



# Milliman USA

*Consultants and Actuaries*

The Ohio Retirement Study Council

**Second Quarter 2003**

INVESTMENT PERFORMANCE REVIEW

November 6, 2003

The following analysis was prepared by Milliman USA, Inc. utilizing secondary data from statements provided by the plan trustee and/or custodian, Milliman USA computer software and selected information in the Milliman USA database. Reasonable care has been taken to assure the accuracy of the data contained herein, and all written comments are objectively stated and are based on facts gathered in good faith. Milliman USA disclaims responsibility, financial or otherwise, for the accuracy or completeness of this report.

**OHIO RETIREMENT STUDY COUNCIL**  
Comparative Performance Study

**TABLE OF CONTENTS**

Executive Summary	a-p
Fund Profiles	q-u
Total Fund	1-7
Domestic Equity	8-10
Fixed Income	11-13
International Equity	14-15
Real Estate	16
Highway Patrol Retirement System	17-21
Public Employees Retirement System	22-27
Police & Fire Pension Fund	28-32
School Employees Retirement System	33-37
State Teachers Retirement System	38-43
<b>Appendix</b>	
Performance Attribution Exhibits	44-50

## **OHIO RETIREMENT STUDY COUNCIL**

Comparative Performance Study

Period ending 6/30/03

### **Introduction**

Milliman USA 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 ninth report prepared by Milliman USA 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 nine and one-half-year period beginning January 1, 1994 and ending June 30, 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 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 nine and one-half 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.

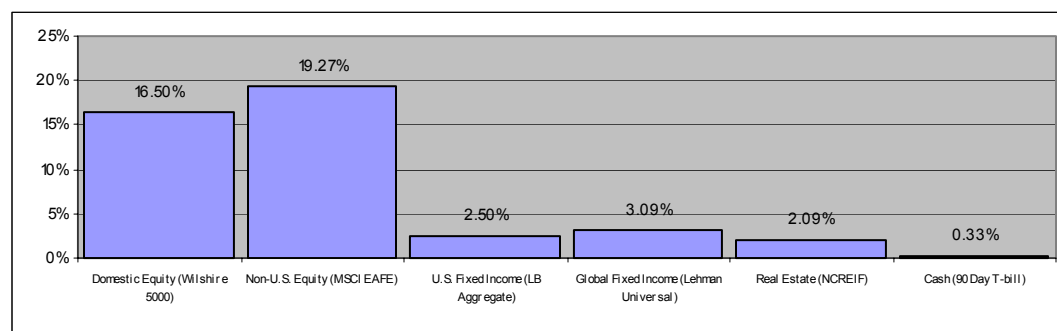
The majority of pension assets, in both the public and private sector, are managed with “prudent person” guidelines, which is to say largely without minimums or maximums placed on individual asset classes or securities. This approach, currently in place in the Ohio systems, is the optimal way to manage 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 6/30/03, the period since our last report, was extremely positive for the systems. All experienced positive results, ranging from 9.96% (HPRS) to 9.06% (SERS). All of the funds except OP&F outperformed their target policies for the period, with excess results ranging from 0.52% (HPRS) to 0.15% (PERS). All of the funds also ranked well above the median public retirement system in a broad universe of such funds. The highest ranking fund for the six months was HPRS (15<sup>th</sup> percentile). The other funds ranged from 16<sup>th</sup> percentile (PERS) to the 34<sup>th</sup> percentile (SERS).
- Longer term, only SERS and OP&F have outperformed their respective policy benchmarks for the past five years. The other three funds experienced results that lagged their benchmarks in annualized amounts ranging from 0.32% (STRS) to 1.77% (HPRS).
- The impact of the three years of negative returns from 2000 through 2002 has not been erased by this year’s good results. All of the funds still have long-term (nine and one-half year) annualized returns that are below their actuarial interest-rate assumptions.
- HPRS, which experienced the lowest return over the entire measurement period, continues to show signs of improvement. The fund’s 9.96% return over the past six months compares favorably to the 9.44% return for its policy benchmark. It is now also ahead of its benchmark for trailing one and three year periods.

## Market Environment

The second 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 16.5% and 19.3% gain respectively. Global fixed income returned 2.5% for the period, and real estate was up 2.1%. Cash returned .33%.



## Median Fund Returns

The median fund in the Wilshire public fund database returned 10.28% in the second quarter and 4.15% 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 10.90% for the quarter and 5.78% over the last year.

### Universe Medians Performance Summary Periods ending June 30, 2003

	One Quarter	Two Quarters	One Year	Three Years	Five Years	Ten Years
<b>Fund Sponsor</b>						
Public Fund Universe	10.28%	8.47%	4.15%	-0.35%	2.91%	8.22%
Corporate DB Universe	11.14%	9.36%	3.58%	-1.75%	2.63%	8.70%
Education Eleemosynary Universe	11.42%	9.13%	4.37%	-2.15%	3.52%	8.92%
Taft-Hartley Universe	8.74%	7.85%	5.07%	0.93%	3.63%	7.68%
Balanced Funds	9.10%	7.90%	4.43%	-0.88%	3.53%	7.83%
<b>60% Wilshire 5000 / 40% LB Aggregate</b>	<b>10.90%</b>	<b>9.47%</b>	<b>5.78%</b>	<b>-1.96%</b>	<b>2.96%</b>	<b>9.10%</b>

## 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.

<b>Total Fund Return vs. Policy Benchmark</b>					
<b>Fund</b>	<b>One Quarter</b>	<b>Two Quarters</b>	<b>One Year</b>	<b>Three Years</b>	<b>Five Years</b>
<b>HPRS</b>					
Actual	12.10%	9.96%	3.88%	-1.47%	0.39%
Policy	12.16%	9.52%	2.46%	-3.55%	2.18%
Difference	-0.06%	0.44%	1.42%	2.08%	-1.79%
<b>OP&amp;F</b>					
Actual	11.66%	9.47%	2.93%	-2.50%	1.94%
Policy	12.98%	10.48%	3.70%	-3.89%	1.92%
Difference	-1.32%	-1.01%	-0.77%	1.39%	0.02%
<b>PERS</b>					
Actual	12.53%	9.82%	3.19%	-2.88%	1.95%
Policy	12.21%	9.67%	2.79%	-2.78%	2.75%
Difference	0.32%	0.15%	0.40%	-0.10%	-0.80%
<b>SERS</b>					
Actual	11.82%	9.06%	1.81%	-4.34%	2.00%
Policy	11.09%	8.89%	1.80%	-4.19%	1.87%
Difference	0.73%	0.17%	0.01%	-0.15%	0.13%
<b>STRS</b>					
Actual	12.08%	9.38%	2.32%	-4.15%	1.85%
Policy	11.84%	8.90%	2.06%	-3.96%	2.17%
Difference	0.24%	0.48%	0.26%	-0.19%	-0.32%

All returns are for periods ending 6/30/2003. Returns for periods longer than one year are annualized.

- HPRS: The six-month return for the total fund has outperformed the policy index by 44 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 1.79% annually.
- OP&F: OP&F trails its policy index by 1.01% for the last six months. Longer term, the fund is performing right in line with its policy index for the five-year period, outperforming it by 0.02% annually.
- PERS: The six-month return for the total fund has outperformed the policy index by 0.15%. Over the three and five year periods, the fund is underperforming its policy index by 0.10% and 0.80% annually.
- SERS: The six-month return for the total fund has outperformed its policy index return by 0.17%. Over the longer term, the fund has performed right in line with its policy index. For the three-year period, it trails the policy by 0.15% annually and for the five-year period the fund is outperforming its policy by 0.13% annually.
- STRS: The six-month return for the total fund outperformed its policy by 0.48%. Longer term, the fund is slightly underperforming its policy on an annual basis. The three-year return trails the policy by 0.19% and the five-year return trails the policy by 0.32%.

## 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	17.66%	13.92%	1.22%	-7.96%	-5.26%	
Policy	17.02%	12.97%	0.20%	-8.43%	0.31%	
Difference	0.64%	0.95%	1.02%	0.47%	-5.57%	
OP&F						
Actual	15.89%	11.65%	-1.94%	-7.03%	-0.49%	
Policy	16.50%	12.91%	1.28%	-10.58%	-1.30%	
Difference	-0.61%	-1.26%	-3.22%	3.55%	0.81%	
PERS						
Actual	16.23%	12.73%	1.07%	-9.52%	-1.58%	
Policy	16.25%	12.70%	0.75%	-9.87%	-0.69%	
Difference	-0.02%	0.03%	0.32%	0.35%	-0.89%	
SERS						
Actual	16.73%	13.20%	0.19%	-10.93%	-1.15%	
Policy	16.25%	12.70%	0.76%	-10.47%	-1.14%	
Difference	0.48%	0.50%	-0.57%	-0.46%	-0.01%	
STRS						
Actual	16.11%	12.30%	0.19%	-10.30%	-1.83%	
Policy	15.88%	12.01%	0.18%	-9.97%	-0.87%	
Difference	0.23%	0.29%	0.01%	-0.33%	-0.96%	

The domestic equity markets posted very strong gains in the second quarter and results for each of the funds exceeded 15% for the quarter. On an absolute and relative basis, HPRS had the best results with a 17.66% return which exceeded its equity benchmark by 64 basis points. For the five-year period, OP&F has had the best absolute and relative results. The fund's domestic equity return of -0.49% is the highest of the funds and resulted in a 0.81% 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.

All returns are for periods ending 6/30/2003. Returns for periods longer than one year are annualized.

## 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>	
<b>HPRS</b>						
Actual	3.20%	5.49%	11.48%	10.70%	7.98%	
Policy	2.50%	3.93%	10.40%	10.08%	7.54%	
Difference	0.70%	1.56%	1.08%	0.62%	0.44%	
<b>OP&amp;F</b>						
Actual	4.32%	7.20%	12.75%	10.97%	8.07%	
Policy	2.50%	3.93%	10.40%	10.08%	7.54%	
Difference	1.82%	3.27%	2.35%	0.89%	0.53%	
<b>PERS</b>						
Actual	3.15%	5.20%	11.92%	10.19%	7.58%	
Policy	3.09%	4.96%	11.55%	10.41%	7.72%	
Difference	0.06%	0.24%	0.37%	-0.22%	-0.14%	
<b>SERS</b>						
Actual	2.91%	4.51%	11.12%	10.89%	7.97%	
Policy	2.50%	3.93%	10.40%	10.08%	7.54%	
Difference	0.41%	0.58%	0.72%	0.81%	0.43%	
<b>STRS</b>						
Actual	3.24%	5.56%	12.99%	10.84%	8.07%	
Policy	3.09%	4.96%	11.52%	10.00%	7.50%	
Difference	0.15%	0.60%	1.47%	0.84%	0.57%	

Fixed income returns were positive for all of the funds for the second quarter. OP&F had the best second quarter return (+4.32%) followed by STRS (+3.24%), HPRS (3.20%), PERS (+3.15%), and SERS (+2.91%). For the five-year period, OP&F again had the highest return (+8.07%), which was also matched by STRS. 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.

All returns are for periods ending 6/30/2003. Returns for periods longer than one year are annualized.

## International Equity Returns

International Equity Return vs. Policy Benchmark						
<b>Fund</b>	<b>One Quarter</b>	<b>Two Quarters</b>	<b>One Year</b>	<b>Three Years</b>	<b>Five Years</b>	
<b>HPRS</b>						
Actual	20.72%	8.10%	-8.79%	-11.13%	-1.86%	
Policy	19.27%	9.47%	-6.46%	-13.52%	-4.00%	
Difference	1.45%	-1.37%	-2.33%	2.39%	2.14%	
<b>OP&amp;F</b>						
Actual	18.73%	9.39%	-5.46%	-14.75%	-3.27%	
Policy	19.85%	11.10%	-4.19%	-12.48%	-2.81%	
Difference	-1.12%	-1.71%	-1.27%	-2.27%	-0.46%	
<b>PERS</b>						
Actual	19.83%	10.40%	-4.77%	-12.97%	-1.91%	
Policy	19.58%	10.73%	-4.60%	-12.76%	-2.78%	
Difference	0.25%	-0.33%	-0.17%	-0.21%	0.87%	
<b>SERS</b>						
Actual	18.60%	9.22%	-8.07%	-14.19%	-4.18%	
Policy	17.85%	8.21%	-8.73%	-13.54%	-3.10%	
Difference	0.76%	1.01%	0.66%	-0.65%	-1.08%	
<b>STRS</b>						
Actual	18.51%	10.17%	-4.73%	-10.51%	-0.60%	
Policy	18.79%	9.00%	-6.92%	-12.72%	-2.46%	
Difference	-0.28%	1.17%	2.19%	2.21%	1.86%	

The international equity markets posted very strong gains in the second quarter. The international equity returns of all of the funds exceeded 18% for the quarter. HPRS had the best absolute and relative results, returning a positive 20.72% and outperforming its policy by 145 basis points. PERS and SERS also had positive absolute and relative results. OP&F and STRS both posted gains of over 18% however they underperformed their policy returns by 112 and 28 basis points respectively. For the five-year period, STRS had the best absolute results (-0.60%), but on a relative basis, HPRS exceeded its policy by the greatest margin (214 basis points). No fund had positive international equity performance for the five-year period.

All returns are for periods ending 6/30/2003. Returns for periods longer than one year are annualized.

## Real Estate Returns

Real Estate Return vs. Policy Benchmark					
<b>Fund</b>	<b>One Quarter</b>	<b>Two Quarters</b>	<b>One Year</b>	<b>Three Years</b>	<b>Five Years</b>
<b>HPRS</b>					
Actual	2.98%	4.32%	6.01%	10.03%	8.80%
Policy	1.80%	3.48%	6.20%	7.31%	9.63%
Difference	1.18%	0.84%	-0.19%	2.72%	-0.83%
<b>OP&amp;F</b>					
Actual	2.10%	5.69%	10.61%	9.16%	10.20%
Policy	2.09%	4.02%	7.67%	4.95%	7.12%
Difference	0.01%	1.67%	2.94%	4.21%	3.08%
<b>PERS</b>					
Actual	3.88%	5.40%	6.35%	9.67%	9.05%
Policy	2.89%	4.49%	6.48%	9.54%	8.36%
Difference	0.99%	0.91%	-0.13%	0.13%	0.69%
<b>SERS</b>					
Actual	4.05%	3.71%	5.59%	5.43%	7.69%
Policy	4.08%	5.62%	6.65%	8.38%	10.14%
Difference	-0.03%	-1.91%	-1.06%	-2.95%	-2.45%
<b>STRS</b>					
Actual	2.52%	3.59%	6.25%	7.50%	9.27%
Policy	3.05%	4.79%	6.92%	7.97%	8.82%
Difference	-0.53%	-1.20%	-0.67%	-0.47%	0.45%

Absolute real estate results for the five funds were all positive for the second quarter. SERS had the highest real estate return (+4.05%) followed by PERS (+3.88%), HPRS (+2.98%), STRS (+2.52%), and OP&F (+2.10%). 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 10.20% for the five years and outperformed its policy return by almost 300 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.

All returns are for periods ending 6/30/2003. Returns for periods longer than one year are annualized.

## 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>
<b>HPRS</b>					
Actual	N/A	N/A	N/A	N/A	N/A
Policy	N/A	N/A	N/A	N/A	N/A
Difference	N/A	N/A	N/A	N/A	N/A
<b>OP&amp;F</b>					
Actual	-4.59%	-11.84%	-22.92%	-22.56%	1.95%
Policy	-1.84%	7.06%	-19.03%	-11.14%	1.25%
Difference	-2.75%	-18.90%	-3.89%	-11.42%	0.70%
<b>PERS</b>					
Actual	2.15%	3.20%	-5.89%	-10.68%	6.70%
Policy	-2.32%	6.30%	-22.18%	-16.35%	-3.94%
Difference	4.47%	-3.10%	16.29%	5.67%	10.64%
<b>SERS</b>					
Actual	-2.64%	-8.97%	-17.99%	-25.87%	4.39%
Policy	-3.53%	5.05%	-21.76%	-12.57%	-1.18%
Difference	0.89%	-14.02%	3.77%	-13.30%	5.57%
<b>STRS</b>					
Actual	2.86%	2.00%	-12.56%	-10.99%	-2.26%
Policy	2.86%	2.00%	-12.56%	N/A	N/A
Difference	0.00%	0.00%	0.00%	N/A	N/A

For the second quarter STRS had the best absolute return (+2.86), while PERS had the best relative results, outperforming its policy return by 447 basis points. For the five-year period, PERS had the best absolute and relative results, returning a positive 6.70% and beating the policy return by 10.64% 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.

All returns are for periods ending 6/30/2003. Returns for periods longer than one year are annualized.

## Long-Term Results vs. Targets

### Long Term Return - 9<sup>1/2</sup> Years

	Actual Return	Benchmark Actual Return	Actuarial Interest Rate	Valuation Date
<b>HPRS</b>	5.95%	8.43%	8.00%	1/1/2003
<b>OP&amp;F</b>	7.48%	7.18%	8.25%	1/1/2003
<b>PERS</b>	6.09%	6.73%	8.00%	7/1/2003
<b>SERS</b>	7.89%	8.06%	8.25%	1/1/2003
<b>STRS</b>	6.97%	7.57%	7.75%	7/1/2003

The table above provides a long-term look at how the systems have performed compared to their policy returns and also compared to their actuarial interest rate. For the nine and one half year period ending June 30, 2003, no fund has outperformed its actuarial interest rate. On a relative basis, only OP&F has exceeded their policy return over the nine and one half 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.



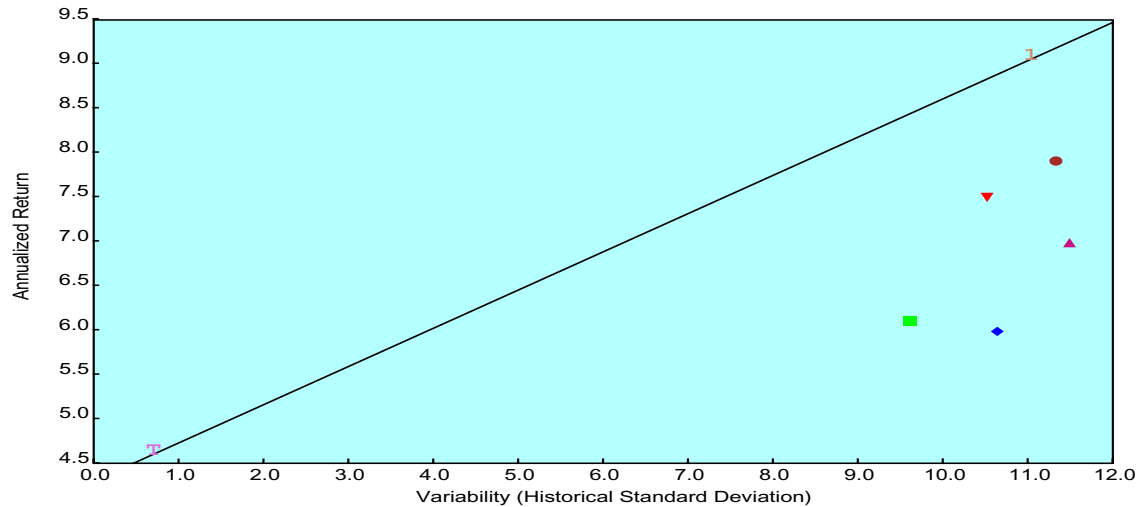
## Universe Comparisons

### Public Fund Universe Peer Rankings

	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>HPRS</b>	12	15	57	55	95
<b>OP&amp;F</b>	22	26	73	72	77
<b>PERS</b>	9	16	67	77	72
<b>SERS</b>	16	34	89	92	70
<b>STRS</b>	12	26	82	90	77

The public funds universe in the Wilshire Co-operative consists of 167 federal, state and local funds. For the most recent quarter, all five of the Ohio systems ranked in the top quartile. PERS had the best second quarter ranking, placing in the 9<sup>th</sup> percentile while OP&F had the lowest ranking placing in the 22<sup>nd</sup> percentile. Over the longer term, the systems haven't fared as well. Two of the funds (SERS & PERS) have placed in the low third quartile while the remaining three systems (HPRS, OP&F, and STRS) placed in the fourth quartile. HPRS had the worst five-year ranking, placing the fund in the bottom decile of all public funds.

