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## The Ohio Retirement Study Council

November 17, 2004

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## **OHIO RETIREMENT STUDY COUNCIL**

Comparative Performance Study

Period ending 6/30/2004

### **Introduction**

Evaluation Associates is pleased to present to the Council the most recent results of our ongoing, semi-annual comparative study of the performance of the five Ohio Statewide pension funds pursuant to Section 171.04 of the Revised Code. This is the eleventh report we have prepared pursuant to this authority. The purpose of this comparative report is to provide the framework for dialogue with the retirement systems and to assist the Council in meeting its oversight responsibilities. This report reflects investment performance for all five retirement systems over the ten and one half year period beginning January 1, 1994 and ending June 30, 2004.

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

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

While the entire measurement period for this report, as mentioned above, is ten 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.

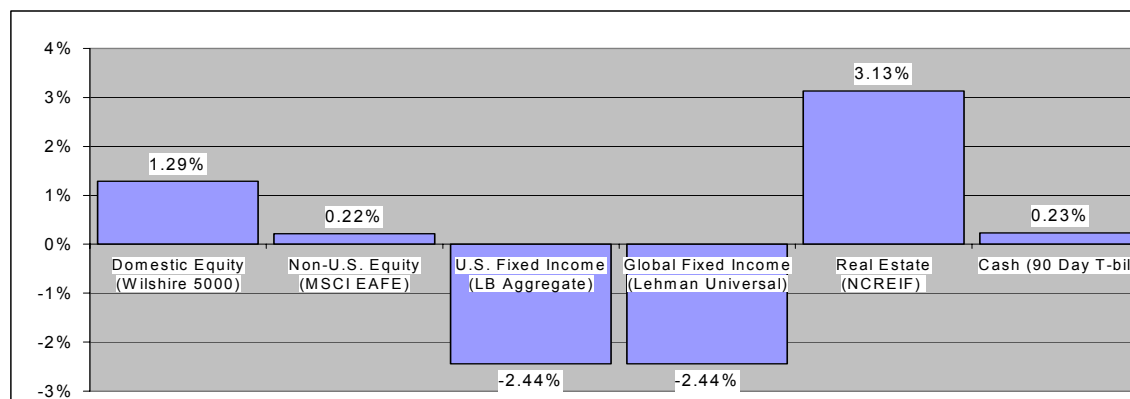
The majority of pension assets, in both the public and private sector, are managed with “prudent person” guidelines, which is to say largely without minimums or maximums placed on individual asset classes or securities. This approach, currently in place in the Ohio systems, is the optimal way to manage 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 6/30/2004, the period since our last report, was positive for the systems. All experienced positive results, ranging from 3.07% (PERS) to 3.90% (OP&F). HPRS, OP&F, and STRS outperformed their respective policies for the six-month period, while PERS and SERS slightly lagged their policies. All of the funds also ranked well above the median public retirement system in a broad universe of such funds. The top-performing fund for the six months was OP&F (12<sup>th</sup> percentile). The other funds ranged from the 17<sup>th</sup> percentile (HPRS) to the 40<sup>th</sup> percentile (PERS).
- Longer term, OP&F, PERS, SERS and STRS have now outperformed their respective policy benchmarks for the past five years. HPRS underperformed by 0.54%.
- The systems have not entirely recovered the losses from the bear market of 2001 and 2002, however long-term ten-year results have improved as a result of strong gains in 2003. OP&F, SERS and STRS have 10-year returns that are above their actuarial interest rate assumption. The HPRS and PERS performance is still below their actuarial interest rate, but the two funds have narrowed that spread significantly over the past twelve months.
- HPRS, which experienced the lowest return over the entire measurement period, continues to show signs of improvement. The fund’s 18.26% return over the past twelve months compares favorably to the 17.03% return for its policy benchmark. It is now also ahead of its benchmark for trailing one and three year periods.
- It is clear from our analysis that all of the systems have been enjoying positive results in recent years. Except for HPRS, all of the total fund results have exceeded their policy benchmarks for the past five years, and HPRS has exceeded its policy for the past three years by a significant margin. If there is one message to be derived from this report it is that all of the systems are currently doing very well when compared to the most important measure – their own custom policy benchmarks.

## Market Environment

The second quarter produced a mixed bag of investment results for the major asset classes. The best returns were in US equity and real estate, with a 1.29% and 3.13% gain respectively. International stocks were up slightly at 0.22%. US fixed income was negative for the quarter at -2.44%. Cash returned 0.23%.



## Median Fund Returns

The median fund in the Wilshire public fund database returned 0.01% in the second quarter and 13.83% 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 -0.20% for the quarter and 12.57% over the last year.

### Universe Medians Performance Summary Periods ending June 30, 2004

	One Quarter	One Year	Three Years	Five Years	Ten Years
<b>Fund Sponsor</b>					
Public Fund Universe	0.01%	13.83%	4.44%	3.62%	9.17%
Corporate DB Universe	-0.21%	14.82%	3.95%	3.58%	10.13%
Education Eleemosynary Universe	-0.29%	16.30%	4.96%	4.97%	10.91%
Taft-Hartley Universe	-0.16%	11.04%	4.15%	3.86%	8.89%
Balanced Funds	-0.17%	10.93%	3.23%	3.20%	10.08%
Balanced Public Funds	-0.18%	11.08%	4.20%	3.55%	N/A
<b>60% Wilshire 5000 / 40% LB Aggregate</b>	<b>-0.20%</b>	<b>12.57%</b>	<b>3.72%</b>	<b>2.76%</b>	<b>10.38%</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><u>One Quarter</u></b>	<b><u>Two Quarters</u></b>	<b><u>One Year</u></b>	<b><u>Three Years</u></b>	<b><u>Five Years</u></b>
<b>HPRS</b>						
	Actual	0.58%	3.79%	17.93%	5.66%	3.02%
	Policy	0.37%	3.51%	17.03%	4.52%	3.45%
	Difference	0.21%	0.28%	0.90%	1.17%	-0.43%
<b>OP&amp;F</b>						
	Actual	0.20%	3.90%	18.61%	4.94%	3.56%
	Policy	0.24%	3.47%	18.45%	4.41%	2.81%
	Difference	-0.04%	0.43%	0.16%	0.53%	0.75%
<b>PERS</b>						
	Actual	-0.11%	3.07%	17.67%	4.16%	3.26%
	Policy	0.10%	3.12%	17.17%	4.03%	3.16%
	Difference	-0.21%	-0.05%	0.50%	0.13%	0.10%
<b>SERS</b>						
	Actual	0.32%	3.40%	16.54%	3.05%	2.79%
	Policy	0.22%	3.45%	16.13%	2.90%	2.32%
	Difference	0.10%	-0.05%	0.41%	0.15%	0.47%
<b>STRS</b>						
	Actual	0.18%	3.69%	17.70%	3.43%	2.74%
	Policy	0.00%	3.14%	16.35%	3.25%	2.42%
	Difference	0.18%	0.55%	1.35%	0.18%	0.32%

All returns are for periods ending 6/30/2004. Returns for periods longer than one year are annualized.



- HPRS: The six-month return for the total fund has outperformed the policy index by 28 basis points. Recent out-performance has helped the fund's tracking of its benchmark, however over the five-year period, the fund still trails its policy index by 0.43% annually.
- OP&F: OP&F outperformed its policy index by 0.43% over the last six months. Longer term, the fund is outperforming its policy index for the three-year period by 0.53% annually and for the five-year period by 0.75% annually.
- PERS: The six-month return for the total fund has lagged the policy index by 0.05%. Over the three-year and five-year periods, the fund is outperforming its benchmark by 0.13% and 0.10% respectively on an annual basis.
- SERS: The six-month return for the total fund has underperformed its policy index return by 0.05%. Over the longer term, the fund has outperformed its policy index. For the three-year period, it leads the policy by 0.15% annually and for the five-year period the fund is outperforming its policy by 0.47% annually.
- STRS: The six-month return for the total fund outperformed its policy by 0.55%. The three-year return is outperforming the policy by 0.18%, and the five-year return is outperforming 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	1.91%	5.45%	27.35%	4.49%	-0.75%	
Policy	1.37%	4.15%	22.33%	1.39%	0.59%	
Difference	0.54%	1.30%	5.02%	3.10%	-1.34%	
OP&F						
Actual	1.46%	4.76%	21.97%	1.67%	0.77%	
Policy	1.29%	3.93%	21.17%	0.77%	-1.04%	
Difference	0.17%	0.83%	0.80%	0.90%	1.81%	
PERS						
Actual	1.33%	3.70%	20.61%	0.62%	-1.35%	
Policy	1.33%	3.59%	20.45%	0.27%	-1.63%	
Difference	0.00%	0.11%	0.16%	0.35%	0.28%	
SERS						
Actual	1.56%	3.98%	21.36%	0.55%	-0.72%	
Policy	1.33%	3.59%	20.45%	0.14%	-1.08%	
Difference	0.23%	0.39%	0.91%	0.41%	0.36%	
STRS						
Actual	1.13%	3.54%	20.04%	-0.26%	-1.50%	
Policy	1.33%	3.59%	20.38%	0.23%	-1.03%	
Difference	-0.20%	-0.05%	-0.34%	-0.49%	-0.47%	

All returns are for periods ending 6/30/2004. Returns for periods longer than one year are annualized.

The domestic equity market was positive in the second quarter. On an absolute and relative basis, HPRS had the best results with a 1.91% return which exceeded its equity benchmark by 54 basis points. For the five-year period, OP&F has had the best absolute and relative results. The fund's domestic equity return of 0.77% is the highest of the funds and resulted in a 1.81% 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. Over the past three years, however, HPRS equity results have exceeded the other funds by a significant margin.

## 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	-2.43%	0.18%	1.49%	7.33%	7.52%
	Policy	-2.44%	0.15%	0.32%	6.36%	6.95%
	Difference	0.01%	0.03%	1.17%	0.97%	0.57%
<b>OP&amp;F</b>						
	Actual	-1.78%	0.73%	3.44%	8.09%	8.27%
	Policy*	-1.95%	0.66%	2.74%	7.47%	7.65%
	Difference	0.17%	0.07%	0.70%	0.62%	0.62%
<b>PERS</b>						
	Actual	-2.38%	0.19%	1.39%	6.65%	7.22%
	Policy	-2.44%	0.16%	1.01%	6.92%	7.28%
	Difference	0.06%	0.03%	0.38%	-0.27%	-0.06%
<b>SERS</b>						
	Actual	-2.06%	0.39%	1.29%	7.11%	7.67%
	Policy	-2.44%	0.15%	0.32%	6.36%	6.95%
	Difference	0.38%	0.24%	0.97%	0.75%	0.72%
<b>STRS</b>						
	Actual	-2.21%	0.19%	1.49%	7.32%	7.75%
	Policy	-2.44%	0.16%	1.01%	6.65%	7.05%
	Difference	0.23%	0.03%	0.48%	0.67%	0.70%

All returns are for periods ending 6/30/2004. Returns for periods longer than one year are annualized.

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

Fixed income returns were negative for all of the funds for the second quarter. OP&F had the best second quarter return (-1.78%) followed by SERS (-2.06%), STRS (-2.21%), PERS (-2.38%), and HPRS (-2.43%). For the five-year period, OP&F again had the highest return (+8.27%). PERS had the lowest five-year return and was the only system in which the fixed income results did not exceed its policy return for the same period.

## International Equity Returns

International Equity Return vs. Policy Benchmark					
<u>Fund</u>	<u>One Quarter</u>	<u>Two Quarters</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>
<b>HPRS</b>					
Actual	-0.51%	3.22%	26.51%	2.31%	1.49%
Policy	0.22%	4.56%	32.37%	3.87%	0.06%
Difference	-0.73%	-1.34%	-5.86%	-1.56%	1.43%
<b>OP&amp;F</b>					
Actual	-1.27%	4.05%	32.79%	4.24%	0.21%
Policy	-0.69%	4.11%	32.50%	5.25%	0.96%
Difference	-0.58%	-0.06%	0.29%	-1.01%	-0.75%
<b>PERS</b>					
Actual	-1.16%	4.30%	32.93%	4.91%	1.92%
Policy	0.10%	4.34%	31.95%	4.11%	0.41%
Difference	-1.26%	-0.04%	0.98%	0.80%	1.51%
<b>SERS</b>					
Actual	0.02%	4.73%	27.56%	1.08%	0.21%
Policy	0.16%	4.83%	27.82%	0.57%	-0.21%
Difference	-0.14%	-0.10%	-0.26%	0.51%	0.42%
<b>STRS</b>					
Actual	-1.95%	3.39%	29.24%	4.28%	2.12%
Policy	-1.67%	3.69%	28.55%	2.18%	-0.11%
Difference	-0.28%	-0.30%	0.69%	2.10%	2.23%

All returns are for periods ending 6/30/2004. Returns for periods longer than one year are annualized.

The MSCI EAFE (Net) Index returned a positive 0.22% for the quarter, however international equity results were negative for all but SERS (+0.02%). SERS had the best absolute results, followed by HPRS (-0.51%), PERS (-1.16%), OP&F (-1.27%) and STRS (-1.95%). For the five-year period, STRS had the best absolute results and relative results with a 2.12% return, which outperformed its policy by 2.23% annually.

## 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		1.79%	4.28%	5.13%	6.61%	8.92%
Policy		2.89%	5.72%	9.68%	6.69%	8.82%
Difference		-1.10%	-1.44%	-4.55%	-0.08%	0.10%
<b>OP&amp;F</b>						
Actual		3.03%	8.01%	15.53%	10.33%	10.44%
Policy		3.13%	5.77%	10.83%	5.83%	7.15%
Difference		-0.10%	2.24%	4.70%	4.50%	3.29%
<b>PERS</b>						
Actual		0.40%	4.83%	11.69%	8.32%	9.95%
Policy		2.23%	5.57%	11.72%	8.82%	9.67%
Difference		-1.83%	-0.74%	-0.03%	-0.50%	0.28%
<b>SERS</b>						
Actual		0.05%	4.76%	13.19%	5.71%	8.41%
Policy		0.89%	5.55%	13.23%	8.73%	9.90%
Difference		-0.84%	-0.79%	-0.04%	-3.02%	-1.49%
<b>STRS</b>						
Actual		4.28%	11.74%	17.64%	9.11%	10.41%
Policy		2.04%	5.57%	12.27%	8.17%	9.33%
Difference		2.24%	6.17%	5.37%	0.94%	1.08%

All returns are for periods ending 6/30/2004. Returns for periods longer than one year are annualized.

Absolute real estate results for the five funds were all positive for the second quarter. STRS had the highest real estate return (+4.28%) followed by OP&FS (+3.03%), HPRS (+1.79%), PERS (+0.40%), and SERS (+0.05%). 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 10.44% for the five years and outperformed its policy return by 329 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.

## 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	N/A
Policy	N/A	N/A	N/A	N/A	N/A	N/A
Difference	N/A	N/A	N/A	N/A	N/A	N/A
<b>OP&amp;F</b>						
Actual	0.16%	6.40%	4.81%	-13.90%	0.27%	
Policy	3.85%	17.85%	44.37%	7.78%	4.41%	
Difference	-3.69%	-11.45%	-39.56%	-21.68%	-4.14%	
<b>PERS</b>						
Actual	3.58%	12.40%	32.64%	5.19%	12.11%	
Policy	3.23%	16.90%	42.59%	2.15%	-0.31%	
Difference	0.35%	-4.50%	-9.95%	3.04%	12.42%	
<b>SERS</b>						
Actual	0.72%	7.52%	8.53%	-13.06%	-0.74%	
Policy	1.16%	13.88%	38.14%	1.55%	0.39%	
Difference	-0.44%	-6.36%	-29.61%	-14.61%	-1.13%	
<b>STRS</b>						
Actual	5.85%	11.85%	19.69%	-2.85%	2.09%	
Policy	5.85%	11.85%	19.69%	N/A	N/A	
Difference	0.00%	0.00%	0.00%	N/A	N/A	

All returns are for periods ending 6/30/2004. Returns for periods longer than one year are annualized.

For the second quarter, STRS had the best absolute return (+5.85%). For the five-year period, PERS had the best absolute and relative results, returning a positive 12.11% and beating the policy return by 12.42% 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, on the other hand, adds 5% annually to the Wilshire 5000 index to benchmark its alternative investment returns.

## Long-Term Results vs. Targets

### Long Term Return - 10 Years

	Actual Return	Benchmark Actual Return	Actuarial Interest Rate	Valuation Date
HPRS	7.84%	9.62%	8.00%	1/1/2004
OP&F	9.37%	8.87%	8.25%	1/1/2004
PERS	7.72%	7.76%	8.00%	1/1/2004
SERS	9.49%	9.47%	8.25%	7/1/2003
STRS	8.65%	9.09%	8.00%	7/1/2003

The table above provides a long-term look at how the systems are performing compared to their policy returns and also compared to their actuarial interest rate. On a relative basis, OP&F and SERS have exceeded their policies over the ten-year period. PERS is essentially even with its policy over the ten-year period while HPRS and STRS are underperforming their policy by 178 and 44 basis points respectively on an annual basis. Only HPRS and PERS have performance below their current actuarial interest rate, however they are only trailing by 16 and 28 basis points respectively.

## Universe Comparisons

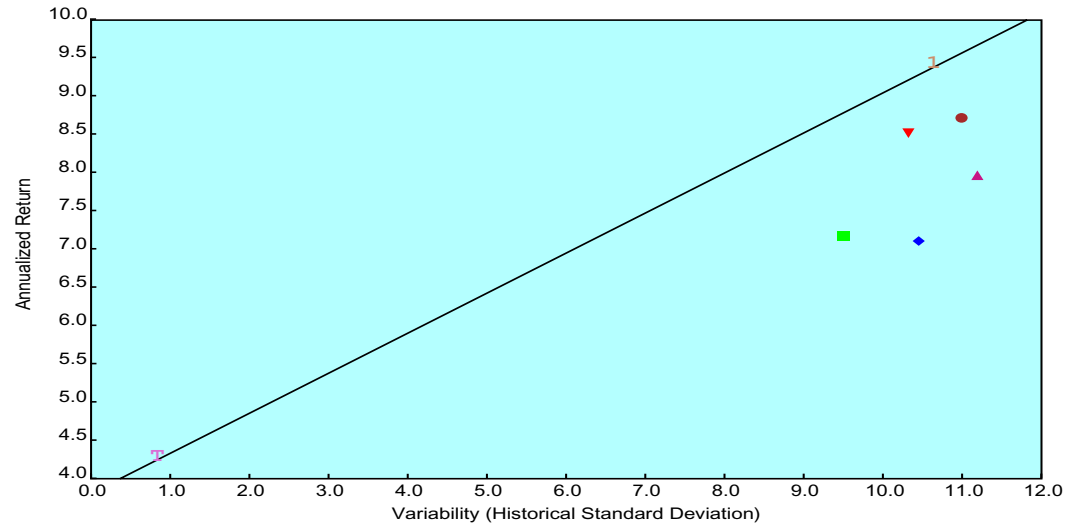
Public Fund Universe Peer Rankings

	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>HPRS</b>	19	17	12	16	66
<b>OP&amp;F</b>	38	12	9	33	54
<b>PERS</b>	57	40	12	62	61
<b>SERS</b>	32	26	18	77	68
<b>STRS</b>	41	21	12	71	69

The public funds universe in the Wilshire Co-operative consists of 173 federal, state and local funds. For the most recent quarter, all but PERS ranked ahead of the median. For the one-year period, all of the systems placed in the top quartile with HPRS and OP&F placing in the top decile. Over the longer term, all of the systems have displayed third quartile performance for the five-year period.



### Quarterly Total Return Market Line Analysis Periods from 12/93 to 6/04

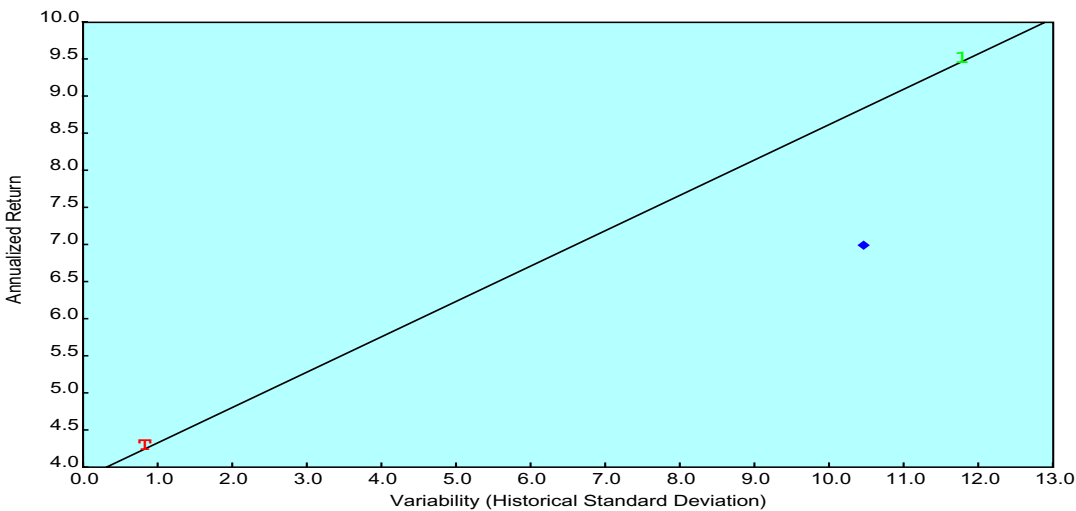
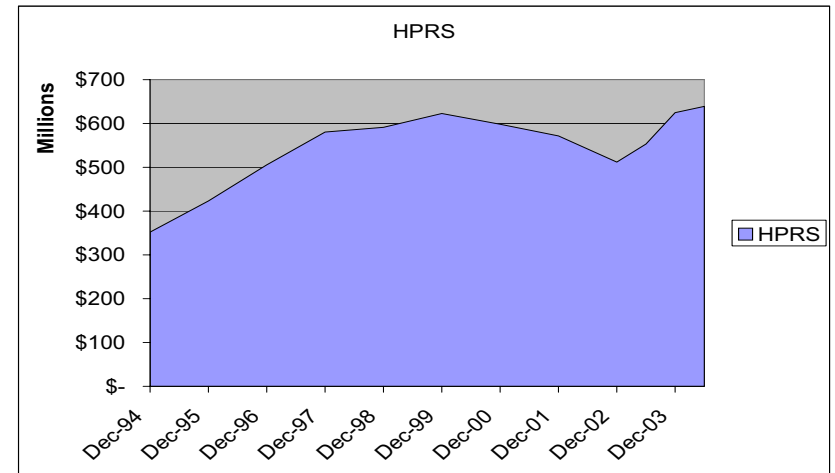


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.05	10.52	2.81	0.27
■ PERS	7.15	9.57	2.87	0.30
▼ OP&F	8.50	10.39	4.22	0.41
● SERS	8.70	11.06	4.42	0.40
▲ STRS	7.95	11.26	3.67	0.33
⌋ 60/40 Index	9.41	10.69	5.13	0.48
⌋ 91-Day Treasury Bill	4.28	0.90	0.00	0.00

The Capital Market Line above plots the ten 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	1.91%	5.45%	27.35%	4.49%	-0.76%
Benchmark	1.37%	4.15%	22.33%	1.39%	0.59%
Difference	0.54%	1.30%	5.02%	3.10%	-1.35%
<b>Fixed Income</b>					
Actual	-2.43%	0.18%	1.48%	7.33%	7.52%
Benchmark	-2.44%	0.15%	0.32%	6.36%	7.39%
Difference	0.01%	0.03%	1.16%	0.97%	0.13%
<b>Intl. Equity</b>					
Actual	-0.51%	3.22%	26.51%	2.31%	1.49%
Benchmark	0.22%	4.56%	32.37%	3.87%	0.06%
Difference	-0.73%	-1.34%	-5.86%	-1.56%	1.43%
<b>Real Estate</b>					
Actual	1.79%	4.28%	5.13%	6.61%	9.53%
Benchmark	2.89%	5.72%	9.68%	6.69%	8.82%
Difference	-1.10%	-1.44%	-4.55%	-0.08%	0.71%



Annualized Return	Variability	Reward	Sharpe Ratio
6.98	10.54	2.71	0.26
9.50	11.84	5.22	0.44
4.28	0.90	0.00	0.00

- ◆ HPRS
- ┌ HPRS Total Policy (2)
- ▴ 91-Day Treasury Bill

Asset Mix			
	Actual	Target	Difference
June 30, 2004			
US Equity	54.7%	48.0%	6.7%
Intl. Equity	14.3%	15.0%	-0.7%
Alternative Assets	0.0%	0.0%	0.0%
<b>Total Equity</b>	<b>69.0%</b>	<b>63.0%</b>	<b>6.0%</b>
Fixed Income	21.9%	25.0%	-3.2%
Real Estate	8.9%	12.0%	-3.1%
Short Term Investments	0.2%	0.0%	0.2%
<b>Total Debt</b>	<b>31.0%</b>	<b>37.0%</b>	<b>-6.0%</b>
	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

