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RVK

# Executive Summary:

## June 30, 2015

## Investment Performance

Ohio Retirement Study Council

# Memorandum

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|---|---|
| To | Ohio Retirement Study Council |
| From | RVK, Inc. |
| Subject | Executive Summary: June 30, 2015 Investment Performance |
| Date | November 12, 2015 |

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Outlined below please find a summary of significant observations, key attributes, and performance metrics of Ohio's six[1] public retirement plans for the period ended June 30, 2015. The purpose of this analysis is to facilitate an objective "apples-to-apples" comparison of the six plans relative to each other, similar benchmarks, and peer universe data consisting of similarly sized public pension plans.

While much of the discussion in this summary focuses on results from the first half of 2015, we strongly encourage the Council to place significant weight on the 3-, 5-, and 10-year results to better assess the management of the State's various pension plan assets. Though the six investment programs share many similarities, it is important to be aware of the crucial differences that may affect performance when reviewing this analysis. Each plan has unique long-term investment objectives and therefore distinct asset allocations in order to meet these objectives. Investment execution approaches also vary as it relates to active/passive and internal/external management.

The full results of our analysis are contained within our Investment Performance Analysis Report and we hope this Executive Summary will help in your review of that data. The information received by RVK, to the best of our knowledge, is complete and appropriate.

**Total Fund Returns and Risk**

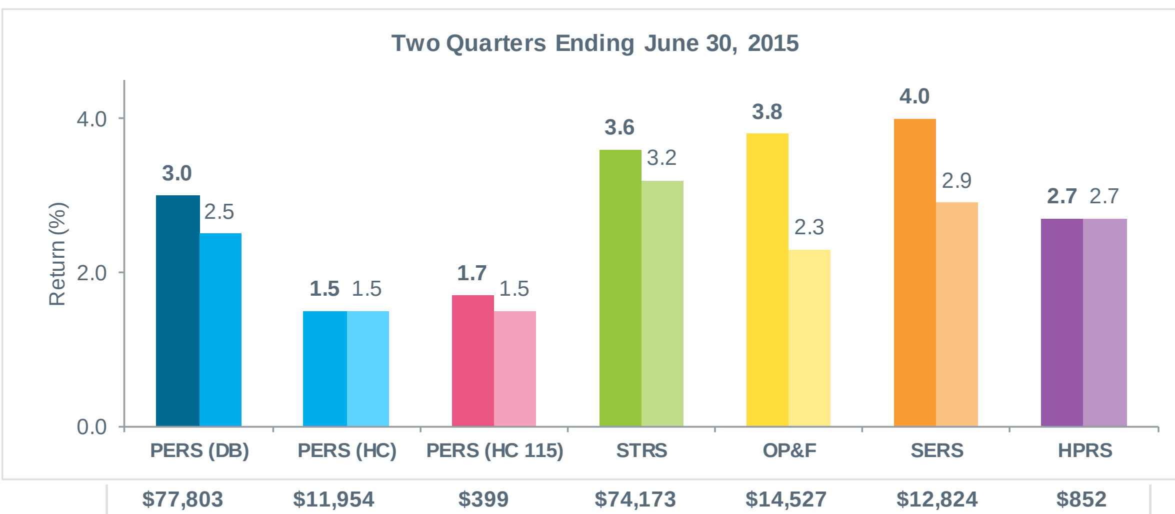
Returns for the Ohio plans ranged from 1.5% to 4.0%[i] for the first half of the 2015 calendar year period as divergent monetary policies by central banks throughout the world exerted pressure on asset prices and exchange rates. With investors fixated on Greece's debt situation and government intervention in China, these past two quarters experienced increased global market volatility in contrast to what has been a period of reduced volatility and low interest rates following the Great Financial Crisis of 2008-2009.

[1]Ohio PERS funded a new Plan during October 2014 (PERS (HC 115)). PERS (HC 115) adopted the same asset allocation policy as PERS (HC) and is excluded from some sections of the Executive Summary Memo due to limited performance history. Additional details regarding PERS (HC 115) can be found in the full performance report.

The wide dispersion in results among the State's retirement plans is driven by differences in asset allocation, asset class structure (including the mix of assets actively and passively managed) and investment manager selection, though it is not possible with the data available to RVK for us to weight each factor.

During the first half of 2015, all seven plans kept pace with or outperformed their custom total fund benchmarks.  Each plan will have different investment objectives and goals and the Total Fund Benchmarks will reflect this.  For example the PERS Health Care (HC) Plan has an objective to earn a reasonable return and preserve capital, which is reflected in a lower six-month return for both Total Fund and benchmark.  Total Fund over/under performance can come from differences in actual allocations or investment manager results.

