



# Milliman USA

*Consultants and Actuaries*

INVESTMENT PERFORMANCE REVIEW

for

**The Ohio Retirement Study Council**

**For the period ending December 31, 2001**

April 17, 2002

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**OHIO RETIREMENT STUDY COUNCIL**  
Comparative Performance Study

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**OHIO RETIREMENT STUDY COUNCIL**  
Comparative Performance Study  
Period ending 12/31/2001  
Executive Summary and Explanation of Exhibits

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 sixth 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. This report reflects investment performance for all five retirement systems over the eight-year period beginning January 1, 1994 and ending December 31, 2001

Our findings may be summarized as follows:

- The calendar year ending 12/31/01 was a difficult period for all of the funds. All experienced negative results, ranging from -3.24% (HPRS) to -5.66% (STRS) and compared to a broad universe of public retirement systems, all of the Statewide funds were in the third and fourth quartiles.
- Longer term, the impact of two years of negative returns has been meaningful. Both PERS and HPRS have eight-year annualized returns that are below their actuarial interest-rate assumptions, and for the past five years only SERS has enjoyed a return in excess of its assumption.
- Also longer term, OP&F is the only fund that had results that were ahead of its own benchmark for the eight-year measurement period (1/1/94 – 12/31/01), outperforming it by 0.43%. HPRS had the worst eight-year results relative to benchmark, underperforming by 3.56%.
- SERS has had the best absolute results over the full measurement period, achieving an average return of 9.93%.
- HPRS' 7.01% average long-term results are troublesome, particularly if they persist into the future. The fund has, however, shown signs of improvement in the past year (the -3.24% return referenced above not only represents the smallest loss experienced by any of the systems for the year, but compares favorably to the -3.79% benchmark return for 2001.

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.

Before presenting this 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 plan is to include such an analysis in our next report, when the systems have had five full years to operate under the "prudent person" standard.

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 will focus a significant amount of attention on performance relative to the asset allocation of each of the funds.

The report begins with a table that summarizes the data that are analyzed further in the body of the document. Each system's results are displayed for periods ending 12/31/01, and broken out for the most recent quarter (10/1/01 – 12/31/01), two quarters (7/1/01 – 12/31/01), three quarters (4/1/00 – 12/31/01),

one year (1/1/00 – 12/31/01), three years (1/1/99 – 12/31/01) and five years (1/1/97 – 12/31/01). Here, as in the rest of the report, results for periods of one year or less are for that period (not annualized) and returns for periods of more than one year are annual compound returns for that period.

The Summary Table (pages 1&2) shows that for the eight-year, since-inception measurement period (“Incept Ret” at the far right of the table), SERS had the highest total return (9.93% per year) and HPRS had the lowest total return (7.01% 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 12/31/2001, SERS again had the highest total return (8.54% per year) and HPRS had the lowest total return (4.37% per year). For the most recent calendar year, all of the funds experienced negative returns. The smallest loss was experienced by HPRS (-3.46%) and the greatest loss was produced by STRS (-5.66%).

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 -0.80%. STRS had the greatest six-month loss – a total return of -2.80%.

Page 2 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 eight-year measurement period, the broad U.S. equity market, as defined by the Wilshire 5000 Index, returned 12.83% per year. SERS is the only one of the funds that experienced domestic equity performance in excess of this index for the period (an annual return of 13.19%).

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 remainder of the report is divided into sections. **Section I** (pp. 3-9) provides additional analysis of the Total Fund results for each system. Pages 3 and 4 compare the Total Fund results to a broad universe of Total Funds – 1012 other funds including those of public, corporate and multi-employer pension plans – over an eight-year measurement period. Here and elsewhere in the report, the “floating bars” define the universe against which the performance is being compared. The top of the bar is the 5<sup>th</sup> percentile, the higher dotted line is the 25<sup>th</sup> percentile (bottom of the first quartile), the solid line is the median, the lower dotted line is the 75<sup>th</sup> percentile (bottom of the third quartile) and the bottom of the bar is the 95<sup>th</sup> percentile. The table below the graph defines the quartile marks and the table at the bottom of the page displays each fund’s return for that period and the relevant ranking in the universe. At the very bottom of the page is the return and rank of a hypothetical portfolio of 50% stocks (Wilshire 5000) and 50% bonds (Lehman Aggregate Bond Index).

Pages 5 through 8 are similar to pages 3 and 4. This time, however, the Total Fund results are compared to a universe comprised solely of the 123 Public Retirement Systems in the universe (pp. 5-6) and again (pp. 7-8) to funds with assets in excess of \$1 Billion (66 funds). The percentile rankings vary a bit, depending on the universe chosen, but the relative results are similar: SERS has the best long-term relative rankings, followed by OP&F and STRS. These relative rankings have persisted for the past several reporting periods.

In sections I-V, each of which compares all five funds’ results for either the Total Fund or a particular asset class, there are both cumulative and consecutive period comparisons. The cumulative period graphs (pp. 3, and 5, for example) show quarter (10/1/01-12/31/01), one year (1/1/01 – 12/31/01), two year (1/1/00 – 12/31/01), three year (1/1/99 – 12/31/01), four year (1/1/98 – 12/31/01), five year (1/1/97 – 12/31/01), six year (1/1/96 – 12/31/01), seven year (1/1/95 – 12/31/01), and eight year (1/1/94 – 12/31/01) periods. The consecutive period graphs (pp. 4, 6 and 8, for example), on the other hand, look at the calendar

years ending 12/31/94, 12/31/95, etc. This second group of graphs can be useful for examining trends in performance. For example, both PERS and HPRS have had relatively poor Total Fund results over the measurement period. An examination of the consecutive performance comparison on page 6, however, shows that PERS, after two particularly bad years in 1996 (96<sup>th</sup> percentile vs. other Public Funds) and 1997 (92<sup>nd</sup> percentile), showed improvement in relative performance (albeit to the 3<sup>rd</sup> quartile) in 1998, 1999, 2000 and 2001. HPRS, on the other hand, exhibits a very different picture. After a good relative year in 1996 (42<sup>nd</sup> percentile), followed by results in the fourth quartile of the Public Fund universe for the years ending in December of 97, 98 and 99, HPRS has recovered to just below the median for 2000 and 2001.

2001 was a difficult year in relative terms for all of the Funds. Compared, again, to a broad universe of public retirement systems, all of the Statewide funds were in the third and fourth quartiles.

Page 9 provides the first analysis of risk. The eight-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 that hypothetical 50% stock, 50% bond portfolio defined above. 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 two funds with the lowest return for the period (PERS and HPRS) and note that 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.

Whenever risk and return are compared, a Sharpe Ratio is calculated for each fund or asset class being examined. This ratio, developed by the Nobel Prize-winning economist William Sharpe, is a measure of risk-adjusted return. It is designed to measure the expected return per unit of risk and is calculated by dividing the portfolio's return in excess of the risk-free T-bill rate by the variability of the portfolio's returns. While the absolute Sharpe Ratio number is not particularly meaningful, when comparing two funds or a fund and a benchmark, the Higher Sharpe Ratio is the better risk-adjusted return. SERS and OP&F stand out on the basis of this comparison. Both have Sharpe Ratios greater than 0.40. HPRS, on the other hand, stands out on the opposite side of the spectrum. One could conclude from this comparison that on a risk-adjusted basis HPRS has done roughly half as well as the next highest fund (0.18 for HPRS vs. 0.34 for STRS).

**Section II** focuses on US Equity results. The analysis is similar to the Total Fund analysis described above, with comparisons to a broad equity universe (pages 10 and 11) and to the equity returns of Public Funds (pages 12 and 13).

When compared to equity portfolios in the broad equity universe (pages 10-11), the Ohio systems, with the exception of HPRS, tend to be in or near the third quartile over the past five years (prior to 1997 and the adoption of the “prudent person” standard, equity universe comparisons are not particularly relevant). The SERS and OP&F equity results are just above the 70<sup>th</sup> percentile and only one of the large funds is slightly below the third quartile (PERS, in the 76<sup>th</sup> percentile). HPRS equity results for the past five years are in the 97<sup>th</sup> percentile.

Relative results are better, however, for the year 2001. All of the Ohio systems had roughly median domestic equity results – and results within 100 basis points of the Wilshire 5000 index – for the year.

Page 14 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 above, here, and in every case where risk-return analysis is performed, a Sharpe Ratio is calculated, providing a means of comparing returns adjusted for risk. SERS, OP&F and STRS have enjoyed the best risk-adjusted equity results over the eight-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.

**Section III** is an analysis of Fixed Income results. Each fund is compared, using an analytical framework similar to previous sections, to a broad universe of fixed income portfolios (pages 15 and 16) and to a Public Fund fixed income universe (pages 17 and 18). Compared to the broad fixed income universe, four of the funds’ fixed income returns are above the median for the past eight years (1/1/94 – 12/31/01). STRS had particularly strong (17<sup>th</sup> percentile vs. public funds) fixed income results over the full measurement period (1/1/94 – 12/31/01) and OP&F has had top decile results for the most recent three years (1/1/99 – 12/31/01). HPRS had low third quartile results for the eight-year period but above-median results for the most recent three years.

The risk/return analysis on page 19 shows that three of the funds’ fixed income portfolios (STRS, PERS and OP&F) have enjoyed risk-adjusted returns (as measured by Sharpe Ratio) greater than the bond market as defined by the Lehman Aggregate Index. SERS and HPRS have shared the lowest Sharpe Ratio for the eight-year period (1/1/94 – 12/31/01).

**Section IV** analyzes International Equity results. In this case, seven and eight-year comparisons are not meaningful, since two of the funds have not had allocations to this asset class for that length of time. All funds have at least six years of history, however, so comparisons over that time period are valid.

On page 20 we see that over the six years ending 12/31/01 (1/1/96 – 12/31/01) all of the funds have had International Equity returns that are below the median



International Equity portfolio in our universe. On an absolute basis, these range from 5.07% (SERS) to 1.37% (PERS). STRS had the best International Equity return for the most recent 12 months (-14.63%).

On a risk/return basis (page 22), for the six-year common measurement period, the results are quite disparate. The international equity returns of all of the funds fell short of the T-Bill return for the period. On the other hand, only PERS underperformed the generic EAFE international benchmark for the period.

**Section V** looks at Real Estate. For the eight-year period (1/1/94 – 12/31/01), four of the funds' returns have been at or near the broad benchmark NCREIF (10.63%) annualized return. The exception is HPRS, whose return of 8.06% per year is well below the other funds. Returns for the most recent calendar year show OP&F ahead of the other funds in this asset class with an 11.84% return vs. 7.41% 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.

Recognizing the importance of asset allocation in the determination of long-term investment results, **Section VI** is a departure from the rest of the document. Instead of comparing the funds to one another, this section provides a comparison of each fund's total return to its own asset allocation policy benchmark. Five exhibits are included for each fund. First we lay out the asset allocation of the fund in a pie chart. Second, we trace the asset allocation of the fund over the past 10 quarters (6/31/99 – 12/31/01). Third, we describe the custom benchmark that has been used to measure relative results. Fourth, we display the total fund's return compared to its custom benchmark (Policy Index). For reference, each asset class is then compared to a broad market index. (In order to be consistent, we use the same broad indexes for all funds. Many of the funds have individual asset class policy benchmarks, which differ from these indexes.) Finally, we display the five-year total fund results in risk-return space compared to the custom 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 1 of the report and rank the funds in order of their long-term returns. For example, part of the difference between the 9.93% compound return for SERS over the measurement period (1/1/94 – 12/31/01) and the 7.55% compound return for PERS over the same period can be explained by the fact that the policy

benchmark for SERS had a return of 10.32% (p. 49) for the period compared to the PERS policy benchmark return of 8.14% (p. 36). In the preparation of this section of the report, each fund office was contacted to confirm that the custom policy benchmark was appropriate.

When each fund is compared to its own asset allocation policies and actuarial interest rate assumptions (as of the most recent valuation) for the eight-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	7.01%	10.57%	8.00%	12/31/00
PERS	7.55%	8.14%	7.75% <sup>1</sup>	12/31/00
STRS	8.78%	9.48%	7.75%	7/1/00
OP&F	9.13%	8.70%	8.25%	1/1/00
SERS	9.93%	10.32%	8.25%	6/30/00

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 356 basis points below the target policy benchmark return for the measurement period.

Two years of adverse market conditions have taken their toll on the systems' returns. While all of the funds except HPRS and PERS, have exceeded their actuarial interest-rate assumptions over the entire measurement period, the cushion enjoyed a few years ago has eroded. With long U.S. Treasury bonds yielding less than 6% and stock market returns unlikely to be as robust as they were in the 90s, however, this might be a good time to reexamine benchmarks and assumptions.

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.

Another observation could be made from these long-term results. If you accept the premise that a fund's return can be divided into three basic components: 1) benchmark (market) return, 2) deviations from the benchmark and 3) security

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<sup>1</sup> PERS adopted an 8% assumption at their December Board meeting. Since this change was not in effect during the period covered by this report, it is not reflected in this comparison.

selection, only OP&F, whose results, as stated above, are ahead of its benchmark for the period, has enjoyed any added value from active fund management over the past eight years.

**OHIO RETIREMENT STUDY COUNCIL**  
**Performance Summary Table**  
**Quarter Ending 12/31/01**

Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	Since 12/31/95	Incept Date	Incept Ret
<b>HPRS</b>									
Total Return	6.78	-0.80	3.83	-3.24	1.17	4.37	5.97	12/31/93	7.01
Equity	11.41	-3.20	4.57	-8.74	-3.84	1.24	4.73	12/31/93	8.45
Fixed Income	-0.40	4.47	5.26	8.30	6.38	7.38	6.61	12/31/93	6.68
Cash & Equiv	0.50	1.67	3.20	4.67	4.95	5.20	5.21	3/31/94	5.20
Real Estate	2.91	3.48	7.51	8.26	11.23	9.10	8.96	12/31/93	8.06
International Equity	9.31	-6.05	-4.93	-16.34	0.75	4.12	4.59	3/31/95	5.27
<b>PERS</b>									
Total Return	7.00	-1.99	1.03	-4.61	2.00	6.60	6.81	12/31/93	7.55
Equity	11.80	-4.75	1.60	-10.15	-1.26	8.81	10.57	12/31/93	10.43
Fixed Income	0.10	4.50	5.32	9.15	6.44	7.37	6.63	12/31/93	7.32
Cash & Equiv	0.60	1.51	2.64	4.00	5.24	5.40	5.45	12/31/93	5.37
Real Estate	-0.90	-0.11	4.61	6.58	10.02	9.94	10.29	12/31/93	10.42
International Equity	8.70	-7.71	-8.28	-20.40	-1.36	0.86	1.37	12/31/95	1.37
<b>OP&amp;F</b>									
Total Return	7.82	-1.24	2.54	-3.83	2.67	7.59	8.56	12/31/93	9.13
Equity	11.84	-3.76	3.60	-7.47	1.83	9.84	11.86	12/31/93	12.41
Fixed Income	1.34	5.82	6.57	9.90	7.47	7.83	7.24	12/31/93	7.18
Cash & Equiv	0.64	1.73	2.88	4.43	5.04	5.10		9/30/96	4.98
Real Estate	1.50	4.04	5.91	11.84	11.60	12.90	11.52	12/31/93	10.98
International Equity	12.39	-6.97	-6.90	-19.93	-3.68	2.13	3.91	9/30/94	4.55
<b>SERS</b>									
Total Return	6.81	-2.63	1.34	-5.52	3.02	8.54	9.24	12/31/93	9.93
Equity	12.62	-4.63	2.48	-10.97	0.33	9.98	11.82	12/31/93	13.19
Fixed Income	0.48	4.79	5.77	9.33	6.81	7.71	7.00	12/31/93	6.91
Cash & Equiv	1.70	2.41	3.95	6.65	6.48	6.07	5.96	12/31/93	5.75
Real Estate	-1.25	-0.90	2.23	3.42	9.49	10.47	10.48	12/31/93	10.36
International Equity	9.46	-8.89	-8.04	-16.91	-0.53	4.16	5.07	9/30/94	6.16

**OHIO RETIREMENT STUDY COUNCIL**  
**Performance Summary Table**  
**Quarter Ending 12/31/01**

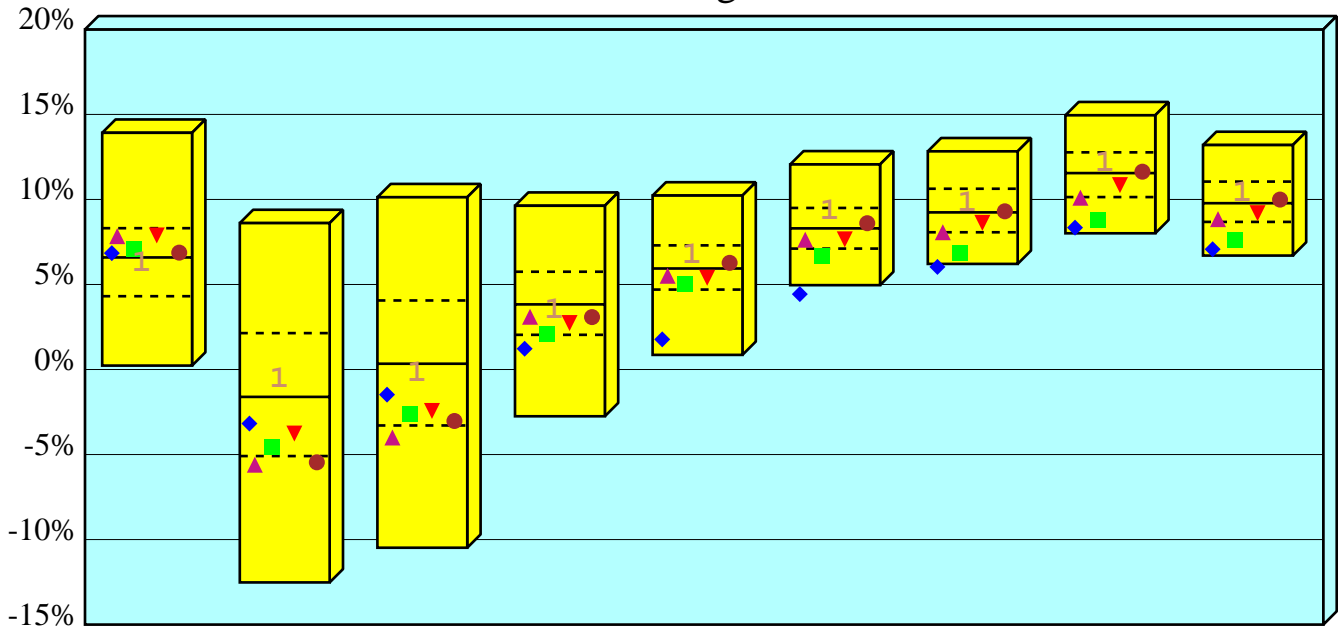
Manager	1 Qtr	2 Qtrs	3 Qtrs	1 Year	3 Yrs	5 Yrs	Since 12/31/95	Incept Date	Incept Ret
<b>STRS</b>									
Total Return	7.78	-2.80	0.86	-5.66	3.04	7.57	8.01	12/31/93	8.78
Equity	11.88	-5.45	0.87	-10.90	-0.56	9.16	10.56	12/31/93	11.47
Fixed Income	1.05	5.11	5.82	9.17	6.49	8.28	7.44	12/31/93	7.74
Cash & Equiv	0.64	1.48	2.57	4.04	5.31	5.47	5.48	12/31/93	5.17
Real Estate	1.04	2.48	4.71	6.30	11.09	12.27	11.70	12/31/93	10.77
International Equity	11.15	-7.72	-5.49	-14.63	2.25	1.24	2.18	12/31/93	3.24
								<b>Since</b>	
<b>Indices</b>									
Russell 1000	11.12	-5.82	0.12	-12.46	-0.81	10.49	12.39	12/31/93	13.67
Russell 2000	21.08	-4.09	9.62	2.49	6.42	7.52	8.97	12/31/93	9.79
Russell 3000	11.76	-5.70	0.79	-11.46	-0.32	10.13	12.00	12/31/93	13.25
Standard & Poors 500	10.69	-5.57	-0.04	-11.88	-1.05	10.70	12.67	12/31/93	13.98
S&P 500 Equal Wtd	18.08	-4.06	4.21	-0.42	6.07	12.09	13.45	12/31/93	14.13
S&P 600 Small Cap	20.69	0.29	14.03	6.55	10.22	10.67	12.37	12/31/93	12.09
S&P MidCap 400	17.97	-1.62	11.33	-0.64	10.29	16.09	16.61	12/31/93	15.54
Wilshire 5000	12.37	-5.50	1.57	-10.96	-0.65	9.71	11.54	12/31/93	12.83
LB Aggregate	0.04	4.66	5.24	8.43	6.28	7.43	6.78	12/31/93	6.90
SB Broad Inv Grade	0.02	4.73	5.26	8.51	6.29	7.43	6.79	12/31/93	6.92
MSCI EAFE (Net)	6.97	-8.00	-8.96	-21.45	-5.04	0.89	1.73	12/31/93	3.62
MSCI Em Mkts Free (G	26.61	-0.74	3.24	-2.37	4.08	-5.73	-3.87	12/31/93	-4.47
MSCI World Ex-US (Ne	7.16	-7.88	-8.60	-21.40	-4.50	1.13	2.06	12/31/93	3.84
LB Mortgage	0.07	4.29	5.35	8.22	7.01	7.49	7.13	12/31/93	7.15
NCREIF	0.74	2.36	4.92	7.41	10.32	12.20	11.88	12/31/93	10.63
Wilshire RE Funds	1.06	2.21	4.47	6.29	8.86	11.44	10.78	12/31/93	8.74

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Total Fund Portfolios

#### Periods Ending 12/01



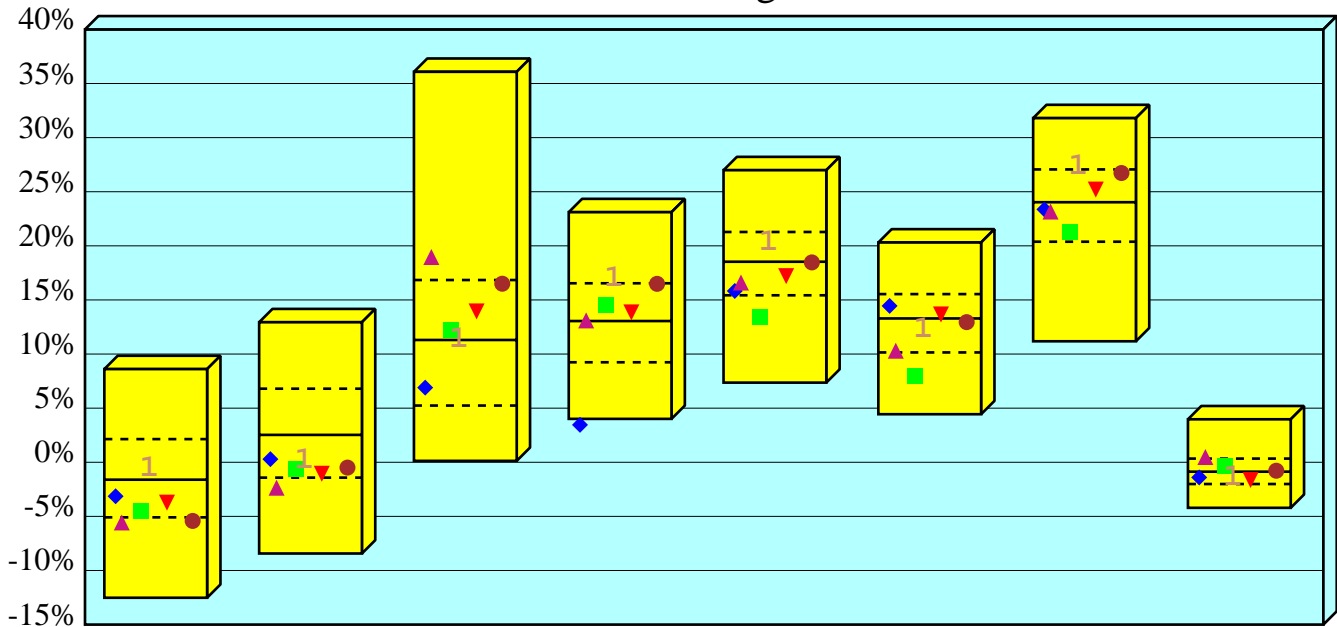
	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	13.92	8.61	10.13	9.63	10.23	12.06	12.83	14.95	13.20
1st Qt	8.31	2.14	4.06	5.75	7.30	9.50	10.63	12.77	11.05
Median	6.59	-1.61	0.34	3.83	5.94	8.30	9.24	11.55	9.78
3rd Qt	4.31	-5.09	-3.29	2.04	4.70	7.11	8.07	10.14	8.68
Low	0.23	-12.52	-10.48	-2.75	0.86	4.96	6.21	8.01	6.70
<b>◆</b> HPRS Return	6.78	-3.24	-1.54	1.16	1.71	4.37	5.97	8.28	7.01
Rank	45	60	61	83	93	97	96	93	94
<b>■</b> PERS Return	7.00	-4.61	-2.70	2.00	4.97	6.60	6.81	8.75	7.55
Rank	41	71	70	75	68	83	88	90	91
<b>▼</b> OP&F Return	7.82	-3.83	-2.50	2.67	5.33	7.59	8.56	10.78	9.13
Rank	31	65	68	64	62	65	63	61	64
<b>●</b> SERS Return	6.81	-5.52	-3.09	3.02	6.21	8.54	9.24	11.57	9.93
Rank	45	77	72	59	43	46	50	48	46
<b>▲</b> STRS Return	7.78	-5.66	-4.06	3.04	5.45	7.57	8.01	10.04	8.78
Rank	31	77	80	59	59	67	76	77	73
<b>1</b> 50/50 Index Return	6.21	-0.61	-0.26	3.45	6.67	9.26	9.74	12.09	10.30
Rank	54	43	56	54	33	28	37	35	38

