, a difference of over \$78,040,193 or 14.66% of assets. If the fund had been indexed in a 60% equity/40% fixed income split, the assets of the fund could have grown to \$648,779,303. The difference between this and the ending value given the actual results is \$116,491,446 or 21.89% of assets. Financial statements were not yet available for 2003. An addendum to this report will be created to include the investment results of 2003 when the financial reports become available.

Performance to date

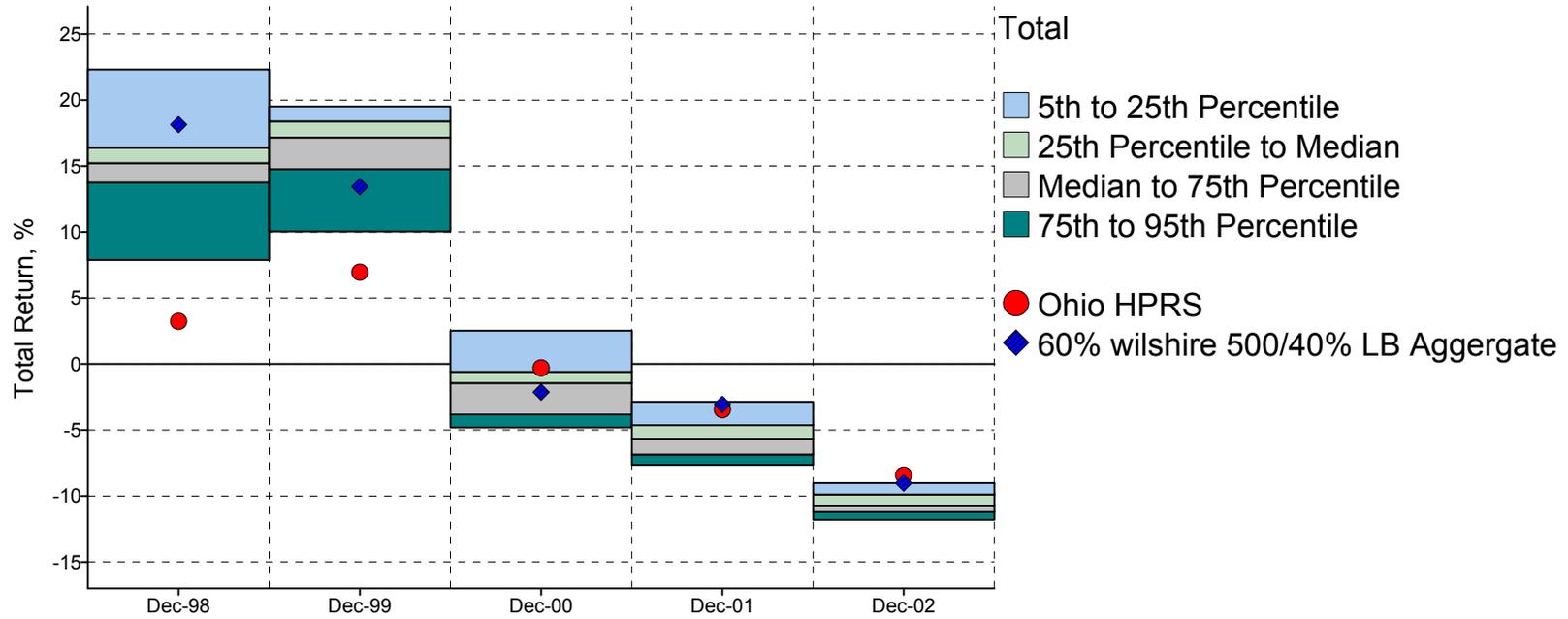
Mar-98 - Dec-02



	Ohio HPRS	60% Wilshire 500/40% LB Aggregate	Universe				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Last Quarter	5.22	5.47	5.74	5.54	5.09	4.92	4.65
One Year	-8.42	-9.02	-9.02	-9.89	-10.77	-11.20	-11.80
Three Years	-4.12	-4.79	-3.76	-5.20	-6.01	-6.73	-7.87
Five Years	-0.54	2.95	3.52	2.81	2.10	1.61	0.30

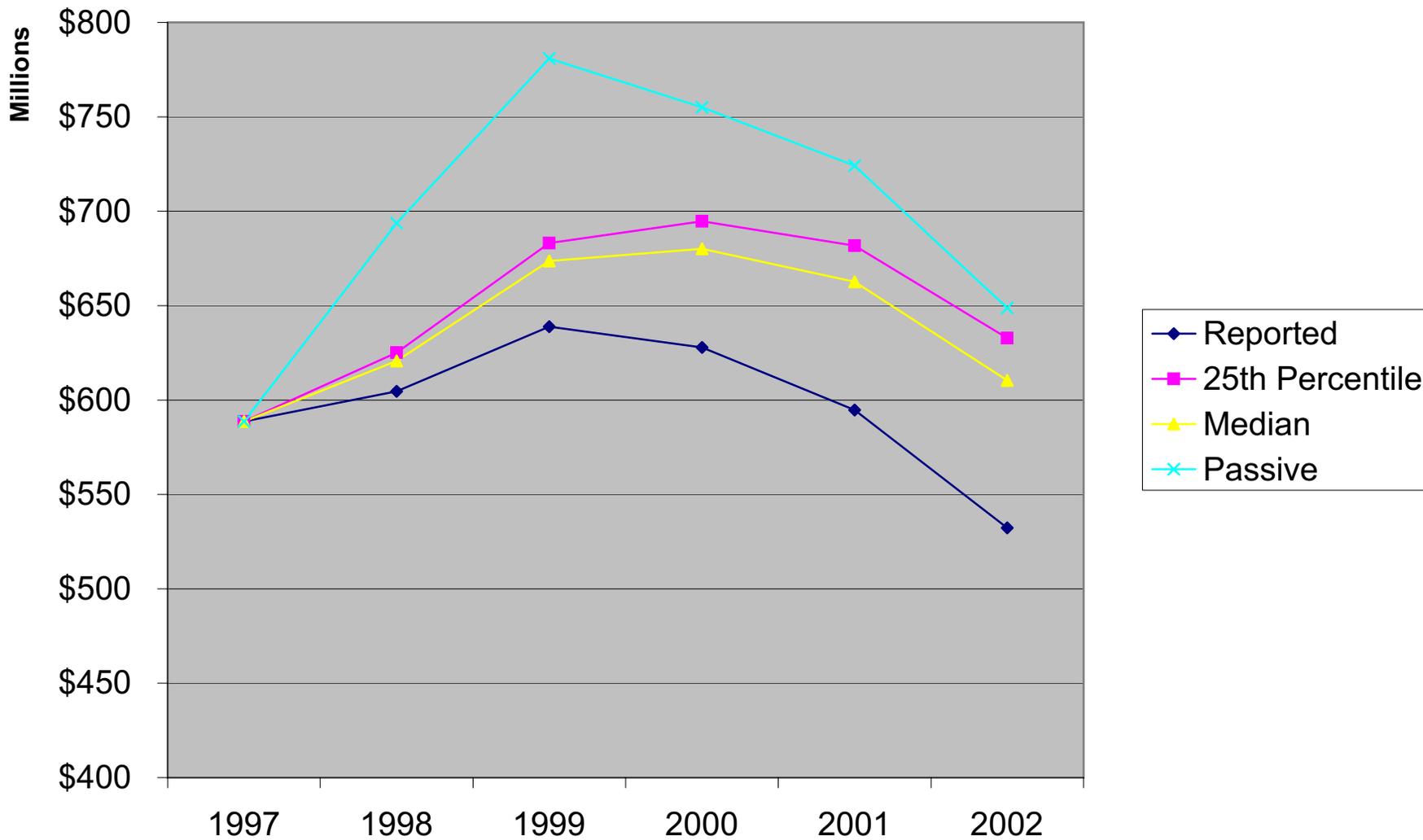
4 Quarter Performance

Mar-98 - Dec-02



	Ohio HPRS	60% wilshire 500/40% LB Aggragate	Universe				
	4 Quarter Return, %	4 Quarter Return, %	4 Quarter Return, %				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Mar-98 - Dec-98	3.23	18.13	22.31	16.39	15.22	13.75	7.88
Mar-99 - Dec-99	6.96	13.43	19.52	18.38	17.15	14.77	10.04
Mar-00 - Dec-00	-0.29	-2.13	2.52	-0.59	-1.44	-3.83	-4.82
Mar-01 - Dec-01	-3.46	-3.06	-2.86	-4.64	-5.66	-6.86	-7.65
Mar-02 - Dec-02	-8.42	-9.02	-9.02	-9.89	-10.77	-11.20	-11.80