**Figure 1: Total Fund Performance** (dark shade) **vs. Total Fund Benchmarks** (light shade)




- Total Fund Benchmark is a target allocation index based on the targeted asset class percentages and appropriate asset class indexes for each individual plan.
- Market values shown are in millions ($000,000)
- (DB): Defined Benefit Fund
- (HC): Health Care Fund

In many publicly traded asset and sub-asset classes, active investment managers produced generally positive results relative to their relevant broad market indices to start 2015 – a reversal from calendar year 2014 when active management struggled to outperform.  Most of the State's retirement plans invest in both active and passive (index-tracking) strategies within public equities, as shown below.  This breakdown is an important metric to look at because it gives insight into the expected tracking of an index.

As an example, during the first six months of 2015 the broad market indices for both US and international equities ranked near the bottom third, while fixed income ranked in the bottom 20th percentile compared to all active investment fund strategies in the selected peer groups (see Figure 2).

**Figure 2: Actively Managed Assets**

| Percentage of Actively Managed Assets - As of 06/30/2015 | | | | | | |
|---|---|---|---|---|---|---|
| | Total Fund | Domestic Equity | International Equity | Fixed Income | Real Estate | Alternatives |
| PERS (DB) | 91% | 34% | 78% | 100% | 100% | 100% |
| PERS (HC) | 84% | 34% | 78% | 100% | 0% | 100% |
| PERS (HC 115) | 85% | 34% | 78% | 100% | 0% | 100% |
| STRS | 87% | 62% | 100% | 100% | 86% | 100% |
| OP&F | 87% | 54% | 100% | 100% | 100% | 100% |
| SERS | 78% | 49% | 60% | 100% | 96% | 100% |
| HPRS | 77% | 50% | 73% | 100% | 100% | 100% |
| | | Russell 3000 | MSCI ACW ex US | Barclays US Agg | | |
| 2 Quarters Index Ranks* | --- | 65 | 68 | 83 | --- | --- |
| 2014 Calendar Year Ranks* | --- | 32 | 63 | 36 | --- | --- |

*Investment Metrics Separate Account and Commingled Fund Manager Peer Groups used for index rankings.

During the past three years, five of the six plans outperformed their custom benchmarks, which we view has been appropriately selected by each individual System. Longer-term relative performance also remains strong as four of six beat their custom benchmarks over the last five years and five of six outperformed over the trailing ten-year period.

Plan sponsor peer group benchmarking is another way to compare performance results of Ohio's retirement plans, however there can be a wide range in investment objectives and different benefit plan structures, for example PERS Health Care Fund's objective of capital preservation which leads to a larger allocation to fixed income. Relative to peers, five of the six plans outperformed the All Public Plans > $1B median over the trailing three-year period and three plans also outperformed the median peer over the trailing ten-year period (see Figure 3 on the following page).

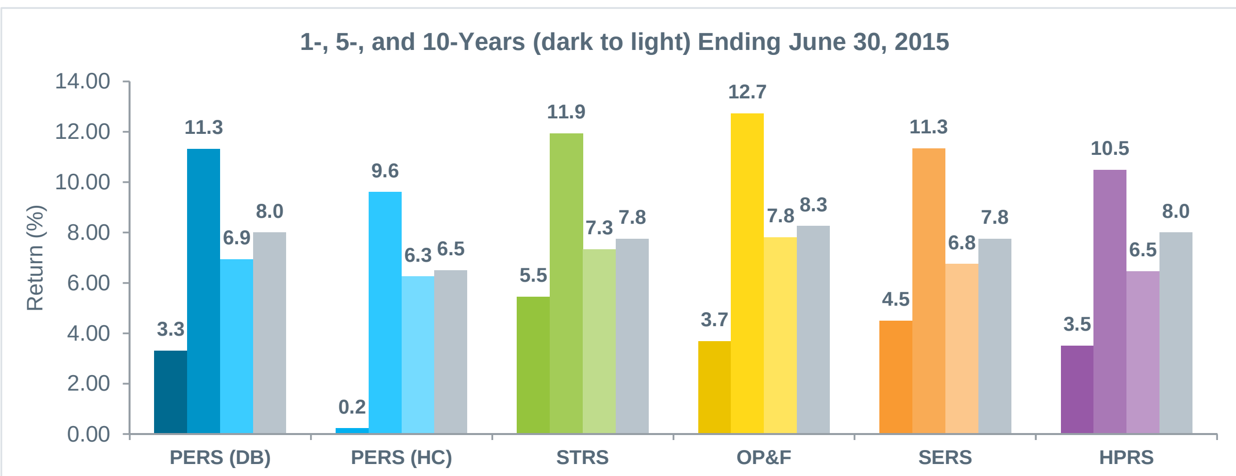
When reviewing a peer group of plan sponsors with assets greater than $10B (may not be an appropriate asset level cutoff for all plans, for example HPRS has $852m in plan assets) ranks generally improve over the 3-, 5-, and 7-year periods for all plans. Over the ten-year period, the HPRS results would compare more favorably to similar sized peers ($250M to $1B).