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Total Fund Portfolios

#### Years Ending



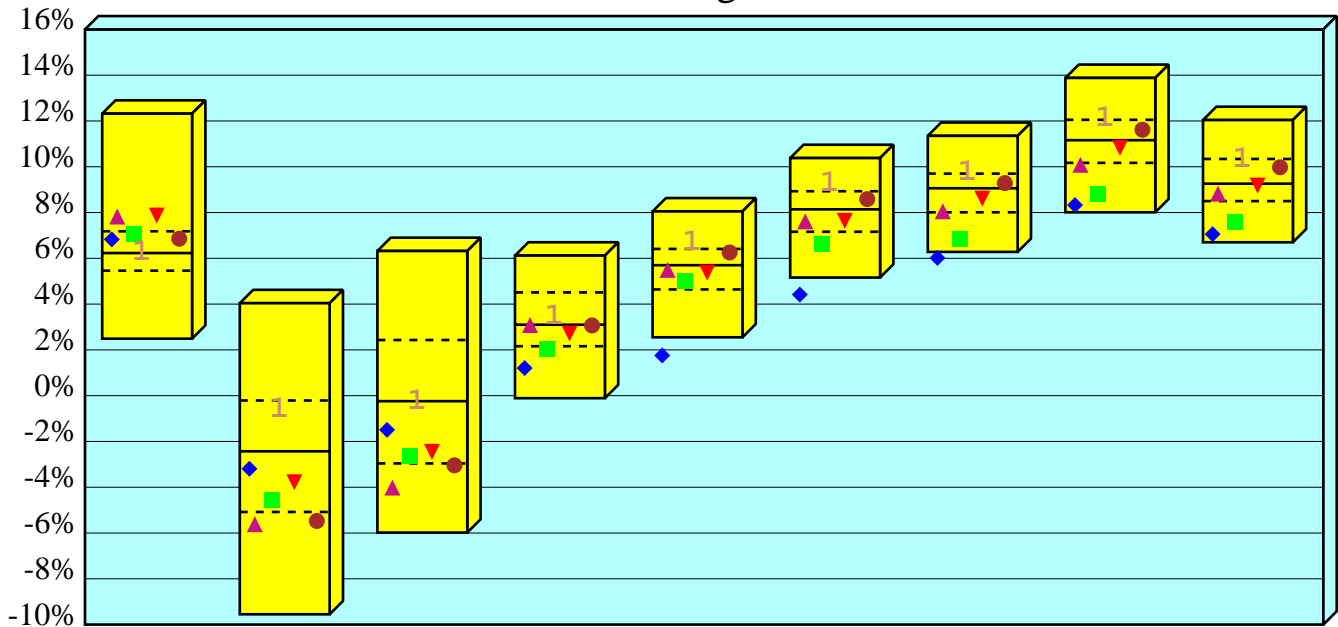
	Year 12/01	Year 12/00	Year 12/99	Year 12/98	Year 12/97	Year 12/96	Year 12/95	Year 12/94
High	8.61	12.94	36.08	23.11	26.99	20.31	31.80	3.97
1st Qt	2.14	6.80	16.84	16.54	21.28	15.54	27.06	0.34
Median	-1.61	2.53	11.30	13.05	18.53	13.29	24.03	-0.87
3rd Qt	-5.09	-1.42	5.24	9.24	15.43	10.15	20.38	-2.01
Low	-12.52	-8.43	0.13	4.01	7.36	4.44	11.18	-4.21
◆ HPRS								
Return	-3.24	0.19	6.80	3.36	15.73	14.35	23.27	-1.50
Rank	60	65	68	95	72	37	57	65
■ PERS								
Return	-4.61	-0.75	12.09	14.43	13.35	7.86	21.14	-0.48
Rank	71	70	46	41	82	84	71	40
▼ OP&F								
Return	-3.83	-1.16	13.84	13.75	17.10	13.56	25.10	-1.74
Rank	65	73	36	46	63	46	41	69
● SERS								
Return	-5.52	-0.59	16.40	16.39	18.37	12.85	26.63	-0.88
Rank	77	69	26	26	51	53	28	51
▲ STRS								
Return	-5.66	-2.45	18.87	13.01	16.51	10.21	23.07	0.39
Rank	77	80	20	50	67	74	58	24
1 50/50 Index								
Return	-0.61	0.09	11.29	16.95	20.27	12.18	27.27	-1.47
Rank	43	66	50	23	33	60	23	64

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Total Fund Public Funds

#### Periods Ending 12/01



	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	12.32	4.04	6.32	6.12	8.05	10.38	11.35	13.88	12.04
1st Qt	7.18	-0.21	2.43	4.51	6.41	8.93	9.70	12.05	10.34
Median	6.23	-2.43	-0.24	3.10	5.70	8.14	9.06	11.16	9.26
3rd Qt	5.46	-5.08	-2.96	2.16	4.64	7.16	8.01	10.17	8.50
Low	2.49	-9.55	-5.98	-0.11	2.55	5.16	6.28	8.01	6.70
<b>◆</b> HPRS									
Return	6.78	-3.24	-1.54	1.16	1.71	4.37	5.97	8.28	7.01
Rank	38	58	58	83	99	100	97	93	93
<b>■</b> PERS									
Return	7.00	-4.61	-2.70	2.00	4.97	6.60	6.81	8.75	7.55
Rank	32	67	70	79	67	79	90	91	89
<b>▼</b> OP&F									
Return	7.82	-3.83	-2.50	2.67	5.33	7.59	8.56	10.78	9.13
Rank	15	62	65	62	63	65	60	59	60
<b>●</b> SERS									
Return	6.81	-5.52	-3.09	3.02	6.21	8.54	9.24	11.57	9.93
Rank	38	81	76	54	27	35	42	42	36
<b>▲</b> STRS									
Return	7.78	-5.66	-4.06	3.04	5.45	7.57	8.01	10.04	8.78
Rank	15	82	82	52	57	67	75	76	68
<b>1</b> 50/50 Index									
Return	6.21	-0.61	-0.26	3.45	6.67	9.26	9.74	12.09	10.30
Rank	51	27	50	41	19	17	23	23	25

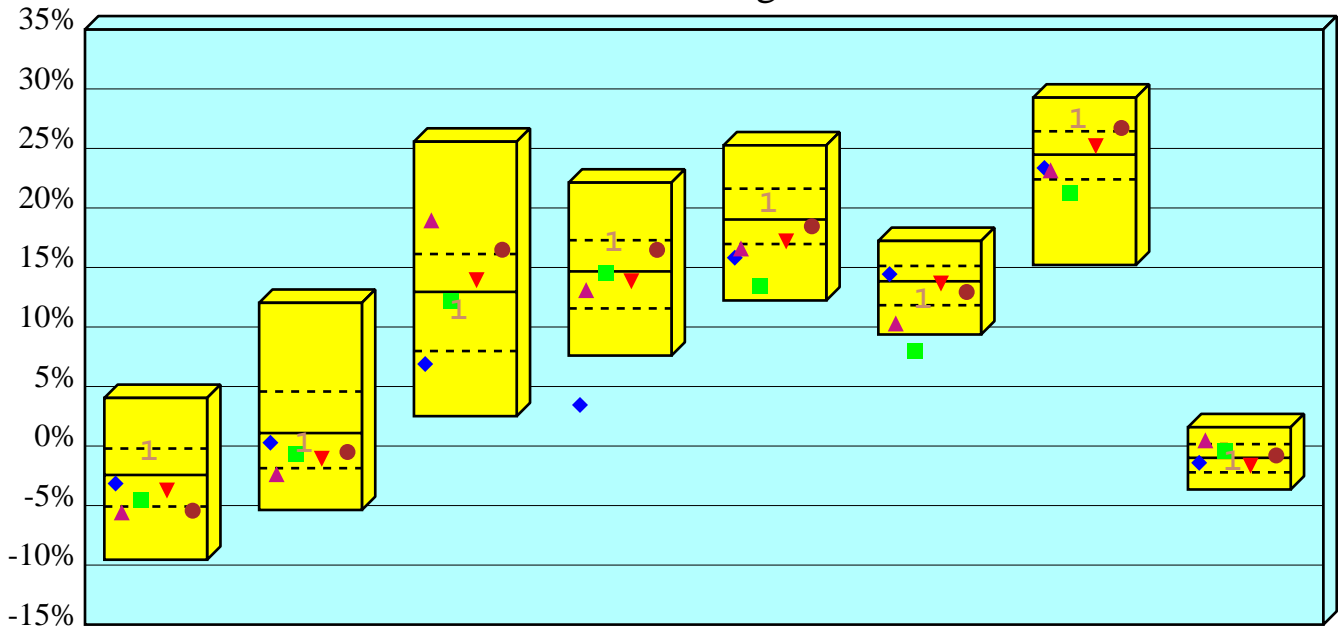


# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Total Fund Public Funds

#### Years Ending



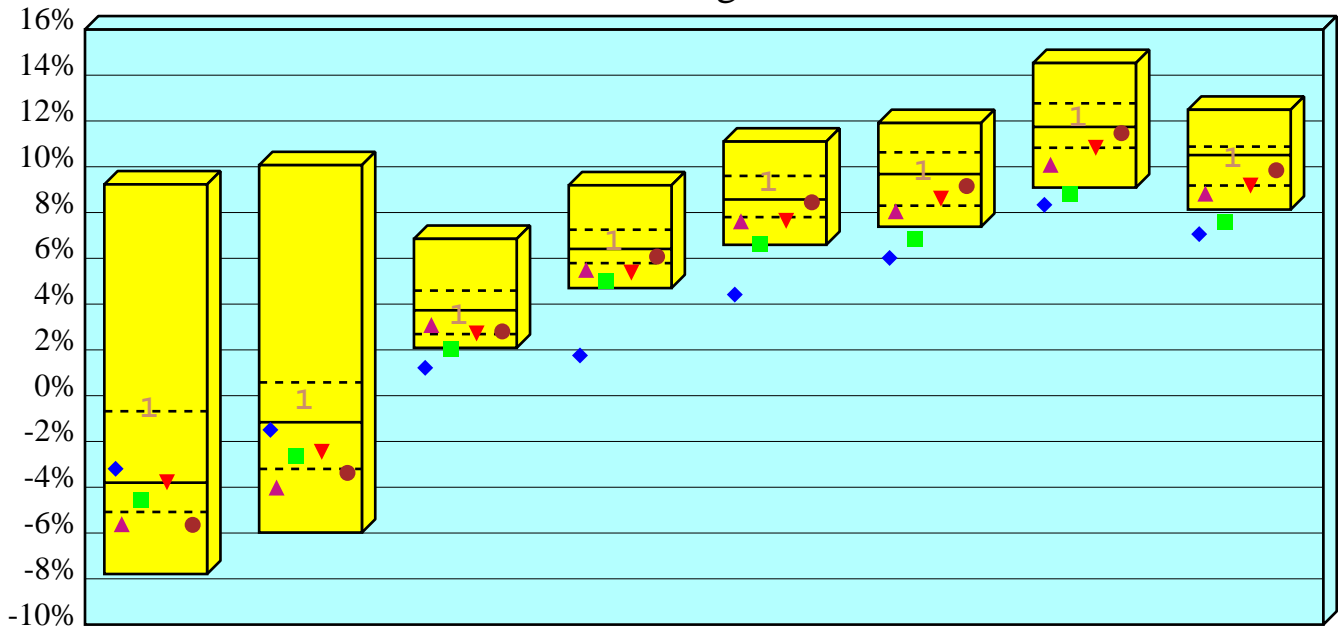
	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	4.04	12.03	25.57	22.13	25.26	17.23	29.27	1.58
1st Qt	-0.21	4.58	16.13	17.29	21.62	15.13	26.44	0.16
Median	-2.43	1.09	12.95	14.67	19.03	13.84	24.48	-0.99
3rd Qt	-5.08	-1.86	7.98	11.56	16.97	11.83	22.40	-2.21
Low	-9.55	-5.37	2.51	7.60	12.23	9.37	15.21	-3.65
<b>◆ HPRS</b>								
Return	-3.24	0.19	6.80	3.36	15.73	14.35	23.27	-1.50
Rank	58	57	79	98	81	42	65	63
<b>■ PERS</b>								
Return	-4.61	-0.75	12.09	14.43	13.35	7.86	21.14	-0.48
Rank	67	62	54	52	92	96	81	34
<b>▼ OP&amp;F</b>								
Return	-3.83	-1.16	13.84	13.75	17.10	13.56	25.10	-1.74
Rank	62	65	40	59	72	53	45	66
<b>● SERS</b>								
Return	-5.52	-0.59	16.40	16.39	18.37	12.85	26.63	-0.88
Rank	81	62	23	30	56	62	23	49
<b>▲ STRS</b>								
Return	-5.66	-2.45	18.87	13.01	16.51	10.21	23.07	0.39
Rank	82	78	11	66	77	86	68	22
<b>1 50/50 Index</b>								
Return	-0.61	0.09	11.29	16.95	20.27	12.18	27.27	-1.47
Rank	27	57	57	28	40	72	19	62

# OHIO RETIREMENT STUDY COUNCIL

## Total Returns of Total Fund Portfolios

### Total Market Value Over One Billion

#### Periods Ending 12/01



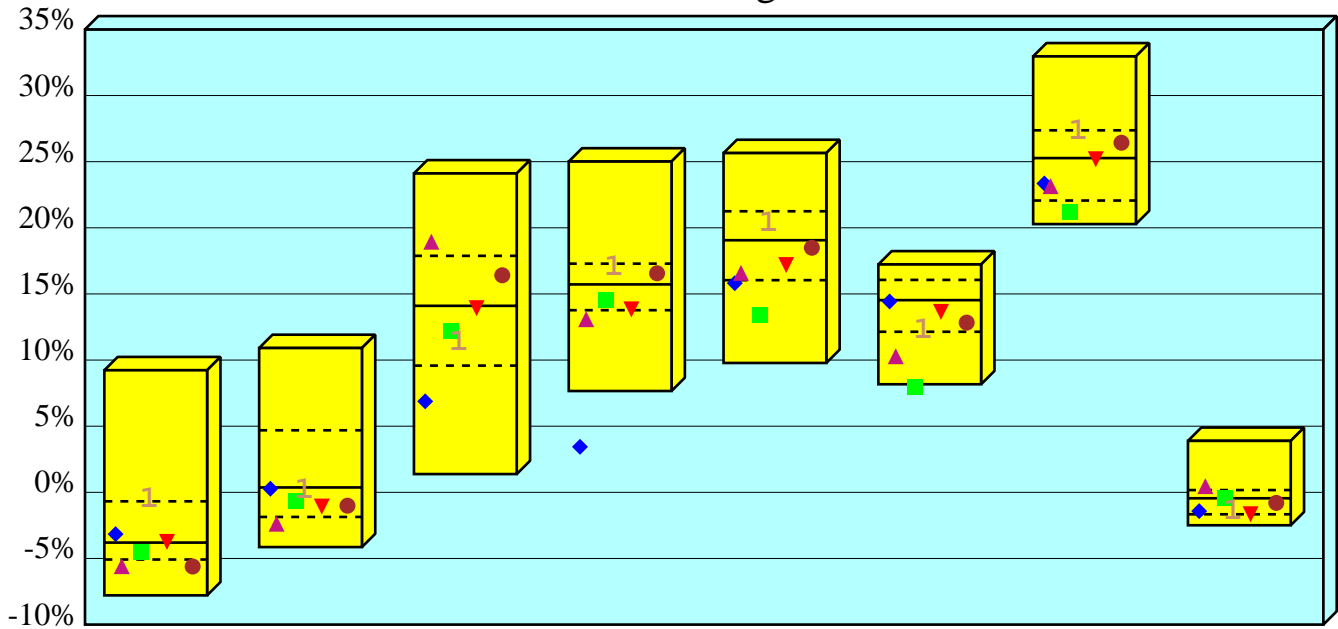
	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	9.23	10.07	6.85	9.19	11.10	11.91	14.53	12.49
1st Qt	-0.68	0.58	4.59	7.25	9.60	10.63	12.77	10.88
Median	-3.80	-1.16	3.73	6.41	8.57	9.68	11.74	10.51
3rd Qt	-5.08	-3.20	2.69	5.79	7.80	8.30	10.83	9.18
Low	-7.79	-5.98	2.09	4.70	6.59	7.38	9.09	8.13
◆ HPRS								
Return	-3.24	-1.54	1.17	1.71	4.37	5.97	8.29	7.01
Rank	41	50	95	100	100	100	100	100
■ PERS								
Return	-4.61	-2.70	2.00	4.97	6.60	6.81	8.75	7.55
Rank	71	62	95	88	92	100	99	99
▼ OP&F								
Return	-3.83	-2.50	2.67	5.33	7.59	8.56	10.78	9.13
Rank	50	56	78	88	88	67	75	75
● SERS								
Return	-5.69	-3.42	2.76	6.03	8.40	9.11	11.42	9.80
Rank	78	78	71	57	57	57	50	54
▲ STRS								
Return	-5.66	-4.06	3.04	5.45	7.57	8.01	10.04	8.78
Rank	78	81	65	81	88	79	83	79
┆ 50/50 Index								
Return	-0.61	-0.26	3.45	6.67	9.26	9.74	12.09	10.30
Rank	22	37	56	40	32	42	42	50

# OHIO RETIREMENT STUDY COUNCIL

## Total Returns of Total Fund Portfolios

### Total Market Value Over One Billion

#### Years Ending

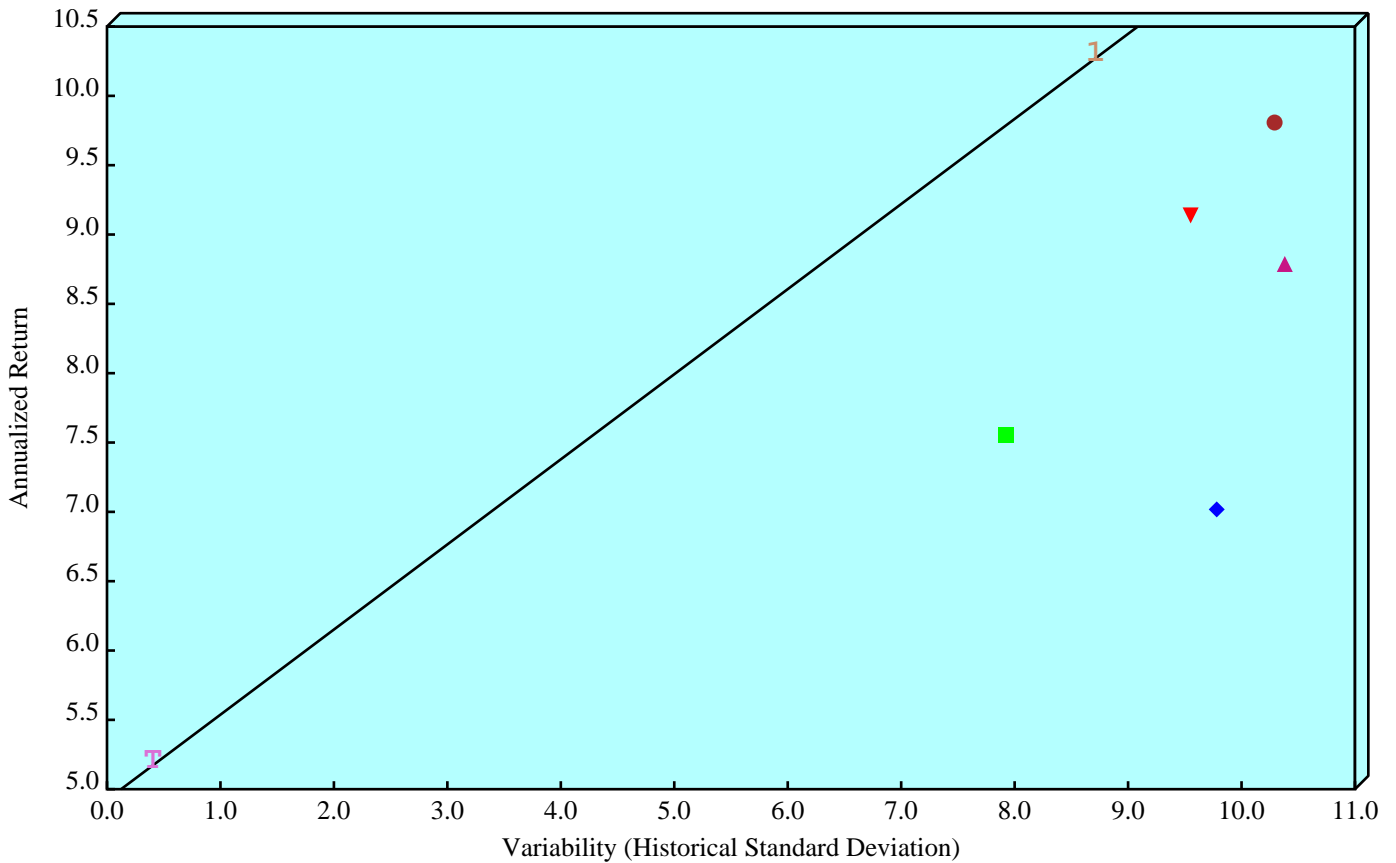


	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	9.23	10.91	24.11	25.01	25.65	17.23	32.96	3.89
1st Qt	-0.68	4.69	17.88	17.29	21.25	16.06	27.37	0.17
Median	-3.80	0.37	14.10	15.72	19.06	14.53	25.27	-0.45
3rd Qt	-5.08	-1.86	9.58	13.77	16.04	12.14	22.06	-1.66
Low	-7.79	-4.14	1.38	7.66	9.78	8.17	20.28	-2.49
<b>◆</b> HPRS								
Return	-3.24	0.19	6.80	3.36	15.73	14.35	23.27	-1.50
Rank	41	50	88	100	78	53	70	66
<b>■</b> PERS								
Return	-4.61	-0.75	12.09	14.43	13.35	7.86	21.14	-0.48
Rank	71	53	68	68	88	95	83	50
<b>▼</b> OP&F								
Return	-3.83	-1.16	13.84	13.75	17.10	13.56	25.10	-1.74
Rank	50	56	50	75	64	64	58	79
<b>●</b> SERS								
Return	-5.69	-1.09	16.33	16.48	18.41	12.75	26.35	-0.88
Rank	78	53	31	28	57	67	32	62
<b>▲</b> STRS								
Return	-5.66	-2.45	18.87	13.01	16.51	10.21	23.07	0.39
Rank	78	78	18	75	71	83	70	9
<b>I</b> 50/50 Index								
Return	-0.61	0.09	11.29	16.95	20.27	12.18	27.27	-1.47
Rank	22	50	68	28	37	71	25	66

# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Total Return Market Line Analysis

Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.01	9.84	1.81	0.18
■ PERS	7.55	7.98	2.34	0.29
▼ OP&F	9.13	9.61	3.93	0.41
● SERS	9.80	10.35	4.60	0.44
▲ STRS	8.78	10.44	3.58	0.34
1 50/50 Index	10.30	8.76	5.09	0.58
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

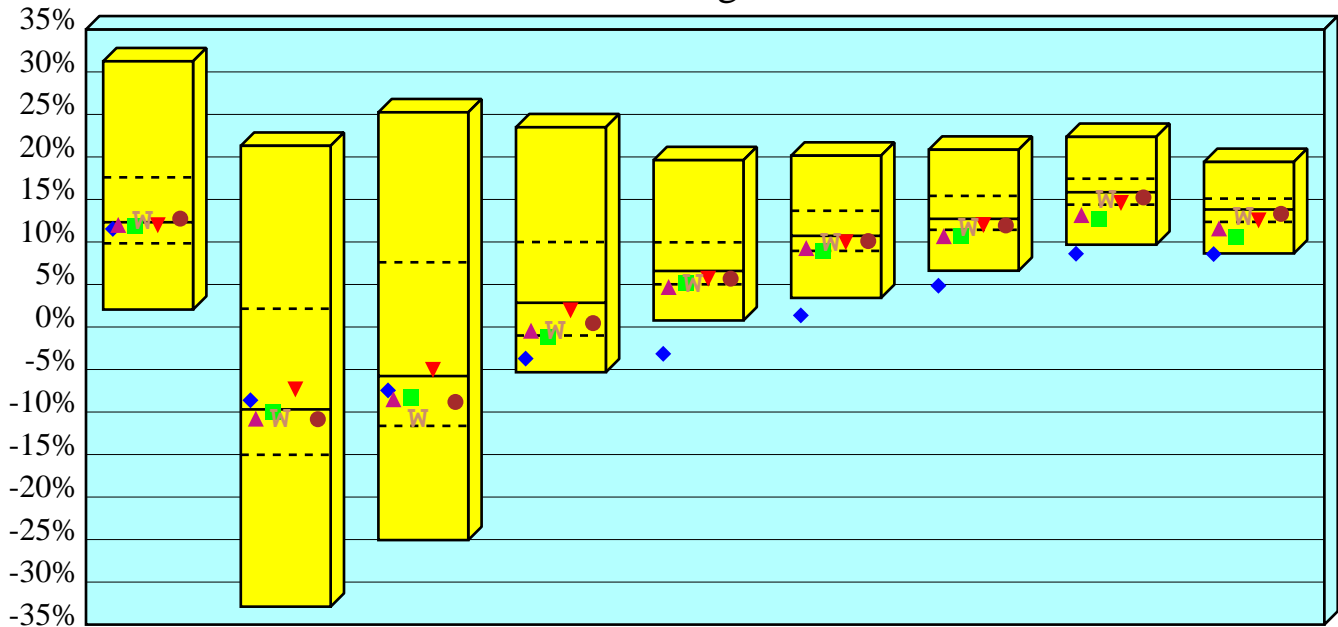
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Equity Portfolios