### Quarterly Total Return Market Line Analysis Periods from 12/93 to 6/03



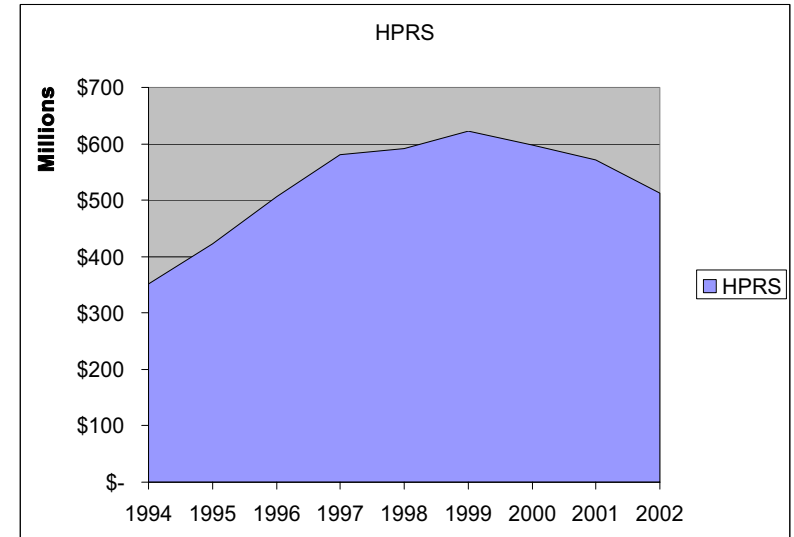
	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	5.97	10.71	1.34	0.13
■ PERS	6.09	9.68	1.46	0.15
▼ OP&F	7.48	10.59	2.86	0.27
● SERS	7.89	11.40	3.26	0.29
▲ STRS	6.97	11.56	2.34	0.20
┌ 60/40 Index	9.08	11.09	4.45	0.40
┐ 91-Day Treasury Bill	4.63	0.77	0.00	0.00

The Capital Market Line above plots the nine and one half 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
<b>US Equity</b>					
Actual	17.66%	13.92%	1.22%	-7.96%	-5.26%
Benchmark	17.02%	12.97%	0.20%	-8.43%	0.31%
Difference	0.64%	0.95%	1.02%	0.47%	-5.57%
<b>Fixed Income</b>					
Actual	2.43%	4.69%	10.65%	10.42%	7.81%
Benchmark	2.50%	3.93%	10.40%	10.08%	7.54%
Difference	-0.07%	0.76%	0.25%	0.34%	0.27%
<b>Intl. Equity</b>					
Actual	20.72%	8.10%	-8.79%	-11.13%	-1.86%
Benchmark	19.27%	9.47%	-6.46%	-13.52%	-4.00%
Difference	1.45%	-1.37%	-2.33%	2.39%	2.14%
<b>Real Estate</b>					
Actual	2.98%	4.32%	6.01%	10.03%	8.80%
Benchmark	1.80%	3.48%	6.20%	7.31%	9.63%
Difference	1.18%	0.84%	-0.19%	2.72%	-0.83%



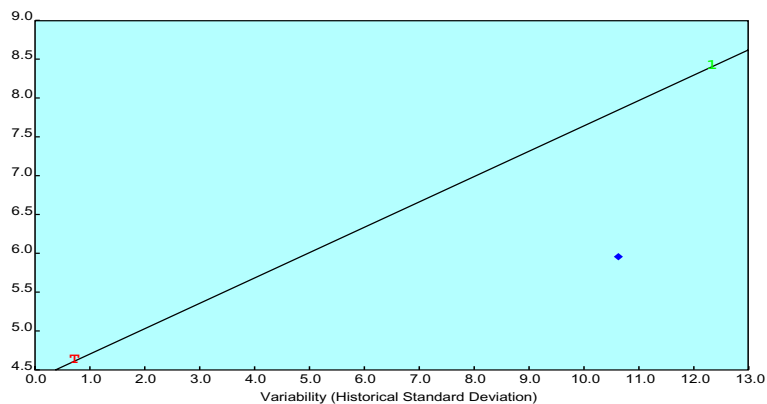
## Asset Mix

### Actual

### June 30, 2003 Target Difference

	Actual	Target	Difference
US Equity	50.2%	48.0%	2.2%
Intl. Equity	12.7%	15.0%	-2.3%
Alternative Assets	0.0%	0.0%	0.0%
<i>Total Equity</i>	63.0%	63.0%	0.0%
Fixed Income	23.6%	25.0%	-1.4%
Real Estate	13.3%	12.0%	1.3%
Short Term Investments	0.2%	0.0%	0.2%
<i>Total Debt</i>	37.1%	37.0%	0.0%
	100.0%	100.0%	0.0%

Periods from 12/93 to 6/03



Annualized Return	Variability	Reward	Sharpe Ratio
5.95	10.69	1.32	0.12
8.43	12.38	3.80	0.31
4.63	0.77	0.00	0.00

- ◆ HPRS
- Policy Index
- ▲ 91-Day Treasury Bill

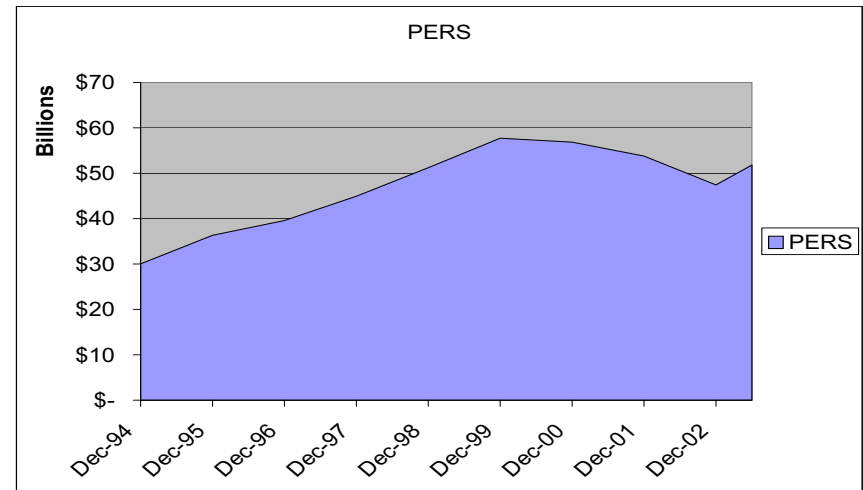
## Characteristic Data

Assets @ 6-30-2003: \$ 553,155,478  
 Actuarial Interest Rate: 8.00%  
 Investment Staff Size: 1  
 2003 Investment Budget: \$ 2,275,000

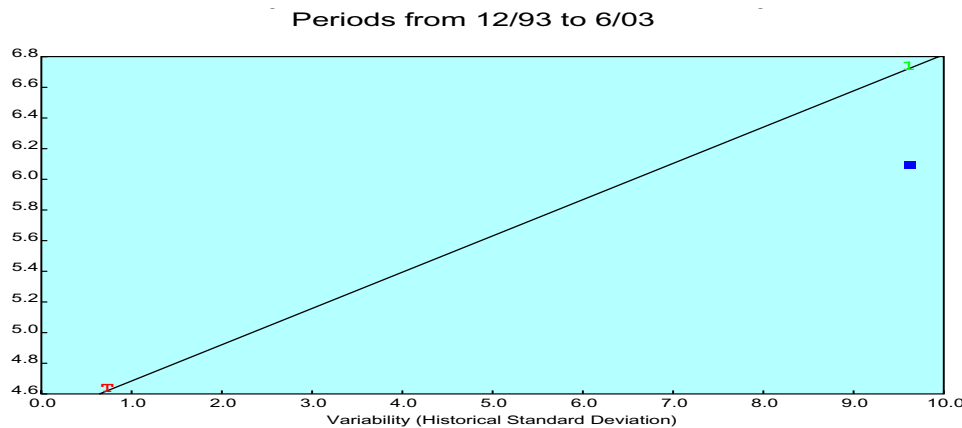
	Internal	External	Total
Active	1.6%	87.5%	89.1%
Passive	0.0%	10.9%	10.9%
Total	1.6%	98.4%	100.0%

# Public Employees Retirement System

PERS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	16.23%	12.72%	1.07%	-9.52%	-1.58%
Benchmark	16.25%	12.70%	0.75%	-9.87%	-0.69%
Difference	-0.02%	0.02%	0.32%	0.35%	-0.89%
<b>Fixed Income</b>					
Actual	3.15%	5.20%	11.92%	10.19%	7.58%
Benchmark	3.09%	4.96%	11.55%	10.41%	7.72%
Difference	0.06%	0.24%	0.37%	-0.22%	-0.14%
<b>Intl. Equity</b>					
Actual	19.83%	10.40%	-4.77%	-12.97%	-1.91%
Benchmark	19.58%	10.73%	-4.60%	-12.76%	-2.78%
Difference	0.25%	-0.33%	-0.17%	-0.21%	0.87%
<b>Real Estate</b>					
Actual	3.88%	5.40%	6.35%	9.67%	9.05%
Benchmark	2.89%	4.49%	6.48%	9.54%	8.36%
Difference	0.99%	0.91%	-0.13%	0.13%	0.69%
<b>Private Equity</b>					
Actual	2.15%	3.20%	-5.98%	-10.68%	6.70%
Benchmark	-2.32%	6.30%	-22.18%	-16.35%	-3.94%
Difference	4.47%	-3.10%	16.20%	5.67%	10.64%



Asset Mix			
	Actual	Target	Difference
	June 30, 2003		
US Equity	46.8%	46.0%	0.8%
Intl. Equity	21.1%	20.0%	1.1%
Alternative Assets	0.6%	1.0%	-0.4%
Total Equity	68.4%	67.0%	1.4%
Fixed Income	22.2%	23.0%	-0.8%
Real Estate	8.0%	9.0%	-1.0%
Short Term Investments	1.4%	1.0%	0.4%
Total Debt	31.6%	33.0%	-1.4%
	100.0%	100.0%	0.0%



## Characteristic Data

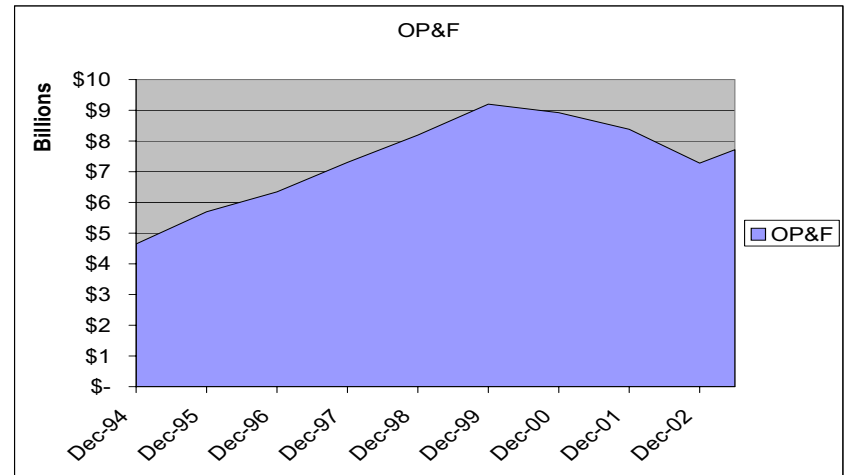
Assets @ 6-30-2003: \$ 51,801,615,943  
 Actuarial Interest Rate: 8%  
 Investment Staff Size: 60  
 2003 Investment Budget: \$ 83,924,000.00

	Annualized Return	Variability	Reward	Sharpe Ratio
PERS	6.09	9.68	1.46	0.15
PERS Policy Index	6.73	9.65	2.11	0.22
91-Day Treasury Bill	4.63	0.77	0.00	0.00

	Internal	External	Total
Active	27.5%	33.1%	60.5%
Passive	31.4%	8.0%	39.5%
Total	58.9%	41.1%	100.0%

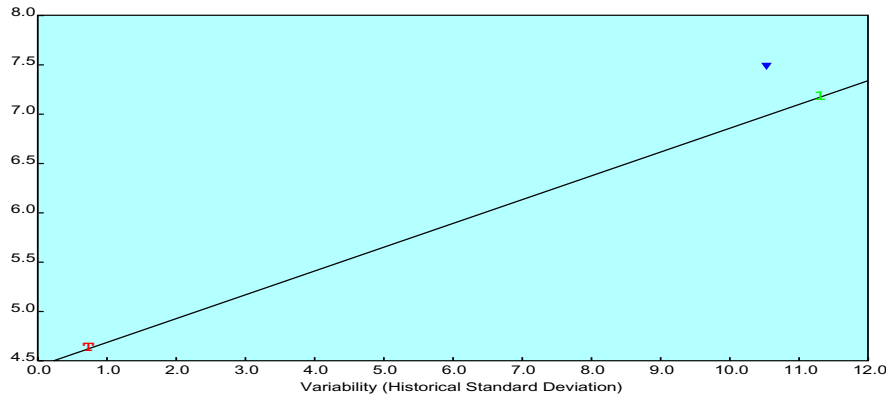
# Police & Fire Pension Fund

OP&F Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	15.89%	11.65%	-1.94%	-7.03%	-0.49%
Benchmark	16.50%	12.91%	1.28%	-10.58%	-1.30%
Difference	-0.61%	-1.26%	-3.22%	3.55%	0.81%
<b>Fixed Income</b>					
Actual	4.32%	7.20%	12.75%	10.97%	8.07%
Benchmark	2.50%	3.93%	10.40%	10.08%	7.54%
Difference	1.82%	3.27%	2.35%	0.89%	0.53%
<b>Intl. Equity</b>					
Actual	18.73%	9.39%	-5.46%	-14.75%	-3.27%
Benchmark	19.85%	11.10%	-4.19%	-12.48%	-2.81%
Difference	-1.12%	-1.71%	-1.27%	-2.27%	-0.46%
<b>Real Estate</b>					
Actual	2.10%	5.69%	10.61%	9.16%	10.20%
Benchmark	2.09%	4.02%	7.67%	4.95%	7.12%
Difference	0.01%	1.67%	2.94%	4.21%	3.08%
<b>Private Equity</b>					
Actual	-4.59%	-11.84%	-22.92%	-22.56%	1.95%
Benchmark	-1.84%	7.06%	-19.03%	-11.14%	1.25%
Difference	-2.75%	-18.90%	-3.89%	-11.42%	0.70%



Asset Mix			
	Actual	Target	Difference
	June 30, 2003		
US Equity	47%	48%	-1%
Intl. Equity	18%	20%	-2%
Alternative Assets	1%	1%	0%
<b>Total Equity</b>	<b>66%</b>	<b>69%</b>	<b>-3%</b>
Fixed Income	26%	23%	3%
Real Estate	7%	8%	-1%
Short Term Investments	1%	0%	1%
<b>Total Debt</b>	<b>34%</b>	<b>31%</b>	<b>3%</b>
	<b>100%</b>	<b>100%</b>	<b>0%</b>

Periods from 12/93 to 6/03



Annualized Return	Variability	Reward	Sharpe Ratio
7.48	10.59	2.86	0.27
7.18	11.35	2.55	0.22
4.63	0.77	0.00	0.00

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

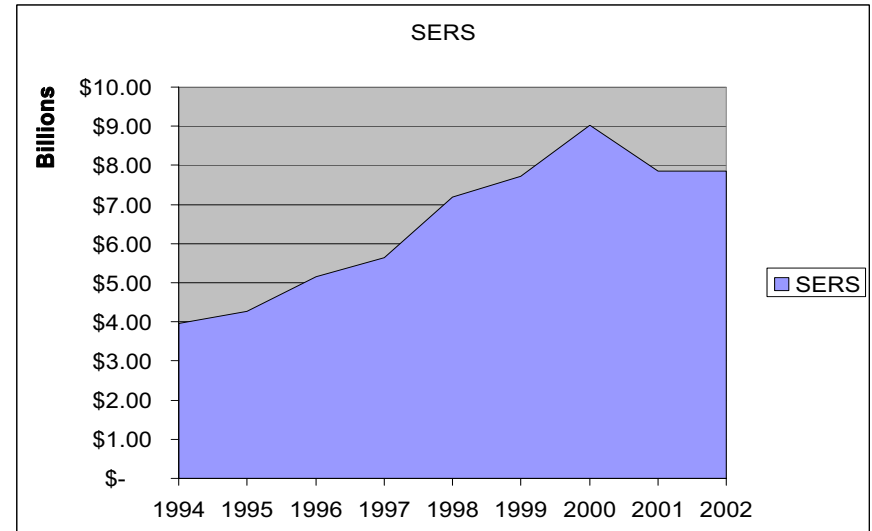
## Characteristic Data

Assets @ 6-30-2003: \$ 7,835,669  
 Actuarial Interest Rate: 8.25%  
 Investment Staff Size: 19  
 2003 Investment Budget: \$ 17,930,179

	Internal	External	Total
Active	0.0%	76.4%	76.4%
Passive	0.0%	23.6%	23.6%
<b>Total</b>	<b>0.0%</b>	<b>100.0%</b>	<b>100.0%</b>

# School Employees Retirement System

SERS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	16.73%	13.20%	0.19%	-10.93%	-1.15%
Benchmark	16.25%	12.70%	0.76%	-10.47%	-1.14%
Difference	0.48%	0.50%	-0.57%	-0.46%	-0.01%
<b>Fixed Income</b>					
Actual	2.91%	4.51%	11.12%	10.89%	7.97%
Benchmark	2.50%	3.93%	10.40%	10.08%	7.54%
Difference	0.41%	0.58%	0.72%	0.81%	0.43%
<b>Intl. Equity</b>					
Actual	18.60%	9.22%	-8.07%	-14.19%	-4.18%
Benchmark	17.85%	8.21%	-8.73%	-13.54%	-3.10%
Difference	0.75%	1.01%	0.66%	-0.65%	-1.08%
<b>Real Estate</b>					
Actual	4.05%	3.71%	5.59%	5.43%	7.69%
Benchmark	4.08%	5.62%	6.65%	8.38%	10.14%
Difference	-0.03%	-1.91%	-1.06%	-2.95%	-2.45%
<b>Private Equity</b>					
Actual	-2.64%	-8.97%	-17.99%	-25.87%	4.39%
Benchmark	-3.53%	5.05%	-21.76%	-12.57%	-1.18%
Difference	0.89%	-14.02%	3.77%	-13.30%	5.57%



## Asset Mix Actual

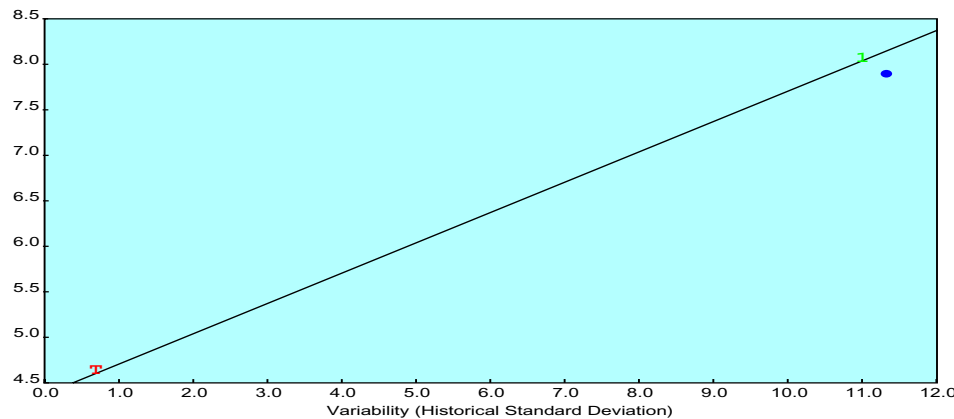
	June 30, 2003	Target	Difference
US Equity	48.4%	46.0%	2.4%
Intl. Equity	17.3%	16.0%	1.3%
Alternative Assets	1.3%	3.0%	-1.7%
Total Equity	67.0%	65.0%	2.0%
Fixed Income	22.7%	23.0%	-0.3%
Real Estate	9.6%	10.0%	-0.4%
Short Term Investments	0.7%	2.0%	-1.3%
Total Debt	33.0%	35.0%	-2.0%
	100.0%	100.0%	0.0%

## Characteristic Data

Assets @ 6-30-2003: \$ 7,236,358,866  
 Actuarial Interest Rate: 8.25%  
 Investment Staff Size:  
 2003 Investment Budget:

	Internal	External	Total
Active	0.00%	59.06%	59.06%
Passive	0.69%	40.24%	40.94%
Total	0.69%	99.31%	100.00%

Periods from 12/93 to 6/03

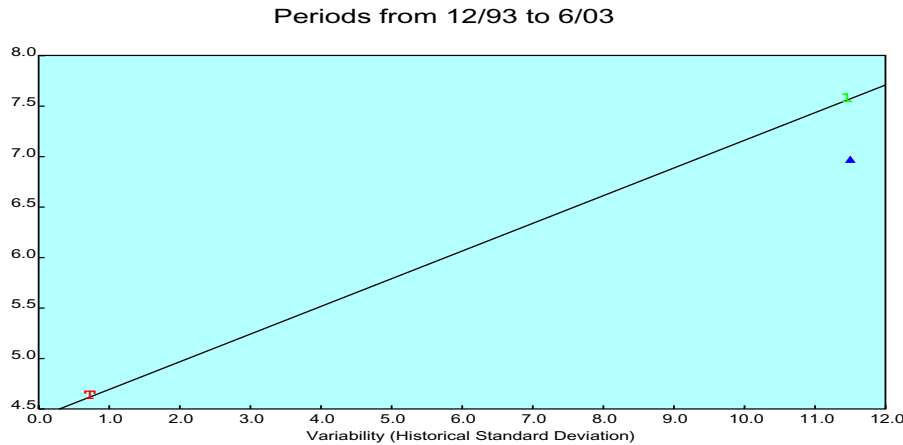
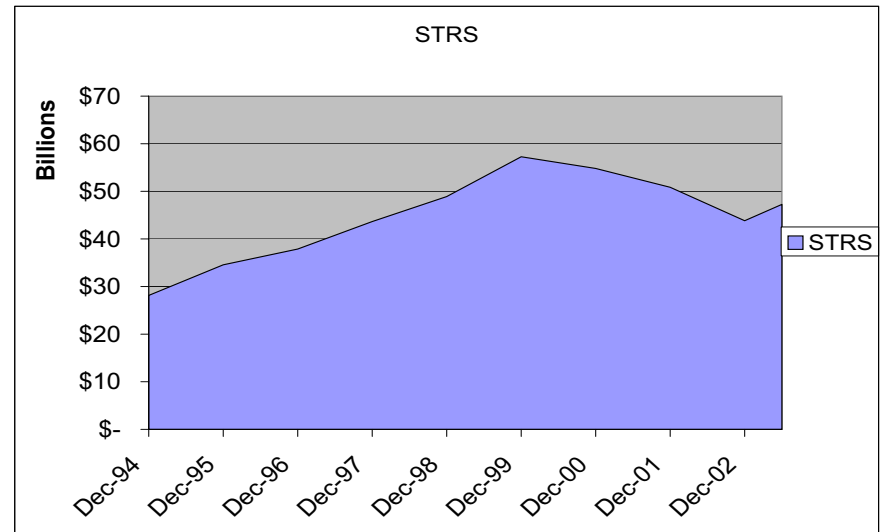


● SERS  
 ■ SERS Policy Index  
 ▲ 91-Day Treasury Bill

Annualized Return	Variability	Reward	Sharpe Ratio
7.89	11.40	3.26	0.29
8.06	11.06	3.44	0.31
4.63	0.77	0.00	0.00

# State Teachers Retirement System

STRS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	16.11%	12.30%	0.19%	-10.30%	-1.83%
Benchmark	15.88%	12.01%	0.18%	-10.25%	-0.97%
Difference	0.23%	0.29%	0.01%	-0.05%	-0.86%
<b>Fixed Income</b>					
Actual	3.24%	5.56%	12.99%	10.84%	8.07%
Benchmark	3.09%	4.96%	11.52%	10.00%	7.50%
Difference	0.15%	0.60%	1.47%	0.84%	0.57%
<b>Intl. Equity</b>					
Actual	18.51%	10.17%	-4.73%	-10.51%	-0.60%
Benchmark	18.79%	9.00%	-6.92%	-12.72%	-2.46%
Difference	-0.28%	1.17%	2.19%	2.21%	1.86%
<b>Real Estate</b>					
Actual	2.52%	3.59%	6.25%	7.50%	9.27%
Benchmark	3.05%	4.79%	6.92%	7.97%	8.82%
Difference	-0.53%	-1.21%	-0.67%	-0.47%	0.45%
<b>Private Equity</b>					
Actual	2.86%	2.00%	-12.56%	-10.99%	-2.26%
Benchmark	2.86%	2.00%	-12.56%	N/A	N/A
Difference	0.00%	0.00%	0.00%	N/A	N/A



	Annualized Return	Variability	Reward	Sharpe Ratio
▲ STRS	6.97	11.56	2.34	0.20
▲ STRS Policy Index	7.57	11.50	2.94	0.26
■ 91-Day Treasury Bill	4.63	0.77	0.00	0.00

Asset Mix			
	Actual	Target	Difference
June 30, 2003			
US Equity	46.0%	45.0%	1.0%
Intl. Equity	21.4%	20.0%	1.4%
Alternative Assets	2.2%	2.0%	0.2%
<i>Total Equity</i>	69.5%	67.0%	2.5%
Fixed Income	17.3%	23.0%	-5.7%
Real Estate	10.3%	9.0%	1.3%
Short Term Investments	2.9%	1.0%	1.9%
<i>Total Debt</i>	30.5%	33.0%	-2.6%
	100.0%	100.0%	0.0%

## Characteristic Data

Assets @ 6-30-2003: \$ 47,258,692,594  
 Actuarial Interest Rate: 7.75%  
 Investment Staff Size: 130  
 2003 Investment Budget: \$ 49,432,036

