



Milliman USA

Consultants and Actuaries

The Ohio Retirement Study Council

Fourth Quarter 2002

INVESTMENT PERFORMANCE REVIEW

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OHIO RETIREMENT STUDY COUNCIL
Comparative Performance Study

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OHIO RETIREMENT STUDY COUNCIL

Comparative Performance Study

Period ending 12/31/2002

Executive Summary

Milliman USA is pleased to present to the Council the most recent results of our ongoing, semi-annual comparative study of the performance of the five Ohio Statewide pension funds pursuant to Section 171.04 of the Revised Code. This is the eighth report prepared by Milliman USA pursuant to this authority. The purpose of this comparative report is to provide the framework for dialogue with the retirement systems to assist the Council in meeting its oversight responsibilities. The legislature guarantees the defined benefit pension benefits that are paid to participants and determines maximum contribution rates. Underscoring the importance of investment results is the fact that the majority of the benefits paid are typically funded by investment income. A very simplistic rule of thumb for retirement systems such as the Ohio pension funds is that during the first three years of a person's retirement, all of that individual's contributions are exhausted. Furthermore, in the next three to five years, all of the employer's contributions are exhausted. After six to eight years, therefore, a retiree's pension is entirely dependent upon investment earnings. This report reflects investment performance for all five retirement systems over the nine-year period beginning January 1, 1994 and ending December 31, 2002.

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 first three sections of the report, to such things as quartile rankings and universe comparisons. The universes used for comparative purposes are those of the Wilshire Cooperative Universe Service. The comparisons are formulated by pooling data from a wide range of investment consulting firms and they provide a statistically valid measure of results relative to a large sample.

Our findings may be summarized as follows:

- € The year ending 12/31/02 was a difficult and volatile period for all of the funds. All experienced negative results, ranging from -8.42(HPRS) to -11.58 (SERS and STRS). All of the funds ranked below the median public retirement system in a broad universe of such funds. The highest ranking fund for the year was HPRS, with a 55th percentile rank. The other funds ranged from 73rd percentile (OP&F) to 88th percentile (SERS and STRS).
- € Longer term, the impact of three years of negative returns has been meaningful. All of the funds now have nine-year annualized returns that are below their actuarial interest-rate assumptions. While the funding implications of lowering

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assumptions may be severe, one must question if it is realistic to maintain assumed rates of return that are, in general, significantly higher than actual experience over what is now nearly a decade. On the other hand, when we performed our analysis for the period ending December 1999 (three years ago), all of the funds had six-year total returns that were significantly in excess of their actuarial assumptions. Using the returns of the recent past to forecast the future is not a prudent practice.

- € Also longer term, only OP&F had results that were ahead of its own benchmark for the nine-year measurement period (1/1/94 – 12/31/02). HPRS had the worst nine-year results relative to benchmark, underperforming by 2.67%.
- € SERS had the best absolute results over the full measurement period, achieving an average return of 7.31%
- € HPRS, which has experienced the lowest return over the entire measurement period, has shown dramatic signs of improvement over the past year. The fund's –8.42% return over the past twelve months not only represents the smallest loss experienced by any of the systems for the year, but compares favorably to its –11.58% benchmark return for the twelve months ending 12/31/2002.
- € We have compared the Ohio funds' results to three "peer" universes. First, we compare them to a broad Total Fund universe, which includes roughly 1,100 private and public plans, both large and small. Second, we compare them to a Public Fund universe, which includes 158 plans with an average size of over \$2 Billion. Finally, we compare them to a Large Plan universe which includes 67 plans with an average size of \$6.8 Billion. For the last five-year cumulative period, all of the funds are in the bottom half of every one of those universes. While it is true that this comparison is less relevant than a comparison to individual benchmark returns, these poor relative results are troubling none the less.

Before presenting our detailed comparative data, we wish to caution against jumping to conclusions, particularly in volatile markets, regarding the investment performance of any of the systems based on a single performance report. Any investment program, no matter how sound, can expect to encounter unfavorable investment environments. It is important that the systems' long term results be reviewed for reasonableness and not judged on short-term performance, whether favorable or unfavorable. Because of the long-term nature of the systems' obligations, it is also important that the funds not be managed with near-term results in mind. Such market timing is a recipe for disaster.

Over the long term, it is reasonable for the Council to expect to see emerging investment performance reflecting the systems' investment policies and to make judgments regarding whether those policies are being effectively implemented. While reasonable people could disagree over the definition of long term, it is generally accepted that five years (twenty quarters) is a sufficient time period to provide meaningful analysis of such things as the value added (or subtracted) by deviations from policy targets and active vs. passive investment strategies. Our analysis now includes an exhibit for each fund that breaks down the difference between the five-year total return achieved by each fund and the five-year return of its custom benchmark, dividing it into two component parts: asset allocation and selection. This exhibit allows us to examine whether a fund is adding (or subtracting) value by its decisions to deviate from its policy target and whether value is being added (or subtracted) from the non-asset allocation decisions such as manager and security selection.

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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.

The subjects of ethics in general and conflicts of interest in particular have been pushed to the front of the public's mind with respect to the world of investment management. Simply put, the behavior of a few large, visible firms has cast a shadow over the whole industry. Accordingly, we requested that each of the funds provide us with copies of policies and procedures documents that address such items as insider trading, conflicts of interest, self dealing, etc. All of the funds responded to our request. For the two funds that manage substantial assets in-house (PERS and STRS), there are, for all investment personnel, detailed policies that address ethical conduct and strict requirements for the disclosure of personal financial transactions. For the two larger funds that outsource investment management (OP&F and SERS), detailed ethics policies have also been implemented, and examples of ethical policies of outside investment management organizations were also provided. HPRS did not provide a formal policy document or examples of ethical policies for its outside managers, however they stated that while it has not found it necessary to regulate the personal investments of staff, all staff must comply with the Ohio Ethics Commission standards and all newly hired employees are trained in those regulations. In order to determine whether the Ohio funds' ethics policies and procedures are in line with other major statewide pension funds we will do further research and report our findings to the Council when we present our next report.

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Three years of adverse market conditions have taken their toll on the systems' returns. The cushion enjoyed a few years ago has eroded. With long U.S. Treasury bonds yielding less than 5%, most economists and market forecasters agree that stock and bond market returns are unlikely to be as robust as they were in the 90s. This might be a good time, therefore, to reexamine benchmarks and assumptions.

When each fund is compared to its own asset allocation policies and actuarial interest rate assumptions (as of the most recent valuation) for the nine- year measurement period, the following picture emerges: (funds are listed below in ascending order by their average annual return for the entire period)

Fund	Annual Return	Benchmark Annual Return	Actuarial Interest Rate	Valuation Date
HPRS	5.18%	7.85%	8.00%	12/31/2001
PERS	5.34%	6.03%	8.00%	12/31/2001
STRS	6.31%	6.98%	7.75%	7/1/2002
OP&F	6.84%	6.40%	8.25%	1/1/2002
SERS	7.31%	7.51%	8.25%	6/30/2002

Only OP&F is ahead of its benchmark. Most of the funds, however, are within 100 basis points of their target policies' returns for the measurement period. The exception, with respect to performance vs. benchmark, is HPRS, whose annual results are 267 basis points below the target policy benchmark return for the measurement period.

For funding purposes, pension funds smooth asset values and returns over long periods (typically four years) in order to keep contribution rates and funded ratios stable. The losses experienced during the recent market downturn will have an impact over the next several years, having a dampening effect on any gains that might occur. It is important that any decisions regarding benefits be made with an understanding of the smoothing process in mind. The imbedded losses that are currently present have not been fully reflected in the actuarial value of fund assets.

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Performance Summary Table
Quarter Ending 12/31/02

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	Since 12/31/95	Incept Date	Incept Ret
HPRS									
Total Return	5.22	-5.63	-9.61	-8.42	-3.89	-0.40	3.78	12/31/93	5.18
Equity	9.38	-11.15	-20.04	-18.76	-11.47	-6.60	1.00	12/31/93	5.02
Fixed Income	0.32	5.69	10.24	10.56	9.96	7.69	7.17	12/31/93	7.10
Cash & Equiv	0.49	1.06	1.83	2.49	4.26	4.55	4.81	3/31/94	4.89
Real Estate	2.03	1.62	4.41	6.35	11.11	8.40	8.69	12/31/93	7.95
International Equity	6.39	-15.63	-17.47	-16.66	-13.56	-0.53	1.25	3/31/95	2.15
PERS									
Total Return	5.53	-6.04	-11.83	-10.77	-5.48	1.61	4.09	12/31/93	5.34
Equity	8.07	-10.35	-22.05	-21.37	-12.92	-0.89	5.32	12/31/93	6.34
Fixed Income	2.55	6.39	8.65	8.88	9.67	7.32	6.94	12/31/93	7.49
Cash & Equiv	0.37	0.82	1.27	1.70	4.03	4.60	4.90	12/31/93	4.95
Real Estate	1.07	0.91	3.89	7.35	10.26	8.69	9.92	12/31/93	10.12
International Equity	6.61	-13.75	-16.47	-14.60	-17.34	-1.52	-1.11	12/31/95	-1.11
OP&F									
Total Return	4.54	-5.98	-11.26	-9.89	-5.03	2.10	5.71	12/31/93	6.84
Equity	6.58	-12.17	-21.57	-19.81	-10.37	-0.12	6.65	12/31/93	8.25
Fixed Income	1.74	5.18	6.82	7.63	10.01	7.54	7.29	12/31/93	7.23
Cash & Equiv	0.43	0.88	1.36	1.78	4.11	4.59	5.24	9/30/96	4.46
Real Estate	2.20	4.65	6.78	5.71	8.92	11.64	10.59	12/31/93	10.32
International Equity	7.34	-13.57	-17.71	-16.17	-19.05	-2.02	0.77	9/30/94	1.79
SERS									
Total Return	5.06	-6.65	-12.41	-11.58	-6.01	2.39	5.99	12/31/93	7.31
Equity	7.59	-11.50	-22.59	-21.66	-13.75	-0.79	6.10	12/31/93	8.50
Fixed Income	1.77	6.33	10.17	10.70	10.77	7.88	7.53	12/31/93	7.33
Cash & Equiv	0.35	0.72	1.14	0.94	5.15	5.13	5.24	12/31/93	5.22
Real Estate	1.78	1.82	2.83	1.49	6.49	7.94	9.20	12/31/93	9.38
International Equity	5.48	-15.71	-20.79	-18.53	-15.25	-1.67	1.32	9/30/94	2.81

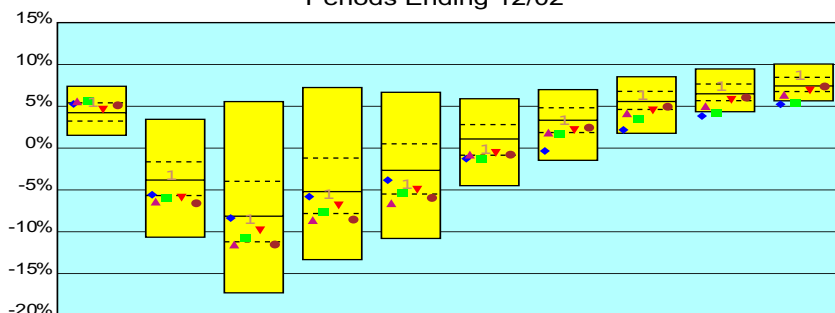
Performance Summary Table
Quarter Ending 12/31/02

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	Since 12/31/95	Incept Date	Incept Ret
STRS									
Total Return	5.54	-6.45	-12.74	-11.58	-6.64	1.80	4.96	12/31/93	6.31
Equity	8.21	-10.78	-22.65	-22.16	-13.37	-1.42	5.15	12/31/93	7.11
Fixed Income	3.26	7.04	9.28	9.76	10.47	7.75	7.68	12/31/93	8.08
Cash & Equiv	0.39	0.84	1.31	1.77	4.14	4.67	4.94	12/31/93	4.79
Real Estate	2.99	2.57	4.36	4.01	8.47	9.84	10.57	12/31/93	9.99
International Equity	5.04	-13.52	-17.67	-13.69	-14.84	-1.60	-0.26	12/31/93	1.21
Indices									
Russell 1000	8.16	-10.14	-22.23	-21.65	-14.17	-0.58	6.75	Since 12/31/93	9.07
Russell 2000	6.15	-16.57	-23.53	-20.48	-7.55	-1.36	4.17	12/31/93	5.92
Russell 3000	8.02	-10.60	-22.30	-21.55	-13.70	-0.72	6.44	12/31/93	8.72
Standard & Poors 500	8.43	-10.32	-22.34	-22.12	-14.56	-0.58	6.88	12/31/93	9.26
S&P 500 Equal Wtd	13.04	-9.99	-20.36	-16.28	-3.81	2.61	8.63	12/31/93	10.27
S&P 600 Small Cap	4.91	-14.61	-20.19	-14.63	0.57	2.44	8.05	12/31/93	8.75
S&P MidCap 400	5.83	-11.70	-19.91	-14.52	-0.05	6.42	11.55	12/31/93	11.73
Wilshire 5000	7.82	-10.30	-21.62	-20.86	-14.36	-0.85	6.21	12/31/93	8.47
LB Aggregate	1.57	6.23	10.15	10.26	10.10	7.54	7.27	12/31/93	7.27
SB Broad Inv Grade	1.60	6.27	10.02	10.11	10.06	7.53	7.25	12/31/93	7.27
MSCI EAFE (Net)	6.45	-14.55	-16.36	-15.94	-17.24	-2.89	-1.00	12/31/93	1.24
MSCI Em Mkts Free (G)	10.04	-7.90	-15.63	-6.00	-13.96	-4.57	-4.18	12/31/93	-4.64
MSCI World Ex-US (Ne)	6.54	-14.36	-16.28	-15.81	-16.93	-2.73	-0.71	12/31/93	1.45
LB Mortgage	1.36	4.06	7.68	8.74	9.37	7.35	7.36	12/31/93	7.33
NCREIF	1.59	3.27	5.02	6.67	8.75	10.73	11.12	12/31/93	10.18

The Summary Tables show that for the 9-year, since inception measurement period, SERS had the highest total return (7.31% per year) and HPRS had the lowest total return (5.18% per year). Total Return, here and throughout the report, is defined as the return for the entire fund, including all asset classes. For the five years ending 12/31/2002, SERS again had the highest total return (2.39% per year) and HPRS had the lowest total return (-0.40% per year). For the most recent twelve month period, all of the funds experienced negative returns. The smallest loss was experienced by HPRS (-8.42%) and the greatest loss was produced by both SERS and STRS (-11.58%). For the second half of this year (2 Qtrs. on the table and the period since our last report), all of the funds again suffered losses. HPRS produced the smallest loss of all the funds with a return of -5.63%. SERS had the greatest six-month loss with a total return of -6.65%. The table on the right also includes a summary of the returns of the various benchmarks utilized by the funds. These may be used as reference points to compare the asset class results of the various funds. For example, for the 9-year measurement period, the broad U.S. equity market, as defined by the Wilshire 5000 Index, returned 8.47% per year. SERS is the only fund that experienced domestic equity performance (8.50%) in excess of this index for the period.

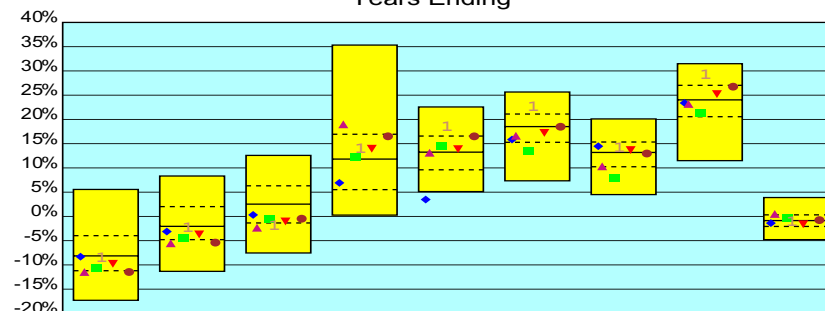
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Cumulative Performance Comparison
Total Returns of Total Fund Portfolios
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	7.39	3.44	5.56	7.24	6.67	5.90	6.99	8.53	9.46	10.05
1st Qt	5.41	-1.64	-3.97	-1.19	0.51	2.81	4.82	6.78	7.66	8.46
Median	4.23	-3.82	-8.14	-5.20	-2.66	1.09	3.33	5.57	6.49	7.43
3rd Qt	3.23	-5.67	-11.20	-7.82	-5.49	-0.85	1.86	4.62	5.67	6.76
Low	1.53	-10.65	-17.30	-13.33	-10.80	-4.49	-1.46	1.77	4.35	5.65
◆ HPRS Return	5.22	-5.63	-8.42	-5.86	-3.89	-1.32	-0.40	2.12	3.78	5.18
Rank	27	74	53	59	62	79	92	94	95	96
■ PERS Return	5.53	-6.04	-10.77	-7.75	-5.48	-1.36	1.61	3.48	4.09	5.34
Rank	21	79	73	74	74	79	78	86	95	95
▼ OP&F Return	4.54	-5.98	-9.89	-6.91	-5.03	-0.63	2.10	4.45	5.71	6.84
Rank	44	78	67	68	71	72	72	78	74	71
● SERS Return	5.06	-6.65	-11.58	-8.60	-6.01	-0.84	2.39	4.89	5.99	7.31
Rank	33	83	78	80	78	74	66	68	67	51
▲ STRS Return	5.54	-6.45	-11.58	-8.66	-6.64	-0.83	1.80	4.11	4.96	6.31
Rank	21	82	78	81	84	74	75	83	89	86
┌ 60/40 Index Return	5.32	-3.37	-8.69	-5.69	-4.52	-0.25	3.23	6.21	7.28	8.51
Rank	26	44	55	58	68	69	51	37	32	24

Consecutive Performance Comparison
Total Returns of Total Fund Portfolios
Years Ending