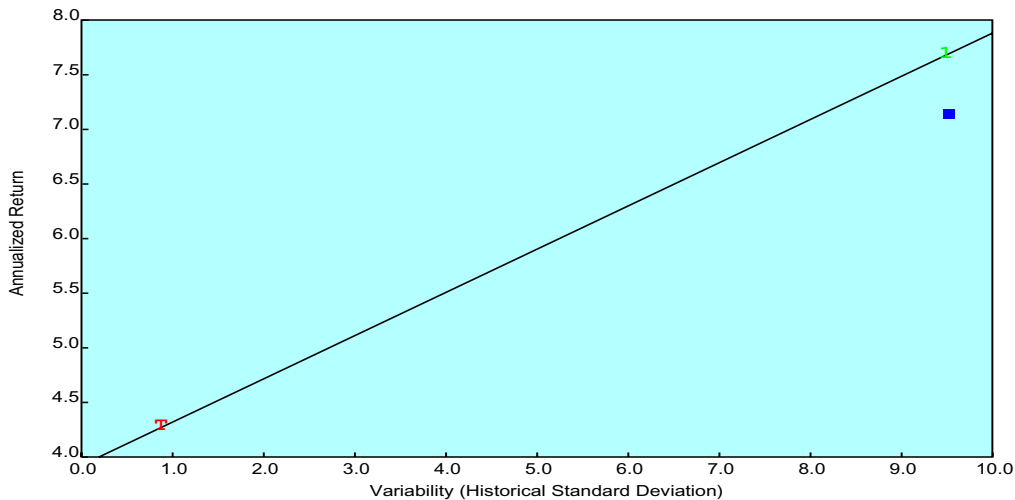
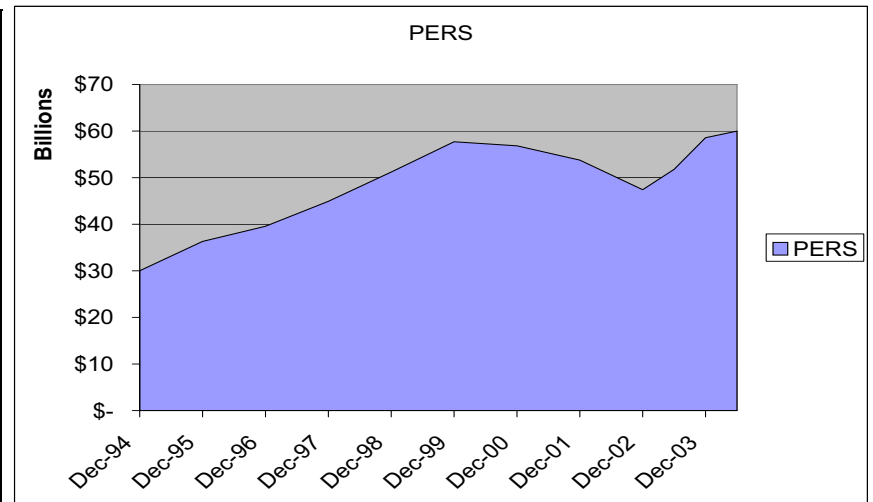
## Characteristic Data

Assets @ 6-30-2004: \$ 639,184,706  
 Actuarial Interest Rate: 8.00%  
 Investment Staff Size: 1

	Internal	External	Total
Active			0.0%
Passive			0.0%
<b>Total</b>	0.0%	0.0%	0.0%

# Public Employees Retirement System

PERS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	1.33%	3.70%	20.61%	0.62%	-1.35%
Benchmark	1.33%	3.59%	20.45%	0.27%	-1.63%
Difference	0.00%	0.11%	0.16%	0.35%	0.28%
<b>Fixed Income</b>					
Actual	-2.38%	0.19%	1.39%	6.65%	7.22%
Benchmark	-2.44%	0.16%	1.01%	6.92%	7.28%
Difference	0.06%	0.03%	0.38%	-0.27%	-0.06%
<b>Intl. Equity</b>					
Actual	-1.16%	4.30%	32.93%	4.91%	1.92%
Benchmark	0.10%	4.34%	31.95%	4.11%	0.41%
Difference	-1.26%	-0.04%	0.98%	0.80%	0.00%
<b>Real Estate</b>					
Actual	0.40%	4.83%	11.69%	8.32%	9.95%
Benchmark	2.23%	5.57%	11.72%	8.82%	9.67%
Difference	-1.83%	-0.74%	-0.03%	-0.50%	0.28%
<b>Private Equity</b>					
Actual	3.58%	12.40%	32.64%	5.19%	12.11%
Benchmark	3.23%	16.90%	42.59%	2.15%	-0.31%
Difference	0.35%	-4.50%	-9.95%	3.04%	12.42%



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

Annualized Return	Variability	Reward	Sharpe Ratio
7.14	9.57	2.87	0.30
7.69	9.52	3.41	0.36
4.28	0.90	0.00	0.00

Asset Mix			
	Actual	Target	Difference
June 30, 2004			
US Equity	48.1%	46.0%	2.1%
Intl. Equity	21.7%	20.0%	1.7%
Alternative Assets	0.5%	1.0%	-0.5%
Total Equity	70.3%	67.0%	3.3%
Fixed Income	22.8%	23.0%	-0.2%
Real Estate	5.4%	9.0%	-3.6%
Short Term Investments	1.5%	1.0%	0.5%
Total Debt	29.7%	33.0%	-3.3%
	100.0%	100.0%	0.0%

## Characteristic Data

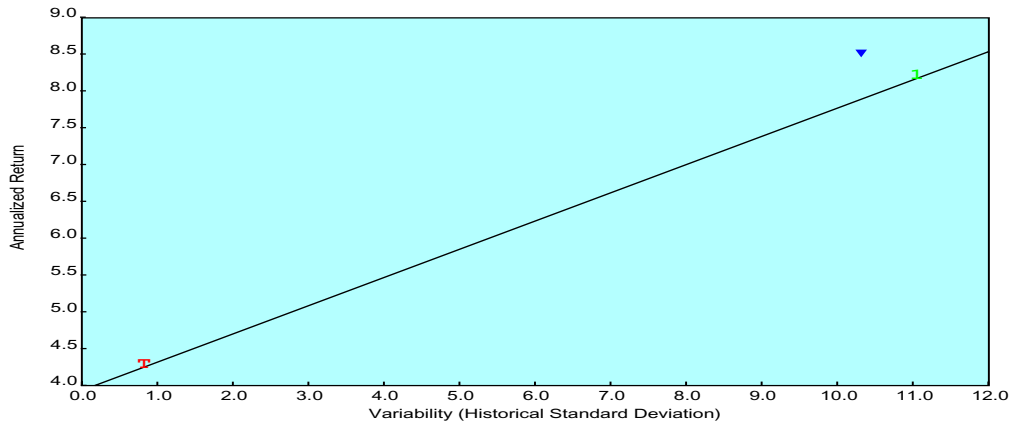
Assets @ 6-30-2004: \$ 60,004,955,000  
 Actuarial Interest Rate: 8%  
 Investment Staff Size: 56

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

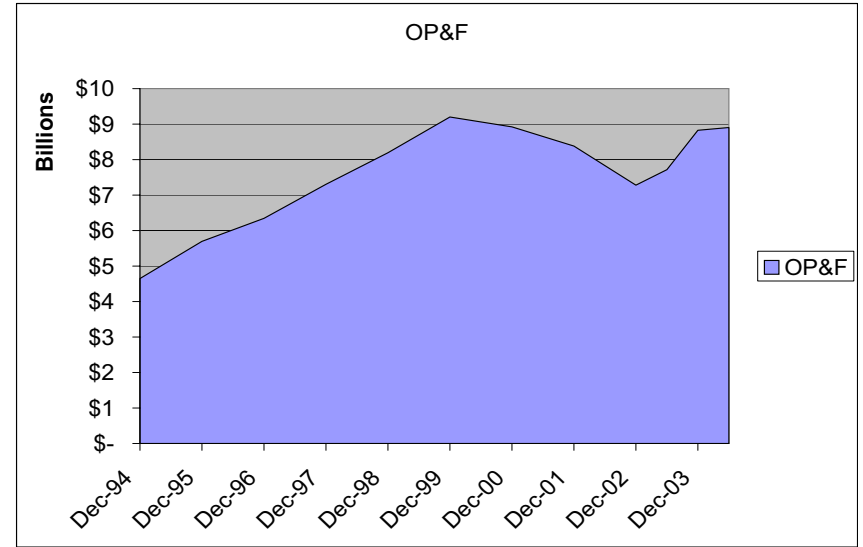
# Police & Fire Pension Fund

OP&F Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	1.46%	4.76%	21.97%	1.67%	0.77%
Benchmark	1.29%	3.93%	21.17%	0.77%	-1.04%
Difference	0.17%	0.83%	0.80%	0.90%	1.81%
<b>Fixed Income</b>					
Actual	-1.78%	0.73%	3.44%	8.09%	8.27%
Benchmark*	-1.95%	0.66%	2.74%	7.47%	7.65%
Difference	0.17%	0.07%	0.70%	0.62%	0.62%
<b>Intl. Equity</b>					
Actual	-1.27%	4.05%	32.79%	4.24%	0.21%
Benchmark	-0.69%	4.11%	32.50%	5.25%	0.96%
Difference	-0.58%	-0.06%	0.29%	-1.01%	-0.75%
<b>Real Estate</b>					
Actual	3.03%	8.01%	15.53%	10.33%	10.44%
Benchmark	3.13%	5.77%	10.83%	5.83%	7.15%
Difference	-0.10%	2.24%	4.70%	4.50%	3.29%
<b>Private Equity</b>					
Actual	0.16%	6.40%	4.81%	-13.90%	0.27%
Benchmark	3.85%	17.85%	44.37%	7.78%	4.41%
Difference	-3.69%	-11.45%	-39.56%	-21.68%	-4.14%

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



	Annualized Return	Variability	Reward	Sharpe Ratio
▼ OP&F	8.50	10.39	4.22	0.41
■ OP&F Policy Index	8.20	11.11	3.93	0.35
■ 91-Day Treasury Bill	4.28	0.90	0.00	0.00



Asset Mix			
	Actual	Target	Difference
June 30, 2004			
US Equity	48.3%	48.0%	0.3%
Intl. Equity	21.8%	20.0%	1.8%
Alternative Assets	1.2%	1.0%	0.2%
Total Equity	71.4%	69.0%	2.4%
Fixed Income	22.1%	23.0%	-0.9%
Real Estate	5.6%	8.0%	-2.4%
Short Term Investments	0.9%	0.0%	0.9%
Total Debt	28.6%	31.0%	-2.4%
	100.0%	100.0%	0.0%

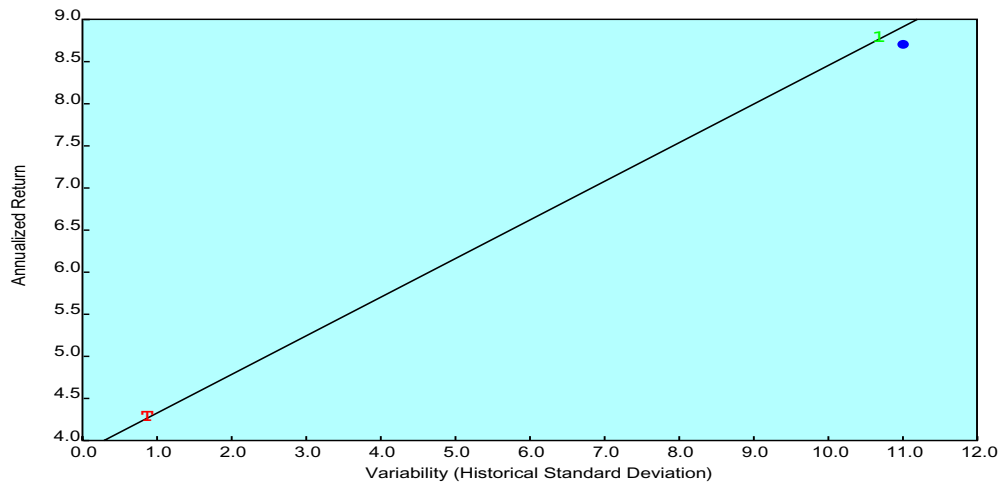
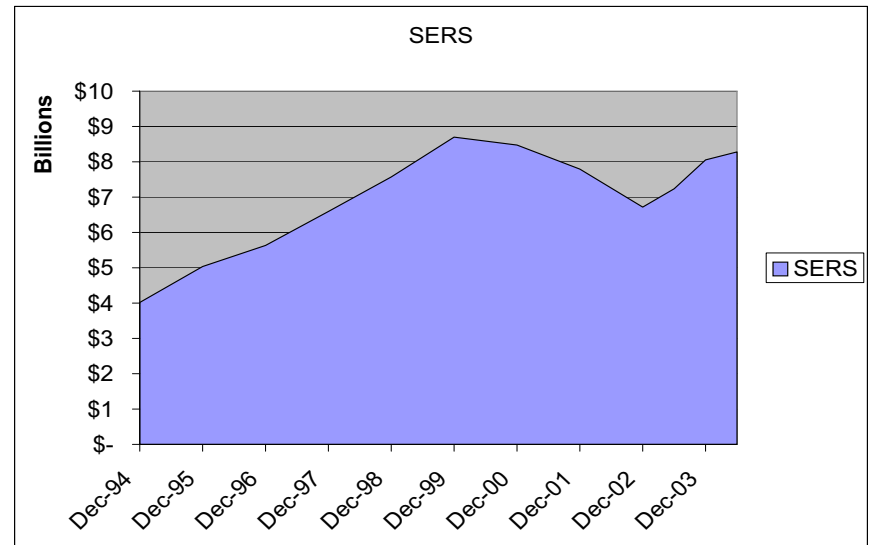
## Characteristic Data

Assets @ 6-30-2003: \$ 9,009,510,000  
 Actuarial Interest Rate: 8.25%  
 Investment Staff Size:

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

# School Employees Retirement System

SERS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	1.56%	3.98%	21.36%	0.55%	-0.72%
Benchmark	1.33%	3.59%	20.45%	0.14%	-1.08%
Difference	0.23%	0.39%	0.91%	0.41%	0.36%
<b>Fixed Income</b>					
Actual	-2.06%	0.39%	1.29%	7.11%	7.67%
Benchmark	-2.44%	0.15%	0.32%	6.36%	6.95%
Difference	0.38%	0.24%	0.97%	0.75%	0.72%
<b>Intl. Equity</b>					
Actual	0.02%	4.73%	27.56%	1.08%	0.21%
Benchmark	0.16%	4.83%	27.82%	0.57%	-0.21%
Difference	-0.14%	-0.10%	-0.26%	0.51%	0.42%
<b>Real Estate</b>					
Actual	0.05%	4.76%	13.19%	5.71%	8.41%
Benchmark	0.89%	5.51%	13.23%	8.73%	9.90%
Difference	-0.84%	-0.75%	-0.04%	-3.02%	-1.49%
<b>Private Equity</b>					
Actual	0.72%	7.52%	8.53%	-13.06%	-0.74%
Benchmark	1.16%	13.88%	38.14%	1.55%	0.39%
Difference	-0.44%	-6.36%	-29.61%	-14.61%	-1.13%



Annualized Return	Variability	Reward	Sharpe Ratio
8.70	11.06	4.42	0.40
8.78	10.72	4.50	0.42
4.28	0.90	0.00	0.00

- SERS
- ┆ SERS Policy Index
- ▴ 91-Day Treasury Bill

Asset Mix			
	Actual	Target	Difference
US Equity	48.3%	46.0%	2.3%
Intl. Equity	18.0%	16.0%	2.0%
Alternative Assets	1.5%	3.0%	-1.5%
Total Equity	67.8%	65.0%	2.8%
Fixed Income	22.4%	23.0%	-0.6%
Real Estate	8.8%	10.0%	-1.2%
Short Term Investments	1.0%	2.0%	-1.0%
Total Debt	32.2%	35.0%	-2.8%
	100.0%	100.0%	0.0%

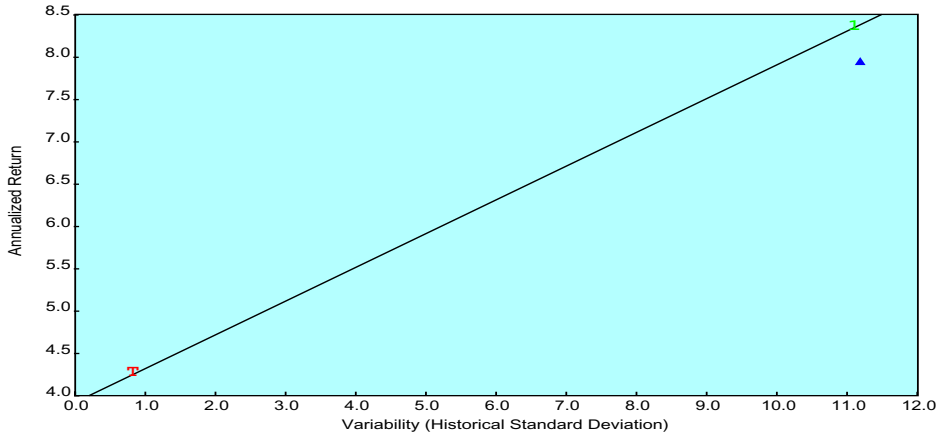
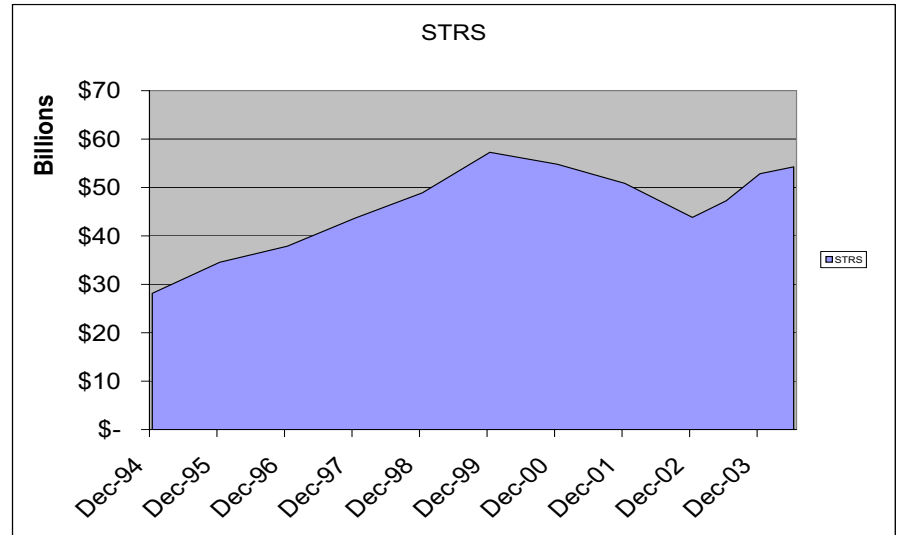
## Characteristic Data

Assets @ 6-30-2004: \$ 8,280,221,451  
 Actuarial Interest Rate: 8.25%  
 Investment Staff Size: 11

	Internal	External	Total
Active	1.0%	69.2%	70.2%
Passive	0.0%	29.8%	29.8%
Total	1.0%	99.0%	100.0%

# State Teachers Retirement System

STRS Returns					
Portfolio	One Quarter	Two Quarters	One Year	Three Years	Five Years
<b>US Equity</b>					
Actual	1.13%	3.54%	20.04%	-0.26%	-1.50%
Benchmark	1.33%	3.59%	20.38%	0.23%	-1.03%
Difference	-0.20%	-0.05%	-0.34%	-0.49%	-0.47%
<b>Fixed Income</b>					
Actual	-2.21%	0.19%	1.49%	7.32%	7.75%
Benchmark	-2.44%	0.16%	1.01%	6.65%	7.05%
Difference	0.23%	0.03%	0.48%	0.67%	0.70%
<b>Intl. Equity</b>					
Actual	-1.95%	3.39%	29.24%	4.28%	2.12%
Benchmark	-1.67%	3.69%	28.55%	2.18%	-0.11%
Difference	-0.28%	-0.30%	0.69%	2.10%	2.23%
<b>Real Estate</b>					
Actual	4.28%	11.74%	17.64%	9.11%	10.41%
Benchmark	2.04%	5.57%	12.27%	8.17%	9.33%
Difference	2.24%	6.17%	5.37%	0.94%	1.08%
<b>Private Equity</b>					
Actual	5.85%	11.85%	19.69%	-2.85%	2.09%
Benchmark	5.85%	11.85%	19.69%	N/A	N/A
Difference	0.00%	0.00%	0.00%	N/A	N/A



Annualized Return	Variability	Reward	Sharpe Ratio
7.95	11.26	3.67	0.33
8.37	11.16	4.10	0.37
4.28	0.90	0.00	0.00

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

Asset Mix			
	Actual June 30, 2004	Target	Difference
US Equity	47.2%	45.0%	2.2%
Intl. Equity	20.9%	20.0%	0.9%
Alternative Assets	2.3%	2.0%	0.3%
<i>Total Equity</i>	<i>70.3%</i>	<i>67.0%</i>	<i>3.3%</i>
Fixed Income	18.8%	23.0%	-4.2%
Real Estate	8.5%	9.0%	-0.5%
Short Term Investments	2.4%	1.0%	1.4%
<i>Total Debt</i>	<i>29.7%</i>	<i>33.0%</i>	<i>-3.3%</i>
	100.0%	100.0%	0.0%

## Characteristic Data

Assets @ 6-30-2004: \$ 54,275,972,025  
 Actuarial Interest Rate: 8.00%  
 Investment Staff Size: 112

	Internal	External	Total
Active	63%	23%	86%
Passive	14%		14%
Total	77%	23%	100%

# Ohio Retirement Study Council

Performance Summary Table  
Periods Ending 6/30/04

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	10 Yrs	Incept Date	Incept Ret
<b>HPRS</b>									
Total Return	0.58	3.79	13.79	17.94	5.66	3.02	7.84	12/31/93	7.05
Equity	1.91	5.45	21.15	27.35	4.49	-0.75	8.05	12/31/93	7.08
Fixed Income	-2.43	0.18	0.91	1.48	7.33	7.52	7.54	12/31/93	6.82
Cash & Equiv	0.29	0.63	0.78	0.96	1.93	3.35	4.34	3/31/94	4.32
Real Estate	1.79	4.28	3.07	5.14	6.61	8.92	7.90	12/31/93	7.71
International Equity	-0.51	3.22	20.18	26.51	2.31	1.49		3/31/95	5.30
<b>PERS</b>									
Total Return	-0.11	3.07	13.18	17.67	4.16	3.26	7.72	12/31/93	7.14
Equity	1.33	3.70	16.60	20.61	0.62	-1.34	9.47	12/31/93	8.54
Fixed Income	-2.38	0.19	1.14	1.39	6.65	7.20	7.75	12/31/93	7.03
Cash & Equiv	0.27	0.53	0.80	1.08	1.62	3.31	4.44	12/31/93	4.39
Real Estate	0.40	4.83	8.18	11.69	8.32	9.95	10.38	12/31/93	10.30
International Equity	-1.16	4.30	21.62	32.93	-0.91	-1.52		12/31/95	1.60
Other	3.58	12.41	20.41	32.63	5.19	12.10		12/31/95	15.20
<b>OP&amp;F</b>									
Total Return	0.20	3.90	14.13	18.61	4.94	3.56	9.37	12/31/93	8.50
Equity	1.46	4.76	17.61	21.97	1.67	0.77	11.32	12/31/93	10.23
Fixed Income	-1.78	0.73	2.51	3.44	8.09	8.32	8.06	12/31/93	7.22
Cash & Equiv	0.23	0.47	0.73	0.98	1.71	3.23		9/30/96	3.80
Real Estate	3.03	8.01	10.71	15.53	10.33	10.44	11.11	12/31/93	10.97
International Equity	-1.27	4.05	21.45	32.79	4.24	0.21		9/30/94	5.45
Other	0.16	6.40	5.87	4.81	-13.90	0.23			
<b>SERS</b>									
Total Return	0.32	3.40	12.54	16.54	3.05	2.79	9.49	12/31/93	8.70
Equity	1.56	3.98	16.88	21.36	0.55	-0.72	11.52	12/31/93	10.54
Fixed Income	-2.06	0.39	1.24	1.29	7.11	7.67	7.67	12/31/93	6.83
Cash & Equiv	0.26	0.49	0.72	0.95	1.62	3.88	4.65	12/31/93	4.60
Real Estate	0.05	4.76	9.10	13.19	5.71	8.41	9.78	12/31/93	9.66
International Equity	0.02	4.73	18.97	27.56	1.08	0.21		12/31/94	5.75
Other	0.72	7.52	8.72	8.53	-13.06	-0.74	14.85	12/31/93	15.69

Performance Summary Table  
Periods Ending 6/30/04

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	10 Yrs	Incept Date	Incept Ret
<b>STRS</b>									
Total Return	0.18	3.69	13.41	17.70	3.43	2.74	8.65	12/31/93	7.95
Equity	1.13	3.54	16.31	20.04	-0.26	-1.50	9.99	12/31/93	9.13
Fixed Income	-2.21	0.19	1.29	1.49	7.32	7.75	8.43	12/31/93	7.67
Cash & Equiv	0.26	0.52	0.79	1.06	1.65	3.36	4.50	12/31/93	4.26
Real Estate	4.28	11.74	14.86	17.64	9.11	10.41	10.71	12/31/93	10.57
International Equity	-1.95	3.39	18.59	29.24	4.28	2.12	3.79	12/31/93	4.49
Other	5.85	11.85	17.37	19.69	-2.85	2.09	3.33	12/31/93	5.14
<b>Indices</b>									
									Since
Russell 1000	1.40	3.32	15.99	19.47	-0.32	-1.65	11.83	12/31/93	10.79
Russell 2000	0.47	6.76	22.27	33.36	6.23	6.63	10.93	12/31/93	9.68
Russell 3000	1.33	3.59	16.47	20.45	0.14	-1.08	11.66	12/31/93	10.60
Standard & Poors 500	1.71	3.44	16.04	19.11	-0.71	-2.20	11.83	12/31/93	10.87
S&P 500 Equal Wtd	2.37	6.05	22.00	28.43	6.16	5.20	13.95	12/31/93	12.95
S&P 600 Small Cap	3.60	10.04	26.30	35.24	9.36	10.70	13.60	12/31/93	11.88
S&P MidCap 400	0.97	6.08	20.07	27.95	6.52	9.04	15.45	12/31/93	13.84
Wilshire 5000	1.29	3.93	16.84	21.17	0.77	-1.04	11.53	12/31/93	10.47
LB Aggregate	-2.44	0.15	0.47	0.32	6.36	6.95	7.39	12/31/93	6.62
SB Broad Inv Grade	-2.45	0.17	0.53	0.37	6.38	6.95	7.39	12/31/93	6.64
MSCI EAFE (Net)	0.22	4.56	22.42	32.37	3.87	0.06	4.05	12/31/93	4.69
MSCI Em Mkts Free (G	-9.57	-0.78	16.88	33.51	13.10	3.28	1.21	12/31/93	0.10
MSCI World Ex-US (Ne	0.10	4.34	22.08	31.95	4.11	0.41	4.36	12/31/93	4.92
LB Mortgage	-1.13	0.76	1.70	2.22	5.60	6.60	7.29	12/31/93	6.63
NCREIF	3.13	5.77	8.69	10.83	7.96	9.40	10.36	12/31/93	10.14

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.