	Internal	External	Total
Active	64%	21%	85%
Passive	15%	0%	15%
Total	79%	21%	100%

# Ohio Retirement Study Council

**Performance Summary Table**  
Periods Ending 6/30/03

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	Since 6/30/96	Incept Date	Incept Ret
<b>HPRS</b>									
Total Return	12.10	9.96	15.71	3.88	-1.47	0.39	4.17	12/31/93	5.97
Equity	17.66	13.92	24.60	1.22	-7.96	-5.26	1.07	12/31/93	6.20
Fixed Income	3.20	5.49	5.82	11.48	10.70	7.98	8.20	12/31/93	7.33
Cash & Equiv	0.39	0.66	1.15	1.73	3.59	4.14	4.54	3/31/94	4.69
Real Estate	2.98	4.32	6.44	6.01	10.03	8.80	8.62	12/31/93	7.99
International Equity	20.72	8.10	15.01	-8.79	-11.13	-1.86	1.66	3/31/95	2.98
<b>PERS</b>									
Total Return	12.53	9.82	15.89	3.19	-2.88	1.95	5.28	12/31/93	6.09
Equity	16.23	12.73	21.83	1.07	-9.52	-1.58	5.58	12/31/93	7.35
Fixed Income	3.15	5.20	7.89	11.92	10.19	7.58	8.09	12/31/93	7.65
Cash & Equiv	0.30	0.60	0.97	1.43	3.22	4.14	4.58	12/31/93	4.75
Real Estate	3.88	5.40	6.52	6.35	9.67	9.05	10.15	12/31/93	10.16
International Equity	19.83	10.41	17.71	-4.77	-13.02	-1.93	1.03	12/31/95	0.28
Other	2.15	3.19	-6.30	-5.90	-10.68	6.70		12/31/96	1.91
<b>OP&amp;F</b>									
Total Return	11.66	9.47	14.44	2.93	-2.50	1.94	6.28	12/31/93	7.48
Equity	15.89	11.65	18.99	-1.94	-7.03	-0.49	6.76	12/31/93	9.06
Fixed Income	4.32	7.20	9.06	12.75	10.97	8.07	8.49	12/31/93	7.62
Cash & Equiv	0.33	0.63	1.06	1.52	3.34	4.16		9/30/96	4.22
Real Estate	2.10	5.69	8.02	10.61	9.16	10.20	10.73	12/31/93	10.40
International Equity	18.73	9.39	17.41	-5.46	-14.75	-3.27	0.81	9/30/94	2.74
Other	-4.59	-11.84	-15.10	-22.93	-22.56	1.95		12/31/96	-4.76
<b>SERS</b>									
Total Return	11.82	9.06	14.58	1.81	-4.34	2.00	6.54	12/31/93	7.89
Equity	16.73	13.20	21.80	0.19	-10.93	-1.15	6.62	12/31/93	9.46
Fixed Income	2.91	4.51	6.36	11.12	10.89	7.97	8.45	12/31/93	7.43
Cash & Equiv	0.27	0.55	0.91	1.28	4.30	4.70	4.93	12/31/93	5.00
Real Estate	4.05	3.71	5.56	5.59	5.43	7.69	8.98	12/31/93	9.28
International Equity	18.60	9.22	15.20	-8.07	-14.19	-4.18	0.69	9/30/94	3.00
Other	-2.64	-8.97	-13.43	-17.93	-25.87	4.39		12/31/96	-1.80

**Performance Summary Table**  
Periods Ending 6/30/03

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	Since 6/30/96	Incept Date	Incept Ret
<b>STRS</b>									
Total Return	12.08	9.38	15.44	2.32	-4.15	1.85	5.70	12/31/93	6.97
Equity	16.11	12.30	21.52	0.19	-10.30	-1.83	5.59	12/31/93	8.04
Fixed Income	3.24	5.56	9.00	12.99	10.84	8.07	8.98	12/31/93	8.34
Cash & Equiv	0.30	0.62	1.01	1.47	3.29	4.22	4.63	12/31/93	4.60
Real Estate	2.52	3.59	6.68	6.25	7.50	9.27	10.69	12/31/93	9.85
International Equity	18.51	10.17	15.72	-4.73	-10.51	-0.60	0.09	12/31/93	2.18
Other	2.86	2.00	-6.54	-12.56	-10.99	-2.26		12/31/96	-1.33
<b>Indices</b>									
								Since	
Russell 1000	15.74	12.35	21.51	0.96	-11.00	-1.25	7.10	12/31/93	9.91
Russell 2000	23.42	17.88	25.13	-1.65	-3.30	0.97	5.16	12/31/93	7.45
Russell 3000	16.25	12.70	21.75	0.76	-10.47	-1.14	6.83	12/31/93	9.61
Standard & Poors 500	15.39	11.76	21.17	0.22	-11.21	-1.61	7.09	12/31/93	10.03
S&P 500 Equal Wtd	21.72	16.00	31.13	4.41	2.24	3.32	9.41	12/31/93	11.43
S&P 600 Small Cap	19.88	12.94	18.49	-3.56	2.43	3.73	8.29	12/31/93	9.67
S&P MidCap 400	17.64	12.31	18.86	-0.82	0.96	7.14	11.99	12/31/93	12.45
Wilshire 5000	16.50	12.91	21.74	1.27	-10.58	-1.30	6.57	12/31/93	9.40
LB Aggregate	2.50	3.93	5.56	10.40	10.08	7.54	8.05	12/31/93	7.31
SB Broad Inv Grade	2.56	4.01	5.67	10.53	10.09	7.53	8.05	12/31/93	7.32
MSCI EAFE (Net)	19.27	9.47	16.54	-6.46	-13.52	-4.00	-0.34	12/31/93	2.14
MSCI Em Mkts Free (G	23.38	16.14	27.79	6.96	-7.02	2.52	-3.51	12/31/93	-2.89
MSCI World Ex-US (Ne	19.22	10.25	17.46	-5.58	-13.32	-3.65	0.03	12/31/93	2.42
LB Mortgage	0.67	1.60	2.98	5.72	8.64	6.97	7.55	12/31/93	7.11
NCREIF	2.09	4.02	5.78	7.67	8.28	9.84	11.03	12/31/93	10.09

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.

# Ohio Retirement Study Council

**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.

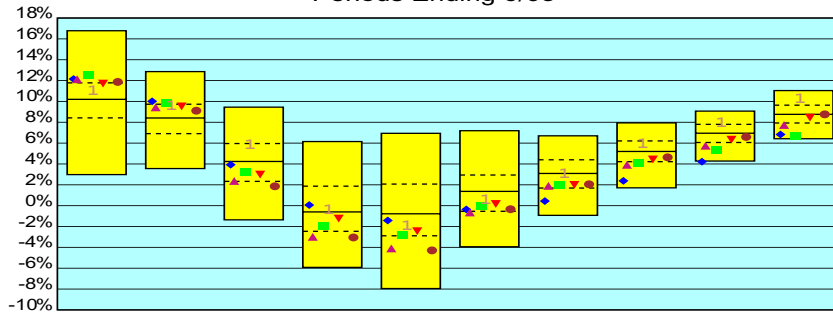
**MSCI World Ex-US** – An index that measures the performance of the stock markets of the following developed countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Norway 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.

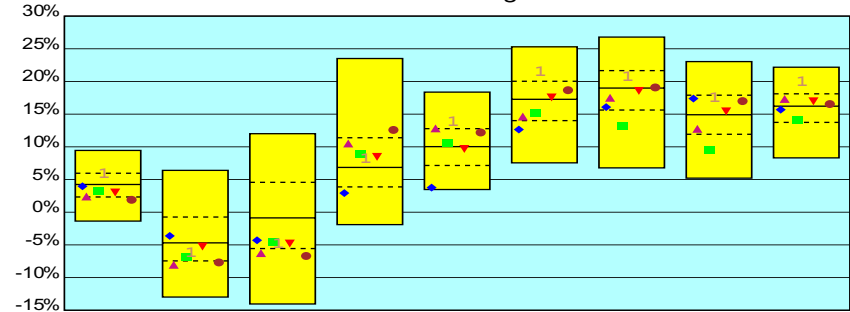
# Ohio Retirement Study Council

Cumulative Performance Comparison  
Total Returns of Total Fund Portfolios  
Periods Ending 6/03



	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
High	16.78	12.86	9.45	6.15	6.94	7.19	6.70	7.94	9.07	11.04
1st Qt	11.78	9.73	5.96	1.87	2.07	2.94	4.40	6.21	7.80	9.64
Median	10.20	8.41	4.24	-0.60	-0.78	1.37	3.09	5.20	6.95	8.76
3rd Qt	8.42	6.91	2.33	-2.46	-2.89	-0.54	1.69	4.22	6.06	7.93
Low	2.98	3.56	-1.36	-5.92	-7.95	-3.94	-0.93	1.71	4.28	6.42
◆ HPRS Return	12.10	9.96	3.88	0.01	-1.47	-0.41	0.39	2.33	4.17	6.78
Rank	21	22	56	42	56	73	90	93	95	90
■ PERS Return	12.53	9.82	3.19	-2.01	-2.88	-0.09	1.95	4.03	5.28	6.68
Rank	17	23	65	71	74	71	68	77	87	92
▼ OP&F Return	11.66	9.47	2.93	-1.29	-2.50	0.11	1.94	4.38	6.28	8.39
Rank	26	29	67	61	71	69	69	71	67	64
● SERS Return	11.82	9.06	1.81	-3.10	-4.34	-0.39	2.00	4.59	6.54	8.71
Rank	24	36	80	80	84	73	68	65	62	51
▲ STRS Return	12.08	9.38	2.32	-3.04	-4.15	-0.70	1.85	3.87	5.70	7.69
Rank	21	31	75	79	84	77	71	79	83	79
⊠ Policy Index Return	10.90	9.47	5.78	-0.44	-1.96	0.44	2.96	5.83	7.83	10.13
Rank	37	29	27	47	64	66	53	35	24	15

Consecutive Performance Comparison  
Total Returns of Total Fund Portfolios  
Years Ending



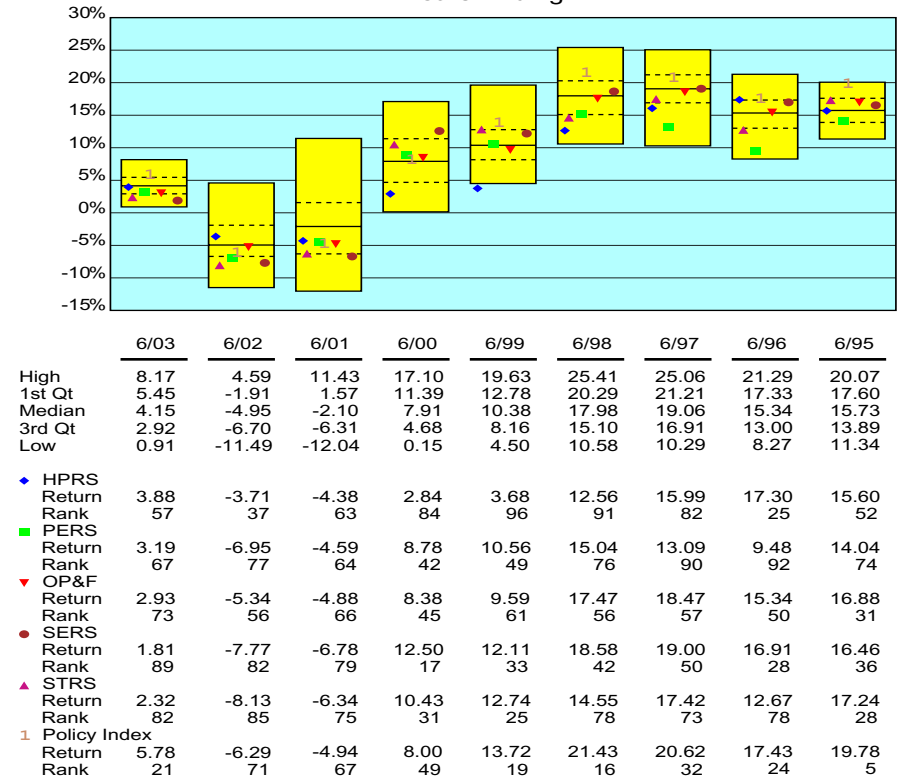
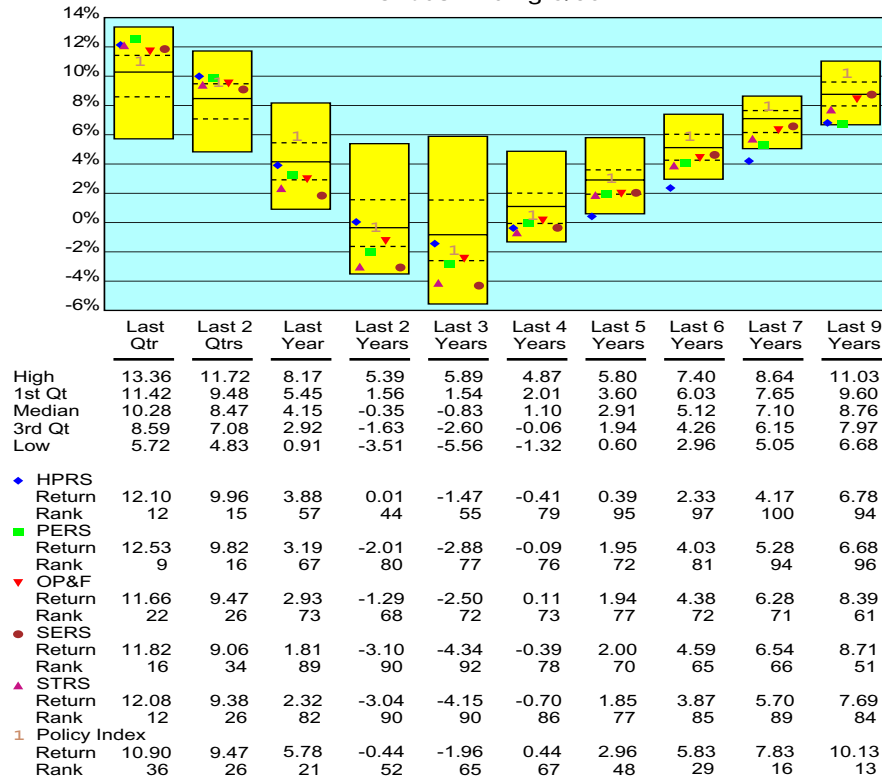
	Year 6/03	Year 6/02	Year 6/01	Year 6/00	Year 6/99	Year 6/98	Year 6/97	Year 6/96	Year 6/95
High	9.45	6.40	12.01	23.51	18.37	25.30	26.79	23.04	22.18
1st Qt	5.96	-0.74	4.57	11.39	12.78	20.03	21.66	17.90	18.11
Median	4.24	-4.69	-0.87	6.85	10.03	17.27	18.99	14.91	16.22
3rd Qt	2.33	-7.45	-5.56	3.87	7.15	14.01	15.63	11.92	13.74
Low	-1.36	-12.98	-14.04	-1.90	3.47	7.55	6.78	5.21	8.31
◆ HPRS Return	3.88	-3.71	-4.38	2.84	3.68	12.56	15.99	17.30	15.60
Rank	56	41	68	81	93	82	72	28	56
■ PERS Return	3.19	-6.95	-4.59	8.78	10.56	15.04	13.09	9.48	14.04
Rank	65	70	69	37	44	67	83	84	73
▼ OP&F Return	2.93	-5.34	-4.88	8.38	9.59	17.47	18.47	15.34	16.88
Rank	67	56	71	39	54	47	55	45	38
● SERS Return	1.81	-7.77	-6.78	12.50	12.11	18.58	19.00	16.91	16.46
Rank	80	76	81	20	30	37	49	31	45
▲ STRS Return	2.32	-8.13	-6.34	10.43	12.74	14.55	17.42	12.67	17.24
Rank	75	79	78	29	25	71	63	71	34
⊠ Policy Index Return	5.78	-6.29	-4.94	8.00	13.72	21.43	20.62	17.43	19.78
Rank	27	65	71	41	18	16	34	27	10

This page compares the Total Fund results to a broad universe of total funds - 1279 other funds, including those of public, corporate, and multi-employer pension plans and totaling \$792.7 Billion in assets - over a nine-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 5<sup>th</sup> percentile, the higher dotted line is the 25<sup>th</sup> percentile (bottom of the first quartile), the solid line is the median, the lower dotted line is the 75<sup>th</sup> percentile (bottom of the third quartile) and the bottom of the bar is the 95<sup>th</sup> 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 nine years. The graph on the right is a consecutive performance comparison with twelve-month measurement periods ending 6/2003. The graph on the left shows that SERS has demonstrated the highest return for the nine-year period with an 8.71% per year return, which ranks the fund in the 51<sup>st</sup> percentile. The graph on the right shows that this nine-year ranking was achieved by above-median performance for 12 month periods ending 6/30 in 1995 through 2000.

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Total Fund Public Sponsors  
Periods Ending 6/03

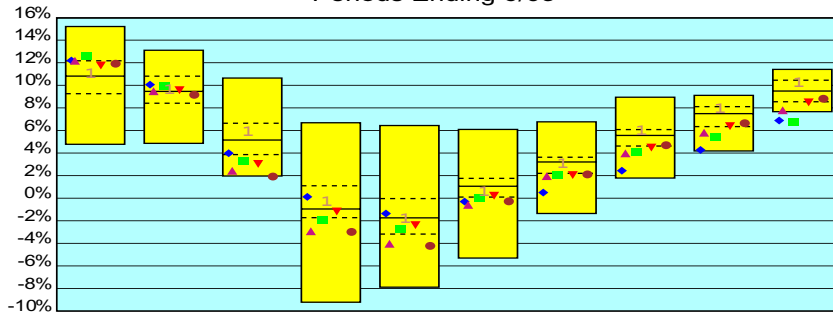
**Consecutive Performance Comparison**  
Total Returns of Total Fund Public Sponsors  
Years Ending



The graphs above compare the Total Fund results to a universe comprised solely of the 167 Public Retirement Systems in the universe. SERS is the only Ohio fund to rank near the median return for this universe over the last nine years. OP&F has displayed third quartile performance over the nine-year measurement period, while PERS, HPRS, and STRS have placed in the fourth quartile over the same nine-year period.

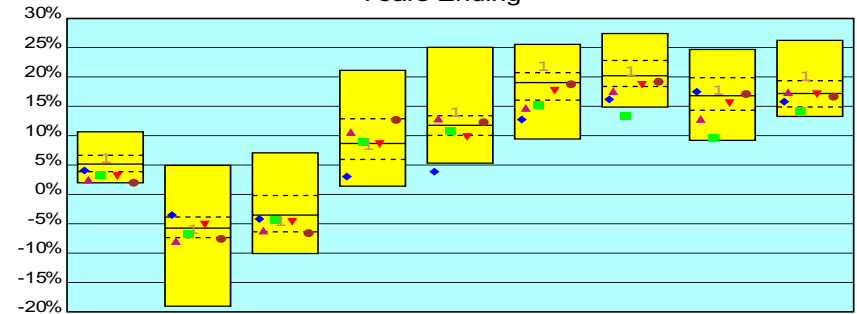
# Ohio Retirement Study Council

Total Returns of Total Fund Portfolios  
Total Market Value Over One Billion  
Periods Ending 6/03



	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
High	15.20	13.09	10.62	6.65	6.40	6.05	6.72	8.90	9.06	11.36
1st Qt	12.16	10.79	6.61	1.06	-0.08	1.71	3.58	6.03	8.06	10.40
Median	10.80	9.44	5.12	-1.00	-1.79	1.01	3.16	5.51	7.44	9.44
3rd Qt	9.24	8.39	3.83	-1.77	-3.23	0.05	2.15	4.57	6.29	8.49
Low	4.75	4.83	1.93	-9.27	-7.94	-5.36	-1.41	1.73	4.13	7.61
◆ HPRS Return Rank	12.10 28	9.96 35	3.88 73	0.01 34	-1.47 46	-0.41 81	0.39 88	2.33 92	4.17 93	6.78 99
■ PERS Return Rank	12.53 21	9.82 41	3.19 81	-2.01 79	-2.88 66	-0.09 75	1.95 75	4.03 81	5.28 88	6.68 99
▼ OP&F Return Rank	11.66 37	9.47 48	2.93 83	-1.29 55	-2.50 58	0.11 72	1.94 77	4.38 77	6.28 75	8.39 78
● SERS Return Rank	11.82 32	9.06 57	1.81 95	-3.10 89	-4.34 87	-0.39 81	2.00 75	4.59 72	6.54 70	8.71 65
▲ STRS Return Rank	12.08 28	9.38 53	2.32 93	-3.04 89	-4.15 83	-0.70 85	1.85 77	3.87 83	5.70 88	7.69 90
⊥ 60/40 Index Return Rank	10.90 44	9.47 48	5.78 37	-0.44 40	-1.96 54	0.44 60	2.96 54	5.83 31	7.83 30	10.13 30

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

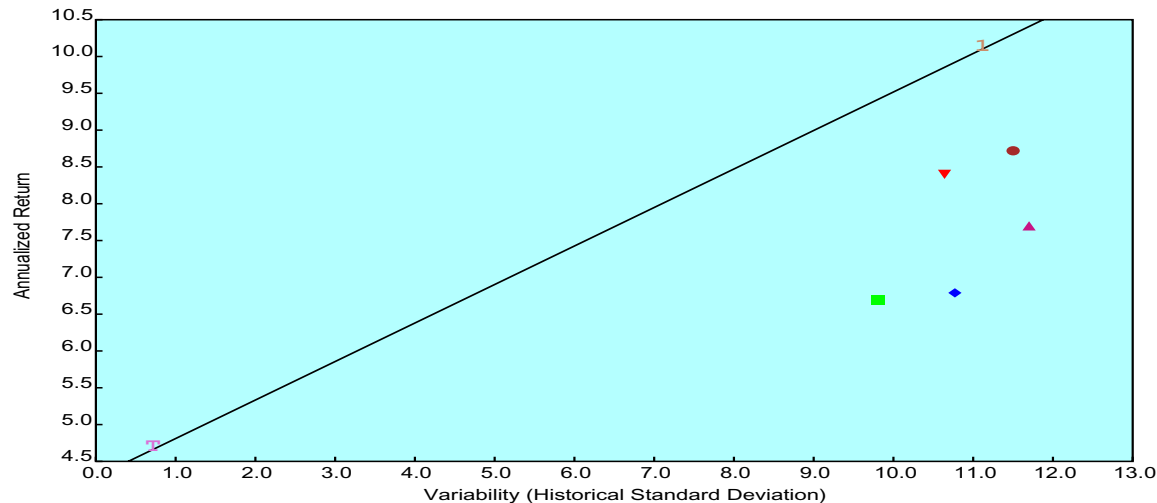


	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	10.62	4.89	7.02	21.07	24.99	25.48	27.32	24.60	26.14
1st Qt	6.61	-3.91	-0.25	12.82	13.33	20.66	22.73	19.79	19.27
Median	5.12	-5.80	-3.59	8.61	11.70	18.97	20.13	16.72	17.09
3rd Qt	3.83	-7.42	-6.44	5.89	9.98	15.98	18.30	14.24	14.79
Low	1.93	-19.11	-10.14	1.33	5.25	9.36	14.79	9.11	13.18
◆ HPRS Return Rank	3.88 73	-3.71 19	-4.38 61	2.84 91	3.68 99	12.56 88	15.99 91	17.30 47	15.60 62
■ PERS Return Rank	3.19 81	-6.95 63	-4.59 61	8.78 47	10.56 61	15.04 81	13.09 96	9.48 93	14.04 90
▼ OP&F Return Rank	2.93 83	-5.34 42	-4.88 61	8.38 52	9.59 79	17.47 56	18.47 70	15.34 66	16.88 53
● SERS Return Rank	1.81 95	-7.77 75	-6.78 77	12.50 27	12.11 45	18.58 50	19.00 55	16.91 47	16.46 59
▲ STRS Return Rank	2.32 93	-8.13 79	-6.34 73	10.43 39	12.74 27	14.55 81	17.42 83	12.67 80	17.24 47
⊥ 60/40 Index Return Rank	5.78 37	-6.29 51	-4.94 63	8.00 54	13.72 21	21.43 17	20.62 42	17.43 47	19.78 11

The charts above compare the total fund returns to a universe of large funds. This particular universe consists of 83 funds with total assets over one billion dollars. The combined assets of the 83 funds in this universe totals \$667.1 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 6/94 to 6/03

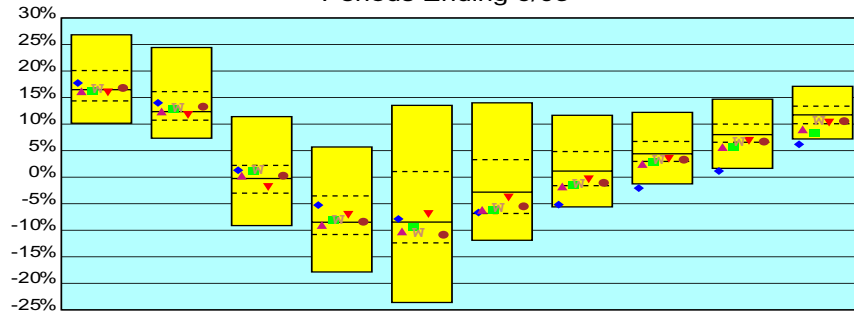


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	6.78	10.84	2.09	0.19
■ PERS	6.68	9.87	1.99	0.20
▼ OP&F	8.39	10.71	3.70	0.35
● SERS	8.71	11.57	4.02	0.35
▲ STRS	7.69	11.77	3.00	0.25
■ 60/40 Index	10.13	11.17	5.44	0.49
▲ 91-Day Treasury Bill	4.69	0.77	0.00	0.00

The graph above provides the first analysis of risk. The 9-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.