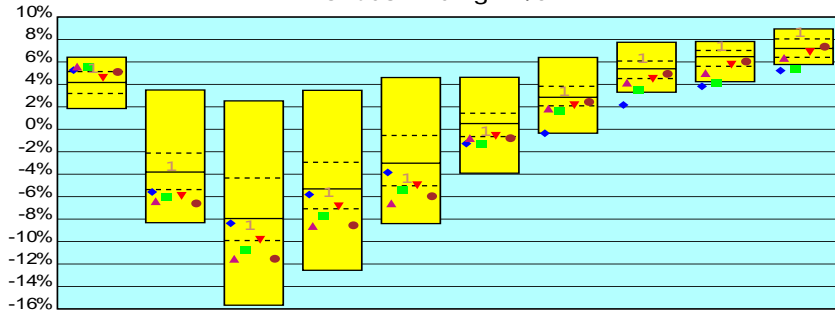


	Year 12/02	Year 12/01	Year 12/00	Year 12/99	Year 12/98	Year 12/97	Year 12/96	Year 12/95	Year 12/94
High	5.56	8.33	12.58	35.33	22.57	25.65	20.10	31.49	3.89
1st Qt	-3.97	2.02	6.31	16.94	16.57	21.11	15.34	27.03	0.32
Median	-8.14	-2.05	2.53	11.82	13.25	18.52	13.19	24.03	-0.86
3rd Qt	-11.20	-4.79	-1.35	5.52	9.61	15.28	10.24	20.56	-2.07
Low	-17.30	-11.33	-7.54	0.27	5.12	7.34	4.50	11.50	-4.79
◆ HPRS Return	-8.42	-3.24	0.19	6.80	3.36	15.73	14.35	23.27	-1.50
Rank	53	61	65	70	96	73	36	57	64
■ PERS Return	-10.77	-4.64	-0.75	12.09	14.43	13.35	7.86	21.14	-0.48
Rank	73	73	71	48	41	82	85	71	40
▼ OP&F Return	-9.89	-3.83	-1.16	13.84	13.75	17.10	13.56	25.10	-1.74
Rank	67	65	73	39	46	63	46	41	68
● SERS Return	-11.58	-5.52	-0.59	16.40	16.39	18.37	12.85	26.63	-0.88
Rank	78	79	70	27	26	51	52	27	51
▲ STRS Return	-11.58	-5.66	-2.45	18.87	13.01	16.51	10.21	23.07	0.39
Rank	78	79	81	19	52	67	75	58	23
┌ 60/40 Index Return	-8.69	-2.59	-2.15	13.74	18.40	22.44	13.95	29.07	-1.19
Rank	55	55	80	39	16	16	41	11	58

This page compares the Total Fund results to a broad universe of total funds - 1095 other funds, including those of public, corporate, and multi-employer pension plans - over a nine-year measurement period. Here and elsewhere in the report, the “floating bars” define the universe against which the performance is being compared. The top of the bar is the 5th percentile, the higher dotted line is the 25th percentile (bottom of the first quartile), the solid line is the median, the lower dotted line is the 75th percentile (bottom of the third quartile) and the bottom of the bar is the 95th percentile. The table just below the graph defines the quartile marks and the table below that displays each fund’s return for that period and the relevant ranking in the universe. The numbers in the “rank” rows are percentile rankings. The last line in the bottom table is the return and rank of a hypothetical portfolio of 60% stocks (Wilshire 5000) and 40% bonds (Lehman Aggregate Bond Index). The graph on the left is a cumulative performance comparison with measurement periods that are annualized over the last nine years. The graph on the right is a consecutive performance comparison with twelve-month measurement periods ending 12/2002. The graph on the left shows that SERS has demonstrated the highest return for the nine-year period with a 7.31% per year return, which ranks the fund in the 51st percentile. The graph on the right shows that this nine-year ranking was achieved by above-median performance for 12 month periods ending 12/31 in 1995, 1998, and 1999.

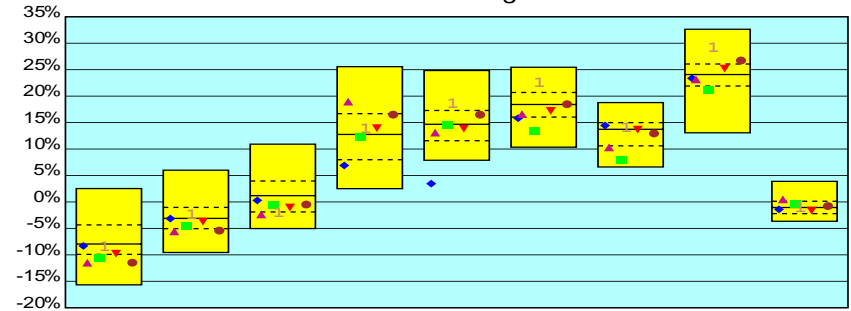
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Cumulative Performance Comparison
Total Returns of Total Fund Public Sponsors
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	6.42	3.50	2.53	3.47	4.61	4.63	6.40	7.75	7.82	8.94
1st Qt	5.14	-2.12	-4.34	-2.94	-0.55	1.43	3.83	6.08	7.02	8.05
Median	4.17	-3.81	-7.95	-5.31	-3.02	0.51	2.85	5.39	6.47	7.20
3rd Qt	3.19	-5.37	-9.91	-7.08	-5.03	-0.65	2.09	4.52	5.61	6.41
Low	1.85	-8.32	-15.67	-12.56	-8.40	-3.91	-0.35	3.30	4.24	5.77
◆ HPRS Return	5.22	-5.63	-8.42	-5.86	-3.89	-1.32	-0.40	2.12	3.78	5.18
Rank	21	81	55	56	61	81	95	100	99	99
■ PERS Return	5.53	-6.04	-10.77	-7.75	-5.48	-1.36	1.61	3.48	4.09	5.34
Rank	16	86	83	80	78	81	81	90	95	95
▼ OP&F Return	4.54	-5.98	-9.89	-6.91	-5.03	-0.63	2.10	4.45	5.71	6.84
Rank	43	84	73	70	75	69	73	77	73	65
● SERS Return	5.06	-6.65	-11.58	-8.60	-6.01	-0.84	2.39	4.89	5.99	7.31
Rank	26	89	88	88	83	75	64	66	62	42
▲ STRS Return	5.54	-6.45	-11.58	-8.66	-6.64	-0.83	1.80	4.11	4.96	6.31
Rank	16	88	88	88	87	75	80	84	89	81
┌ 60/40 Index Return	5.32	-3.37	-8.69	-5.69	-4.52	-0.25	3.23	6.21	7.28	8.51
Rank	19	42	59	55	67	64	40	22	17	13

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

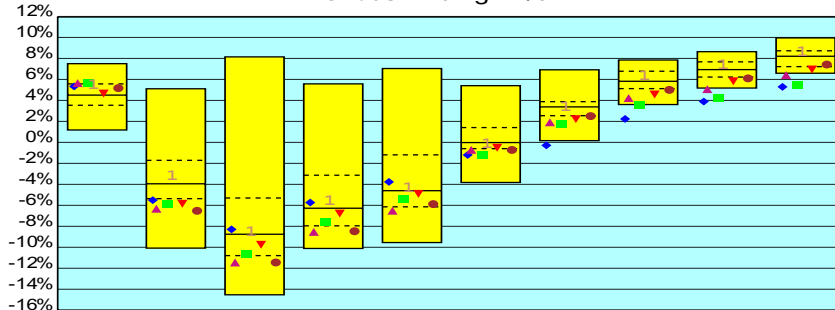


	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	2.53	6.00	10.92	25.57	24.84	25.46	18.78	32.64	3.89
1st Qt	-4.34	-1.03	3.96	16.69	17.29	20.69	14.99	26.07	0.13
Median	-7.95	-3.11	1.19	12.76	14.68	18.42	13.73	24.08	-1.05
3rd Qt	-9.91	-5.05	-1.89	7.98	11.57	16.04	10.60	21.91	-2.21
Low	-15.67	-9.55	-5.03	2.51	7.88	10.35	6.61	13.07	-3.65
◆ HPRS Return	-8.42	-3.24	0.19	6.80	3.36	15.73	14.35	23.27	-1.50
Rank	55	53	57	79	99	76	40	60	59
■ PERS Return	-10.77	-4.64	-0.75	12.09	14.43	13.35	7.86	21.14	-0.48
Rank	83	70	62	55	54	89	92	80	33
▼ OP&F Return	-9.89	-3.83	-1.16	13.84	13.75	17.10	13.56	25.10	-1.74
Rank	73	60	65	43	59	64	50	37	64
● SERS Return	-11.58	-5.52	-0.59	16.40	16.39	18.37	12.85	26.63	-0.88
Rank	88	81	62	26	30	50	55	21	46
▲ STRS Return	-11.58	-5.66	-2.45	18.87	13.01	16.51	10.21	23.07	0.39
Rank	88	82	77	13	66	70	83	63	19
┌ 60/40 Index Return	-8.69	-2.59	-2.15	13.74	18.40	22.44	13.95	29.07	-1.19
Rank	59	43	75	44	17	12	45	9	52

The graphs above compare the Total Fund results to a universe comprised solely of the 158 Public Retirement Systems in the universe. SERS is the only Ohio fund to rank above the median return for this universe over the last nine years. OP&F has displayed third quartile performance over the nine-year measurement period, while PERS, HPRS, and STRS have placed in the fourth quartile over the same nine-year period.

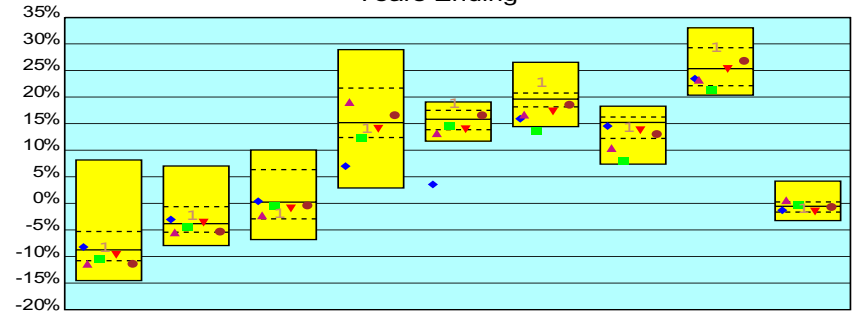
Ohio Retirement Study Council

Total Returns of Total Fund Portfolios
Total Market Value Over One Billion
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	7.48	5.08	8.12	5.54	7.00	5.36	6.87	7.80	8.59	9.90
1st Qt	5.55	-1.75	-5.35	-3.18	-1.24	1.36	3.83	6.73	7.62	8.67
Median	4.48	-3.99	-8.81	-6.33	-4.66	-0.07	3.33	5.77	6.88	8.15
3rd Qt	3.51	-5.41	-10.85	-8.01	-6.20	-0.65	2.49	5.07	6.17	7.16
Low	1.15	-10.13	-14.59	-10.17	-9.61	-3.88	0.11	3.55	5.12	6.53
◆ HPRS Return Rank	5.22 27	-5.63 80	-8.42 41	-5.86 44	-3.89 34	-1.32 85	-0.40 99	2.12 99	3.78 99	5.18 100
■ PERS Return Rank	5.53 25	-6.04 88	-10.77 72	-7.75 72	-5.48 59	-1.36 85	1.61 81	3.48 95	4.09 99	5.34 100
▼ OP&F Return Rank	4.54 42	-5.98 85	-9.89 66	-6.91 55	-5.03 56	-0.63 67	2.10 75	4.45 83	5.71 87	6.84 91
● SERS Return Rank	5.06 32	-6.65 91	-11.58 83	-8.60 78	-6.01 68	-0.84 85	2.39 75	4.89 75	5.99 79	7.31 66
▲ STRS Return Rank	5.54 25	-6.45 91	-11.58 83	-8.66 78	-6.64 75	-0.83 85	1.80 81	4.11 87	4.96 95	6.31 99
⊥ 60/40 Index Return Rank	5.32 27	-3.37 37	-8.69 47	-5.69 41	-4.52 46	-0.25 53	3.23 50	6.21 35	7.28 35	8.51 25

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

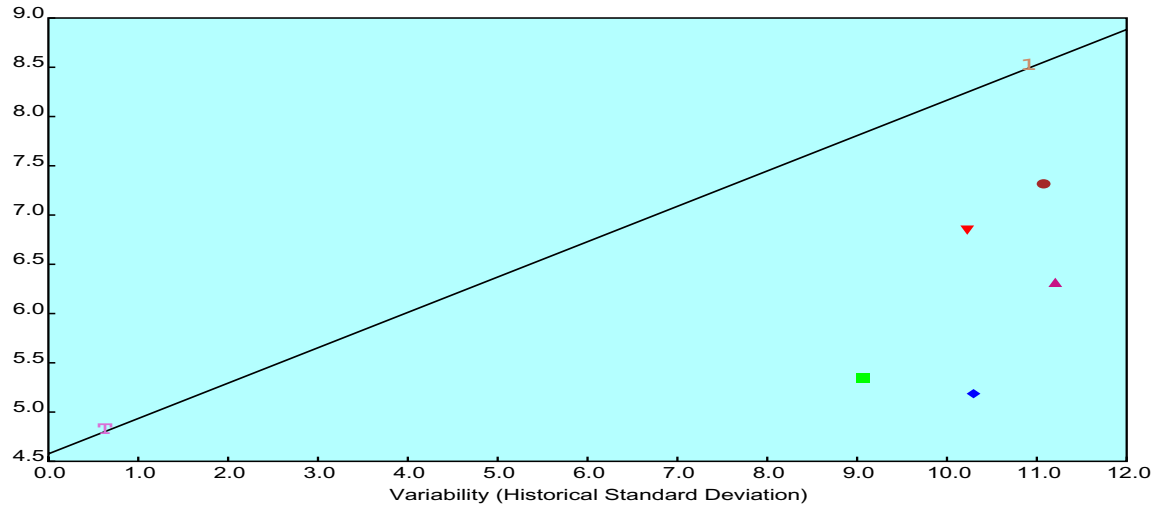


	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	8.12	6.98	9.98	28.88	19.02	26.48	18.21	32.96	4.09
1st Qt	-5.35	-0.68	6.29	21.64	17.44	20.69	16.17	29.21	0.17
Median	-8.81	-3.88	0.17	15.13	15.76	19.55	15.15	25.27	-0.65
3rd Qt	-10.85	-5.49	-2.98	12.33	13.80	18.09	12.14	22.06	-1.74
Low	-14.59	-8.00	-6.88	2.83	11.64	14.37	7.30	20.28	-3.34
◆ HPRS Return Rank	-8.42 41	-3.24 44	0.19 46	6.80 85	3.36 100	15.73 91	14.35 53	23.27 66	-1.50 66
■ PERS Return Rank	-10.77 72	-4.64 66	-0.75 56	12.09 75	14.43 67	13.35 95	7.86 91	21.14 83	-0.48 41
▼ OP&F Return Rank	-9.89 66	-3.83 47	-1.16 59	13.84 50	13.75 78	17.10 83	13.56 67	25.10 58	-1.74 79
● SERS Return Rank	-11.58 83	-5.52 78	-0.59 53	16.40 43	16.39 34	18.37 71	12.85 67	26.63 42	-0.88 58
▲ STRS Return Rank	-11.58 83	-5.66 78	-2.45 71	18.87 31	13.01 78	16.51 87	10.21 87	23.07 66	0.39 9
⊥ 60/40 Index Return Rank	-8.69 47	-2.59 41	-2.15 71	13.74 53	18.40 5	22.44 12	13.95 57	29.07 25	-1.19 62

The charts above compare the total fund returns to a universe of large funds. This particular universe consists of 67 funds with total assets over one billion dollars. Results are similar to the Public Fund comparisons on the previous page.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/02

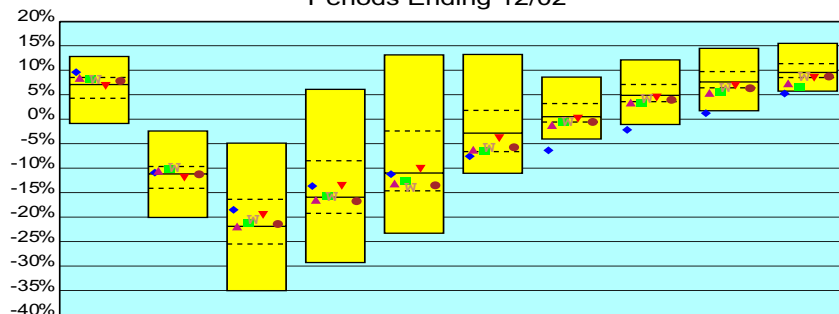


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	5.18	10.36	0.36	0.03
■ PERS	5.34	9.13	0.52	0.06
▼ OP&F	6.84	10.29	2.02	0.20
● SERS	7.31	11.14	2.49	0.22
▲ STRS	6.31	11.27	1.49	0.13
└ 60/40 Index	8.51	10.96	3.69	0.34
┘ 91-Day Treasury Bill	4.82	0.68	0.00	0.00

The graph above provides the first analysis of risk. The 9-year results of each Total Fund are displayed in risk-return space. The vertical axis shows the fund's return and the horizontal axis shows the fund's risk (defined as annualized quarterly standard deviation of returns) for the period. The diagonal line is the Capital Market Line, drawn by connecting the risk/return point of US T-bills (the theoretical risk-free rate) and the risk/return point of the hypothetical 60% stock, 40% bond portfolio that was introduced on page 6. 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

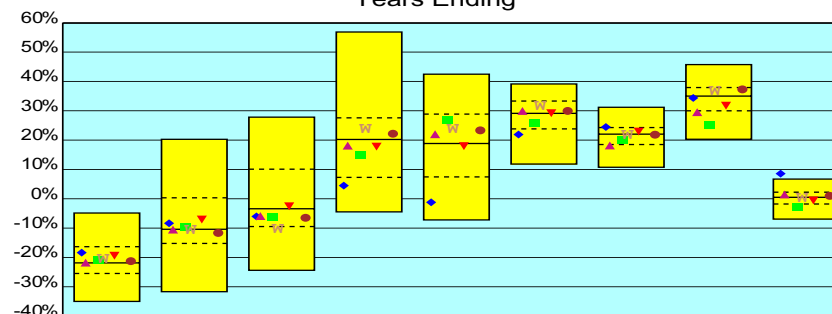
Cumulative Performance Comparison
Total Returns of Equity Portfolios
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	12.78	-2.47	-4.96	6.03	13.07	13.15	8.51	12.02	14.37	15.38
1st Qt	8.49	-9.73	-16.45	-8.57	-2.49	1.71	3.10	6.99	9.62	11.23
Median	7.04	-11.25	-21.98	-16.03	-11.09	-2.94	0.41	4.77	7.50	9.43
3rd Qt	4.23	-14.19	-25.59	-19.33	-14.73	-6.72	-0.68	3.48	6.30	8.39
Low	-0.92	-20.15	-35.13	-29.39	-23.40	-11.15	-4.15	-1.19	1.61	5.61