Ohio Highway Patrol Retirement System

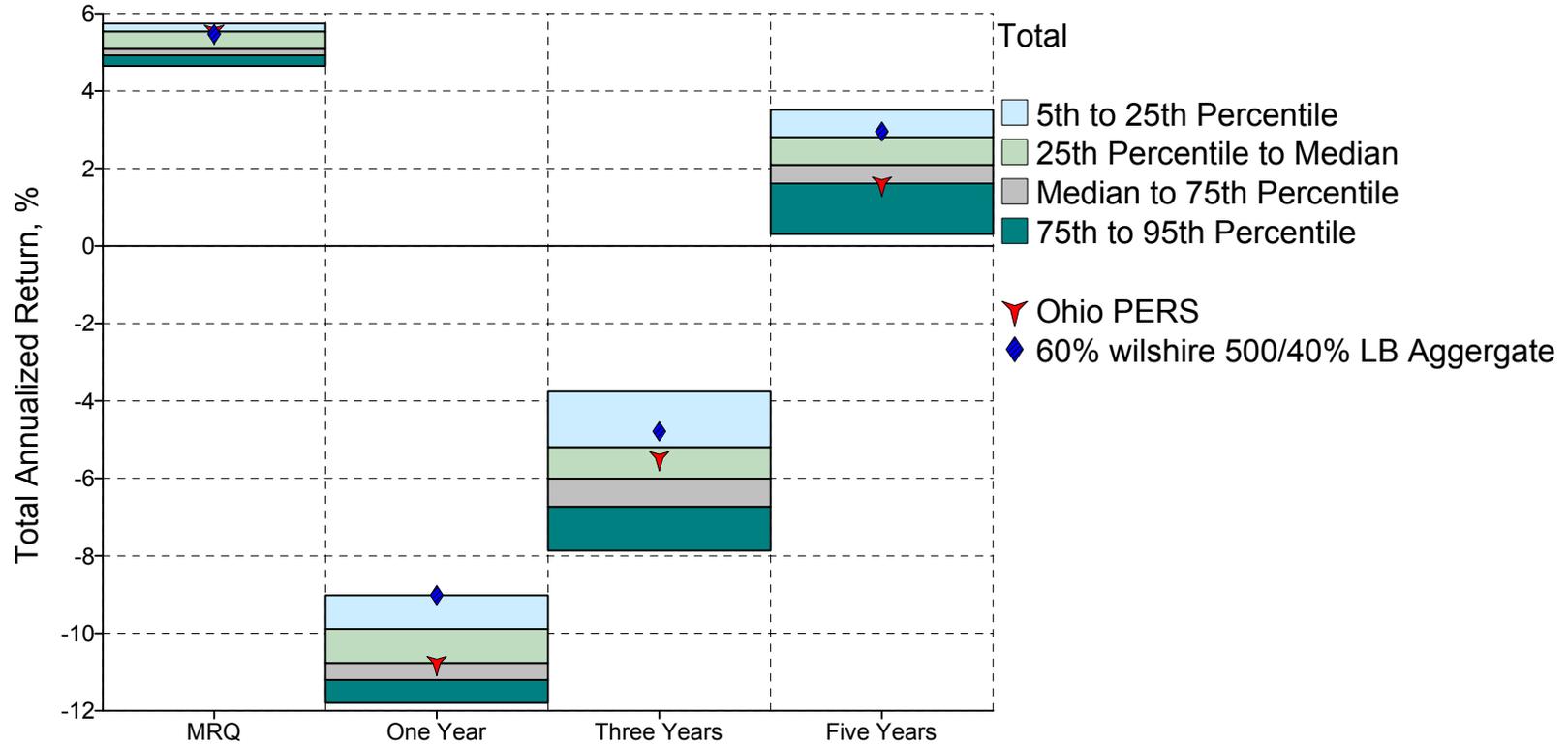


Public Employees Retirement System

Pages B7 and B8 plot the PERS performance against the custom universe. Five-year performance has been below the median, however the performance for the most recent quarter, one-year, and three-year periods has been at or above the median fund. Page B9 is a growth of assets page. Assets are grown using actual, 25th percentile, median and passive returns. The beginning market value for the PERS fund was 45,333,231,319 on January 1, 1998. Over the next five years, assets increased to \$48,253,063,514. Performance at the 25th percentile of our custom universe over the five-year period would have allowed the assets of the fund to grow to \$51,212,977,396, which is a difference of \$2,959,913,882 or 6.13% of assets. Median performance would have allowed the assets to grow to \$49,444,852,789, a difference of \$1,191,789,275 or 2.47% of assets. Had the fund invested in a 60% equity/40% fixed income passive strategy assets could have grown to \$52,195,939,868, a difference of \$3,942,876,354 or 8.17% of assets. Financial statements were not yet available for 2003. An addendum to this report will be created to include the investment results of 2003 when the financial reports become available.

Performance to date

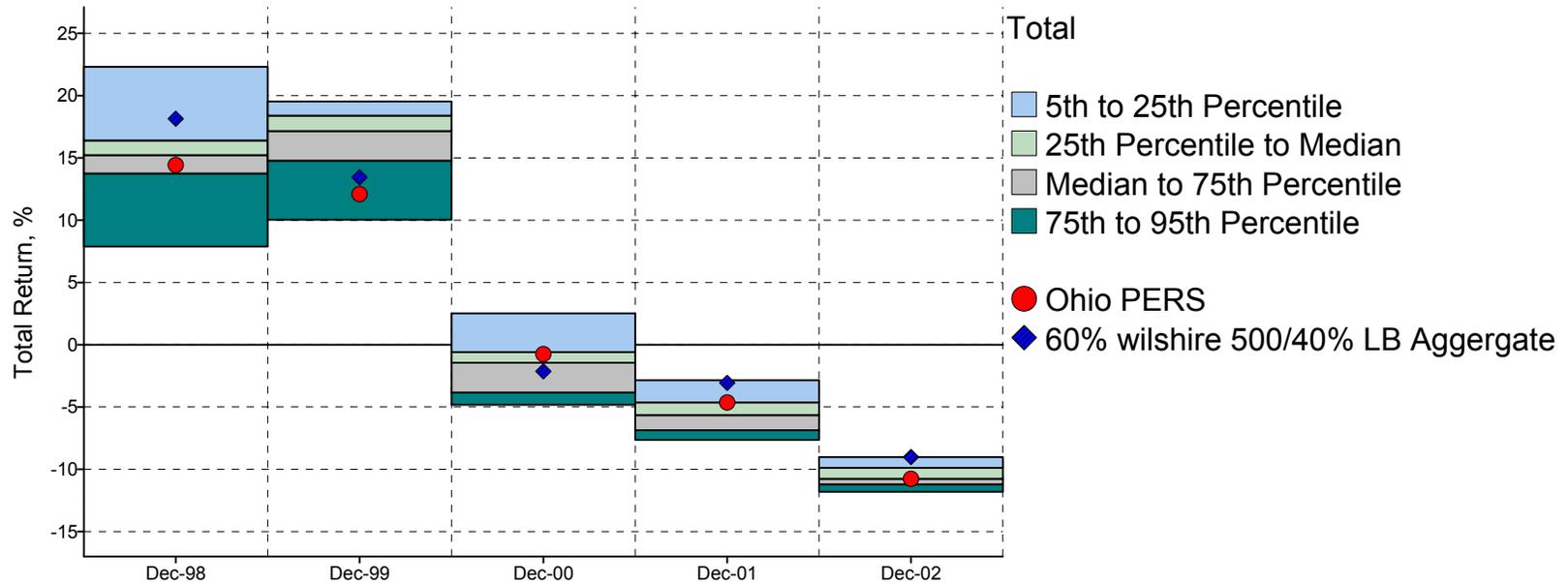
Mar-98 - Dec-02



	Ohio PERS	60% wilshire 500/40% LB Aggergate	Universe				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Last Quarter	5.53	5.47	5.74	5.54	5.09	4.92	4.65
One Year	-10.77	-9.02	-9.02	-9.89	-10.77	-11.20	-11.80
Three Years	-5.48	-4.79	-3.76	-5.20	-6.01	-6.73	-7.87
Five Years	1.61	2.95	3.52	2.81	2.10	1.61	0.30

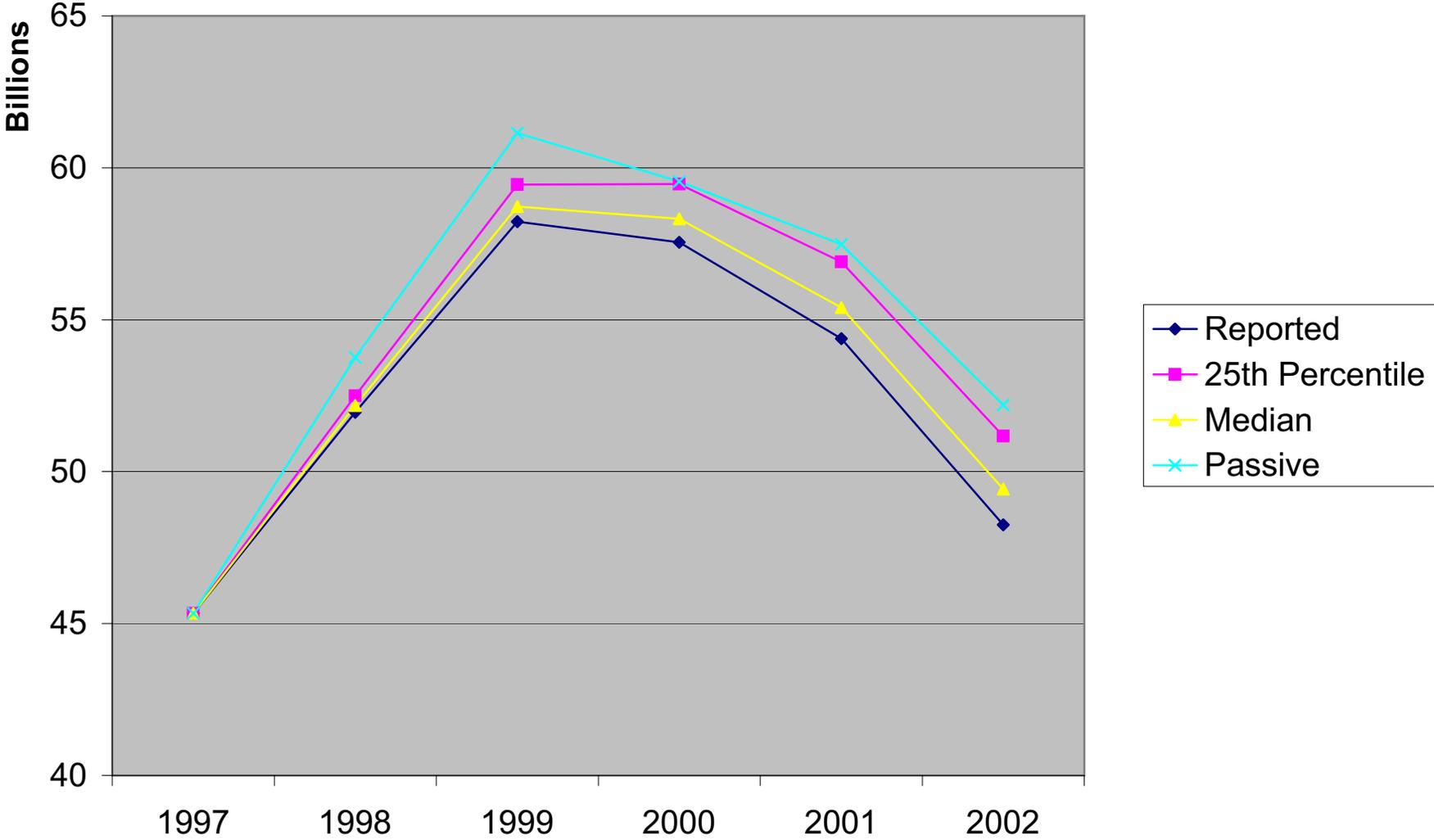
4 Quarter Performance

Mar-98 - Dec-02



	Ohio PERS	60% wilshire 500/40% LB Aggergate	Universe				
	4 Quarter Return, %		4 Quarter Return, %				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Mar-98 - Dec-98	14.43	18.13	22.31	16.39	15.22	13.75	7.88
Mar-99 - Dec-99	12.09	13.43	19.52	18.38	17.15	14.77	10.04
Mar-00 - Dec-00	-0.75	-2.13	2.52	-0.59	-1.44	-3.83	-4.82
Mar-01 - Dec-01	-4.64	-3.06	-2.86	-4.64	-5.66	-6.86	-7.65
Mar-02 - Dec-02	-10.77	-9.02	-9.02	-9.89	-10.77	-11.20	-11.80