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Equity Portfolios  
Periods Ending 6/03

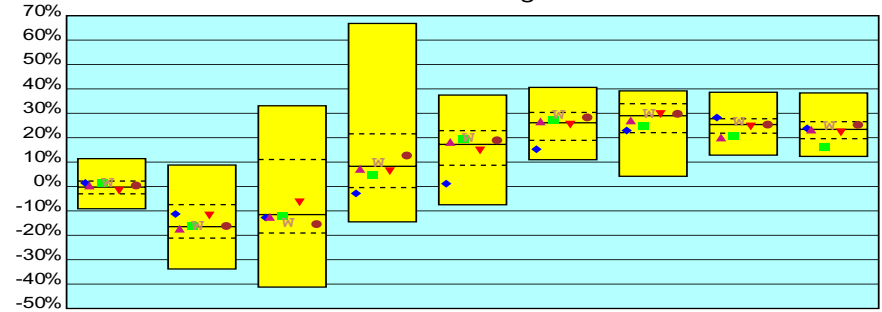


	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	26.83	24.43	11.41	5.69	13.53	14.01	11.66	12.21	14.69	17.12
1st Qt	20.09	16.12	2.22	-3.53	1.06	3.30	4.83	6.73	10.00	13.38
Median	16.49	12.35	-0.25	-8.49	-8.46	-2.82	1.15	4.41	8.02	11.74
3rd Qt	14.37	10.74	-3.01	-10.80	-12.38	-6.84	-1.60	2.97	6.58	10.07
Low	10.16	7.34	-9.12	-17.86	-23.61	-11.89	-5.60	-1.26	1.66	7.20

◆ HPRS Domestic Equity	Return	17.66	13.92	1.22	-5.35	-7.96	-6.75	-5.26	-2.15	1.07	6.10
	Rank	39	35	31	32	49	71	94	95	95	96
■ PERS Domestic Equity	Return	16.23	12.73	1.07	-8.10	-9.52	-6.19	-1.58	2.71	5.58	8.29
	Rank	52	44	32	47	54	68	74	80	82	91
▼ OP&F Domestic Equity	Return	15.89	11.65	-1.94	-7.18	-7.03	-3.92	-0.49	3.38	6.76	10.20
	Rank	55	63	65	41	47	55	63	62	72	73
● SERS Domestic Equity	Return	16.73	13.20	0.19	-8.48	-10.93	-5.58	-1.15	3.21	6.62	10.47
	Rank	47	39	46	49	61	65	67	65	74	70
▲ STRS Domestic Equity	Return	16.11	12.30	0.19	-9.09	-10.30	-6.25	-1.83	2.40	5.59	8.93
	Rank	53	50	46	55	57	68	79	81	82	89
W Wilshire 5000	Return	16.50	12.91	1.27	-8.11	-10.58	-5.93	-1.30	3.19	6.57	10.51
	Rank	49	41	30	47	59	66	68	65	75	69

**Consecutive Performance Comparison**  
Total Returns of Equity Portfolios  
Years Ending



	Year 6/03	Year 6/02	Year 6/01	Year 6/00	Year 6/99	Year 6/98	Year 6/97	Year 6/96	Year 6/95
High	11.41	8.79	33.08	66.82	37.47	40.61	39.18	38.62	38.34
1st Qt	2.22	-7.44	11.05	21.58	22.89	30.35	33.92	27.76	26.57
Median	-0.25	-16.47	-11.52	8.27	17.25	26.11	29.00	25.39	23.40
3rd Qt	-3.01	-21.16	-19.07	-0.44	8.70	18.91	22.07	21.84	19.60
Low	-9.12	-33.81	-41.23	-14.49	-7.49	10.97	4.18	12.85	12.33

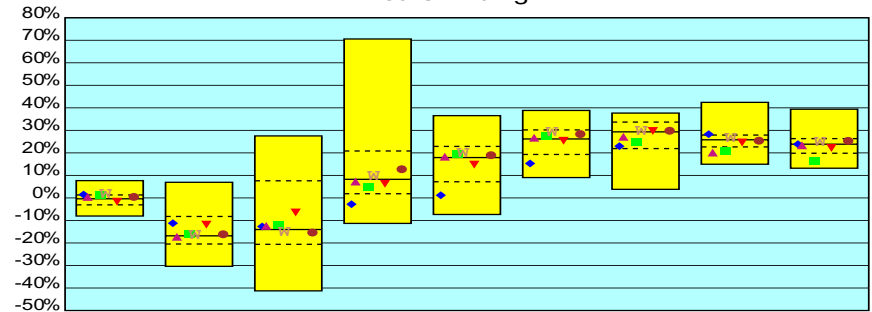
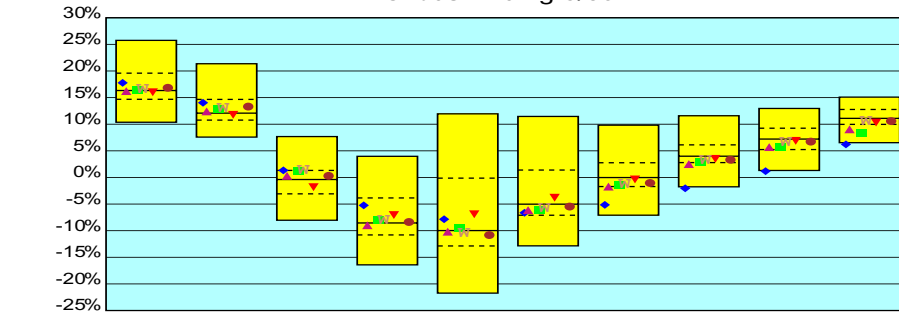
◆ HPRS Domestic Equity	Return	1.22	-11.49	-12.95	-3.05	0.93	15.04	22.71	28.03	23.59
	Rank	31	34	52	78	86	88	73	23	49
■ PERS Domestic Equity	Return	1.07	-16.44	-12.29	4.57	19.22	27.13	24.57	20.63	16.13
	Rank	32	49	51	67	43	46	67	80	88
▼ OP&F Domestic Equity	Return	-1.94	-12.13	-6.73	6.02	14.52	25.11	29.45	24.35	21.92
	Rank	65	36	44	64	58	53	47	58	59
● SERS Domestic Equity	Return	0.19	-16.40	-15.63	12.48	18.71	28.09	29.56	25.15	25.06
	Rank	46	49	68	40	45	42	46	52	40
▲ STRS Domestic Equity	Return	0.19	-17.51	-12.67	7.01	18.04	26.47	26.87	19.88	23.11
	Rank	46	54	52	61	47	48	60	82	51
W Wilshire 5000	Return	1.27	-16.62	-15.32	9.52	19.60	28.87	29.31	26.23	24.73
	Rank	30	50	67	46	42	40	47	35	43

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 9 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) and three of them (HPRS, PERS and OP&F) have outperformed the Wilshire 5000 index. The exhibit on the right displays performance by twelve-month periods ending June 30. 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, 1999 and 2000. Since then, results have rebounded nicely.

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Public Equity Portfolios  
Periods Ending 6/03

**Consecutive Performance Comparison**  
Total Returns of Public Equity Portfolios  
Years Ending



	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
High	25.75	21.36	7.68	3.97	11.95	11.46	9.82	11.59	12.96	15.09
1st Qt	19.59	14.66	1.32	-3.85	-0.13	1.39	2.76	6.12	9.25	12.77
Median	16.33	12.08	-0.39	-8.55	-9.98	-5.02	-0.02	3.99	7.21	11.10
3rd Qt	14.68	10.77	-3.08	-10.80	-12.87	-7.10	-1.71	2.79	5.24	9.97
Low	10.37	7.58	-8.04	-16.42	-21.73	-12.85	-7.09	-1.76	1.31	6.53
◆ HPRS Domestic Equity	Return 17.66	13.92	1.22	-5.35	-7.96	-6.75	-5.26	-2.15	1.07	6.10
	Rank 38	28	26	35	41	64	91	95	95	97
■ PERS Domestic Equity	Return 16.23	12.73	1.07	-8.10	-9.52	-6.19	-1.58	2.71	5.58	8.29
	Rank 50	41	27	46	47	59	71	76	72	91
▼ OP&F Domestic Equity	Return 15.89	11.65	-1.94	-7.18	-7.03	-3.92	-0.49	3.38	6.76	10.20
	Rank 54	63	66	42	38	45	54	60	65	66
● SERS Domestic Equity	Return 16.73	13.20	0.19	-8.48	-10.93	-5.58	-1.15	3.21	6.62	10.47
	Rank 46	34	45	49	56	54	60	61	66	64
▲ STRS Domestic Equity	Return 16.11	12.30	0.19	-9.09	-10.30	-6.25	-1.83	2.40	5.59	8.93
	Rank 51	47	45	56	51	59	76	77	72	89
W Wilshire 5000	Return 16.50	12.91	1.27	-8.11	-10.58	-5.93	-1.30	3.19	6.57	10.51
	Rank 48	37	25	47	52	56	63	62	66	63

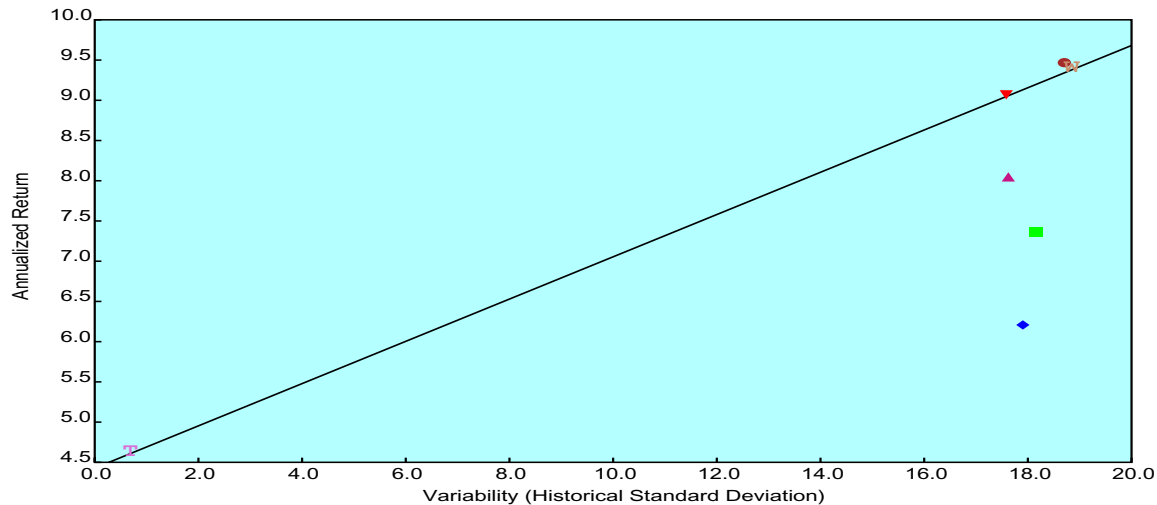
	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	7.68	6.94	27.53	70.57	36.53	38.84	37.67	42.43	39.39
1st Qt	1.32	-8.23	7.60	20.84	22.87	30.19	33.67	27.91	26.33
Median	-0.39	-16.83	-14.03	8.26	17.92	26.18	29.33	25.81	23.86
3rd Qt	-3.08	-20.46	-20.60	1.86	7.17	19.30	21.91	22.65	19.84
Low	-8.04	-30.38	-41.27	-11.32	-7.35	9.04	3.81	14.96	13.19
◆ HPRS Domestic Equity	Return 1.22	-11.49	-12.95	-3.05	0.93	15.04	22.71	28.03	23.59
	Rank 26	32	45	82	84	88	73	24	53
■ PERS Domestic Equity	Return 1.07	-16.44	-12.29	4.57	19.22	27.13	24.57	20.63	16.13
	Rank 27	48	43	70	44	45	70	84	89
▼ OP&F Domestic Equity	Return -1.94	-12.13	-6.73	6.02	14.52	25.11	29.45	24.35	21.92
	Rank 66	34	38	66	60	53	49	63	63
● SERS Domestic Equity	Return 0.19	-16.40	-15.63	12.48	18.71	28.09	29.56	25.15	25.06
	Rank 45	47	65	39	46	41	48	57	39
▲ STRS Domestic Equity	Return 0.19	-17.51	-12.67	7.01	18.04	26.47	26.87	19.88	23.11
	Rank 45	53	44	62	49	48	63	87	55
W Wilshire 5000	Return 1.27	-16.62	-15.32	9.52	19.60	28.87	29.31	26.23	24.73
	Rank 25	48	64	46	42	38	50	37	43

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 26<sup>th</sup> percentile (HPRS) to the 66<sup>th</sup> percentile (OP&F). Over the past five years, OP&F had the highest return and ranking (-0.49% and 54<sup>th</sup> percentile). All of the fund's domestic equity results fell short of the median portfolio for the five-year period. Two-year results are somewhat better with all of the funds near or above the median. Only three (HPRS, PERS, & OP&F), however, have outperformed the Wilshire 5000 Index.



# Ohio Retirement Study Council

## Quarterly Total Return Market Line Analysis Periods from 12/93 to 6/03



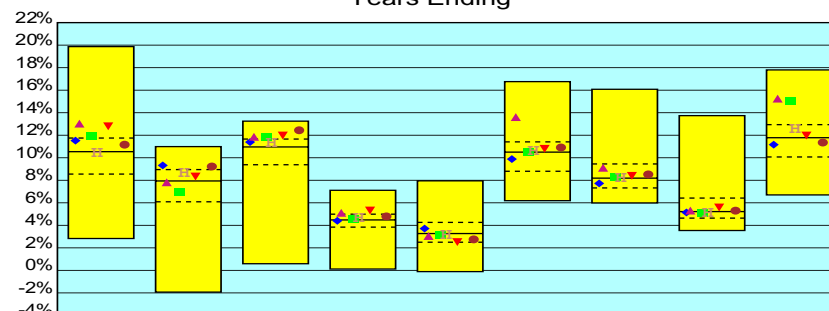
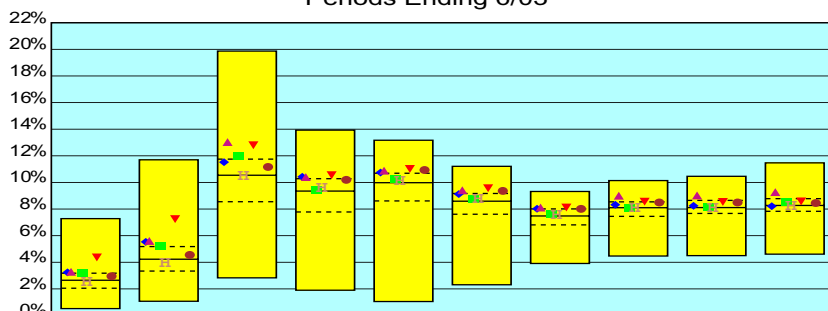
	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Equity	6.20	18.01	1.57	0.09
■ PERS Domestic Equity	7.35	18.26	2.72	0.15
▼ OP&F Domestic Equity	9.06	17.69	4.43	0.25
● SERS Domestic Equity	9.46	18.81	4.83	0.26
▲ STRS Domestic Equity	8.04	17.73	3.41	0.19
W Wilshire 5000	9.40	18.93	4.77	0.25
⌘ 91-Day Treasury Bill	4.63	0.77	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 9 and one half year period. SERS , in particular, had “above the line” risk-adjusted equity results and a Sharpe Ratio greater than the broad-market Wilshire 5000 index.

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Fixed Income Portfolios  
Periods Ending 6/03

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



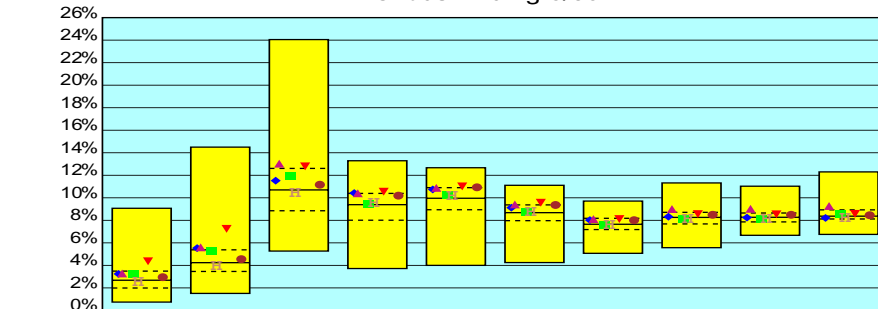
	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	7.28	11.70	19.87	13.93	13.17	11.21	9.32	10.14	10.46	11.47
1st Qt	3.18	5.18	11.75	10.28	10.69	9.17	8.01	8.54	8.65	8.78
Median	2.65	4.23	10.54	9.35	9.98	8.59	7.48	8.10	8.11	8.27
3rd Qt	2.05	3.34	8.55	7.78	8.61	7.61	6.81	7.45	7.67	7.83
Low	0.52	1.07	2.83	1.90	1.05	2.31	3.91	4.47	4.50	4.61
◆ HPRS Domestic Fixed Income										
Return	3.20	5.49	11.48	10.38	10.70	9.08	7.98	8.28	8.20	8.17
Rank	24	21	28	23	24	29	26	37	45	61
■ PERS Domestic Fixed Income										
Return	3.15	5.20	11.92	9.39	10.19	8.73	7.58	8.07	8.09	8.49
Rank	25	24	22	49	43	43	46	50	52	38
▼ OP&F Domestic Fixed Income										
Return	4.32	7.20	12.75	10.50	10.97	9.52	8.07	8.51	8.49	8.53
Rank	13	13	18	21	16	14	24	26	32	37
● SERS Domestic Fixed Income										
Return	2.91	4.51	11.12	10.15	10.89	9.32	7.97	8.45	8.45	8.41
Rank	32	40	38	28	20	20	26	28	35	39
▲ STRS Domestic Fixed Income										
Return	3.24	5.56	12.99	10.36	10.84	9.37	8.07	8.96	8.98	9.23
Rank	24	20	16	23	22	20	24	9	17	15
⊞ LB Aggregate										
Return	2.50	3.93	10.40	9.51	10.08	8.68	7.54	8.04	8.05	8.20
Rank	61	61	53	45	47	48	47	52	58	60

	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	19.87	10.99	13.25	7.11	7.95	16.76	16.08	13.74	17.80
1st Qt	11.75	8.95	11.66	4.99	4.26	11.41	9.45	6.42	12.94
Median	10.54	7.94	10.96	4.48	3.27	10.50	8.19	5.22	11.78
3rd Qt	8.55	6.09	9.38	3.84	2.50	8.80	7.32	4.64	10.07
Low	2.83	-1.93	0.59	0.12	-0.11	6.19	5.99	3.54	6.70
◆ HPRS Domestic Fixed Income									
Return	11.48	9.28	11.35	4.36	3.67	9.84	7.68	5.10	11.12
Rank	28	18	36	56	39	61	64	56	63
■ PERS Domestic Fixed Income									
Return	11.92	6.91	11.81	4.48	3.10	10.51	8.22	5.05	15.01
Rank	22	67	20	50	56	49	49	58	11
▼ OP&F Domestic Fixed Income									
Return	12.75	8.29	11.93	5.27	2.47	10.75	8.35	5.54	11.93
Rank	18	44	18	15	76	42	45	40	46
● SERS Domestic Fixed Income									
Return	11.12	9.18	12.40	4.75	2.71	10.87	8.48	5.26	11.31
Rank	38	20	11	36	69	38	41	48	60
▲ STRS Domestic Fixed Income									
Return	12.99	7.78	11.82	5.07	3.01	13.57	9.07	5.27	15.21
Rank	16	52	20	21	59	9	29	48	10
⊞ LB Aggregate									
Return	10.40	8.63	11.23	4.56	3.13	10.54	8.16	5.01	12.55
Rank	53	34	41	46	55	48	50	60	32

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 nine years, four of the fund's fixed income results are above the median, with HPRS placing in the 61<sup>st</sup> percentile. Over the last twelve months, the results have varied a bit. PERS, OP&F, and STRS placed in the top quartile, while HPRS and SERS placed in the second quartile. The graph on the right provides an analysis of the performance of twelve-month periods ending June 30<sup>th</sup>. The chart shows (for example) that STRS nine-year cumulative return was spurred by very strong performance in the twelve month periods ending June 30 in 1995, 1998, 2000, 2001 and 2003.