◆ HPRS Domestic Equity	Return	9.38	-11.15	-18.76	-13.90	-11.47	-7.81	-6.60	-2.41	1.00	5.02
	Rank	16	48	33	43	51	86	97	97	96	96
■ PERS Domestic Equity	Return	8.07	-10.35	-21.37	-15.94	-12.92	-6.73	-0.89	3.07	5.32	6.34
	Rank	38	39	45	49	56	75	78	79	83	90
▼ OP&F Domestic Equity	Return	6.58	-12.17	-19.81	-13.86	-10.37	-4.11	-0.12	4.20	6.65	8.25
	Rank	56	59	37	43	48	56	58	67	70	76
● SERS Domestic Equity	Return	7.59	-11.50	-21.66	-16.99	-13.75	-5.97	-0.79	3.73	6.10	8.50
	Rank	44	52	47	55	58	66	77	74	75	74
▲ STRS Domestic Equity	Return	8.21	-10.78	-22.16	-16.72	-13.37	-6.47	-1.42	3.18	5.15	7.11
	Rank	35	45	57	53	57	69	82	77	84	86
W Wilshire 5000	Return	7.82	-10.30	-20.86	-16.06	-14.36	-6.14	-0.85	3.89	6.21	8.47
	Rank	41	38	41	50	63	67	78	71	75	74

Consecutive Performance Comparison
Total Returns of Equity Portfolios
Years Ending



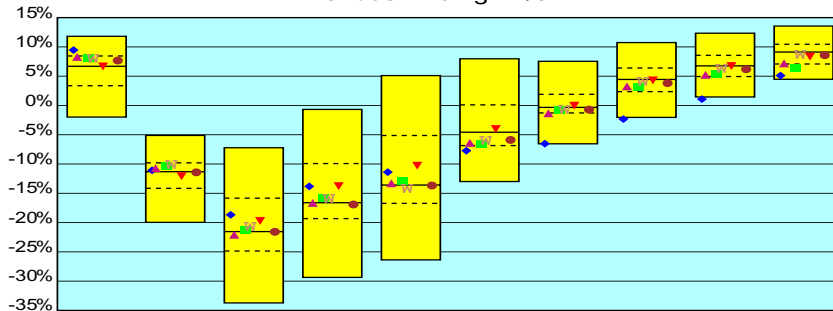
	Year 12/02	Year 12/01	Year 12/00	Year 12/99	Year 12/98	Year 12/97	Year 12/96	Year 12/95	Year 12/94
High	-4.96	20.18	27.73	56.77	42.36	39.01	31.04	45.59	6.51
1st Qt	-16.45	0.22	9.97	27.48	28.74	33.18	24.12	37.76	2.04
Median	-21.98	-10.52	-3.53	20.10	18.71	28.98	21.87	34.84	0.29
3rd Qt	-25.59	-15.35	-9.60	7.16	7.31	23.68	18.33	29.82	-1.99
Low	-35.13	-31.82	-24.54	-4.61	-7.37	11.68	10.57	20.11	-7.14

◆ HPRS Domestic Equity	Return	-18.76	-8.74	-6.41	4.11	-1.59	21.54	24.10	34.02	8.19
	Rank	33	45	56	80	87	81	25	54	3
■ PERS Domestic Equity	Return	-21.37	-10.15	-6.55	14.64	26.33	25.41	19.84	24.95	-3.12
	Rank	45	49	56	60	36	68	65	89	83
▼ OP&F Domestic Equity	Return	-19.81	-7.47	-2.95	17.41	17.57	28.81	22.54	31.38	-0.95
	Rank	37	42	48	55	52	51	44	67	64
● SERS Domestic Equity	Return	-21.66	-12.04	-6.87	21.81	22.96	29.59	21.48	36.94	0.61
	Rank	47	63	57	37	42	47	53	36	46
▲ STRS Domestic Equity	Return	-22.16	-10.90	-6.28	17.75	21.64	29.58	17.81	29.17	1.08
	Rank	57	51	55	54	44	47	78	77	41
W Wilshire 5000	Return	-20.86	-10.96	-10.87	23.56	23.45	31.28	21.20	36.47	-0.06
	Rank	41	51	78	31	41	38	55	40	54

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 11). When compared to equity portfolios in the broad equity universe (above), for the past 9 years OP&F and SERS have placed in the third quartile while HPRS, PERS, and STRS have placed in the fourth quartile. Over the past two years, all five of the funds have displayed near-median results and three of them (HPRS, PERS, and OP&F) have outperformed the Wilshire 5000 index. The exhibit on the right displays performance by twelve-month periods ending December 31. This exhibit highlights the fact that the long-term underperformance of the HPRS fund can be significantly explained by its bottom-quartile equity results in 1997, 1998, and 1999. Since then, results have rebounded nicely.

Ohio Retirement Study Council

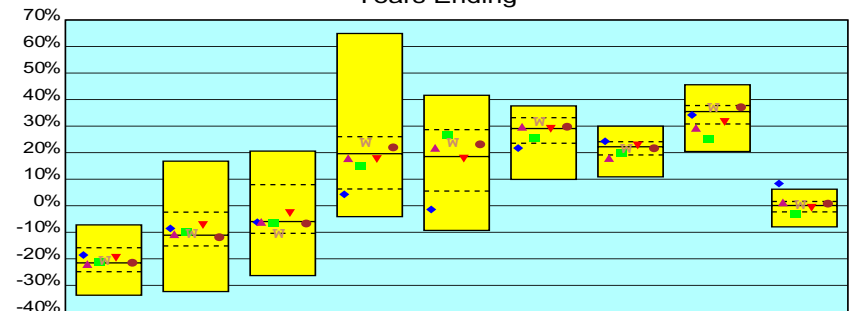
Cumulative Performance Comparison
Total Returns of Public Equity Portfolios
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	11.81	-5.12	-7.22	-0.68	5.10	7.97	7.54	10.74	12.34	13.56
1st Qt	8.45	-9.80	-15.83	-9.92	-5.13	0.10	1.90	6.39	8.56	10.45
Median	6.69	-11.31	-21.54	-16.61	-13.59	-4.57	-0.33	4.44	6.76	9.12
3rd Qt	3.37	-14.15	-24.86	-19.32	-16.72	-6.85	-1.28	2.36	4.94	7.08
Low	-1.98	-19.96	-33.72	-29.36	-26.37	-12.99	-6.55	-2.04	1.45	4.47

◆ HPRS Domestic Equity										
Return	9.38	-11.15	-18.76	-13.90	-11.47	-7.81	-6.60	-2.41	1.00	5.02
Rank	14	46	35	38	39	81	95	95	96	92
■ PERS Domestic Equity										
Return	8.07	-10.35	-21.37	-15.94	-12.92	-6.73	-0.89	3.07	5.32	6.34
Rank	35	38	48	45	45	71	70	65	65	87
▼ OP&F Domestic Equity										
Return	6.58	-12.17	-19.81	-13.86	-10.37	-4.11	-0.12	4.20	6.65	8.25
Rank	51	57	40	38	36	46	45	54	53	58
● SERS Domestic Equity										
Return	7.59	-11.50	-21.66	-16.99	-13.75	-5.97	-0.79	3.73	6.10	8.50
Rank	40	52	51	53	51	62	68	62	58	53
▲ STRS Domestic Equity										
Return	8.21	-10.78	-22.16	-16.72	-13.37	-6.47	-1.42	3.18	5.15	7.11
Rank	33	43	59	51	48	65	76	64	67	73
W Wilshire 5000										
Return	7.82	-10.30	-20.86	-16.06	-14.36	-6.14	-0.85	3.89	6.21	8.47
Rank	38	36	43	46	59	63	69	60	58	53

Consecutive Performance Comparison
Total Returns of Public Equity Portfolios
Years Ending



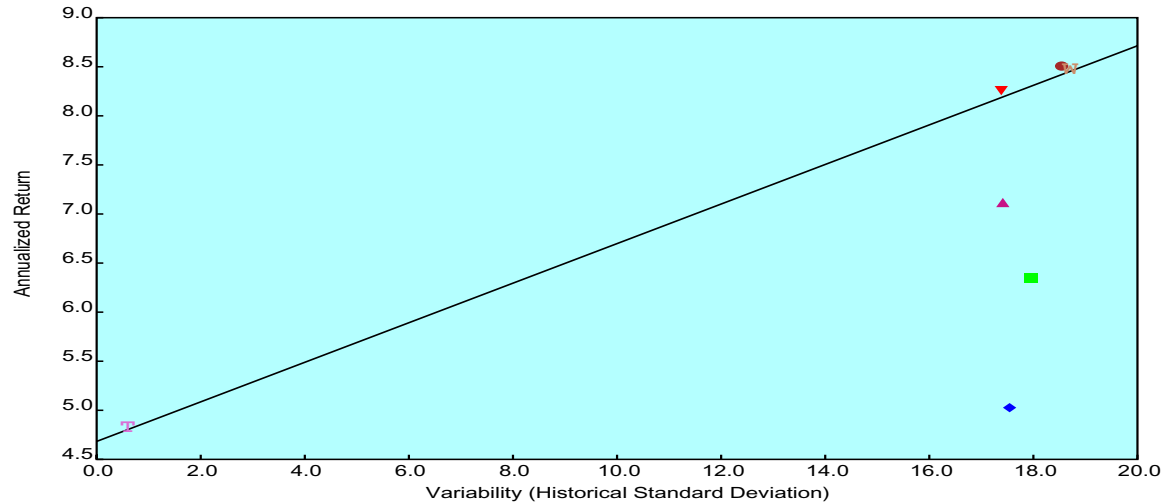
	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	-7.22	16.80	20.59	64.91	41.62	37.62	29.98	45.59	6.23
1st Qt	-15.83	-2.42	7.94	26.02	28.67	33.18	24.12	37.76	1.60
Median	-21.54	-11.10	-5.96	19.61	18.53	29.09	22.22	35.48	0.08
3rd Qt	-24.86	-15.15	-10.40	6.31	5.53	23.55	19.14	30.81	-2.32
Low	-33.72	-32.34	-26.32	-4.11	-9.30	9.92	10.88	20.43	-7.96

◆ HPRS Domestic Equity									
Return	-18.76	-8.74	-6.41	4.11	-1.59	21.54	24.10	34.02	8.19
Rank	35	41	51	79	85	80	25	58	2
■ PERS Domestic Equity									
Return	-21.37	-10.15	-6.55	14.64	26.33	25.41	19.84	24.95	-3.12
Rank	48	45	51	60	34	67	69	90	82
▼ OP&F Domestic Equity									
Return	-19.81	-7.47	-2.95	17.41	17.57	28.81	22.54	31.38	-0.95
Rank	40	36	43	55	52	52	47	71	61
● SERS Domestic Equity									
Return	-21.66	-12.04	-6.87	21.81	22.96	29.59	21.48	36.94	0.61
Rank	51	62	52	36	41	46	57	37	44
▲ STRS Domestic Equity									
Return	-22.16	-10.90	-6.28	17.75	21.64	29.58	17.81	29.17	1.08
Rank	59	49	50	54	43	46	81	79	38
W Wilshire 5000									
Return	-20.86	-10.96	-10.87	23.56	23.45	31.28	21.20	36.47	-0.06
Rank	43	49	76	28	40	37	59	41	51

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 35th percentile (HPRS) to the 59th percentile (STRS). Over the past five years, OP&F had the highest return and ranking (-0.12% and 45th percentile). With the exception of OP&F, the domestic equity results for four of the five systems fell short of the median portfolio for the five-year period. Three-year results are somewhat better with all of the funds at or above the median and ahead of the Wilshire 5000 Index.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/02



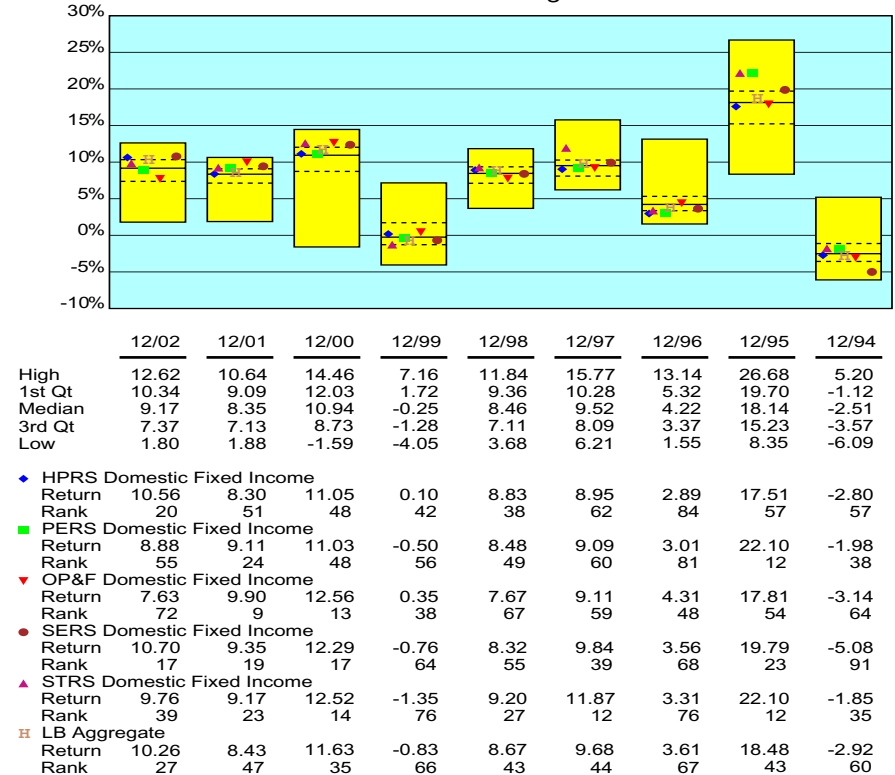
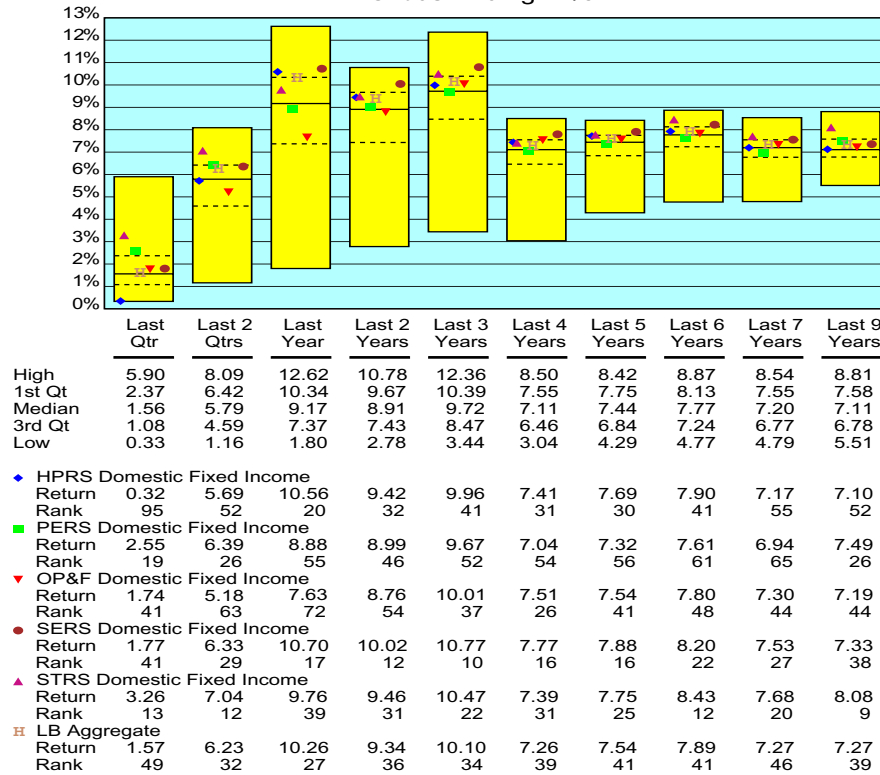
	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Equity	5.02	17.65	0.21	0.01
■ PERS Domestic Equity	6.34	18.07	1.53	0.08
▼ OP&F Domestic Equity	8.25	17.49	3.43	0.20
● SERS Domestic Equity	8.50	18.65	3.69	0.20
▲ STRS Domestic Equity	7.11	17.52	2.29	0.13
w Wilshire 5000	8.47	18.79	3.65	0.19
T 91-Day Treasury Bill	4.82	0.68	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 8, a Sharpe Ratio is calculated, providing a means of comparing returns adjusted for risk. SERS, OP&F, & STRS have enjoyed the best risk-adjusted equity results over the 9-year period. SERS and OP&F, in particular, had “above the line” risk-adjusted equity results and Sharpe Ratios greater than the broad-market Wilshire 5000 index.

Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of Fixed Income Portfolios
Periods Ending 12/02

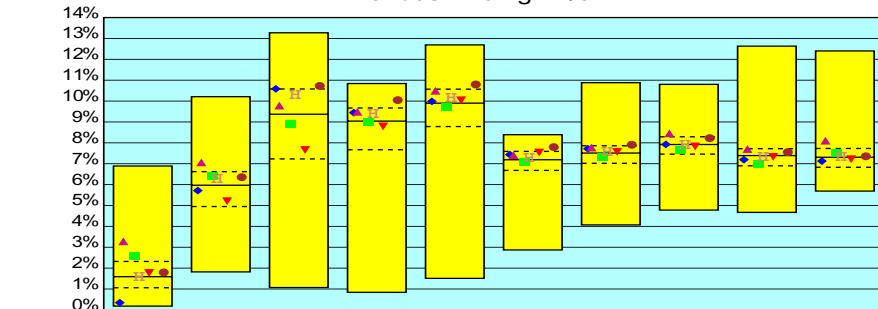
Consecutive Performance Comparison
Total Returns of Fixed Income Portfolios
Years Ending



The exhibits above, and those on the next two pages, compare the fixed income results of the five funds to that of a broad fixed income universe. Over the past nine years, four of the fund's fixed income results are above the median, with HPRS falling just short of median results. Over the last twelve months, the results have varied a bit. Both HPRS and SERS have placed in the top quartile, while PERS and STRS have placed near the median and OP&F has placed in the lower part of the third quartile. The graph on the right provides an analysis of the performance of twelve-month periods ending December 31st. The chart shows (for example) that STRS nine-year cumulative return was spurred by very strong performance in the calendar years 1995, 1997, and 2000.