**Figure 3: Fund Performance vs. Public Plans**

| | Market Value | 2 Quarters | | | 1 Year | | | 3 Years | | | 5 Years | | | 7 Years | | | 10 Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | % | Rank | | % | Rank | | % | Rank | | % | Rank | | % | Rank | | % | Rank | |
| | ($000,000) | Return | > $1B | > $10B | Return | > $1B | > $10B | Return | > $1B | > $10B | Return | > $1B | > $10B | Return | > $1B | > $10B | Return | > $1B | > $10B |
| PERS (DB) | 77,803 | 3.0 | (46) | (35) | 3.3 | (46) | (35) | 11.0 | (41) | (30) | 11.3 | (39) | (22) | 6.5 | (54) | (43) | 6.9 | (45) | (24) |
| PERS (HC) | 11,954 | 1.5 | (93) | (92) | 0.2 | (98) | (92) | 8.7 | (88) | (86) | 9.6 | (84) | (80) | 5.9 | (81) | (81) | 6.3 | (77) | (94) |
| STRS | 74,173 | 3.6 | (11) | (5) | 5.5 | (5) | (5) | 11.9 | (22) | (1) | 11.9 | (15) | (1) | 6.6 | (47) | (32) | 7.3 | (15) | (1) |
| OP&F | 14,527 | 3.8 | (9) | (3) | 3.7 | (38) | (3) | 12.0 | (17) | (1) | 12.7 | (1) | (1) | 7.3 | (14) | (2) | 7.8 | (2) | (1) |
| SERS | 12,824 | 4.0 | (7) | (1) | 4.5 | (14) | (1) | 11.9 | (20) | (1) | 11.3 | (36) | (11) | 6.0 | (78) | (74) | 6.8 | (61) | (67) |
| HPRS | 852 | 2.7 | (56) | (51) | 3.5 | (41) | (51) | 11.6 | (29) | (11) | 10.5 | (60) | (45) | 6.2 | (69) | (53) | 6.5 | (75) | (89) |
| > $1B Peer Median | | 2.8 | | | 3.2 | | | 10.8 | | | 11.0 | | | 6.6 | | | 6.9 | | |
| > $10B Peer Median | | 2.7 | | | 2.7 | | | 10.1 | | | 10.3 | | | 6.3 | | | 6.8 | | |

Over the trailing five-year period, all six plans outperformed their actuarial assumed rate of return as shown by Figure 4. However over the longer ten-year time period, all plans trailed their respective actuarial benchmark.

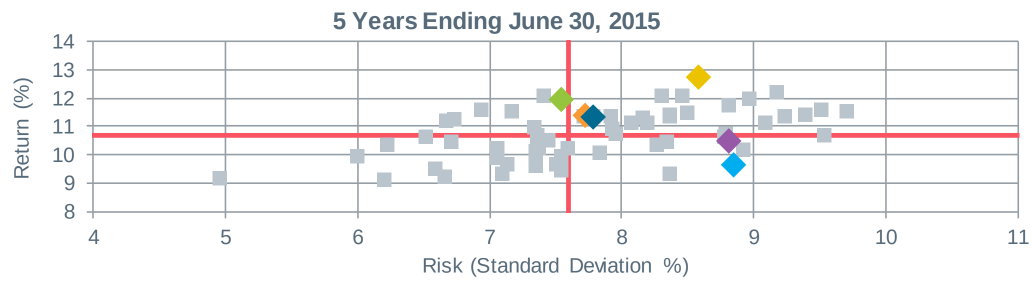
**Figure 4: Fund Performance vs. Actuarial Rate of Return (Gray)**




*PERS (HC 115)'s actuarial assumed rate of return is the same as PERS (HC) (6.50%).