#### Periods Ending 12/01



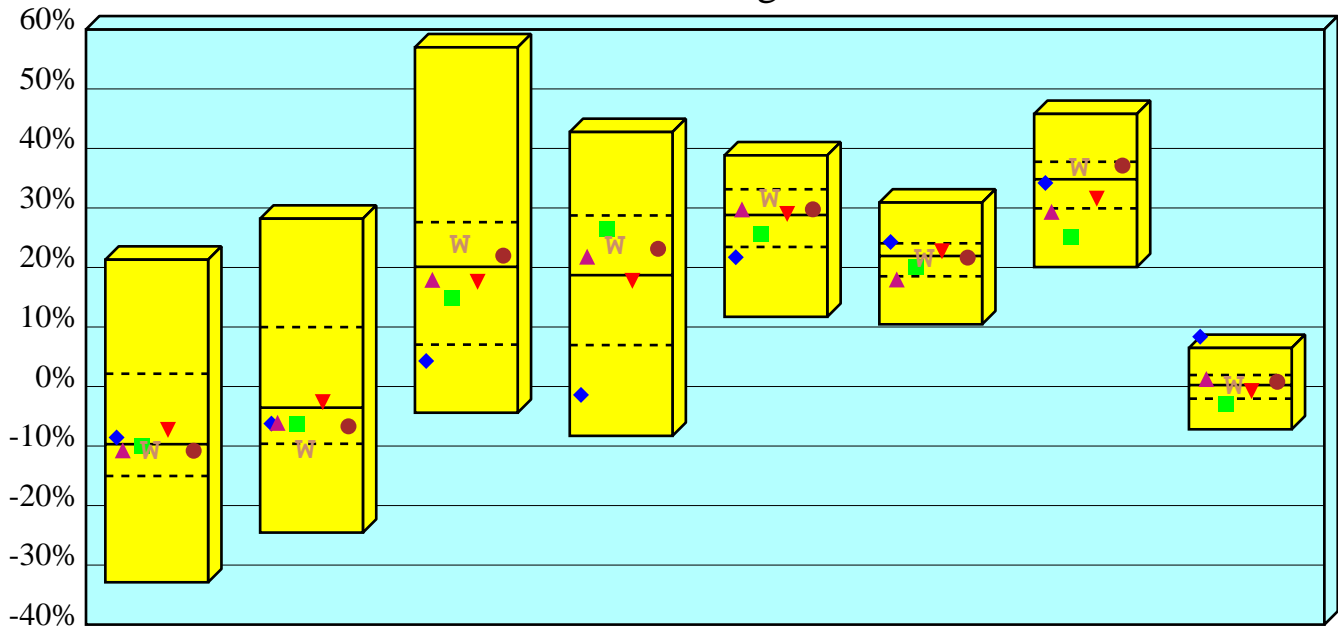
	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	31.25	21.31	25.25	23.49	19.62	20.15	20.85	22.36	19.41
1st Qt	17.60	2.15	7.61	9.99	9.96	13.67	15.42	17.44	15.10
Median	12.32	-9.69	-5.77	2.85	6.59	10.72	12.72	15.85	13.82
3rd Qt	9.84	-15.03	-11.63	-1.00	5.02	8.95	11.43	14.39	12.36
Low	2.05	-32.89	-25.06	-5.32	0.77	3.42	6.62	9.68	8.65
<b>◆ HPRS Domestic Equity</b>									
Return	11.41	-8.74	-7.58	-3.84	-3.28	1.24	4.73	8.49	8.45
Rank	54	47	54	89	98	97	98	96	96
<b>■ PERS Domestic Equity</b>									
Return	11.80	-10.15	-8.37	-1.26	5.01	8.81	10.57	12.52	10.43
Rank	53	50	55	82	75	76	79	89	89
<b>▼ OP&amp;F Domestic Equity</b>									
Return	11.84	-7.47	-5.17	1.83	5.55	9.84	11.86	14.46	12.41
Rank	52	43	48	56	69	69	70	73	74
<b>● SERS Domestic Equity</b>									
Return	12.62	-10.97	-8.94	0.33	5.56	9.98	11.82	15.11	13.18
Rank	47	52	57	62	69	68	71	63	58
<b>▲ STRS Domestic Equity</b>									
Return	11.88	-10.90	-8.62	-0.56	4.58	9.16	10.56	13.04	11.47
Rank	52	51	56	68	78	74	79	87	84
<b>W Wilshire 5000</b>									
Return	12.37	-10.96	-10.92	-0.65	4.89	9.71	11.54	14.81	12.83
Rank	49	52	72	69	76	70	74	68	67

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Equity Portfolios

#### Years Ending



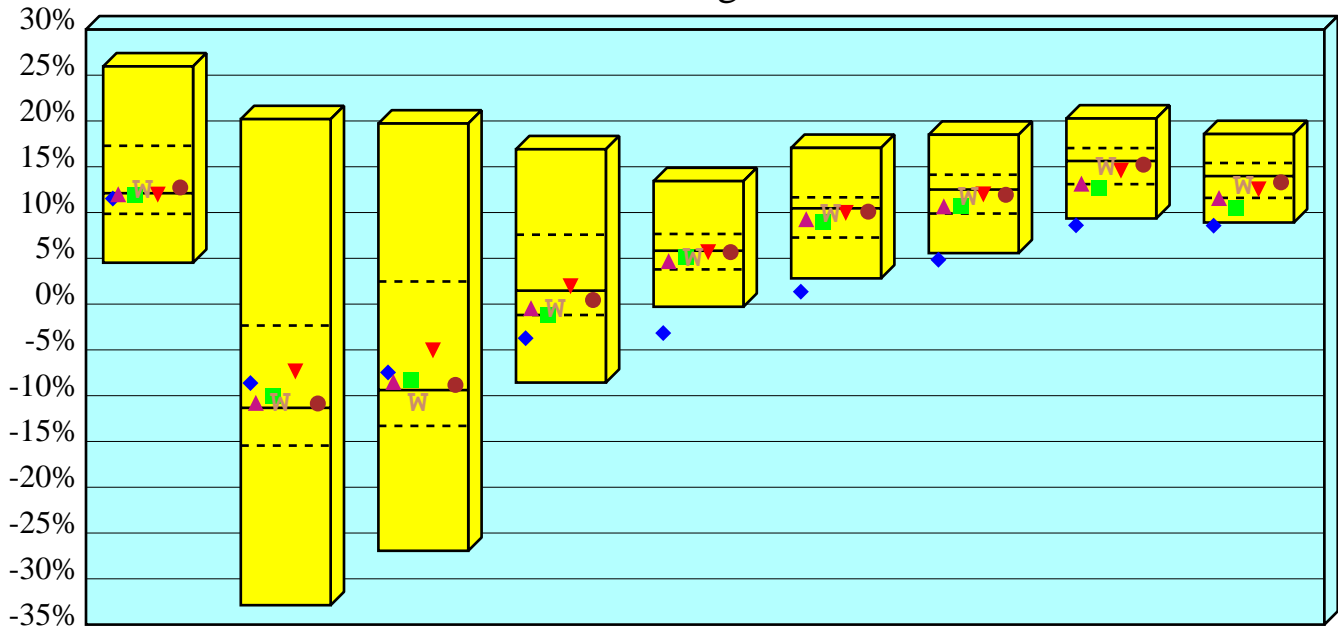
	Year 12/01	Year 12/00	Year 12/99	Year 12/98	Year 12/97	Year 12/96	Year 12/95	Year 12/94
High	21.31	28.20	56.99	42.76	38.84	30.91	45.80	6.48
1st Qt	2.15	9.98	27.61	28.74	33.14	24.06	37.76	1.93
Median	-9.69	-3.55	20.11	18.71	28.82	21.93	34.82	0.24
3rd Qt	-15.03	-9.62	7.04	6.96	23.45	18.52	29.93	-2.04
Low	-32.89	-24.54	-4.40	-8.29	11.71	10.45	20.07	-7.19
<b>◆ HPRS Domestic Equity</b>								
Return	-8.74	-6.41	4.11	-1.59	21.54	24.10	34.02	8.19
Rank	47	56	80	86	80	24	54	3
<b>■ PERS Domestic Equity</b>								
Return	-10.15	-6.55	14.64	26.33	25.41	19.84	24.95	-3.12
Rank	50	57	61	36	67	66	89	83
<b>▼ OP&amp;F Domestic Equity</b>								
Return	-7.47	-2.81	17.41	17.57	28.81	22.54	31.38	-0.95
Rank	43	47	55	52	50	44	68	64
<b>● SERS Domestic Equity</b>								
Return	-10.97	-6.87	21.81	22.96	29.59	21.48	36.94	0.61
Rank	52	57	36	42	46	53	35	46
<b>▲ STRS Domestic Equity</b>								
Return	-10.90	-6.28	17.75	21.64	29.58	17.81	29.17	1.08
Rank	51	56	54	44	46	78	78	40
<b>W Wilshire 5000</b>								
Return	-10.96	-10.87	23.56	23.45	31.28	21.20	36.47	-0.06
Rank	52	78	31	41	37	56	40	53

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Equity Public Funds

#### Periods Ending 12/01



	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	25.96	20.20	19.72	16.91	13.43	17.06	18.50	20.27	18.57
1st Qt	17.29	-2.34	2.47	7.58	7.66	11.66	14.13	17.04	15.41
Median	12.11	-11.33	-9.39	1.47	5.83	10.46	12.51	15.63	13.98
3rd Qt	9.86	-15.45	-13.30	-1.19	3.79	7.27	9.89	13.10	11.60
Low	4.52	-32.88	-26.94	-8.57	-0.29	2.81	5.57	9.35	8.91

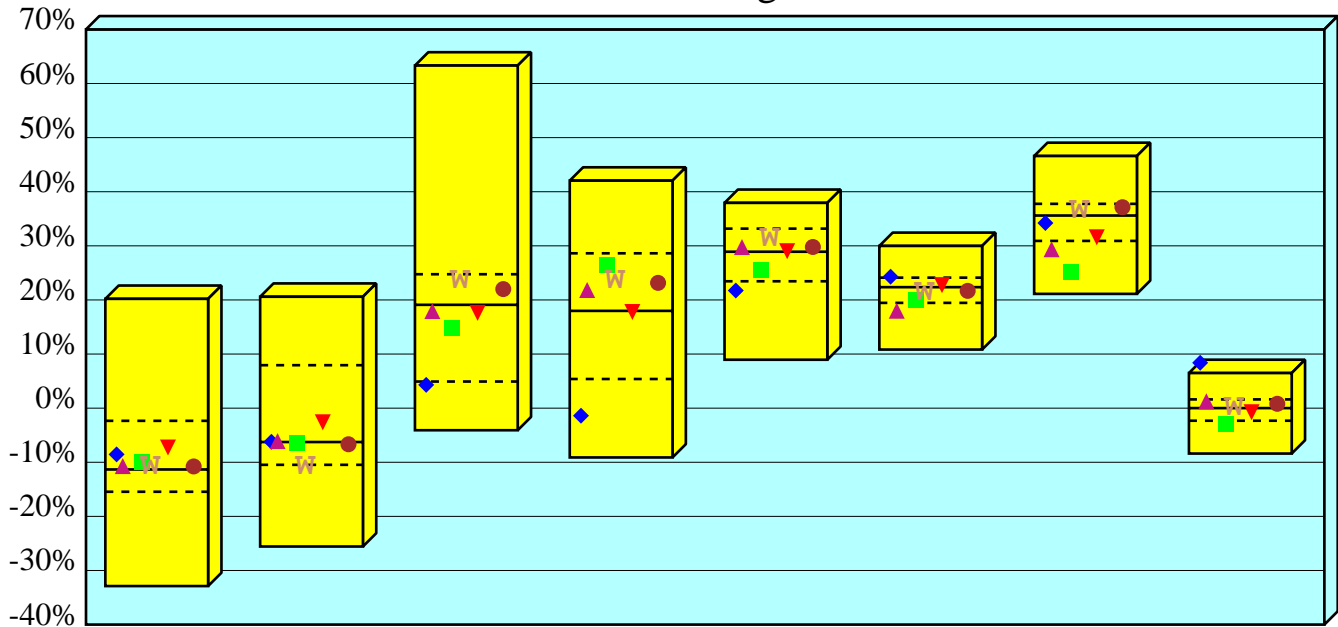
◆ HPRS Domestic Equity									
Return	11.41	-8.74	-7.58	-3.84	-3.28	1.24	4.73	8.49	8.45
Rank	53	40	44	85	99	97	97	95	97
■ PERS Domestic Equity									
Return	11.80	-10.15	-8.37	-1.26	5.01	8.81	10.57	12.52	10.43
Rank	51	44	46	76	66	64	66	81	84
▼ OP&F Domestic Equity									
Return	11.84	-7.47	-5.17	1.83	5.55	9.84	11.86	14.46	12.41
Rank	50	35	36	48	60	57	59	65	63
● SERS Domestic Equity									
Return	12.62	-10.97	-8.94	0.33	5.56	9.98	11.82	15.11	13.18
Rank	45	47	47	56	60	56	59	58	56
▲ STRS Domestic Equity									
Return	11.88	-10.90	-8.62	-0.56	4.58	9.16	10.56	13.04	11.47
Rank	50	47	47	60	69	60	66	77	75
W Wilshire 5000									
Return	12.37	-10.96	-10.92	-0.65	4.89	9.71	11.54	14.81	12.83
Rank	48	47	69	61	68	57	59	61	61

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Equity Public Funds

#### Years Ending



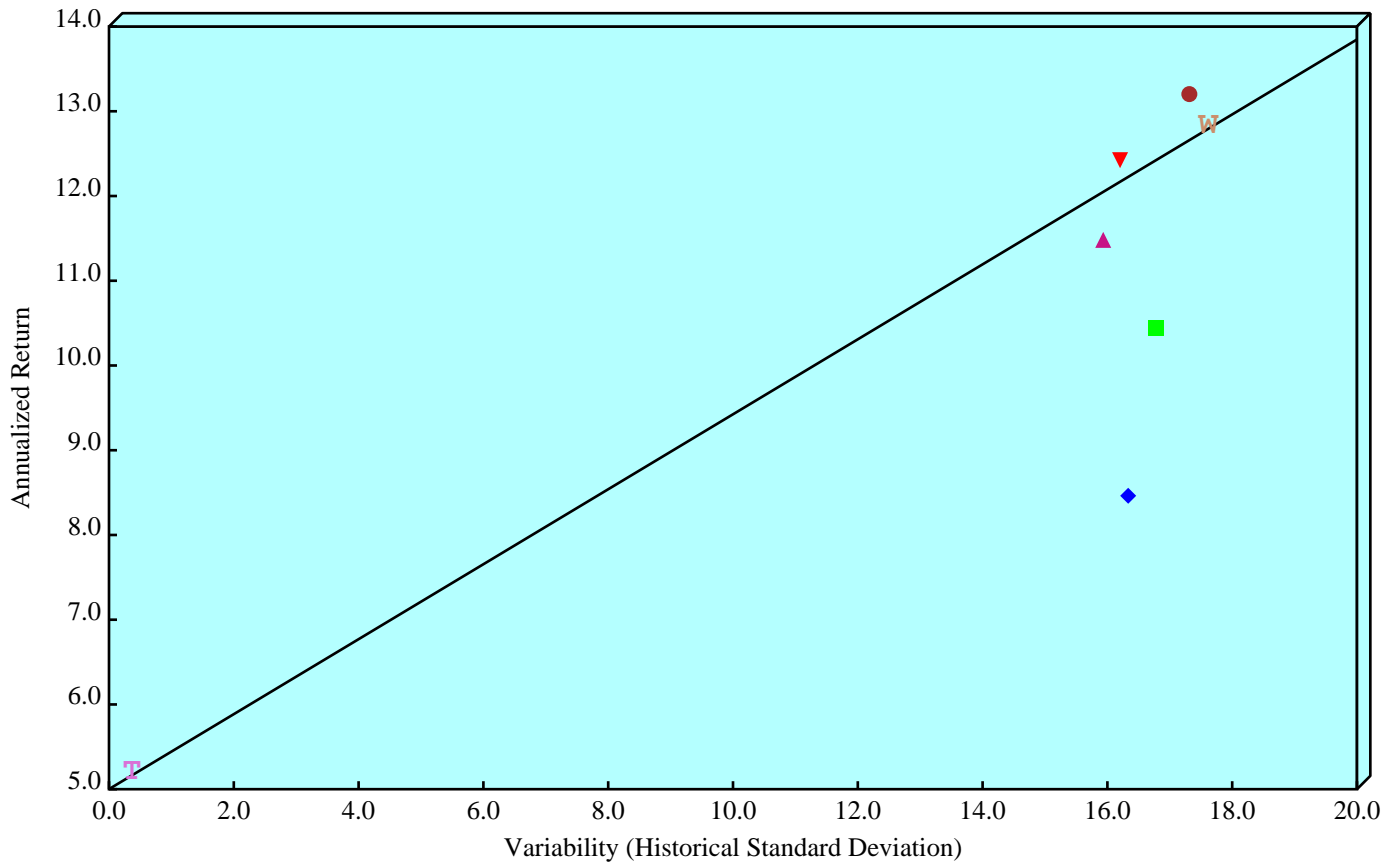
	Year 12/01	Year 12/00	Year 12/99	Year 12/98	Year 12/97	Year 12/96	Year 12/95	Year 12/94
High	20.20	20.59	63.32	42.05	37.94	29.98	46.60	6.49
1st Qt	-2.34	7.94	24.75	28.62	33.18	24.12	37.76	1.62
Median	-11.33	-6.26	19.10	17.98	28.91	22.36	35.60	0.01
3rd Qt	-15.45	-10.47	4.92	5.39	23.45	19.46	30.91	-2.32
Low	-32.88	-25.57	-4.08	-9.11	8.95	10.83	21.12	-8.39
<b>◆ HPRS Domestic Equity</b>								
Return	-8.74	-6.41	4.11	-1.59	21.54	24.10	34.02	8.19
Rank	40	50	78	85	80	25	59	3
<b>■ PERS Domestic Equity</b>								
Return	-10.15	-6.55	14.64	26.33	25.41	19.84	24.95	-3.12
Rank	44	51	59	34	66	71	90	82
<b>▼ OP&amp;F Domestic Equity</b>								
Return	-7.47	-2.81	17.41	17.57	28.81	22.54	31.38	-0.95
Rank	35	42	54	51	51	47	72	61
<b>● SERS Domestic Equity</b>								
Return	-10.97	-6.87	21.81	22.96	29.59	21.48	36.94	0.61
Rank	47	52	33	41	44	59	38	44
<b>▲ STRS Domestic Equity</b>								
Return	-10.90	-6.28	17.75	21.64	29.58	17.81	29.17	1.08
Rank	47	50	53	43	45	82	80	39
<b>W Wilshire 5000</b>								
Return	-10.96	-10.87	23.56	23.45	31.28	21.20	36.47	-0.06
Rank	47	76	27	39	36	61	42	50



# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Equity Return Market Line Analysis

Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	8.45	16.44	3.25	0.20
■ PERS	10.43	16.88	5.23	0.31
▼ OP&F	12.41	16.31	7.21	0.44
● SERS	13.19	17.42	7.98	0.46
▲ STRS	11.47	16.04	6.27	0.39
W Wilshire 5000	12.83	17.70	7.63	0.43
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

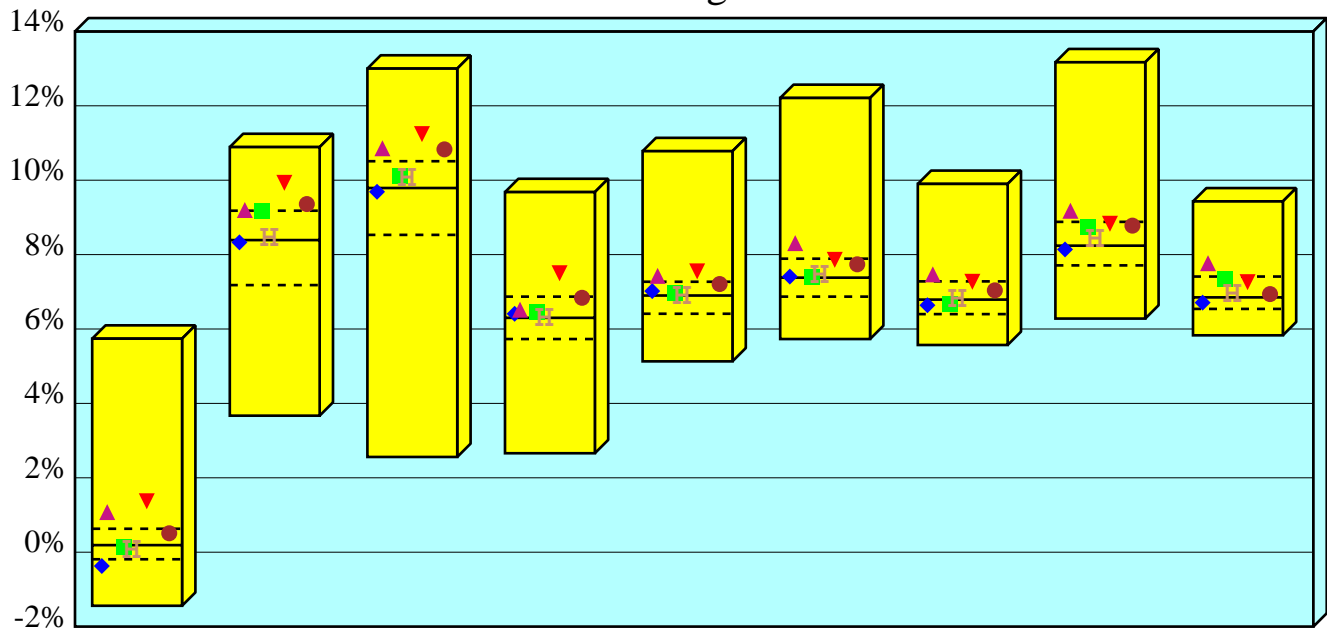
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Fixed Income Portfolios

#### Periods Ending 12/01



	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	5.74	10.89	13.00	9.68	10.78	12.21	9.90	13.17	9.43
1st Qt	0.63	9.18	10.51	6.87	7.27	7.89	7.28	8.88	7.41
Median	0.19	8.39	9.79	6.30	6.90	7.38	6.79	8.24	6.85
3rd Qt	-0.19	7.18	8.53	5.73	6.41	6.87	6.40	7.71	6.54
Low	-1.44	3.67	2.56	2.66	5.13	5.73	5.57	6.28	5.83

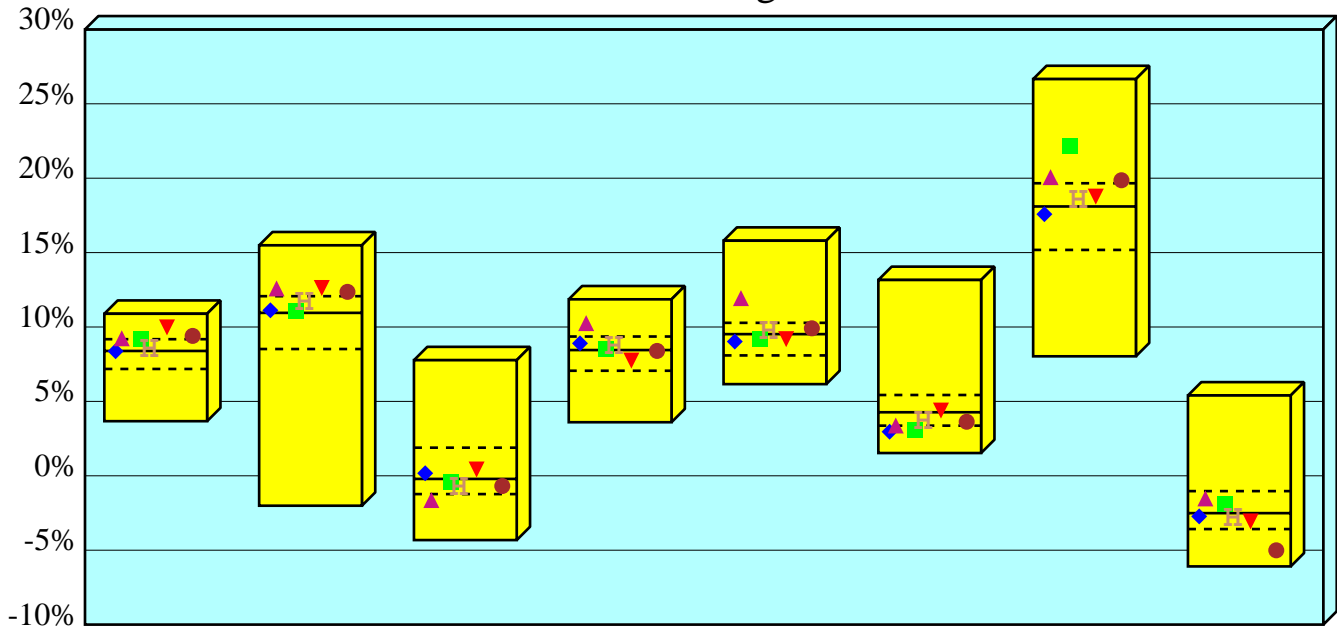
◆ HPRS Domestic Fixed Income									
Return	-0.40	8.30	9.66	6.38	6.99	7.38	6.61	8.11	6.68
Rank	81	53	54	44	42	50	67	59	63
■ PERS Domestic Fixed Income									
Return	0.10	9.15	10.09	6.44	6.95	7.37	6.63	8.72	7.32
Rank	59	25	38	42	46	50	65	28	27
▼ OP&F Domestic Fixed Income									
Return	1.34	9.90	11.21	7.47	7.52	7.83	7.24	8.80	7.23
Rank	14	10	9	9	16	27	25	27	31
● SERS Domestic Fixed Income									
Return	0.48	9.33	10.80	6.81	7.18	7.71	7.01	8.75	6.91
Rank	32	21	14	27	28	32	32	28	46
▲ STRS Domestic Fixed Income									
Return	1.05	9.17	10.83	6.49	7.40	8.28	7.44	9.15	7.74
Rank	17	25	12	39	19	15	20	19	13
⊞ LB Aggregate									
Return	0.04	8.43	10.02	6.28	6.87	7.43	6.78	8.38	6.90
Rank	64	48	42	52	53	46	50	42	46