Ohio Retirement Study Council

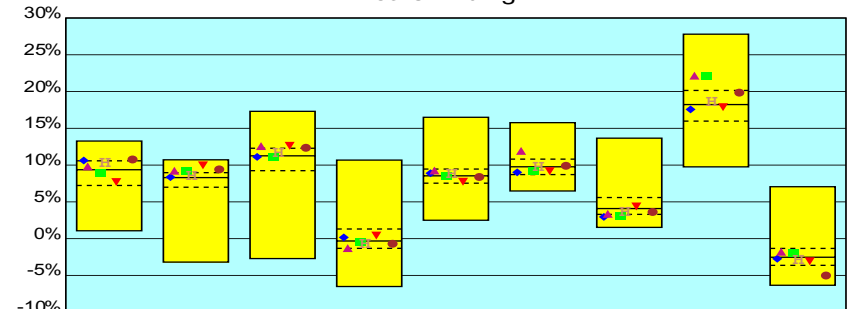
Cumulative Performance Comparison
Total Returns of Public Fixed Income Portfolios
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	6.89	10.21	13.27	10.84	12.69	8.39	10.88	10.80	12.63	12.40
1st Qt	2.32	6.62	10.58	9.67	10.57	7.59	7.86	8.29	7.72	7.73
Median	1.59	5.97	9.37	9.04	9.90	7.19	7.51	7.92	7.39	7.31
3rd Qt	1.06	4.95	7.23	7.67	8.78	6.68	7.02	7.46	6.90	6.83
Low	0.18	1.82	1.07	0.84	1.51	2.87	4.07	4.78	4.67	5.69

◆ HPRS Domestic Fixed Income										
Return	0.32	5.69	10.56	9.42	9.96	7.41	7.69	7.90	7.17	7.10
Rank	93	59	25	37	47	35	41	52	59	65
■ PERS Domestic Fixed Income										
Return	2.55	6.39	8.88	8.99	9.67	7.04	7.32	7.61	6.94	7.49
Rank	20	33	56	50	54	57	62	70	73	31
▼ OP&F Domestic Fixed Income										
Return	1.74	5.18	7.63	8.76	10.01	7.51	7.54	7.80	7.30	7.19
Rank	42	69	72	58	45	28	49	59	58	62
● SERS Domestic Fixed Income										
Return	1.77	6.33	10.70	10.02	10.77	7.77	7.88	8.20	7.53	7.33
Rank	40	37	22	15	19	17	24	30	37	45
▲ STRS Domestic Fixed Income										
Return	3.26	7.04	9.76	9.46	10.47	7.39	7.75	8.43	7.68	8.08
Rank	15	18	43	35	28	35	34	20	29	16
▣ LB Aggregate										
Return	1.57	6.23	10.26	9.34	10.10	7.26	7.54	7.89	7.27	7.27
Rank	51	40	33	39	43	45	49	52	58	55

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



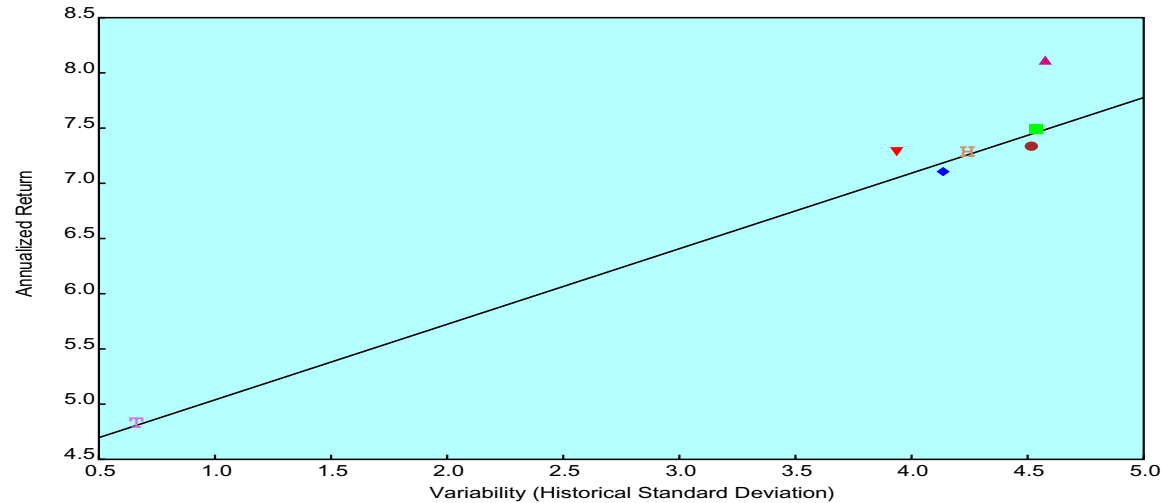
	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	13.27	10.72	17.31	10.68	16.50	15.77	13.66	27.80	7.06
1st Qt	10.58	8.97	12.29	1.31	9.46	10.81	5.59	20.15	-1.33
Median	9.37	8.30	11.26	-0.32	8.54	9.77	4.09	18.23	-2.53
3rd Qt	7.23	6.99	9.24	-1.32	7.54	8.71	3.30	15.98	-3.63
Low	1.07	-3.19	-2.71	-6.51	2.50	6.48	1.53	9.76	-6.34

◆ HPRS Domestic Fixed Income									
Return	10.56	8.30	11.05	0.10	8.83	8.95	2.89	17.51	-2.80
Rank	25	50	52	41	40	70	81	63	59
■ PERS Domestic Fixed Income									
Return	8.88	9.11	11.03	-0.50	8.48	9.09	3.01	22.10	-1.98
Rank	56	21	52	52	52	69	79	18	40
▼ OP&F Domestic Fixed Income									
Return	7.63	9.90	12.56	0.35	7.67	9.11	4.31	17.81	-3.14
Rank	72	10	20	36	73	68	44	59	65
● SERS Domestic Fixed Income									
Return	10.70	9.35	12.29	-0.76	8.32	9.84	3.56	19.79	-5.08
Rank	22	17	25	60	60	48	66	28	89
▲ STRS Domestic Fixed Income									
Return	9.76	9.17	12.52	-1.35	9.20	11.87	3.31	22.10	-1.85
Rank	43	19	21	76	29	16	74	18	33
▣ LB Aggregate									
Return	10.26	8.43	11.63	-0.83	8.67	9.68	3.61	18.48	-2.92
Rank	33	45	43	63	45	53	64	43	61

The exhibits above compare the fixed income results of the five funds to that of the fixed income returns of public funds in the Wilshire universe. The analysis is similar to page 13. STRS has had the best performance over the past nine years (8.11%), while HPRS has had the worst fixed income performance over the same measurement period (7.10%). Four of the funds (PERS, OP&F, SERS, & STRS) outperformed the LB Aggregate Bond Market index for the same period, while HPRS underperformed the LB Aggregate by only a small margin.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/02

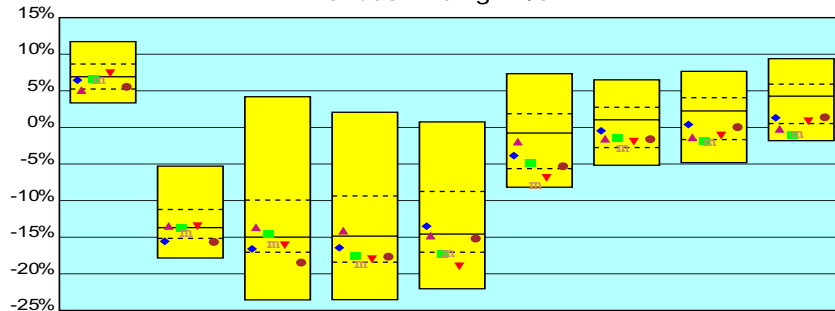


	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS Domestic Fixed Income	7.10	4.16	2.29	0.55
■ PERS Domestic Fixed Income	7.49	4.56	2.67	0.59
▼ OP&F Domestic Fixed Income	7.28	3.96	2.46	0.62
● SERS Domestic Fixed Income	7.33	4.54	2.51	0.55
▲ STRS Domestic Fixed Income	8.11	4.60	3.29	0.71
■ LB Aggregate	7.27	4.26	2.45	0.58
■ 91-Day Treasury Bill	4.82	0.68	0.00	0.00

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

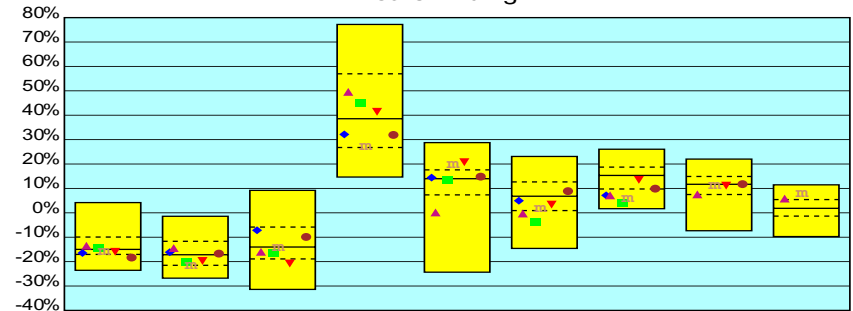
Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of International Equity Portfolios
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years
High	11.72	-5.29	4.19	2.07	0.75	7.34	6.50	7.66	9.39
1st Qt	8.66	-11.21	-9.93	-9.36	-8.75	1.87	2.75	4.06	5.91
Median	6.92	-13.69	-14.99	-14.85	-14.57	-0.77	1.04	2.25	4.27
3rd Qt	5.24	-15.16	-17.05	-18.41	-17.05	-5.63	-2.75	-1.66	0.53
Low	3.35	-17.84	-23.56	-23.53	-22.04	-8.17	-5.17	-4.81	-1.81
◆ HPRS Intn'l Equity									
Return	6.39	-15.63	-16.66	-16.50	-13.56	-3.92	-0.53	0.33	1.25
Rank	62	82	69	59	42	66	57	60	70
■ PERS Intn'l Equity									
Return	6.61	-13.75	-14.60	-17.62	-17.34	-4.90	-1.52	-1.93	-1.11
Rank	55	50	45	65	78	72	65	78	91
▼ OP&F Intn'l Equity									
Return	7.34	-13.57	-16.17	-18.07	-19.05	-6.97	-2.02	-1.18	0.77
Rank	45	48	65	69	88	79	70	70	70
● SERS Intn'l Equity									
Return	5.48	-15.71	-18.53	-17.72	-15.25	-5.37	-1.67	-0.02	1.32
Rank	73	82	85	66	58	74	67	62	68
▲ STRS Intn'l Equity									
Return	5.04	-13.52	-13.69	-14.16	-14.84	-1.99	-1.60	-1.41	-0.26
Rank	77	47	40	46	55	58	66	71	88
■ MSCI EAFE (Net)									
Return	6.45	-14.55	-15.94	-18.74	-17.24	-7.89	-2.89	-2.13	-1.00
Rank	60	61	62	79	78	90	76	81	91

Consecutive Performance Comparison
Total Returns of International Equity Portfolios
Years Ending

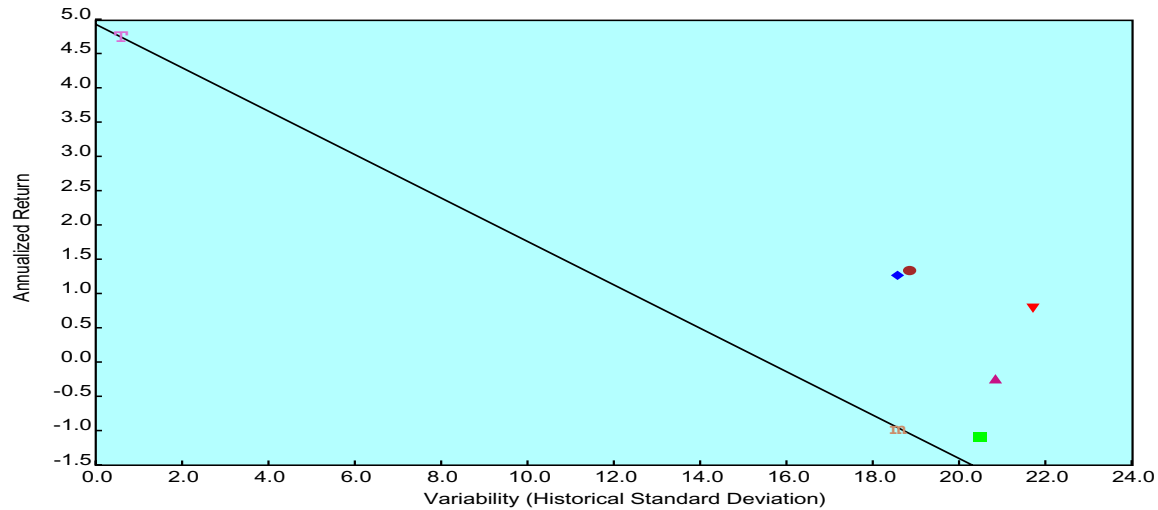


	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	4.19	-1.42	9.20	77.20	28.77	23.10	26.06	22.02	11.47
1st Qt	-9.93	-11.67	-5.84	56.97	17.60	12.66	18.73	14.90	5.43
Median	-14.99	-17.18	-14.02	38.56	13.98	6.80	15.32	11.69	1.84
3rd Qt	-17.05	-21.51	-18.90	26.77	7.35	0.92	9.77	7.50	-1.35
Low	-23.56	-26.78	-31.39	14.66	-24.33	-14.59	1.69	-7.34	-9.73
◆ HPRS Intn'l Equity									
Return	-16.66	-16.34	-7.35	31.94	14.24	4.76	6.96		
Rank	69	46	29	60	48	58	84		
■ PERS Intn'l Equity									
Return	-14.60	-20.54	-16.77	44.85	13.23	-3.94	3.94		
Rank	45	70	61	40	54	85	92		
▼ OP&F Intn'l Equity									
Return	-16.17	-19.93	-20.98	41.21	20.55	3.17	13.32	10.94	
Rank	65	66	80	44	13	63	61	60	
● SERS Intn'l Equity									
Return	-18.53	-16.91	-10.08	31.73	14.63	8.69	9.71	11.56	
Rank	85	49	39	60	46	43	75	52	
▲ STRS Intn'l Equity									
Return	-13.69	-14.63	-16.17	49.38	-0.03	-0.47	6.97	7.37	5.65
Rank	40	42	58	35	84	78	84	75	24
■ MSCI EAFE (Net)									
Return	-15.94	-21.45	-14.16	26.97	19.97	1.77	6.05	11.22	7.76
Rank	62	74	50	74	17	71	90	56	16

The exhibits on this page and the one on the next page analyze the International Equity results of the five funds. Nine-year comparisons are not meaningful, since two of the funds have not had allocations to this asset class for that length of time. For the seven-year period ending 12/31/2002, 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 -1.11% (PERS) to 1.32% (SERS). STRS had the best International Equity return for the most recent twelve months, followed by PERS.

Ohio Retirement Study Council

Quarterly Total Return Market Line Analysis
Periods from 12/95 to 12/02

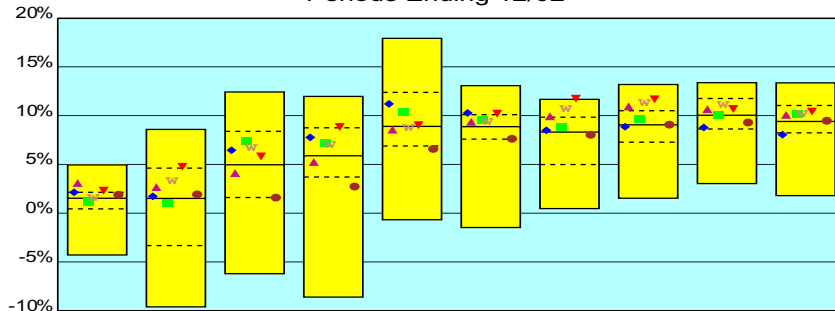


	Annualized Return	Variability	Reward
◆ HPRS Intn'l Equity	1.25	18.73	-3.46
■ PERS Intn'l Equity	-1.11	20.64	-5.82
▼ OP&F Intn'l Equity	0.77	21.87	-3.94
● SERS Intn'l Equity	1.32	19.01	-3.40
▲ STRS Intn'l Equity	-0.26	21.00	-4.97
■ MSCI EAFE (Net)	-1.00	18.72	-5.72
▴ 91-Day Treasury Bill	4.72	0.70	0.00

On a risk-return basis, for the 7-years that all five funds have international equity data, the results are quite disparate. The international equity returns of all of the funds fell short of the T-bill return for the period. In this negative environment for international investing, only PERS underperformed the generic EAFE international benchmark for the period. Since negative Sharpe Ratios are not meaningful, they are not included in this exhibit.