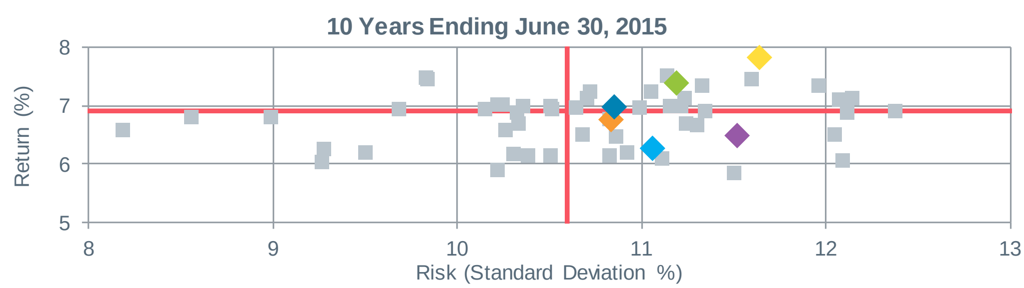
While additional analysis is needed to fully understand the risk posture of each plan, the risk and return charts shown below suggest all six plans to varying degrees have exhibited more asset risk relative to peers (see Figure 5). Over the trailing five-year period, four of the six plans have generated more return for each unit of risk exposure (as measured by standard deviation) than the median peer. OP&F and STRS have also generated risk-adjusted returns (as measured by Sharpe Ratio) that rank in the top 40% of all Public Plans Greater than $1B over the trailing ten-year time period. Peers may have different risk/return results for a variety of reasons, including but not limited to: objectives and goals, target allocations, time of allocation changes, investment restrictions, asset class exposures, or investment management execution.

**Figure 5: All Public Plans > $1B Risk and Return**




| | Return | Standard Dev. | Sharpe Ratio |
|---|---|---|---|
| PERS (DB) | 11.3 | 7.8 | 1.4 |
| PERS (HC) | 9.6 | 8.9 | 1.1 |
| STRS | 11.9 | 7.6 | 1.5 |
| OP&F | 12.7 | 8.6 | 1.5 |
| SERS | 11.3 | 7.7 | 1.4 |
| HPRS | 10.5 | 8.8 | 1.2 |
| Median | 10.7 | 7.6 | 1.4 |

*Grey boxes on scatterplot charts represent members of the peer universe.




| | Return | Standard Dev. | Sharpe Ratio |
|---|---|---|---|
| PERS (DB) | 6.9 | 11.0 | 0.5 |
| PERS (HC) | 6.3 | 11.1 | 0.5 |
| STRS | 7.3 | 11.3 | 0.6 |
| OP&F | 7.8 | 11.6 | 0.6 |
| SERS | 6.7 | 10.8 | 0.5 |
| HPRS | 6.5 | 11.5 | 0.5 |
| Median | 6.9 | 10.6 | 0.5 |