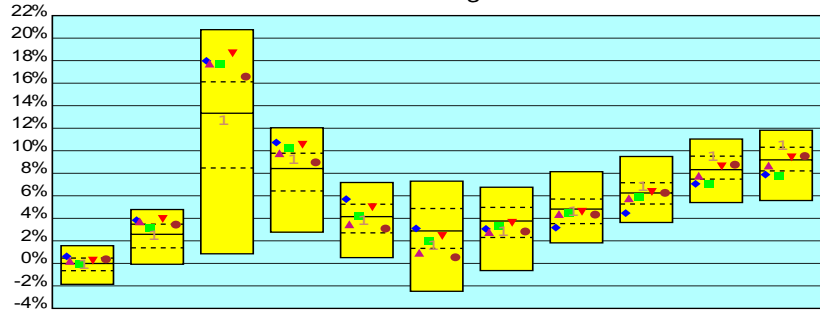
**MSCI World Ex-US** – An index that measures the performance of the stock markets of the following developed countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Norway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

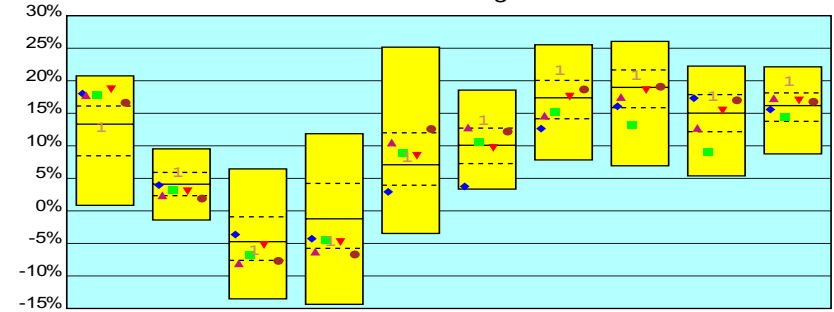
**Cumulative Performance Comparison**  
Total Returns of Total Fund Portfolios  
Periods Ending 6/04



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	1.57	4.78	20.75	12.04	7.18	7.30	6.76	8.14	9.49	11.04	11.82
1st Qt	0.47	3.48	16.12	9.78	5.25	4.87	4.97	5.71	7.16	9.52	10.31
Median	-0.01	2.58	13.33	8.42	4.15	2.88	3.76	4.82	6.25	8.32	9.19
3rd Qt	-0.65	1.38	8.47	6.43	2.71	1.33	2.30	3.53	5.27	7.48	8.21
Low	-1.86	-0.08	0.85	2.77	0.51	-2.48	-0.64	1.82	3.63	5.40	5.58

◆ HPRS	0.58	3.79	17.94	10.69	5.66	3.06	3.02	3.13	4.42	7.02	7.84
Return Rank	20	18	11	13	16	47	64	85	92	82	83
■ PERS	-0.11	3.07	17.67	10.19	4.16	1.91	3.26	4.44	5.89	7.01	7.72
Return Rank	53	35	12	17	49	66	61	58	60	82	84
▼ OP&F	0.20	3.90	18.61	10.49	4.94	2.39	3.56	4.54	6.30	8.57	9.37
Return Rank	38	14	10	15	31	58	55	57	49	42	44
● SERS	0.32	3.40	16.54	8.93	3.05	0.50	2.79	4.29	6.22	8.72	9.49
Return Rank	32	26	20	42	70	81	66	61	50	39	43
▲ STRS	0.18	3.69	17.70	9.74	3.43	0.90	2.74	4.34	5.74	7.74	8.65
Return Rank	39	19	12	25	65	79	68	60	64	69	66
┆ Policy Index	-0.20	2.42	12.57	9.12	3.72	1.48	2.76	4.51	6.77	9.38	10.38
Return Rank	56	55	55	36	60	72	68	57	37	29	23

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



	Year 6/04	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	20.75	9.53	6.45	11.86	25.16	18.56	25.53	26.05	22.25	22.14
1st Qt	16.12	5.91	-0.91	4.22	12.00	12.72	20.05	21.66	17.87	18.13
Median	13.33	4.10	-4.73	-1.22	7.09	10.08	17.38	18.98	15.02	16.18
3rd Qt	8.47	2.34	-7.61	-5.76	3.94	7.27	14.16	15.86	12.17	13.76
Low	0.85	-1.40	-13.52	-14.36	-3.47	3.35	7.83	6.93	5.38	8.76

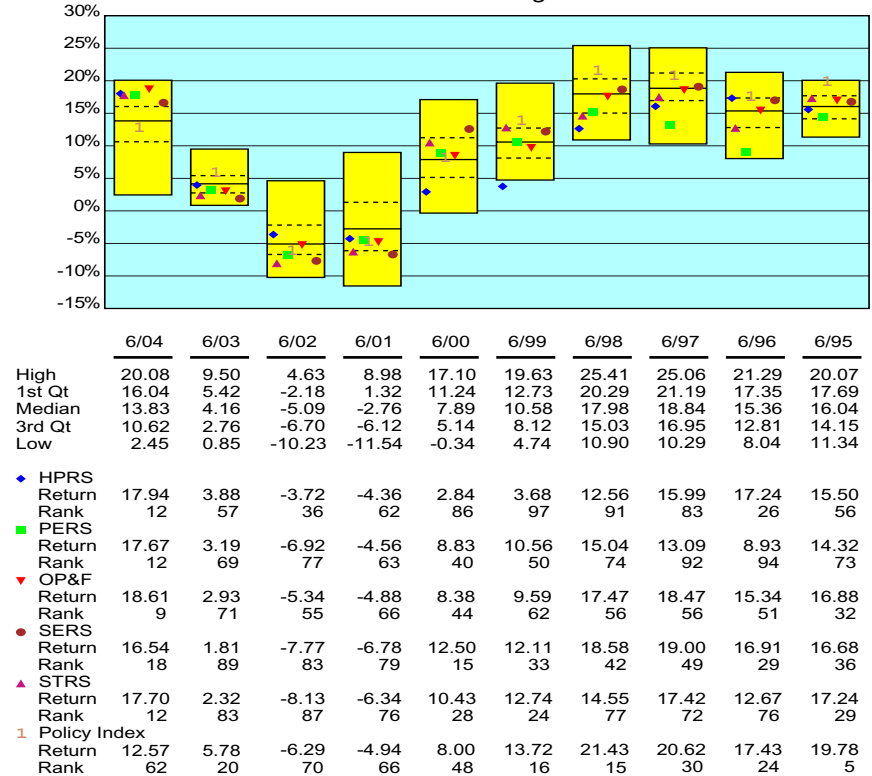
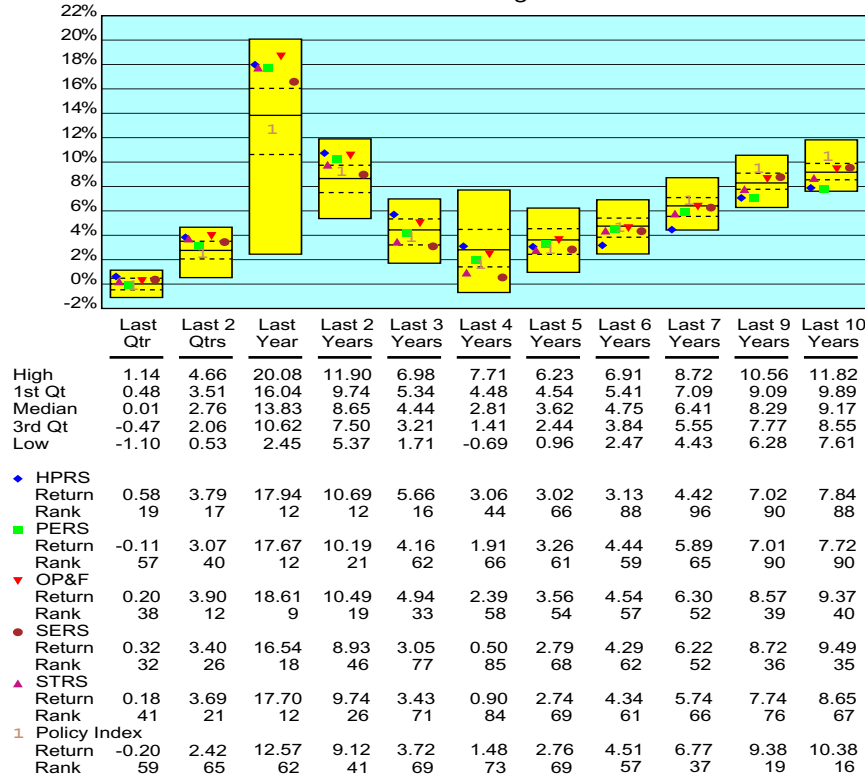
◆ HPRS	17.94	3.88	-3.72	-4.36	2.84	3.68	12.56	15.99	17.24	15.50
Return Rank	11	53	39	67	81	93	82	73	28	57
■ PERS	17.67	3.19	-6.92	-4.56	8.83	10.56	15.04	13.09	8.93	14.32
Return Rank	12	64	69	68	39	45	68	84	87	70
▼ OP&F	18.61	2.93	-5.34	-4.88	8.38	9.59	17.47	18.47	15.34	16.88
Return Rank	10	67	55	70	41	55	48	55	47	37
● SERS	16.54	1.81	-7.77	-6.78	12.50	12.11	18.58	19.00	16.91	16.68
Return Rank	20	80	75	80	22	31	38	49	31	41
▲ STRS	17.70	2.32	-8.13	-6.34	10.43	12.74	14.55	17.42	12.67	17.24
Return Rank	12	75	78	78	31	24	72	63	72	33
┆ Policy Index	12.57	5.78	-6.29	-4.94	8.00	13.72	21.43	20.62	17.43	19.78
Return Rank	55	26	64	70	43	17	16	34	27	10

This page compares the Total Fund results to a broad universe of total funds - 1424 other funds, including those of public, corporate, and multi-employer pension plans and totaling \$698.6 Billion in assets - over a ten-year measurement period. Here and elsewhere in the report, the "floating bars" define the universe against which the performance is being compared. The top of the bar is the 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 ten years. The graph on the right is a consecutive performance comparison with twelve-month measurement periods ending 6/2004. The graph on the left shows that SERS has demonstrated the highest return for the ten-year period with a 9.49% per year return, which ranks the fund in the 43<sup>rd</sup> percentile. The graph on the right shows that this ten-year ranking was achieved by above-median performance for 12 month periods ending 6/30 in 1995, 1996, 1997, 1998, 1999, 2000 and 2004.

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Total Fund Public Sponsors  
Periods Ending 6/04

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

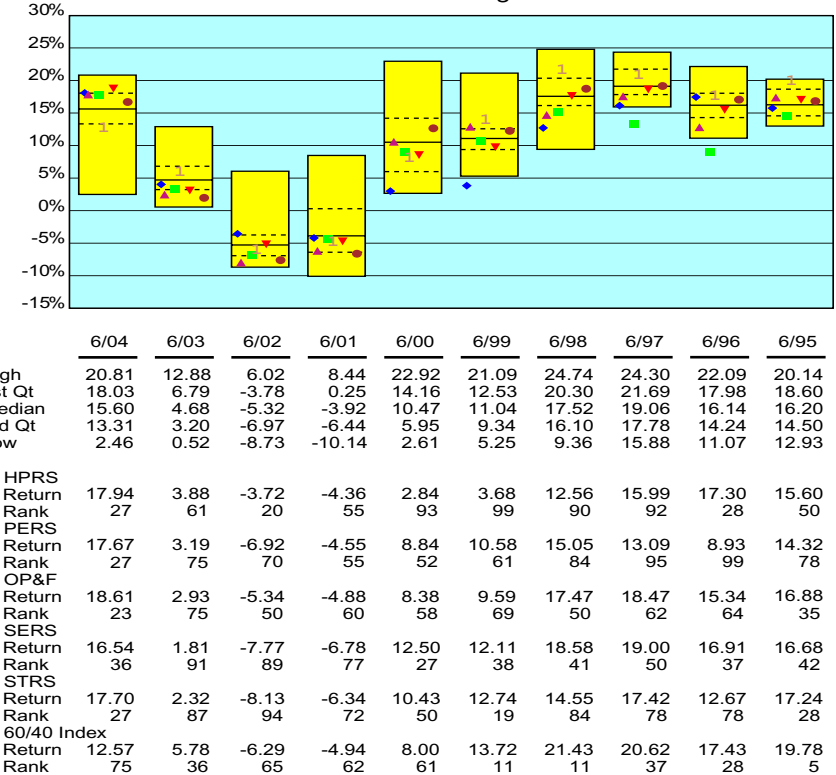
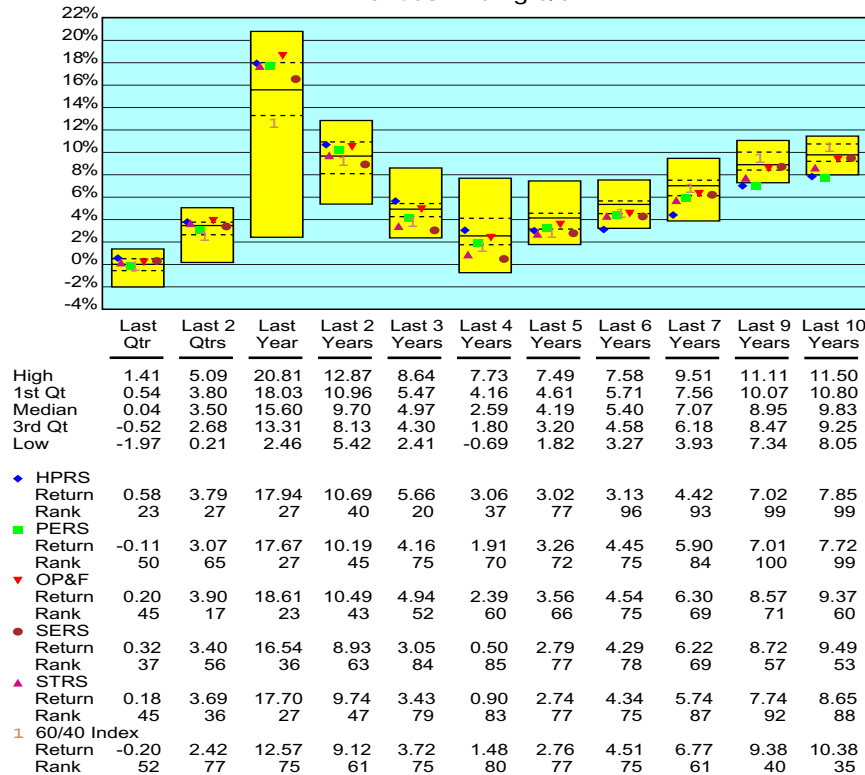


The graphs above compare the Total Fund results to a universe comprised solely of the 173 Public Retirement Systems in the universe. SERS and OP&F are the only Ohio funds to rank above the median return for this universe over the last ten years. SERS ranked in the 35<sup>th</sup> percentile, OP&F placed in the 40<sup>th</sup> percentile, STRS placed in the 67<sup>th</sup> percentile, and HPRS and PERS ranked in the 88<sup>th</sup> and 90<sup>th</sup> percentile respectively.

# Ohio Retirement Study Council

Total Returns of Total Fund Portfolios  
Total Market Value Over One Billion  
Periods Ending 6/04

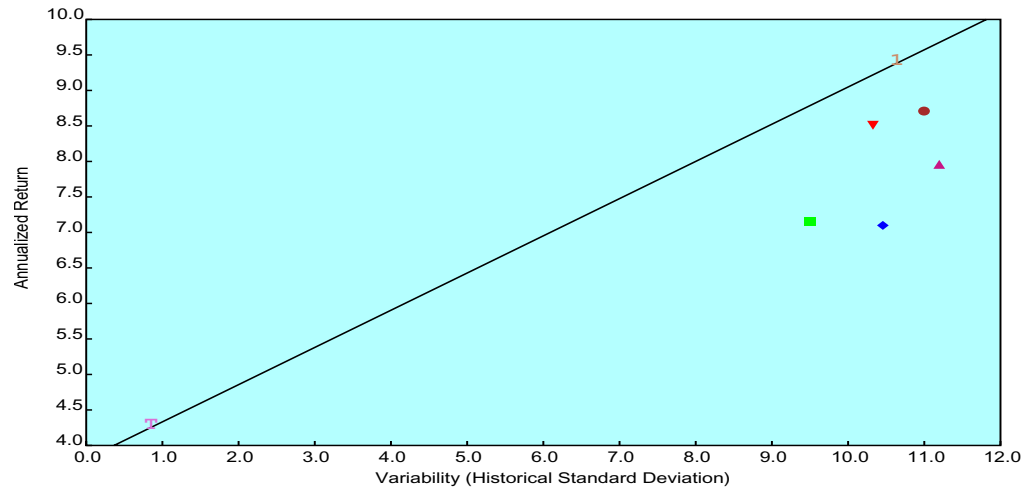
Total Returns of Total Fund Portfolios  
Total Market Value Over One Billion  
Years Ending



The charts above compare the total fund returns to a universe of large funds. This particular universe consists of 73 funds with total assets over one billion dollars. The combined assets of the 73 funds in this universe totals \$551.3 Billion. Results are similar to the Public Fund comparisons on the previous page.

# Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis  
Periods from 12/93 to 6/04

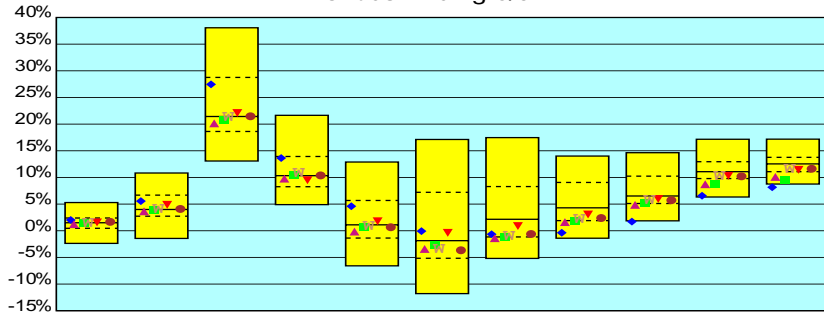


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.09	10.52	2.81	0.27
■ PERS	7.15	9.57	2.87	0.30
▼ OP&F	8.50	10.39	4.22	0.41
● SERS	8.70	11.06	4.42	0.40
▲ STRS	7.95	11.26	3.67	0.33
■ 60/40 Index	9.41	10.69	5.13	0.48
△ 91-Day Treasury Bill	4.28	0.90	0.00	0.00

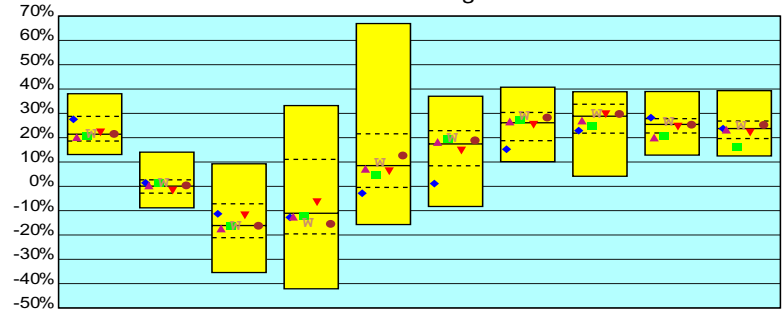
The graph above provides the first analysis of risk. The 10 and one half year results of each Total Fund are displayed in risk-return space. The vertical axis shows the fund's return and the horizontal axis shows the fund's risk (defined as annualized quarterly standard deviation of returns) for the 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 6/04



**Consecutive Performance Comparison**  
Total Returns of 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	Last 10 Years
High	5.29	10.83	38.07	21.65	12.89	17.12	17.47	14.01	14.64	17.16	17.18
1st Qt	2.39	6.68	28.76	13.93	5.68	7.21	8.29	9.06	10.24	12.95	13.77
Median	1.50	3.99	21.43	10.33	1.11	-1.86	2.15	4.30	6.52	11.08	12.54
3rd Qt	0.46	2.73	18.62	8.26	-1.37	-5.16	-1.16	1.90	5.11	9.79	11.08
Low	-2.37	-1.44	13.08	4.90	-6.58	-11.79	-5.19	-1.40	1.86	6.33	8.76

◆ HPRS Domestic Equity	Return	1.91	5.45	27.35	13.53	4.49	-0.18	-0.76	-0.48	1.61	6.46	8.05
	Rank	34	35	31	26	28	46	72	91	95	94	96
■ PERS Domestic Equity	Return	1.33	3.70	20.61	10.41	0.62	-2.78	-1.35	1.81	5.09	8.75	9.47
	Rank	54	55	55	49	53	54	75	75	75	83	89
▼ OP&F Domestic Equity	Return	1.46	4.76	21.97	9.37	1.67	-0.50	0.77	2.94	5.85	10.20	11.32
	Rank	51	42	47	60	46	47	59	65	61	69	72
● SERS Domestic Equity	Return	1.56	3.98	21.36	10.27	0.55	-3.77	-0.72	2.28	5.62	10.10	11.52
	Rank	48	50	50	50	53	62	71	72	65	69	70
▲ STRS Domestic Equity	Return	1.13	3.54	20.04	9.67	-0.26	-3.52	-1.50	1.52	4.75	8.62	9.99
	Rank	58	58	58	55	59	60	76	81	77	84	87
W Wilshire 5000	Return	1.29	3.93	21.17	10.78	0.77	-3.52	-1.04	2.13	5.58	10.15	11.53
	Rank	54	51	51	47	52	60	74	74	65	69	70

	Year 6/04	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	38.07	14.05	9.27	33.20	66.92	37.04	40.75	38.89	38.97	39.33
1st Qt	28.76	2.67	-7.18	11.08	21.59	22.88	30.37	33.75	27.82	26.84
Median	21.43	0.08	-16.12	-11.07	8.52	17.43	26.13	28.83	25.46	23.75
3rd Qt	18.62	-2.80	-21.11	-19.55	-0.44	8.45	18.77	21.86	21.93	19.64
Low	13.08	-8.84	-35.44	-42.12	-15.71	-8.28	10.15	4.14	12.84	12.49

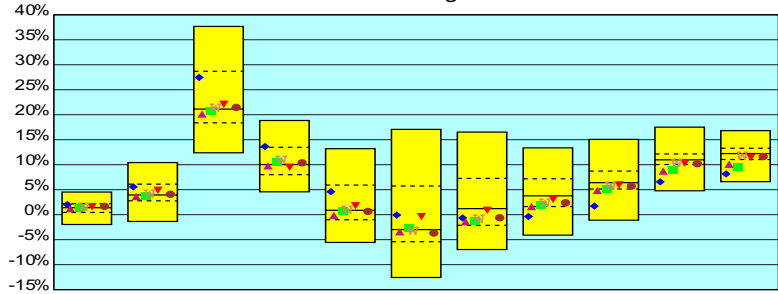
  

◆ HPRS Domestic Equity	Return	27.35	1.22	-11.50	-12.96	-3.04	0.93	15.04	22.69	28.03	23.52
	Rank	31	33	36	53	78	85	87	72	23	51
■ PERS Domestic Equity	Return	20.61	1.07	-16.44	-12.29	4.57	19.22	27.13	24.57	20.63	16.13
	Rank	55	35	51	52	67	44	46	67	80	88
▼ OP&F Domestic Equity	Return	21.97	-1.94	-12.13	-6.73	6.00	14.52	25.11	29.45	24.35	21.92
	Rank	47	67	37	44	64	58	53	46	59	60
● SERS Domestic Equity	Return	21.36	0.19	-16.40	-15.63	12.48	18.71	28.09	29.56	25.15	25.06
	Rank	50	48	50	68	41	45	42	46	53	42
▲ STRS Domestic Equity	Return	20.04	0.19	-17.51	-12.67	7.01	18.04	26.47	26.87	19.88	23.11
	Rank	58	48	56	53	60	47	48	59	82	53
W Wilshire 5000	Return	21.17	1.27	-16.62	-15.32	9.52	19.60	28.87	29.31	26.23	24.73
	Rank	51	33	51	67	47	42	39	47	36	44

The exhibits above, and those on the next two pages, focus on US Equity results. The analysis is similar to the Total Fund analysis, except that now the comparisons are to a broad equity universe (above) and to the equity returns of Public Funds (page 9). When compared to equity portfolios in the broad equity universe (above), for the past 10 years OP&F and SERS have placed in the third quartile while HPRS, PERS, and STRS have placed in the fourth quartile. Over the last five years, four of the five funds (HPRS, PERS, OP&F, and SERS) have displayed third quartile performance, with STRS ranking just outside the third quartile in the 76<sup>th</sup> percentile. Over that same period, three of the systems (HPRS, OP&F, and SERS) have outperformed the broad equity market as defined by the Wilshire 5000. Results over the last twelve months are very strong on an absolute basis. All five systems have experienced returns in excess of 20%. The exhibit on the right displays performance by twelve-month periods ending June 30<sup>th</sup>. 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.