# Ohio Retirement Study Council

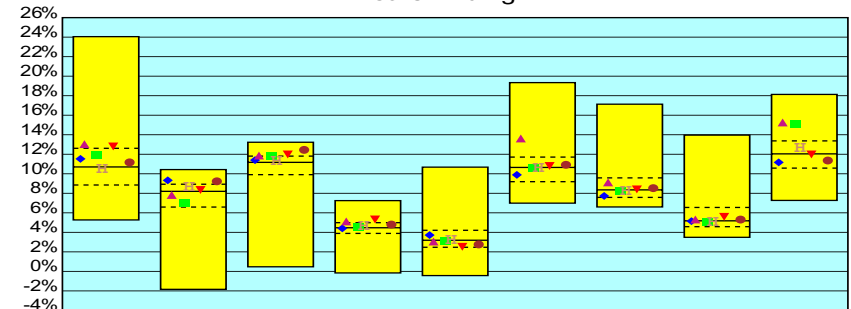
**Cumulative Performance Comparison**  
Total Returns of Public Fixed Income Portfolios  
Periods Ending 6/03



	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
High	9.07	14.50	24.05	13.29	12.67	11.11	9.71	11.32	11.03	12.30
1st Qt	3.49	5.38	12.61	10.39	10.90	9.37	8.18	8.71	8.65	8.93
Median	2.68	4.24	10.70	9.39	9.96	8.68	7.65	8.26	8.27	8.37
3rd Qt	1.99	3.46	8.85	8.01	8.94	7.97	7.18	7.68	7.86	8.12
Low	0.74	1.51	5.27	3.72	4.00	4.25	5.07	5.57	6.67	6.75

◆ HPRS Domestic Fixed Income	Return	3.20	5.49	11.48	10.38	10.70	9.08	7.98	8.28	8.20	8.17
	Rank	29	23	35	25	30	37	34	48	54	70
■ PERS Domestic Fixed Income	Return	3.15	5.20	11.92	9.39	10.19	8.73	7.58	8.07	8.09	8.49
	Rank	30	27	30	50	43	47	52	58	61	39
▼ OP&F Domestic Fixed Income	Return	4.32	7.20	12.75	10.50	10.97	9.52	8.07	8.51	8.49	8.53
	Rank	18	16	24	23	22	20	32	33	38	39
● SERS Domestic Fixed Income	Return	2.91	4.51	11.12	10.15	10.89	9.32	7.97	8.45	8.45	8.41
	Rank	38	41	41	29	25	25	34	38	39	41
▲ STRS Domestic Fixed Income	Return	3.24	5.56	12.99	10.36	10.84	9.37	8.07	8.96	8.98	9.23
	Rank	29	23	22	26	28	25	32	15	17	19
▣ LB Aggregate	Return	2.50	3.93	10.40	9.51	10.08	8.68	7.54	8.04	8.05	8.20
	Rank	62	63	58	46	47	50	57	58	64	70

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



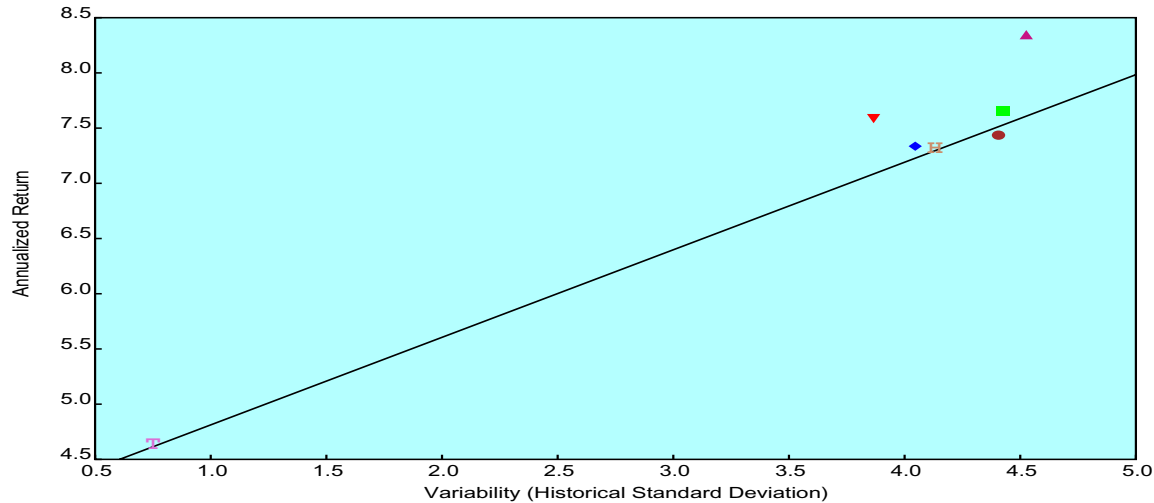
	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	24.05	10.43	13.23	7.25	10.68	19.34	17.13	13.96	18.13
1st Qt	12.61	8.93	11.81	4.99	4.21	11.71	9.58	6.55	13.37
Median	10.70	8.20	11.17	4.47	3.19	10.65	8.35	5.18	12.04
3rd Qt	8.85	6.59	9.91	3.89	2.47	9.19	7.58	4.58	10.58
Low	5.27	-1.84	0.47	-0.16	-0.43	6.99	6.60	3.49	7.27

◆ HPRS Domestic Fixed Income	Return	11.48	9.28	11.35	4.36	3.67	9.84	7.68	5.10	11.12
	Rank	35	16	42	58	38	67	71	55	68
■ PERS Domestic Fixed Income	Return	11.92	6.91	11.81	4.48	3.10	10.51	8.22	5.05	15.01
	Rank	30	71	25	49	56	54	54	57	14
▼ OP&F Domestic Fixed Income	Return	12.75	8.29	11.93	5.27	2.47	10.75	8.35	5.54	11.93
	Rank	24	47	22	16	75	46	50	39	51
● SERS Domestic Fixed Income	Return	11.12	9.18	12.40	4.75	2.71	10.87	8.48	5.26	11.31
	Rank	41	19	13	36	70	43	45	46	65
▲ STRS Domestic Fixed Income	Return	12.99	7.78	11.82	5.07	3.01	13.57	9.07	5.27	15.21
	Rank	22	57	24	23	58	13	33	45	13
▣ LB Aggregate	Return	10.40	8.63	11.23	4.56	3.13	10.54	8.16	5.01	12.55
	Rank	58	35	48	46	54	53	56	59	38

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 nine years (9.23%), while HPRS has had the worst fixed income performance over the same measurement period (8.17%). Four of the funds (PERS, OP&F, SERS, & STRS) outperformed the LB Aggregate Bond Market index for the same period, while HPRS underperformed the LB Aggregate by only a small margin.

# Ohio Retirement Study Council

## Quarterly Total Return Market Line Analysis Periods from 12/93 to 6/03

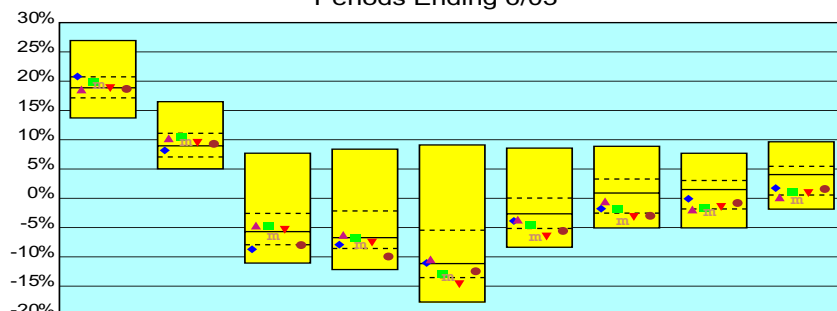


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Fixed Income	7.33	4.07	2.71	0.66
■ PERS Domestic Fixed Income	7.65	4.45	3.02	0.68
▼ OP&F Domestic Fixed Income	7.58	3.89	2.96	0.76
● SERS Domestic Fixed Income	7.43	4.43	2.80	0.63
▲ STRS Domestic Fixed Income	8.34	4.55	3.71	0.82
■ LB Aggregate	7.31	4.15	2.68	0.65
▲ 91-Day Treasury Bill	4.63	0.77	0.00	0.00

The risk-return analysis above shows that four of the funds' fixed income portfolios (HPRS, OP&F, PERS & STRS) have enjoyed risk-adjusted returns (as measured by their Sharpe Ratios) greater than the bond market as defined by the Lehman Aggregate Index. SERS cumulative return has outperformed the Lehman Aggregate Index over the observed 9 and one half year period, however its return volatility has resulted in a slightly lower Sharpe Ratio than the index.

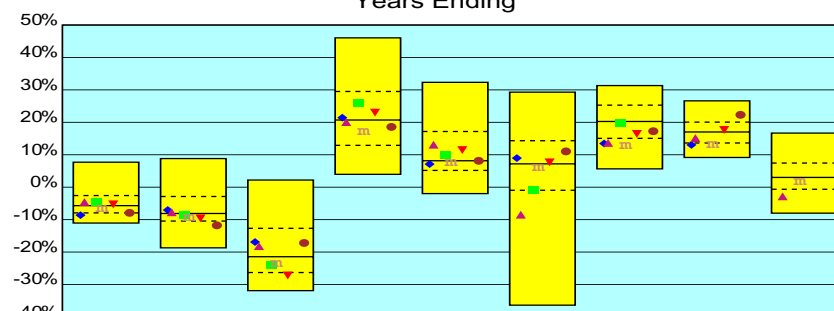
# Ohio Retirement Study Council

Cumulative Performance Comparison  
Total Returns of International Equity Portfolios  
Periods Ending 6/03



	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
High	26.94	16.50	7.70	8.39	9.11	8.57	8.88	7.69	9.65
1st Qt	20.74	11.10	-2.58	-2.16	-5.45	0.04	3.29	3.04	5.46
Median	18.87	8.96	-5.69	-6.72	-11.15	-2.65	0.90	1.49	4.05
3rd Qt	17.15	7.06	-7.93	-8.57	-13.54	-5.15	-2.53	-1.82	0.56
Low	13.72	5.04	-11.06	-12.17	-17.71	-8.36	-5.06	-5.05	-1.85
◆ HPRS Intn'l Equity									
Return	20.72	8.10	-8.79	-8.00	-11.13	-3.95	-1.86	-0.16	1.66
Rank	25	61	82	70	49	64	70	64	64
■ PERS Intn'l Equity									
Return	19.83	10.41	-4.77	-6.80	-13.02	-4.63	-1.93	-1.77	1.03
Rank	33	28	38	50	68	67	70	73	68
▼ OP&F Intn'l Equity									
Return	18.73	9.39	-5.46	-7.64	-14.75	-6.61	-3.27	-1.56	0.81
Rank	51	44	47	63	86	83	81	71	69
● SERS Intn'l Equity									
Return	18.60	9.22	-8.07	-10.02	-12.54	-5.65	-3.07	-0.88	1.51
Rank	53	45	75	87	66	76	79	66	65
▲ STRS Intn'l Equity									
Return	18.51	10.17	-4.73	-6.33	-10.51	-3.72	-0.60	-1.99	0.09
Rank	54	31	38	45	43	63	63	76	83
■ MSCI EAFE (Net)									
Return	19.27	9.47	-6.46	-7.99	-13.52	-6.70	-4.00	-2.39	-0.34
Rank	46	43	61	70	74	85	87	81	87

Consecutive Performance Comparison  
Total Returns of International Equity Portfolios  
Years Ending

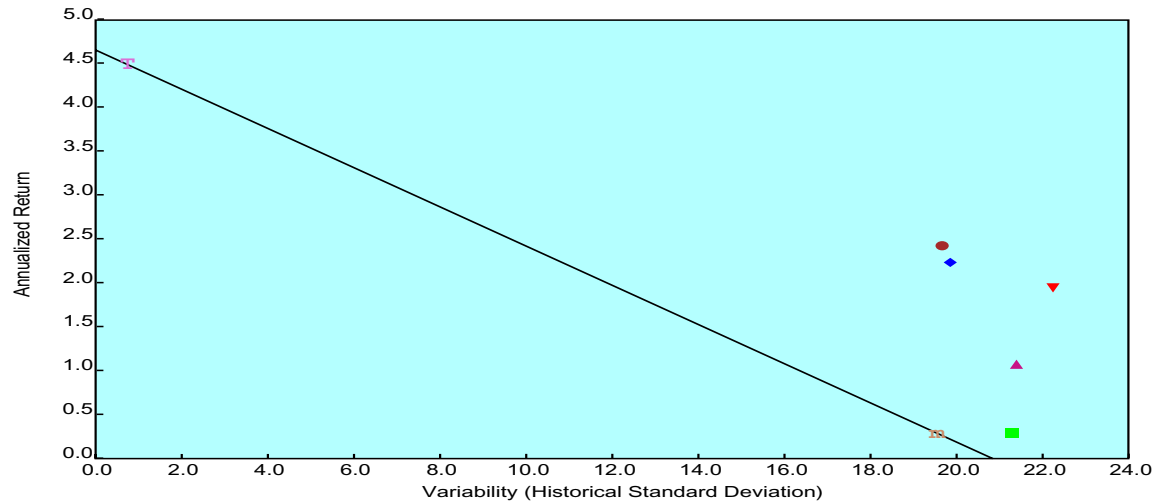


	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	7.70	8.82	2.20	46.04	32.33	29.30	31.33	26.62	16.68
1st Qt	-2.58	-2.87	-12.68	29.51	17.17	14.33	25.29	20.06	7.44
Median	-5.69	-8.11	-21.44	20.71	8.15	7.19	20.26	17.02	3.01
3rd Qt	-7.93	-10.44	-26.32	12.90	5.17	-0.95	15.06	13.63	-0.64
Low	-11.06	-18.70	-31.90	3.96	-1.98	-36.38	5.65	9.16	-8.01
◆ HPRS Intn'l Equity									
Return	-8.79	-7.20	-17.07	21.27	6.96	8.81	13.31	12.87	
Rank	82	42	32	49	60	40	80	83	
■ PERS Intn'l Equity									
Return	-4.77	-8.78	-24.25	25.72	9.63	-0.95	19.62		
Rank	38	58	64	33	41	75	54		
▼ OP&F Intn'l Equity									
Return	-5.46	-9.77	-27.38	22.82	11.29	7.49	16.26	17.49	
Rank	47	69	81	45	37	48	70	44	
● SERS Intn'l Equity									
Return	-8.07	-11.93	-17.36	18.42	7.97	10.87	17.10	22.15	
Rank	75	80	32	54	52	34	66	13	
▲ STRS Intn'l Equity									
Return	-4.73	-7.90	-18.33	19.90	12.94	-8.64	13.49	14.98	-2.98
Rank	38	46	34	51	34	82	79	66	83
■ MSCI EAFE (Net)									
Return	-6.46	-9.49	-23.61	17.18	7.59	6.09	12.84	13.28	1.66
Rank	61	67	60	61	55	55	85	80	60

The exhibits on this page and the one on the next page analyze the International Equity results of the five funds. Nine and one half year comparisons are not meaningful, since two of the funds have not had allocations to this asset class for that length of time. For the seven-year period ending 6/30/2003, 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 0.09% (STRS) to 1.66% (HPRS). STRS had the best International Equity return for the most recent twelve months, followed by PERS.

# Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis  
Periods from 12/95 to 6/03

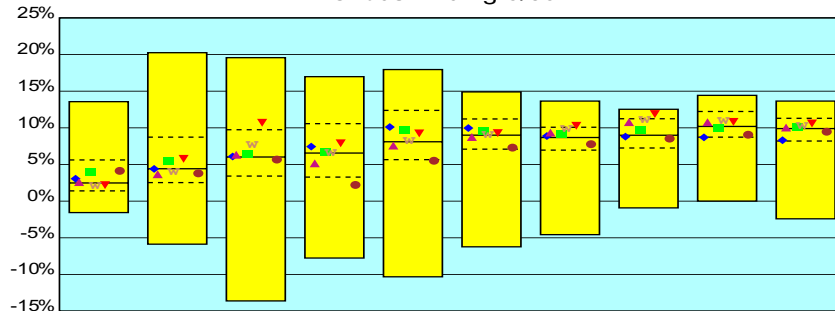


	Annualized Return	Variability	Reward
◆ HPRS Intn'l Equity	2.22	19.97	-2.26
■ PERS Intn'l Equity	0.28	21.40	-4.20
▼ OP&F Intn'l Equity	1.93	22.36	-2.55
● SERS Intn'l Equity	2.41	19.78	-2.07
▲ STRS Intn'l Equity	1.06	21.51	-3.43
■ MSCI EAFE (Net)	0.27	19.64	-4.21
▲ 91-Day Treasury Bill	4.48	0.80	0.00

On a risk-return basis, for the 7 years that all five funds have international equity data, the results are quite disparate. The international equity returns of all of the funds fell short of the T-bill return for the period. In this negative environment for international investing, PERS equalled the MSCI EAFE (net) Index while the other four funds outperformed it. Since negative Sharpe Ratios are not meaningful, they are not included in this exhibit.

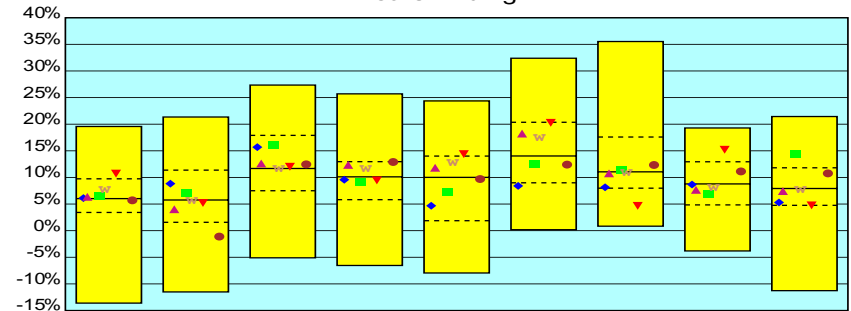
# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Real Estate Portfolios  
Periods Ending 6/03



	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
High	13.57	20.25	19.57	16.98	17.95	14.90	13.65	12.53	14.43	13.65
1st Qt	5.62	8.73	9.74	10.57	12.38	11.21	10.08	11.24	12.23	11.30
Median	2.48	4.42	6.02	6.56	8.10	9.00	8.68	8.99	10.19	9.90
3rd Qt	1.40	2.53	3.42	3.28	5.66	7.09	6.96	7.25	8.73	8.20
Low	-1.56	-5.87	-13.61	-7.76	-10.32	-6.23	-4.57	-0.92	0.01	-2.41
◆ HPRS Real Estate	Return 2.98	4.32	6.01	7.36	10.03	9.89	8.80	8.72	8.62	8.23
	Rank 37	52	50	44	38	34	49	57	75	72
■ PERS Real Estate	Return 3.88	5.40	6.35	6.67	9.67	9.53	9.05	9.61	9.84	9.99
	Rank 32	37	46	48	38	41	44	46	58	47
▼ OP&F Real Estate	Return 2.10	5.69	10.61	7.81	9.16	9.20	10.20	11.80	10.73	10.51
	Rank 58	35	16	39	42	44	23	11	42	37
● SERS Real Estate	Return 4.05	3.71	5.59	2.13	5.43	7.22	7.69	8.45	8.98	9.39
	Rank 31	63	53	80	77	70	65	64	69	56
▲ STRS Real Estate	Return 2.52	3.59	6.25	5.08	7.50	8.67	9.27	10.70	10.69	9.96
	Rank 46	65	46	63	57	52	38	33	42	47
Ⓜ NCREIF	Return 2.09	4.02	7.67	6.65	8.28	9.11	9.84	11.07	11.03	10.34
	Rank 58	58	40	49	46	48	28	28	41	43

**Consecutive Performance Comparison**  
Total Returns of Real Estate Portfolios  
Years Ending



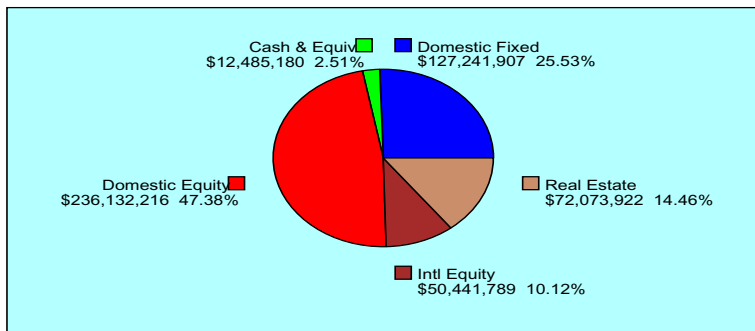
	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	19.57	21.35	27.35	25.70	24.37	32.39	35.53	19.29	21.44
1st Qt	9.74	11.37	17.90	12.96	14.01	20.36	17.59	12.94	11.81
Median	6.02	5.76	11.68	10.11	10.01	14.03	11.05	8.78	7.92
3rd Qt	3.42	1.57	7.50	5.82	1.87	8.99	7.98	4.84	4.76
Low	-13.61	-11.51	-5.10	-6.54	-7.95	0.18	0.84	-3.81	-11.27
◆ HPRS Real Estate	Return 6.01	8.72	15.58	9.46	4.57	8.30	8.04	8.56	5.19
	Rank 50	33	29	52	69	79	74	52	73
■ PERS Real Estate	Return 6.35	6.98	15.94	9.09	7.15	12.48	11.21	6.82	14.32
	Rank 46	43	28	54	60	59	45	63	12
▼ OP&F Real Estate	Return 10.61	5.09	11.90	9.33	14.27	20.15	4.55	15.09	4.64
	Rank 16	54	47	53	24	26	90	16	76
● SERS Real Estate	Return 5.59	-1.22	12.35	12.79	9.59	12.30	12.23	11.02	10.65
	Rank 53	86	40	26	54	60	42	36	33
▲ STRS Real Estate	Return 6.25	3.92	12.51	12.25	11.71	18.13	10.66	7.56	7.33
	Rank 46	59	39	30	41	33	53	59	58
Ⓜ NCREIF	Return 7.67	5.64	11.61	11.63	12.79	17.45	10.81	8.07	7.80
	Rank 40	52	51	35	33	36	51	57	52

The exhibits above evaluate the real estate returns for the five funds. For the nine-year cumulative period only one of the funds (OP&F) 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 10.61% return vs. 7.67% 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.