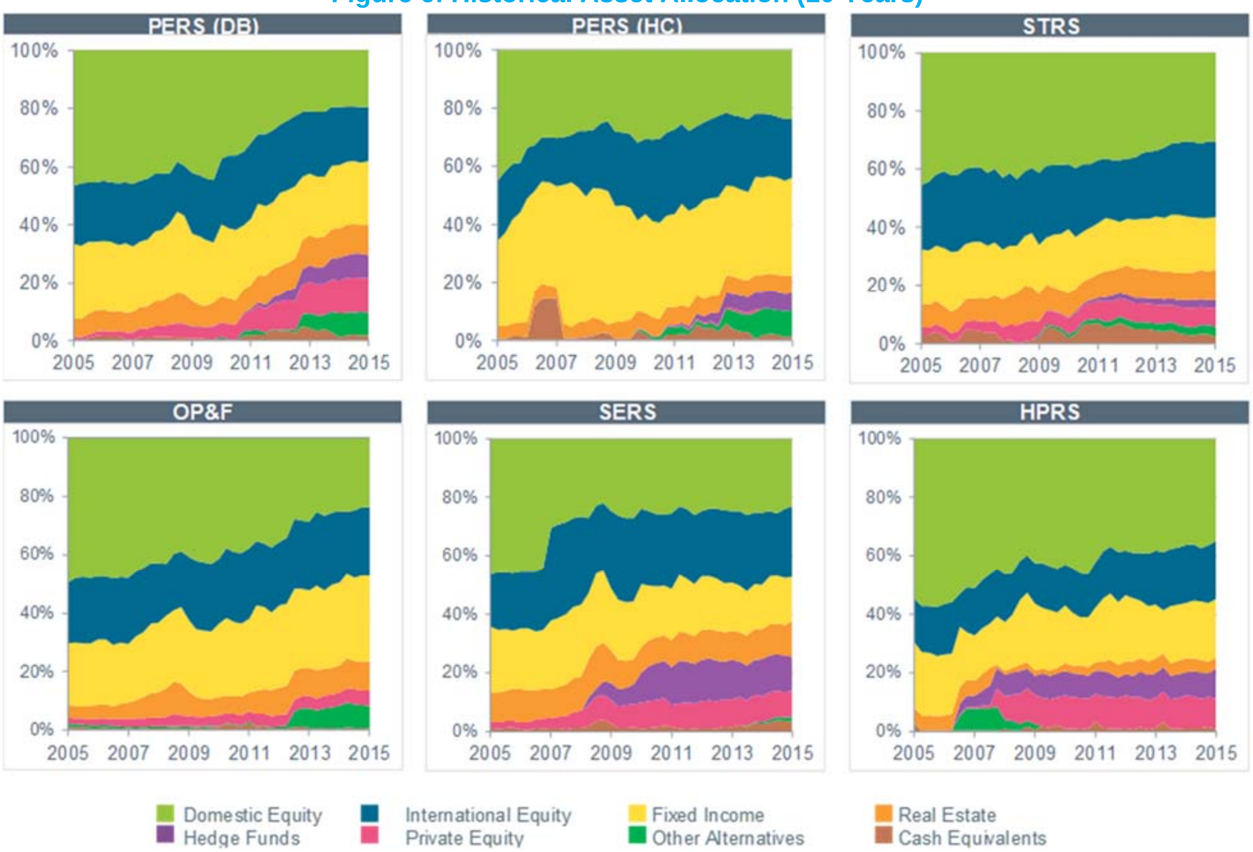
*Grey boxes on scatterplot charts represent members of the peer universe.

## Asset Allocation

Overall, the six plans all exhibit characteristics of increasingly diversified, institutional quality portfolios. Exposures to public equities (capital appreciation or "growth" assets) make up the largest component for each plan. Within equities, domestic equity investments have generally declined over the past ten years while allocations to alternatives, particularly hedge funds and private equity, have increased. The charts in Figure 6 show a "lookback" at the historical asset allocations for each plan and how they have moved to today's portfolio.

HPRS currently has the largest allocation to domestic equity at 35% while PERS (DB) has the smallest domestic equity allocation at 20%. PERS (HC) has the largest fixed income allocation at 34%. The average total allocation to hedge funds, private equity, and other alternatives among the six plans is 19%. Relative to peers, the six plans have higher strategic exposures to international equities and lower strategic exposures to domestic equities. The six plans also have higher allocations to alternatives and real estate relative to the median Public Plan > $1B.

**Figure 6: Historical Asset Allocation (10 Years)**



The table below highlights recent target allocation changes since our last report.

**Figure 7: Changes to Target Allocations since 12/31/2014 (%)**

| | Domestic Equity | International Equity | Fixed Income | Real Estate | Hedge Funds | Private Equity | Other Alternatives |
|---|---|---|---|---|---|---|---|
| PERS (DB) | 0.70% | -0.70% | --- | --- | --- | --- | --- |
| PERS (HC) | 0.70% | -0.70% | --- | --- | --- | --- | --- |
| STRS | --- | --- | --- | --- | --- | --- | --- |
| OP&F | 3.25% | 2.25% | -2.00% | -2.00% | --- | --- | -1.50% |
| SERS | --- | --- | --- | -3.00% | 3.00% | --- | --- |
| HPRS | --- | --- | --- | --- | --- | --- | --- |

Detailed asset allocation targets as of 06/30/2015 can be found in the full performance report.

Other Alternatives of OP&F include Master Limited Partnerships (+1%) and Timber (-2.5%)

The table below highlights calendar year performance for key asset classes.