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Fixed Income Portfolios

#### Years Ending



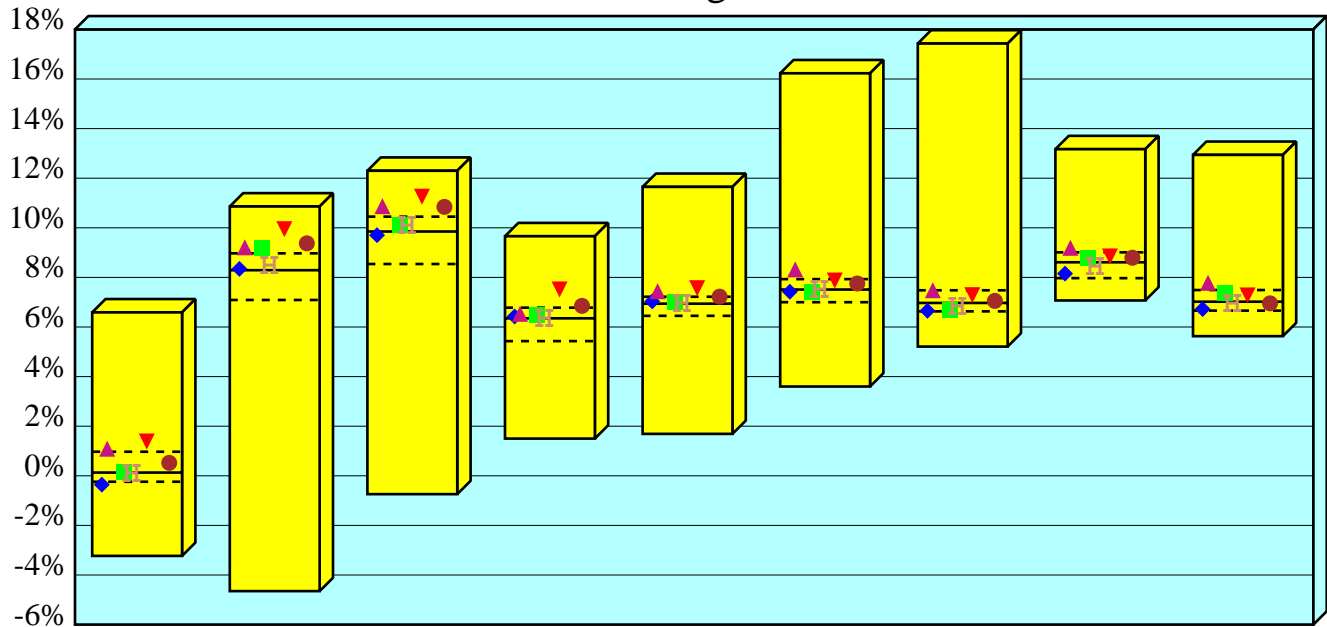
	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	10.89	15.49	7.77	11.86	15.80	13.16	26.66	5.40
1st Qt	9.18	12.07	1.89	9.36	10.28	5.43	19.66	-1.03
Median	8.39	10.95	-0.21	8.45	9.52	4.27	18.10	-2.51
3rd Qt	7.18	8.52	-1.23	7.06	8.09	3.37	15.18	-3.58
Low	3.67	-2.01	-4.32	3.60	6.16	1.53	8.03	-6.09
<b>◆</b> HPRS Domestic Fixed Income								
Return	8.30	11.05	0.10	8.83	8.95	2.89	17.51	-2.80
Rank	53	48	43	37	62	83	56	57
<b>■</b> PERS Domestic Fixed Income								
Return	9.15	11.03	-0.50	8.48	9.09	3.01	22.10	-1.98
Rank	25	48	57	48	60	81	12	39
<b>▼</b> OP&F Domestic Fixed Income								
Return	9.90	12.55	0.35	7.67	9.11	4.31	18.69	-3.14
Rank	10	14	39	65	59	49	40	63
<b>●</b> SERS Domestic Fixed Income								
Return	9.33	12.29	-0.76	8.32	9.84	3.56	19.79	-5.08
Rank	21	18	65	53	39	69	23	91
<b>▲</b> STRS Domestic Fixed Income								
Return	9.17	12.52	-1.70	10.19	11.87	3.31	20.00	-1.59
Rank	25	15	80	11	12	76	19	30
<b>H</b> LB Aggregate								
Return	8.43	11.63	-0.83	8.67	9.68	3.61	18.48	-2.92
Rank	48	36	67	43	45	67	43	59

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Fixed Income Public Funds

#### Periods Ending 12/01



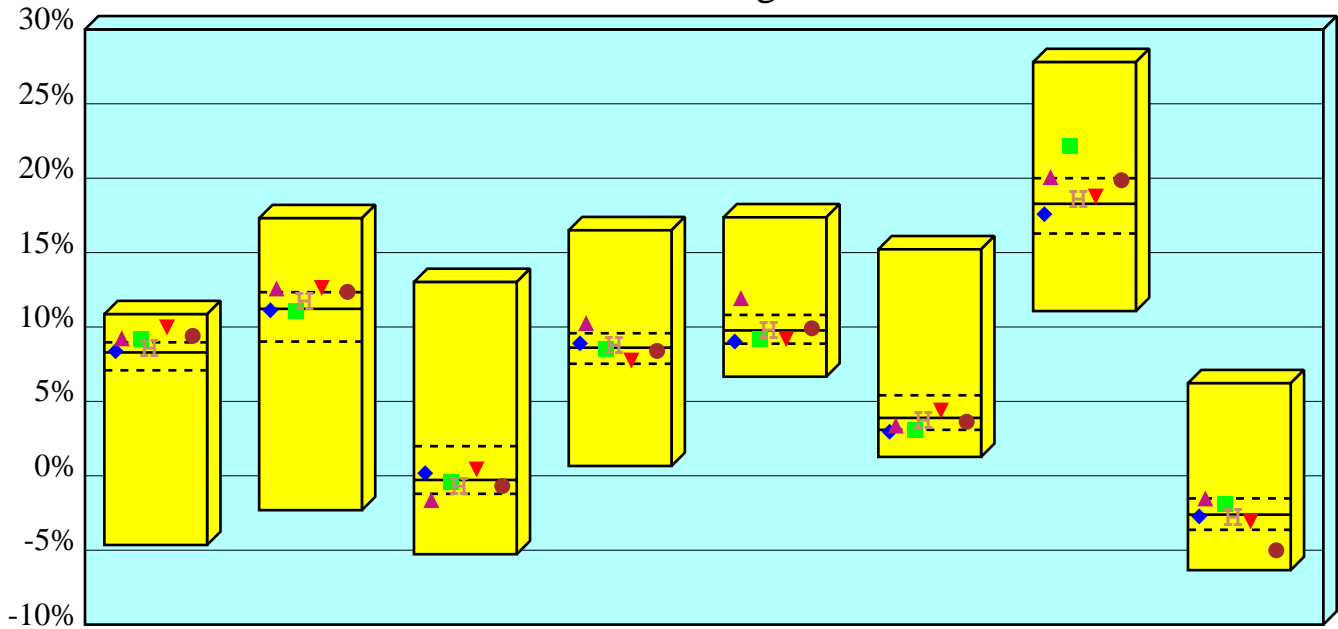
	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	6.59	10.86	12.30	9.66	11.65	16.23	17.43	13.17	12.94
1st Qt	0.97	8.97	10.45	6.78	7.22	7.93	7.48	9.01	7.49
Median	0.13	8.29	9.85	6.35	6.94	7.51	6.97	8.61	7.02
3rd Qt	-0.24	7.09	8.54	5.43	6.45	7.00	6.63	7.97	6.66
Low	-3.23	-4.65	-0.74	1.50	1.69	3.60	5.21	7.07	5.63
<b>◆ HPRS Domestic Fixed Income</b>									
Return	-0.40	8.30	9.66	6.38	6.99	7.38	6.61	8.11	6.68
Rank	80	49	55	48	43	58	75	70	73
<b>■ PERS Domestic Fixed Income</b>									
Return	0.10	9.15	10.09	6.44	6.95	7.37	6.63	8.72	7.32
Rank	55	20	41	45	48	58	75	36	32
<b>▼ OP&amp;F Domestic Fixed Income</b>									
Return	1.34	9.90	11.21	7.47	7.52	7.83	7.24	8.80	7.23
Rank	22	9	8	7	13	28	35	33	38
<b>● SERS Domestic Fixed Income</b>									
Return	0.48	9.33	10.80	6.81	7.18	7.71	7.01	8.75	6.91
Rank	34	18	15	22	26	34	47	36	53
<b>▲ STRS Domestic Fixed Income</b>									
Return	1.05	9.17	10.83	6.49	7.40	8.28	7.44	9.15	7.74
Rank	24	20	15	40	15	19	25	23	17
<b>H LB Aggregate</b>									
Return	0.04	8.43	10.02	6.28	6.87	7.43	6.78	8.38	6.90
Rank	62	45	45	52	52	57	64	60	53

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Fixed Income Public Funds

#### Years Ending

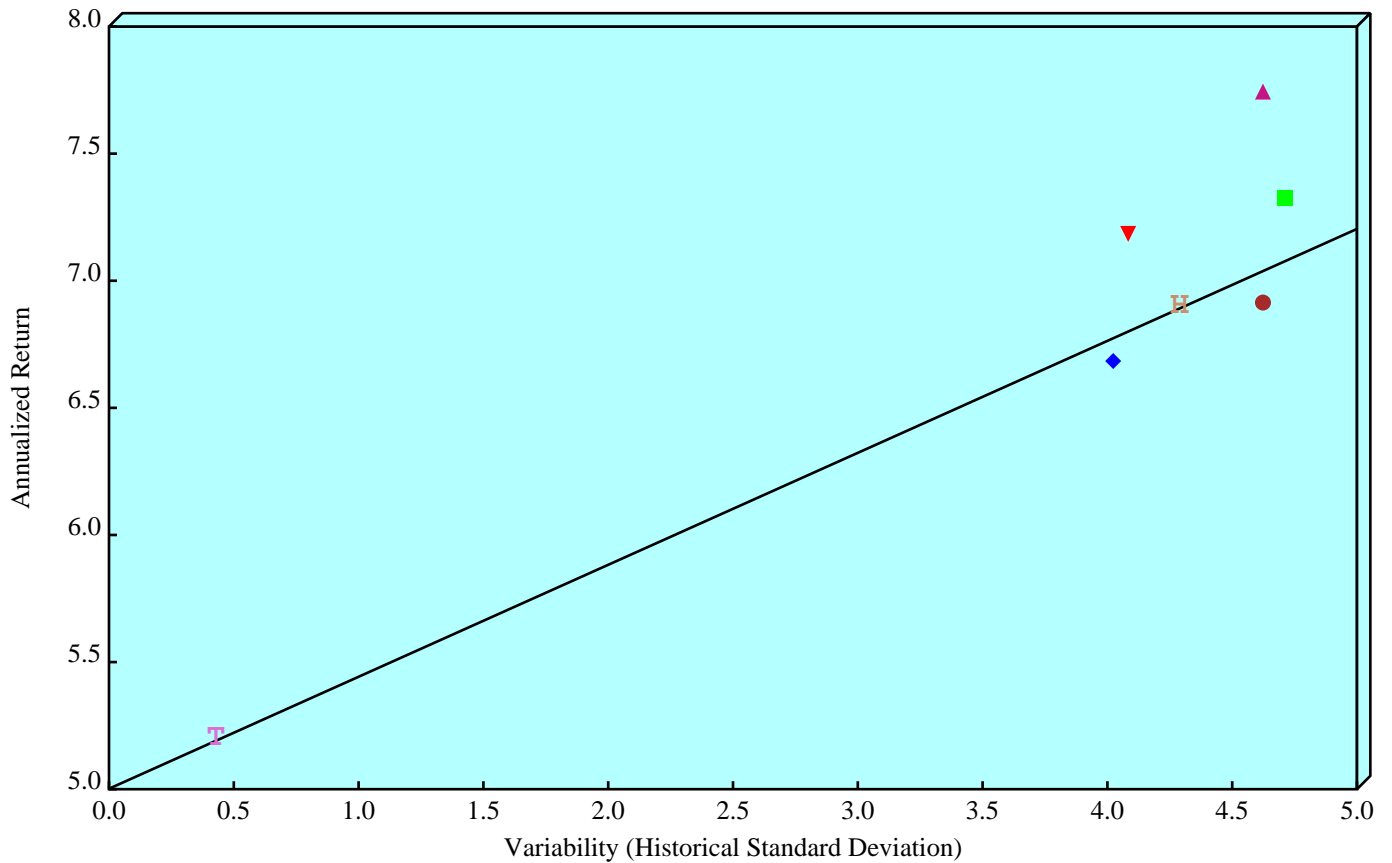


	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	10.86	17.31	13.02	16.50	17.37	15.22	27.80	6.22
1st Qt	8.97	12.34	1.99	9.58	10.81	5.41	20.00	-1.52
Median	8.29	11.22	-0.28	8.61	9.77	3.89	18.28	-2.61
3rd Qt	7.09	9.02	-1.21	7.53	8.88	3.09	16.28	-3.63
Low	-4.65	-2.31	-5.27	0.66	6.66	1.27	11.07	-6.34
<b>◆ HPRS Domestic Fixed Income</b>								
Return	8.30	11.05	0.10	8.83	8.95	2.89	17.51	-2.80
Rank	49	51	43	44	73	77	63	56
<b>■ PERS Domestic Fixed Income</b>								
Return	9.15	11.03	-0.50	8.48	9.09	3.01	22.10	-1.98
Rank	20	52	54	53	71	76	16	37
<b>▼ OP&amp;F Domestic Fixed Income</b>								
Return	9.90	12.55	0.35	7.67	9.11	4.31	18.69	-3.14
Rank	9	21	39	72	70	40	41	63
<b>● SERS Domestic Fixed Income</b>								
Return	9.33	12.29	-0.76	8.32	9.84	3.56	19.79	-5.08
Rank	18	26	63	59	47	62	27	90
<b>▲ STRS Domestic Fixed Income</b>								
Return	9.17	12.52	-1.70	10.19	11.87	3.31	20.00	-1.59
Rank	20	22	80	15	18	71	25	26
<b>H LB Aggregate</b>								
Return	8.43	11.63	-0.83	8.67	9.68	3.61	18.48	-2.92
Rank	45	45	65	48	53	62	44	60

# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Fixed Income Return Market Line Analysis

Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	6.68	4.05	1.48	0.36
■ PERS	7.32	4.74	2.11	0.45
▼ OP&F	7.18	4.11	1.98	0.48
● SERS	6.91	4.65	1.71	0.37
▲ STRS	7.74	4.65	2.54	0.55
■ LB Aggregate	6.90	4.31	1.69	0.39
■ 91-Day Treasury Bill	5.20	0.45	0.00	0.00

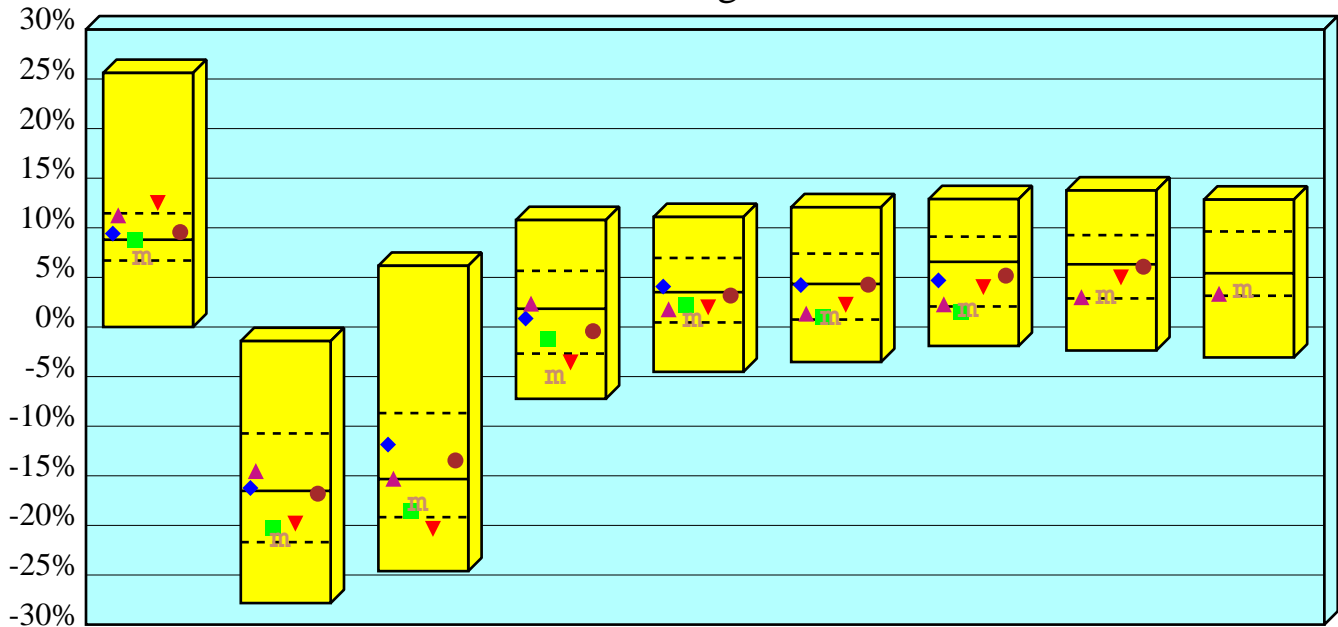
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of International Equity Portfolios

#### Periods Ending 12/01



	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	25.61	-1.42	6.17	10.78	11.09	12.07	12.89	13.76	12.84
1st Qt	11.46	-10.73	-8.68	5.66	6.96	7.40	9.11	9.26	9.63
Median	8.80	-16.52	-15.33	1.84	3.51	4.34	6.57	6.32	5.42
3rd Qt	6.70	-21.69	-19.17	-2.68	0.46	0.75	2.07	2.88	3.15
Low	-0.00	-27.83	-24.61	-7.24	-4.52	-3.53	-1.91	-2.37	-3.07

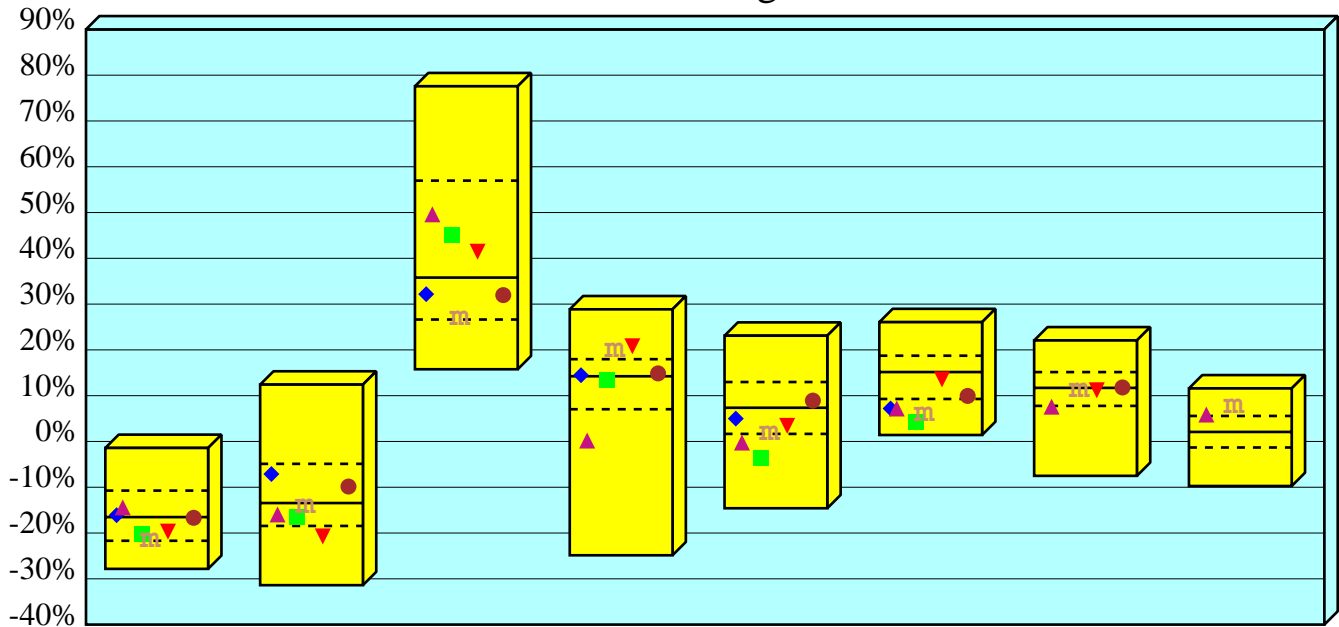
◆ HPRS Intn'l Equity									
Return	9.31	-16.34	-11.96	0.75	3.97	4.12	4.59		
Rank	44	49	32	58	43	50	57		
■ PERS Intn'l Equity									
Return	8.70	-20.40	-18.61	-1.36	2.10	0.86	1.37		
Rank	50	70	71	70	58	73	83		
▼ OP&F Intn'l Equity									
Return	12.39	-19.93	-20.46	-3.68	1.87	2.13	3.91	4.89	
Rank	20	69	83	80	58	60	66	59	
● SERS Intn'l Equity									
Return	9.46	-16.91	-13.56	-0.53	3.06	4.16	5.07	5.97	
Rank	43	52	42	67	53	50	55	53	
▲ STRS Intn'l Equity									
Return	11.15	-14.63	-15.40	2.25	1.68	1.24	2.18	2.90	3.24
Rank	27	44	50	48	60	68	72	73	71
■ MSCI EAFE (Net)									
Return	6.97	-21.45	-17.88	-5.04	0.67	0.89	1.73	3.04	3.62
Rank	70	73	61	89	70	73	81	73	68

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of International Equity Portfolios

#### Years Ending



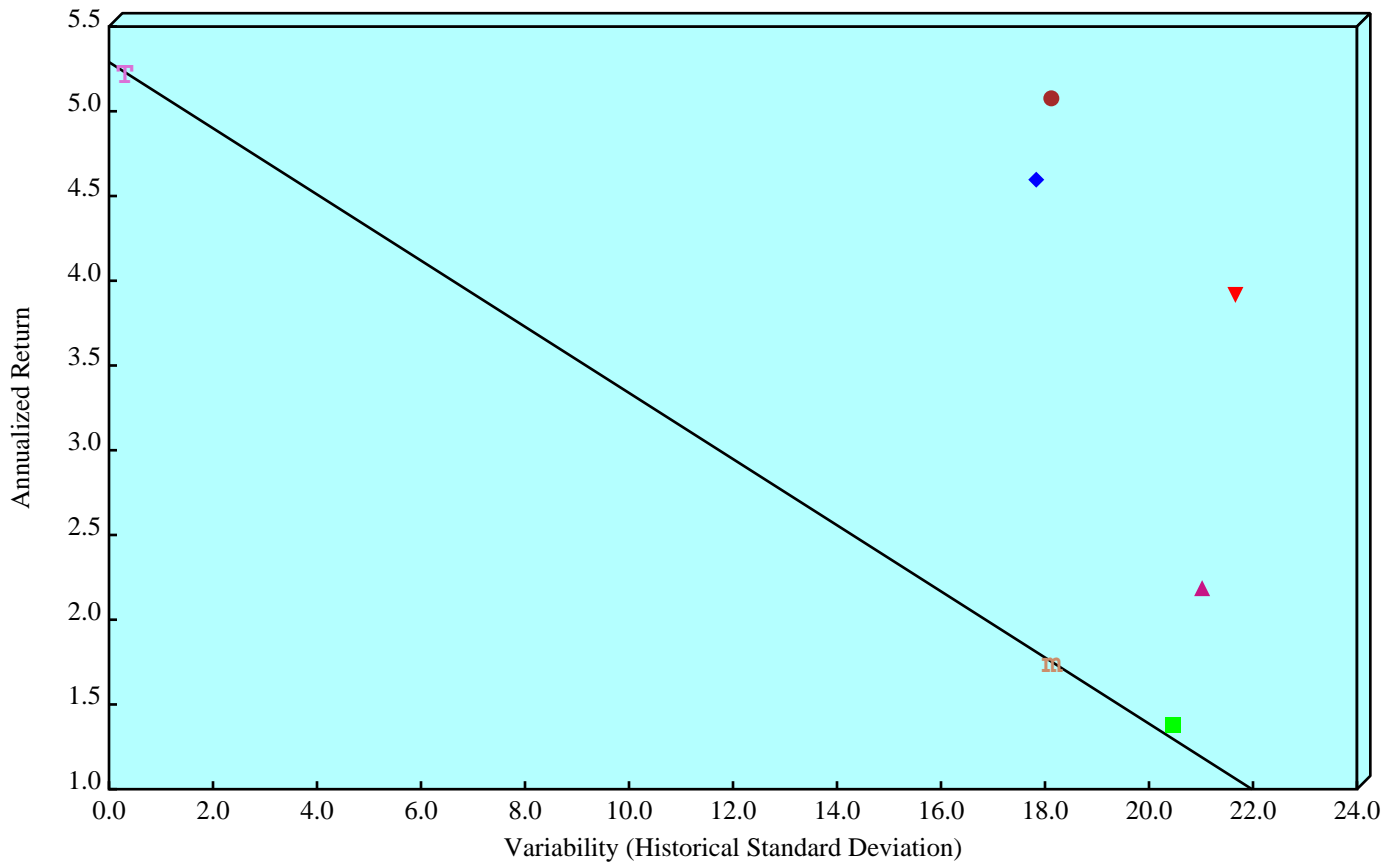
	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	-1.42	12.42	77.58	28.86	23.10	26.06	22.07	11.59
1st Qt	-10.73	-4.89	56.97	17.97	12.98	18.73	15.15	5.57
Median	-16.52	-13.45	35.79	14.24	7.36	15.16	11.70	2.08
3rd Qt	-21.69	-18.45	26.63	7.04	1.65	9.28	7.77	-1.32
Low	-27.83	-31.39	15.77	-24.86	-14.59	1.41	-7.51	-9.73
<b>◆ HPRS Intn'l Equity</b>								
Return	-16.34	-7.35	31.94	14.24	4.76	6.96		
Rank	49	32	58	50	61	83		
<b>■ PERS Intn'l Equity</b>								
Return	-20.40	-16.77	44.85	13.23	-3.94	3.94		
Rank	70	63	38	55	88	92		
<b>▼ OP&amp;F Intn'l Equity</b>								
Return	-19.93	-20.98	41.21	20.55	3.17	13.32	10.94	
Rank	69	82	43	14	66	60	61	
<b>● SERS Intn'l Equity</b>								
Return	-16.91	-10.08	31.73	14.63	8.69	9.71	11.56	
Rank	52	42	58	47	46	73	53	
<b>▲ STRS Intn'l Equity</b>								
Return	-14.63	-16.17	49.38	-0.03	-0.47	6.97	7.37	5.65
Rank	44	60	35	83	81	83	76	24
<b>m MSCI EAFE (Net)</b>								
Return	-21.45	-14.16	26.97	19.97	1.77	6.05	11.22	7.76
Rank	73	53	72	18	73	90	56	17



# OHIO RETIREMENT STUDY COUNCIL

## Quarterly International Equity Return Market Line Analysis

Periods from 12/95 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	4.59	17.96	-0.62	-0.03
■ PERS	1.37	20.59	-3.84	-0.19
▼ OP&F	3.91	21.79	-1.30	-0.06
● SERS	5.07	18.25	-0.15	-0.01
▲ STRS	2.18	21.15	-3.04	-0.14
■ MSCI EAFE (Net)	1.73	18.24	-3.48	-0.19
■ 91-Day Treasury Bill	5.21	0.41	0.00	0.00