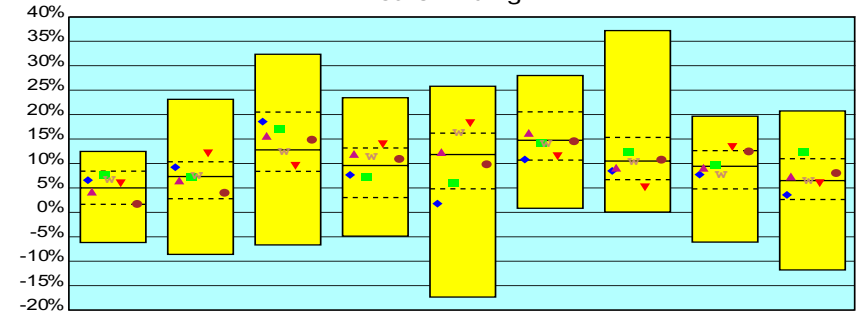
Ohio Retirement Study Council

Cumulative Performance Comparison
Total Returns of Real Estate Portfolios
Periods Ending 12/02



	Last Qtr	Last 2 Qtrs	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 9 Years
High	4.93	8.57	12.41	11.95	17.91	13.05	11.64	13.16	13.34	13.32
1st Qt	2.12	4.60	8.37	8.73	12.36	10.07	9.81	10.47	11.72	11.00
Median	1.51	1.49	4.94	5.86	8.87	8.84	8.28	9.02	10.00	9.36
3rd Qt	0.42	-3.35	1.58	3.68	6.86	7.56	4.95	7.24	8.59	8.19
Low	-4.31	-9.64	-6.24	-8.64	-0.71	-1.51	0.43	1.49	2.99	1.75
◆ HPRS Real Estate	Return 2.03	1.62	6.34	7.67	11.11	10.18	8.40	8.76	8.69	7.95
	Rank 25	48	40	34	28	21	49	60	72	76
■ PERS Real Estate	Return 1.07	0.91	7.35	7.14	10.26	9.44	8.69	9.56	9.92	10.12
	Rank 58	62	36	35	37	37	44	39	50	32
▼ OP&F Real Estate	Return 2.20	4.65	5.71	8.73	8.92	10.10	11.64	11.58	10.59	10.32
	Rank 24	23	44	25	49	23	5	16	35	32
● SERS Real Estate	Return 1.78	1.82	1.49	2.63	6.49	7.53	7.94	8.98	9.20	9.38
	Rank 37	47	78	80	76	79	55	51	58	48
▲ STRS Real Estate	Return 2.99	2.57	4.01	5.15	8.47	9.27	9.84	10.85	10.57	9.99
	Rank 15	38	62	59	53	42	23	23	35	34
Ⓜ NCREIF	Return 1.59	3.27	6.67	7.04	8.75	9.40	10.73	11.26	11.12	10.18
	Rank 49	36	40	35	53	37	15	22	30	32

Consecutive Performance Comparison
Total Returns of Real Estate Portfolios
Years Ending



	12/02	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	12.41	23.07	32.29	23.38	25.72	27.91	37.10	19.56	20.63
1st Qt	8.37	10.28	20.45	13.09	16.12	20.47	15.23	12.51	10.85
Median	4.94	7.26	12.71	9.50	11.74	14.65	10.39	9.31	6.37
3rd Qt	1.58	2.72	8.31	2.94	4.72	10.59	6.58	4.68	2.50
Low	-6.24	-8.68	-6.75	-4.96	-17.44	0.73	-0.05	-6.21	-11.92
◆ HPRS Real Estate	Return 6.34	9.00	18.34	7.43	1.55	10.59	8.25	7.50	3.34
	Rank 40	36	28	59	79	75	65	66	70
■ PERS Real Estate	Return 7.35	6.93	16.77	7.01	5.76	14.02	12.08	9.56	12.09
	Rank 36	53	33	61	73	53	38	47	17
▼ OP&F Real Estate	Return 5.71	11.84	9.29	13.71	18.02	11.26	4.89	13.14	5.74
	Rank 44	17	71	23	16	68	84	23	54
● SERS Real Estate	Return 1.49	3.78	14.64	10.71	9.61	14.33	10.55	12.24	7.82
	Rank 78	71	39	43	62	52	49	28	39
▲ STRS Real Estate	Return 4.01	6.30	15.43	11.73	12.11	16.04	8.91	8.90	7.12
	Rank 62	56	36	34	47	45	58	54	43
Ⓜ NCREIF	Return 6.67	7.41	12.25	11.36	16.24	13.91	10.31	7.54	6.39
	Rank 40	49	54	40	24	53	50	66	49

The exhibits above evaluate the real estate returns for the five funds. For the nine-year cumulative period only one of the funds (OP&F) had real estate performance that outperformed the NCREIF benchmark. Returns for the past twelve month period show PERS ahead of the other funds in this asset class with a 7.35% return vs. 6.67% for the NCREIF real estate index. We have not included a risk/return analysis for real estate. While institutional investors in real property compute and report quarterly returns, these returns are based on appraisals and are not appropriately compared with other investments which actually trade on a daily basis. An annualized quarterly standard deviation of returns for real estate is, in our judgement, a meaningless number.

Ohio Retirement Study Council

Comparative Asset Allocation and Custom Benchmark Analysis

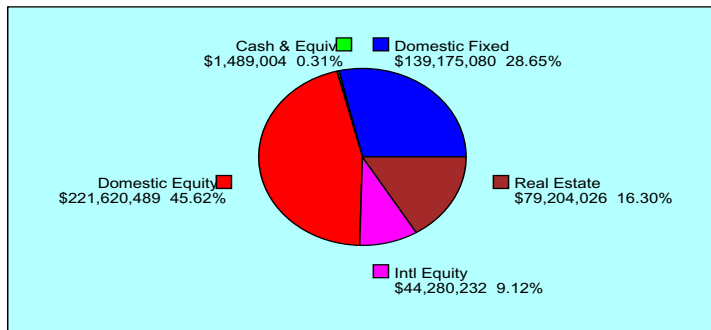
Recognizing the importance of asset allocation in the determination of long-term investment results, this section of the report is a departure from the rest of the document. Instead of comparing the funds to one another, we now provide a comparison of each fund's total return to its own asset allocation policy benchmark. The inclusion of this fund-by-fund analysis is an acknowledgement of the importance of comparing each fund to its own set of objectives. While it is valid to look at each of the state pension funds in relation to each other and in comparison to a universe of other funds, conclusions must not be drawn without reference to the unique nature of each fund. It is not sufficient to look at page 5 of the report and rank the funds in order of their long-term returns. For example, part of the difference between the 7.31% compound return for SERS over the measurement period (1/1/94 – 12/31/02) and the 5.34% compound return for PERS over the same period can be explained by the fact that the policy benchmark for SERS had a return of 7.51% (p. 38) for the period compared to the PERS policy benchmark return of 6.03% (p. 28). In the preparation of this section of the report, each fund office was contacted to confirm that the custom policy benchmark was appropriate.

Several academic studies have concluded that more than 90% of the variability in returns on investment performance is attributable to the asset allocation between fixed income investments, equity investments, cash equivalents, and other investments. Ten percent or less of a portfolio's performance can be attributed to relative performance within a given asset class due to superior security selection and/or market timing. Consequently, we focus a significant amount of attention on performance relative to the asset allocation of each of the funds.

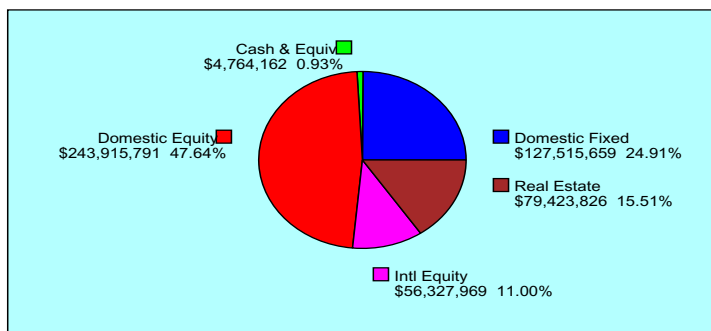
Highway Patrol Retirement System

Asset Allocation
HPRS

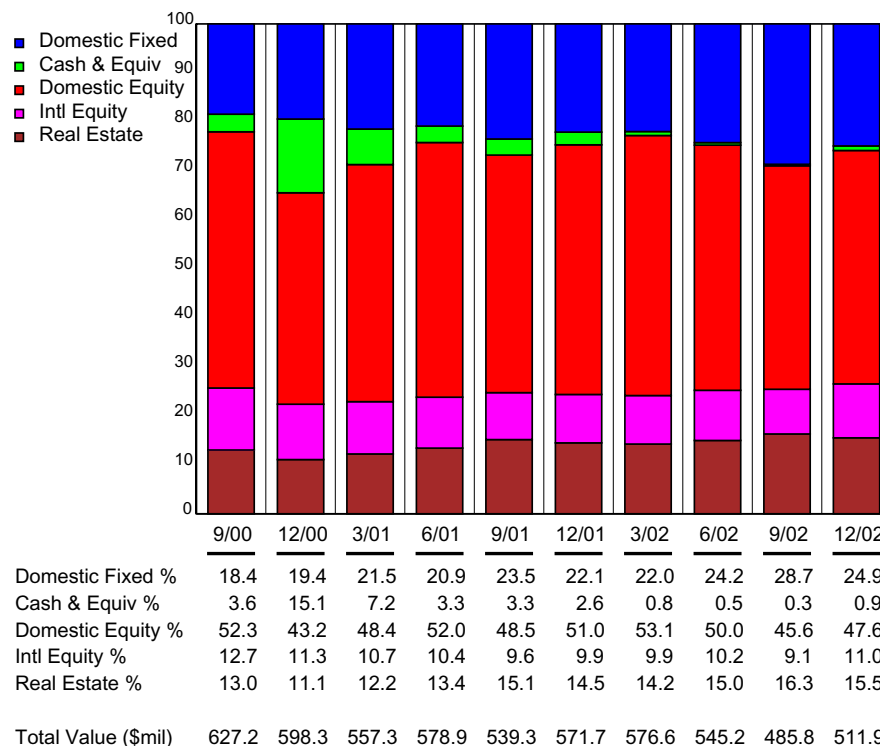
September 30, 2002 \$485,768,831



December 31, 2002 \$511,947,407



Asset Allocation
HPRS



This is the first page devoted to the analysis of the Ohio Highway Patrol Retirement System's asset allocation and its performance compared to its asset allocation policy benchmark. The chart on the left displays the fund's asset allocation over the last two quarters of 2002. The chart on the right tracks the quarterly asset allocation of the fund over the last ten periods.

Highway Patrol Retirement System

Custom Benchmark Specification

HPRS

Quarter Ending 12/31/02

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	

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

Highway Patrol Retirement System

Performance Overview

HPRS

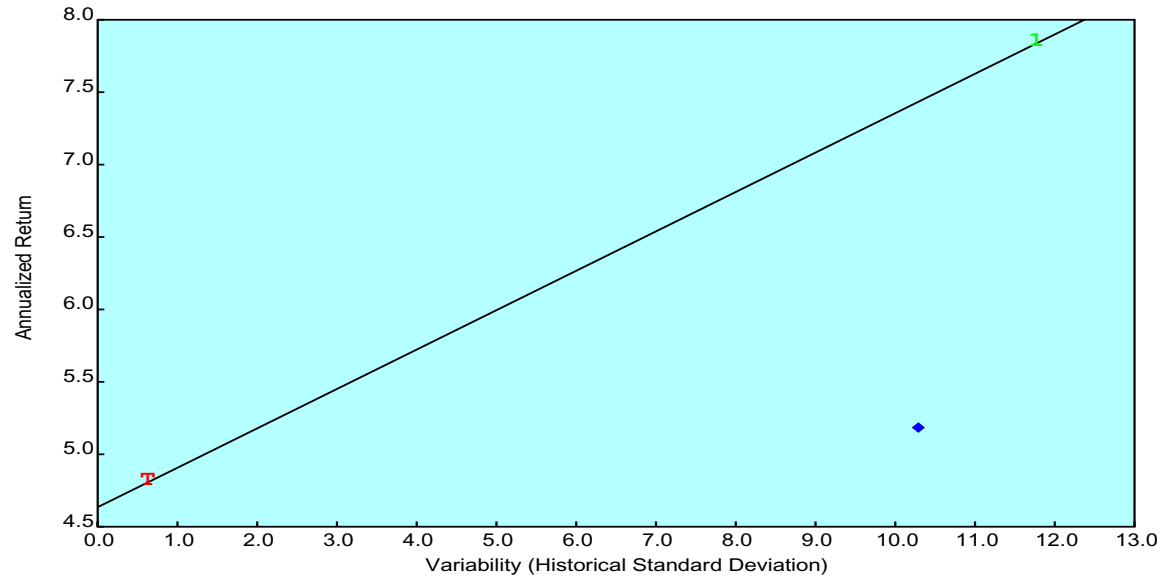
Returns for Periods Ending December 31, 2002

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	5.22	-5.63	-9.61	-8.42	-3.89	-0.40	5.18
Policy Index Return	5.79	-6.45	-12.50	-11.58	-5.99	2.56	7.85
Domestic Equity Return	9.38	-11.15	-20.04	-18.76	-11.47	-6.60	5.02
Equity Segment Median Return	7.34	-11.45	-22.32	-22.04	-11.91	0.10	9.54
Wilshire 5000	7.82	-10.30	-21.62	-20.86	-14.36	-0.85	8.47
Int'l Equity Return	6.39	-15.63	-17.47	-16.66	-13.56	-0.53	
Int'l Equity Segment Median Return	6.85	-14.48	-16.52	-15.56	-15.09	1.27	
MSCI EAFE (Net)	6.45	-14.55	-16.36	-15.94	-17.24	-2.89	1.24
Domestic Fixed Return	0.32	5.69	10.24	10.56	9.96	7.69	7.10
Fixed Income Segment Median Return	1.51	6.01	9.51	9.70	9.92	7.53	7.23
LB Aggregate	1.57	6.23	10.15	10.26	10.10	7.54	7.27
Cash Return	0.49	1.06	1.83	2.49	4.26	4.55	
Real Estate Return	2.03	1.62	4.41	6.34	11.11	8.40	7.95
NCREIF	1.59	3.27	5.02	6.67	8.75	10.73	10.18

Over the entire observed period, the fund's total return is trailing its policy index by over 2.5% annually. This is due almost entirely to its domestic equity returns, which lagged the broad market as defined by the Wilshire 5000 by 3.4% annually. The most recent twelve months, however, show that HPRS has outperformed its policy index by a substantial margin.

Highway Patrol Retirement System

Quarterly Total Return Market Line Analysis
Periods from 12/93 to 12/02



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	5.18	10.36	0.36	0.03
┆ HPRS Policy Index	7.85	11.82	3.04	0.26
┆ 91-Day Treasury Bill	4.82	0.68	0.00	0.00

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

Highway Patrol Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	32.71%	S & P 500	40%	-7.29%
Small/Mid Cap Equi	17.31%	Russell 2500	20%	-2.69%
Fixed Income	24.23%	LB Aggregate	20%	4.23%
Intl. Equity	10.24%	MSCI EAFE (Net)	10%	0.24%
Real Estate	14.97%	NCREIF	10%	4.97%
Short Term	0.52%		0%	0.52%

December 31, 2002

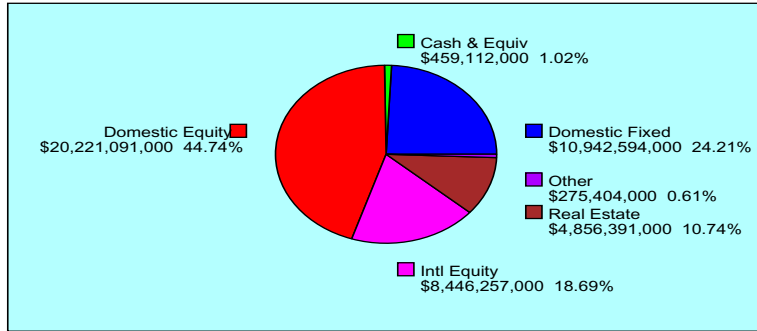
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	31.09%	S & P 500	40%	-8.91%
Small/Mid Cap Equi	16.55%	Russell 2500	20%	-3.45%
Fixed Income	24.91%	LB Aggregate	20%	4.91%
Intl. Equity	11.00%	MSCI EAFE (Net)	10%	1.00%
Real Estate	15.51%	NCREIF	10%	5.51%
Short Term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

Over the past two quarters, the HPRS fund has been underweight in domestic equity and overweight in fixed income and real estate. As of December 31, the fund held a 1% cash position.

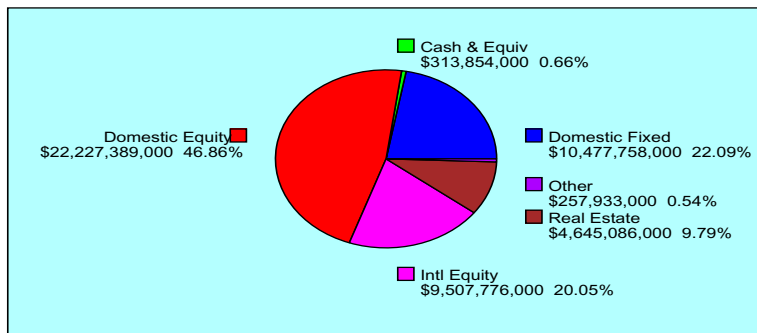
Public Employees Retirement System

Asset Allocation
PERS

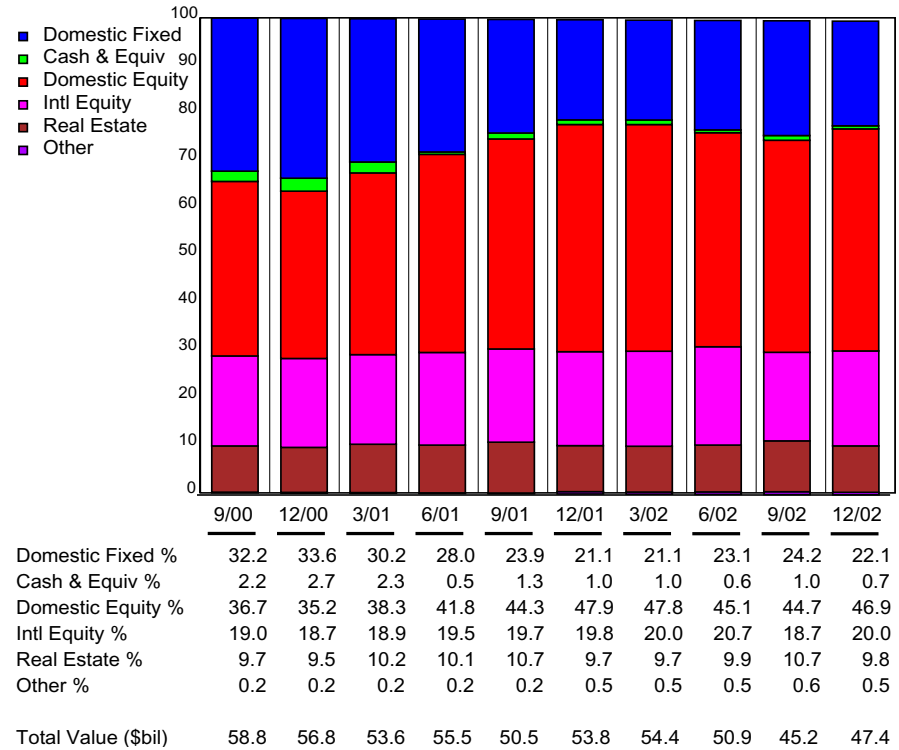
September 30, 2002 \$45,200,849,000



December 31, 2002 \$47,429,796,000



Asset Allocation
PERS



This is page devoted to the analysis of the Ohio Public Employees Retirement System's asset allocation and its performance compared to its asset allocation policy benchmark. The chart on the left displays the fund's asset allocation over the last two quarters of 2002. The chart on the right tracks the quarterly asset allocation of the fund over the last ten periods.

Public Employees Retirement System

Custom Benchmark Specification

PERS

Quarter Ending 12/31/02

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

Custom Benchmark Specification

PERS

Quarter Ending 12/31/02

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

The charts above and on the following page track PERS asset allocation policy index over the last 9 years. The current policy index is located on page 27 in the chart on the right.