**Figure 8: Annual Asset Class Performance**

| Index (Asset Class) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | YTD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S&P 500 (US Large Cap) | 25.9 | 55.8 | 25.6 | 34.0 | 32.2 | 39.4 | 5.2 | 78.5 | 26.9 | 16.0 | 18.2 | 38.8 | 13.7 | 7.3 | Highest Annual Return |
| Russell 2000 (US Small Cap) | 10.3 | 47.3 | 20.2 | 21.4 | 26.3 | 16.2 | -10.0 | 31.8 | 18.9 | 7.8 | 17.3 | 32.4 | 12.5 | 5.5 | |
| MSCI EAFE (Int'l Developed) | 5.5 | 38.6 | 18.3 | 21.4 | 18.4 | 16.0 | -21.4 | 27.2 | 16.8 | 2.1 | 16.3 | 22.8 | 6.0 | 4.8 | |
| MSCI EM (Int'l Emg Markets) | 1.0 | 28.7 | 13.1 | 13.5 | 16.3 | 11.2 | -33.8 | 26.5 | 16.4 | -4.2 | 16.0 | 13.9 | 4.9 | 2.9 | |
| Barclays US Agg Bond (Fixed Income) | -6.2 | 23.9 | 10.9 | 7.5 | 15.8 | 10.3 | -35.6 | 18.9 | 15.1 | -5.7 | 10.9 | 9.0 | 3.4 | 2.7 | |
| NCREIF ODCE (Real Estate) | -15.9 | 11.6 | 9.1 | 4.9 | 10.4 | 7.0 | -37.0 | 11.5 | 7.8 | -12.1 | 4.8 | -2.0 | -2.2 | 1.2 | |
| HFRI FOF (Absolute Return) | -20.5 | 9.3 | 6.9 | 4.6 | 4.3 | 5.5 | -43.4 | 5.9 | 6.5 | -13.3 | 4.2 | -2.6 | -4.9 | -0.1 | |
| Bloomberg Cmdty (Commodities) | -22.1 | 4.1 | 4.3 | 2.4 | 2.1 | -1.6 | -53.3 | -29.8 | 5.7 | -18.4 | -1.1 | -9.5 | -17.0 | -1.6 | Lowest Annual Return |

YTD: Year-to-Date through June 30, 2015

## Asset Class Returns and Risk

The following section includes information on all “major” asset classes. Additional details are available within our full report.

### US Equity

The domestic equity allocation for all plans outperformed the 1.9% return earned by the Russell 3000 Index during the first half of 2015. Three of six plans trailed the broad market index over the trailing three-year period (see Figure 9). Longer-term performance remains strong for the three plans that outperformed the Russell 3000 Index and peer universe over the trailing seven-year period. HPRS and OP&F also outperformed the 8.2% earned by both the Russell 3000 Index and the peer universe median over the trailing ten-year period.

**Figure 9: Domestic Equity Performance**

| | 2 Quarters | | 1 Year | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank |
| **PERS (DB)** | 2.2 | (55) | 7.0 | (55) | 17.6 | (46) | 17.5 | (56) | 9.5 | (51) | 8.0 | (61) |
| **PERS (HC)** | 2.2 | (55) | 7.0 | (55) | 17.6 | (46) | 17.5 | (56) | 9.5 | (51) | 8.0 | (61) |
| **STRS** | 2.4 | (50) | 7.3 | (45) | 17.1 | (69) | 17.2 | (62) | 9.6 | (48) | 7.9 | (63) |
| **OP&F** | 2.5 | (45) | 6.6 | (58) | 17.8 | (40) | 17.8 | (29) | 10.4 | (18) | 8.8 | (10) |
| **SERS** | 2.4 | (50) | 6.0 | (70) | 18.6 | (15) | 17.9 | (20) | 10.0 | (34) | 8.1 | (59) |
| **HPRS** | 2.2 | (56) | 7.7 | (30) | 18.3 | (24) | 17.4 | (58) | 10.3 | (24) | 8.6 | (25) |
| R 3000 Index | 1.9 | | 7.3 | | 17.7 | | 17.5 | | 9.7 | | 8.2 | |
| Peer Median | 2.4 | | 7.2 | | 17.5 | | 17.5 | | 9.5 | | 8.2 | |

### International Equity

The international equity allocation at all six plans outperformed their respective benchmarks over the trailing two quarter and one-year periods. STRS earned the highest absolute performance over the trailing year with a return of 2.1% (see Figure 10). All funds outperformed their respective benchmarks over the trailing three- and five-year periods, with two of the six funds also outperforming the peer median. Over the trailing ten-year period, the six funds earned absolute returns ranging from 5.6% to 7.2%. All six plans outperformed their respective benchmarks and three plans outperformed the Universe median.