Ohio Public Employees Retirement System

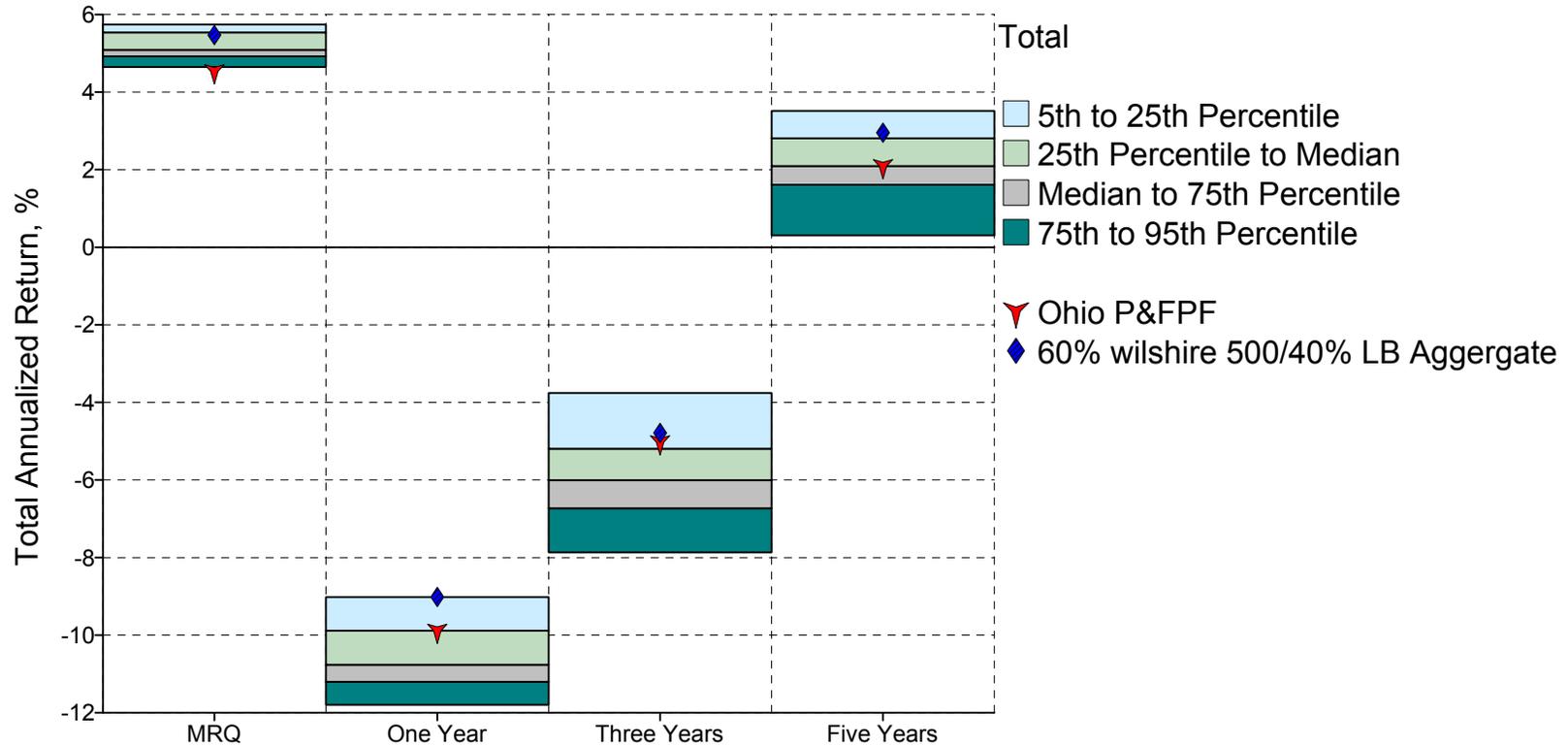


Ohio Police & Fire Pension Fund

Pages B11 and B12 plot the performance of the OP&F fund against the custom universe. OP&F had median performance for the five-year period while placing in the top quartile for both the one-year and three-year periods. Performance slipped in the fourth quarter of 2002 and the fund displayed fourth quartile performance. Page B13 is a growth of assets page. The reported value of the fund was \$7,663,656,000. After five years, the assets grew to \$7,799,826,624. Had the fund experienced 25th percentile returns over this period, assets would have grown to \$8,083,102,771, a difference of \$283,276,147 or 3.63%. OP&F displayed median performance so results would have been the same as actual results. A 60% equity/40% fixed income passive strategy could have allowed assets to grow to \$8,269,021,892, a difference of \$469,195,268 or 6.02% of assets. Financial statements were not yet available for 2003. An addendum to this report will be created to include the investment results of 2003 when the financial reports become available.

Performance to date

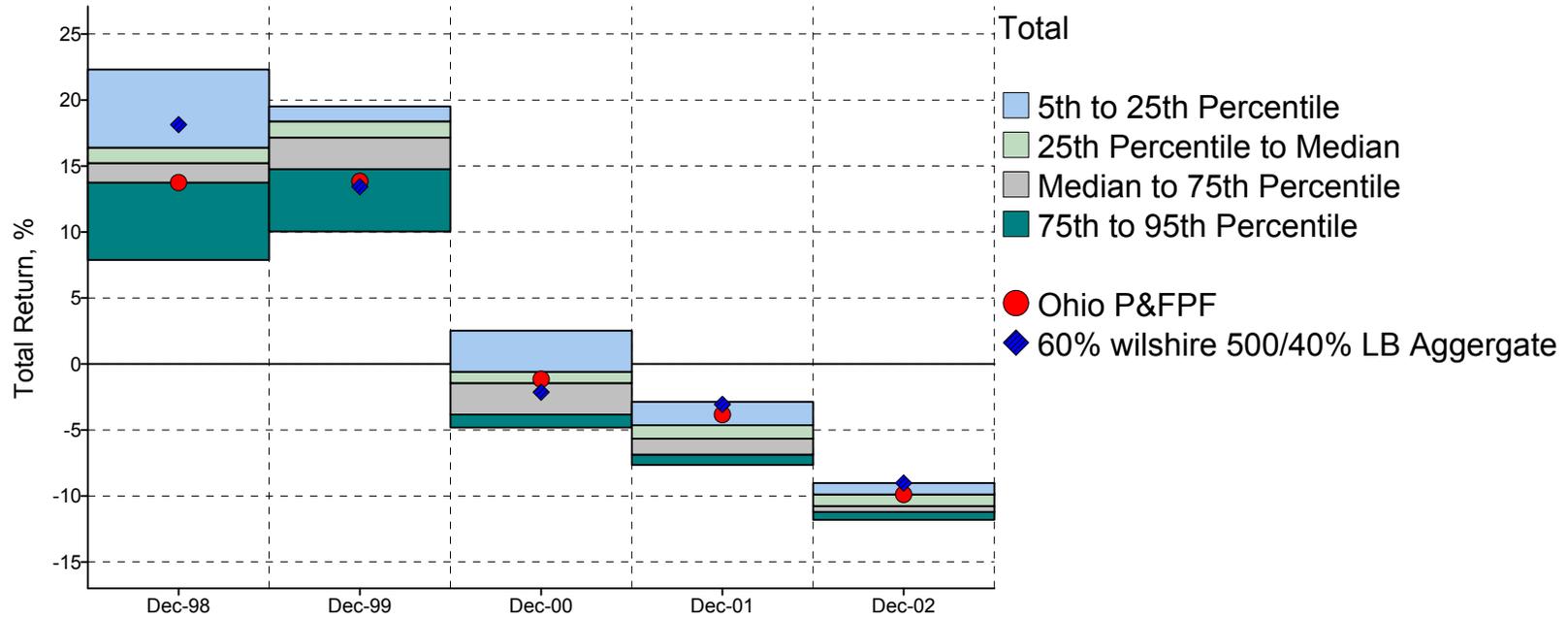
Mar-98 - Dec-02



	Ohio P&FPF	60% wilshire 500/40% LB Aggergate	Universe				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Last Quarter	4.54	5.47	5.74	5.54	5.09	4.92	4.65
One Year	-9.89	-9.02	-9.02	-9.89	-10.77	-11.20	-11.80
Three Years	-5.03	-4.79	-3.76	-5.20	-6.01	-6.73	-7.87
Five Years	2.10	2.95	3.52	2.81	2.10	1.61	0.30