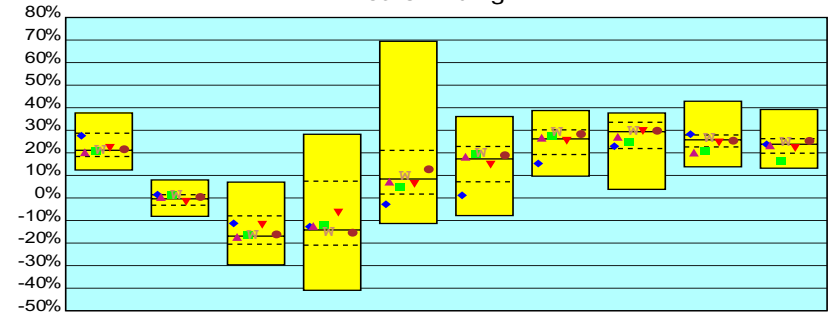
# Ohio Retirement Study Council

Cumulative Performance Comparison  
Total Returns of Public Equity Portfolios  
Periods Ending 6/04



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	4.53	10.43	37.67	18.85	13.21	17.07	16.53	13.37	15.07	17.52	16.82
1st Qt	2.19	6.11	28.70	13.49	5.93	5.74	7.26	7.19	8.73	12.15	13.30
Median	1.40	3.95	21.13	10.03	0.88	-2.98	1.21	3.77	6.41	10.98	12.23
3rd Qt	0.45	2.78	18.38	8.01	-1.01	-5.41	-2.13	1.63	5.14	10.04	11.04
Low	-1.96	-1.35	12.39	4.58	-5.55	-12.56	-6.97	-4.09	-1.10	4.79	6.61
◆ HPRS Domestic Equity											
Return	1.91	5.45	27.35	13.53	4.49	-0.18	-0.76	-0.48	1.61	6.46	8.05
Rank	30	33	29	24	30	41	59	88	88	91	91
■ PERS Domestic Equity											
Return	1.33	3.70	20.61	10.41	0.62	-2.78	-1.35	1.81	5.09	8.75	9.47
Rank	51	55	54	47	53	49	63	69	76	83	87
▼ OP&F Domestic Equity											
Return	1.46	4.76	21.97	9.37	1.67	-0.50	0.77	2.94	5.85	10.20	11.32
Rank	47	39	46	59	44	42	51	57	57	71	70
● SERS Domestic Equity											
Return	1.56	3.98	21.36	10.27	0.55	-3.77	-0.72	2.28	5.62	10.10	11.52
Rank	45	48	47	47	53	57	59	63	62	72	70
▲ STRS Domestic Equity											
Return	1.13	3.54	20.04	9.67	-0.26	-3.52	-1.50	1.52	4.75	8.62	9.99
Rank	56	57	57	52	61	55	66	80	78	84	85
W Wilshire 5000											
Return	1.29	3.93	21.17	10.78	0.77	-3.52	-1.04	2.13	5.58	10.15	11.53
Rank	52	51	49	44	51	55	61	65	62	72	70

Consecutive Performance Comparison  
Total Returns of Public Equity Portfolios  
Years Ending

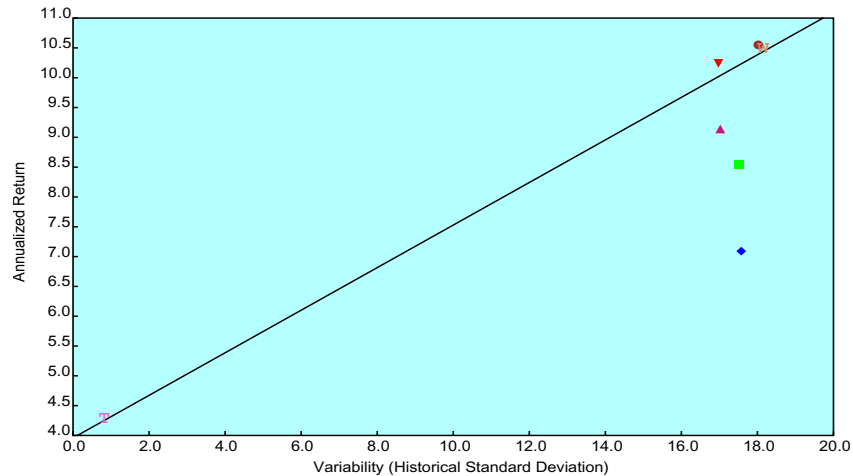


	6/04	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	37.67	7.99	7.02	28.23	69.45	36.10	38.75	37.67	42.88	39.22
1st Qt	28.70	1.43	-7.94	7.44	21.09	22.83	30.19	33.55	27.92	26.27
Median	21.13	-0.39	-16.92	-14.19	8.40	17.31	26.18	29.38	25.77	23.81
3rd Qt	18.38	-3.22	-20.50	-20.93	1.72	7.17	19.25	21.91	22.62	19.84
Low	12.39	-8.15	-29.65	-40.94	-11.32	-7.81	9.66	3.81	13.81	13.19
◆ HPRS Domestic Equity										
Return	27.35	1.22	-11.50	-12.96	-3.04	0.93	15.04	22.69	28.03	23.52
Rank	29	26	32	44	81	84	89	73	24	52
■ PERS Domestic Equity										
Return	20.61	1.07	-16.44	-12.29	4.57	19.22	27.13	24.57	20.63	16.13
Rank	54	28	47	43	70	44	45	69	83	89
▼ OP&F Domestic Equity										
Return	21.97	-1.94	-12.13	-6.73	6.00	14.52	25.11	29.45	24.35	21.92
Rank	46	65	34	37	66	59	53	49	62	62
● SERS Domestic Equity										
Return	21.36	0.19	-16.40	-15.63	12.48	18.71	28.09	29.56	25.15	25.06
Rank	47	44	47	64	40	45	41	49	57	39
▲ STRS Domestic Equity										
Return	20.04	0.19	-17.51	-12.67	7.01	18.04	26.47	26.87	19.88	23.11
Rank	57	44	53	44	62	48	48	63	86	54
W Wilshire 5000										
Return	21.17	1.27	-16.62	-15.32	9.52	19.60	28.87	29.31	26.23	24.73
Rank	49	25	48	63	46	42	39	50	37	42

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 29<sup>th</sup> percentile (HPRS) to the 57<sup>th</sup> percentile (STRS). Over the past five years, OP&F had the highest return and ranking (0.77% and 51<sup>st</sup> percentile). HPRS, OP&F and SERS outperformed the Wilshire 5000 Index over the five-year period. Two-year results are somewhat better with all of the funds near or above the median. Only HPRS, however, outperformed the Wilshire 5000 Index during that period.

# Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis  
Periods from 12/93 to 6/04



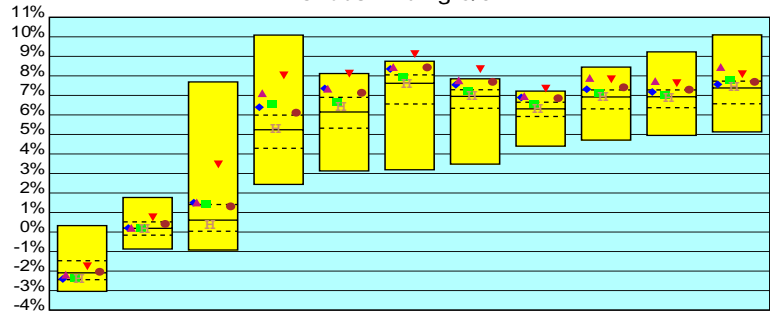
	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Equity	7.08	17.68	2.81	0.16
■ PERS Domestic Equity	8.54	17.63	4.27	0.24
▼ OP&F Domestic Equity	10.23	17.08	5.95	0.35
● SERS Domestic Equity	10.54	18.13	6.26	0.35
▲ STRS Domestic Equity	9.13	17.13	4.85	0.28
■ Wilshire 5000	10.47	18.24	6.19	0.34
Ⓜ 91-Day Treasury Bill	4.28	0.90	0.00	0.00

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



# Ohio Retirement Study Council

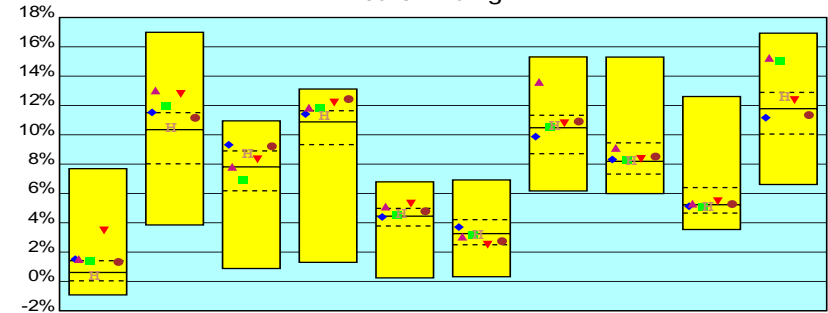
**Cumulative Performance Comparison**  
Total Returns of Fixed Income Portfolios  
Periods Ending 6/04



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years	Last 10 Years
High	0.33	1.77	7.69	10.09	8.12	8.75	7.85	7.22	8.45	9.23	10.10
1st Qt	-1.47	0.52	1.41	5.99	6.90	8.05	7.29	6.65	7.28	7.28	7.73
Median	-2.09	0.19	0.61	5.24	6.15	7.62	6.95	6.31	6.92	6.93	7.38
3rd Qt	-2.44	-0.16	0.04	4.29	5.32	6.56	6.34	5.92	6.31	6.37	6.57
Low	-3.04	-0.87	-0.92	2.44	3.13	3.19	3.48	4.40	4.71	4.95	5.13

◆ HPRS Domestic Fixed Income	Return -2.43	0.18	1.48	6.37	7.33	8.33	7.52	6.87	7.29	7.15	7.54
	Rank 74	53	24	17	15	13	15	15	23	34	36
■ PERS Domestic Fixed Income	Return -2.38	0.19	1.39	6.53	6.65	7.92	7.22	6.53	7.09	6.98	7.76
	Rank 70	52	25	15	33	31	27	34	37	48	22
▼ OP&F Domestic Fixed Income	Return -1.78	0.73	3.44	8.00	8.09	9.09	8.32	7.32	7.80	7.60	8.06
	Rank 36	17	10	7	5	3	2	4	6	17	16
● SERS Domestic Fixed Income	Return -2.06	0.39	1.29	6.09	7.11	8.41	7.67	6.83	7.39	7.27	7.67
	Rank 47	34	26	21	18	10	10	17	17	27	27
▲ STRS Fixed Income	Return -2.21	0.19	1.49	7.09	7.32	8.43	7.75	6.94	7.87	7.71	8.43
	Rank 60	52	23	11	15	10	6	14	6	14	10
▣ LB Aggregate	Return -2.44	0.15	0.32	5.24	6.36	7.56	6.95	6.30	6.90	6.83	7.39
	Rank 75	56	63	50	44	52	50	52	53	55	48

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



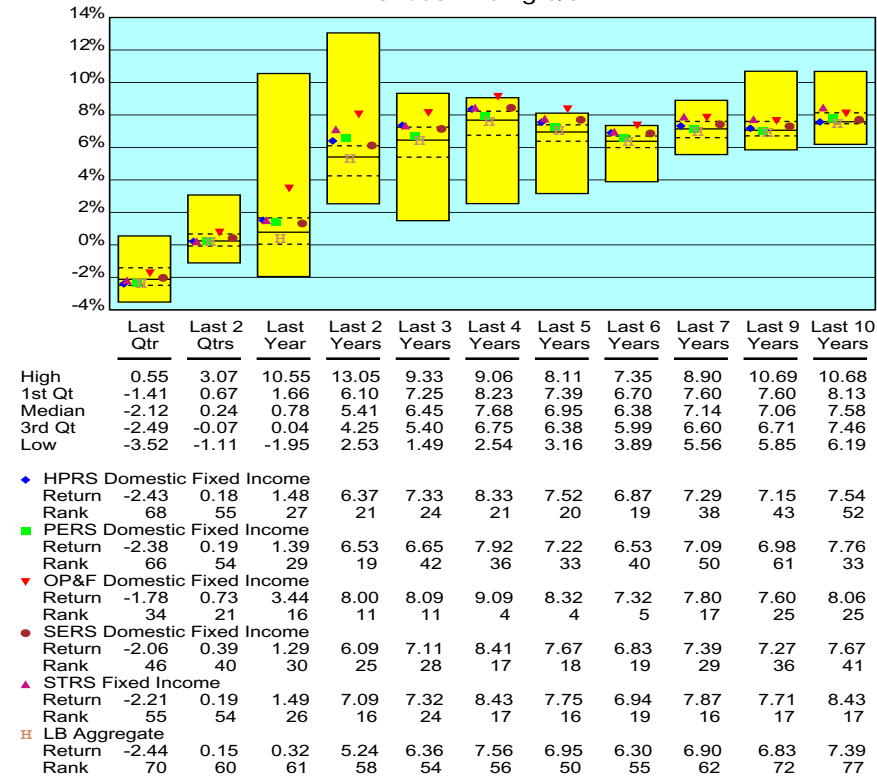
	6/04	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	7.69	16.99	10.95	13.12	6.79	6.92	15.31	15.30	12.61	16.93
1st Qt	1.41	11.51	8.90	11.64	4.98	4.21	11.33	9.45	6.40	12.89
Median	0.61	10.35	7.81	10.88	4.45	3.26	10.48	8.19	5.23	11.78
3rd Qt	0.04	8.02	6.18	9.33	3.78	2.50	8.71	7.32	4.66	10.05
Low	-0.92	3.85	0.88	1.30	0.24	0.32	6.17	5.99	3.54	6.61

◆ HPRS Domestic Fixed Income	Return 1.48	11.49	9.28	11.38	4.36	3.67	9.84	8.28	5.09	11.13
	Rank 24	25	16	34	54	38	60	47	56	64
■ PERS Domestic Fixed Income	Return 1.39	11.92	6.91	11.81	4.48	3.10	10.51	8.22	5.05	15.01
	Rank 25	19	66	19	48	56	49	48	58	10
▼ OP&F Domestic Fixed Income	Return 3.44	12.75	8.29	12.16	5.27	2.47	10.75	8.32	5.43	12.33
	Rank 10	14	42	13	15	76	41	46	44	38
● SERS Domestic Fixed Income	Return 1.29	11.12	9.18	12.40	4.75	2.71	10.87	8.48	5.24	11.31
	Rank 26	33	18	10	34	69	37	41	49	61
▲ STRS Fixed Income	Return 1.49	12.99	7.78	11.82	5.07	3.02	13.57	9.07	5.27	15.21
	Rank 23	13	50	19	21	59	7	29	48	9
▣ LB Aggregate	Return 0.32	10.40	8.63	11.23	4.56	3.13	10.54	8.16	5.01	12.55
	Rank 63	48	32	40	45	55	48	50	61	32

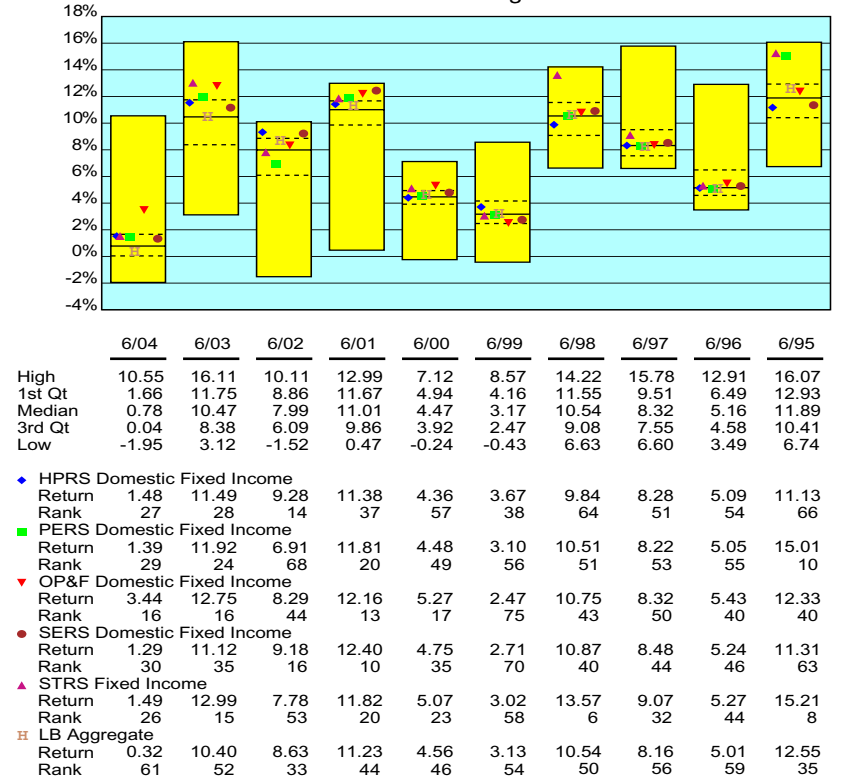
The exhibits above, and those on the next two pages, compare the fixed income results of the five funds to that of a broad fixed income universe consisting of all of the fixed income accounts in the Wilshire Co-op. Over the past ten years, all five of the fund's fixed income results are above the median. Over the last twelve months, HPRS, PERS, OP&F, and STRS placed in the top quartile, while SERS placed just outside of the first 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 ten-year cumulative return was spurred by very strong performance in the twelve month periods ending June 30<sup>th</sup> in 1995, 1997, 1998, 2000, 2001, 2003 and 2004.

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Public Fixed Income Portfolios  
Periods Ending 6/04



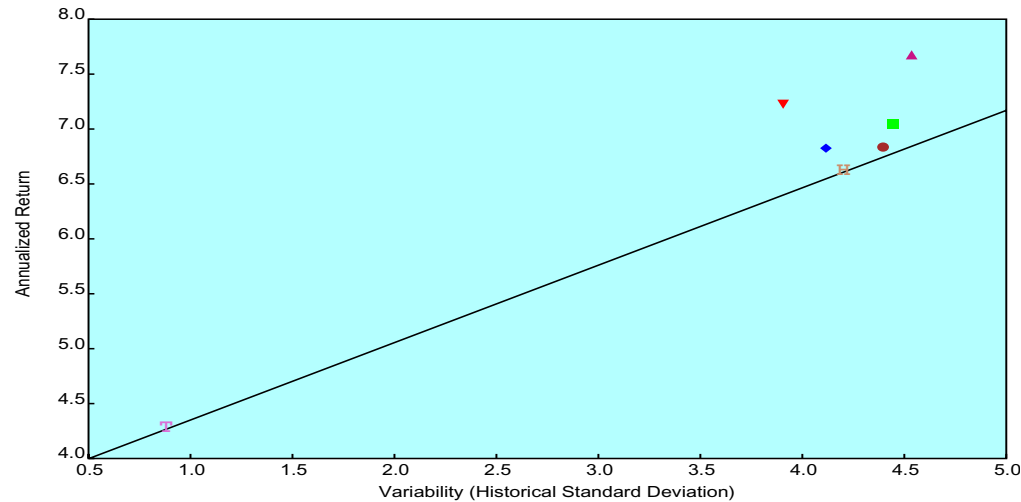
**Consecutive Performance Comparison**  
Total Returns of Public Fixed Income Portfolios  
Years Ending



The exhibits above compare the fixed income results of the five funds to that of the fixed income returns of the 173 public funds in the Wilshire universe. The analysis is similar to page 9. STRS has had the best performance over the past ten years (+8.43%), while HPRS has had the lowest fixed income performance over the same measurement period (+7.54%). It should be noted that the fixed income returns for all five systems are near-median or better over the ten-year period and have outperformed the Lehman Brothers Aggregate Bond Index.

# Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis  
Periods from 12/93 to 6/04

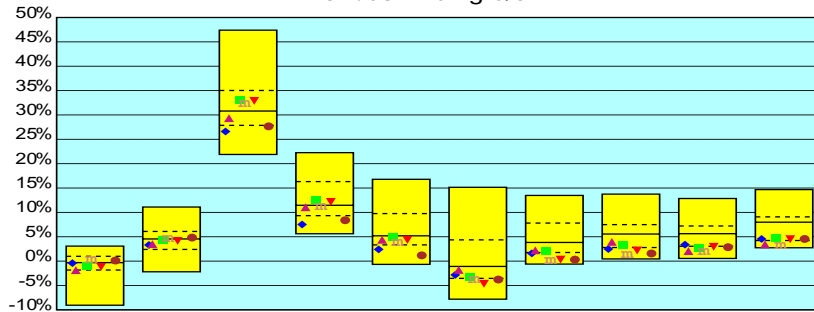


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Fixed Income	6.82	4.14	2.54	0.61
■ PERS Domestic Fixed Income	7.04	4.47	2.76	0.62
▼ OP&F Domestic Fixed Income	7.22	3.93	2.95	0.75
● SERS Domestic Fixed Income	6.83	4.42	2.55	0.58
▲ STRS Fixed Income	7.67	4.56	3.39	0.74
■ LB Aggregate	6.62	4.22	2.35	0.56
△ 91-Day Treasury Bill	4.28	0.90	0.00	0.00

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

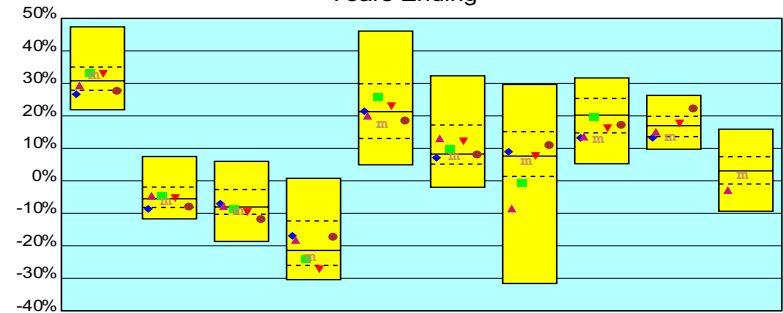
# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of International Equity Portfolios  
Periods Ending 6/04



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	3.08	11.10	47.40	22.26	16.79	15.15	13.48	13.75	12.85	14.68
1st Qt	0.99	6.09	35.02	16.32	9.76	4.36	7.81	7.49	7.21	9.08
Median	-0.31	4.55	30.80	11.46	5.19	-1.09	3.83	5.56	5.63	7.99
3rd Qt	-1.83	2.40	27.86	9.33	3.33	-3.54	1.77	2.79	3.05	4.23
Low	-9.05	-2.19	21.89	5.62	-0.67	-7.81	-0.61	0.45	0.55	2.74
◆ HPRS Intn'l Equity										
Return	-0.51	3.22	26.51	7.42	2.31	-2.93	1.49	2.38	3.28	4.45
Rank	52	63	81	86	80	71	77	76	72	70
■ PERS Intn'l Equity										
Return	-1.16	4.30	32.93	12.51	4.91	-3.29	1.92	3.17	2.57	4.56
Rank	59	52	33	39	52	73	73	72	78	68
▼ OP&F Intn'l Equity										
Return	-1.27	4.05	32.79	12.05	4.24	-4.76	0.21	2.08	2.84	4.40
Rank	61	53	34	45	64	87	91	79	77	71
● SERS Intn'l Equity										
Return	0.02	4.73	27.56	8.29	1.08	-3.88	0.21	1.47	2.76	4.45
Rank	44	45	77	83	88	76	91	88	78	70
▲ STRS Intn'l Equity										
Return	-1.95	3.39	29.24	10.96	4.28	-1.90	2.12	3.85	1.96	3.34
Rank	77	61	65	60	58	57	73	71	88	90
■ MSCI EAFE (Net)										
Return	0.22	4.56	32.37	11.27	3.87	-3.81	0.06	1.28	1.95	3.25
Rank	42	49	36	58	70	76	91	91	88	92

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

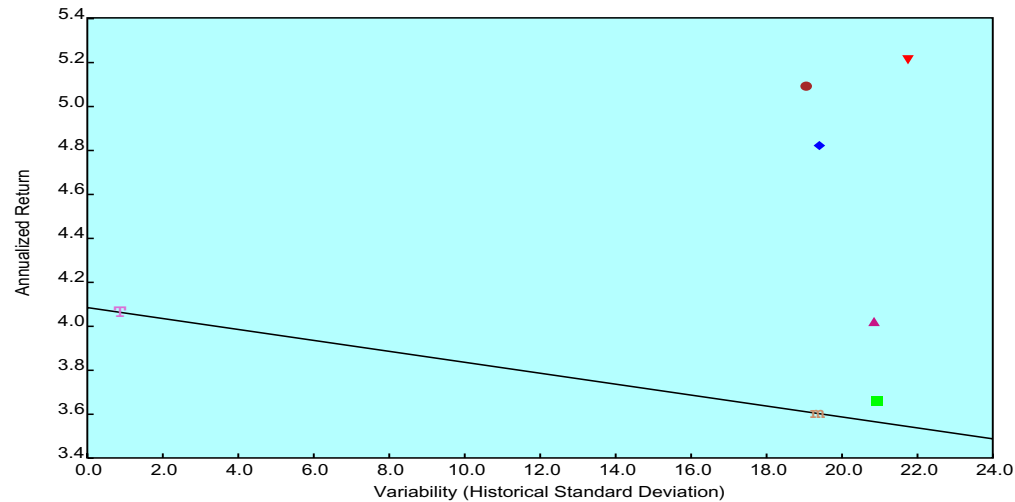


	6/04	6/03	6/02	6/01	6/00	6/99	6/98	6/97	6/96	6/95
High	47.40	7.48	5.99	0.77	46.09	32.33	29.67	31.67	26.30	15.89
1st Qt	35.02	-1.93	-2.68	-12.34	29.89	17.18	15.14	25.36	19.85	7.44
Median	30.80	-5.52	-8.06	-21.43	21.29	8.24	7.61	20.21	16.97	3.07
3rd Qt	27.86	-8.20	-10.30	-26.04	13.04	5.14	1.36	14.77	13.61	-0.98
Low	21.89	-11.71	-18.66	-30.42	4.93	-1.98	-31.60	5.26	9.73	-9.37
◆ HPRS Intn'l Equity										
Return	26.51	-8.79	-7.20	-17.08	21.27	6.96	8.81	13.08	13.11	
Rank	81	80	43	33	50	60	42	81	81	
■ PERS Intn'l Equity										
Return	32.93	-4.77	-8.78	-24.25	25.72	9.63	-0.95	19.62		
Rank	33	40	60	65	35	43	79	54		
▼ OP&F Intn'l Equity										
Return	32.79	-5.46	-9.77	-27.38	22.82	11.99	7.49	16.05	17.49	
Rank	34	49	70	84	46	36	51	69	44	
● SERS Intn'l Equity										
Return	27.56	-8.07	-11.93	-17.36	18.42	7.97	10.87	17.10	22.15	
Rank	77	74	81	33	55	52	36	64	11	
▲ STRS Intn'l Equity										
Return	29.24	-4.73	-7.90	-18.33	19.90	12.94	-8.64	13.49	14.98	-2.98
Rank	65	40	47	35	52	35	87	78	65	81
■ MSCI EAFE (Net)										
Return	32.37	-6.46	-9.49	-23.61	17.18	7.59	6.09	12.84	13.28	1.66
Rank	36	60	68	62	61	56	58	84	79	61

The exhibits on this page and the one on the next page analyze the International Equity results of the five funds. Comparisons beyond eight years are not meaningful, since two of the funds have not had allocations to this asset class for that length of time. For the eight-year period ending 6/30/2004, all of the funds have had International Equity results that are below the median international equity portfolio in our universe. On an absolute basis, these range from 3.34% (STRS) to 4.56% (PERS). PERS had the best International Equity return for the most recent twelve months followed by OP&F.

# Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis  
Periods from 12/95 to 6/04



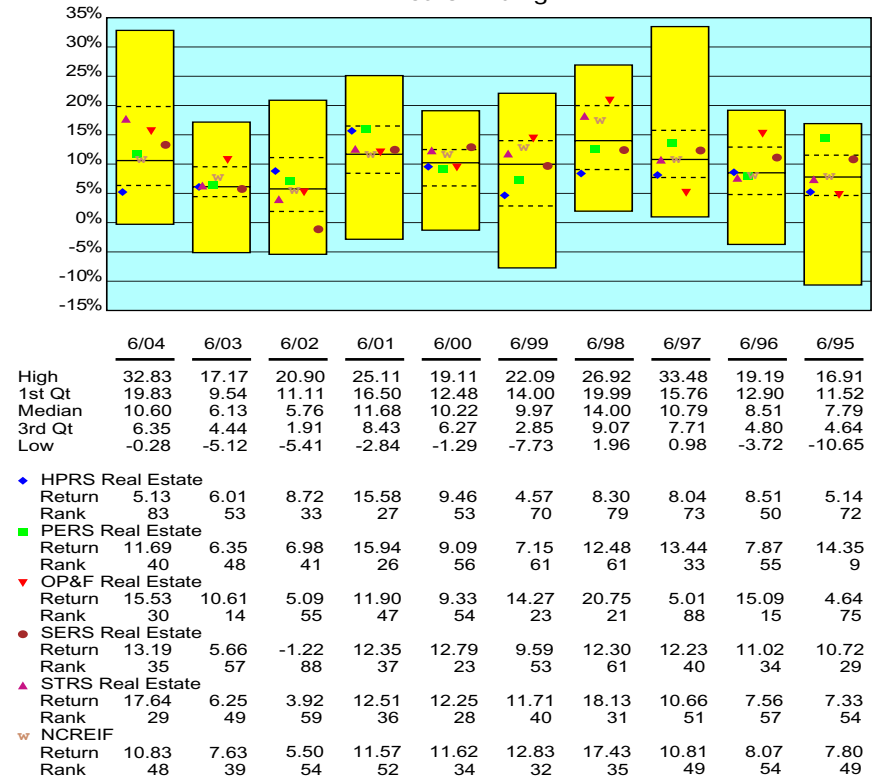
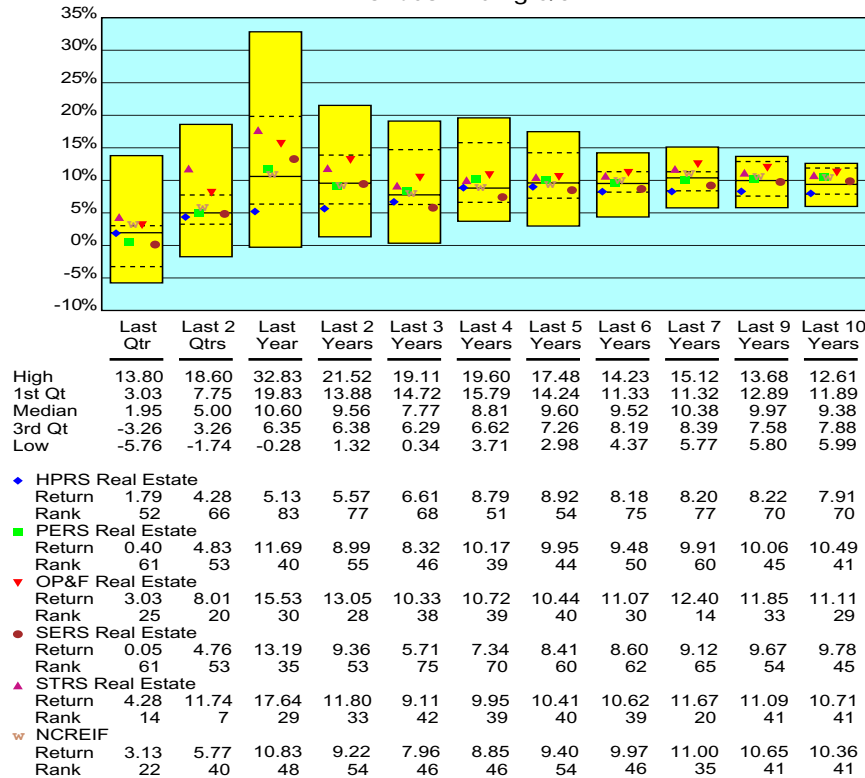
	Annualized Return	Variability	Reward
◆ HPRS Intn'l Equity	4.82	19.52	0.76
■ PERS Intn'l Equity	3.66	21.06	-0.40
▼ OP&F Intn'l Equity	5.21	21.87	1.15
● SERS Intn'l Equity	5.09	19.17	1.02
▲ STRS Intn'l Equity	4.02	20.97	-0.04
■ MSCI EAFE (Net)	3.60	19.45	-0.47
Ⓣ 91-Day Treasury Bill	4.06	0.94	0.00

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

# Ohio Retirement Study Council

**Cumulative Performance Comparison**  
Total Returns of Real Estate Portfolios  
Periods Ending 6/04

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

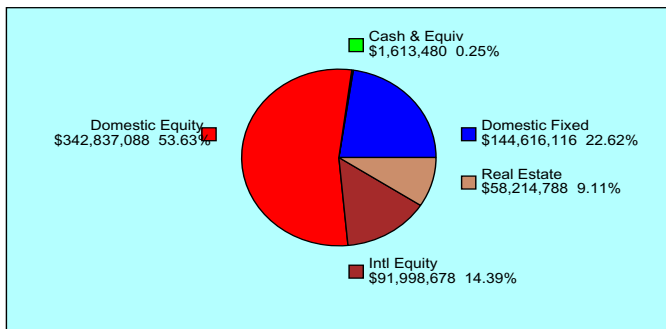


The exhibits above evaluate the real estate returns for the five funds. For the ten-year cumulative period, OP&F, PERS and STRS had real estate performance that outperformed the NCREIF benchmark. Returns for the past twelve month period show STRS ahead of the other funds in this asset class with a 17.64% return vs. 10.83% 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.

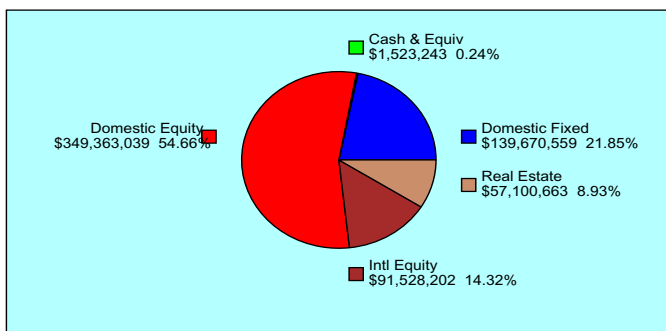
# Highway Patrol Retirement System

Asset Allocation  
HPRS

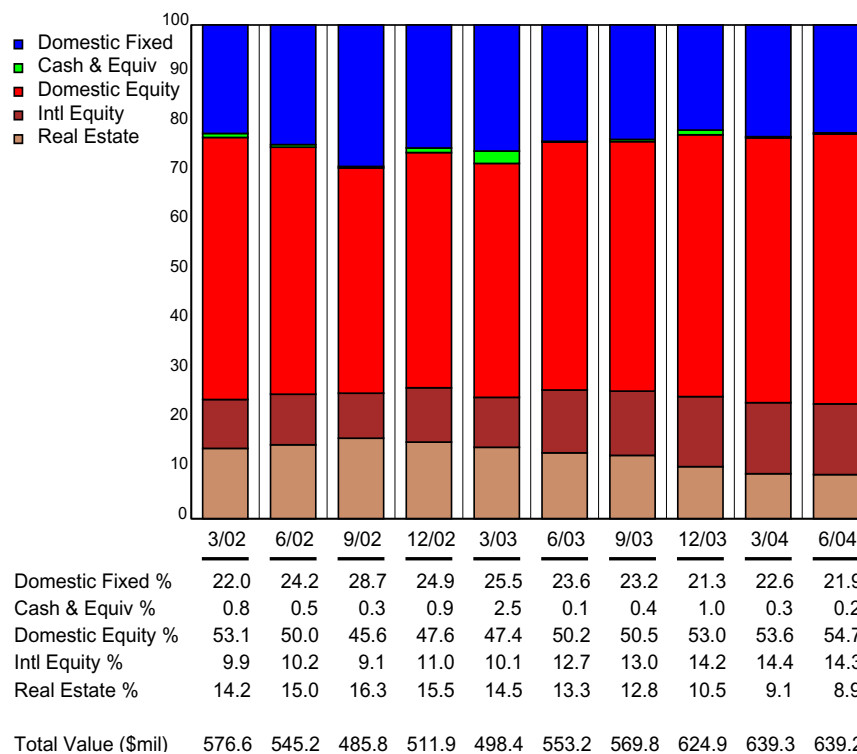
March 31, 2004 \$639,280,150



June 30, 2004 \$639,185,706



Asset Allocation  
HPRS



This is the first page devoted to the analysis of the Ohio Highway Patrol Retirement System's asset allocation. The chart on the left displays the fund's asset allocation over the first two quarters of 2004. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

# Highway Patrol Retirement System

Quarter Ending 6/30/2004

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)
			10.00	NCREIF
	Dec-99	Dec-00	40.00	Standard & Poors 500
			20.00	Russell 2000
			20.00	LB Aggregate
			10.00	MSCI EAFE (Net)
			10.00	NCREIF
	Mar-02	Dec-02	40.00	Standard & Poors 500
			20.00	Russell 2500
			20.00	LB Aggregate
			10.00	MSCI EAFE (Net)
10.00			NCREIF	
Mar-03	Jun-04	32.00	Standard & Poors 500	
		16.00	Russell 2500	
		25.00	LB Aggregate	
		15.00	MSCI EAFE (Net)	
		12.00	NCREIF	

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



# Highway Patrol Retirement System

## Performance Overview

### HPRS

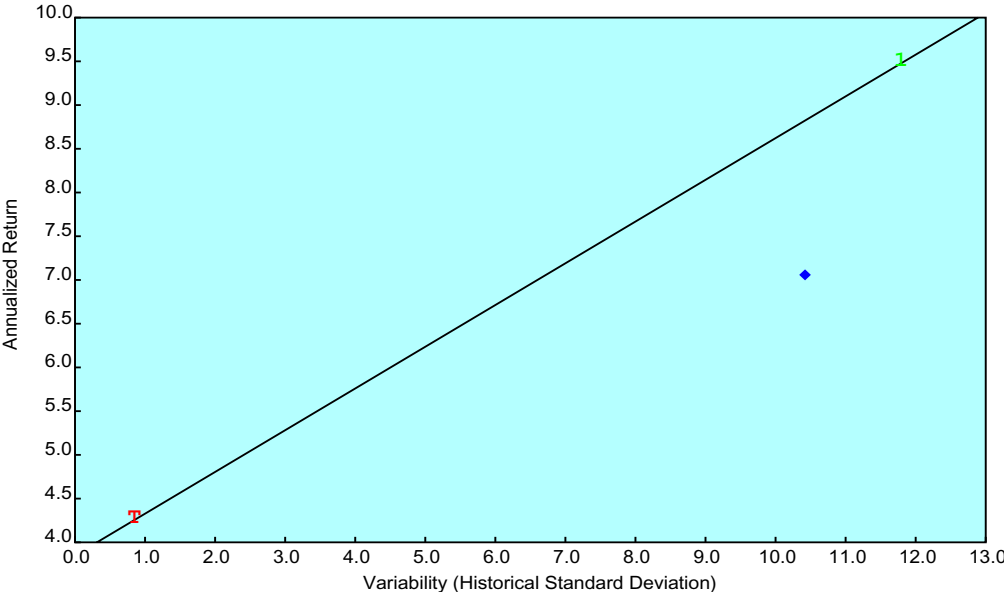
#### Returns for Periods Ending June 30, 2004

	<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	0.58	3.79	13.79	17.94	5.66	3.02	7.05
Policy Index Return	0.37	3.51	12.93	17.03	4.52	3.45	9.50
Domestic Equity Return	1.91	5.45	21.15	27.35	4.49	-0.75	7.08
Equity Segment Median Return	1.55	4.15	17.57	21.61	0.54	1.07	
Wilshire 5000	1.29	3.93	16.84	21.17	0.77	-1.04	10.47
Int'l Equity Return	-0.51	3.22	20.18	26.51	2.31	1.49	
Int'l Equity Segment Median Return	-0.28	4.72	20.84	30.97	5.31	3.73	
MSCI EAFE (Net)	0.22	4.56	22.42	32.37	3.87	0.06	4.69
Domestic Fixed Return	-2.43	0.18	0.91	1.48	7.33	7.52	6.82
Fixed Income Segment Median Return	-2.15	0.15	0.51	0.55	6.43	7.05	
LB Aggregate	-2.44	0.15	0.47	0.32	6.36	6.95	6.62
Cash Return	0.29	0.63	0.78	0.96	1.93	3.35	
Real Estate Return	1.79	4.28	3.07	5.14	6.61	8.92	7.71
NCREIF	3.13	5.77	8.69	10.83	7.96	9.40	10.14

Over the entire ten year and one half year period, the fund's total return is trailing its policy index by 2.52% annually. This is due almost entirely to its domestic equity returns, which lagged the broad market as defined by the Wilshire 5000 by 3.39% annually. The most recent twelve months, however, show that HPRS has outperformed its policy index by 123 basis points.

# Highway Patrol Retirement System

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/04



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.05	10.49	2.77	0.26
1 HPRS Total Policy (2)	9.50	11.84	5.22	0.44
T 91-Day Treasury Bill	4.28	0.90	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

December 31, 2003

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

June 30, 2004

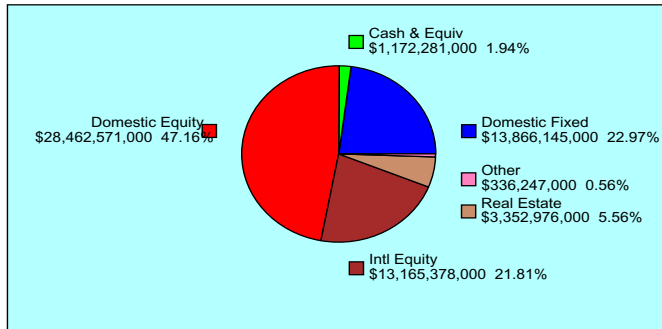
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	36.81%	S & P 500	32%	4.81%
Sm/Mid Cap Equity	17.85%	Russell 2500	16%	1.85%
Fixed Income	21.85%	LB Aggregate	25%	-3.15%
Intl. Equity	14.32%	MSCI EAFE (Net)	15%	-0.68%
Real Estate	8.93%	NCREIF	12%	-3.07%
Short Term			0%	0.00%

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

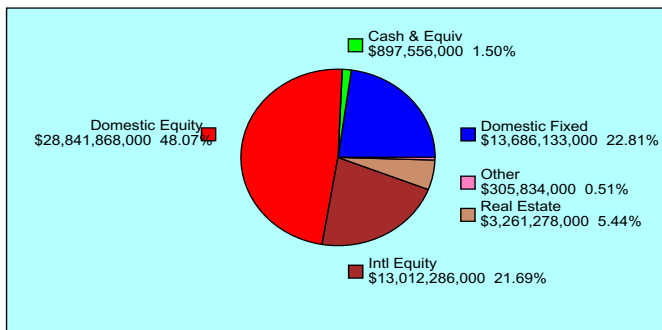
# Public Employees Retirement System

Asset Allocation  
PERS

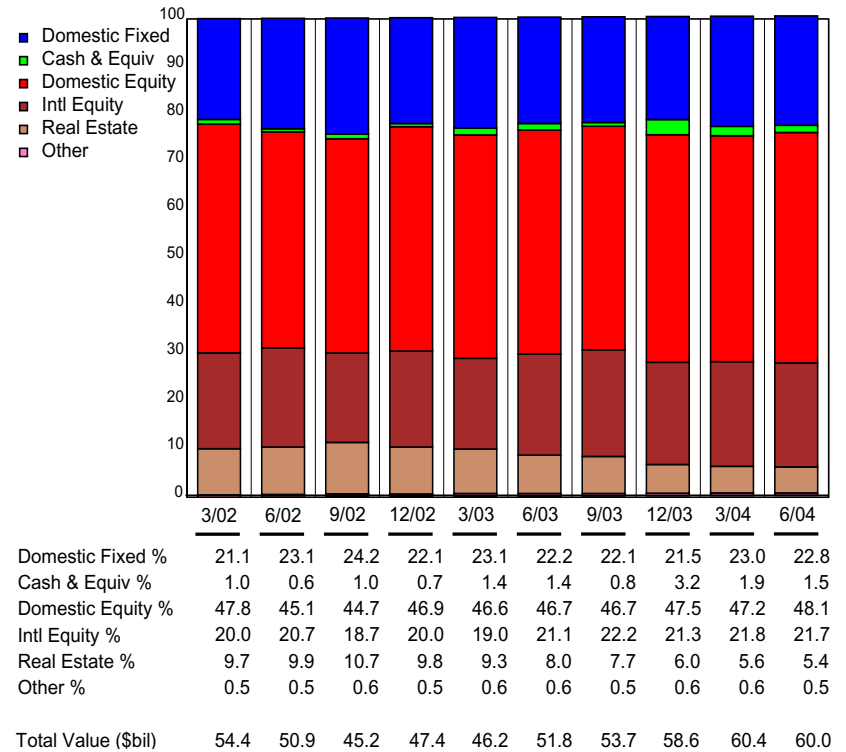
March 31, 2004 \$60,355,598,000



June 30, 2004 \$60,004,955,000



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 2004. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

# Public Employees Retirement System

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	1.00	MSCI EAFE (Net)
			62.50	SB Broad Inv Grade
			23.00	Standard & Poors 500
			8.00	NCREIF
	Mar-97	Dec-97	4.50	91-Day Treasury Bill
			2.00	MSCI EAFE (Net)
			56.50	SB Broad Inv Grade
			27.00	Standard & Poors 500
	Mar-98	Dec-98	8.00	NCREIF
			4.00	MSCI EAFE (Net)
			4.50	91-Day Treasury Bill
			51.00	SB Broad Inv Grade
		30.50	Standard & Poors 500	
		8.00	NCREIF	
		6.00	MSCI EAFE (Net)	
		4.50	91-Day Treasury Bill	

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
			1.60	Gilberto-Levy Mortgage
	Mar-99	Mar-99	45.40	SB Broad Inv Grade
			35.00	Standard & Poors 500
			7.60	MSCI World Ex-US (Net)
			6.60	NCREIF
	Jun-99	Jun-99	2.20	NAREIT
			2.20	Gilberto-Levy Mortgage
			1.00	91-Day Treasury Bill
			1.00	91-Day Treasury Bill
			40.10	SB Broad Inv Grade
			35.00	Standard & Poors 500
			12.90	MSCI World Ex-US (Net)
			6.60	NCREIF
2.20			NAREIT	
2.20			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 ten years. The current policy index is located on page 24 in the chart on the right.