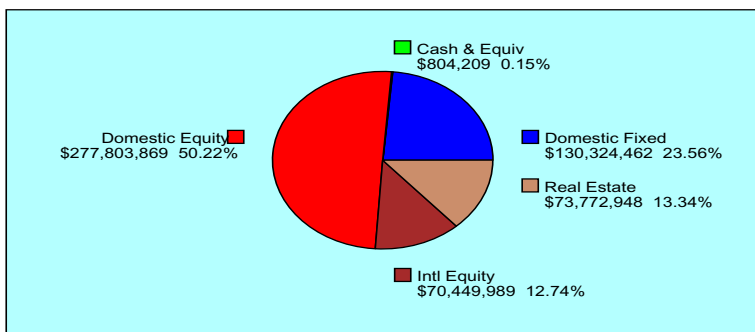
# Highway Patrol Retirement System

Asset Allocation  
HPRS

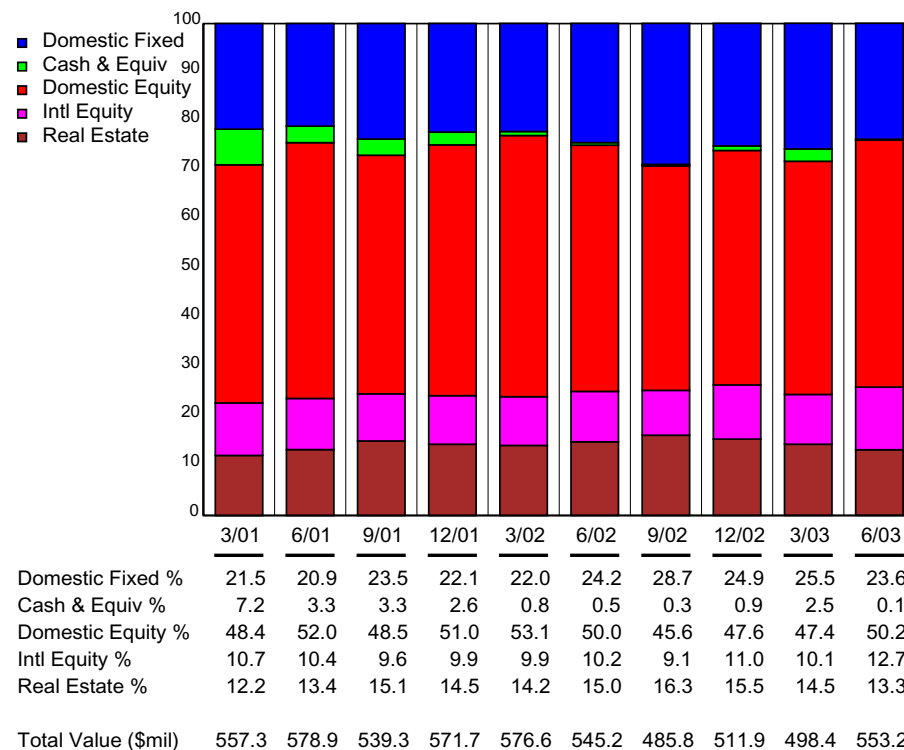
March 31, 2003 \$498,375,014



June 30, 2003 \$553,155,477



Asset Allocation  
HPRS



This page is 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 first 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

## Custom Benchmark Specification

### HPRS

Quarter Ending 6/30/2003

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	Jun-03	10.00	MSCI EAFE (Net)	
		16.00	Russell 2500	
		32.00	Standard & Poors 500	
		25.00	LB Aggregate	
		12.00	NCREIF	

HPRS' custom policy index is listed above. The chart tracks the fund's change in asset allocation strategy over the past 9 and one half years.

# Highway Patrol Retirement System

## Performance Overview

### HPRS

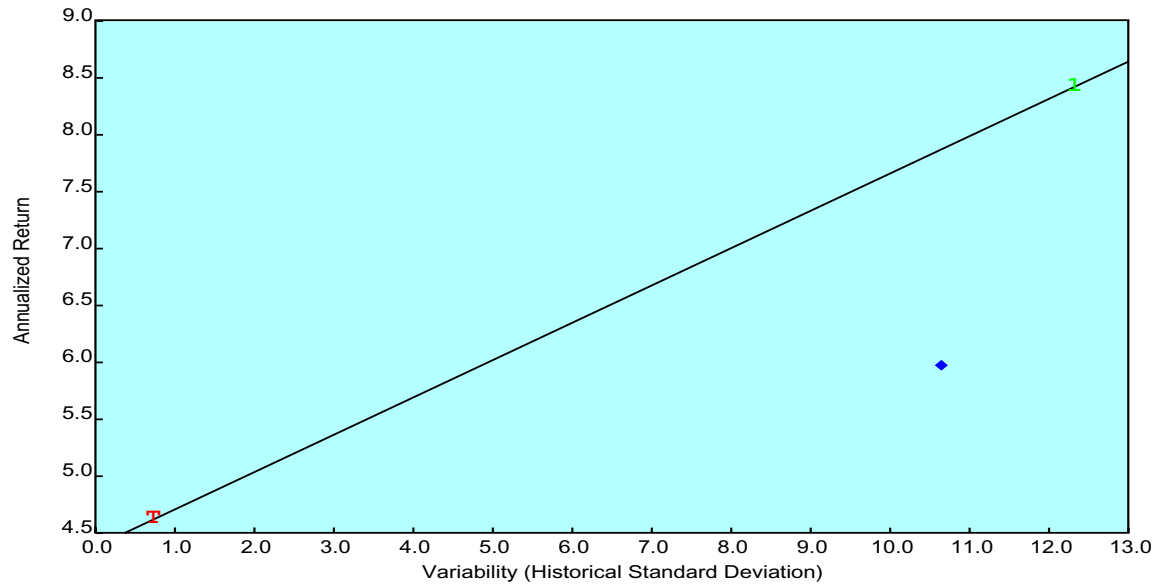
Returns for Periods Ending June 30, 2003

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	12.10	9.96	15.71	3.88	-1.47	0.39	5.97
Policy Index Return	12.16	9.52	15.87	2.46	-3.55	2.18	8.43
Domestic Equity Return	17.66	13.92	24.60	1.22	-7.96	-5.26	6.20
Equity Segment Median Return	16.84	12.50	21.05	-0.56	-9.61	-0.39	
Wilshire 5000	16.50	12.91	21.74	1.27	-10.58	-1.30	9.40
Int'l Equity Return	20.72	8.10	15.01	-8.79	-11.13	-1.86	
Int'l Equity Segment Median Return	18.53	9.21	16.36	-5.95	-12.02	-0.60	
MSCI EAFE (Net)	19.27	9.47	16.54	-6.46	-13.52	-4.00	2.14
Domestic Fixed Return	3.20	5.49	5.82	11.48	10.70	7.98	7.33
Fixed Income Segment Median Return	2.67	4.23	5.79	10.52	10.11	7.55	
LB Aggregate	2.50	3.93	5.56	10.40	10.08	7.54	7.31
Cash Return	0.39	0.66	1.15	1.73	3.59	4.14	
Real Estate Return	2.98	4.32	6.44	6.01	10.03	8.80	7.99
NCREIF	2.09	4.02	5.78	7.67	8.28	9.84	10.09

Over the entire nine and one half year period, the fund's total return is trailing its policy index by almost 2.5% annually. This is due almost entirely to its domestic equity returns, which lagged the broad market as defined by the Wilshire 5000 by 3.2% annually. The most recent twelve months, however, show that HPRS has outperformed its policy index by a substantial margin.

# Highway Patrol Retirement System

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/03



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	5.97	10.71	1.34	0.13
┆ HPRS Policy Index	8.43	12.37	3.80	0.31
┆ 91-Day Treasury Bill	4.63	0.77	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 December 31, 2002

---

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	31.09%	S & P 500	40%	-8.91%
Small/Mid Cap Equi	16.55%	Russell 2500	20%	-3.45%
Fixed Income	24.91%	LB Aggregate	20%	4.91%
Intl. Equity	11.00%	MSCI EAFE (Net)	10%	1.00%
Real Estate	15.51%	NCREIF	10%	5.51%
Short Term	0.93%		0%	0.93%

## June 30, 2003

---

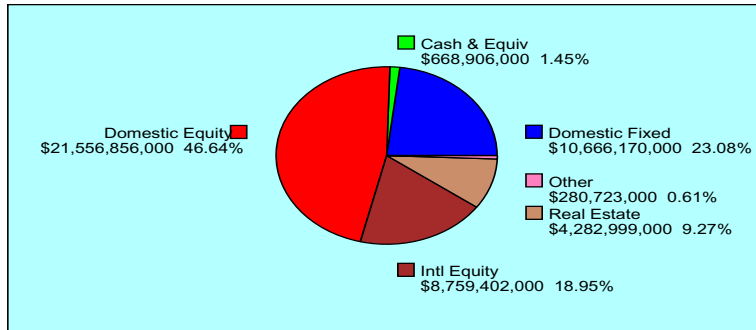
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	31.90%	S & P 500	32%	-0.10%
Small/Mid Cap Equi	18.32%	Russell 2500	16%	2.32%
Fixed Income	23.56%	LB Aggregate	25%	-1.44%
Intl. Equity	12.74%	MSCI EAFE (Net)	15%	-2.26%
Real Estate	13.34%	NCREIF	12%	1.34%
Short Term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

As of the end of the second quarter, the HPRS fund has been underweight in fixed income and international equity and overweight in small/mid cap equity and real estate.

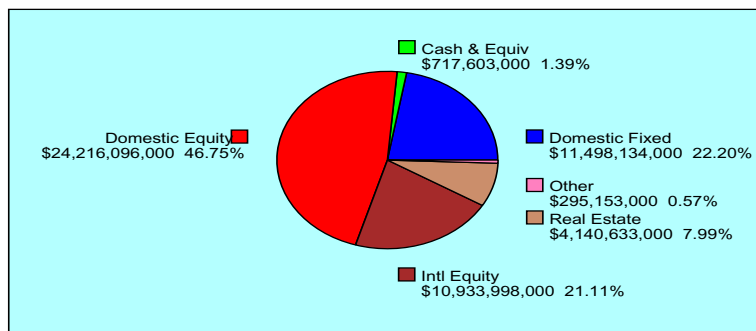
# Public Employees Retirement System

Asset Allocation  
PERS

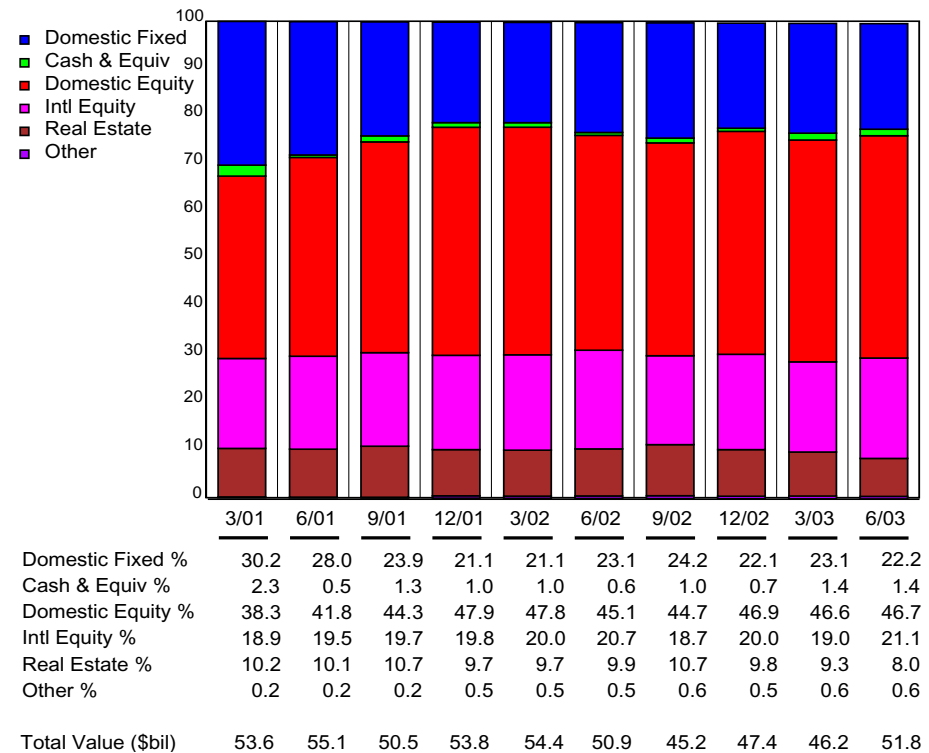
March 31, 2003 \$46,215,056,000



June 30, 2003 \$51,801,617,000



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 first 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 6/30/2003

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
	Mar-96	Dec-96	62.50	SB Broad Inv Grade
			23.00	Standard & Poors 500
			8.00	NCREIF
			4.50	91-Day Treasury Bill
	Mar-97	Dec-97	56.50	SB Broad Inv Grade
			27.00	Standard & Poors 500
			8.00	NCREIF
			4.50	91-Day Treasury Bill
	Mar-98	Dec-98	51.00	SB Broad Inv Grade
			30.50	Standard & Poors 500
			8.00	NCREIF
			4.50	91-Day Treasury Bill

Custom Benchmark Specification

PERS

Quarter Ending 6/30/2003

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
			1.60	Gilberto-Levy Mortgage
			Mar-99	Mar-99
	35.00	Standard & Poors 500		
	7.60	MSCI World Ex-US (Net)		
	6.60	NCREIF		
	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
	Mar-99	Mar-99	2.20	NAREIT
			2.20	Gilberto-Levy Mortgage
			1.00	91-Day Treasury Bill
			1.00	91-Day Treasury Bill

The charts above and on the following page track PERS asset allocation policy index over the last 9 and one half 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 6/30/2003

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	1.90	Giliberto-Levy Mortgage
			0.20	Standard & Poors 500
			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 6/30/2003

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
	Dec-02	Dec-02	0.20	Standard & Poors 500
			47.00	Russell 3000
			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	Jun-03	0.60	91-Day Treasury Bill
			0.40	Standard & Poors 500
			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 June 30, 2003

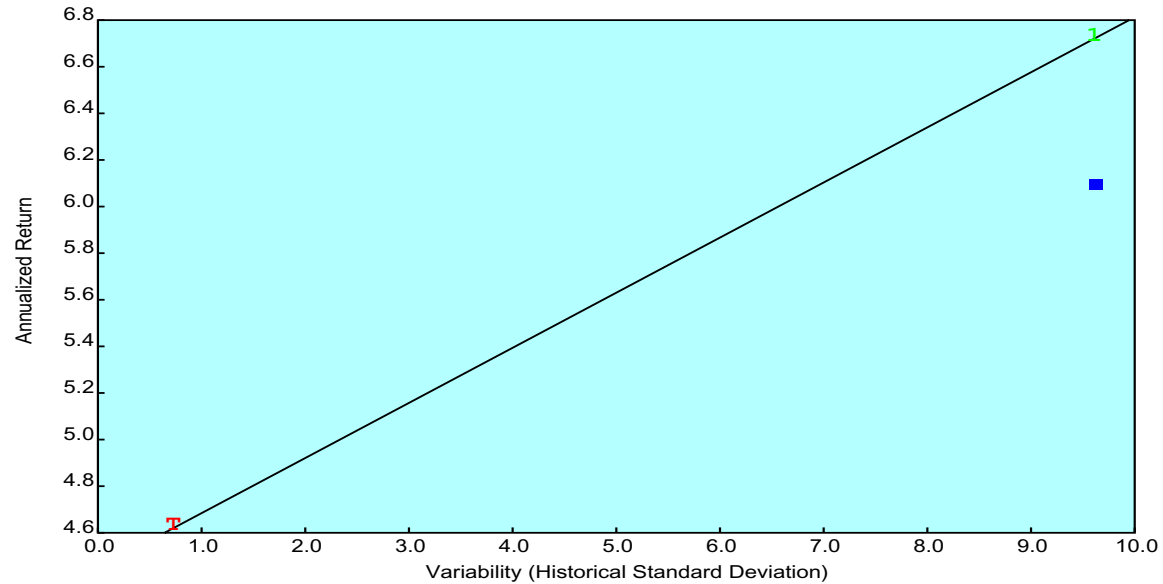
	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	12.53	9.82	15.89	3.19	-2.88	1.95	6.09
Policy Index Return	12.21	9.67	15.93	2.79	-2.78	2.75	6.73
Domestic Equity Return	16.23	12.73	21.83	1.07	-9.52	-1.58	7.35
Equity Segment Median Return	16.84	12.50	21.05	-0.56	-9.61	-0.39	
Wilshire 5000	16.50	12.91	21.74	1.27	-10.58	-1.30	9.40
Int'l Equity Return	19.83	10.41	17.71	-4.77	-13.02	-1.93	
Int'l Equity Segment Median Return	18.53	9.21	16.36	-5.95	-12.02	-0.60	
MSCI EAFE (Net)	19.27	9.47	16.54	-6.46	-13.52	-4.00	2.14
Domestic Fixed Return	3.15	5.20	7.89	11.92	10.19	7.58	7.65
Fixed Income Segment Median Return	2.67	4.23	5.79	10.52	10.11	7.55	
LB Aggregate	2.50	3.93	5.56	10.40	10.08	7.54	7.31
Cash Return	0.30	0.60	0.97	1.43	3.22	4.14	4.75
Real Estate Return	3.88	5.40	6.52	6.35	9.67	9.05	10.16
NCREIF	2.09	4.02	5.78	7.67	8.28	9.84	10.09

Over the past 9 and one half year period, PERS has trailed its policy index by 0.64% annually. During the same period, PERS' US Equity results trailed the broad market Wilshire 5000 index by over 2% 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 6/03



	Annualized Return	Variability	Reward	Sharpe Ratio
■ PERS	6.09	9.68	1.46	0.15
1 PERS Policy Index	6.73	9.65	2.11	0.22
T 91-Day Treasury Bill	4.63	0.77	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 9 and one half year period, with risk similar to the custom benchmark.

# Public Employees Retirement System

## Asset Allocation Actual vs. Benchmark December 31, 2002

---

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.90%	S&P 1500	47.0%	-0.10%
Fixed Income	22.10%	SB Broad Inv Grade	23.0%	-0.90%
Intl. Equity	20.00%	MSCI ACWI	20.0%	0.00%
Real Estate	9.80%	PERS Custom Index	9.0%	0.80%
Venture Capital	0.50%	S&P 500	0.6%	-0.10%
Short Term	0.70%	3 Month T-Bill	0.4%	0.30%

## June 30, 2003

---

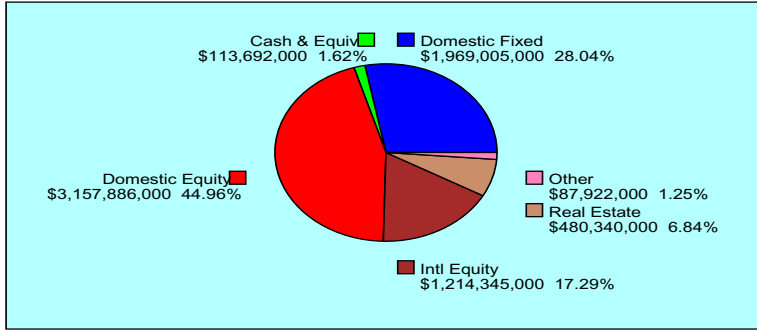
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.70%	S&P 1500	47.0%	-0.30%
Fixed Income	22.20%	Lehman Universal	23.0%	-0.80%
Intl. Equity	21.10%	MSCI ACWI	20.0%	1.10%
Real Estate	8.00%	PERS Custom Index	9.0%	-1.00%
Venture Capital	0.60%	Russell 3000 + 3%	0.6%	0.00%
Short Term	1.40%	3 Month T-Bill	0.4%	1.00%

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

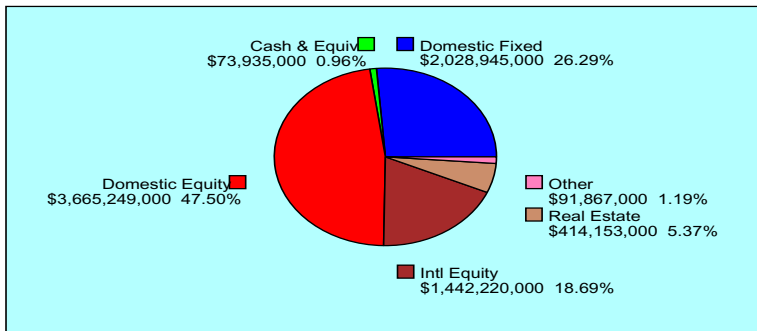
# Police & Fire Pension Fund

Asset Allocation  
OP&F

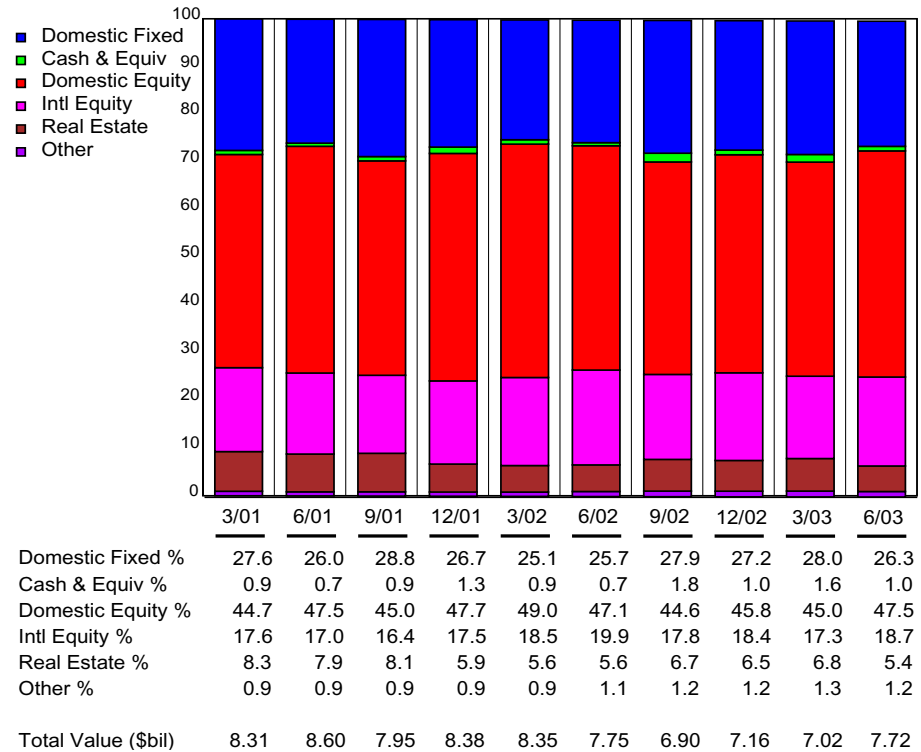
March 31, 2003 \$7,023,190,000



June 30, 2003 \$7,716,369,000



Asset Allocation  
OP&F



This page is 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 first 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 6/30/03

Custom Benchmark Specification  
Police and Fire  
Quarter Ending 6/30/03

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
	Mar-01	Jun-01	5.00	MSCI Em Mkts Free (Gross)
			48.00	Wilshire 5000
			18.00	LB Aggregate
			17.00	MSCI EAFE (Net)
	Sep-02	Mar-02	8.00	Wilshire RE Funds
			5.00	First Boston High Yield
			3.00	MSCI Em Mkts Free (Gross)
			1.00	S&P + 5%

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Jun-02	Jun-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 9 and one half years. The current policy index is listed in the table on the right.