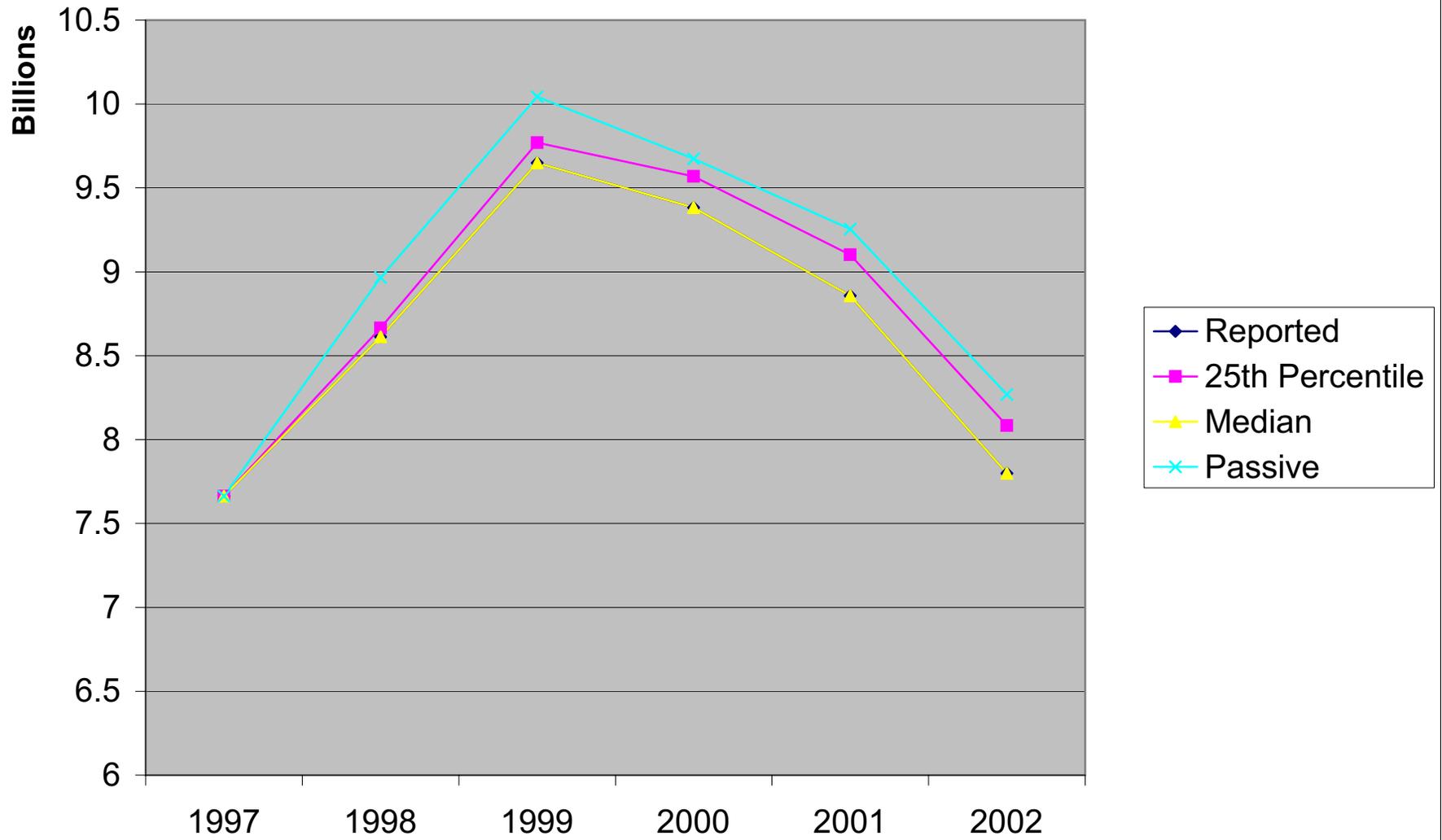
4 Quarter Performance

Mar-98 - Dec-02



	Ohio P&FPF	60% wilshire 500/40% LB Aggergate	Universe				
	4 Quarter Return, %	4 Quarter Return, %	4 Quarter Return, %				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Mar-98 - Dec-98	13.75	18.13	22.31	16.39	15.22	13.75	7.88
Mar-99 - Dec-99	13.84	13.43	19.52	18.38	17.15	14.77	10.04
Mar-00 - Dec-00	-1.16	-2.13	2.52	-0.59	-1.44	-3.83	-4.82
Mar-01 - Dec-01	-3.83	-3.06	-2.86	-4.64	-5.66	-6.86	-7.65
Mar-02 - Dec-02	-9.89	-9.02	-9.02	-9.89	-10.77	-11.20	-11.80

Ohio Police & Fire Pension Fund

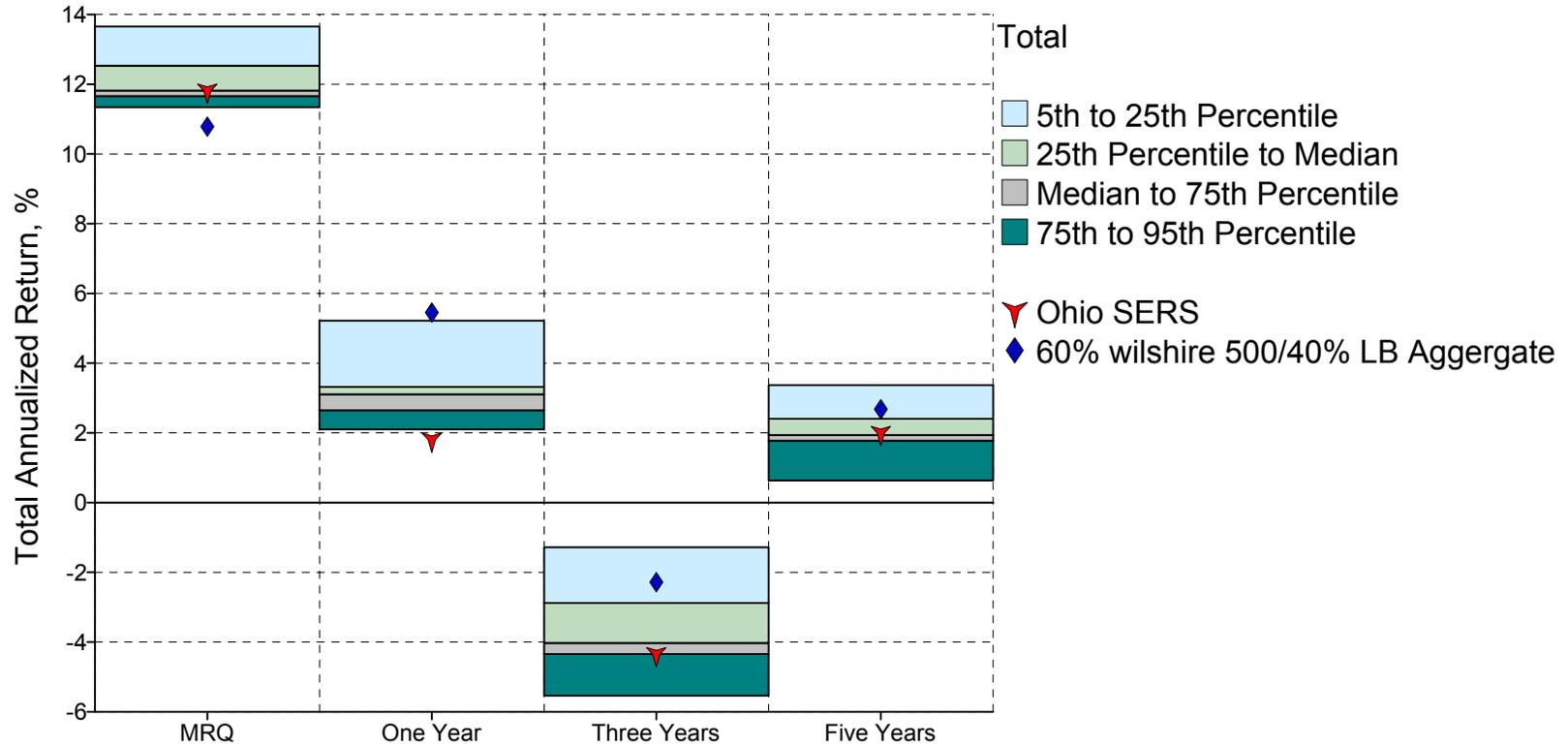


School Employees Retirement System

Pages B15 and B16 plot SERS' returns against the custom universe, however due to its July 1 plan year, the ending period for SERS is June 30, 2003. Five-year performance was above the median, three-year performance placed on the 75th percentile, one-year performance placed in the bottom quartile, while the performance for the quarter ending June 30, 2003 placed on the median. Page B17 is a growth of assets page. SERS' market value as of July 1, 1998 was \$7,457,566,095. The assets grew to \$7,681,747,848 after five years of actual results. The assets could have grown to \$7,839,459,551 had the fund performed at the 25th percentile, a difference of \$157,711,702 or 2.05% of assets. Median results would have seen assets decline to \$7,658,306,370. Assets would have grown to \$7,939,038,174 had the fund been indexed in a 60% equity/40% fixed income split, a difference of \$257,290,326 or 3.35% of assets.

Performance to date

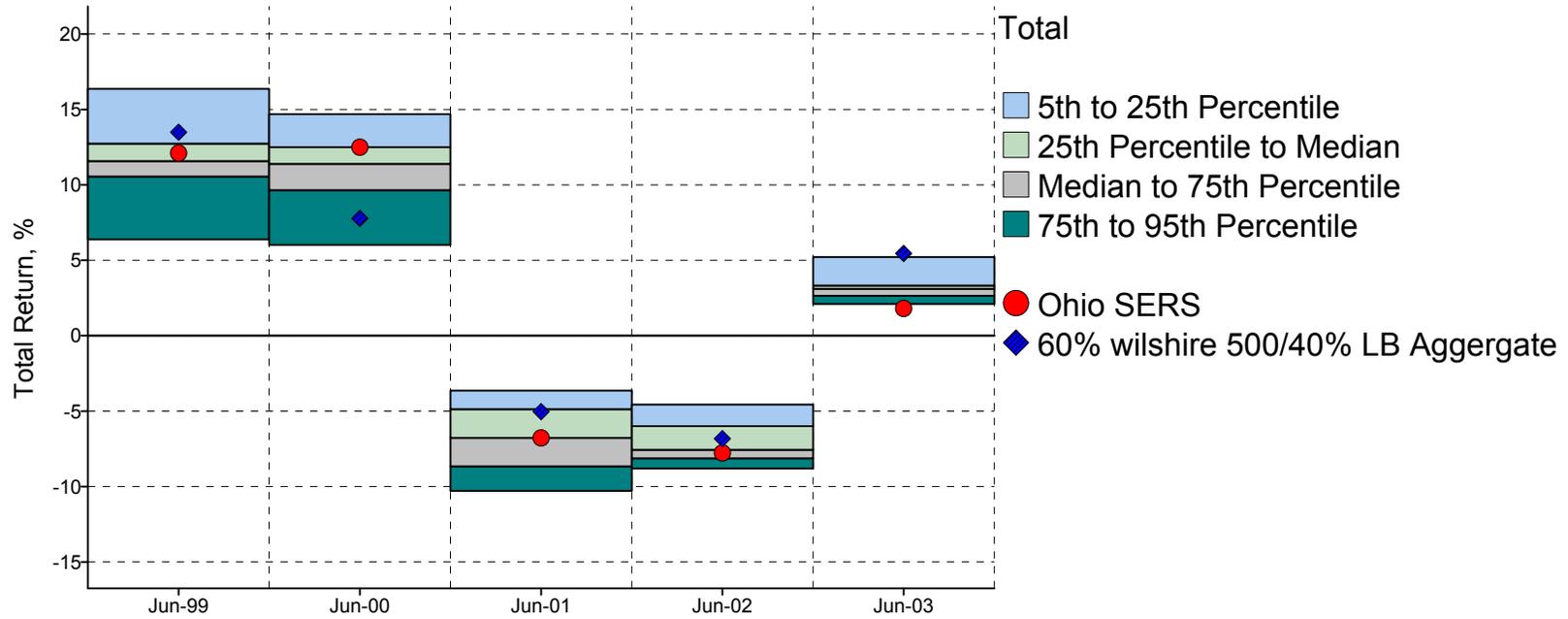
Sep-98 - Jun-03



	Ohio SERS	60% wilshire 500/40% LB Aggergate	Universe				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Last Quarter	11.82	10.78	13.66	12.53	11.82	11.66	11.34
One Year	1.81	5.45	5.22	3.32	3.11	2.65	2.10
Three Years	-4.34	-2.28	-1.29	-2.88	-4.03	-4.34	-5.54
Five Years	2.00	2.68	3.37	2.40	1.94	1.77	0.63