# Public Employees Retirement System

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

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
	Dec-02	Dec-02	0.70	91-Day Treasury Bill
			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
	Mar-03	Jun-04	1.80	NAREIT
			1.80	Giliberto-Levy Mortgage
			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	Wishire Real Estate Securities			
1.00	91-Day Treasury Bill			
1.00	Russell 3000 + 3%			

# Public Employees Retirement System

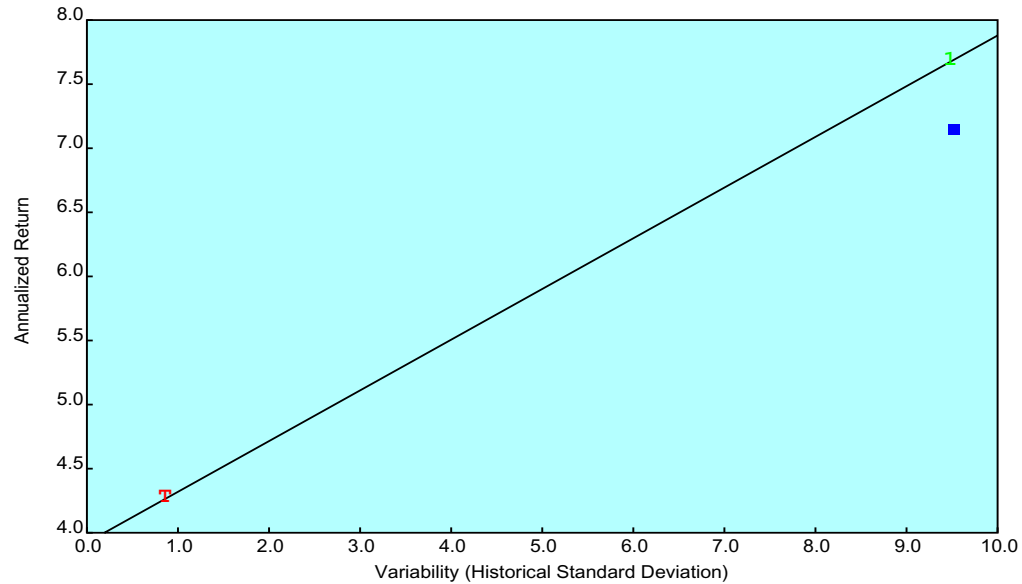
## Performance Overview PERS Returns for Periods Ending June 30, 2004

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	-0.11	3.07	13.18	17.67	4.16	3.26	7.14
Policy Index Return	0.10	3.12	12.96	17.17	4.03	3.16	7.69
Domestic Equity Return	1.33	3.70	16.60	20.61	0.62	-1.34	8.54
Equity Segment Median Return	1.55	4.15	17.57	21.61	0.54	1.07	
Wilshire 5000	1.29	3.93	16.84	21.17	0.77	-1.04	10.47
Int'l Equity Return	-1.16	4.30	21.62	32.92	4.92	1.92	
Int'l Equity Segment Median Return	-0.28	4.72	20.84	30.97	5.31	3.73	
MSCI EAFE (Net)	0.22	4.56	22.42	32.37	3.87	0.06	4.69
Domestic Fixed Return	-2.38	0.19	1.14	1.39	6.65	7.20	7.03
Fixed Income Segment Median Return	-2.15	0.15	0.51	0.55	6.43	7.05	
LB Aggregate	-2.44	0.15	0.47	0.32	6.36	6.95	6.62
Cash Return	0.27	0.53	0.80	1.08	1.62	3.31	4.39
Real Estate Return	0.40	4.83	8.18	11.69	8.32	9.95	10.30
NCREIF	3.13	5.77	8.69	10.83	7.96	9.40	10.14
Other Return	3.58	12.45	20.57	33.05	5.31	12.19	

Over the past ten and one half year period, PERS has trailed its policy index by 0.55% annually. During the same period, PERS' US Equity results trailed the broad market Wilshire 5000 index by 1.93% 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 6/04



	Annualized Return	Variability	Reward	Sharpe Ratio
■ PERS	7.14	9.57	2.87	0.30
1 PERS Policy Index	7.69	9.52	3.41	0.36
T 91-Day Treasury Bill	4.28	0.90	0.00	0.00

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



# Public Employees Retirement System

## Asset Allocation Actual vs. Benchmark December 31, 2003

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

## June 30, 2004

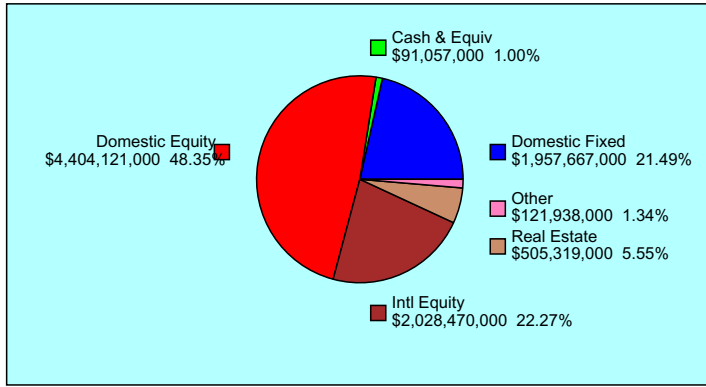
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<u>Asset Class</u>	<u>Asset Allocation</u>	<u>Benchmark</u>	<u>Benchmark Weighting</u>	<u>Difference</u>
Equity	48.10%	S&P 1500	46.0%	2.10%
Fixed Income	22.80%	SB Broad Inv Grade	23.0%	-0.20%
Intl. Equity	21.70%	MSCI ACWI	20.0%	1.70%
Real Estate	5.40%	PERS Custom Index	9.0%	-3.60%
Private Equity	0.50%	S&P 500	1.0%	-0.50%
Short Term	1.50%	3 Month T-Bill	1.0%	0.50%

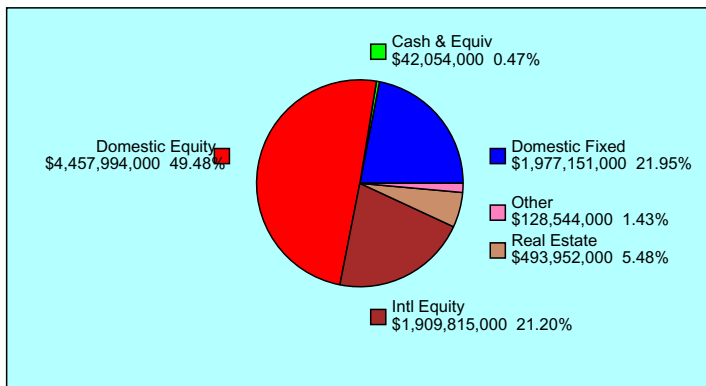
As of the end of the second quarter, PERS is overweight in domestic and international equity, and underweight in real estate.

# Police & Fire Pension Fund

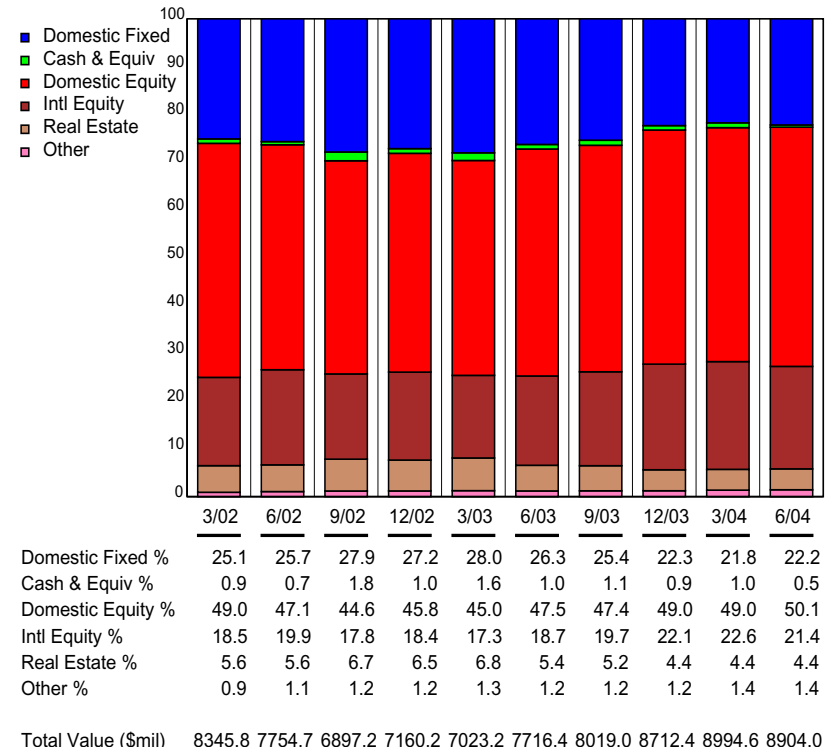
March 31, 2004 \$9,108,572,000



June 30, 2004 \$9,009,510,000



## Asset Allocation OP&F



This is the first page devoted to the analysis of the Ohio Police & Fire Pension Fund's asset allocation. The chart on the left displays the fund's asset allocation over the first two quarters of 2004. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

# Police & Fire Pension Fund

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

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Jun-02	Jun-04	48.00	Wilshire 5000
			18.00	LB Aggregate
			17.00	MSCI EAFE (Net)
			8.00	NCREIF
			5.00	First Boston High Yield
			3.00	MSCI Em Mkts Free (Gross)
			1.00	Wilshire 5000 + 5%

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

# Police & Fire Pension Fund

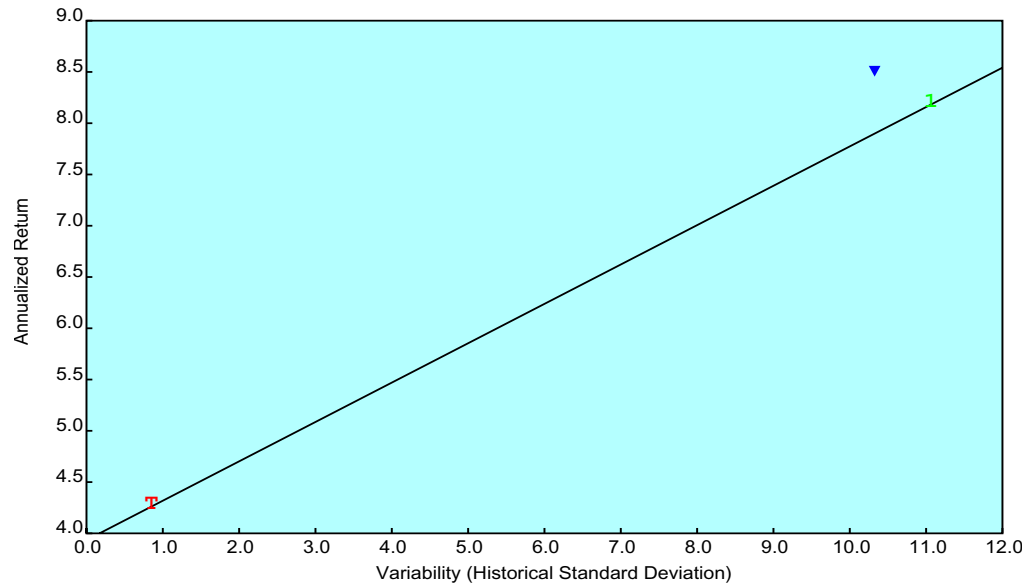
## Performance Overview OP&F Returns for Periods Ending June 30, 2004

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	0.20	3.90	14.13	18.61	4.94	3.56	8.50
Policy Index Return	0.24	3.47	13.84	18.45	4.41	2.81	8.20
Domestic Equity Return	1.46	4.76	17.61	21.97	1.67	0.77	10.23
Equity Segment Median Return	1.55	4.15	17.57	21.61	0.54	1.07	
Wilshire 5000	1.29	3.93	16.84	21.17	0.77	-1.04	10.47
Int'l Equity Return	-1.27	4.05	21.45	32.79	4.24	0.21	
Int'l Equity Segment Median Return	-0.28	4.72	20.84	30.97	5.31	3.73	
MSCI EAFE (Net)	0.22	4.56	22.42	32.37	3.87	0.06	4.69
Domestic Fixed Return	-1.78	0.73	2.51	3.44	8.09	8.32	7.22
Fixed Income Segment Median Return	-2.15	0.15	0.51	0.55	6.43	7.05	
LB Aggregate	-2.44	0.15	0.47	0.32	6.36	6.95	6.62
Cash Return	0.23	0.47	0.73	0.98	1.71	3.23	
Real Estate Return	3.03	8.01	10.71	15.53	10.33	10.44	10.97
NCREIF	3.13	5.77	8.69	10.83	7.96	9.40	10.14
Other Return	0.16	6.40	5.87	4.81	-13.90	0.23	

The chart above is a performance overview for the total fund and all of its asset classes over the past ten and one half years. Over the entire 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 outperformed its policy index by 0.16%.

# Police & Fire Pension Fund

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/04



	Annualized Return	Variability	Reward	Sharpe Ratio
▼ OP&F	8.50	10.39	4.22	0.41
1 OP&F Policy Index	8.20	11.11	3.93	0.35
T 91-Day Treasury Bill	4.28	0.90	0.00	0.00

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

# Police & Fire Pension Fund

## Asset Allocation Actual vs. Benchmark December 31, 2003

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

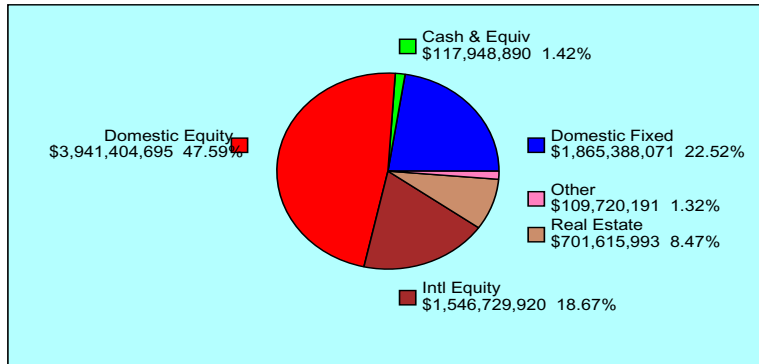
## June 30, 2004

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	49.48%	Wilshire 5000	48%	1.48%
Fixed Income	15.75%	Lehman Aggregate	18%	-2.25%
High Yield Bonds	6.19%	CSFB High Yield	5%	1.19%
Intl. Equity Comp.	21.20%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	1.20%
Real Estate	5.48%	NCREIF	8%	-2.52%
Venture Capital	0.47%	Wilshire 5000 Lagged + 5%	1%	-0.53%
Short Term	1.43%	3 Month T-Bill	0%	1.43%

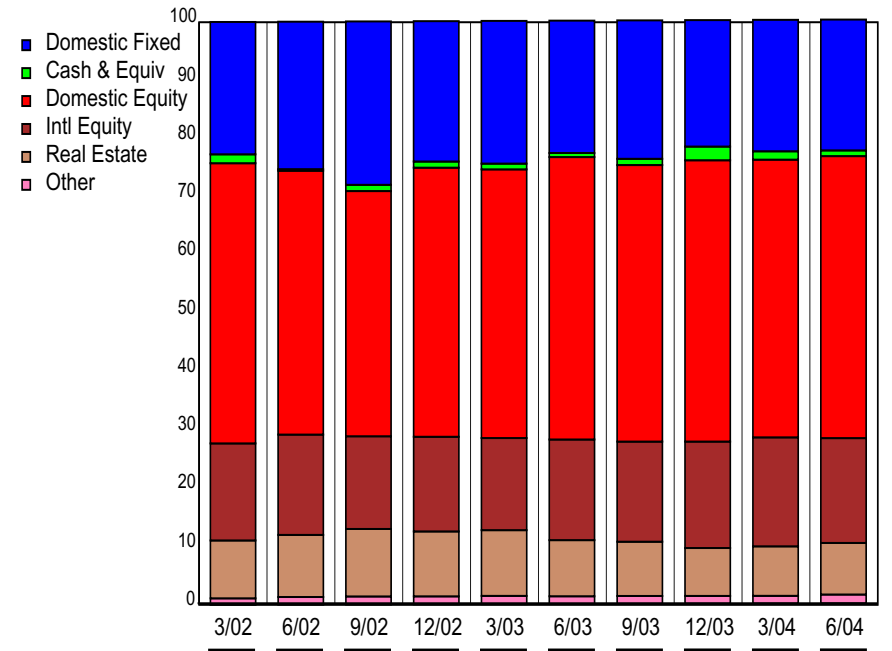
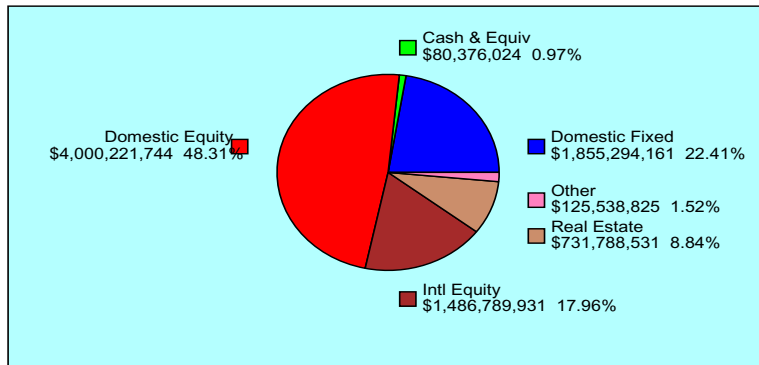
As of the end of the second quarter, the OP&F fund is overweight in domestic and international equity, high yield bonds, and cash, while being underweight in core fixed income and real estate.

# School Employees Retirement System

March 31, 2004 \$8,282,807,760



June 30, 2004 \$8,280,009,216



	3/02	6/02	9/02	12/02	3/03	6/03	9/03	12/03	3/04	6/04
Domestic Fixed %	22.7	25.3	28.0	24.1	24.5	22.7	23.7	21.7	22.5	22.4
Cash & Equiv %	1.5	0.3	1.1	1.1	1.0	0.7	1.1	2.3	1.4	1.0
Domestic Equity %	48.1	45.3	42.1	46.1	46.1	48.4	47.4	48.2	47.6	48.3
Intl Equity %	16.6	17.2	15.9	16.2	15.8	17.3	17.2	18.2	18.7	18.0
Real Estate %	9.9	10.7	11.6	11.1	11.3	9.6	9.3	8.2	8.5	8.8
Other %	1.1	1.3	1.4	1.4	1.4	1.3	1.4	1.3	1.3	1.5

Total Value (\$mil) 7851.7 7298.1 6459.3 6717.4 6523.2 7236.4 7464.5 8054.1 8282.8 8280.0

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 2004. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

# School Employees Retirement System

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

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-97	Jun-99	45.00	Russell 3000
			28.00	LB Aggregate
			14.50	MSCI EAFE 50% Hedged
			0.50	MSCI Em Mkts Free
			10.00	NCREIF
			1.00	Citigroup 30 Day T-Bill
	Sep-99	Dec-99	45.00	Russell 3000
			28.00	LB Aggregate
			14.00	MSCI EAFE 50% Hedged
			1.00	MSCI Em Mkts Free
			10.00	NCREIF
			1.00	Citigroup 30 Day T-Bill
	Mar-00	Jun-01	48.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI EMF + EAFE 50% Hdg + Canada 50% Hdg
			10.00	NCREIF
			1.00	S&P 500 +5%
			2.00	Citigroup 30 Day T-Bill
	Sep-01	Jun-02	47.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI EMF + EAFE 50% Hdg + Canada 50% Hdg
			10.00	NCREIF
			2.00	Private Equity (0% return arrears switch)
			2.00	Citigroup 30 Day T-Bill
Sep-02	Jun-04	46.00	Russell 3000	
		23.00	LB Aggregate	
		16.00	MSCI EMF + EAFE 50% Hdg + Canada 50% Hdg	
		10.00	80% NCREIF (arrears), 20% NAREIT	
		3.00	S&P 500 + 3%	
		2.00	Citigroup 30 Day T-Bill	

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



# School Employees Retirement System

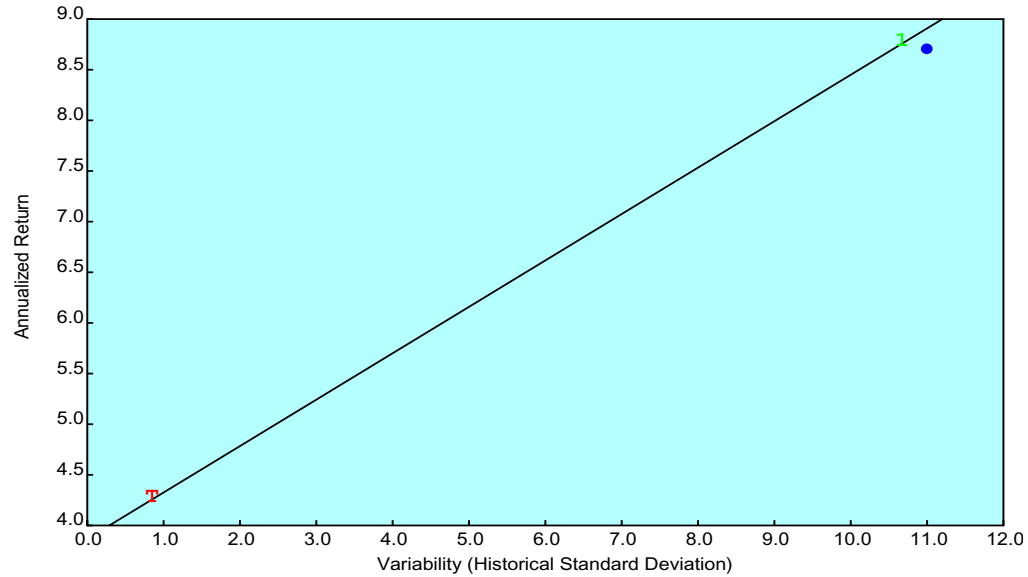
## Performance Overview SERS Returns for Periods Ending June 30, 2004

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	0.32	3.40	12.54	16.54	3.05	2.79	8.70
Policy Index Return	0.22	3.45	12.14	16.13	2.90	2.32	8.78
Domestic Equity Return	1.56	3.98	16.88	21.36	0.55	-0.72	10.54
Equity Segment Median Return	1.55	4.15	17.57	21.61	0.54	1.07	
Wilshire 5000	1.29	3.93	16.84	21.17	0.77	-1.04	10.47
Int'l Equity Return	0.02	4.73	18.97	27.56	1.08	0.21	
Int'l Equity Segment Median Return	-0.28	4.72	20.84	30.97	5.31	3.73	
MSCI EAFE (Net)	0.22	4.56	22.42	32.37	3.87	0.06	4.69
Domestic Fixed Return	-2.06	0.39	1.24	1.29	7.11	7.67	6.83
Fixed Income Segment Median Return	-2.15	0.15	0.51	0.55	6.43	7.05	
LB Aggregate	-2.44	0.15	0.47	0.32	6.36	6.95	6.62
Cash Return	0.26	0.49	0.72	0.95	1.62	3.88	4.60
Real Estate Return	0.05	4.76	9.10	13.19	5.71	8.41	9.66
NCREIF	3.13	5.77	8.69	10.83	7.96	9.40	10.14
Other Return	0.72	7.52	8.72	8.53	-13.06	-0.74	15.69

The chart above is a performance overview for the total fund and all of its asset classes over the past ten and one half years. Over the entire observed period, the fund's total return is trailing its policy index by 0.08% annually. The most recent twelve months show that SERS has outperformed its policy index by 0.41%.