Public Employees Retirement System

Custom Benchmark Specification

PERS

Quarter Ending 12/31/02

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

Custom Benchmark Specification

PERS

Quarter Ending 12/31/02

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
			1.80	NAREIT
			1.80	Giliberto-Levy Mortgage
0.60	91-Day Treasury Bill			
0.40	Standard & Poors 500			

Public Employees Retirement System

Performance Overview

PERS

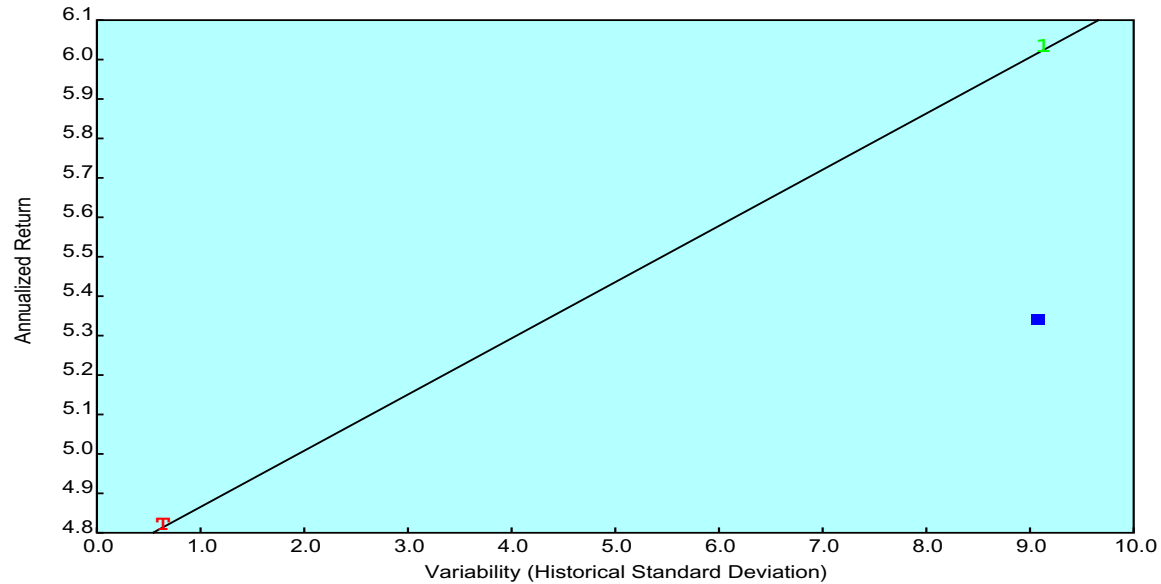
Returns for Periods Ending December 31, 2002

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	5.53	-6.04	-11.83	-10.77	-5.48	1.61	5.34
Policy Index Return	5.70	-6.28	-11.81	-10.76	-5.16	2.65	6.03
Domestic Equity Return	8.07	-10.35	-22.05	-21.37	-12.92	-0.89	6.35
Equity Segment Median Return	7.34	-11.45	-22.32	-22.04	-11.91	0.10	9.54
Wilshire 5000	7.82	-10.30	-21.62	-20.86	-14.36	-0.85	8.47
Int'l Equity Return	6.61	-13.75	-16.47	-14.60	-17.34	-1.52	
Int'l Equity Segment Median Return	6.85	-14.48	-16.52	-15.56	-15.09	1.27	
MSCI EAFE (Net)	6.45	-14.55	-16.36	-15.94	-17.24	-2.89	1.24
Domestic Fixed Return	2.55	6.39	8.65	8.88	9.67	7.32	7.49
Fixed Income Segment Median Return	1.51	6.01	9.51	9.70	9.92	7.53	7.23
LB Aggregate	1.57	6.23	10.15	10.26	10.10	7.54	7.27
Cash Return	0.37	0.82	1.27	1.70	4.03	4.60	4.95
Real Estate Return	1.07	0.91	3.89	7.35	10.26	8.69	10.12
NCREIF	1.59	3.27	5.02	6.67	8.75	10.73	10.18
Other Return	-9.20	-8.81	-2.79	-10.18			

Over the past 9-year period, PERS has trailed its policy index by about 0.7% annually. During the same period, PERS' US Equity results trailed the broad market Wilshire 5000 index by over 2% annually. Over the past twelve months, the fund has essentially matched the policy index. Underperformance from domestic equity and fixed income have been balanced by stronger performance from international equity and real estate.

Public Employees Retirement System

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/02



	Annualized Return	Variability	Reward	Sharpe Ratio
■ PERS	5.34	9.13	0.52	0.06
1 PERS Policy Index	6.03	9.17	1.21	0.13
T 91-Day Treasury Bill	4.82	0.68	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 a real and risk-adjusted basis, the PERS total fund return underperformed the policy index over the 9- year period, with risk similar to the custom benchmark.

Public Employees Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	45.15%	S&P 1500	47.0%	-1.85%
Fixed Income	23.08%	SB Broad Inv Grade	23.0%	0.08%
Intl. Equity	20.74%	MSCI ACWI	20.0%	0.74%
Real Estate	9.89%	PERS Custom Index	9.0%	0.89%
Venture Capital	0.53%	S&P 500	0.6%	-0.07%
Short Term	0.61%	3 Month T-Bill	0.4%	0.21%

December 31, 2002

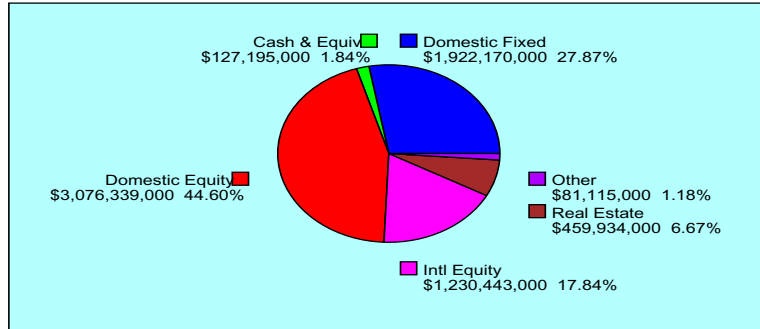
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.90%	S&P 1500	47.0%	-0.10%
Fixed Income	22.10%	SB Broad Inv Grade	23.0%	-0.90%
Intl. Equity	20.00%	MSCI ACWI	20.0%	0.00%
Real Estate	9.80%	PERS Custom Index	9.0%	0.80%
Venture Capital	0.50%	S&P 500	0.6%	-0.10%
Short Term	0.70%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

Over the past two quarters, the PERS fund has not deviated from its target asset allocation strategy.

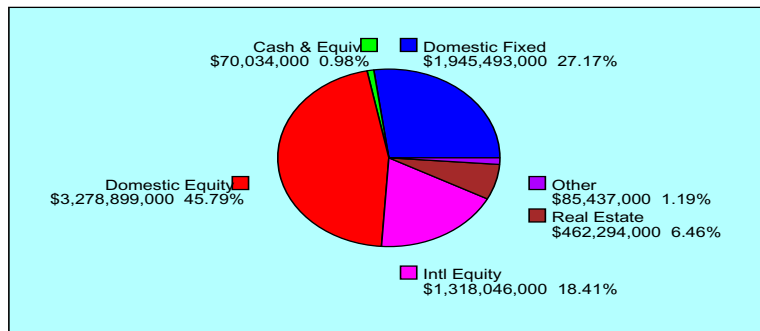
Police & Fire Pension Fund

Asset Allocation
OP&F

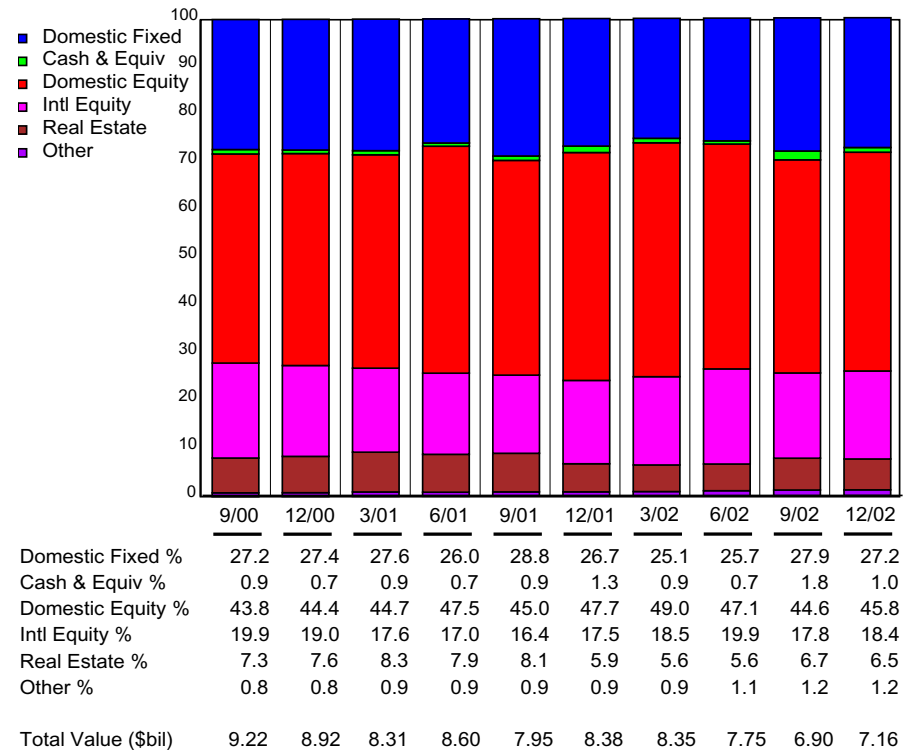
September 30, 2002 \$6,897,196,000



December 31, 2002 \$7,160,203,000



Asset Allocation
OP&F



This is the first page devoted to the analysis of the Ohio Police & Fire Pension Fund's asset allocation and its performance compared to its asset allocation policy benchmark. The chart on the left displays the fund's asset allocation over the last two quarters of 2002. The chart on the right tracks the quarterly asset allocation of the fund over the last ten periods.

Police & Fire Pension Fund

Custom Benchmark Specification
Police and Fire
Quarter Ending 12/31/02

Custom Benchmark Specification
Police and Fire
Quarter Ending 12/31/02

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

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

OP&F's custom policy index is listed above. The chart tracks the fund's change in asset allocation strategy over the past 9 years. The current policy index is listed in the table on the right.

Police & Fire Pension Fund

Performance Overview OP&F

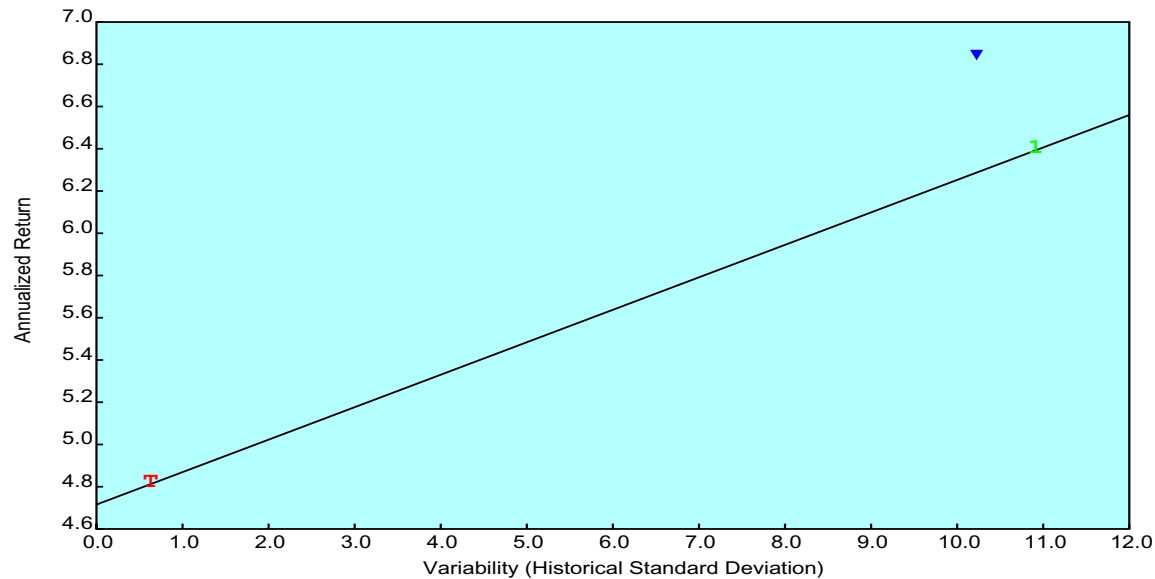
Returns for Periods Ending December 31, 2002

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr 94
Total Return	4.54	-5.98	-11.26	-9.89	-5.03	2.10	6.84
Policy Index Return	5.71	-6.14	-11.73	-10.82	-6.80	1.69	6.40
Domestic Equity Return	6.58	-12.17	-21.57	-19.81	-10.37	-0.12	8.25
Equity Segment Median Return	7.34	-11.45	-22.32	-22.04	-11.91	0.10	9.54
Wilshire 5000	7.82	-10.30	-21.62	-20.86	-14.36	-0.85	8.47
Int'l Equity Return	7.34	-13.57	-17.71	-16.17	-19.05	-2.02	
Int'l Equity Segment Median Return	6.85	-14.48	-16.52	-15.56	-15.09	1.27	
MSCI EAFE (Net)	6.45	-14.55	-16.36	-15.94	-17.24	-2.89	1.24
Domestic Fixed Return	1.74	5.18	6.82	7.63	10.01	7.54	7.23
Fixed Income Segment Median Return	1.51	6.01	9.51	9.70	9.92	7.53	7.23
LB Aggregate	1.57	6.23	10.15	10.26	10.10	7.54	7.27
Cash Return	0.43	0.88	1.36	1.78	4.11	4.59	
Real Estate Return	2.20	4.65	6.78	5.71	8.92	11.64	10.32
NCREIF	1.59	3.27	5.02	6.67	8.75	10.73	10.18
Other Return	-3.70	-12.58	-14.64	-21.62			

The chart above is a performance overview for the total fund and all of its asset classes over the past 9 years. Over the entire observed period, the fund's total return has outperformed its policy index by 0.44% annually. The most recent twelve months show that OP&F has outperformed its policy index by almost 1%. The domestic equity return has outperformed the broad market Wilshire 5000 Index by over 1% in the last twelve months.

Police & Fire Pension Fund

Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/02



	Annualized Return	Variability	Reward	Sharpe Ratio
▼ OP&F	6.84	10.29	2.02	0.20
1 OP&F Policy Index	6.40	10.96	1.59	0.14
T 91-Day Treasury Bill	4.82	0.68	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 a real and risk-adjusted basis over the last 9 years.

Police & Fire Pension Fund

Asset Allocation Actual vs. Benchmark June 30, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.30%	Wilshire 5000	48%	-1.70%
Fixed Income	19.60%	Lehman Aggregate	18%	1.60%
High Yield Bonds	5.70%	CSFB High Yield	5%	0.70%
Intl. Equity Comp.	19.60%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	-0.40%
Real Estate	7.10%	NCREIF	8%	-0.90%
Venture Capital	1.00%	S&P 500 + 5%	1%	0.00%
Short Term	0.70%	3 Month T-Bill	0%	0.70%

December 31, 2002

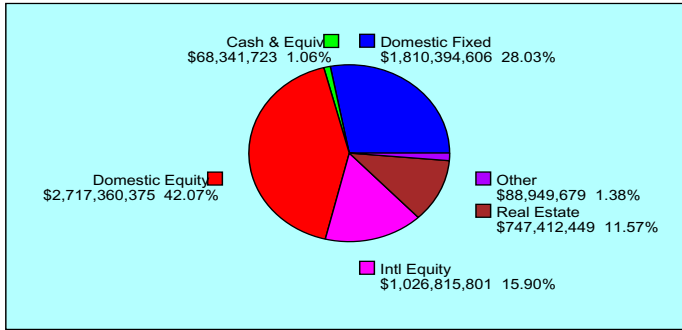
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	45.00%	Wilshire 5000	48%	-3.00%
Fixed Income	20.20%	Lehman Aggregate	18%	2.20%
High Yield Bonds	6.50%	CSFB High Yield	5%	1.50%
Intl. Equity Comp.	18.10%	MSCI EAFE (Net) -17%, MSCI Em Mkts Free - 3%	20%	-1.90%
Real Estate	8.00%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

Over the past two quarters, the OP&F fund has been somewhat overweight in fixed income and underweight in domestic and international equity.

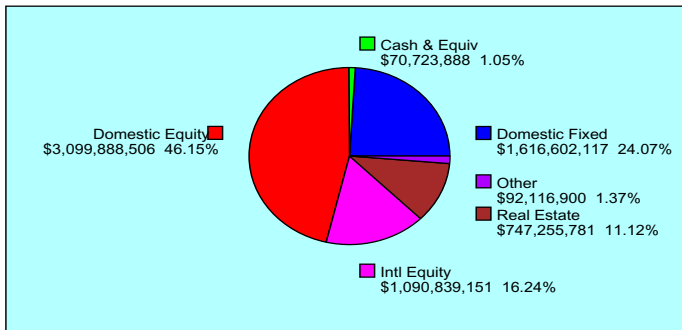
School Employees Retirement System

Asset Allocation
SERS

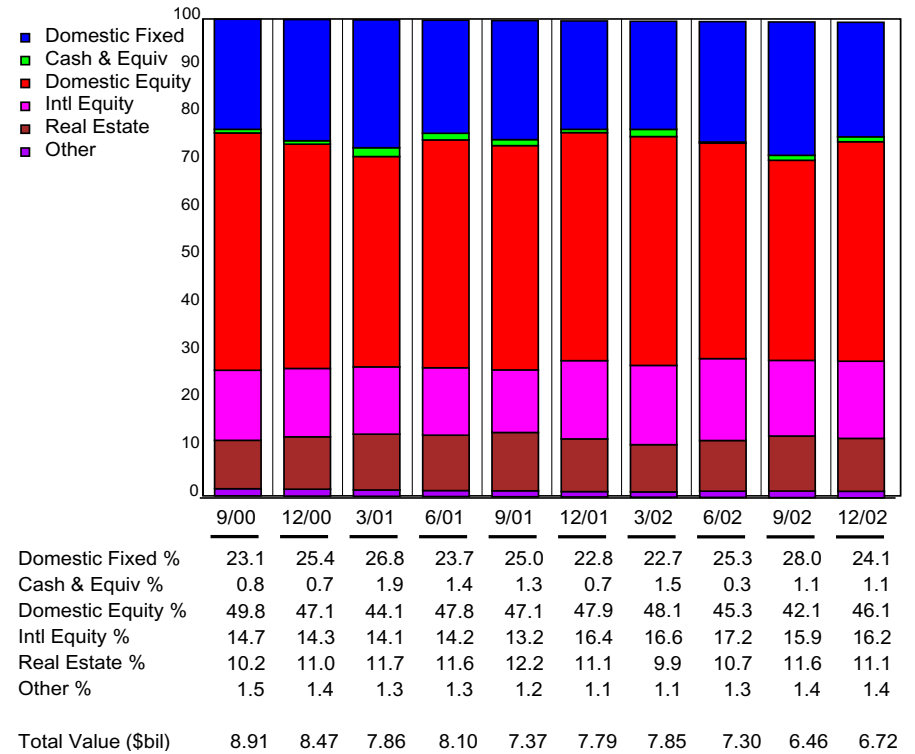
September 30, 2002 \$6,459,274,633



December 31, 2002 \$6,717,426,343



Asset Allocation
SERS



This is the first page devoted to the analysis of the Ohio School Employees Retirement System's asset allocation and its performance compared to its asset allocation policy benchmark. The chart on the left displays the fund's asset allocation over the last two quarters of 2002. The chart on the right tracks the quarterly asset allocation of the fund over the last ten periods.