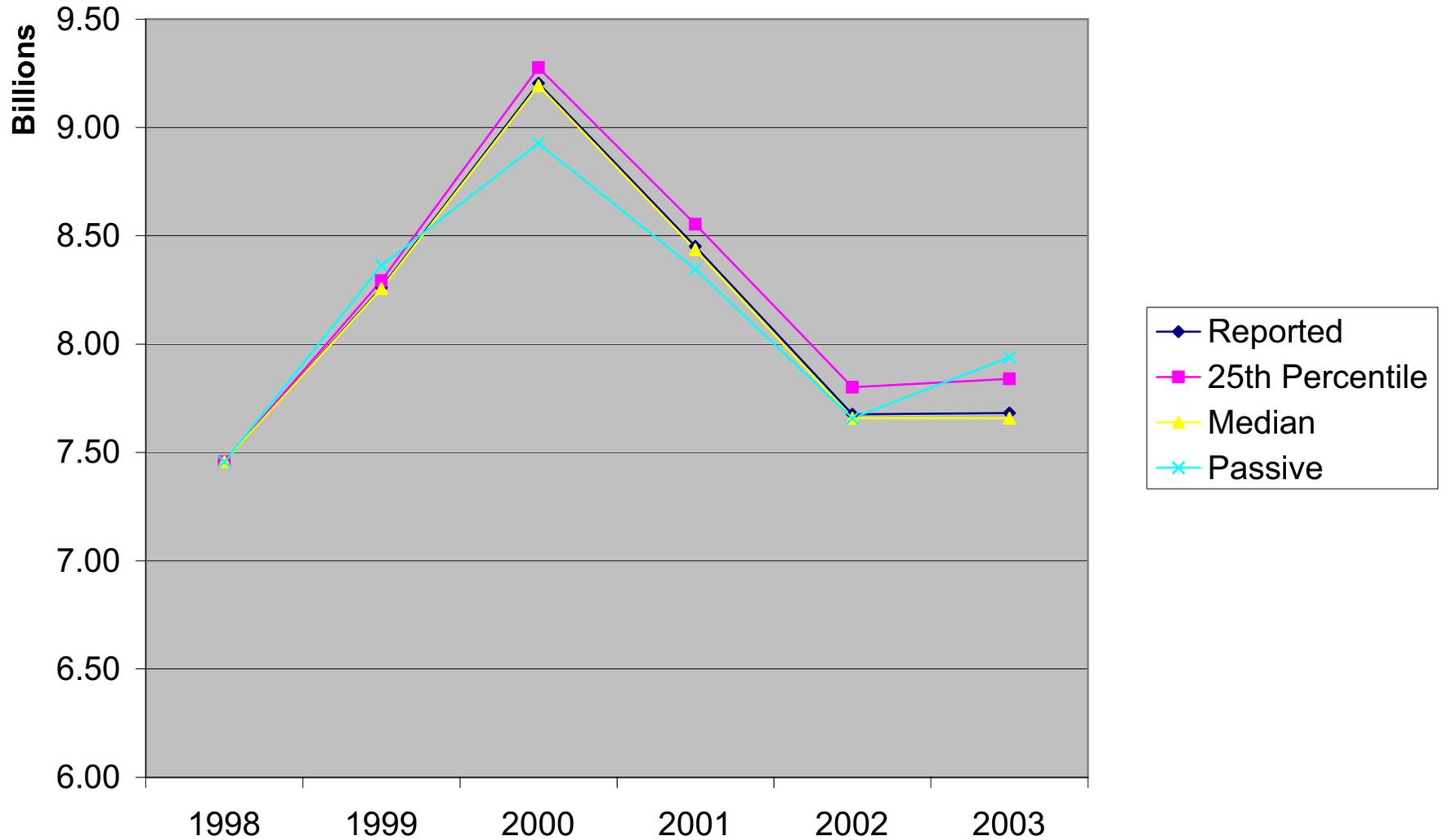
4 Quarter Performance

Sep-98 - Jun-03



	Ohio SERS	60% wilshire 500/40% LB Aggergate	Universe				
	4 Quarter Return, %		4 Quarter Return, %				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Sep-98 - Jun-99	12.11	13.49	16.37	12.74	11.58	10.56	6.38
Sep-99 - Jun-00	12.50	7.78	14.69	12.50	11.39	9.65	6.02
Sep-00 - Jun-01	-6.78	-5.04	-3.64	-4.88	-6.78	-8.66	-10.29
Sep-01 - Jun-02	-7.77	-6.83	-4.57	-5.99	-7.56	-8.13	-8.80
Sep-02 - Jun-03	1.81	5.45	5.22	3.32	3.11	2.65	2.10

Ohio School Employees Retirement System

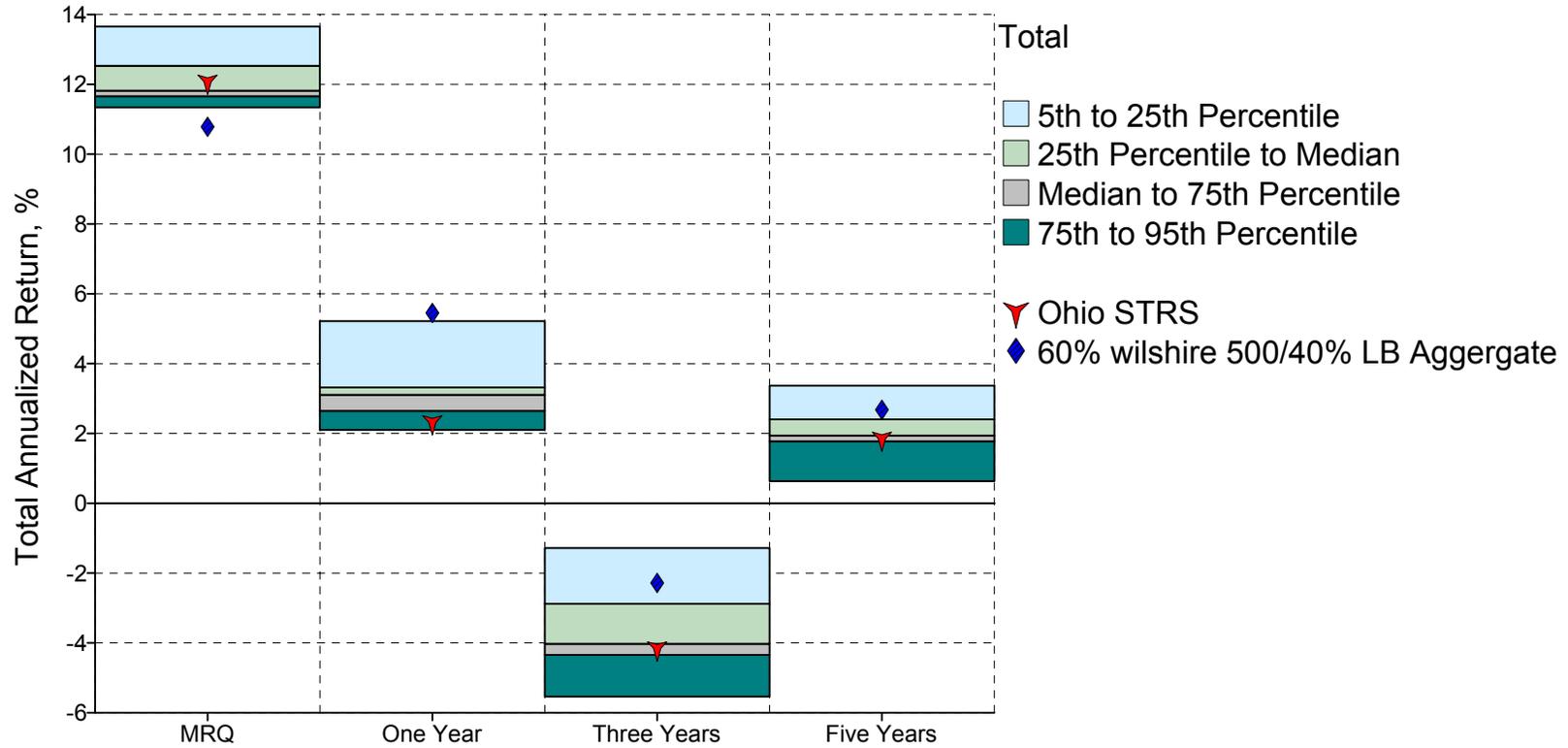


State Teachers Retirement System

Pages B19 and B20 plot the performance of the STRS' fund against the custom universe. For the quarter ending June 30, 2003, the fund placed above the median, however for the one-year period the fund displayed bottom quartile performance. The three-year and five-year performance landed the fund in the third quartile. Page B21 is a growth of assets page. The reported value of the fund on July 1, 1998 was \$47,954,487,000. Growing the assets at the actual rates of return, the reported value of the fund was \$47,986,587,820 on June 30, 2003. Had the fund experienced 25th percentile performance, assets could have grown to \$49,366,906,022, a difference of \$1,380,318,202 or 2.88%. Median performance would have seen the assets grow to \$48,210,390,693, a difference of \$223,802,873 or 0.47% of assets. Had the fund been indexed in a 60% equity/40% fixed income split, the assets could have grown to \$49,982,714,756, a difference of \$1,996,126,936 or 5.94% of assets.