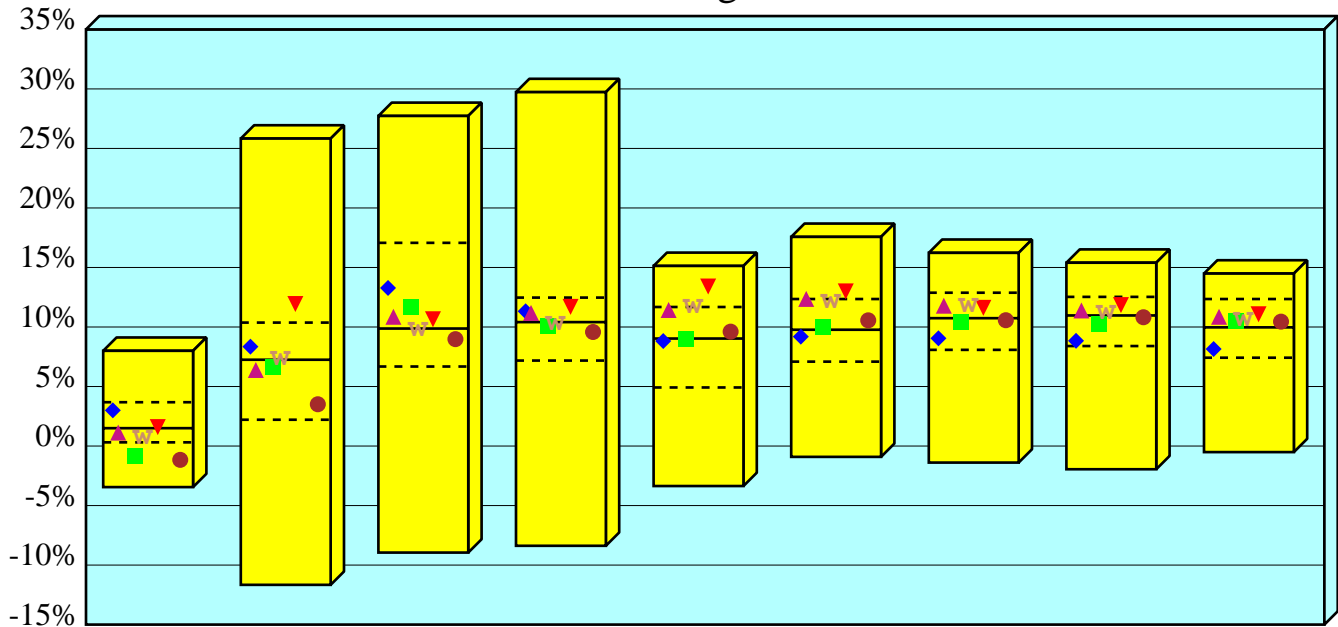
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

## Cumulative Performance Comparison

### Total Returns of Real Estate Portfolios

#### Periods Ending 12/01



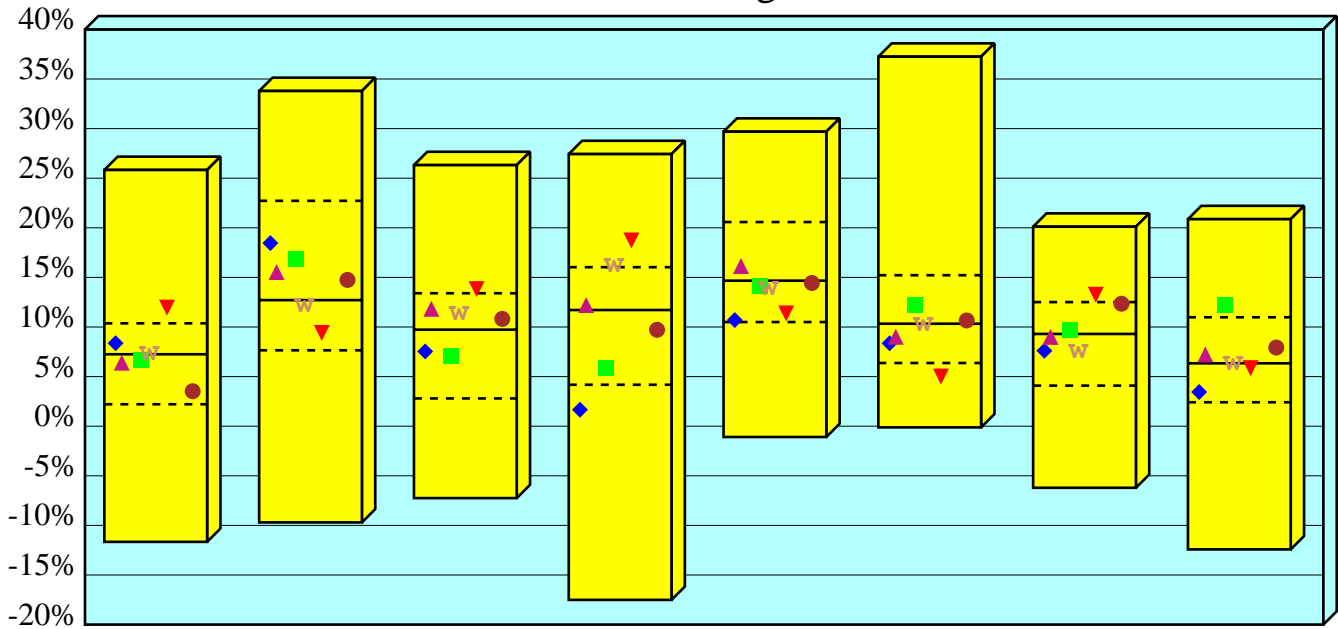
	Last Qtr	Last Year	Last 2 Years	Last 3 Years	Last 4 Years	Last 5 Years	Last 6 Years	Last 7 Years	Last 8 Years
High	8.00	25.83	27.73	29.73	15.13	17.57	16.23	15.40	14.49
1st Qt	3.68	10.37	17.07	12.47	11.68	12.35	12.88	12.53	12.35
Median	1.50	7.25	9.87	10.41	9.03	9.77	10.74	10.97	9.97
3rd Qt	0.31	2.21	6.68	7.18	4.92	7.09	8.08	8.40	7.42
Low	-3.45	-11.66	-8.95	-8.38	-3.36	-0.91	-1.39	-1.95	-0.51
<b>◆ HPRS Real Estate</b>									
Return	2.91	8.26	13.19	11.23	8.73	9.10	8.96	8.75	8.06
Rank	31	40	32	37	51	59	65	71	68
<b>■ PERS Real Estate</b>									
Return	-0.90	6.58	11.56	10.02	8.94	9.94	10.29	10.19	10.42
Rank	85	56	37	54	50	48	54	53	42
<b>▼ OP&amp;F Real Estate</b>									
Return	1.50	11.84	10.56	11.60	13.31	12.90	11.52	11.75	10.98
Rank	50	18	43	32	8	16	36	30	35
<b>● SERS Real Estate</b>									
Return	-1.25	3.42	8.89	9.49	9.52	10.47	10.48	10.73	10.36
Rank	88	70	63	60	46	44	52	53	43
<b>▲ STRS Real Estate</b>									
Return	1.04	6.30	10.77	11.09	11.34	12.27	11.70	11.30	10.77
Rank	60	56	42	38	29	26	36	41	36
<b>w NCREIF</b>									
Return	0.74	7.41	9.80	10.32	11.77	12.20	11.88	11.25	10.63
Rank	62	48	51	52	21	26	33	41	40

# OHIO RETIREMENT STUDY COUNCIL

## Consecutive Performance Comparison

### Total Returns of Real Estate Portfolios

#### Years Ending



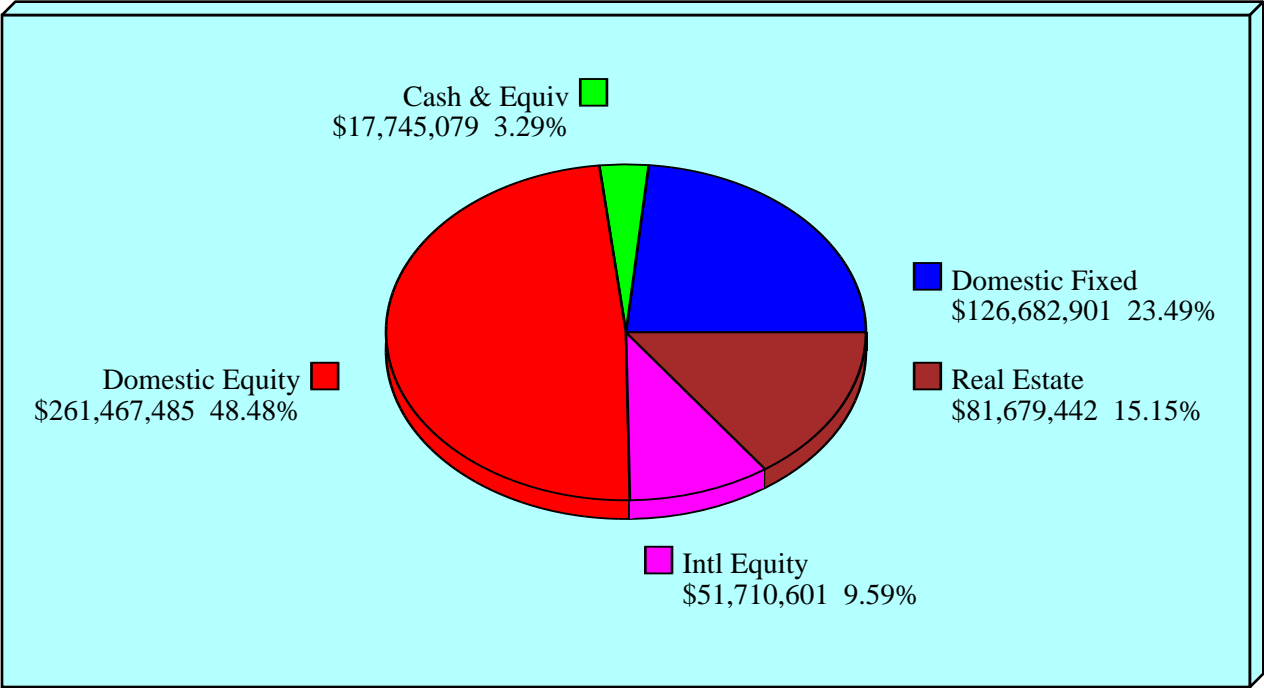
	12/01	12/00	12/99	12/98	12/97	12/96	12/95	12/94
High	25.83	33.79	26.32	27.43	29.69	37.25	20.11	20.87
1st Qt	10.37	22.72	13.40	16.03	20.58	15.22	12.51	10.98
Median	7.25	12.71	9.73	11.71	14.67	10.33	9.30	6.34
3rd Qt	2.21	7.65	2.80	4.18	10.50	6.37	4.09	2.41
Low	-11.66	-9.70	-7.25	-17.51	-1.09	-0.12	-6.21	-12.42
<b>◆ HPRS Real Estate</b>								
Return	8.26	18.35	7.43	1.55	10.59	8.25	7.50	3.34
Rank	40	30	59	79	74	63	66	70
<b>■ PERS Real Estate</b>								
Return	6.58	16.77	7.01	5.76	14.02	12.08	9.56	12.09
Rank	56	35	61	72	53	38	47	18
<b>▼ OP&amp;F Real Estate</b>								
Return	11.84	9.29	13.71	18.61	11.26	4.89	13.14	5.74
Rank	18	69	24	15	68	82	23	53
<b>● SERS Real Estate</b>								
Return	3.42	14.64	10.71	9.61	14.33	10.55	12.24	7.82
Rank	70	40	43	61	52	48	27	40
<b>▲ STRS Real Estate</b>								
Return	6.30	15.43	11.73	12.11	16.04	8.91	8.90	7.12
Rank	56	37	35	46	45	56	54	43
<b>w NCREIF</b>								
Return	7.41	12.25	11.36	16.24	13.91	10.31	7.54	6.39
Rank	48	53	41	24	53	50	65	49

# OHIO RETIREMENT STUDY COUNCIL

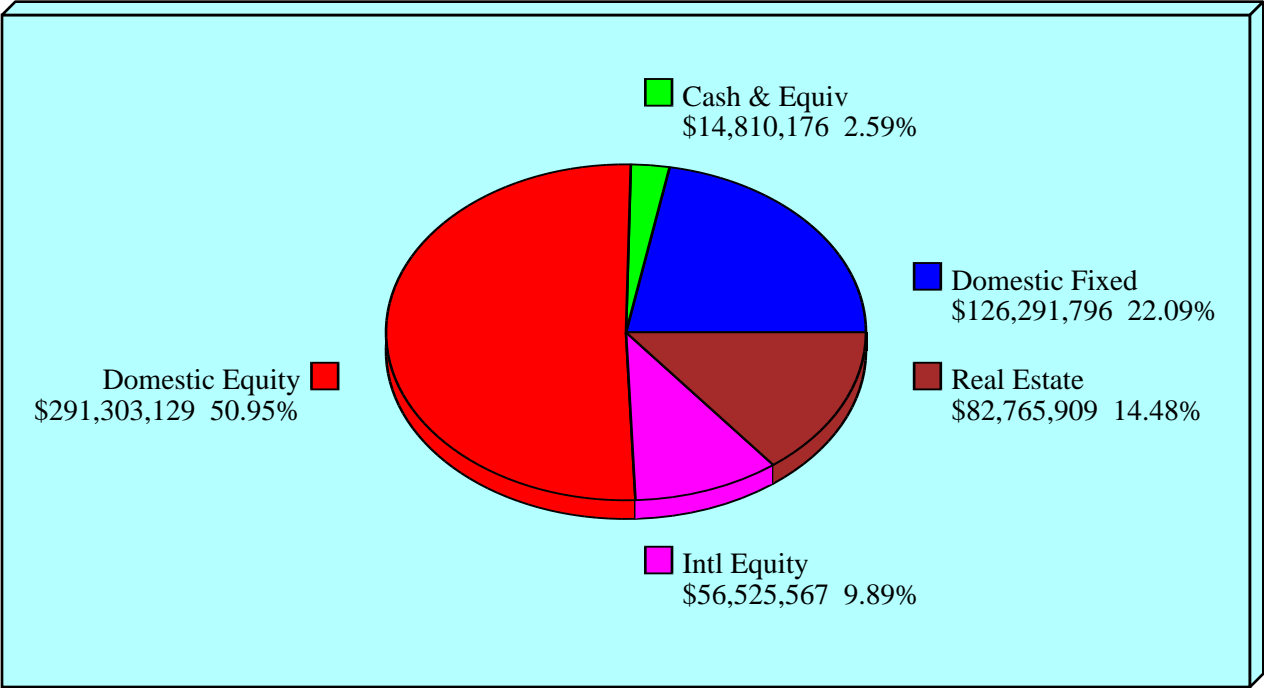
## Asset Allocation

### HPRS

September 30, 2001      \$539,285,508



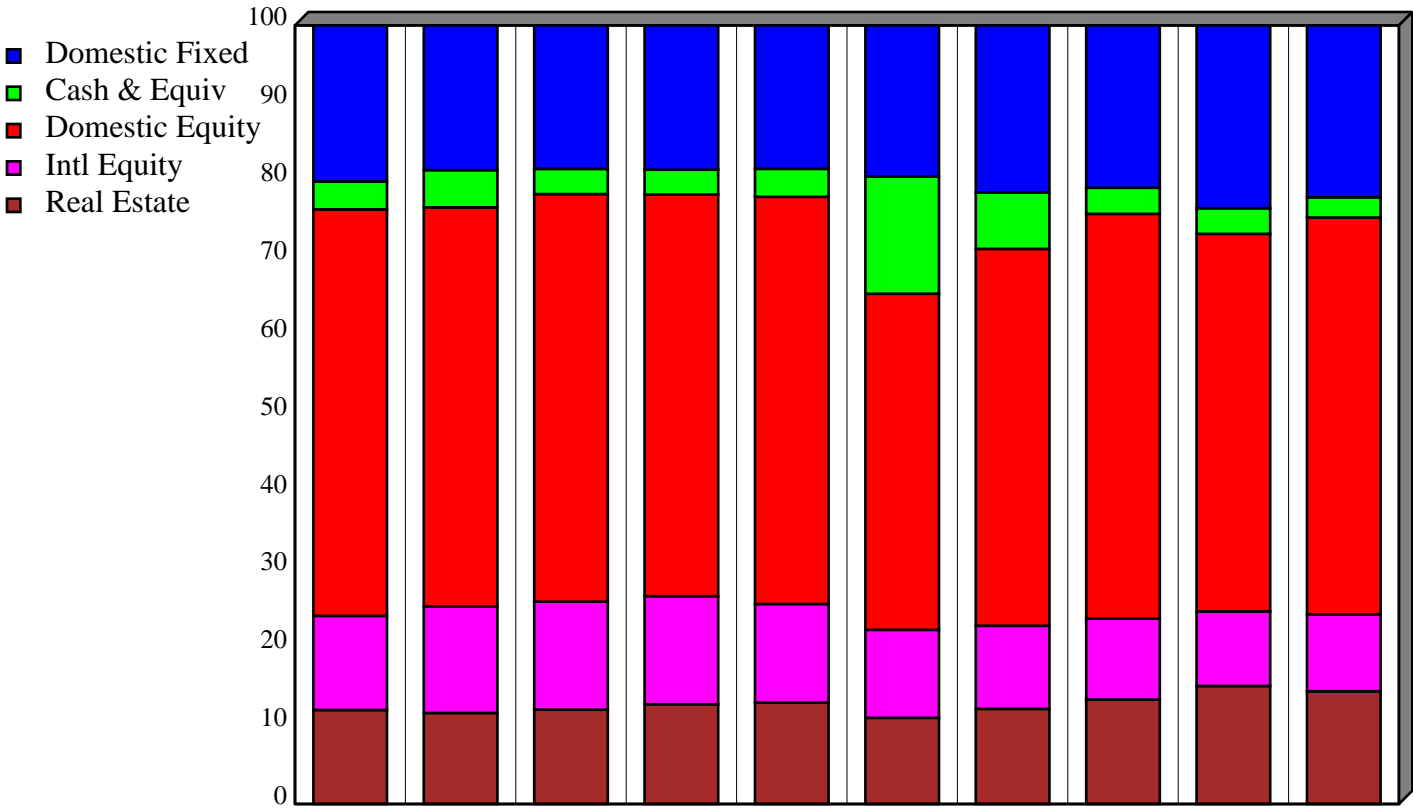
December 31, 2001      \$571,696,577



# OHIO RETIREMENT STUDY COUNCIL

## Asset Allocation

### HPRS



	9/99	12/99	3/00	6/00	9/00	12/00	3/01	6/01	9/01	12/01
Domestic Fixed %	20.0	18.6	18.4	18.5	18.4	19.4	21.5	20.9	23.5	22.1
Cash & Equiv %	3.6	4.8	3.2	3.2	3.6	15.1	7.2	3.3	3.3	2.6
Domestic Equity %	52.2	51.2	52.3	51.6	52.3	43.2	48.4	52.0	48.5	51.0
Intl Equity %	12.1	13.7	13.9	13.9	12.7	11.3	10.7	10.4	9.6	9.9
Real Estate %	12.1	11.7	12.1	12.8	13.0	11.1	12.2	13.4	15.1	14.5
Total Value (\$mil)	590.3	622.9	620.7	611.5	627.2	598.3	557.3	579.4	539.3	571.7

OHIO RETIREMENT STUDY COUNCIL  
 Custom Benchmark Specification  
 HPRS  
 Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	3/94	12/95	50.00	LB Aggregate
			50.00	Standard & Poors 500
	3/96	12/97	5.00	NCREIF
			5.00	MSCI EAFE (Net)
			40.00	LB Aggregate
			50.00	Standard & Poors 500
	3/98	9/99	15.00	Russell 2000
			40.00	Standard & Poors 500
			25.00	LB Aggregate
			10.00	MSCI EAFE (Net)
			10.00	NCREIF
	12/99	12/00	20.00	Russell 2000
			40.00	Standard & Poors 500
			20.00	LB Aggregate
			10.00	MSCI EAFE (Net)
			10.00	NCREIF
	3/01	12/01	40.00	Standard & Poors 500
			20.00	Russell 2500
			20.00	LB Aggregate
			10.00	MSCI EAFE (Net)
10.00			NCREIF	

**OHIO RETIREMENT STUDY COUNCIL**  
**Performance Overview**  
**HPRS**  
**Returns for Periods Ending December 31, 2001**

	<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	6.78	-0.80	3.83	-3.24	1.17	4.37	7.01
Policy Index Return	9.07	-1.79	3.46	-3.79	3.01	9.20	10.57
Domestic Equity Return	11.41	-3.20	4.57	-8.74	-3.84	1.24	8.45
Equity Segment Median Return	12.45	-4.95	1.56	-10.43	1.81	11.00	14.08
Wilshire 5000	12.37	-5.50	1.57	-10.96	-0.65	9.71	12.83
Int'l Equity Return	9.31	-6.05	-4.93	-16.34	0.75	4.12	
Int'l Equity Segment Median Return	8.72	-6.17	-5.25	-14.58	1.78	4.67	
MSCI EAFE (Net)	6.97	-8.00	-8.96	-21.45	-5.04	0.89	3.62
Domestic Fixed Return	-0.40	4.47	5.26	8.30	6.38	7.38	6.68
Fixed Income Segment Median Return	0.08	4.69	5.22	8.55	6.33	7.47	6.97
LB Aggregate	0.04	4.66	5.24	8.43	6.28	7.43	6.90
Cash Return	0.50	1.67	3.20	4.67	4.95	5.20	
Real Estate Return	2.91	3.48	7.51	8.26	11.23	9.10	8.06
NCREIF	0.74	2.36	4.92	7.41	10.32	12.20	10.63

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
HPRS  
Returns for Periods Ending December 31, 2001

Policy Index

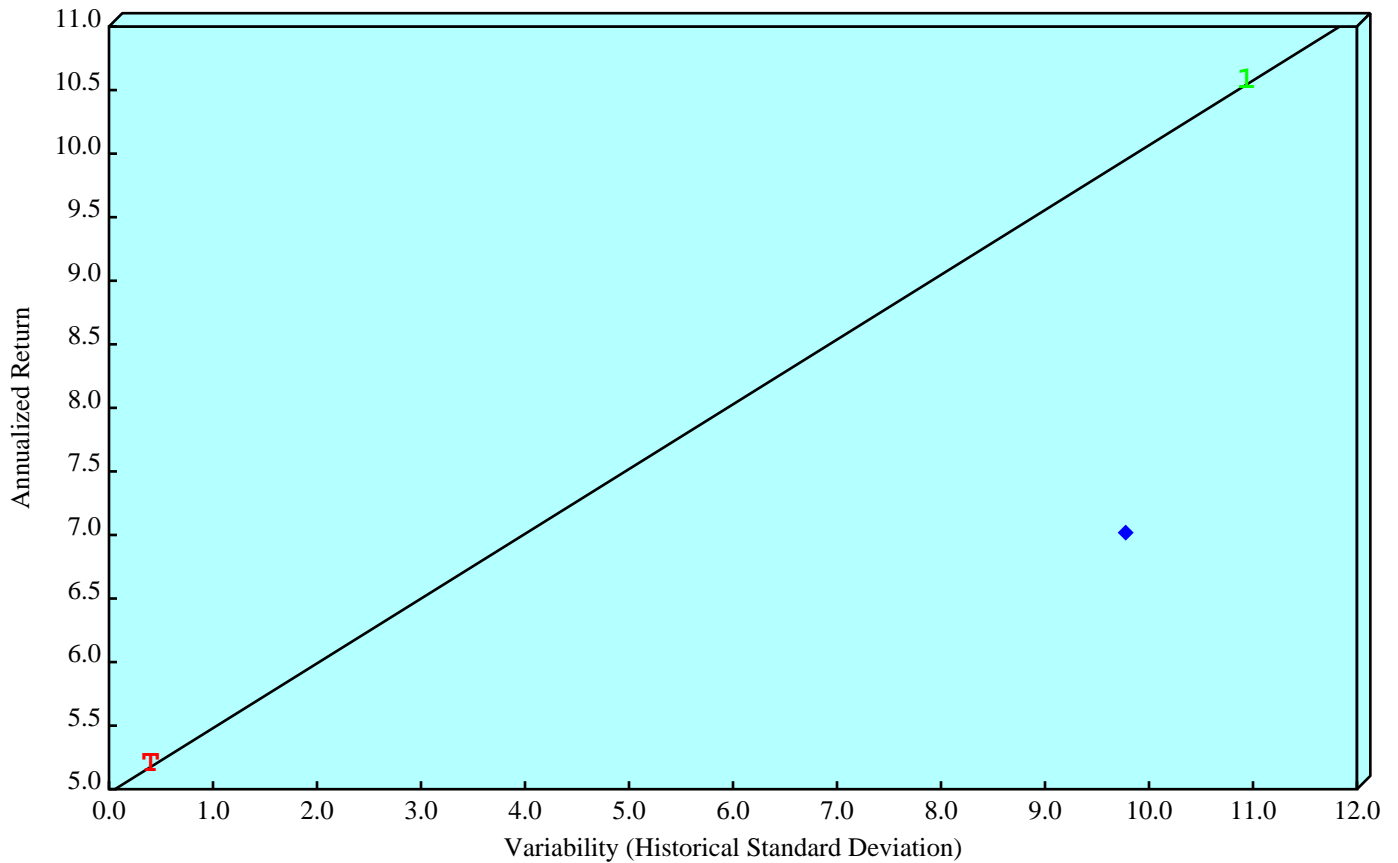
	<u>Segment</u>	<u>Percent</u>
Standard & Poors 500	Domestic Equity	40.00
Russell 2500	Domestic Equity	20.00
LB Aggregate	Domestic Fixed Income	20.00
MSCI EAFE (Net)	International Equity	10.00
NCREIF	Real Estate	10.00



# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Total Return Market Line Analysis

Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
◆ HPRS	7.01	9.84	1.81	0.18
1 Policy Index	10.57	10.99	5.36	0.49
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