# School Employees Retirement System

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/04



	Annualized Return	Variability	Reward	Sharpe Ratio
● SERS	8.70	11.06	4.42	0.40
1 SERS Policy Index	8.78	10.72	4.50	0.42
T 91-Day Treasury Bill	4.28	0.90	0.00	0.00

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

# School Employees Retirement System

## Asset Allocation Actual vs. Benchmark December 31, 2003

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

## June 30, 2004

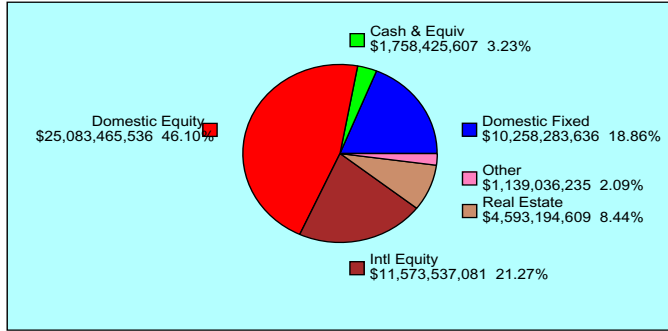
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	48.31%	Russell 3000	46%	2.31%
Fixed Income	22.41%	LB Aggregate	23%	-0.59%
Intl. Equity	17.96%	50% MSCI EMF + 50% EAFE 50% Hdg	16%	1.96%
Real Estate	8.84%	Custom RE (1 Qtr arrears)	10%	-1.16%
Venture Capital	1.52%	S&P 500 + 3%	3%	-1.48%
Short Term	0.97%	Salomon 30 Day CD	2%	-1.03%

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

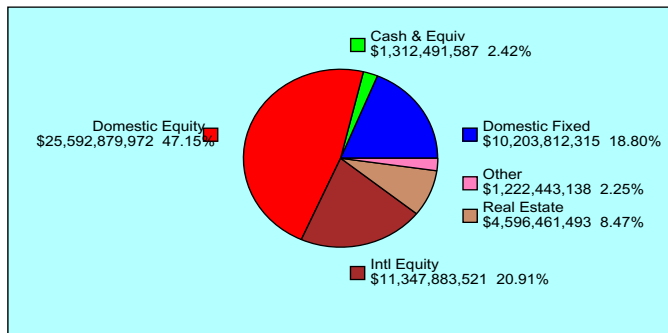
# State Teachers Retirement System

Asset Allocation  
STRS

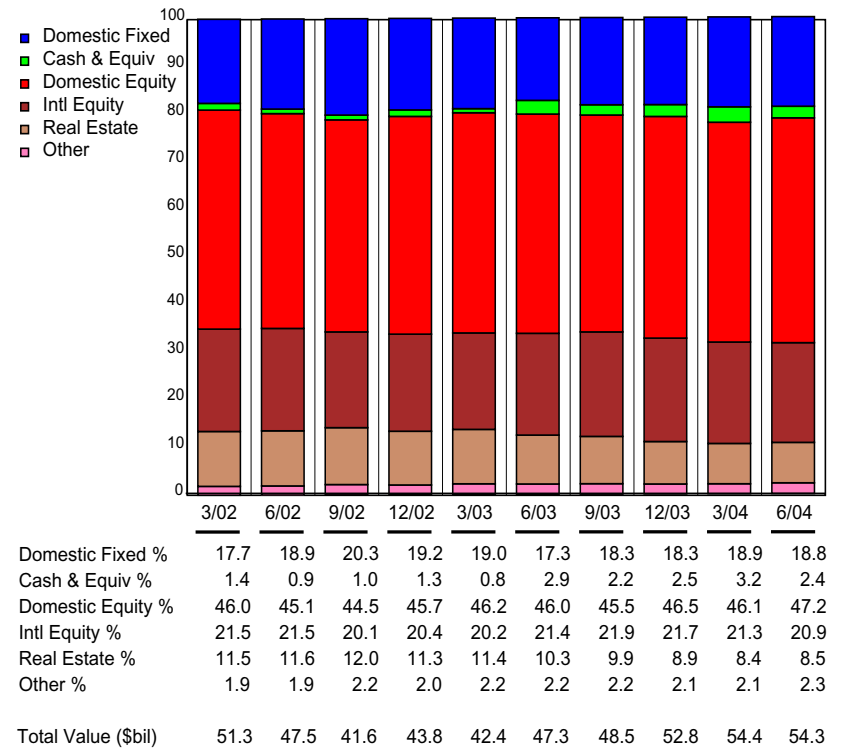
March 31, 2004 \$54,405,942,704



June 30, 2004 \$54,275,972,026



Asset Allocation  
STRS



This page is devoted to the analysis of the Ohio State Teachers Retirement System's asset allocation. The chart on the left displays the fund's asset allocation over the first two quarters of 2004. The chart on the right tracks the quarterly asset allocation of the fund over the last ten quarters.

# State Teachers Retirement System

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 40. The chart tracks the fund's change in asset allocation strategy over the past ten and one half years.

# State Teachers Retirement System

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	Sep-02	Mar-03	45.00	S&P 1500
			23.00	Lehman Universal
			15.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
			5.00	MSCI Em Mkts Free (Gross)
			2.00	Alt. Investment Actual Return
	1.00	91-Day Treasury Bill		
	Mar-03	Jun-03	45.00	S&P/Russell Hybrid*
			23.00	Lehman Universal
15.00			MSCI EAFE 50% Hedged	
9.00			STRS NCREIF Hybrid	
5.00			MSCI Em Mkts Free (Gross)	
2.00			Alt. Investment Actual Return	
1.00	91-Day Treasury Bill			
Jun-03	Jun-04	45.00	Russell 3000*	
		23.00	Lehman Universal	
		15.00	MSCI World ex US 50% Hedged	
		9.00	STRS NCREIF Hybrid	
		5.00	MSCI Em Mkts Free (Gross)	
		2.00	Alt. Investment Actual Return	
1.00	91-Day Treasury Bill			

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

# State Teachers Retirement System

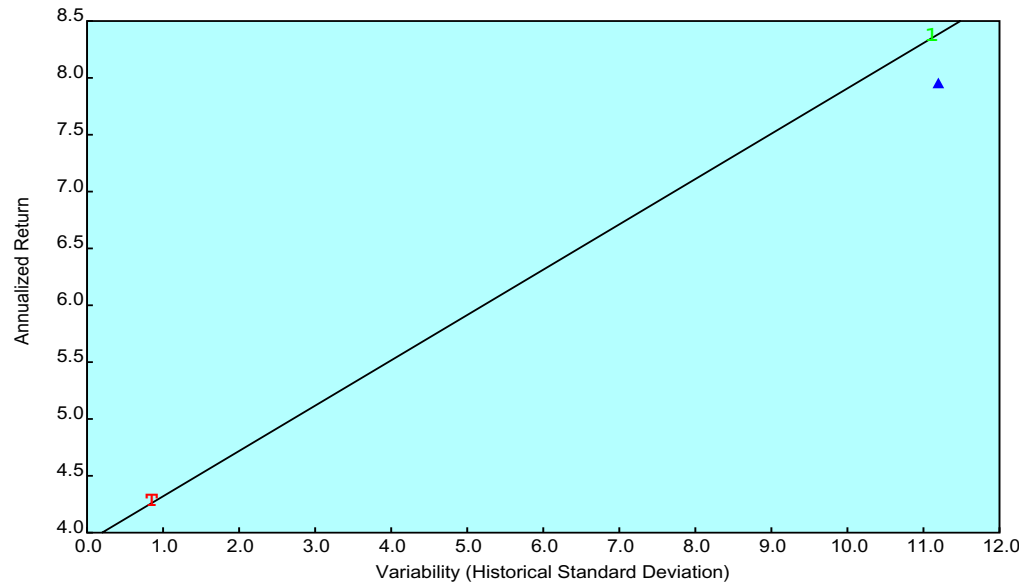
## Performance Overview STRS Returns for Periods Ending June 30, 2004

	<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	0.18	3.69	13.41	17.70	3.43	2.74	7.95
Policy Index Return	0.00	3.14	12.39	16.35	3.25	2.42	8.37
Domestic Equity Return	1.13	3.54	16.31	20.04	-0.26	-1.50	9.13
Equity Segment Median Return	1.55	4.15	17.57	21.61	0.54	1.07	
Wilshire 5000	1.29	3.93	16.84	21.17	0.77	-1.04	10.47
Int'l Equity Return	-1.95	3.39	18.59	29.24	4.28	2.12	4.49
Int'l Equity Segment Median Return	-0.28	4.72	20.84	30.97	5.31	3.73	
MSCI EAFE (Net)	0.22	4.56	22.42	32.37	3.87	0.06	4.69
Domestic Fixed Return	-2.21	0.19	1.29	1.49	7.32	7.75	7.67
Fixed Income Segment Median Return	-2.15	0.15	0.51	0.55	6.43	7.05	
LB Aggregate	-2.44	0.15	0.47	0.32	6.36	6.95	6.62
Cash Return	0.26	0.52	0.79	1.06	1.65	3.36	4.26
Real Estate Return	4.28	11.74	14.86	17.64	9.11	10.41	10.57
NCREIF	3.13	5.77	8.69	10.83	7.96	9.40	10.14
Other Return	5.85	11.85	17.37	19.69	-2.85	2.09	5.14

The exhibit above is a performance overview for the total fund and all of its asset classes over the past ten and one half years. Over the entire observed period, the fund's total return is trailing its policy index by 0.42% annually. Domestic equity returns lagged the broad market as defined by the Wilshire 5000 by 1.34% annually. The most recent twelve months show that STRS has outperformed its policy index by 1.35%. Over the last twelve months domestic and international equity have trailed the respective broad market indices, while fixed income and real estate have outperformed the respective broad market indices.

# State Teachers Retirement System

Quarterly Total Return Market Line Analysis  
 Periods from 12/93 to 6/04



	Annualized Return	Variability	Reward	Sharpe Ratio
▲ STRS	7.95	11.26	3.67	0.33
1 STRS Policy Index	8.37	11.16	4.10	0.37
T 91-Day Treasury Bill	4.28	0.90	0.00	0.00

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



# State Teachers Retirement System

## Asset Allocation Actual vs. Benchmark December 31, 2003

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

## June 30, 2004

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	47.15%	Russell 3000	45%	2.15%
Fixed Income	18.80%	Lehman Universal	23%	-4.20%
Intl. Equity	20.91%	Intl. Hybrid Benchmark	20%	0.91%
Real Estate	8.47%	NCREIF Adjusted	9%	-0.53%
Venture Capital	2.25%	Alt. Inv. Actual Return	2%	0.25%
Short Term	2.42%	3 Month T-Bill	1%	1.42%

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



# Appendix: ORSC Performance Attribution

The following exhibits provide an analysis of the impact of asset allocation and active management for the past six and one half 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

<b>Asset Class</b>	<b>Quarter One Weight</b>	<b>Quarter Two Weight</b>	<b>Average Weight</b>	<b>Market Index Return</b>	<b>Avg Wght * Mkt Idx Ret</b>
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.

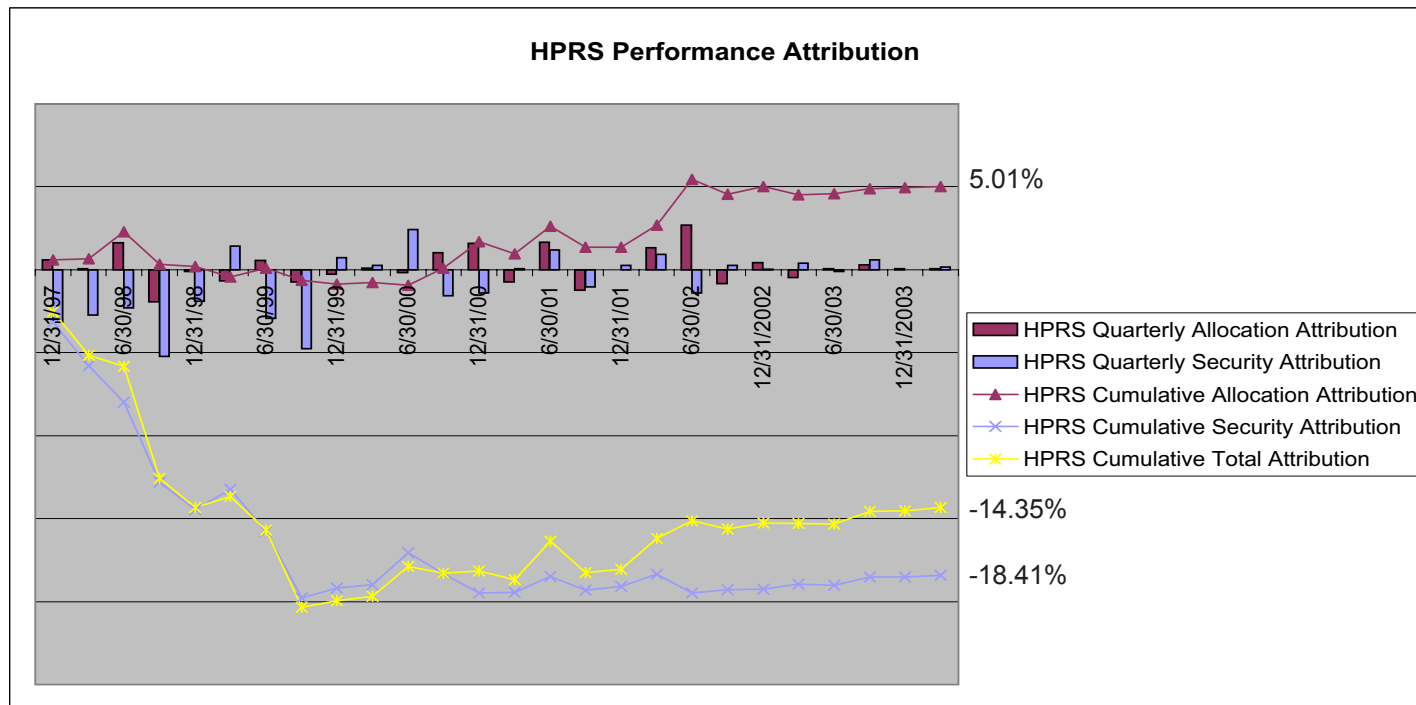
# Appendix: ORSC Performance Attribution

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

## Breakdown of Attribution Results - Last 6<sup>1/2</sup> Years

	<b>Asset Attribution</b>	<b>Selection Attribution</b>	<b>Total Attribution</b>
<b>HPRS</b>	0.76%	-3.08%	-2.35%
<b>PERS</b>	-0.32%	-0.39%	-0.71%
<b>OP&amp;F</b>	-0.04%	0.07%	0.03%
<b>SERS</b>	0.82%	-0.73%	0.09%
<b>STRS</b>	0.51%	-0.57%	-0.05%

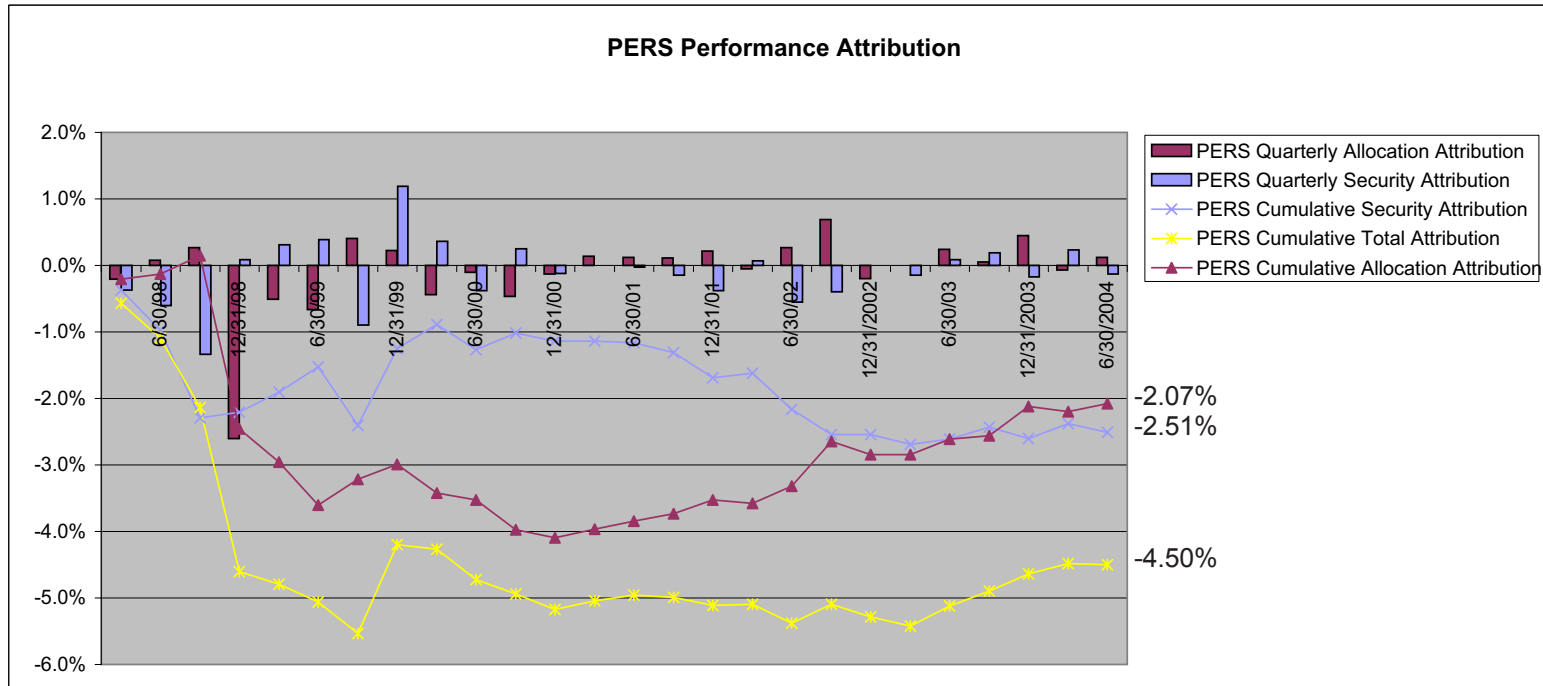
# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	6 1/2 Years
Asset Allocation Attribution	0.473%	1.324%	1.074%	0.755%
Security Selection Attribution	0.648%	0.423%	-1.222%	-3.082%
Total Attribution	1.122%	1.752%	-0.158%	-2.354%

The graph above provides six and one 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 in a particular asset class vs. the policy target. The blue bars represent the value added to (or subtracted from) the portfolio from active portfolio management. The red line is a cumulative measure of the value added to (or subtracted from) the portfolio from asset allocation strategies over the past six and one half years (+5.01%). The blue line represents the cumulative measure of the value added to (or subtracted from) the portfolio from active management over the past six and one half years (-18.41%). The yellow line represents the total value added to (or subtracted by) a combination of asset allocation strategies and active portfolio management (-14.35%). The above graph demonstrates that over the past six and one half years, HPRS’ asset allocation strategy has added 5.01% to the return of the fund, while over the same period, the active management of their investment managers has subtracted 18.41% from the fund’s performance. The cumulative effect of active management and asset allocation has subtracted 14.35% from the fund’s performance over the past six and one half years, which translates into a loss of about 2.35% annually over the period, however the fund has added value over one- and three-year periods.

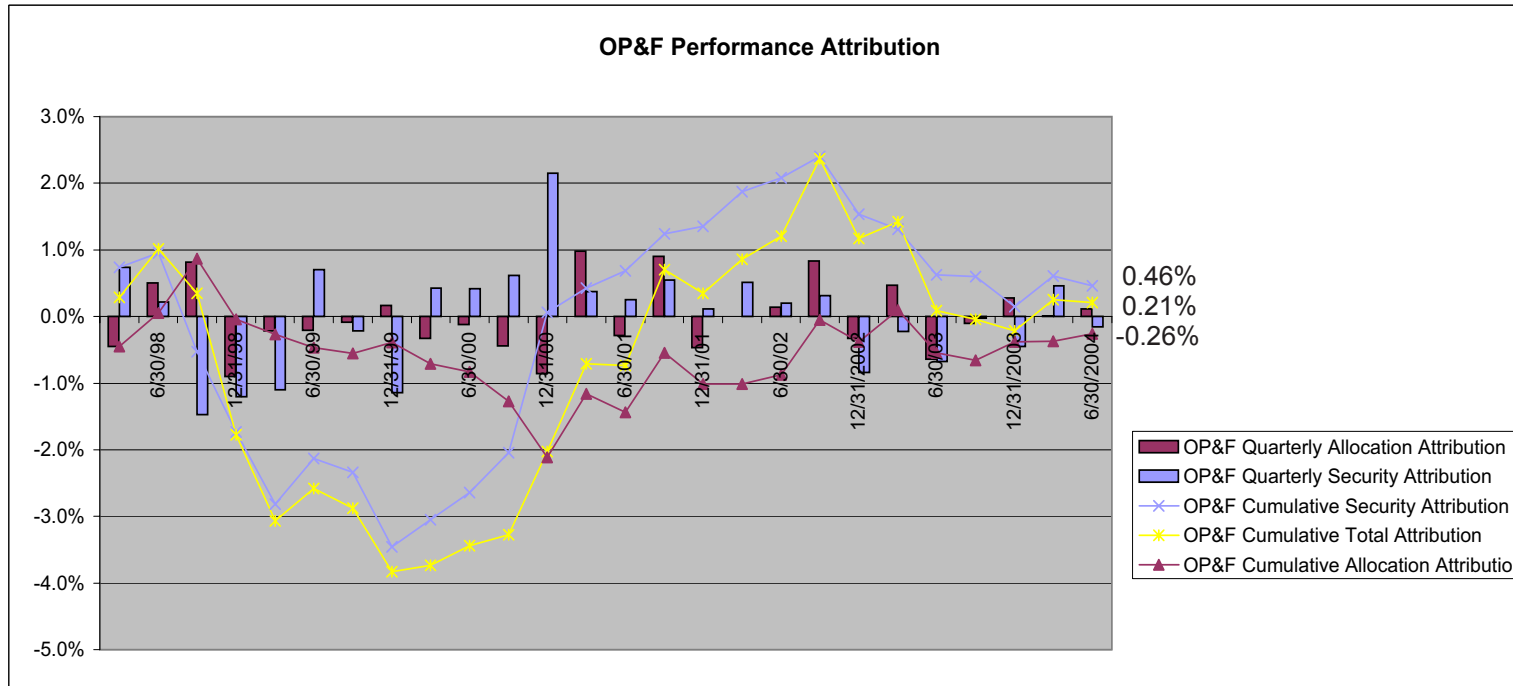
# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	6 <sup>1/2</sup> Years
Asset Allocation Attribution	0.552%	0.610%	0.315%	-0.322%
Security Selection Attribution	0.108%	-0.455%	-0.200%	-0.390%
Total Attribution	0.661%	0.160%	0.119%	-0.705%

The graph above shows that asset allocation and selection have both detracted from PERS' results over the past six and one half years. On an annualized basis, PERS's decisions to deviate from its passive benchmark have cost the fund 0.705% annually over the last six and one half years, however the fund has added value over the one-, three- and five-year period.

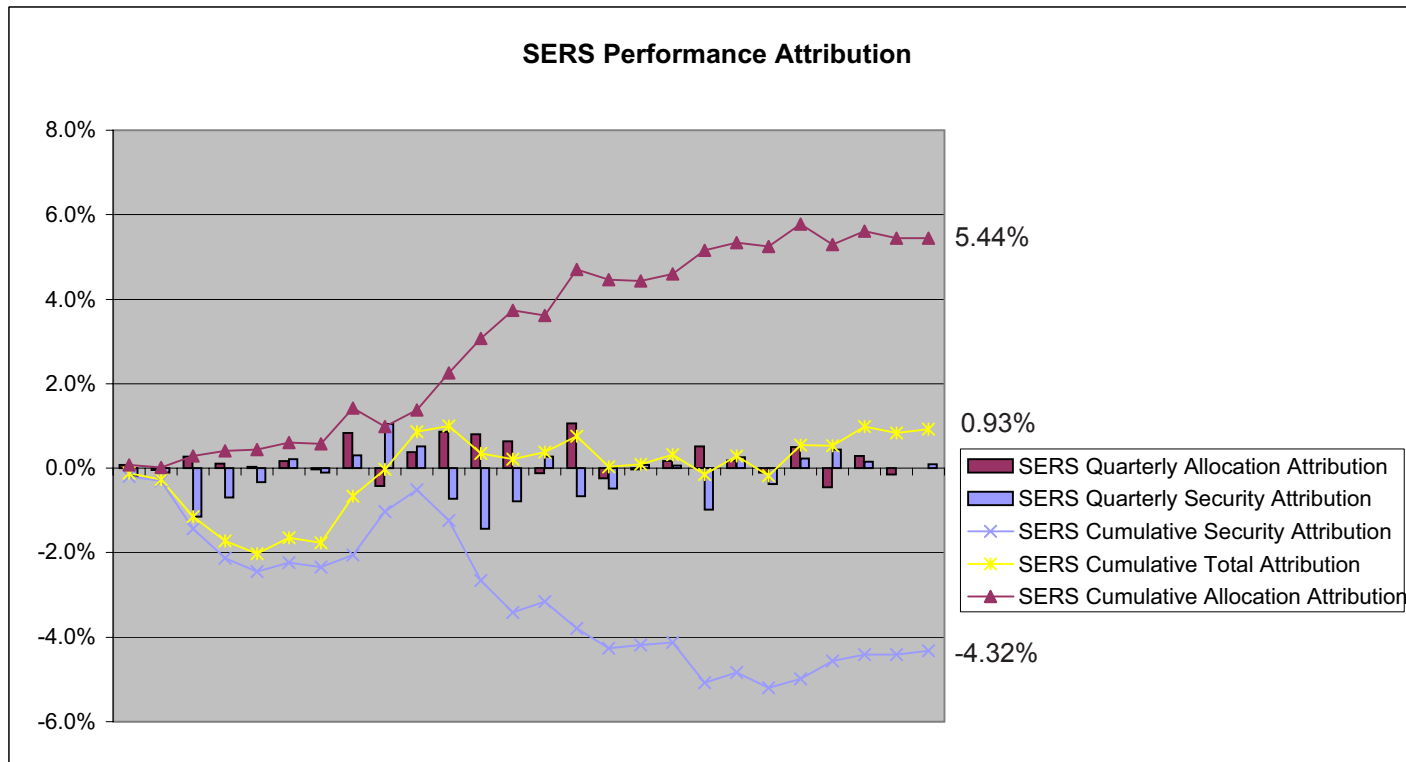
# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	6 <sup>1/2</sup> Years
Asset Allocation Attribution	0.295%	0.397%	0.043%	-0.039%
Security Selection Attribution	-0.167%	-0.075%	0.523%	0.070%
Total Attribution	0.129%	0.318%	0.568%	0.033%

The graph above shows that OP&F has added value with active management over the past six and one half years. This deviation counteracted the negative allocation results, resulting in an overall gain for the fund of 0.03% per year. The fund has added value over the one-, three- and five-year period as well.