Performance to date

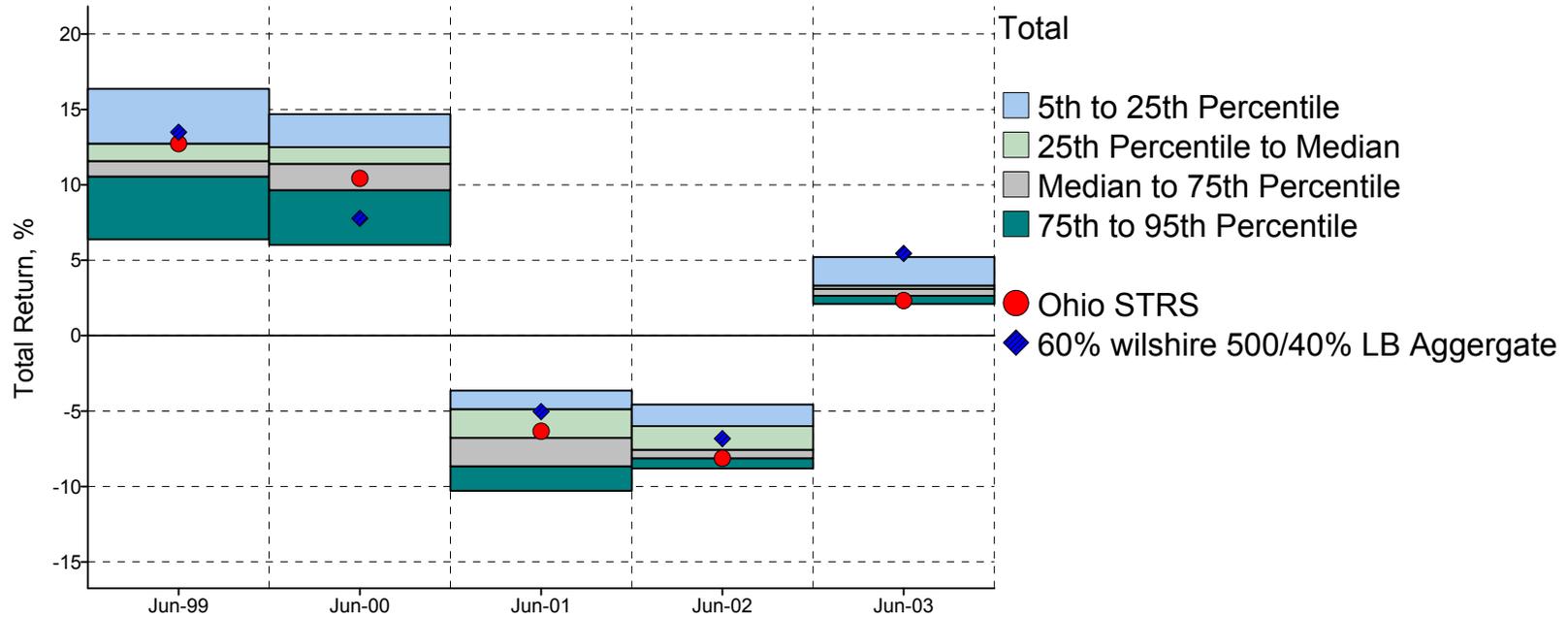
Sep-98 - Jun-03



	Ohio STRS	60% wilshire 500/40% LB Aggergate	Universe				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Last Quarter	12.08	10.78	13.66	12.53	11.82	11.66	11.34
One Year	2.32	5.45	5.22	3.32	3.11	2.65	2.10
Three Years	-4.15	-2.28	-1.29	-2.88	-4.03	-4.34	-5.54
Five Years	1.85	2.68	3.37	2.40	1.94	1.77	0.63

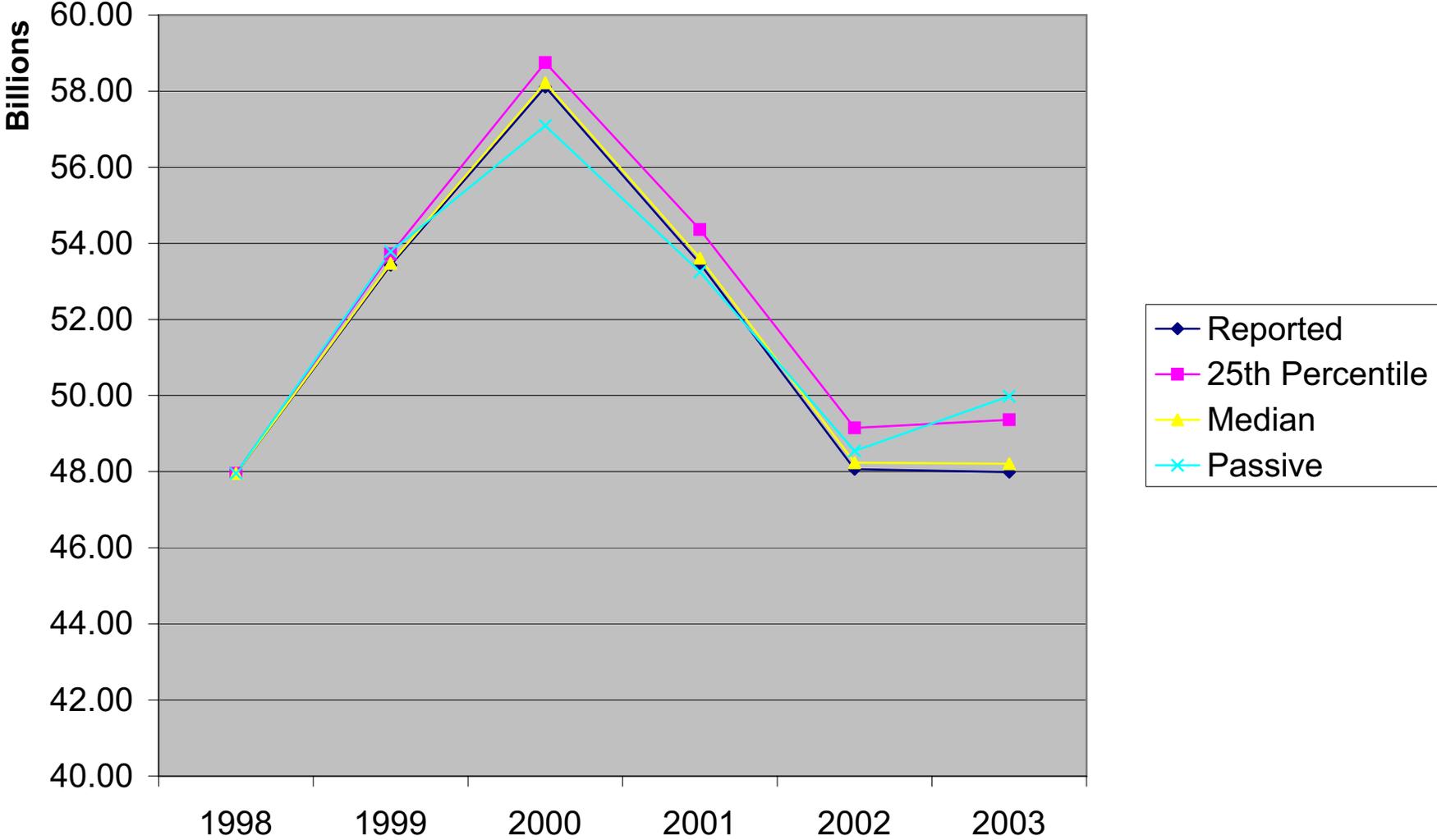
4 Quarter Performance

Sep-98 - Jun-03



	Ohio STRS	60% wilshire 500/40% LB Aggergate	Universe				
	4 Quarter Return, %		4 Quarter Return, %				
	Total	Total	Total(5%)	Total(25%)	Total(Median)	Total(75%)	Total(95%)
Sep-98 - Jun-99	12.74	13.49	16.37	12.74	11.58	10.56	6.38
Sep-99 - Jun-00	10.43	7.78	14.69	12.50	11.39	9.65	6.02
Sep-00 - Jun-01	-6.34	-5.04	-3.64	-4.88	-6.78	-8.66	-10.29
Sep-01 - Jun-02	-8.13	-6.83	-4.57	-5.99	-7.56	-8.13	-8.80
Sep-02 - Jun-03	2.32	5.45	5.22	3.32	3.11	2.65	2.10

Ohio State Teachers Retirement System



Contributing State Organizations**Assets***

New Mexico Educational	\$6.17B
State of New Jersey	\$63.59B
Maine State Retirement	\$6.92B
State Universities of Illinois	\$11.64B
Virginia Retirement System	\$36.24B
Arizona State Retirement System	\$19.13B
Maryland State Retirement System	\$27.36B
Oklahoma Teachers Retirement System	\$6.10B

* Assets are quoted from January 26th Pension & Investments magazine and represent 12/31/2003 values

Appendix: ORSC Performance Attribution

The following exhibits provide an analysis of the impact of asset allocation and active management for the past five years – the time period in which all five funds have been operating under “prudent person” standards. The three data points for each quarter are the allocation index return, the policy index return, and the total fund return. The quarterly asset allocation attribution is the result of deviation in asset allocation from the policy index. In order to accomplish this, an allocation index is created. The allocation index for a particular quarter is created by averaging the weight of a particular asset class at the beginning of the quarter and at the end of a quarter. The resulting average is then multiplied by the return of the market index that has been assigned to that asset class in the policy statement. The product of the allocation weight times the index return is the allocation index return for that asset class. This method is used for each asset class and the results of each asset class are then added together to create the allocation index return for the portfolio.

Here is an example:

HPRS Allocation Index

Asset Class	Quarter One Weight	Quarter Two Weight	Average Weight	Market Index Return	Avg Wght * Mkt Idx Ret
Large Cap	29.22%	31.09%	30.16%	8.45%	2.548%
Small/Mid Cap	16.07%	16.55%	16.31%	6.64%	1.083%
Fixed Income	28.45%	24.91%	26.68%	1.57%	0.419%
Intl. Equity	9.05%	11.00%	10.03%	6.45%	0.647%
Real Estate	16.89%	15.51%	16.20%	1.59%	0.258%
Cash	0.30%	0.93%	0.62%	0.43%	0.003%
Allocation Index Return					4.96%

The policy index return is then subtracted from the allocation index return in order to determine the value added or subtracted by deviations in the funds’ asset allocation from the policy index.

The next step is to determine the value added or subtracted by active management. The allocation index return is subtracted from the total fund return in order to determine value added or subtracted. Finally, the total attribution is calculated by subtracting the policy index from the total fund return. The result is the total value added or subtracted by the combination of asset allocation and active management.

The lines on the graphs represent the cumulative effect of each quarterly attribution number. The endpoint is the total value added or subtracted from the fund’s return for the past five years. The data points on the graph have not been annualized. The table below each graph provides a one-, three-, and five-year annualized representation of the attribution of each fund.