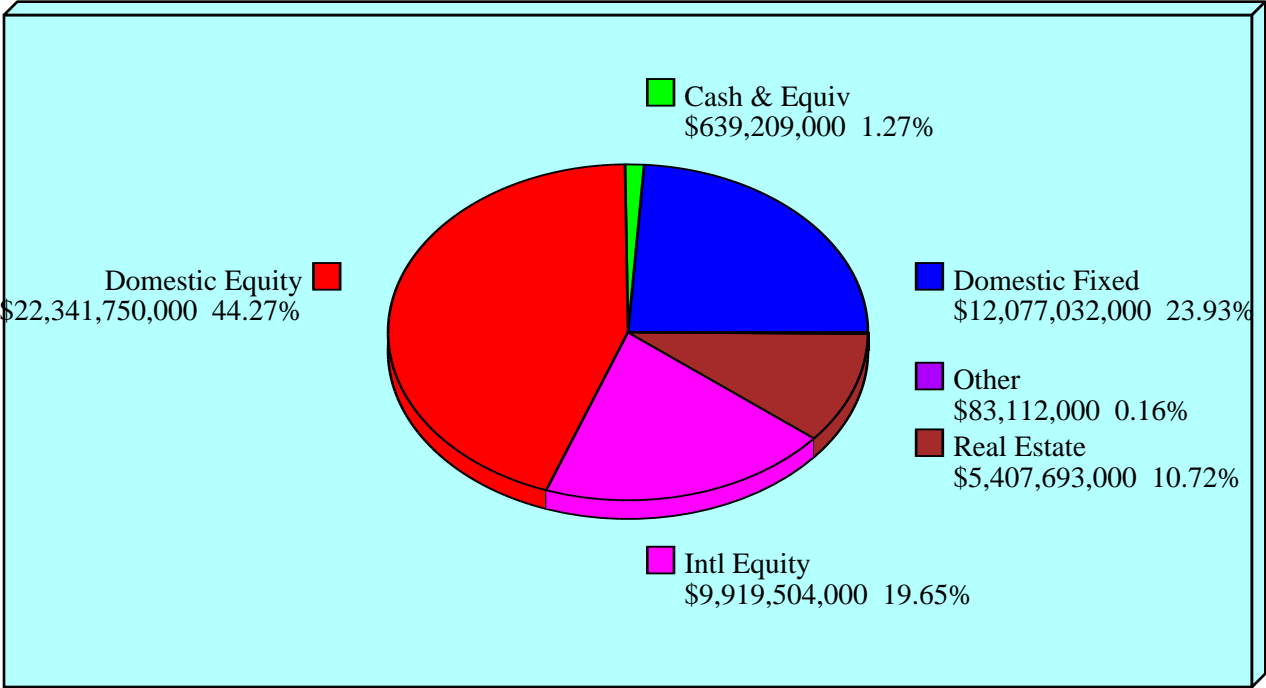
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

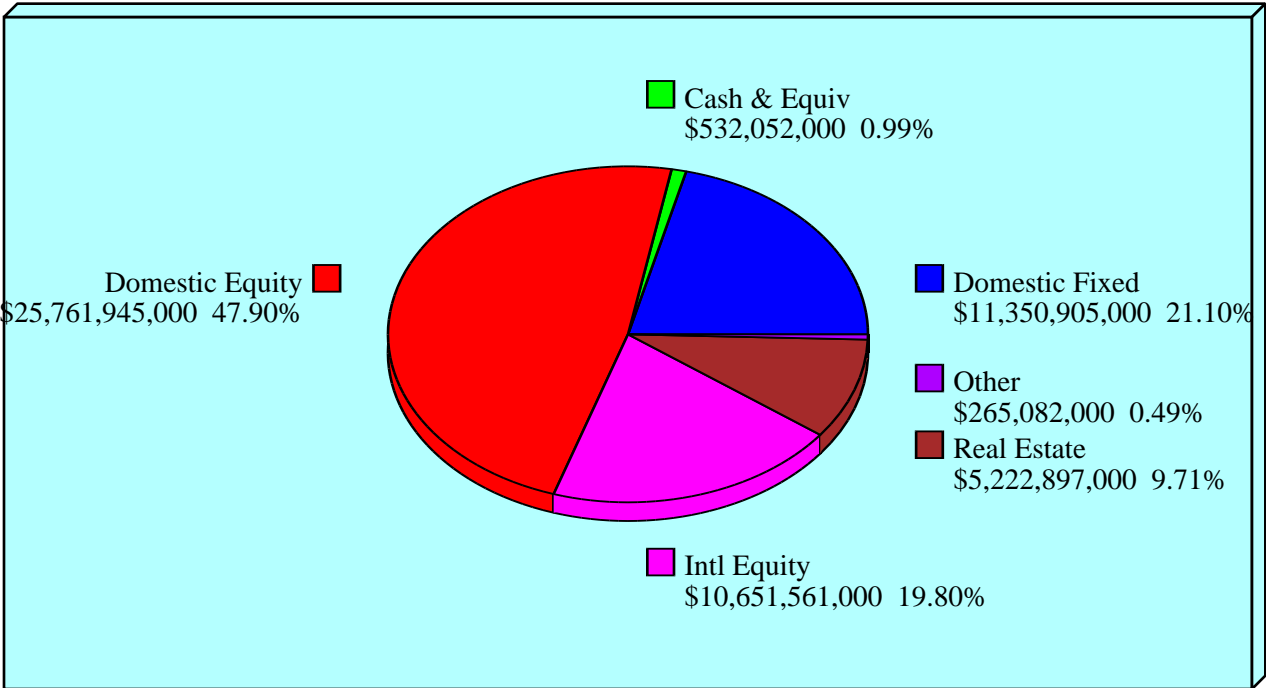
## Asset Allocation

### PERS

September 30, 2001      \$50,468,300,000



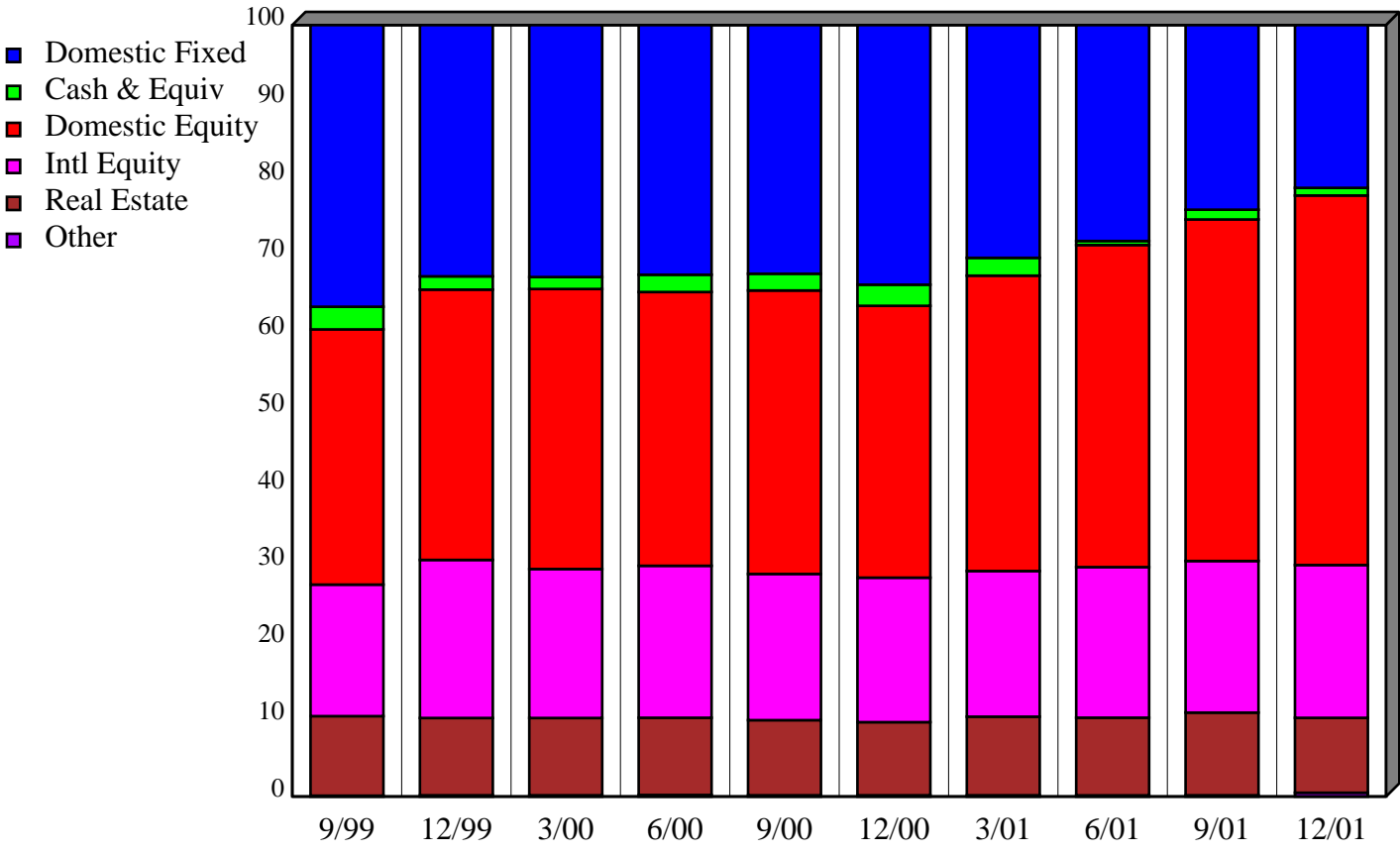
December 31, 2001      \$53,784,442,000



# OHIO RETIREMENT STUDY COUNCIL

## Asset Allocation

### PERS



	9/99	12/99	3/00	6/00	9/00	12/00	3/01	6/01	9/01	12/01
Domestic Fixed %	36.5	32.6	32.7	32.4	32.2	33.6	30.2	28.0	23.9	21.1
Cash & Equiv %	2.9	1.7	1.5	2.2	2.2	2.7	2.3	0.5	1.3	1.0
Domestic Equity %	33.1	35.0	36.3	35.5	36.7	35.2	38.3	41.8	44.3	47.9
Intl Equity %	17.0	20.5	19.3	19.7	19.0	18.7	18.9	19.5	19.7	19.8
Real Estate %	10.3	10.0	10.0	10.0	9.7	9.5	10.2	10.1	10.7	9.7
Other %	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5
Total Value (\$bil)	52.7	57.7	58.7	58.4	58.8	56.8	53.6	55.1	50.5	53.8

OHIO RETIREMENT STUDY COUNCIL  
 Custom Benchmark Specification  
 PERS  
 Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	3/94	6/95	17.00	Standard & Poors 500
			68.00	SB Broad Inv Grade
			7.00	NCREIF
			8.00	91-Day Treasury Bill
	9/95	12/95	26.00	Standard & Poors 500
			59.00	SB Broad Inv Grade
			1.00	MSCI EAFE (Net)
			8.00	NCREIF
			6.00	91-Day Treasury Bill
	3/96	12/96	23.00	Standard & Poors 500
			62.50	SB Broad Inv Grade
			2.00	MSCI EAFE (Net)
8.00			NCREIF	
3/97	12/97	4.50	91-Day Treasury Bill	
		8.00	NCREIF	
		6.00	MSCI EAFE (Net)	
		51.00	SB Broad Inv Grade	
		30.50	Standard & Poors 500	
12/98	12/98	4.50	91-Day Treasury Bill	
		4.80	NCREIF	
		1.60	NAREIT	
		1.60	Giliberto-Levy Mortgage	
		6.00	MSCI World Ex-US (Net)	
		51.00	SB Broad Inv Grade	
		30.50	Russell 3000	
3/99	6/99	1.00	91-Day Treasury Bill	
		6.60	NCREIF	
		2.20	NAREIT	
		2.20	Giliberto-Levy Mortgage	

**OHIO RETIREMENT STUDY COUNCIL**  
**Custom Benchmark Specification**  
**PERS**  
**Quarter Ending 12/31/01**

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)			7.60	MSCI World Ex-US (Net)
			45.40	SB Broad Inv Grade
			35.00	Standard & Poors 500
	6/99	6/99	1.00	91-Day Treasury Bill
			6.60	NCREIF
			2.20	NAREIT
			2.20	Giliberto-Levy Mortgage
			12.90	MSCI World Ex-US (Net)
			40.10	SB Broad Inv Grade
			35.00	Standard & Poors 500
	9/99	12/00	1.00	91-Day Treasury Bill
			6.60	NCREIF
			2.20	NAREIT
			2.20	Giliberto-Levy Mortgage
			35.00	Standard & Poors 500
			36.10	SB Broad Inv Grade
			16.90	MSCI World Ex-US (Net)
	3/01	3/01	34.30	S&P Super 1500 Index
			3.00	Russell 3000
			5.70	NCREIF
		1.90	NAREIT	
		1.90	Giliberto-Levy Mortgage	
		18.90	MSCI ACWI Ex US Index	
		2.30	91-Day Treasury Bill	
		0.20	Standard & Poors 500	
		31.80	SB Broad Inv Grade	
6/01	9/01	34.70	S&P Super 1500 Index	
		5.80	Russell 3000	
		5.58	NCREIF	
		1.86	NAREIT	
		1.86	Giliberto-Levy Mortgage	
	3/99	19.30	MSCI ACWI Ex US Index	
		1.50	91-Day Treasury Bill	
		0.20	Standard & Poors 500	
		29.20	SB Broad Inv Grade	

OHIO RETIREMENT STUDY COUNCIL  
 Custom Benchmark Specification  
 PERS  
 Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	9/01	9/01	44.70	Russell 3000
			19.70	MSCI ACWI Ex US Index
			5.46	NCREIF
			1.82	NAREIT
			1.82	Giliberto-Levy Mortgage
			0.70	91-Day Treasury Bill
			0.20	Standard & Poors 500
			25.60	SB Broad Inv Grade
	12/01	12/01	47.00	Russell 3000
			20.00	MSCI ACWI Ex US Index
			5.40	NCREIF
			1.80	NAREIT
			1.80	Giliberto-Levy Mortgage
			0.60	Standard & Poors 500
		0.40	91-Day Treasury Bill	
		23.00	SB Broad Inv Grade	

**OHIO RETIREMENT STUDY COUNCIL**  
**Performance Overview**  
**PERS**  
**Returns for Periods Ending December 31, 2001**

	<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	7.00	-1.99	1.03	-4.61	2.00	6.60	7.55
Policy Index Return	7.51	-1.70	1.39	-4.33	2.32	7.59	8.14
Domestic Equity Return	11.80	-4.75	1.60	-10.15	-1.26	8.81	10.43
Equity Segment Median Return	12.45	-4.95	1.56	-10.43	1.81	11.00	14.08
Wilshire 5000	12.37	-5.50	1.57	-10.96	-0.65	9.71	12.83
Int'l Equity Return	8.70	-7.71	-8.28	-20.40	-1.36	0.86	
Int'l Equity Segment Median Return	8.72	-6.17	-5.25	-14.58	1.78	4.67	
MSCI EAFE (Net)	6.97	-8.00	-8.96	-21.45	-5.04	0.89	3.62
Domestic Fixed Return	0.10	4.50	5.32	9.15	6.44	7.37	7.32
Fixed Income Segment Median Return	0.08	4.69	5.22	8.55	6.33	7.47	6.97
LB Aggregate	0.04	4.66	5.24	8.43	6.28	7.43	6.90
Cash Return	0.60	1.51	2.64	4.00	5.24	5.40	5.37
Real Estate Return	-0.90	-0.11	4.61	6.58	10.02	9.94	10.42
NCREIF	0.74	2.36	4.92	7.41	10.32	12.20	10.63

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
PERS  
Returns for Periods Ending December 31, 2001

Policy Index

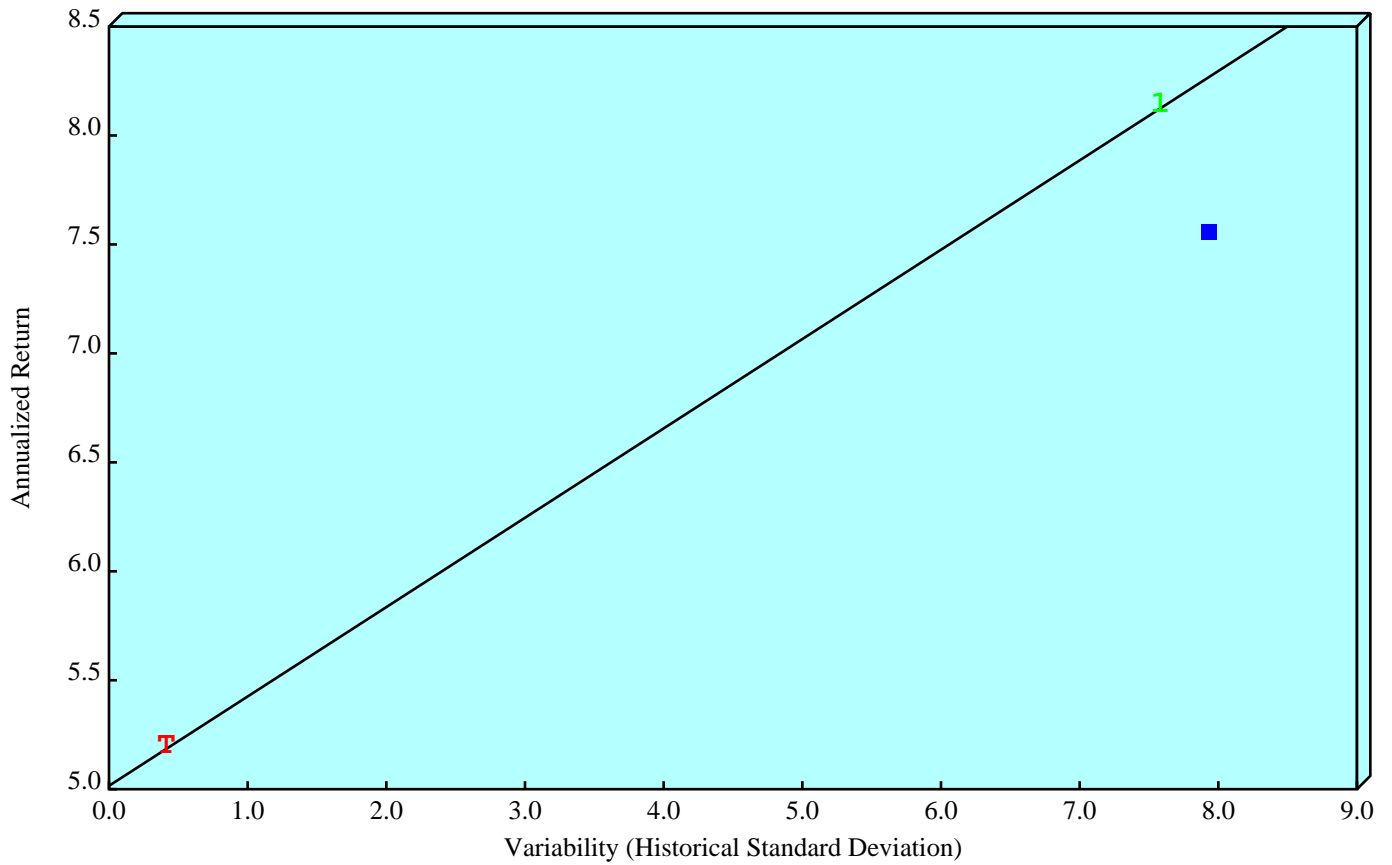
	Segment	Percent
	<hr/>	<hr/>
Russell 3000	Domestic Equity	47.00
MSCI ACWI Ex US Inde	International Equity	20.00
NCREIF	Real Estate	5.40
NAREIT	Real Estate	1.80
Giliberto-Levy Mortg	Mortgage	1.80
Standard & Poors 500	Domestic Equity	0.60
91-Day Treasury Bill	Cash & Equiv	0.40
SB Broad Inv Grade	Domestic Fixed Income	23.00



# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Total Return Market Line Analysis

Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
■ PERS	7.55	7.98	2.34	0.29
1 Policy Index	8.14	7.62	2.94	0.39
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

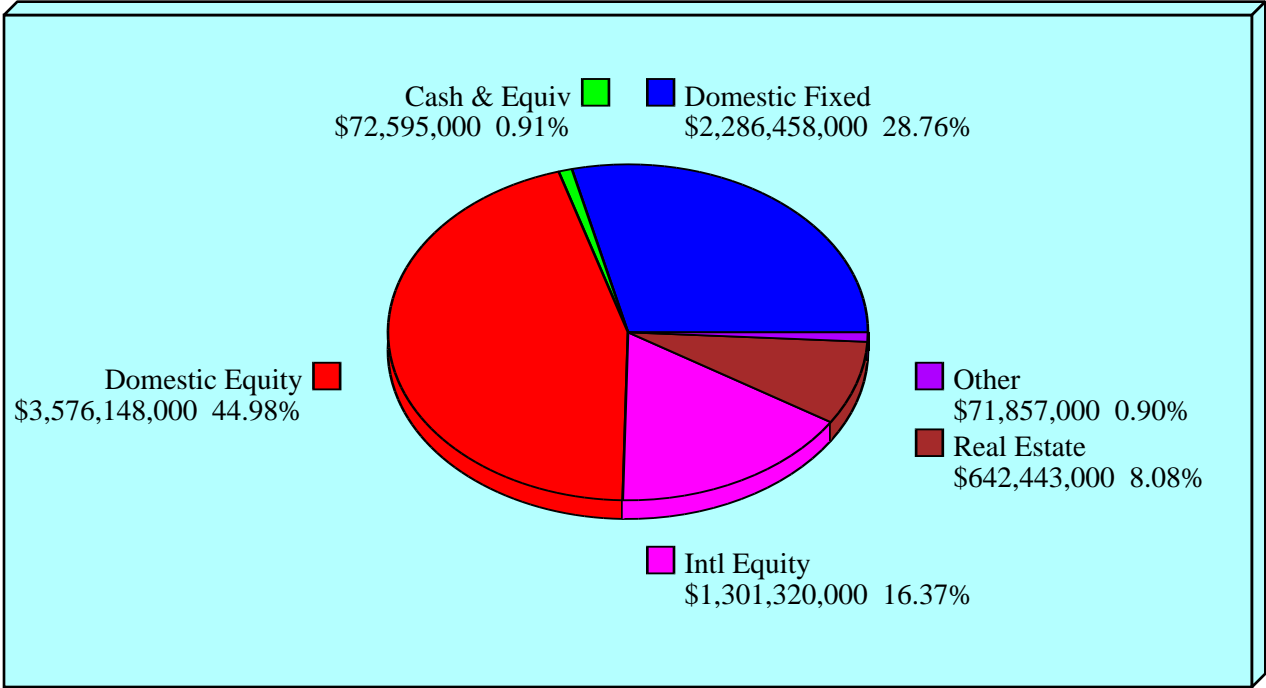
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