**Figure 10: International Equity Performance**

| | 2 Quarters | | 1 Year | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank |
| **PERS (DB)** | 4.7 | (83) | -3.1 | (60) | 10.7 | (71) | 8.8 | (81) | 2.2 | (72) | 6.2 | (51) |
| **PERS (HC)** | 4.7 | (83) | -3.1 | (60) | 10.7 | (71) | 8.8 | (81) | 2.2 | (72) | 6.2 | (51) |
| **STRS** | 6.6 | (13) | 2.1 | (3) | 13.2 | (16) | 9.8 | (42) | 3.8 | (15) | 7.2 | (21) |
| **OP&F** | 6.4 | (17) | -1.7 | (28) | 11.6 | (39) | 10.1 | (35) | 3.2 | (31) | 7.1 | (24) |
| **SERS** | 6.1 | (26) | -3.4 | (65) | 10.7 | (72) | 8.6 | (88) | 2.9 | (39) | 6.8 | (37) |
| **HPRS** | 5.3 | (65) | -4.9 | (95) | 10.6 | (74) | 8.7 | (84) | 1.7 | (86) | 5.6 | (80) |
| MSCI ACW Ex US IMI | 4.6 | | -5.0 | | 9.8 | | 8.0 | | 1.9 | | 5.8 | |
| Peer Median | 5.6 | | -2.8 | | 11.3 | | 9.6 | | 2.5 | | 6.2 | |

## Fixed Income

Domestic fixed income markets ended the first half of 2015 relatively flat, with the Barclays US Aggregate Bond Index returning -0.1%. During the period, all six plans generated positive absolute performance and relative outperformance versus their respective benchmarks, returning 0.1% to 1.2%. All plans outperformed the broad market index over the 3-, 5-, and 7-year trailing periods as shown by Figure 11. SERS's fixed income composite returned 5.7% versus 4.4% for the Barclays US Aggregate Bond Index, the highest absolute and relative return earned among the six plans during the trailing ten-year period.

**Figure 11: Fixed Income Performance**

| | 2 Quarters | | 1 Year | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank | % Return | Rank |
| **PERS (DB) Core FI** | 0.1 | (85) | 2.2 | (23) | 2.5 | (66) | 3.9 | (84) | 4.7 | (85) | 4.2 | (92) |
| **PERS (HC) Core FI** | 0.1 | (85) | 2.2 | (23) | 2.5 | (66) | 3.9 | (84) | 4.7 | (85) | 4.2 | (92) |
| **STRS** | 0.6 | (44) | 1.7 | (49) | 2.5 | (68) | 4.0 | (80) | 5.4 | (58) | 5.2 | (43) |
| **OP&F Core FI** | 1.2 | (19) | 2.1 | (25) | 2.4 | (68) | 3.9 | (84) | 5.4 | (58) | 4.9 | (57) |
| **SERS** | 0.3 | (73) | 1.0 | (73) | 3.4 | (40) | 5.1 | (37) | 6.7 | (17) | 5.7 | (27) |
| **HPRS** | 1.2 | (17) | 2.2 | (22) | 2.5 | (67) | 4.1 | (75) | 5.2 | (68) | 5.1 | (54) |
| B US Agg Bond Index | -0.1 | | 1.9 | | 1.8 | | 3.4 | | 4.6 | | 4.4 | |
| Peer Median | 0.5 | | 1.6 | | 3.0 | | 4.9 | | 5.7 | | 5.1 | |

## Real Estate

Of the five plans with exposure to core and value-added real estate, returns ranged from 4.9% to 8.5% during the first half of the year, making a substantial contribution to absolute returns for these plans. PERS (HC)'s REITs (real estate investment trusts) composite earned -5.7%. Over the trailing ten-year period, returns ranged from 3.7% to 10.9% per annum and four plans outperformed their respective benchmarks (see Figure 12).

**Figure 12: Real Estate Performance**

| Core and Value-Added Real Estate | | | | | | |
|---|---|---|---|---|---|---|
| | 2 Quarters | 1 Year | 3 Years | 5 Years | 7 Years | 10 Years |
| | % Return | % Return | % Return | % Return | % Return | % Return |
| **PERS (DB)** | 8.5 | 20.2 | 16.3 | 15.5 | 5.7 | 9.2 |
| **STRS** | 4.9 | 14.1 | 13.2 | 15.1 | 5.6 | 10.9 |
| **OP&F** | 8.2 | 18.3 | 16.1 | 16.8 | 3.3 | 8.1 |
| **SERS** | 6.9 | 13.3 | 13.2 | 14.4 | 1.7 | 5.3 |
| **HPRS** | 5.6 | 17.5 | 16.6 | 10.0 | 2.7 | 3.7 |
| NCREIF ODCE Index (Net) (AWA) | 6.9 | 13.4 | 12.1 | 13.3 | 2.7 | 5.9 |
| **REITs** | | | | | | |
| **PERS (HC) REITs** | -5.7 | 5.3 | 8.8 | 14.7 | 7.8 | 6.9 |
| DJ US Sel RE Securities | -5.7 | 5.3 | 8.7 | 14.4 | 7.5 | 6.7 |