Appendix: ORSC Performance Attribution

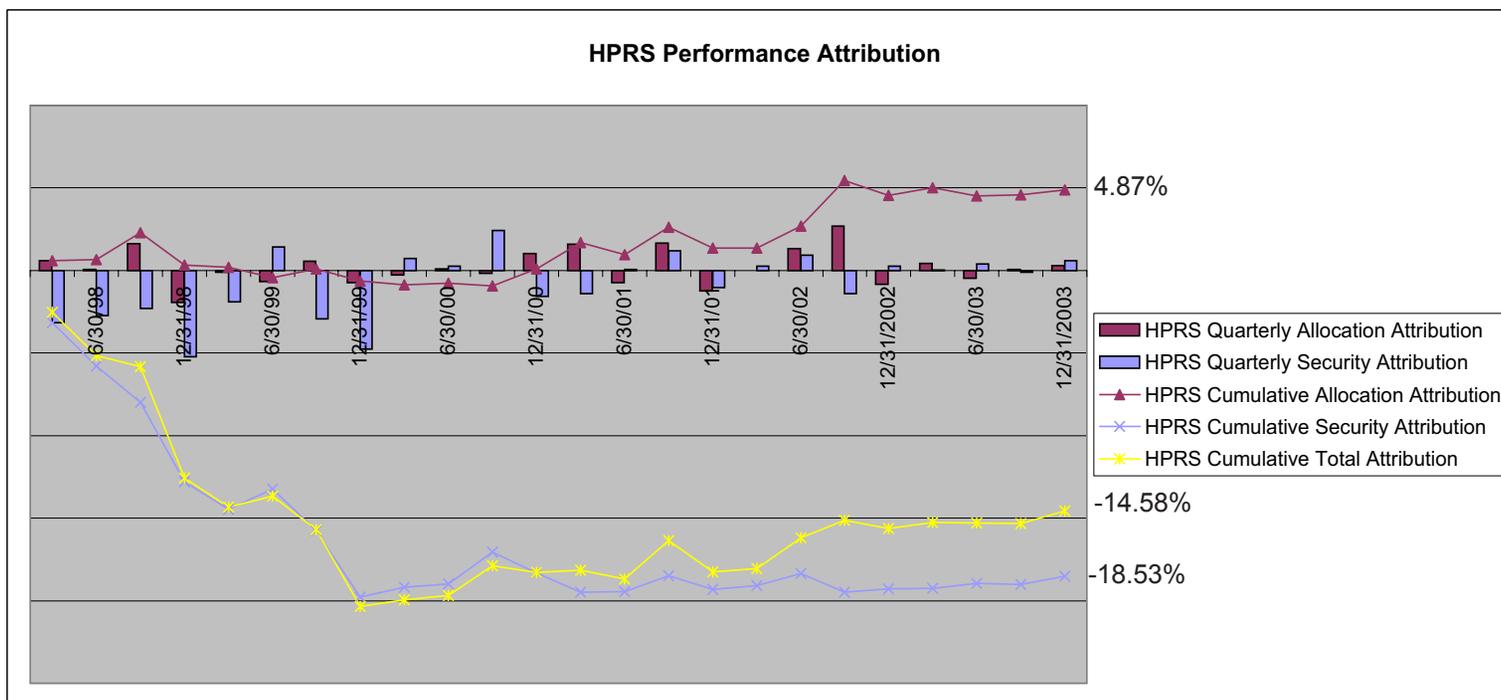
The analysis shows that of the five funds, only SERS has achieved positive attribution results over the past six years from deviations in asset allocation and security selection. Active management has proven to be the biggest detractor from the performance of all five of the funds. Only OP&F achieved positive attribution from active management. On the other hand, three of the funds (HPRS, SERS, & STRS) achieved positive attribution results from their decision to deviate from the target policy asset allocation. Another point of interest is that all five of the funds experienced their worst attribution results at the beginning of the six year period. Since then, their attribution results have moderated and the cumulative numbers have flattened out.

Breakdown of Attribution Results - Last 6 Years

Asset Attribution Selection Attribution Total Attribution

HPRS	0.80%	-3.36%	-2.59%
PERS	-0.36%	-0.44%	-0.79%
OP&F	-0.06%	0.03%	-0.04%
SERS	0.91%	-0.81%	0.10%
STRS	0.54%	-0.69%	-0.14%

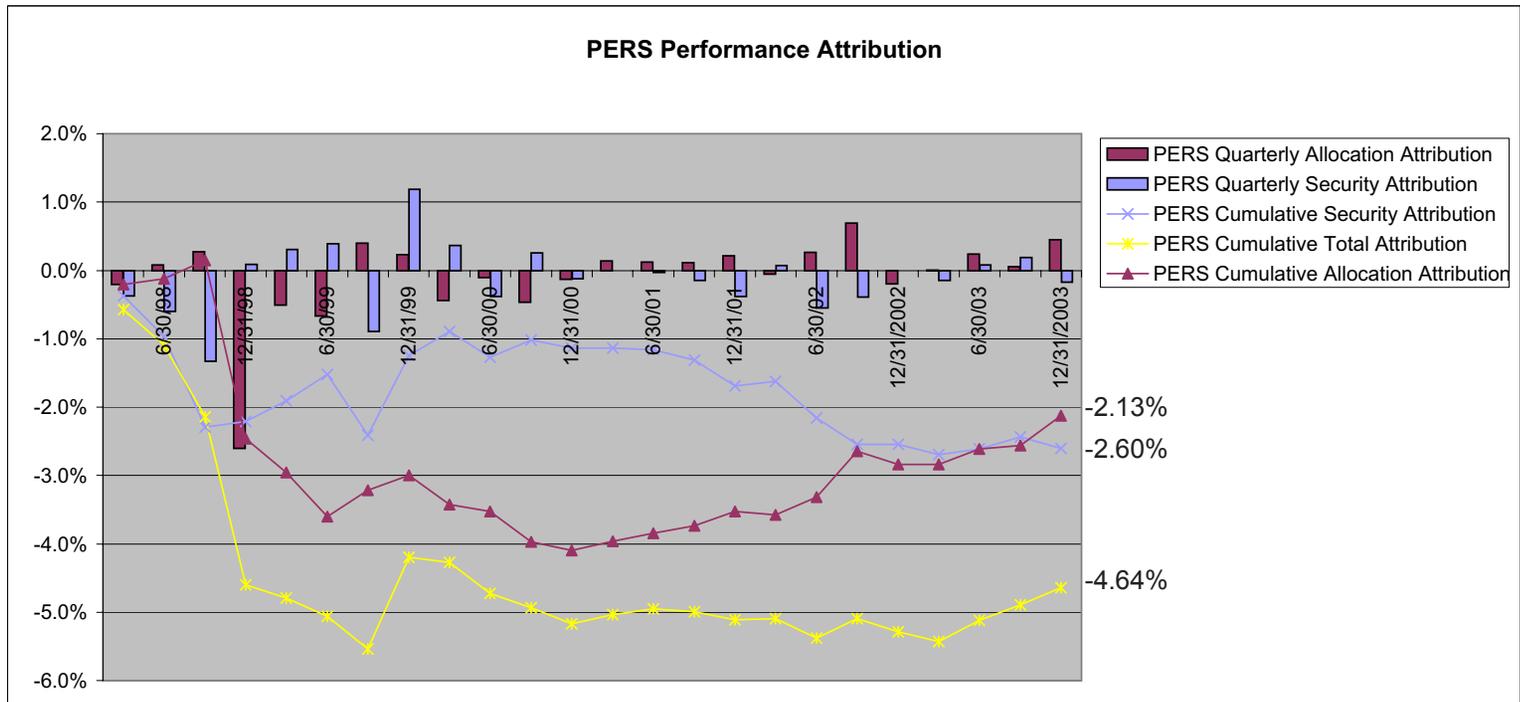
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	Six Years
Asset Allocation Attribution	0.311%	1.570%	0.892%	0.796%
Security Selection Attribution	0.928%	-0.080%	-1.349%	-3.357%
Total Attribution	1.243%	1.495%	-0.464%	-2.592%

The graph above provides six year attribution analysis for the Highway Patrol Retirement System. The red bars represent the value added to (or subtracted from) the portfolio each quarter from the fund's asset allocation decisions – decisions to be under or overweight in a particular asset class vs. the policy target. The blue bars represent the value added to (or subtracted from) the portfolio from active portfolio management. The red line is a cumulative measure of the value added to (or subtracted from) the portfolio from asset allocation strategies over the past six years (+4.87%). The blue line represents the cumulative measure of the value added to (or subtracted from) the portfolio from active management over the past six years (-18.53%). The yellow line represents the total value added to (or subtracted by) a combination of asset allocation strategies and active portfolio management (-14.58%). The above graph demonstrates that over the past six years, HPRS' asset allocation strategy has added 4.87% to the return of the fund, while over the same period, the active management of their investment managers has subtracted 18.53% from the fund's performance. The cumulative effect of active management and asset allocation has subtracted 14.58% from the fund's performance over the past six years, which translates into a loss of about 2.59% annually over the past six years.