School Employees Retirement System

Custom Benchmark Specification
SERS
Quarter Ending 12/31/02

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

Custom Benchmark Specification
SERS
Quarter Ending 12/31/02

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	1-Mar	Jun-01	48.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI ACWI Free ex US
			10.00	NCREIF
			2.00	Salomon 30-Day CD
	Sep-01	Jun-02	47.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI ACWI Free ex US
			10.00	NCREIF
			2.00	S&P 500 +3%
	Sep-02	Dec-02	46.00	Russell 3000
			23.00	LB Aggregate
			16.00	MSCI ACWI Free ex US
			10.00	NCREIF
			3.00	S&P 500 +3%
		2.00	Salomon 30-Day CD	

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

School Employees Retirement System

Performance Overview

SERS

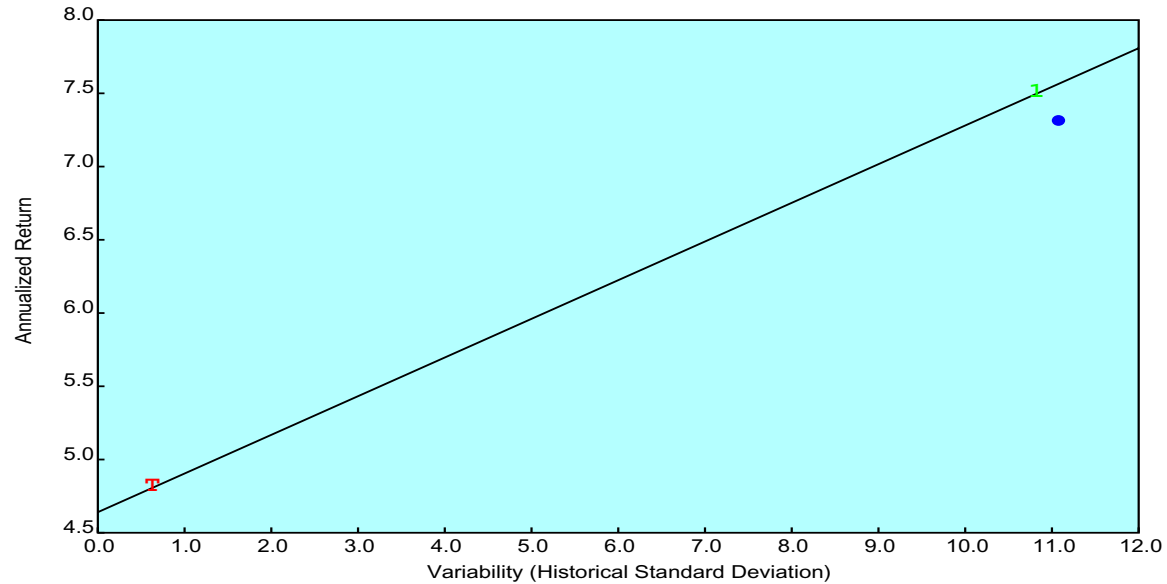
Returns for Periods Ending December 31, 2002

	<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	5.06	-6.65	-12.41	-11.58	-6.01	2.39	7.31
Policy Index Return	4.60	-6.51	-12.52	-11.70	-6.31	2.34	7.51
Domestic Equity Return	7.59	-11.50	-22.59	-21.66	-13.75	-0.79	8.50
Equity Segment Median Return	7.34	-11.45	-22.32	-22.04	-11.91	0.10	9.54
Wilshire 5000	7.82	-10.30	-21.62	-20.86	-14.36	-0.85	8.47
Int'l Equity Return	5.48	-15.71	-20.79	-18.53	-15.25	-1.67	
Int'l Equity Segment Median Return	6.85	-14.48	-16.52	-15.56	-15.09	1.27	
MSCI EAFE (Net)	6.45	-14.55	-16.36	-15.94	-17.24	-2.89	1.24
Domestic Fixed Return	1.77	6.33	10.17	10.70	10.77	7.88	7.33
Fixed Income Segment Median Return	1.51	6.01	9.51	9.70	9.92	7.53	7.23
LB Aggregate	1.57	6.23	10.15	10.26	10.10	7.54	7.27
Cash Return	0.35	0.72	1.14	0.94	5.15	5.13	5.22
Real Estate Return	1.78	1.82	2.83	1.49	6.49	7.94	9.38
NCREIF	1.59	3.27	5.02	6.67	8.75	10.73	10.18
Other Return	-4.90	-9.85	-15.07	-20.00			

The chart above is a performance overview for the total fund and all of its asset classes over the past 9 years. Over the entire observed period, the fund's total return is trailing its policy index by 0.20% annually. The most recent twelve months show that SERS has outperformed its policy index by 0.12%.

School Employees Retirement System

Quarterly Total Return Market Line Analysis
 Periods from 12/93 to 12/02



	Annualized Return	Variability	Reward	Sharpe Ratio
● SERS	7.31	11.14	2.49	0.22
1 SERS Policy Index	7.51	10.87	2.69	0.25
T 91-Day Treasury Bill	4.82	0.68	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 a real and risk-adjusted basis over the last 9 years.

School Employees Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	45.27%	Russell 3000	47%	-1.73%
Fixed Income	25.30%	LB Aggregate	23%	2.30%
Intl. Equity	17.21%	MSCI ACWI ex US	16%	1.21%
Real Estate	10.65%	NCREIF	10%	0.65%
Venture Capital	1.31%	S&P 500 + 3%	2%	-0.69%
Short Term	0.26%	Salomon 30 Day CD	2%	-1.74%

December 31, 2002

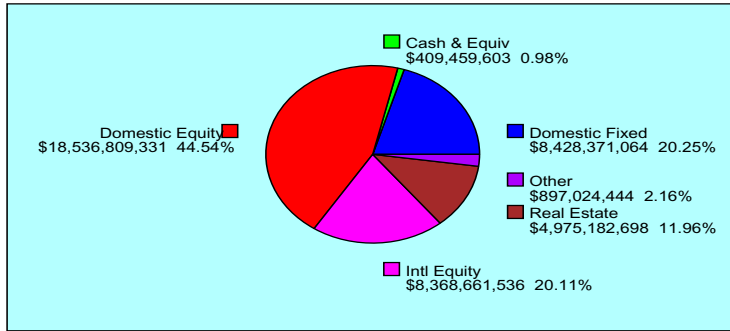
Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	46.15%	Russell 3000	47%	-0.85%
Fixed Income	24.07%	LB Aggregate	23%	1.07%
Intl. Equity	16.24%	MSCI ACWI ex US	16%	0.24%
Real Estate	11.12%	NCREIF	10%	1.12%
Venture Capital	1.37%	S&P 500 + 3%	2%	-0.63%
Short Term	1.05%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

Over the past two quarters, the SERS fund has not deviated substantially from its policy index.

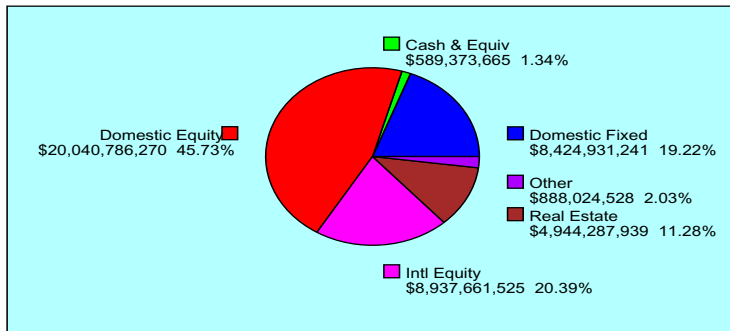
State Teachers Retirement System

Asset Allocation
STRS

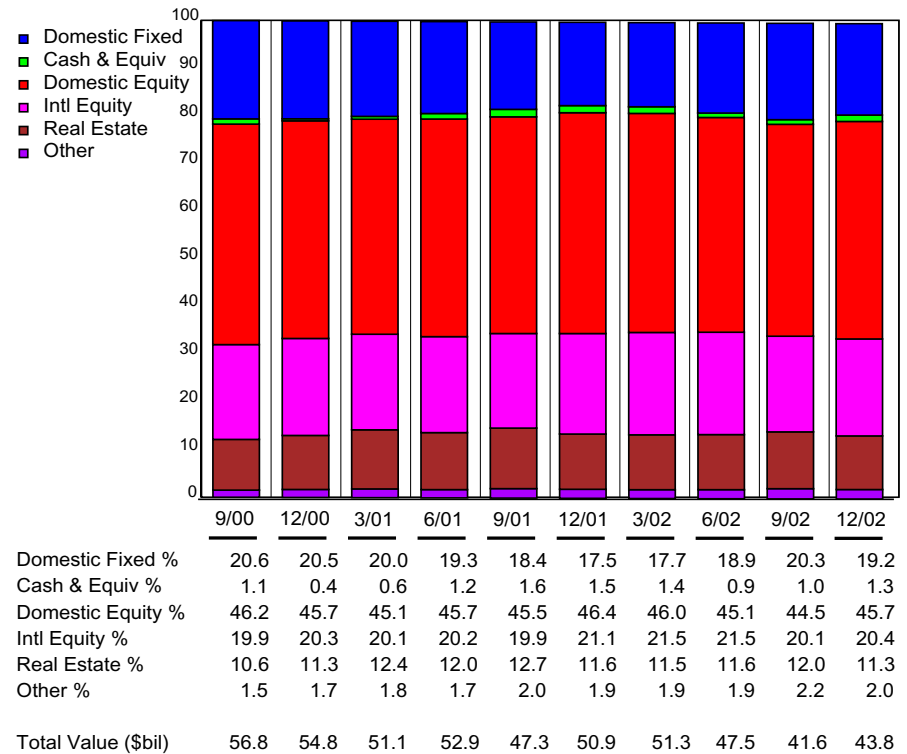
September 30, 2002 \$41,615,508,676



December 31, 2002 \$43,825,065,168



Asset Allocation
STRS



This is the first page devoted to the analysis of the Ohio State Teachers Retirement System's asset allocation and its performance compared to its asset allocation policy benchmark. The chart on the left displays the fund's asset allocation over the last two quarters of 2002. The chart on the right tracks the quarterly asset allocation of the fund over the last ten periods.

State Teachers Retirement System

Custom Benchmark Specification
STRS
 Quarter Ending 12/31/02

Custom Benchmark Specification
STRS
 Quarter Ending 12/31/02

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	Standard & Poors 500
			24.00	LB Aggregate
			12.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
	8.00	MSCI Em Mkts Free (Gross)		
	2.00	91-Day Treasury Bill		
	Dec-98	Sep-00	45.00	S&P 1500
			24.00	LB Aggregate
			14.00	MSCI EAFE 50% Hedged
			9.00	STRS NCREIF Hybrid
6.00	MSCI Em Mkts Free (Gross)			
2.00	91-Day Treasury Bill			
Dec-00	Jun-02	45.00	S&P 1500	
		25.00	Lehman Universal	
		15.00	MSCI EAFE 50% Hedged	
		9.00	STRS NCREIF Hybrid	
5.00	MSCI Em Mkts Free (Gross)			
1.00	91-Day Treasury Bill			

STRS' custom policy index is listed above and on page 43. The chart tracks the fund's change in asset allocation strategy over the past 9 years.

State Teachers Retirement System

Custom Benchmark Specification

STRS

Quarter Ending 12/31/02

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

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

State Teachers Retirement System

Performance Overview STRS

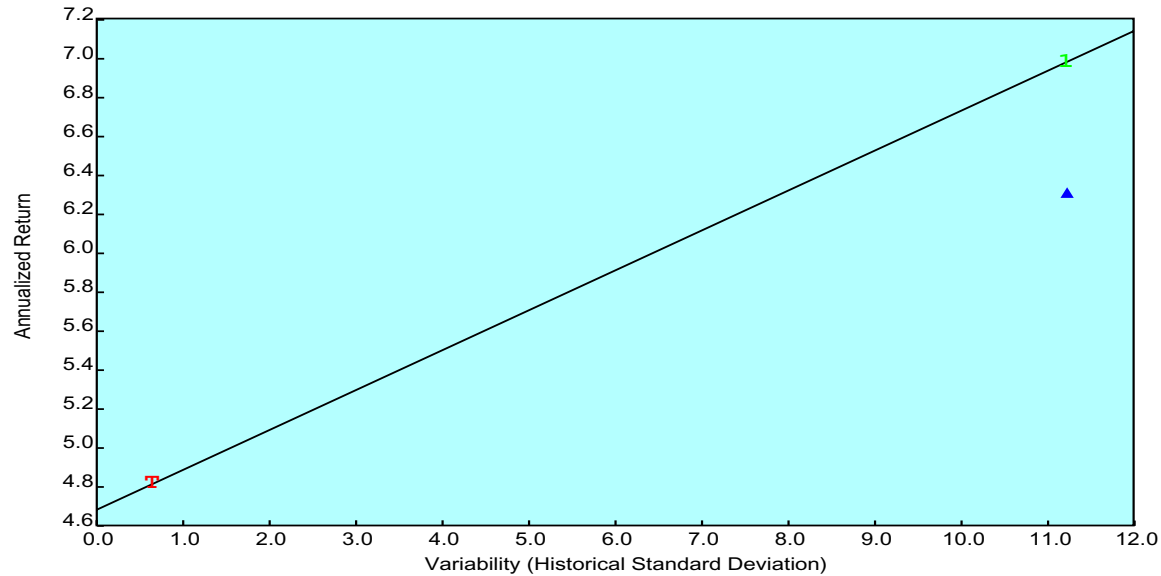
Returns for Periods Ending December 31, 2002

	Last Quarter	Last 2 Quarters	Last 3 Quarters	Last Year	Last 3 Years	Last 5 Years	Since 1st Qtr
Total Return	5.54	-6.45	-12.74	-11.58	-6.64	1.80	6.31
Policy Index Return	5.29	-6.28	-12.34	-11.04	-6.29	2.26	6.98
Domestic Equity Return	8.21	-10.78	-22.65	-22.16	-13.37	-1.42	7.11
Equity Segment Median Return	7.34	-11.45	-22.32	-22.04	-11.91	0.10	9.54
Wilshire 5000	7.82	-10.30	-21.62	-20.86	-14.36	-0.85	8.47
Int'l Equity Return	5.04	-13.52	-17.67	-13.69	-14.84	-1.60	1.21
Int'l Equity Segment Median Return	6.85	-14.48	-16.52	-15.56	-15.09	1.27	5.37
MSCI EAFE (Net)	6.45	-14.55	-16.36	-15.94	-17.24	-2.89	1.24
Domestic Fixed Return	3.26	7.04	9.28	9.76	10.47	7.75	8.08
Fixed Income Segment Median Return	1.51	6.01	9.51	9.70	9.92	7.53	7.23
LB Aggregate	1.57	6.23	10.15	10.26	10.10	7.54	7.27
Cash Return	0.39	0.84	1.31	1.77	4.14	4.67	4.79
Real Estate Return	2.99	2.57	4.36	4.01	8.47	9.84	9.99
NCREIF	1.59	3.27	5.02	6.67	8.75	10.73	10.18
Other Return	-8.37	-14.27	-19.26	-19.62			

The exhibit above is a performance overview for the total fund and all of its asset classes over the past 9 years. Over the entire observed period, the fund's total return is trailing its policy index by 0.67% annually. This is due primarily to its domestic equity returns, which lagged the broad market as defined by the Wilshire 5000 by almost 1.4% annually. The most recent twelve months show that STRS has underperformed its policy index by 0.54%. Over the last twelve months domestic equity and domestic fixed income have trailed the respective broad market indexes, while international equity and real estate have outperformed their respective benchmarks.

State Teachers Retirement System

Quarterly Total Return Market Line Analysis Periods from 12/93 to 12/02



	Annualized Return	Variability	Reward	Sharpe Ratio
▲ STRS	6.31	11.27	1.49	0.13
1 STRS Policy Index	6.98	11.24	2.17	0.19
T 91-Day Treasury Bill	4.82	0.68	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 a real and risk-adjusted basis over the last 9 years.

State Teachers Retirement System

Asset Allocation Actual vs. Benchmark June 30, 2002

Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	45.12%	S&P 1500	45%	0.12%
Fixed Income	18.93%	Lehman Universal	25%	-6.07%
Intl. Equity	21.52%	Intl. Hybrid Benchmark	20%	1.52%
Real Estate	11.57%	NCREIF Adjusted	9%	2.57%
Venture Capital	1.91%		0%	1.91%
Short Term	0.95%	3 Month T-Bill	1%	-0.05%

December 31, 2002

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

Over the past two quarters, the STRS fund is underweight in fixed income and overweight in real estate.