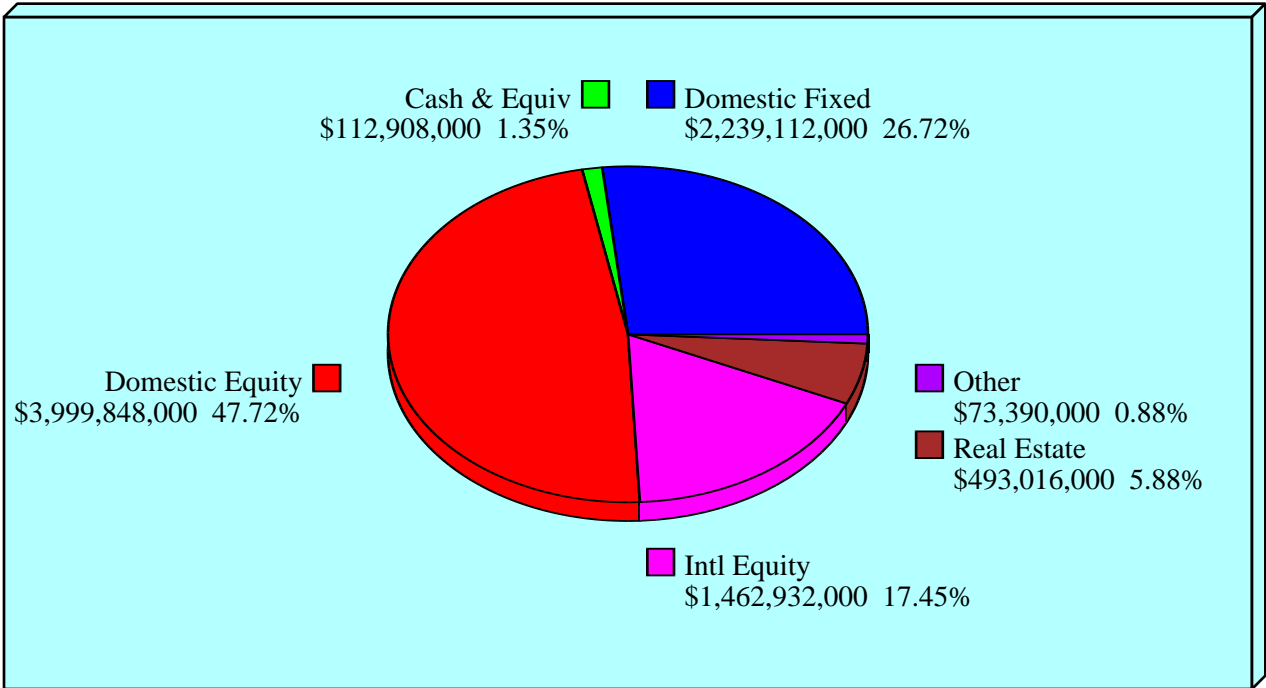
## Asset Allocation

### OP&F

September 30, 2001      \$7,950,821,000



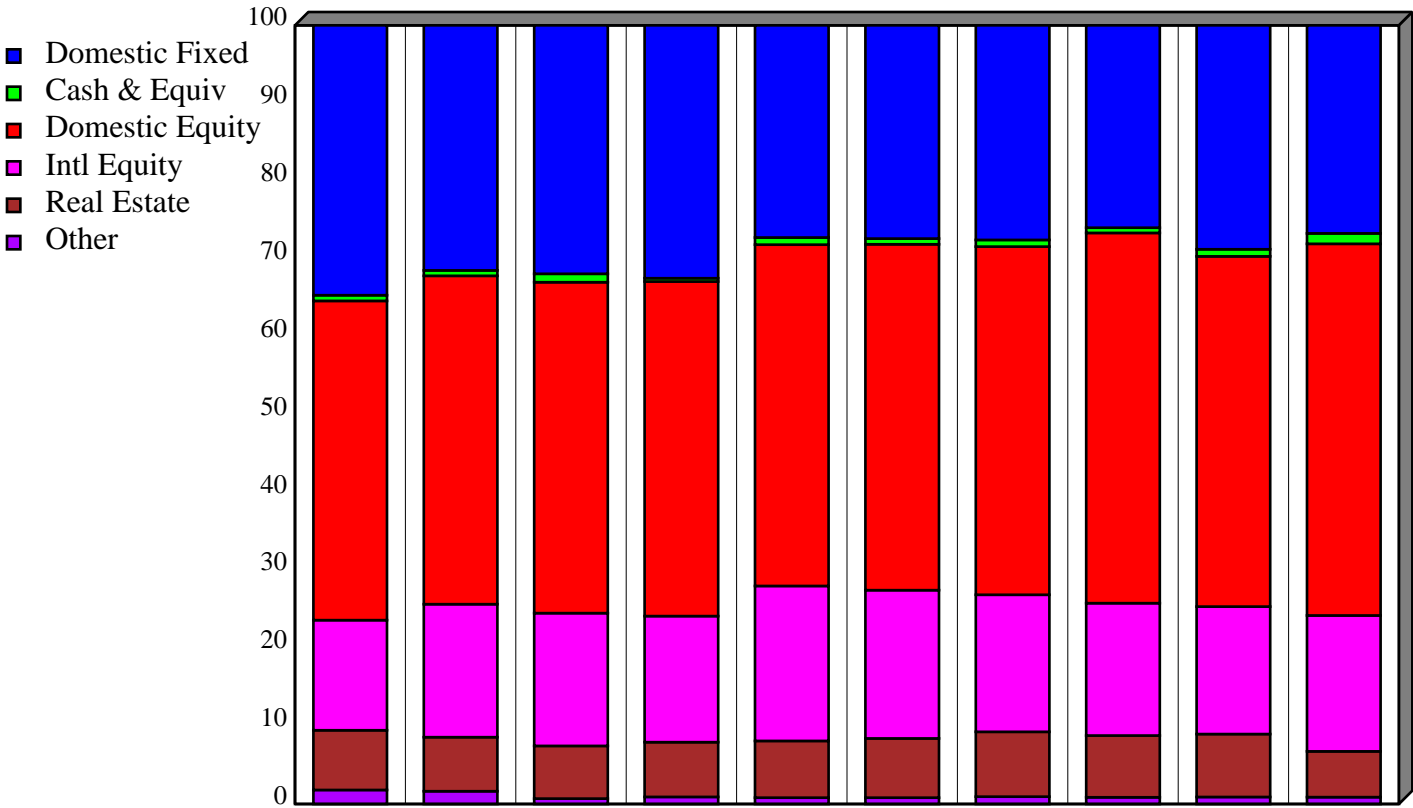
December 31, 2001      \$8,381,206,000



# OHIO RETIREMENT STUDY COUNCIL

## Asset Allocation

### OP&F



	9/99	12/99	3/00	6/00	9/00	12/00	3/01	6/01	9/01	12/01
Domestic Fixed %	34.7	31.5	31.9	32.5	27.2	27.4	27.6	26.0	28.8	26.7
Cash & Equiv %	0.7	0.7	1.1	0.4	0.9	0.7	0.9	0.7	0.9	1.3
Domestic Equity %	41.0	42.2	42.5	43.0	43.8	44.4	44.7	47.5	45.0	47.7
Intl Equity %	14.1	17.1	17.1	16.2	19.9	19.0	17.6	17.0	16.4	17.5
Real Estate %	7.7	6.9	6.8	7.0	7.3	7.6	8.3	7.9	8.1	5.9
Other %	1.8	1.6	0.7	0.9	0.8	0.8	0.9	0.9	0.9	0.9
Total Value (\$mil)	8429.0	9200.3	9348.2	9089.6	9219.6	8922.8	8307.7	8602.8	7950.8	8381.2

OHIO RETIREMENT STUDY COUNCIL  
 Custom Benchmark Specification  
 OP&F  
 Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	3/94	9/97	9.00	Wilshire RE Funds
			10.00	MSCI EAFE (Net)
			39.50	LB Aggregate
			41.50	Wilshire 5000
	12/97	12/00	35.00	LB Aggregate
			10.00	MSCI EAFE (Net)
			5.00	MSCI Em Mkts Free (Gross)
			8.00	Wilshire RE Funds
			42.00	Wilshire 5000
	3/01	6/01	48.00	Wilshire 5000
			18.00	LB Aggregate
			17.00	MSCI EAFE (Net)
			8.00	Wilshire RE Funds
			5.00	First Boston Hi Yld
			3.00	MSCI Em Mkts Free (Gross)
			1.00	S&P + 5%
9/01	12/01	48.00	Wilshire 5000	
		18.00	LB Aggregate	
		17.00	MSCI EAFE (Net)	
		8.00	Wilshire RE Funds	
		5.00	First Boston Hi Yld	
		3.00	MSCI Em Mkts Free (Gross)	
		1.00	Wilshire 5000 +5% Index	

**OHIO RETIREMENT STUDY COUNCIL**  
**Performance Overview**  
**OP&F**  
**Returns for Periods Ending December 31, 2001**

	<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	7.82	-1.24	2.54	-3.83	2.67	7.59	9.13
Policy Index Return	8.15	-2.50	1.07	-6.56	1.69	7.27	8.70
Domestic Equity Return	11.84	-3.76	3.60	-7.47	1.83	9.84	12.41
Equity Segment Median Return	12.45	-4.95	1.56	-10.43	1.81	11.00	14.08
Wilshire 5000	12.37	-5.50	1.57	-10.96	-0.65	9.71	12.83
Int'l Equity Return	12.39	-6.97	-6.90	-19.93	-3.68	2.13	
Int'l Equity Segment Median Return	8.72	-6.17	-5.25	-14.58	1.78	4.67	
MSCI EAFE (Net)	6.97	-8.00	-8.96	-21.45	-5.04	0.89	3.62
Domestic Fixed Return	1.34	5.82	6.57	9.90	7.47	7.83	7.18
Fixed Income Segment Median Return	0.08	4.69	5.22	8.55	6.33	7.47	6.97
LB Aggregate	0.04	4.66	5.24	8.43	6.28	7.43	6.90
Cash Return	0.64	1.73	2.88	4.43	5.04	5.10	
Real Estate Return	1.50	4.04	5.91	11.84	11.60	12.90	10.98
NCREIF	0.74	2.36	4.92	7.41	10.32	12.20	10.63

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
OP&F  
Returns for Periods Ending December 31, 2001

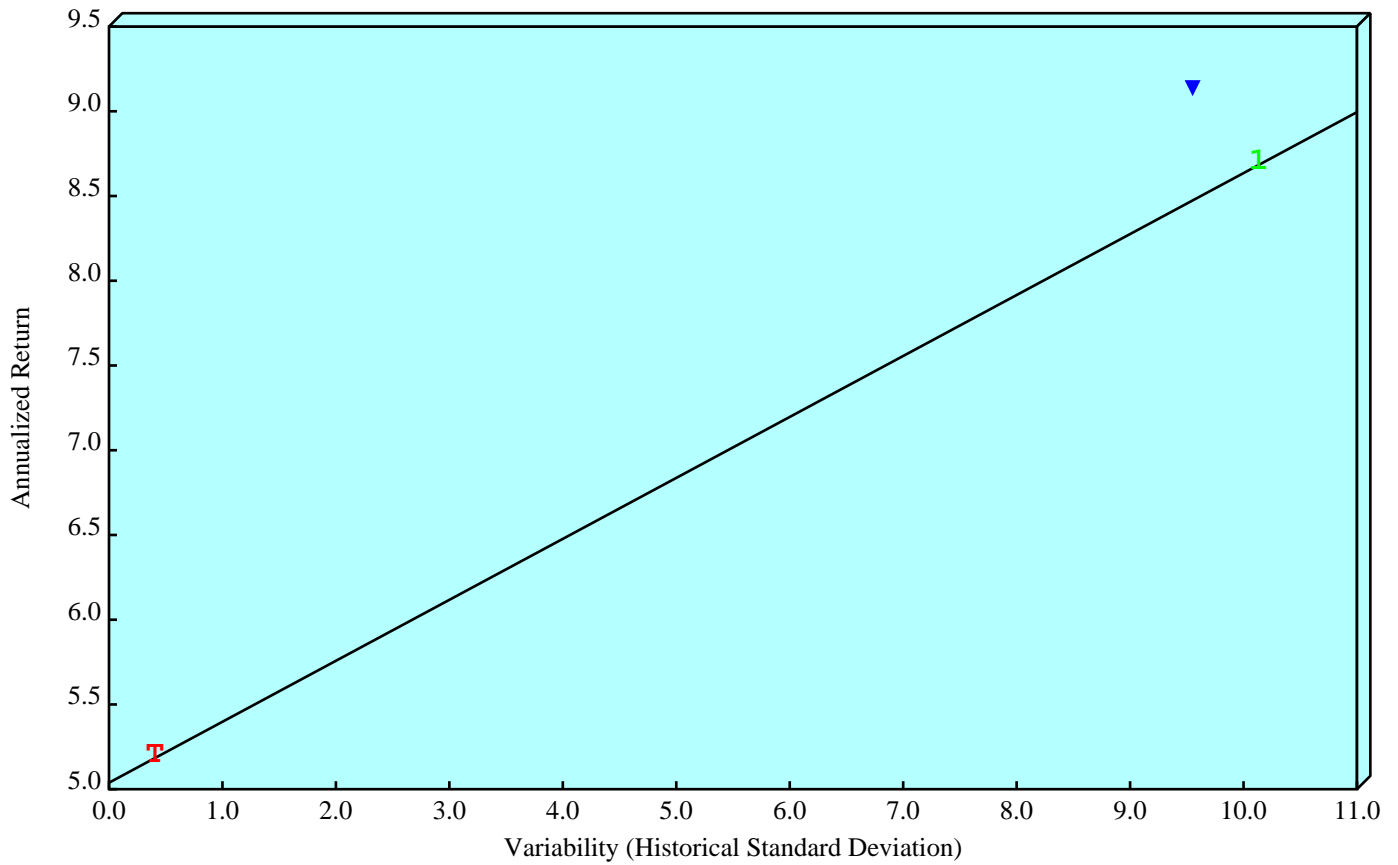
Policy Index

	Segment	Percent
	<hr/>	<hr/>
Wilshire 5000	Domestic Equity	48.00
LB Aggregate	Domestic Fixed Income	18.00
MSCI EAFE (Net)	International Equity	17.00
Wilshire RE Funds	Real Estate	8.00
First Boston Hi Yld	Domestic Fixed Income	5.00
MSCI Em Mkts Free (G	International Equity	3.00
Wilshire 5000 +5% In	Domestic Equity	1.00

# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Total Return Market Line Analysis

### Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
▼ OP&F	9.13	9.61	3.93	0.41
1 Policy Index	8.70	10.18	3.50	0.34
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

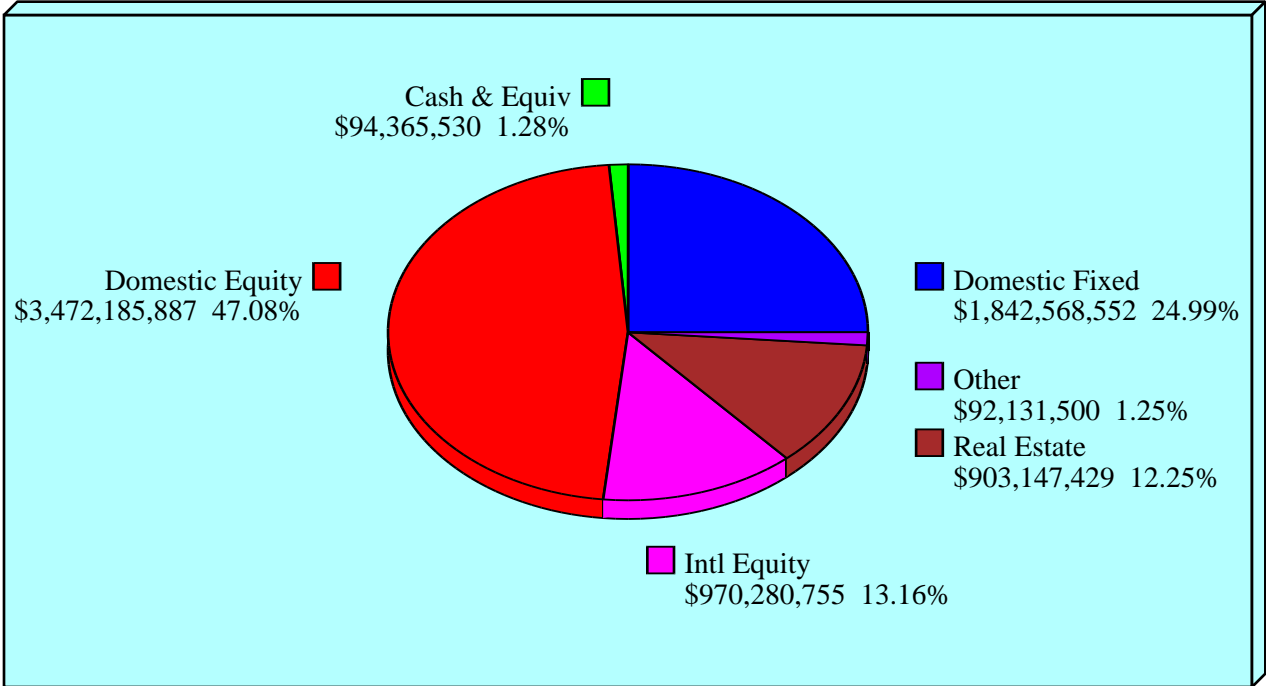
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

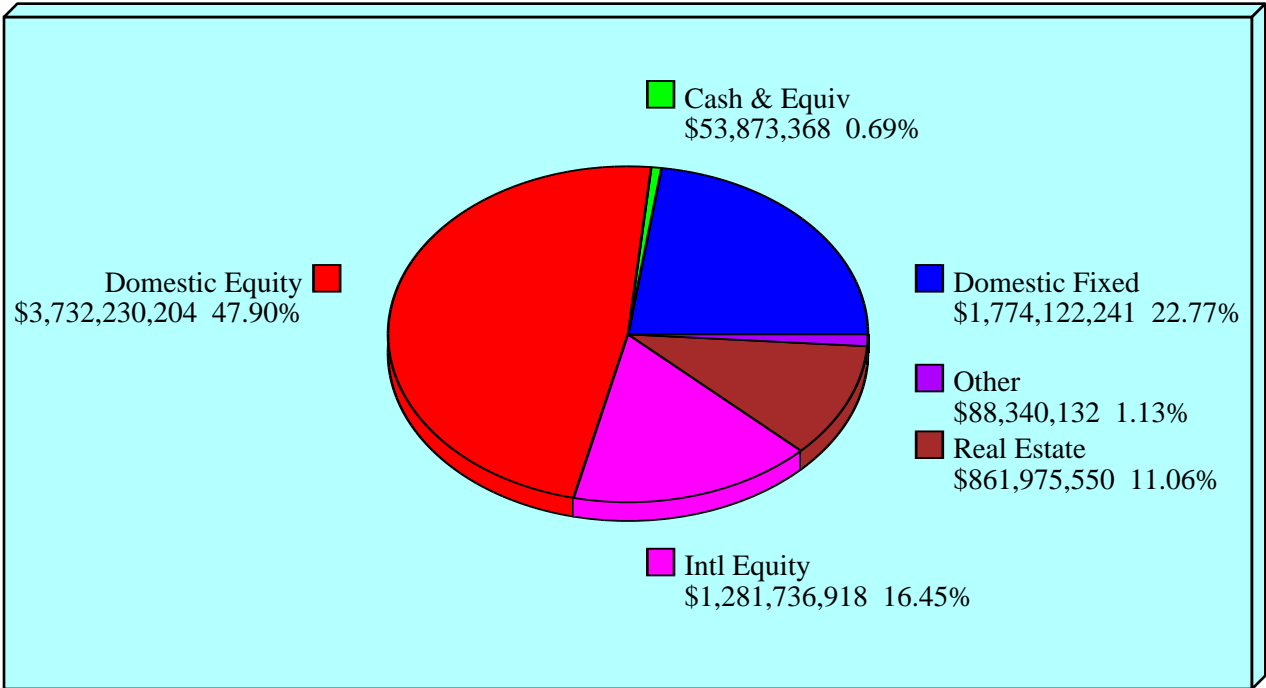
## Asset Allocation

### SERS

September 30, 2001      \$7,374,679,653



December 31, 2001      \$7,792,278,413

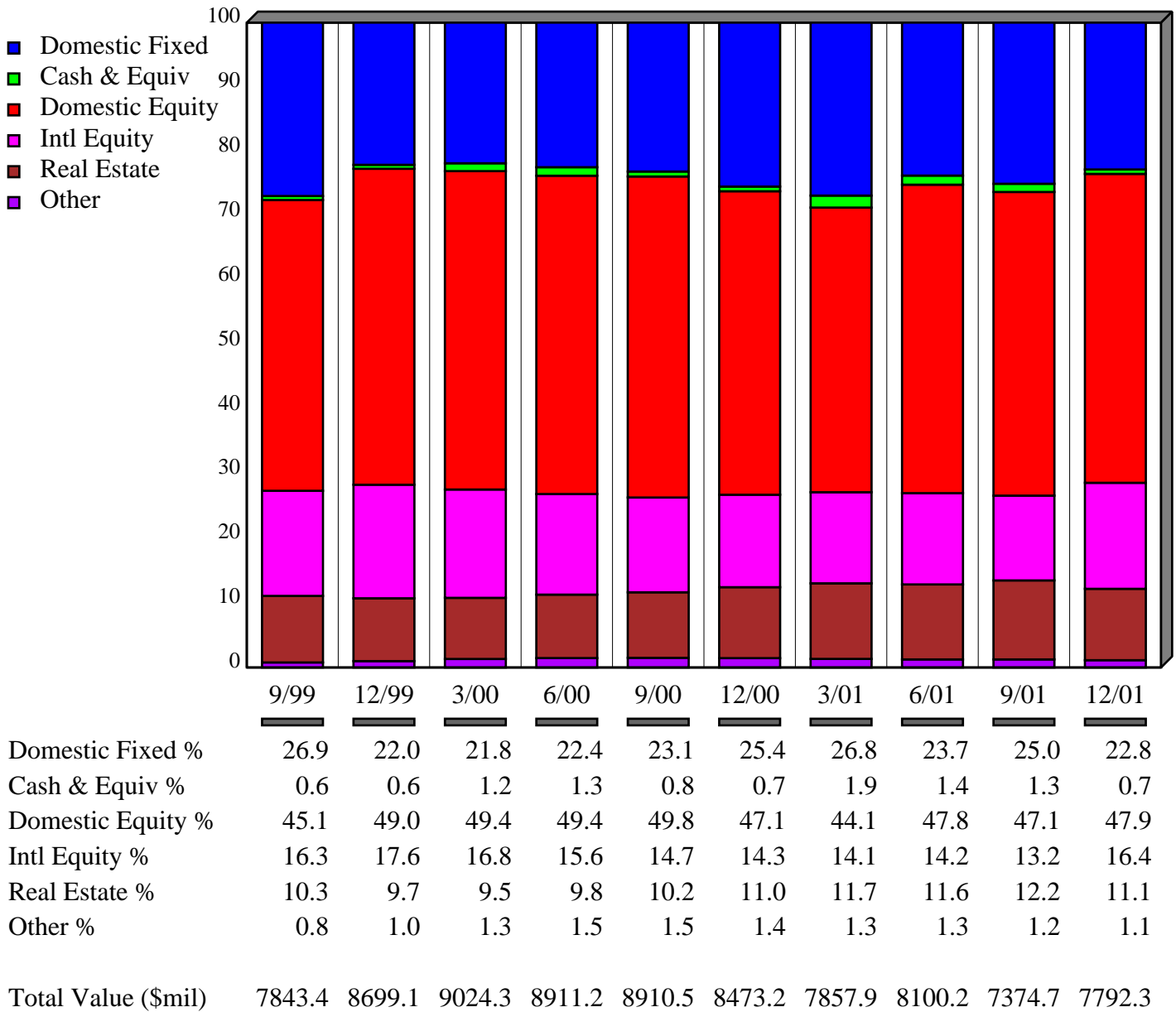




# OHIO RETIREMENT STUDY COUNCIL

## Asset Allocation

### SERS



OHIO RETIREMENT STUDY COUNCIL  
Custom Benchmark Specification  
SERS  
Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index	3/94	9/94	10.00	NCREIF
			10.00	MSCI EAFE (Net)
			28.00	LB Aggregate
			47.00	Standard & Poors 500
			5.00	Salomon 30-day CD
	12/94	12/94	10.00	NCREIF
			5.00	MSCI EAFE Hedged
			5.00	MSCI EAFE (Net)
			28.00	LB Aggregate
			47.00	Standard & Poors 500
	3/95	3/97	10.00	NCREIF
			5.00	MSCI EAFE Hedged
			5.00	MSCI EAFE (Net)
			28.00	LB Aggregate
			47.00	Russell 3000
	6/97	6/97	5.00	Salomon 30-day CD
			46.00	Russell 3000
			28.00	LB Aggregate
			7.50	MSCI EAFE (Net)
			7.50	MSCI EAFE Hedged
9/97	12/00	10.00	NCREIF	
		1.00	Salomon 30-day CD	
		46.00	Russell 3000	
		28.00	LB Aggregate	
		7.25	MSCI EAFE (Net)	
		7.25	MSCI EAFE Hedged	
		0.50	MSCI Em Mkts Free (Gross)	
3/01	9/01	10.00	NCREIF	
		1.00	Salomon 30-day CD	
		48.00	Russell 3000	
		23.00	LB Aggregate	
		16.00	MSCI ACWI Free ex US	
		10.00	NCREIF	
		2.00	Salomon 30-day CD	

OHIO RETIREMENT STUDY COUNCIL  
 Custom Benchmark Specification  
 SERS  
 Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)			1.00	S & P 500 + 3%
	9/01	12/01	47.00	Russell 3000
	23.00	LB Aggregate		
	16.00	MSCI ACWI Free ex US		
	10.00	NCREIF		
	2.00	S & P 500 + 3%		
	2.00	Salomon 30-day CD		

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
SERS  
Returns for Periods Ending December 31, 2001

	<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	6.81	-2.63	1.34	-5.52	3.02	8.54	9.93
Policy Index Return	7.49	-2.26	1.56	-5.18	2.77	8.94	10.32
Domestic Equity Return	12.62	-4.63	2.48	-10.97	0.33	9.98	13.19
Equity Segment Median Return	12.45	-4.95	1.56	-10.43	1.81	11.00	14.08
Wilshire 5000	12.37	-5.50	1.57	-10.96	-0.65	9.71	12.83
Int'l Equity Return	9.46	-8.89	-8.04	-16.91	-0.53	4.16	
Int'l Equity Segment Median Return	8.72	-6.17	-5.25	-14.58	1.78	4.67	
MSCI EAFE (Net)	6.97	-8.00	-8.96	-21.45	-5.04	0.89	3.62
Domestic Fixed Return	0.48	4.79	5.77	9.33	6.81	7.71	6.91
Fixed Income Segment Median Return	0.08	4.69	5.22	8.55	6.33	7.47	6.97
LB Aggregate	0.04	4.66	5.24	8.43	6.28	7.43	6.90
Cash Return	1.70	2.41	3.95	6.65	6.48	6.07	5.75
Real Estate Return	-1.25	-0.90	2.23	3.42	9.49	10.47	10.36
NCREIF	0.74	2.36	4.92	7.41	10.32	12.20	10.63

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
SERS  
Returns for Periods Ending December 31, 2001

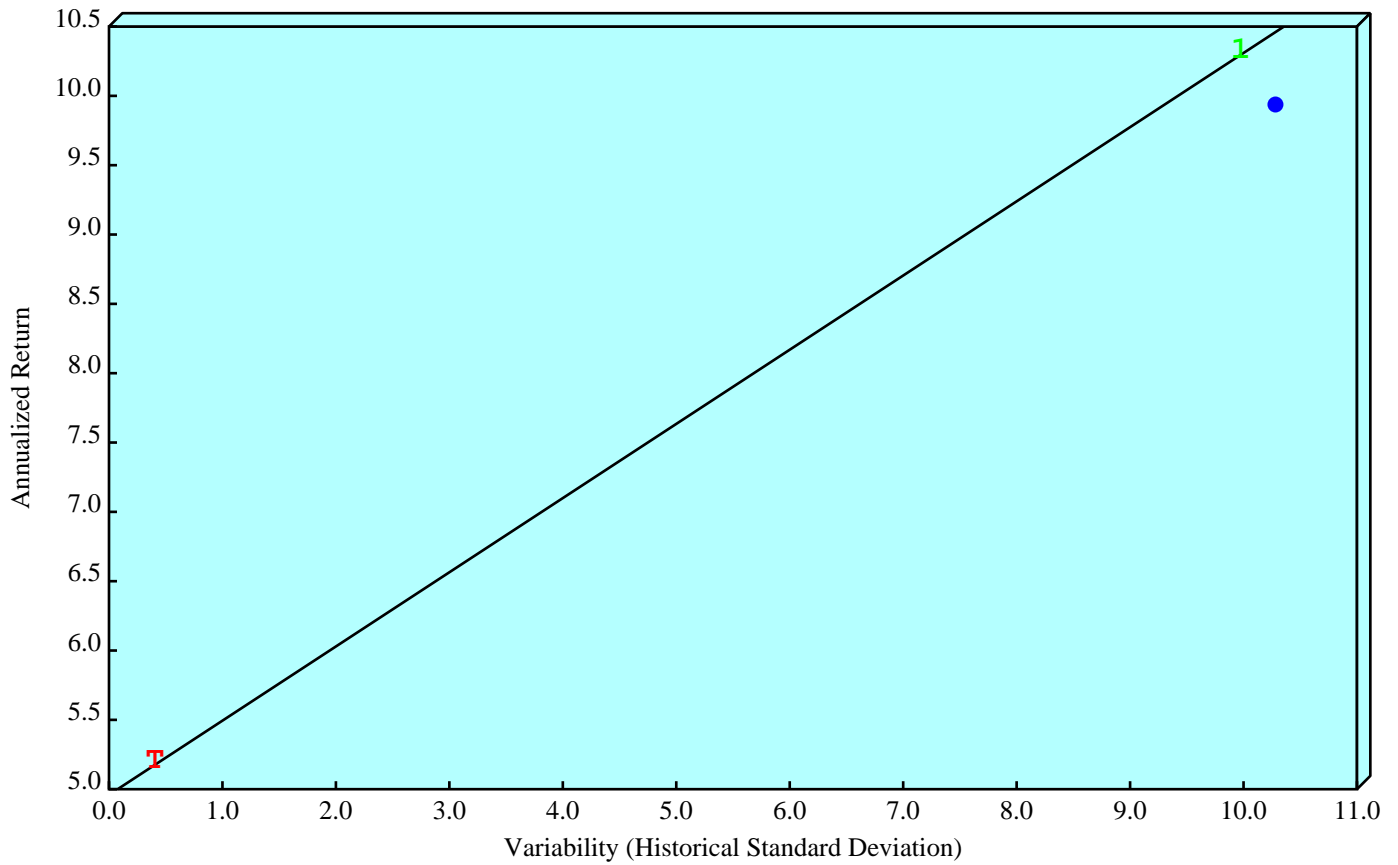
Policy Index

	Segment	Percent
	<hr/>	<hr/>
Russell 3000	Domestic Equity	47.00
LB Aggregate	Domestic Fixed Income	23.00
MSCI ACWI Free ex US	International Equity	16.00
NCREIF	Real Estate	10.00
S & P 500 + 3%	Other Assets	2.00
Salomon 30-day CD	Cash & Equiv	2.00

# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Total Return Market Line Analysis

### Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
● SERS	9.93	10.34	4.73	0.46
1 Policy Index	10.32	10.02	5.12	0.51
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

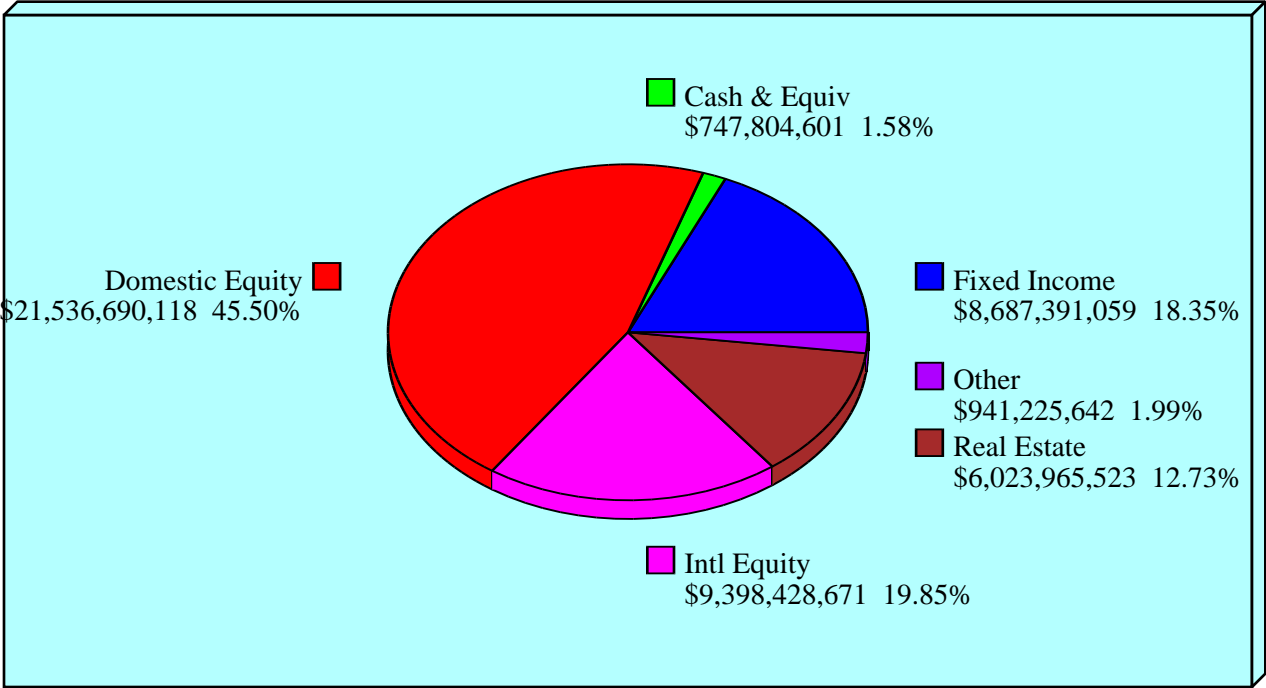
Sharpe Ratio = Reward / Variability

# OHIO RETIREMENT STUDY COUNCIL

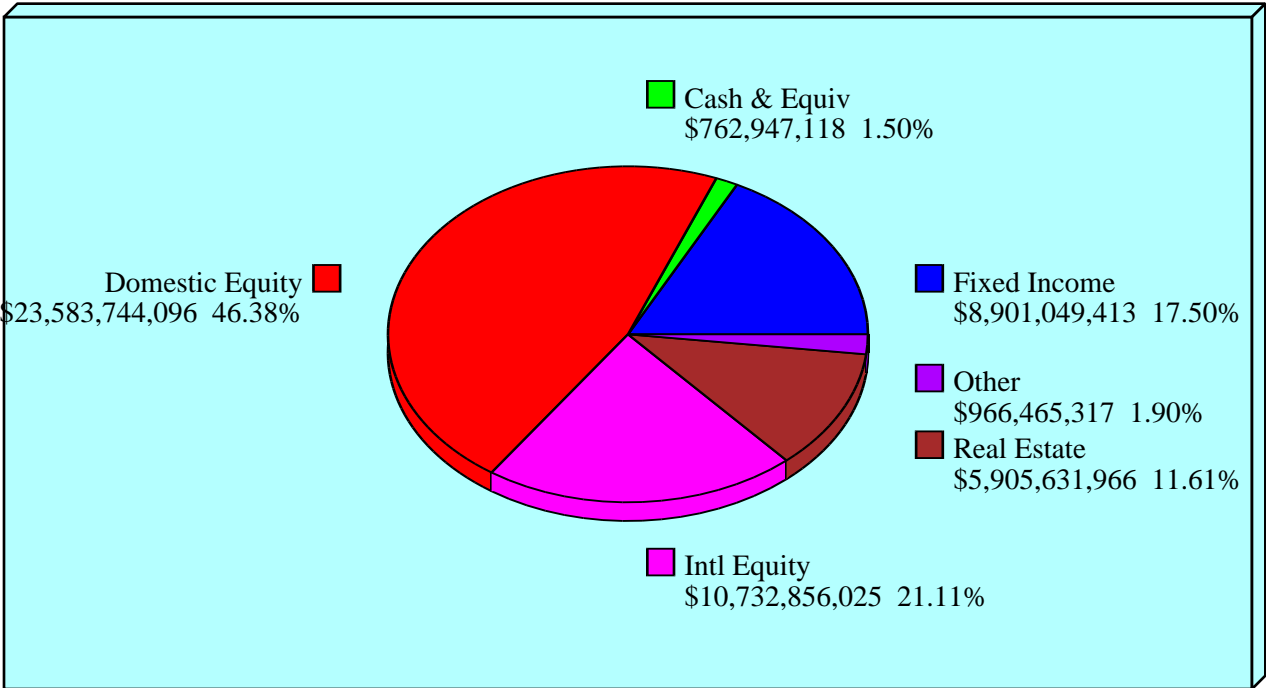
## Asset Allocation

### STRS

September 30, 2001      \$47,335,505,614



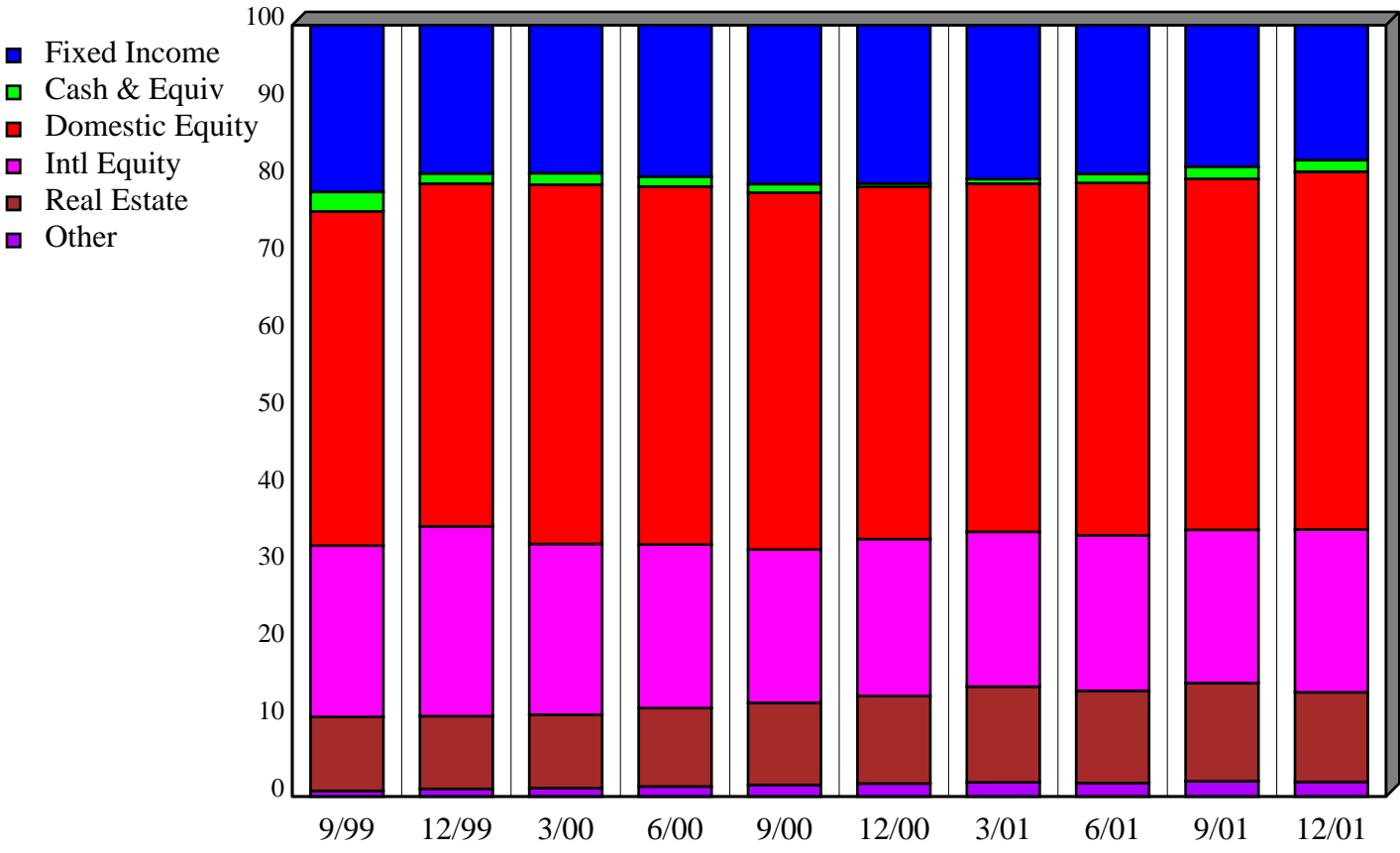
December 31, 2001      \$50,852,693,935



# OHIO RETIREMENT STUDY COUNCIL

## Asset Allocation

### STRS



	9/99	12/99	3/00	6/00	9/00	12/00	3/01	6/01	9/01	12/01
Fixed Income %	21.6	19.2	19.2	19.6	20.6	20.5	20.0	19.3	18.4	17.5
Cash & Equiv %	2.5	1.3	1.5	1.3	1.1	0.4	0.6	1.2	1.6	1.5
Domestic Equity %	43.3	44.4	46.6	46.4	46.2	45.7	45.1	45.7	45.5	46.4
Intl Equity %	22.2	24.6	22.1	21.2	19.9	20.3	20.1	20.2	19.9	21.1
Real Estate %	9.6	9.4	9.5	10.2	10.6	11.3	12.4	12.0	12.7	11.6
Other %	0.7	1.0	1.1	1.3	1.5	1.7	1.8	1.7	2.0	1.9
Total Value (\$bil)	51.4	57.3	58.6	57.5	56.8	54.8	51.1	52.9	47.3	50.9



OHIO RETIREMENT STUDY COUNCIL  
Custom Benchmark Specification  
STRS  
Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
STRS Policy Index	3/94	9/94	3.00	91-Day Treasury Bill
			9.00	STRS NCREIF hybrid
			3.00	MSCI EAFE (Net)
			45.00	LB Aggregate
			40.00	Standard & Poors 500
	12/94	12/94	3.00	91-Day Treasury Bill
			9.00	STRS NCREIF hybrid
			0.75	MSCI Em Mkts Free (Gross)
			2.25	MSCI EAFE (Net)
			45.00	LB Aggregate
	3/95	3/96	2.00	91-Day Treasury Bill
			9.00	STRS NCREIF hybrid
			2.00	MSCI Em Mkts Free (Gross)
			6.00	MSCI EAFE (Net)
			35.00	LB Aggregate
	6/96	12/96	2.00	91-Day Treasury Bill
			9.00	STRS NCREIF hybrid
			2.25	MSCI Em Mkts Free (Gross)
			6.75	MSCI EAFE (Net)
			35.00	LB Aggregate
	3/97	6/97	2.00	91-Day Treasury Bill
			9.00	STRS NCREIF hybrid
			4.00	MSCI Em Mkts Free (Gross)
			6.00	MSCI EAFE (Net)
34.00			LB Aggregate	
9/97	3/98	45.00	Standard & Poors 500	
		24.00	LB Aggregate	
		12.00	MSCI EAFE (Net)	
		8.00	MSCI Em Mkts Free (Gross)	
		9.00	STRS NCREIF hybrid	
			2.00	91-Day Treasury Bill

OHIO RETIREMENT STUDY COUNCIL  
 Custom Benchmark Specification  
 STRS  
 Quarter Ending 12/31/01

Label	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)	3/98	9/98	24.00	LB Aggregate
			8.00	MSCI Em Mkts Free (Gross)
			9.00	STRS NCREIF hybrid
			2.00	91-Day Treasury Bill
			12.00	MSCI EAFE 50% Hedged
			45.00	Standard & Poors 500
	12/98	9/00	24.00	LB Aggregate
			6.00	MSCI Em Mkts Free (Gross)
			9.00	STRS NCREIF hybrid
			2.00	91-Day Treasury Bill
			45.00	S&P Super 1500 Index
			14.00	MSCI EAFE 50% Hedged
	12/00	12/01	1.00	91-Day Treasury Bill
			45.00	S&P Super 1500 Index
			9.00	STRS NCREIF hybrid
25.00			Lehman Universal	
5.00			MSCI Em Mkts Free (Gross)	
		15.00	MSCI EAFE 50% Hedged	

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
STRS  
Returns for Periods Ending December 31, 2001

	<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	7.78	-2.80	0.86	-5.66	3.04	7.57	8.78
Policy Index Return	7.80	-2.32	1.23	-4.99	2.86	7.91	9.48
Domestic Equity Return	11.88	-5.45	0.87	-10.90	-0.56	9.16	11.47
Equity Segment Median Return	12.45	-4.95	1.56	-10.43	1.81	11.00	14.08
Wilshire 5000	12.37	-5.50	1.57	-10.96	-0.65	9.71	12.83
Int'l Equity Return	11.15	-7.72	-5.49	-14.63	2.25	1.24	3.24
Int'l Equity Segment Median Return	8.72	-6.17	-5.25	-14.58	1.78	4.67	11.10
MSCI EAFE (Net)	6.97	-8.00	-8.96	-21.45	-5.04	0.89	3.62
Fixed Income Return	1.05	5.11	5.82	9.17	6.49	8.28	7.74
Fixed Income Segment Median Return	0.08	4.69	5.22	8.55	6.33	7.47	6.97
LB Aggregate	0.04	4.66	5.24	8.43	6.28	7.43	6.90
Cash Return	0.64	1.48	2.57	4.04	5.31	5.47	5.17
91-Day Treasury Bill	0.64	1.73	2.87	4.42	5.03	5.18	5.20
Real Estate Return	1.04	2.48	4.71	6.30	11.09	12.27	10.77

OHIO RETIREMENT STUDY COUNCIL  
Performance Overview  
STRS  
Returns for Periods Ending December 31, 2001

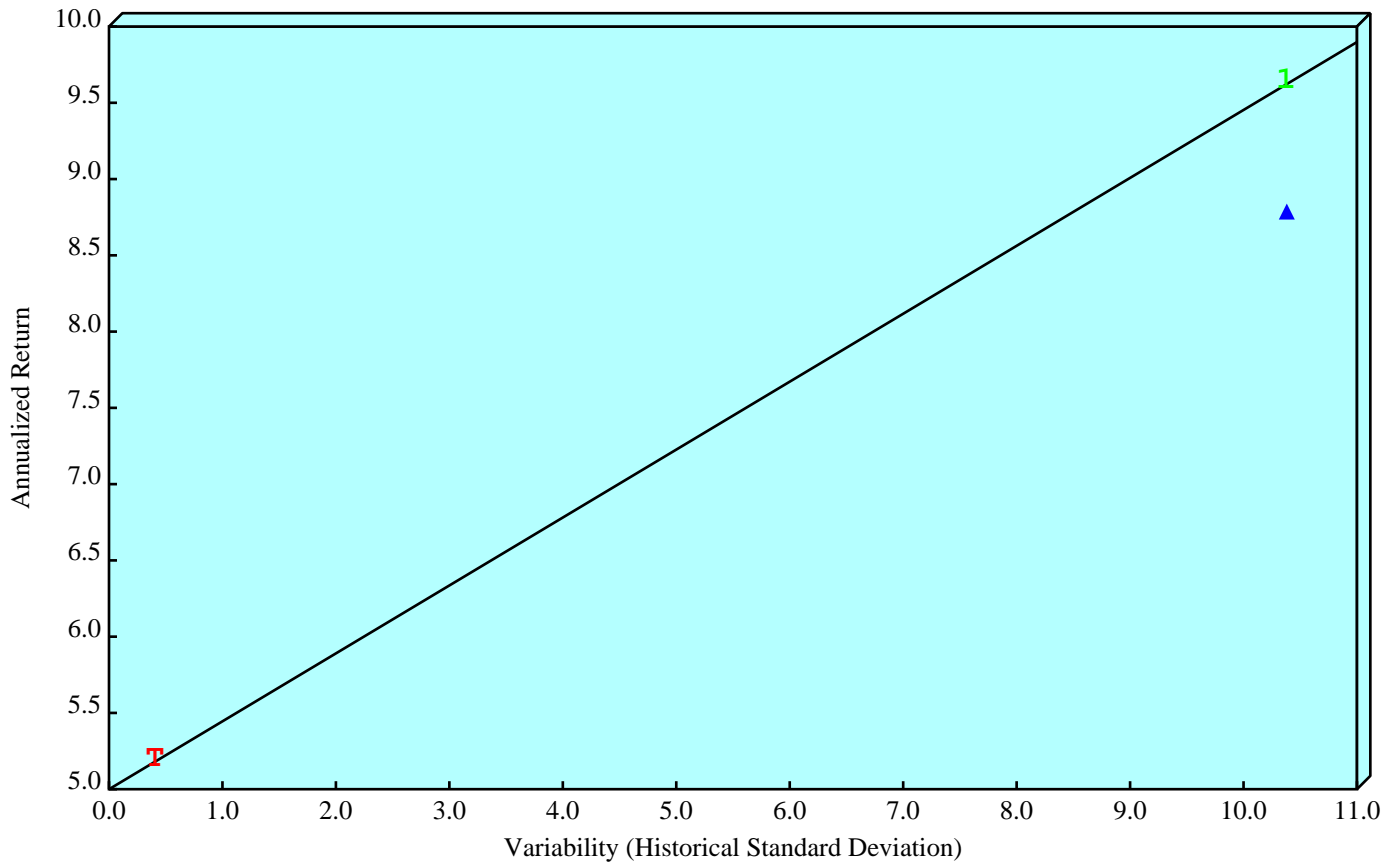
Policy Index

	Segment	Percent
	<hr/>	<hr/>
91-Day Treasury Bill	Cash & Equiv	1.00
S&P Super 1500 Index	Domestic Equity	45.00
STRS NCREIF hybrid	Real Estate	9.00
Lehman Universal	Fixed Income	25.00
MSCI Em Mkts Free (G	International Equity	5.00
MSCI EAFE 50% Hedged	International Equity	15.00

# OHIO RETIREMENT STUDY COUNCIL

## Quarterly Total Return Market Line Analysis

Periods from 12/93 to 12/01



	Annualized Return	Variability	Reward	Sharpe Ratio
▲ STRS	8.78	10.44	3.58	0.34
1 STRS Policy Index	9.64	10.42	4.43	0.43
T 91-Day Treasury Bill	5.20	0.45	0.00	0.00

Sharpe Ratio = Reward / Variability

# Highway Patrol Pension Plan

## Asset Allocation Actual vs. Benchmark June 30, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	35.89%	S & P 500	40%	-4.11%
Small/Mid Cap Equ	16.09%	Russell 2000	20%	-3.91%
Fixed Income	20.86%	LB Aggregate	20%	0.86%
Intl. Equity	10.39%	MSCI EAFE (Net)	10%	0.39%
Real Estate	13.41%	NCREIF	10%	3.41%
Short Term	3.35%		0%	3.35%

December 31, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Large Cap Equity	34.90%	S & P 500	40%	-5.10%
Small/Mid Cap Equ	16.06%	Russell 2000	20%	-3.94%
Fixed Income	22.09%	LB Aggregate	20%	2.09%
Intl. Equity	9.89%	MSCI EAFE (Net)	10%	-0.11%
Real Estate	14.48%	NCREIF	10%	4.48%
Short Term	2.59%		0%	2.59%

# Ohio Police & Fire Pension Plan

## Asset Allocation Actual vs. Benchmark June 30, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	48.01%	Wilshire 5000	48%	0.01%
Fixed Income	20.95%	Lehman Aggregate	18%	2.95%
High Yield Bonds	5.00%	CSFB High Yield	5%	0.00%
Intl. Equity Comp.	13.37%	MSCI EAFE (Net)	17%	-3.63%
Em. Mkts Comp.	3.74%	MSCI Em Mkts Free	3%	0.74%
Real Estate	7.37%	Wilshire RE Fund	8%	-0.63%
Venture Capital	0.89%	S&P 500 + 5%	1%	-0.11%
Short Term	0.68%	3 Month T-Bill	0%	0.68%

December 31, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	47.70%	Wilshire 5000	48%	-0.30%
Fixed Income	21.30%	Lehman Aggregate	18%	3.30%
High Yield Bonds	5.40%	CSFB High Yield	5%	0.40%
Intl. Equity Comp.	13.69%	MSCI EAFE (Net)	17%	-3.31%
Em. Mkts Comp.	3.77%	MSCI Em Mkts Free	3%	0.77%
Real Estate	5.90%	Wilshire RE Fund	8%	-2.10%
Venture Capital	0.90%	S&P 500 + 5%	1%	-0.10%
Short Term	1.30%	3 Month T-Bill	0%	1.30%

# Public Employees Retirement System

## Asset Allocation Actual vs. Benchmark June 30, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	41.75%	S&P 1500	40.5%	1.25%
Fixed Income	28.00%	SB Broad Inv Grade	29.2%	-1.20%
Intl. Equity	19.51%	MSCI ACWI	19.3%	0.21%
Real Estate	10.07%	PERS Custom Index	9.3%	0.77%
Venture Capital	0.15%	S&P 500	0.2%	-0.05%
Short Term	0.52%	3 Month T-Bill	1.5%	-0.98%

December 31, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	47.90%	S&P 1500	47.0%	0.90%
Fixed Income	21.10%	SB Broad Inv Grade	23.0%	-1.90%
Intl. Equity	19.80%	MSCI ACWI	20.0%	-0.20%
Real Estate	9.70%	PERS Custom Index	9.0%	0.70%
Venture Capital	0.50%	S&P 500	0.6%	-0.10%
Short Term	1.00%	3 Month T-Bill	0.4%	0.60%



# School Employees Retirement System

## Asset Allocation Actual vs. Benchmark June 30, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	47.83%	Russell 3000	48%	-0.17%
Fixed Income	23.72%	LB Aggregate	23%	0.72%
Intl. Equity	14.16%	MSCI ACWI ex US	16%	-1.84%
Real Estate	11.63%	NCREIF	10%	1.63%
Venture Capital	1.25%	S&P 500 + 3%	1%	0.25%
Short Term	1.41%	Salomon 30 Day CD	2%	-0.59%

December 31, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Domestic Equity	47.90%	Russell 3000	47%	0.90%
Fixed Income	22.80%	LB Aggregate	23%	-0.20%
Intl. Equity	16.40%	MSCI ACWI ex US	16%	0.40%
Real Estate	11.10%	NCREIF	10%	1.10%
Venture Capital	1.10%	S&P 500 + 3%	2%	-0.90%
Short Term	0.70%	Salomon 30 Day CD	2%	-1.30%

# State Teachers Retirement System

## Asset Allocation Actual vs. Benchmark June 30, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	45.67%	S&P 1500	45%	0.67%
Fixed Income	19.29%	Lehman Universal	25%	-5.71%
Intl. Equity	20.15%	Intl. Hybrid Benchmark	20%	0.15%
Real Estate	11.97%	NCREIF Adjusted	9%	2.97%
Venture Capital	1.74%		0%	1.74%
Short Term	1.18%	3 Month T-Bill	1%	0.18%

## December 31, 2001

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Asset Class	Asset Allocation	Benchmark	Benchmark Weighting	Difference
Equity	46.40%	S&P 1500	45%	1.40%
Fixed Income	17.50%	Lehman Universal	25%	-7.50%
Intl. Equity	21.10%	Intl. Hybrid Benchmark	20%	1.10%
Real Estate	11.60%	NCREIF Adjusted	9%	2.60%
Venture Capital	1.90%		0%	1.90%
Short Term	1.50%	3 Month T-Bill	1%	0.50%