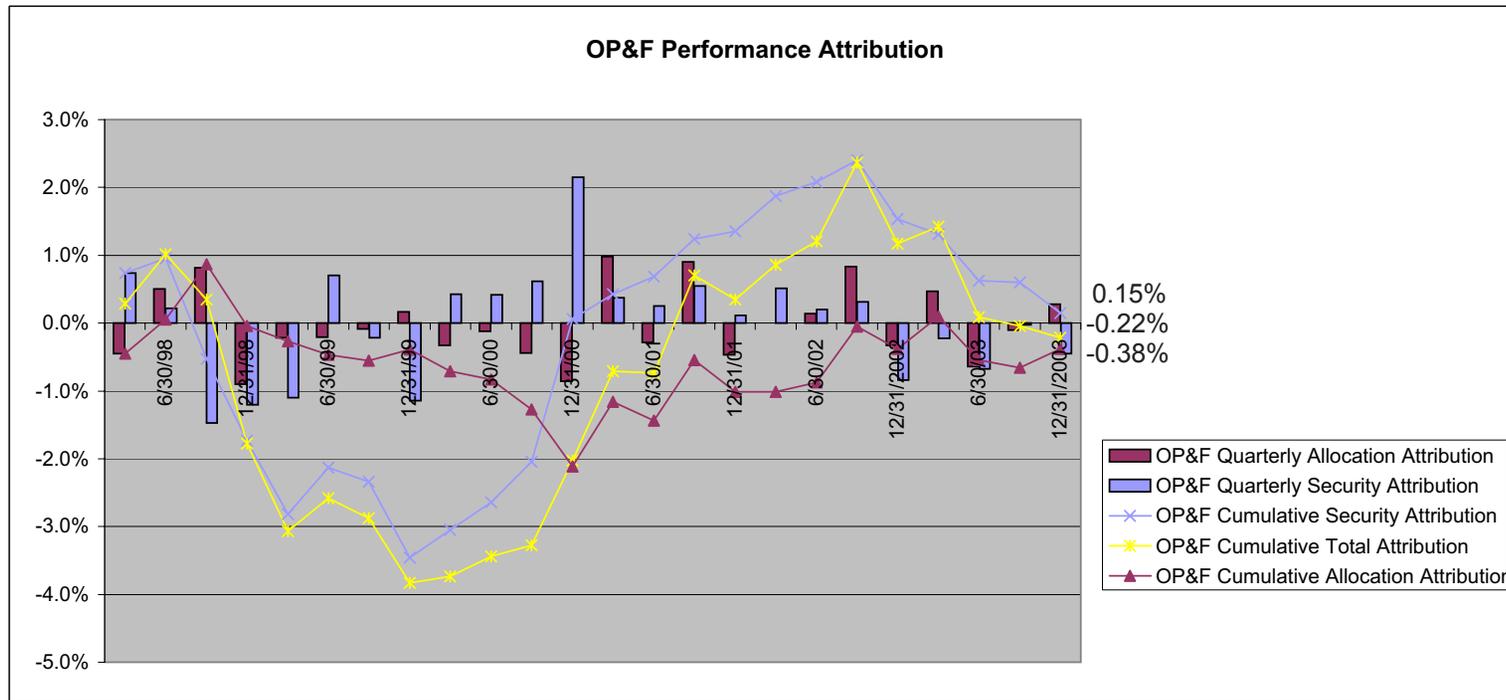
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	Six Years
Asset Allocation Attribution	0.739%	0.681%	0.069%	-0.357%
Security Selection Attribution	-0.058%	-0.497%	-0.081%	-0.439%
Total Attribution	0.681%	0.187%	-0.007%	-0.789%

The graph above shows that asset allocation and selection have both detracted from PERS' results over the past six years. On an annualized basis, PERS's decisions to deviate from its passive benchmark have cost the fund 0.789% annually over the last six years.

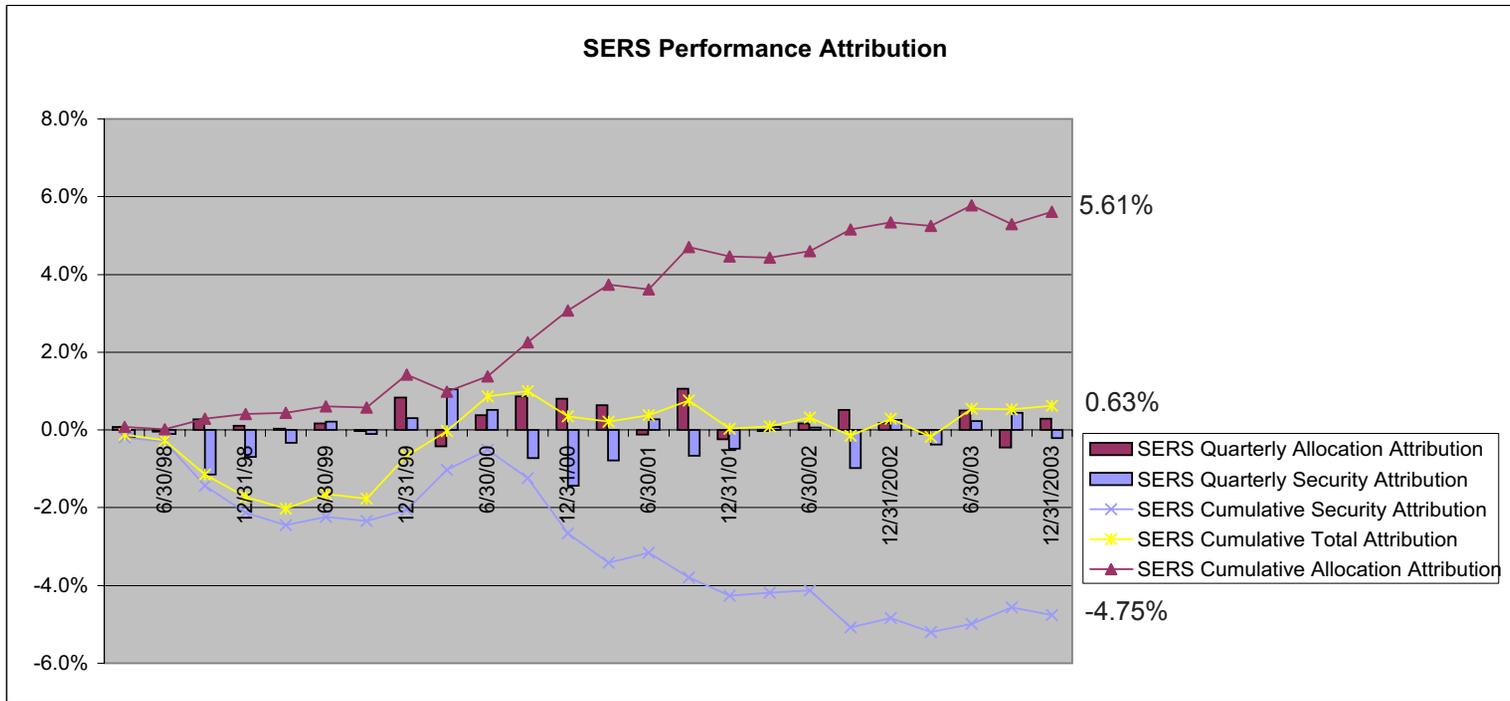
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	Six Years
Asset Allocation Attribution	-0.002%	0.588%	-0.067%	-0.063%
Security Selection Attribution	-1.366%	0.030%	0.380%	0.025%
Total Attribution	-1.370%	0.614%	0.315%	-0.036%

The graph above shows that OP&F has added value with active management over the past six years. This deviation did not counteract the negative allocation results, resulting in an overall loss to the fund of 0.22% per year. Over the past three years, both selection and asset allocation have added value.

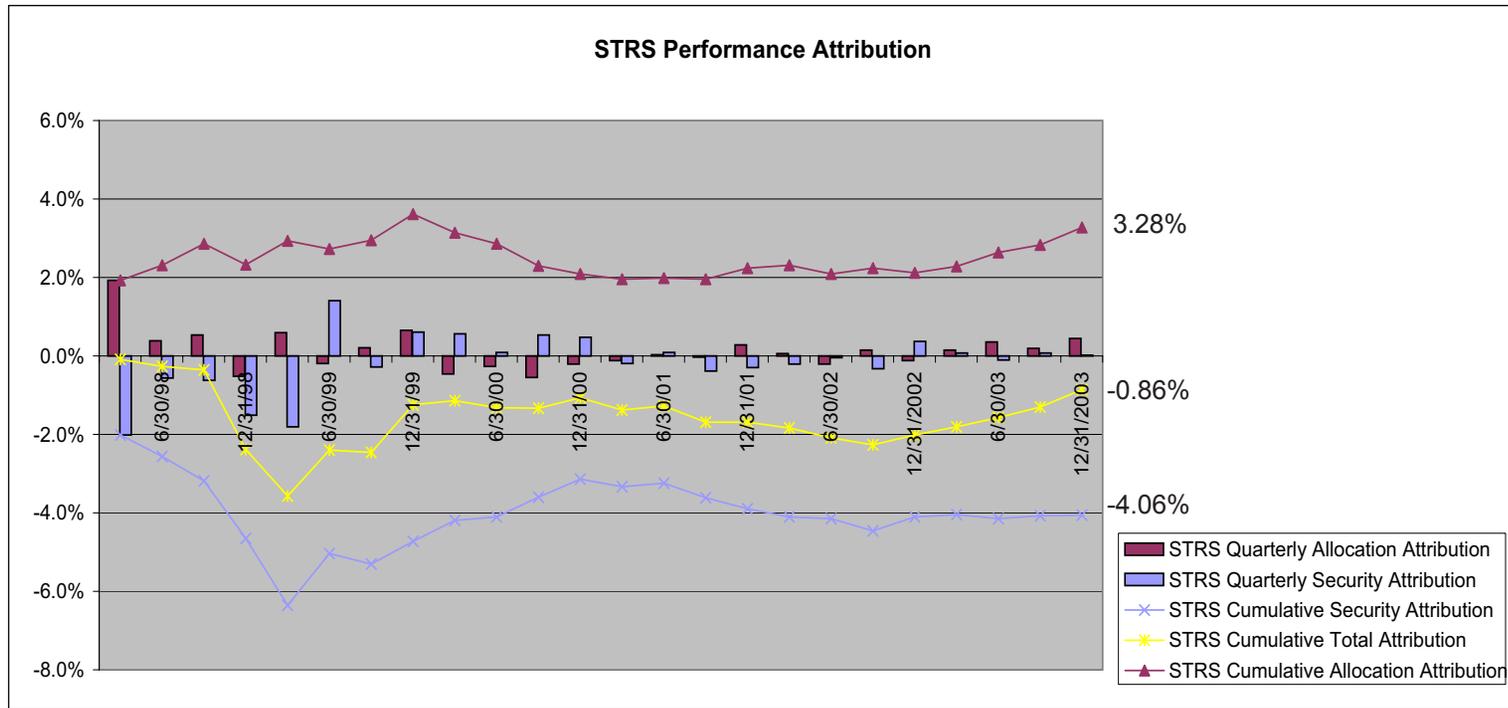
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	Six Years
Asset Allocation Attribution	0.248%	0.813%	1.014%	0.913%
Security Selection Attribution	0.085%	-0.722%	-0.543%	-0.808%
Total Attribution	0.335%	0.091%	0.473%	0.104%

The graph above shows that SERS has added value through asset allocation over the past six years, counteracting the negative impact of selection and resulting in overall positive results of 0.104% annually for the six-year period.

Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	Six Years
Asset Allocation Attribution	1.136%	0.389%	0.186%	0.539%
Security Selection Attribution	0.048%	-0.315%	0.123%	-0.688%
Total Attribution	1.185%	0.073%	0.313%	-0.143%

The graph above shows that for the entire six year period STRS has added value through asset allocation. That incremental value, however was offset by adverse selection results, resulting in underperformance of 0.14% on an annual basis. Over the past three years, however, selection and asset allocation have counteracted one another.