Appendix: ORSC Performance Attribution

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

Here is an example:

HPRS Allocation Index

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

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

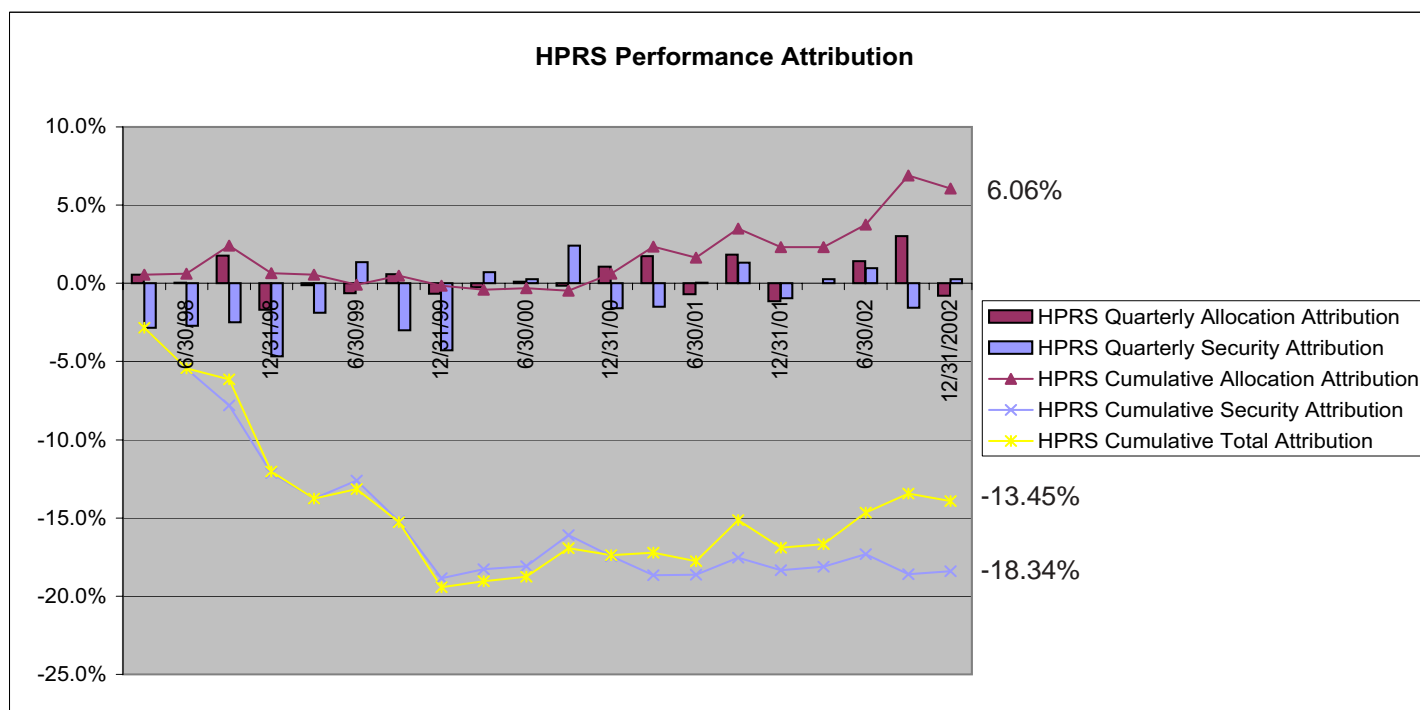
The next step is to determine the value added or subtracted by active management. The allocation index return is subtracted from the total fund return in order to determine value added or subtracted. Finally, the total attribution is calculated by subtracting the policy index from the total fund return.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

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

Appendix: ORSC Performance Attribution

The analysis shows that of the five funds, only two (OP&F and SERS) have achieved positive attribution results over the past five years from deviations in asset allocation and security selection. Active management has proven to be the biggest detractor from the performance of all five of the funds. No fund achieved positive attribution from active management. On the other hand, all but one fund (PERS) achieved positive attribution results from their decision to deviate from the target policy asset allocation. Another point of interest is that all five of the funds experienced their worst attribution results at the beginning of the five year period. Since then, their attribution results have moderated and the cumulative numbers have flattened out.

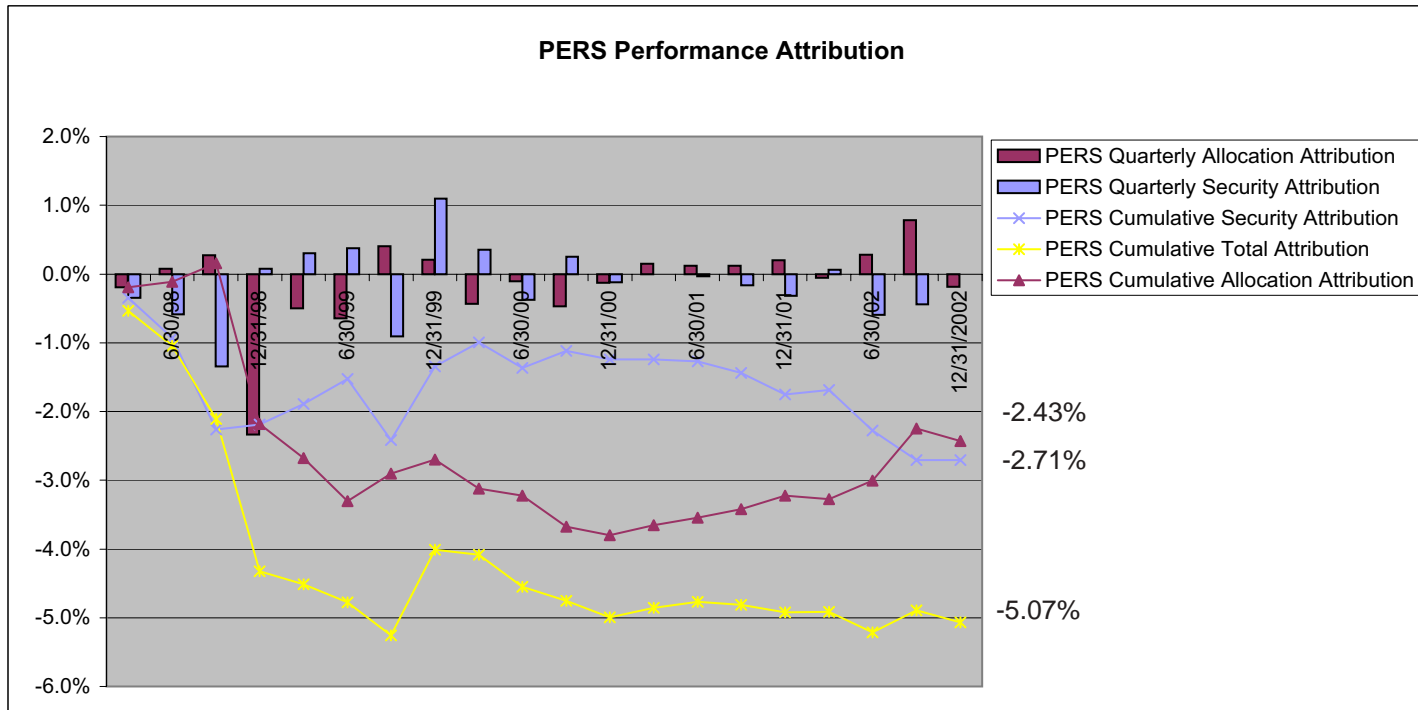
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	3.653%	2.034%	1.183%
Security Selection Attribution	-0.069%	0.189%	-3.984%
Total Attribution	3.581%	2.226%	-2.847%

The graph above provides five-year attribution analysis for the Highway Patrol Retirement System. The red bars represent the value added to (or subtracted from) the portfolio each quarter from the fund's asset allocation decisions – decisions to be under or overweight a particular asset class vs. the policy target. The blue bars represent the value added to (or subtracted from) the portfolio from active portfolio management. The red line is a cumulative measure of the value added to (or subtracted from) the portfolio from asset allocation strategies over the past 5 years (+6.06). The blue line represents the cumulative measure of the value added to (or subtracted from) the portfolio from active management over the past 5 years (-18.34%). The purple line represents the total value added to (or subtracted by) a combination of asset allocation strategies and active portfolio management (-13.45%). The above graph demonstrates that over the past 5 years, HPRS' asset allocation strategy has added 6.06% to the return of the fund, while over the same period, the active management of their investment managers has subtracted 18.34% from the fund's performance. The cumulative effect of active management and asset allocation has subtracted 13.45% from the fund's performance over the past five years, which translates into a loss of about 2.85% annually. The good news is that both asset allocation and selection have added value over the past three years.

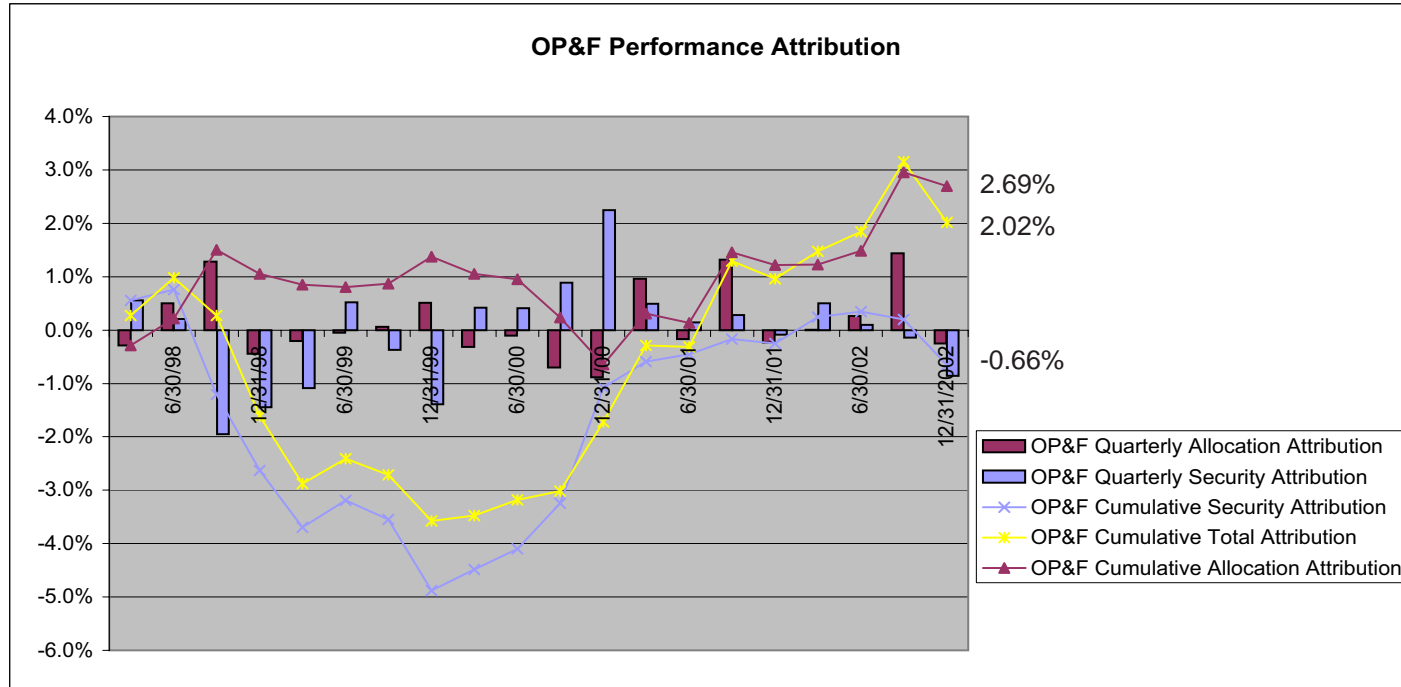
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	0.825%	0.094%	-0.491%
Security Selection Attribution	-0.971%	-0.462%	-0.547%
Total Attribution	-0.154%	-0.369%	-1.035%

The graph above shows that asset allocation and selection have both detracted from PERS' results over the past five years. On an annualized basis, PERS's decisions to deviate from its passive benchmark have cost the fund 1.04%.

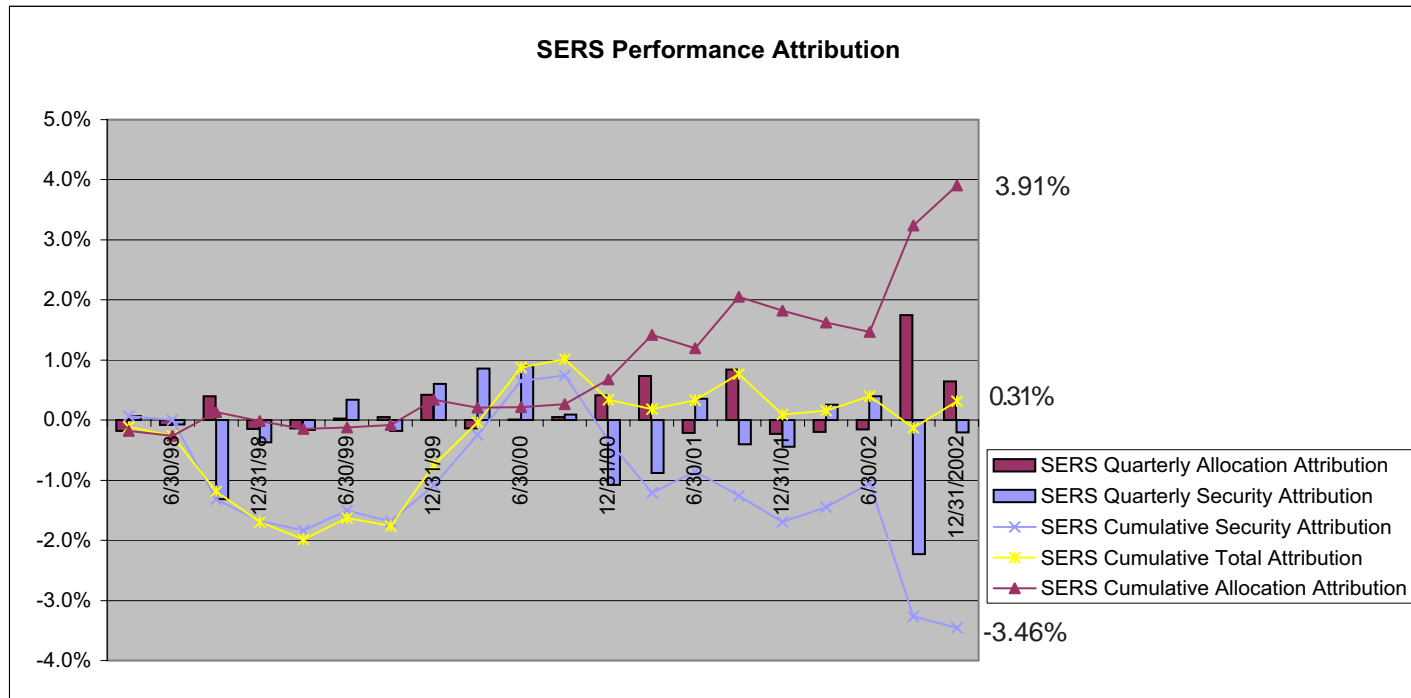
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	1.458%	0.431%	0.533%
Security Selection Attribution	-0.408%	1.459%	-0.132%
Total Attribution	1.044%	1.895%	0.400%

The graph above shows that OP&F has added value by deviating from its policy over the past five years. This deviation has counteracted the negative selection results, resulting in an overall outperformance of 0.4% per year. Over the past three years, both selection and asset allocation have added value.

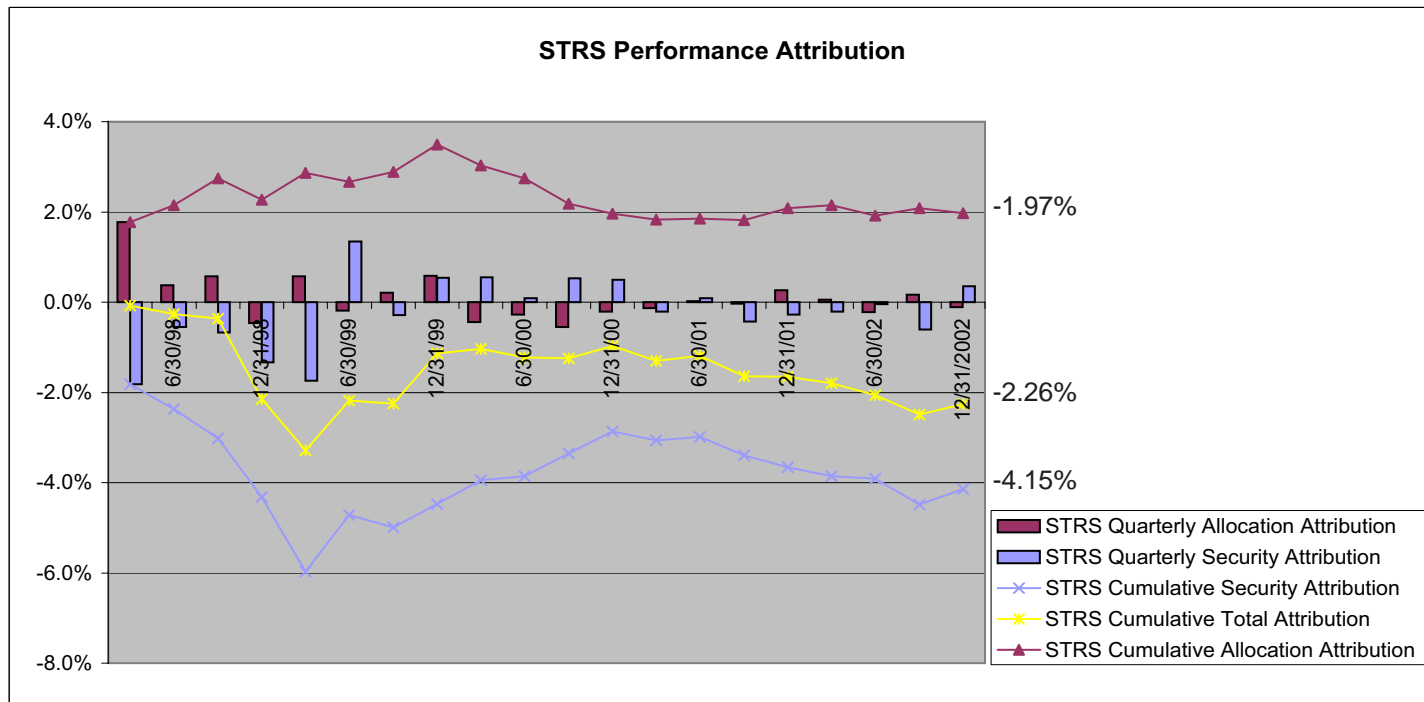
Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	2.048%	1.170%	0.769%
Security Selection Attribution	-1.795%	-0.806%	-0.702%
Total Attribution	0.217%	0.355%	0.062%

The graph above shows that SERS has added value through asset allocation over the past five years, counteracting the negative impact of selection and resulting in overall positive results of just over 6 basis points on annualized basis.

Appendix: ORSC Performance Attribution



Annualized Attribution	One Year	Three Years	Five Years
Asset Allocation Attribution	-0.114%	-0.492%	0.391%
Security Selection Attribution	-0.507%	0.112%	-0.844%
Total Attribution	-0.620%	-0.380%	-0.456%

The graph above shows that for the entire five-year period STRS has added value through asset allocation. That incremental value, however, was offset by adverse selection results, resulting in underperformance of 0.46% on an annualized basis. Over the past three years, however, selection has added value and asset allocation has subtracted from total fund performance.