# Appendix: ORSC Performance Attribution

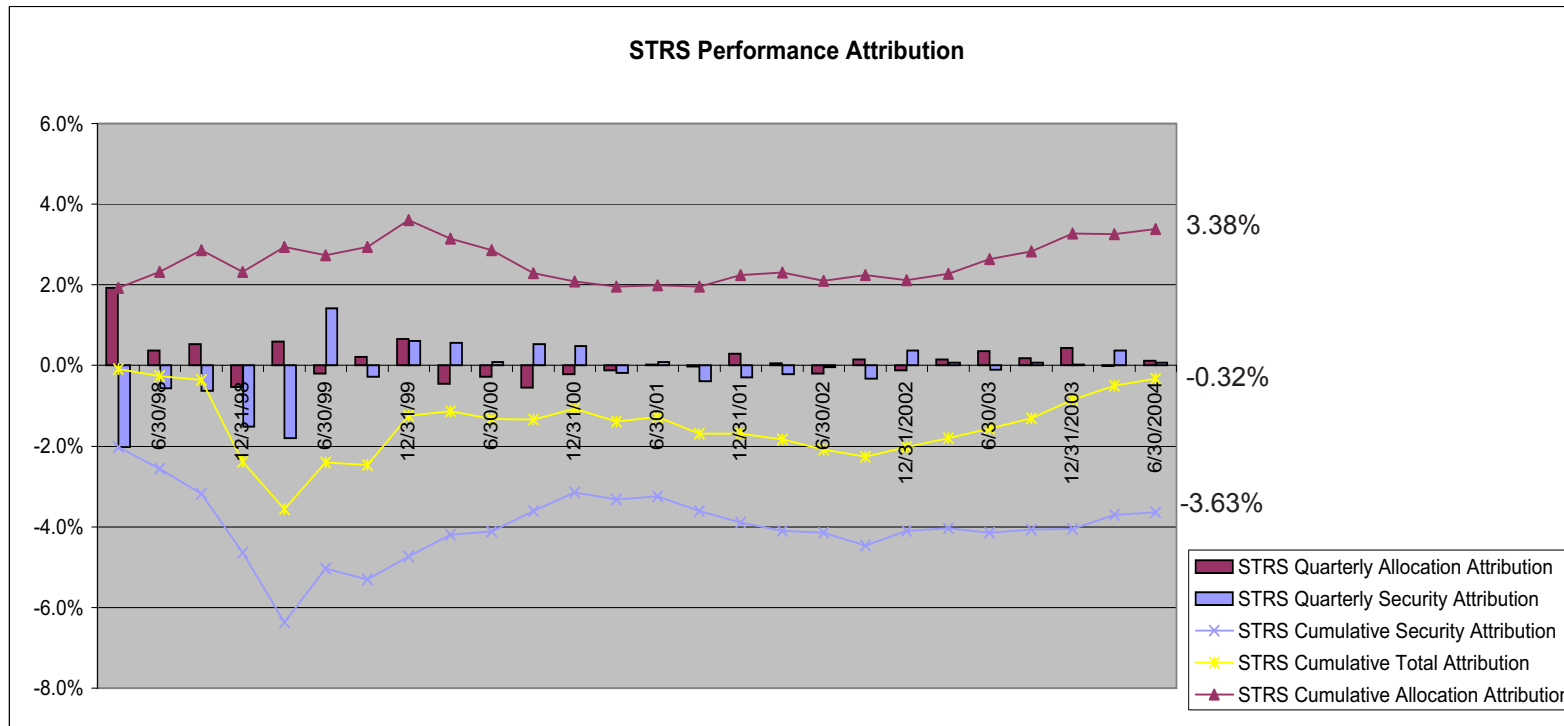


Annualized Attribution	One Year	Three Years	Five Years	6 <sup>1</sup> / <sub>2</sub> Years
Asset Allocation Attribution	-0.313%	0.585%	0.943%	0.819%
Security Selection Attribution	0.702%	-0.402%	-0.428%	-0.677%
Total Attribution	0.388%	0.184%	0.518%	0.142%

The graph above shows that SERS has added value through asset allocation over the past six and one half years, counteracting the negative impact of selection and resulting in overall positive results of 0.142% annually for the six and one half year period. The fund has added value over the one-, three- and five-year period as well.



# Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years	6 <sup>1/2</sup> Years
Asset Allocation Attribution	0.731%	0.455%	0.127%	0.513%
Security Selection Attribution	0.531%	-0.136%	0.294%	-0.568%
Total Attribution	1.266%	0.320%	0.422%	-0.049%

The graph above shows that for the entire six and one half year period STRS has added value through asset allocation. That incremental value, however was offset by adverse selection results, resulting in underperformance of 0.049% on an annualized basis. For the one-, three- and five-year periods, however, STRS investment decisions have been adding value.

# Appendix: ORSC Performance Attribution

## Appendix: Estimated Effect of Investment Performance on Assets

Pursuant to a legislative request, Evaluation Associates has performed an analysis that measures, in dollars, the difference between each System's actual results for the six year period beginning January 1, 1998 and ending December 31, 2003 (the period during which the Funds have been managed according to the "prudent person" standard) and the results that would have been achieved over that same period had their funds been invested in one of three passive portfolios: 1) their custom policy benchmark, 2) a constant mix of 35% equity and 65% fixed income and 3) a constant mix of 50% equity and 50% fixed income.

For the purposes of this analysis, broad market indices were used to represent the passive equity and fixed income markets. The Wilshire 5000 and the Lehman Aggregate Bond Index were chosen, since both are widely accepted to be representative of their respective market's performance.

The two alternative portfolios were chosen to represent policies that reflect the investment restrictions that were placed on the Systems prior to the adoption of the prudent person standard. The 35% equity 65% fixed income portfolio assumes that the investment restriction that was in place prior to the passage of SB 43 in 1993, had not been lifted. The 50% equity 50% bond portfolio assumes that the restriction that was established by SB 43 had not been lifted in 1997 (SB 43 allowed a maximum investment of 50% of the portfolio in stocks).

In order to conduct this analysis, actual and passive returns were used in conjunction with each of the systems' Comprehensive Annual Financial Reports (CAFRs) to produce quarterly values for each portfolio. Annual cash flows (contributions and withdrawals) for each plan were divided into four equal parts and applied to each individual quarter. Since the 6/30/2004 CAFRs for SERS and STRS will not be available until later this year, actual third and fourth quarter 2003 plan additions and deductions were provided by the staff of these Systems. Assets were increased under the assumption that cash flows occur in mid-quarter and therefore carry the effects of investment performance for the remaining half of the quarter. The assets of the funds were increased at different rates of return to estimate the effect of passive management and asset allocation decisions on the market value of each pension fund at the end of a six-year period given actual, custom policy, 50% equity/50% fixed income, and 35% equity/65% fixed income passive management performance.

The graph for each system charts the growth of assets under the four scenarios mentioned above. The assets are grown from the market value of the plan on December 31, 1997. For each quarter, additions such as contributions and deductions such as benefit payments are combined with net investment income to arrive at the ending market value for the quarter. Net investment income is the only variable that fluctuates and it is a function of the beginning market value, the scenario performance, and the net cash flow. The result of this calculation is the quarter-end market value for each scenario, which is then used as the beginning market value for the respective scenario in the next quarter. The assets for each system are grown in this fashion for each quarter over the measurement period (January 1, 1998 through December 31, 2003).

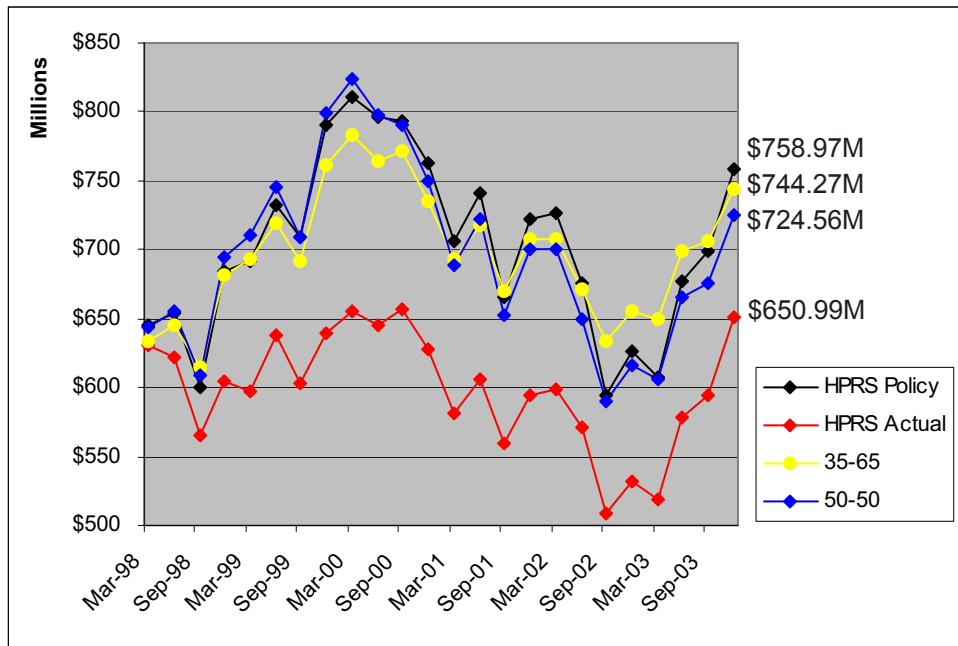
The results from the study show that in most cases, the ability to invest under prudent person standards affords the systems the opportunity to outperform the 35-65 and 50-50 guidelines, however not all have done so. In the majority of instances, the policy index performed better than all other scenarios. Had the systems matched their respective policy indexes, they all would have been better off. When taken in context with the attribution exhibits, the performance of all of the systems suffered relative to their policy indexes immediately after the prudent person guidelines became effective, however the results have stabilized for all five systems and in some cases resulted in positive value added over the measurement period.

As mentioned above, in most cases the funds' actual custom policy benchmarks have outperformed the other passive scenarios over the past six years. This finding confirms the wisdom of the legislature when, in 1997, it gave the systems the ability to operate under the prudent person standard. These custom policy benchmarks could not have been established without this standard. We believe that it is reasonable to assume that maintaining the investment flexibility established by the prudent person standard will continue to maximize the potential for superior results in the future.

# Appendix: ORSC Performance Attribution

## Highway Patrol Retirement System

The Highway Patrol Retirement System's actual results underperformed all three passive portfolios during the measurement period. The estimated asset value under the "actual" scenario on December 31, 2003 is \$650,986,244. Had the system been passively indexed in a 50% domestic equity and 50% bond portfolio, the estimated 12/31 value for the fund would be \$724,564,850, a difference of \$73,578,606. Had the fund been passively indexed in a 35% domestic equity and 65% bond portfolio, results would have been even higher. The estimated value at 12/31/2003 under this scenario would be \$744,272,356. This results in a \$93,286,112 gain over the actual scenario. The Highway Patrol policy outperformed all scenarios. Assets under this scenario would have resulted in a \$107,982,423 gain over the actual scenario with a 12/31/2003 value of \$758,968,667. While the results show that Highway Patrol would have benefited from a structure similar to those in effect prior to the prudent person statute, the results go on to show that the Highway Patrol policy, established under the prudent person standard, outperformed the 50-50 and 35-65 passive portfolios.

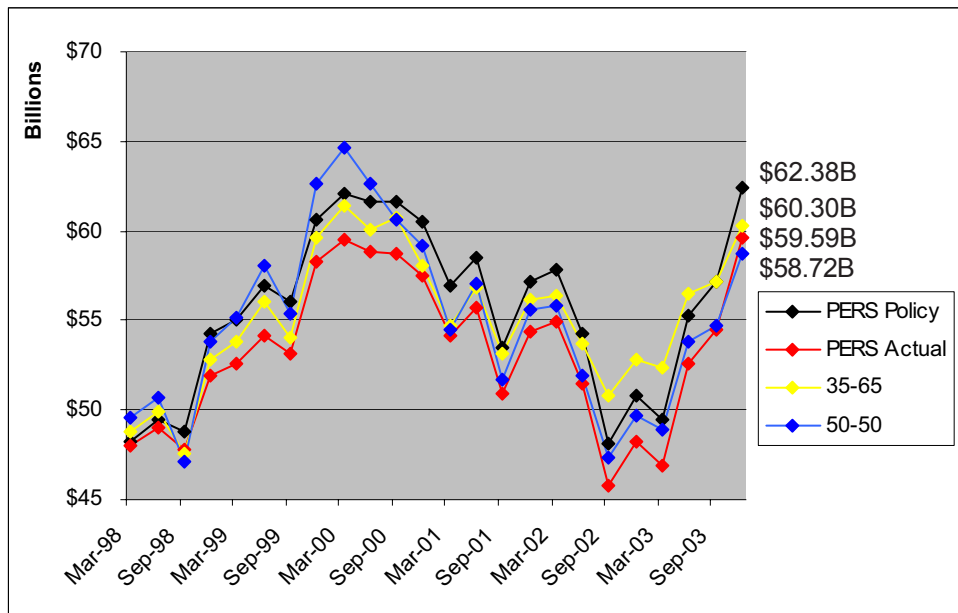


	<u>One Year</u>	<u>Three Year</u>	<u>Five Year</u>	<u>Six Year</u>
Policy	23.83%	5.31%	20.01%	40.22%
Actual	25.30%	10.78%	18.15%	21.97%
35-65	15.75%	6.89%	17.98%	37.35%
50-50	19.98%	2.33%	12.86%	33.85%

# Appendix: ORSC Performance Attribution

## Public Employees Retirement System

The Public Employees Retirement System's actual results underperformed its policy and the 35-65 passive portfolio but outperformed the 50-50 passive portfolio. The ending value under the actual scenario is \$59,593,234,591, which is \$875,730,752 above the \$58,717,503,839 value of the 50-50 portfolio. The value of the fund had it been invested in the 35-65 portfolio would be \$60,300,715,654, an increase of \$707,480,973. Under this scenario, assets would have been \$62,375,948,658, an increase of \$2,782,714,067. The performance of the Public Employees Retirement System resulted in a higher market value than it would have had the fund been invested in the 50-50 passive portfolio, however the fund would have benefited from a portfolio structure similar to the 35-65 portfolio over the measurement period. Results for the fund's policy index outperform all scenarios. Had the fund been passively invested in its policy index, the resulting ending value of the fund could be over \$2.7 billion higher. Similar to HPRS, the Public Employees policy index, established under the prudent person standard, outperformed all scenarios over the measurement period.

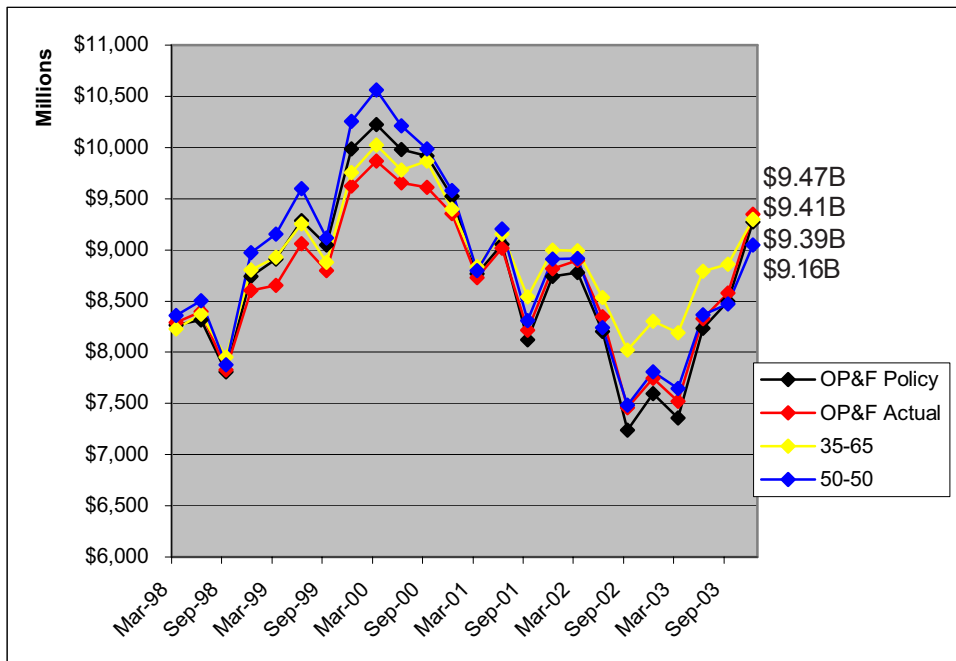


	<u>One Year</u>	<u>Three Year</u>	<u>Five Year</u>	<u>Six Year</u>
Policy	24.62%	6.00%	18.75%	42.03%
Actual	25.38%	6.76%	18.82%	35.97%
35-65	15.75%	6.89%	17.98%	37.35%
50-50	19.98%	2.33%	12.86%	33.85%

# Appendix: ORSC Performance Attribution

## Ohio Police and Fire Pension Fund

The Ohio Police and Fire Pension Fund's actual performance outperformed all scenarios during the measurement period ending with a value of \$9,466,121,408. In this case the policy index scenario slightly underperformed the 35-65 passive portfolio and the ending value for the scenarios would have been \$9,391,166,672 and \$9,410,839,994 respectively. The 50-50 passive portfolio displayed the worst performance over the measurement period. Assets would have been \$9,159,579,996 at December 31, 2003, a decrease of \$306,541,412 from the actual scenario. The Police and Fire results show that the funds can add value through their asset allocation and active management decisions – decisions that can only be made under prudent person standards.

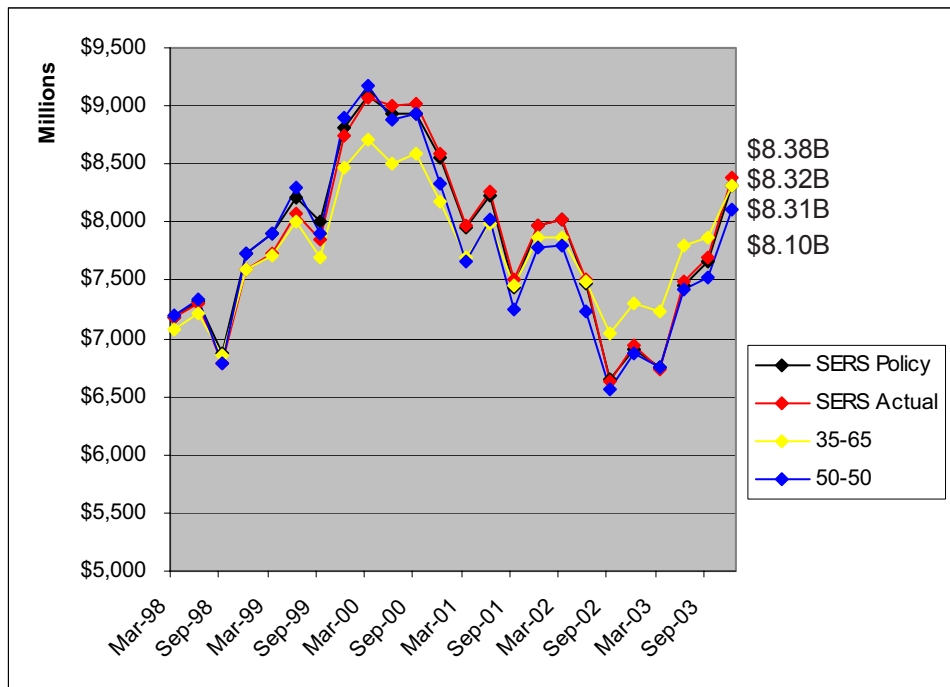


	<u>One Year</u>	<u>Three Year</u>	<u>Five Year</u>	<u>Six Year</u>
Policy	26.48%	5.59%	18.95%	37.52%
Actual	24.97%	8.30%	21.86%	38.62%
35-65	15.75%	6.89%	17.98%	37.35%
50-50	19.98%	2.33%	12.86%	33.85%

# Appendix: ORSC Performance Attribution

## School Employees Retirement System

The School Employees Retirement System's actual performance also outperformed all of the scenarios. Estimated assets on December 31, 2003 are \$8,378,772,732. This results in a gain of \$59,690,602 over the ending value of the 35-65 portfolio, a gain of \$71,080,948 over the ending value of the policy index portfolio, and a gain of \$277,774,046 over the 50-50 portfolio. SERS has added value through their active management decisions that are permitted under prudent person standards and has benefited from the ability to deviate from the more strict statutory guidelines.

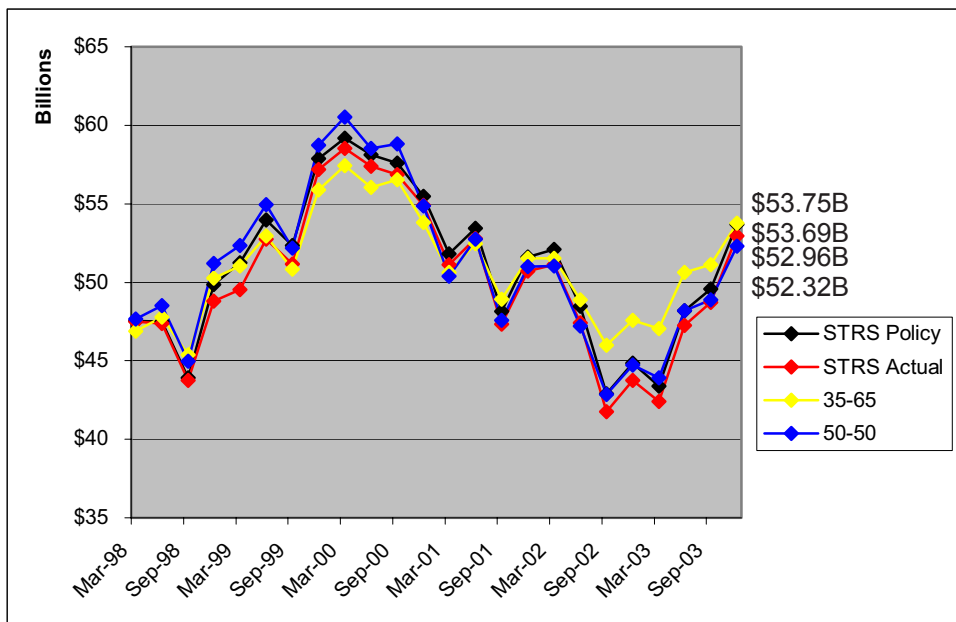


	<u>One Year</u>	<u>Three Year</u>	<u>Five Year</u>	<u>Six Year</u>
Policy	22.22%	2.19%	15.99%	37.33%
Actual	22.93%	2.69%	18.83%	38.31%
35-65	15.75%	6.89%	17.98%	37.35%
50-50	19.98%	2.33%	12.86%	33.85%

# Appendix: ORSC Performance Attribution

## State Teachers Retirement System

The State Teachers Retirement System's actual performance outperformed the 50-50 portfolio however it underperformed the policy and the 35-65 portfolio over the measurement period. The estimated value of assets under the actual scenario is \$52,961,056,407, which is \$641,596,650 above the 50-50 portfolio ending value of \$52,319,459,757. The State Teachers fund would have benefited from the investment performance of both the policy index and the 35-65 portfolio. In this case the 35-65 portfolio resulted in a higher ending value than the policy index. The ending value under the policy index scenario is \$53,689,242,902, an increase of \$728,186,495. Under the 35-65 scenario, assets would have increased to \$53,749,594,066, an increase of \$788,537,659. Along with the 35-65 scenario, the results show that the STRS policy, established under the prudent person standards, outperformed the other scenarios.



	<u>One Year</u>	<u>Three Year</u>	<u>Five Year</u>	<u>Six Year</u>
Policy	22.84%	3.84%	18.97%	37.36%
Actual	24.16%	3.58%	20.11%	35.73%
35-65	15.75%	6.89%	17.98%	37.35%
50-50	19.98%	2.33%	12.86%	33.85%