# Police & Fire Pension Fund

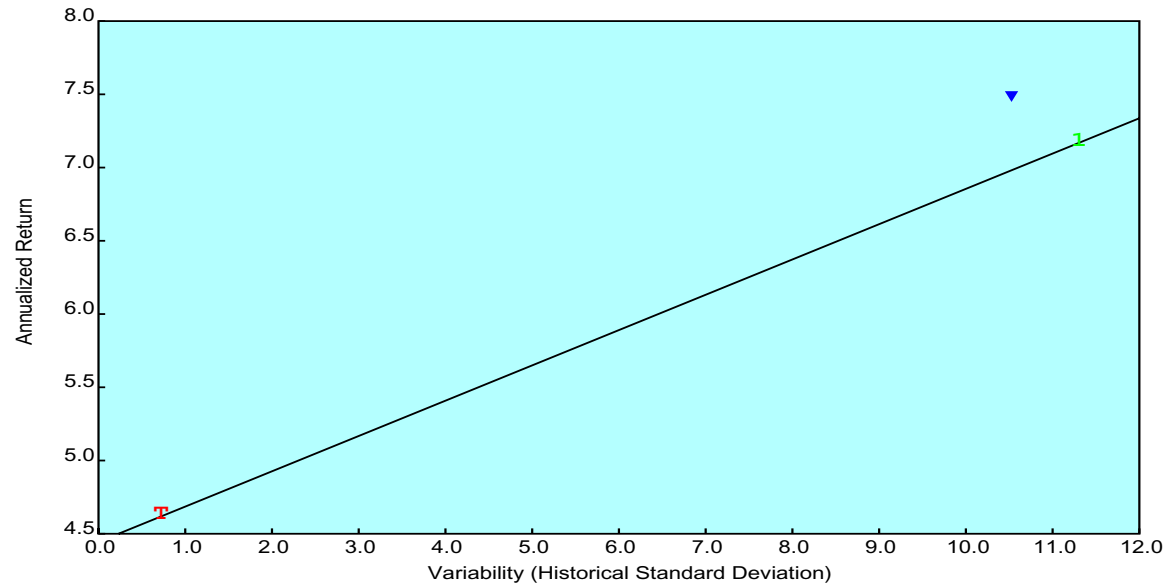
## Performance Overview OP&F Returns for Periods Ending June 30, 2003

	<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	11.66	9.47	14.44	2.93	-2.50	1.94	7.48
Policy Index Return	12.98	10.48	16.79	3.70	-3.89	1.92	7.18
Domestic Equity Return	15.89	11.65	18.99	-1.94	-7.03	-0.49	9.06
Equity Segment Median Return	16.84	12.50	21.05	-0.56	-9.61	-0.39	
Wilshire 5000	16.50	12.91	21.74	1.27	-10.58	-1.30	9.40
Int'l Equity Return	18.73	9.39	17.41	-5.46	-14.75	-3.27	
Int'l Equity Segment Median Return	18.53	9.21	16.36	-5.95	-12.02	-0.60	
MSCI EAFE (Net)	19.27	9.47	16.54	-6.46	-13.52	-4.00	2.14
Domestic Fixed Return	4.32	7.20	9.06	12.75	10.97	8.07	7.62
Fixed Income Segment Median Return	2.67	4.23	5.79	10.52	10.11	7.55	
LB Aggregate	2.50	3.93	5.56	10.40	10.08	7.54	7.31
Cash Return	0.33	0.63	1.06	1.52	3.34	4.16	
Real Estate Return	2.10	5.69	8.02	10.61	9.16	10.20	10.40
NCREIF	2.09	4.02	5.78	7.67	8.28	9.84	10.09

The chart above is a performance overview for the total fund and all of its asset classes over the past 9 and one half years. Over the entire nine and one half year period, the fund's total return has outperformed its policy index by 0.30% annually. The most recent twelve months show that OP&F has underperformed its policy index by 0.77%. The domestic equity return has underperformed the broad market Wilshire 5000 Index by over 3% in the last twelve months.

# Police & Fire Pension Fund

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/03



	Annualized Return	Variability	Reward	Sharpe Ratio
▼ OP&F	7.48	10.59	2.86	0.27
1 OP&F Policy Index	7.18	11.35	2.55	0.22
T 91-Day Treasury Bill	4.63	0.77	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 9 and one half years.

# Police & Fire Pension Fund

## Asset Allocation Actual vs. Benchmark December 31, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	45.00%	Wilshire 5000	48%	-3.00%
Fixed Income	20.20%	Lehman Aggregate	18%	2.20%
High Yield Bonds	6.50%	CSFB High Yield	5%	1.50%
Intl. Equity Comp.	18.10%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	-1.90%
Real Estate	8.00%	NCREIF	8%	0.00%
Venture Capital	1.20%	S&P 500 + 5%	1%	0.20%
Short Term	1.00%	3 Month T-Bill	0%	1.00%

## June 30, 2003

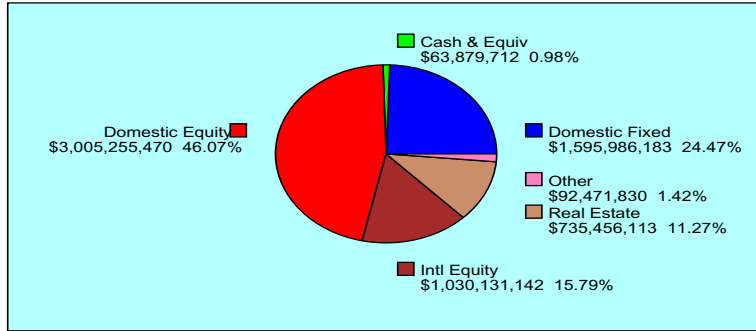
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.78%	Wilshire 5000	48%	-1.22%
Fixed Income	18.98%	Lehman Aggregate	18%	0.98%
High Yield Bonds	6.92%	CSFB High Yield	5%	1.92%
Intl. Equity Comp.	18.41%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	-1.59%
Real Estate	6.80%	NCREIF	8%	-1.20%
Venture Capital	1.17%	S&P 500 + 5%	1%	0.17%
Short Term	0.90%	3 Month T-Bill	0%	0.90%

As of the end of the second quarter, the OP&F fund has been overweight in fixed income and underweight in domestic and international equity.

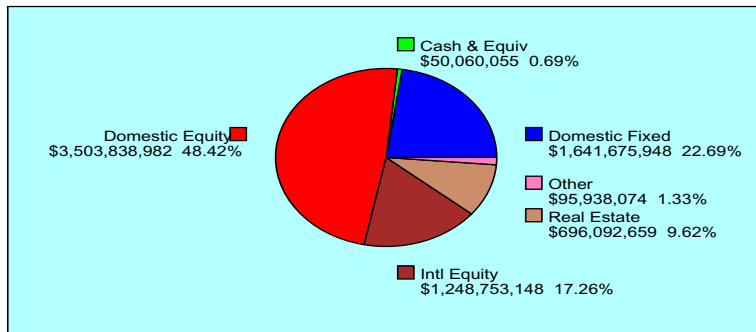
# School Employees Retirement System

Asset Allocation  
SERS

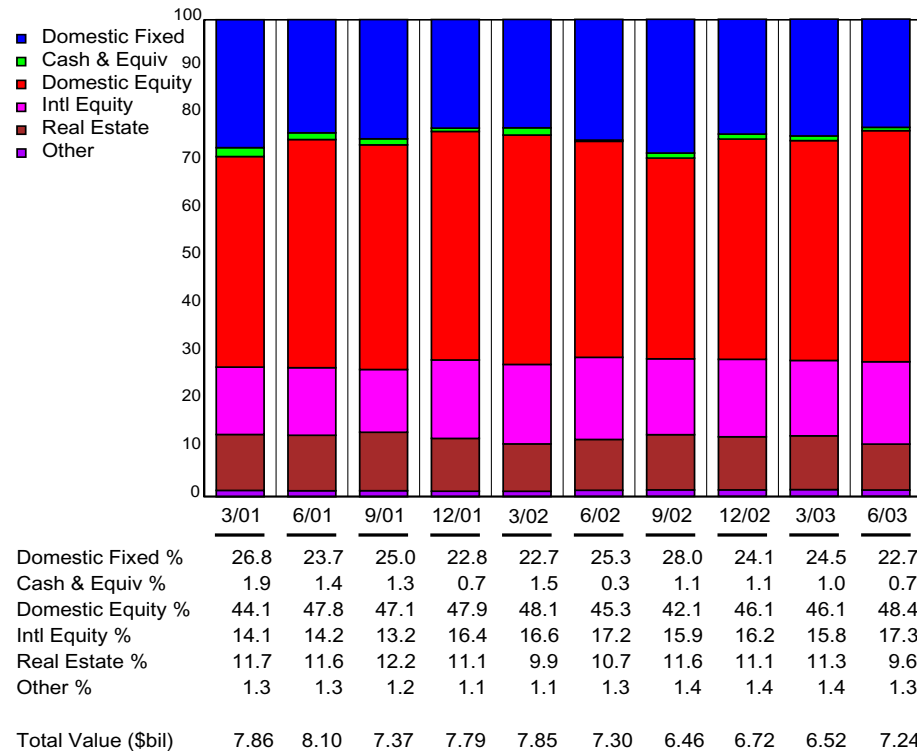
March 31, 2003      \$6,523,180,450



June 30, 2003      \$7,236,358,866



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 first 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 6/30/03

Custom Benchmark Specification  
SERS  
Quarter Ending 6/30/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	Mar-94	Sep-94	47.00	Standard & Poors 500
			28.00	LB Aggregate
			10.00	MSCI EAFE (Net)
			10.00	NCREIF
			5.00	Salomon 30-Day CD
	Dec-94	Dec-94	47.00	Standard & Poors 500
			28.00	LB Aggregate
			10.00	NCREIF
			5.00	MSCI EAFE (Net)
			5.00	MSCI EAFE Hedged
	Mar-95	Mar-97	47.00	Russell 3000
			28.00	LB Aggregate
			10.00	NCREIF
			5.00	MSCI EAFE (Net)
			5.00	MSCI EAFE Hedged
	Jun-97	Sep-97	46.00	Russell 3000
			28.00	LB Aggregate
			10.00	NCREIF
			7.50	MSCI EAFE (Net)
			7.50	MSCI EAFE Hedged
Sep-97	Dec-00	46.00	Russell 3000	
		28.00	LB Aggregate	
		10.00	NCREIF	
		7.25	MSCI EAFE (Net)	
		7.25	MSCI EAFE Hedged	
		1.00	Salomon 30-Day CD	
		0.50	MSCI Em Mkts Free (Gross)	

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Mar-01	Jun-01	48.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI ACWI Free ex US
			10.00	NCREIF
			2.00	Salomon 30-Day CD
			1.00	S&P 500 +3%
	Sep-01	Jun-02	47.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI ACWI Free ex US
			10.00	NCREIF
			2.00	S&P 500 +3%
			2.00	Salomon 30-Day CD
Sep-02	Jun-03	46.00	Russell 3000	
		23.00	LB Aggregate	
		16.00	MSCI ACWI Free ex US	
		10.00	NCREIF	
		3.00	S&P 500 +3%	
		2.00	Salomon 30-Day CD	

SERS' custom policy index is listed above. The chart tracks the fund's change in asset allocation strategy over the past 9 and one half years. The current policy index is listed in the bottom box of the table on the right.

# School Employees Retirement System

## Performance Overview

### SERS

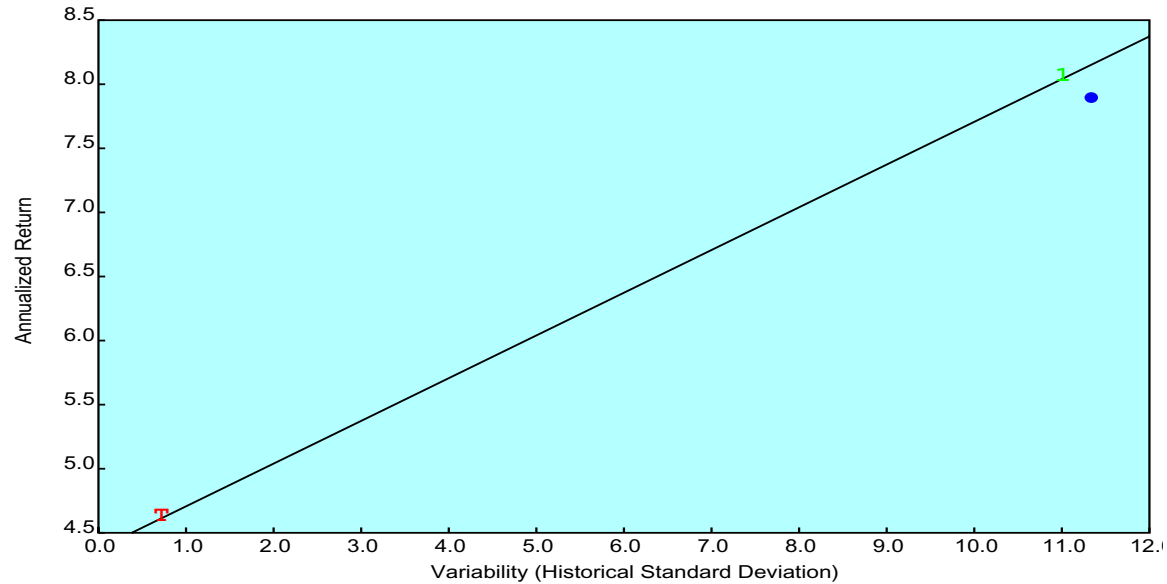
Returns for Periods Ending June 30, 2003

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	11.82	9.06	14.58	1.81	-4.34	2.00	7.89
Policy Index Return	11.09	8.89	13.90	1.80	-4.19	1.87	8.06
Domestic Equity Return	16.73	13.20	21.80	0.19	-10.93	-1.15	9.46
Equity Segment Median Return	16.84	12.50	21.05	-0.56	-9.61	-0.39	
Wilshire 5000	16.50	12.91	21.74	1.27	-10.58	-1.30	9.40
Int'l Equity Return	18.60	9.22	15.20	-8.07	-14.19	-4.18	
Int'l Equity Segment Median Return	18.53	9.21	16.36	-5.95	-12.02	-0.60	
MSCI EAFE (Net)	19.27	9.47	16.54	-6.46	-13.52	-4.00	2.14
Domestic Fixed Return	2.91	4.51	6.36	11.12	10.89	7.97	7.43
Fixed Income Segment Median Return	2.67	4.23	5.79	10.52	10.11	7.55	
LB Aggregate	2.50	3.93	5.56	10.40	10.08	7.54	7.31
Cash Return	0.27	0.55	0.91	1.28	4.30	4.70	5.00
Real Estate Return	4.05	3.71	5.56	5.59	5.43	7.69	9.28
NCREIF	2.09	4.02	5.78	7.67	8.28	9.84	10.09

The chart above is a performance overview for the total fund and all of its asset classes over the past 9 and one half years. Over the entire observed period, the fund's total return is trailing its policy index by 0.17% annually. The most recent twelve months show that SERS has outperformed its policy index by 0.01%.

# School Employees Retirement System

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/03



	Annualized Return	Variability	Reward	Sharpe Ratio
● SERS	7.89	11.40	3.26	0.29
┆ SERS Policy Index	8.06	11.06	3.44	0.31
┆ 91-Day Treasury Bill	4.63	0.77	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 9 and one half years.

# School Employees Retirement System

## Asset Allocation Actual vs. Benchmark December 31, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	46.15%	Russell 3000	47%	-0.85%
Fixed Income	24.07%	LB Aggregate	23%	1.07%
Intl. Equity	16.24%	MSCI ACWI ex US	16%	0.24%
Real Estate	11.12%	NCREIF	10%	1.12%
Venture Capital	1.37%	S&P 500 + 3%	2%	-0.63%
Short Term	1.05%	Salomon 30 Day CD	2%	-0.95%

June 30, 2003

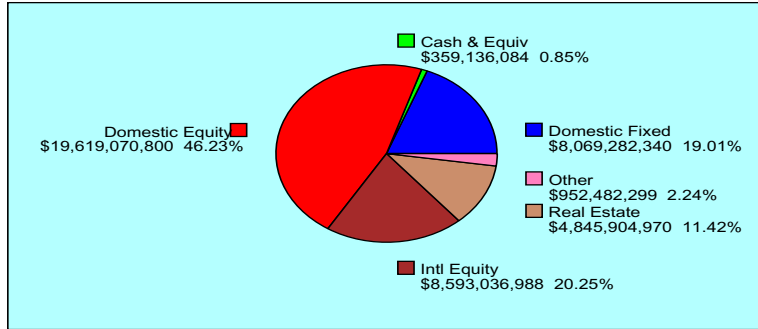
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	48.42%	Russell 3000	47%	1.42%
Fixed Income	22.69%	LB Aggregate	23%	-0.31%
Intl. Equity	17.26%	MSCI ACWI ex US	16%	1.26%
Real Estate	9.62%	NCREIF	10%	-0.38%
Venture Capital	1.33%	S&P 500 + 3%	2%	-0.67%
Short Term	0.69%	Salomon 30 Day CD	2%	-1.31%

As of the end of the second quarter, the SERS fund has been overweight in domestic and international equity.

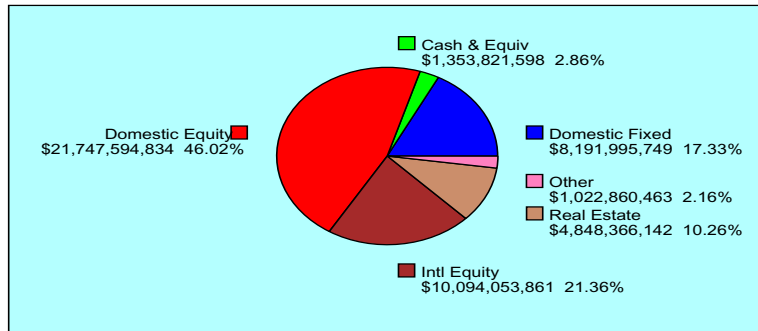
# State Teachers Retirement System

Asset Allocation  
STRS

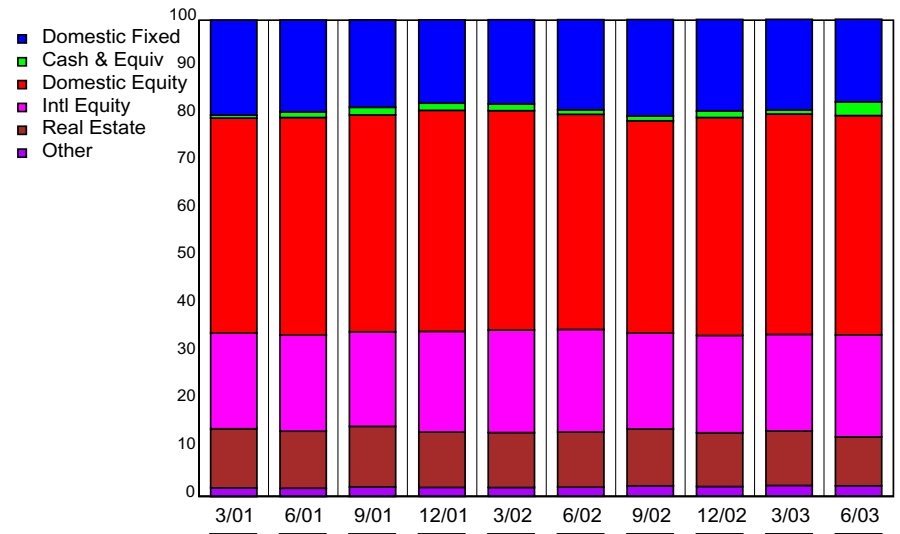
March 31, 2003 \$42,438,913,481



June 30, 2003 \$47,258,692,647



Asset Allocation  
STRS



	3/01	6/01	9/01	12/01	3/02	6/02	9/02	12/02	3/03	6/03
Domestic Fixed %	20.0	19.3	18.4	17.5	17.7	18.9	20.3	19.2	19.0	17.3
Cash & Equiv %	0.6	1.2	1.6	1.5	1.4	0.9	1.0	1.3	0.8	2.9
Domestic Equity %	45.1	45.7	45.5	46.4	46.0	45.1	44.5	45.7	46.2	46.0
Intl Equity %	20.1	20.2	19.9	21.1	21.5	21.5	20.1	20.4	20.2	21.4
Real Estate %	12.4	12.0	12.7	11.6	11.5	11.6	12.0	11.3	11.4	10.3
Other %	1.8	1.7	2.0	1.9	1.9	1.9	2.2	2.0	2.2	2.2
Total Value (\$bil)	51.1	52.9	47.3	50.9	51.3	47.5	41.6	43.8	42.4	47.3

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 first 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 6/30/03

Custom Benchmark Specification  
**STRS**  
 Quarter Ending 6/30/03

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)		
	2.00	91-Day Treasury Bill		
	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)			
2.00	91-Day Treasury Bill			
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)		
	2.00	91-Day Treasury Bill		
	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)			
2.00	91-Day Treasury Bill			
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 43. The chart tracks the fund's change in asset allocation strategy over the past 9 and one half years.

# State Teachers Retirement System

## Custom Benchmark Specification

### STRS

Quarter Ending 6/30/03

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-02	Jun-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

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 June 30, 2003

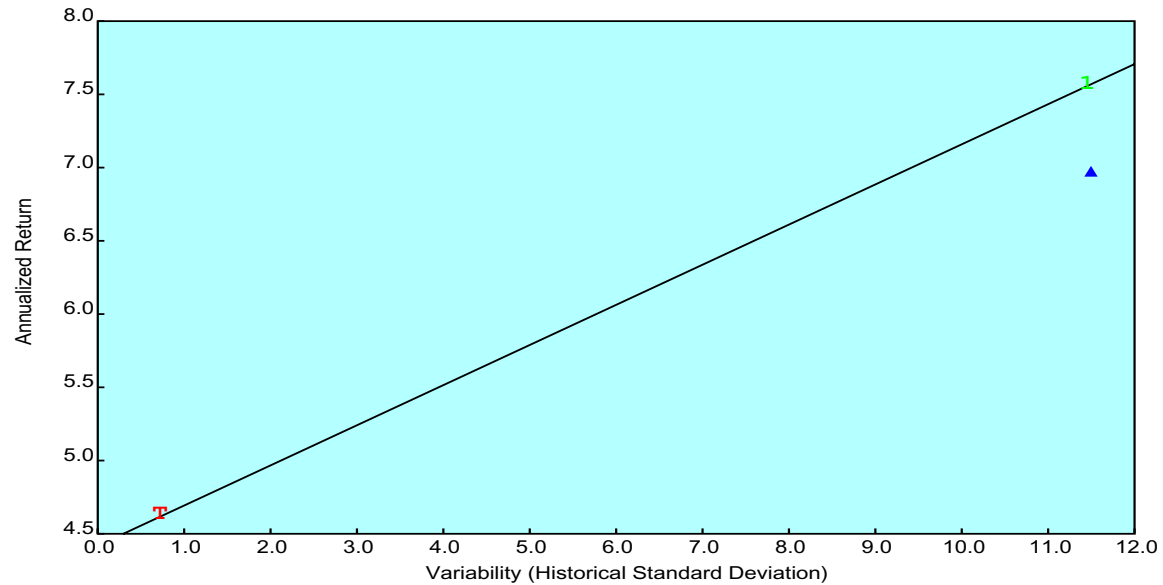
	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	12.08	9.38	15.44	2.32	-4.15	1.85	6.97
Policy Index Return	11.84	8.90	14.66	2.06	-3.96	2.17	7.57
Domestic Equity Return	16.11	12.30	21.52	0.19	-10.30	-1.83	8.04
Equity Segment Median Return	16.84	12.50	21.05	-0.56	-9.61	-0.39	
Wilshire 5000	16.50	12.91	21.74	1.27	-10.58	-1.30	9.40
Int'l Equity Return	18.51	10.17	15.72	-4.73	-10.51	-0.60	2.18
Int'l Equity Segment Median Return	18.53	9.21	16.36	-5.95	-12.02	-0.60	
MSCI EAFE (Net)	19.27	9.47	16.54	-6.46	-13.52	-4.00	2.14
Domestic Fixed Return	3.24	5.56	9.00	12.99	10.84	8.07	8.34
Fixed Income Segment Median Return	2.67	4.23	5.79	10.52	10.11	7.55	
LB Aggregate	2.50	3.93	5.56	10.40	10.08	7.54	7.31
Cash Return	0.30	0.62	1.01	1.47	3.29	4.22	4.60
Real Estate Return	2.52	3.59	6.68	6.25	7.50	9.27	9.85
NCREIF	2.09	4.02	5.78	7.67	8.28	9.84	10.09

The exhibit above is a performance overview for the total fund and all of its asset classes over the past 9 and one half years. Over the entire observed period, the fund's total return is trailing its policy index by 0.60% annually. This is due primarily to its domestic equity returns, which lagged the broad market as defined by the Wilshire 5000 by almost 1.4% annually. The most recent twelve months show that STRS has outperformed its policy index by 0.26%. Over the last twelve months domestic equity and real estate have trailed their respective benchmarks, while international equity and fixed income have outperformed their respective benchmarks.