## Hedge Funds

Composite returns ranged from 1.4% to 3.2% among the five plans with dedicated hedge fund composites. Over the trailing three--year period the hedge fund allocations for all five plans outperformed their respective benchmarks, as shown by Figure 13. STRS's hedge funds composite has the longest available history among the five plans and earned 7.4% per annum over the trailing-ten year period.

**Figure 13: Hedge Funds Performance**

| | 2 Quarters | 1 Year | 3 Years | 5 Years | 7 Years | 10 Years |
|---|---|---|---|---|---|---|
| | % Return | % Return | % Return | % Return | % Return | % Return |
| **PERS (DB)** | 2.4 | 3.4 | 6.7 | 4.1 | 2.2 | N/A |
| **PERS (HC)** | 2.4 | 3.4 | 6.7 | 4.1 | 2.2 | N/A |
| **STRS** | 1.4 | 1.2 | 6.7 | 6.0 | 2.8 | 7.4 |
| **SERS** | 2.4 | 2.3 | 7.1 | 5.9 | N/A | N/A |
| **HPRS** | 3.2 | 3.4 | 6.7 | 4.8 | 3.3 | N/A |
| HFRI FOF Comp Index | 2.7 | 4.0 | 6.3 | 4.1 | 1.2 | 3.2 |

## Private Equity

Five of the six plans have dedicated exposure to private equity. Over the trailing seven-year period, the time-weighted returns for these allocations have ranged from 3.8% to 10.2% per annum. Three of the four plans with available history have outperformed their respective benchmarks over the trailing ten-year period. Although we prefer to measure private equity performance using since inception money-weighted returns (IRR), we have included time-weighted performance in our analysis for illustrative purposes.

## Additional Investments

We have included additional asset class composites which are not shared across the majority of the six plans within our Investment Performance Analysis. PERS (DB), PERS (HC), and OP&F provided additional fixed income sub-asset class performance and five of the six plans provided composite performance for other alternatives such as commodities and opportunistic investments. Please see the respective pages within our Investment Performance Analysis for additional information.

## Considerations

After careful analysis, we put forth the following considerations for the Ohio Retirement Study Council:

1. Be mindful of target asset allocation for each fund and the goals they are attempting to achieve. Currently all the funds are diversified across multiple asset classes and exhibit characteristics of prudent investor diversification.

   - ➔ The determination of a fund's asset allocation is the single most important investment decision and is a major determinant of long-term return and the volatility risk of asset values. Creating a diversified portfolio of asset classes enables the investor to achieve a potential higher rate of return while minimizing volatility of the portfolio. A fund following a smoother, less volatile path compounds value at a faster rate.

   - ➔ Don't assume that all of the Plans should have the same asset allocation. Differences in their liabilities, funding status, the risk tolerance of their fiduciaries and other factors will likely produced legitimate differences in their respective asset allocations.

2. Monitor the change in asset allocation over time.

   - ➔ Target allocations should be formally reviewed (by the Board) every few years with potentially more frequent informal reviews (by Staff). From each review there can be multiple reasons for adopting new targets (with generally gradual shifts) – from a rare occurrence of the overarching goal of the investment program changing to potential consideration of significant, longer-term economic or market changes to the possibility of opportunities to improve the risk/return tradeoff.

3. While this and subsequent reports we deliver to the Council will focus on recent information in return and risk taken at each of the funds, we strongly encourage you to once again focus on the 3 and 5 year risk and return results to better gauge the stewardship of the State's pension assets.

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[i]All performance shown is gross of fees, with the exception of externally managed real estate, hedge fund, and private equity investments. Total Fund performance shown is gross of fees but is net of embedded fees on externally managed real estate and alternative investments.

[2]"PERS (DB)" represents the Ohio PERS Defined Benefit Fund and "PERS (HC)" represents the Ohio PERS Health Care Fund. The Health Care Fund is intended to provide health care benefits to eligible members and has an investment objective to earn a reasonable return and preserve capital.