# State Teachers Retirement System

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/03



	Annualized Return	Variability	Reward	Sharpe Ratio
▲ STRS	6.97	11.56	2.34	0.20
1 STRS Policy Index	7.57	11.50	2.94	0.26
T 91-Day Treasury Bill	4.63	0.77	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 9 and one half years.

# State Teachers Retirement System

## Asset Allocation Actual vs. Benchmark December 31, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	45.73%	S&P 1500	45%	0.73%
Fixed Income	19.22%	Lehman Universal	23%	-3.78%
Intl. Equity	20.39%	Intl. Hybrid Benchmark	20%	0.39%
Real Estate	11.28%	NCREIF Adjusted	9%	2.28%
Venture Capital	2.03%	Alt. Inv. Actual Return	2%	0.03%
Short Term	1.34%	3 Month T-Bill	1%	0.34%

## June 30, 2003

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.02%	S&P 1500	45%	1.02%
Fixed Income	17.33%	Lehman Universal	23%	-5.67%
Intl. Equity	21.36%	Intl. Hybrid Benchmark	20%	1.36%
Real Estate	10.26%	NCREIF Adjusted	9%	1.26%
Venture Capital	2.16%	Alt. Inv. Actual Return	2%	0.16%
Short Term	2.86%	3 Month T-Bill	1%	1.86%

As of the end of the second quarter, the STRS fund is underweight in fixed income and overweight in domestic equity, real estate, and venture capital.

# 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%
<b>Allocation Index Return</b>					<b>4.96%</b>

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.

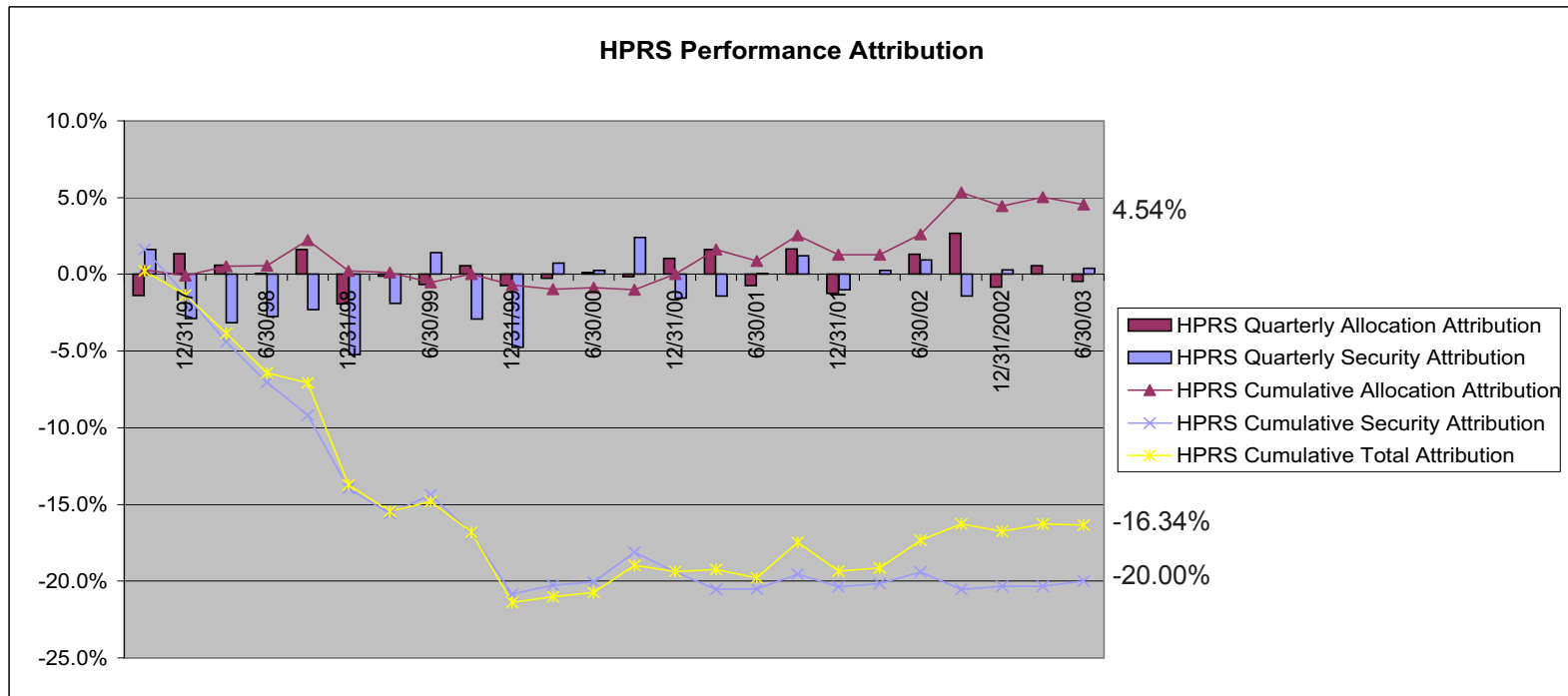
# Appendix: ORSC Performance Attribution

The analysis shows that of the five funds, only two (OP&F and SERS) have achieved positive attribution results over the past five and one half 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. No fund achieved positive attribution from active management. On the other hand, all but one fund (PERS) 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 five year period. Since then, their attribution results have moderated and the cumulative numbers have flattened out.

## Breakdown of Attribution Results - Last 5 <sup>1</sup>/<sub>2</sub> Years

	Asset Attribution	Selection Attribution	Total Attribution
<b>HPRS</b>	4.54%	-20.00%	-16.34%
<b>PERS</b>	-2.31%	-3.19%	-5.39%
<b>OP&amp;F</b>	0.46%	-0.25%	0.22%
<b>SERS</b>	5.78%	-5.31%	0.20%
<b>STRS</b>	2.71%	-3.05%	-0.37%

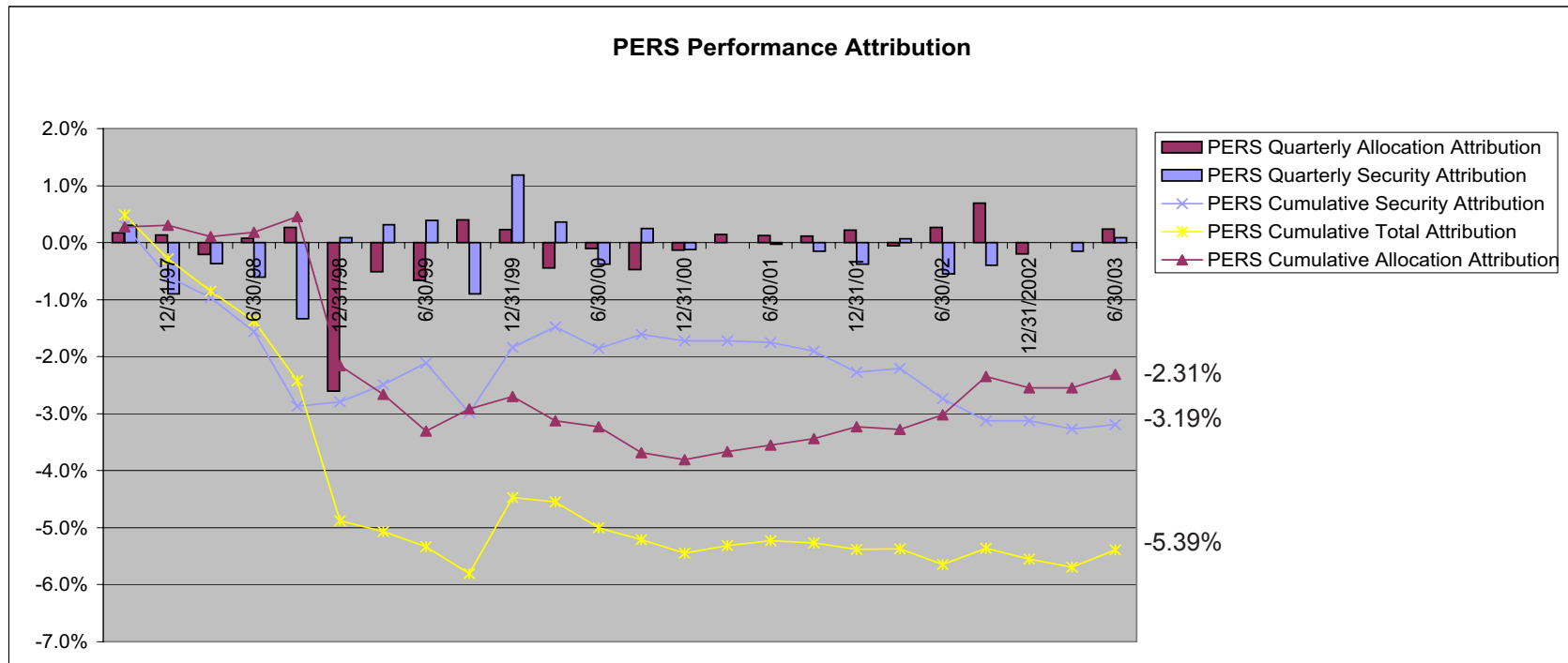
# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	1.893%	1.784%	0.776%
Security Selection Attribution	-0.736%	0.025%	-2.958%
Total Attribution	1.186%	1.823%	-2.214%

The graph above provides five and a half 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 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 5 and one half years (+4.54%). The blue line represents the cumulative measure of the value added to (or subtracted from) the portfolio from active management over the past 5 and one half years (-20.00%). The yellow line represents the total value added to (or subtracted by) a combination of asset allocation strategies and active portfolio management (-16.34%). The above graph demonstrates that over the past 5 and one half years, HPRS' asset allocation strategy has added 4.54% to the return of the fund, while over the same period, the active management of their investment managers has subtracted 20.00% from the fund's performance. The cumulative effect of active management and asset allocation has subtracted 16.34% from the fund's performance over the past five years, which translates into a loss of about 2.21% annually over the past five years. The good news is that both asset allocation and selection have added value over the past three years.

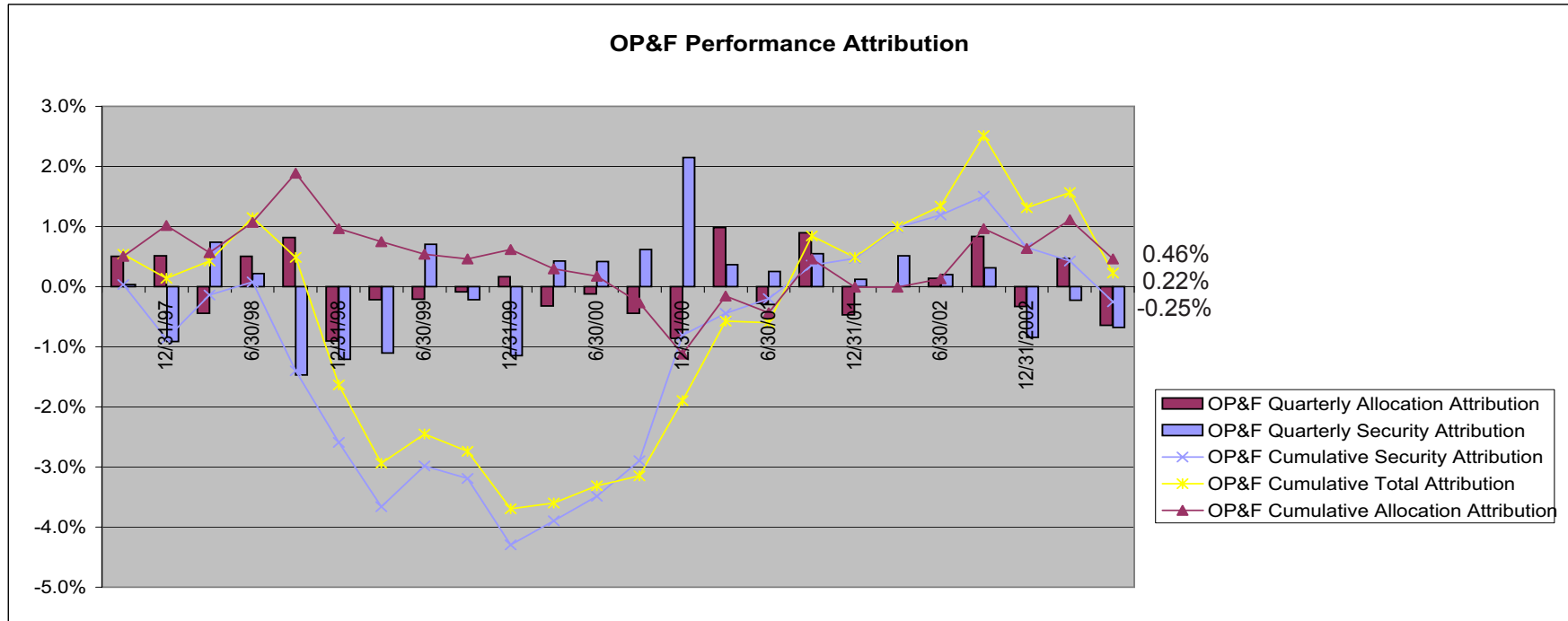
# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	0.732%	0.314%	-0.503%
Security Selection Attribution	-0.463%	-0.456%	-0.334%
Total Attribution	0.269%	-0.138%	-0.829%

The graph above shows that asset allocation and selection have both detracted from PERS' results over the past five and a half years. On an annualized basis, PERS's decisions to deviate from its passive benchmark have cost the fund 0.829% over the last five years.

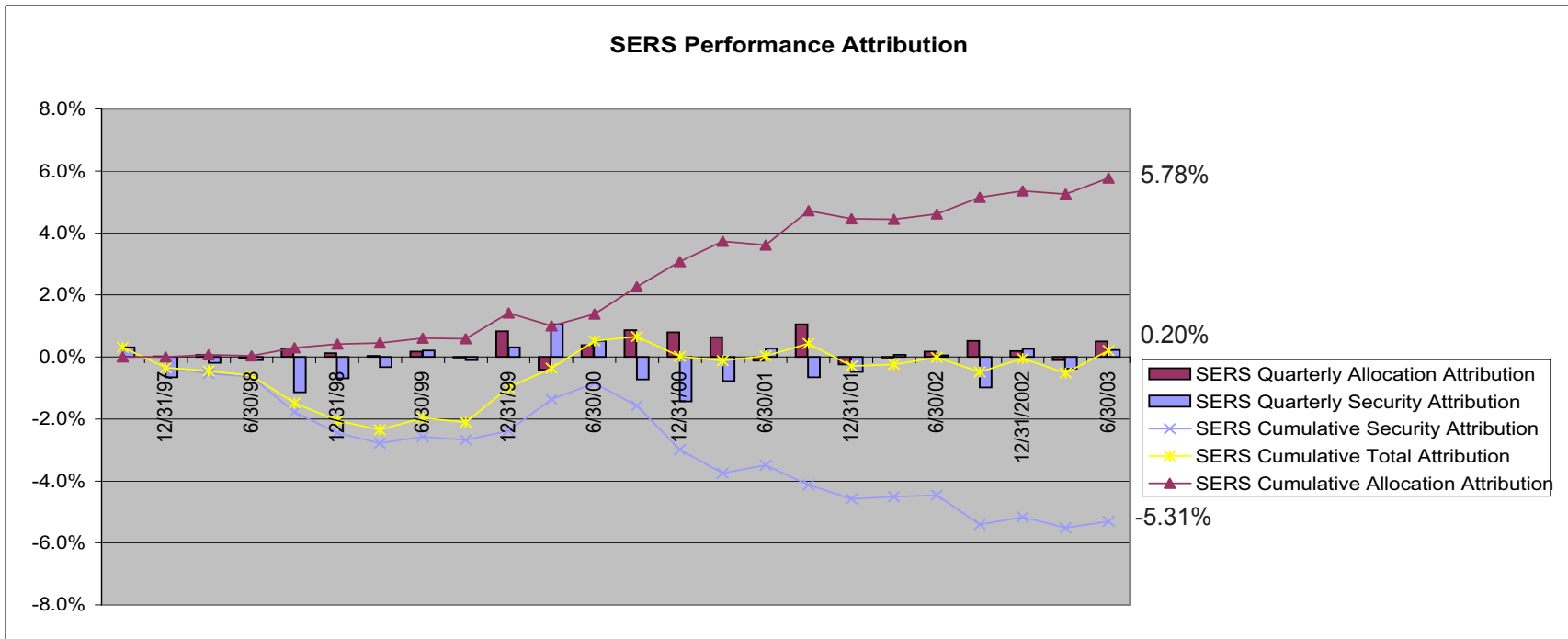
# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	0.332%	0.095%	-0.120%
Security Selection Attribution	-1.425%	1.106%	-0.066%
Total Attribution	-1.106%	1.203%	-0.184%

The graph above shows that OP&F has added value by deviating from its policy over the past five and a half years. This deviation has counteracted the negative selection results, resulting in an overall outperformance of 0.22% per year. Over the past three years, both selection and asset allocation have added value.

# Appendix: ORSC Performance Attribution

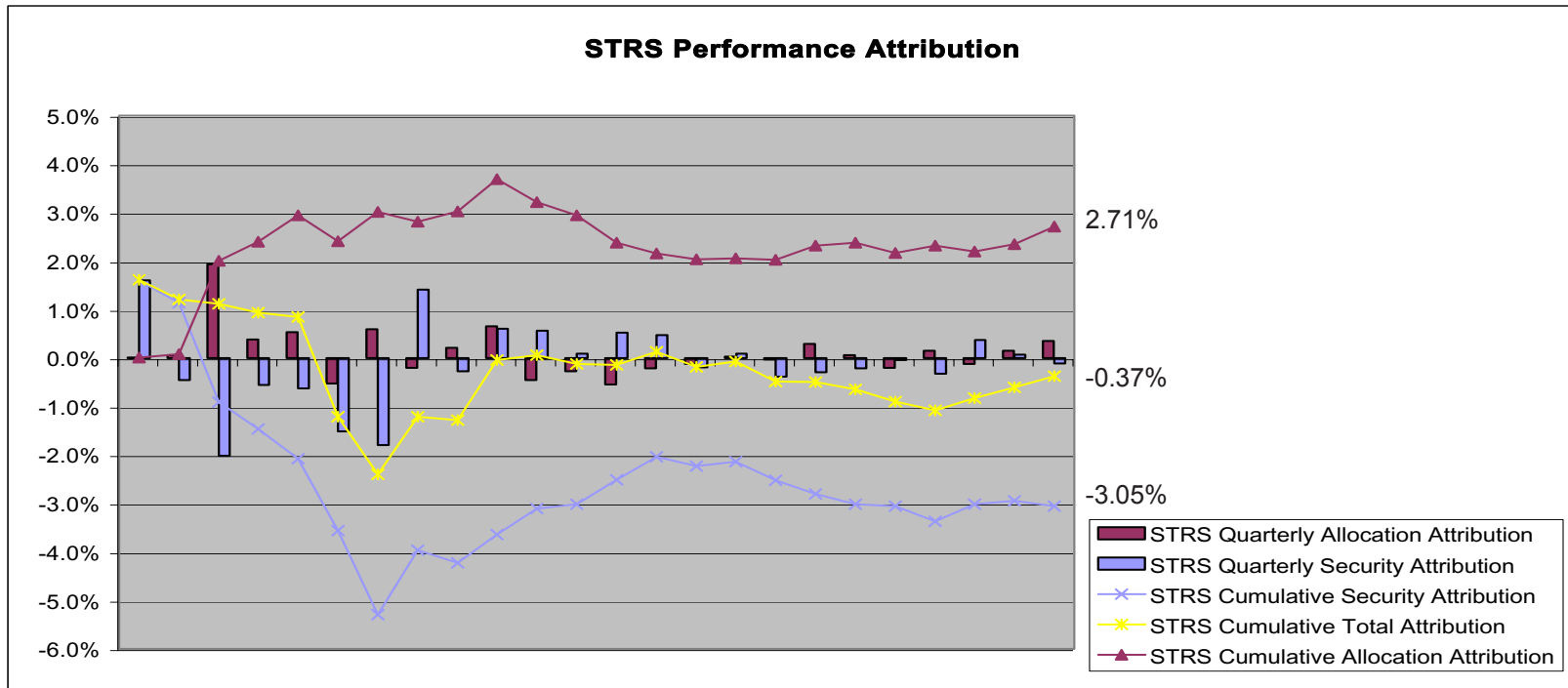


Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	1.118%	1.425%	1.124%
Security Selection Attribution	-0.887%	-1.520%	-0.958%
Total Attribution	0.224%	-0.107%	0.163%

The graph above shows that SERS has added value through asset allocation over the past five and a half years, counteracting the negative impact of selection and resulting in overall positive results of just over 16 basis points on annualized basis for the five-year period.



# Appendix: ORSC Performance Attribution



<b>Annualized Attribution</b>	<b>One Year</b>	<b>Three Years</b>	<b>Five Years</b>
Asset Allocation Attribution	0.527%	-0.074%	0.061%
Security Selection Attribution	0.002%	-0.011%	-0.325%
Total Attribution	0.530%	-0.084%	-0.261%

The graph above shows that for the entire five and a half year period STRS has added value through asset allocation. That incremental value, however was offset by adverse selection results, resulting in underperformance of 0.37% on a cumulative basis. Over the past three years, however, both selection and asset allocation have subtracted from total fund performance.