

# INVESTMENT ADVISORY COMMITTEE MEETING

## December 12, 2017

### State of Michigan Retirement Systems

#### Quarterly Investment Review



Nick A. Khouri, State Treasurer

Prepared by Bureau of Investments  
Michigan Department of Treasury

# INVESTMENT ADVISORY COMMITTEE MEETING

DECEMBER 12, 2017

## Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 9/7/17 IAC Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 9/30/17
- 10:00 a.m. Current Asset Allocation Review  
Markets Review and Outlook
- 10:15 a.m. Review of Investment Reports
- Fixed Income
  - Domestic Equity
  - International Equity
  - Private Equity
  - Real Estate & Infrastructure
  - Absolute and Real Return/Oppportunistic
- Basket Clause – *Receive and File*
- 11:00 a.m. Closing Remarks ~ Adjournment



### 2018 Meeting Schedule

Thursday, March 8, 2018  
Thursday, June 7, 2018  
Thursday, September 6, 2018  
Tuesday, December 11, 2018

All meetings start at 9:30 a.m.

[www.michigan.gov/treasury](http://www.michigan.gov/treasury)

# State of Michigan Retirement Systems

## MINUTES

Investment Advisory Committee Meeting

December 12, 2017



Jon M. Braeutigam  
Chief Investment Officer  
Bureau of Investments

## INVESTMENT ADVISORY COMMITTEE

The Investment Advisory Committee (IAC) held its quarterly meeting on Thursday, September 7, 2017, at the Bureau of Investments, Great Lakes Conference Room, 2501 Coolidge Road, Suite 400, East Lansing, Michigan.

### Members Present:

L. Erik Lundberg, Acting Chair  
Reginald G. Sanders  
Al Pscholka, DTMB  
Allan Pohl, LARA

### In attendance from the Department of Treasury:

|                       |                   |                    |
|-----------------------|-------------------|--------------------|
| Treasurer Nick Khouri | Jon M. Braeutigam | Robert Brackenburg |
| Gregory J. Parker     | Jim Elkins        | Peter Woodford     |
| Jack Behar            | Brian Liikala     | Patrick Moraniec   |
| Dan Quigley           | Travis Haney      | Woody Tyler        |
| Ann Stange            | Tim Reynolds      | Giles Feldpausch   |
| Ann Storberg          | Karen Stout       | Lee Logan          |
| Semone James Howes    | Mark Porrell      | Barb Becker        |
| Lori Barrett          | Annette Russell   | Marge McPhee       |

### Others in attendance:

|                    |                |                |
|--------------------|----------------|----------------|
| Max Kotary         | Tim McEnery    | Joe Hernandez  |
| Molly Jason        | Dick Holcomb   | Paul Lerg      |
| Chuck Abshagen     | Mark Guastella | June Morse     |
| Kerrie VandenBosch | John Ide       | David Lebovitz |

### **Call to Order**

State Treasurer, Nick Khouri called the September 7, 2017, IAC meeting to order at 9:30 a.m., requesting that Mr. Erik Lundberg act as Chair for the meeting.

### **Approval of the June 8, 2017, Minutes**

- Mr. Lundberg asked for a motion to approve the minutes of the June 8, 2017, IAC meeting. Mr. Al Pscholka so moved, seconded by Mr. Reginald Sanders, there were no objections – motion carried.

### **Executive Summary Tab** – Performance Review – Mr. Jon Braeutigam

- Mr. Braeutigam discussed the one-year return which essentially matched the peer median return. The three, five, seven, and ten-year returns; however, substantially outperformed the peer median returns.

- He further noted that the ten-year return of 5.7% compared to the ten-year peer median return of 5.3% adds an excess of \$4 billion of value. Therefore, the plan would have over \$4 billion less if the peer median was earned during these time periods. Good job to the entire team that helped produce these returns.
- Mr. Braeutigam stated that the returns fell just slightly below the policy benchmark due to being tactically underweight risk assets verse target allocations.

### **Performance and Asset Allocation Tabs** – Mr. Greg Parker

- Mr. Parker made three observations: the first observation is that over the past year, the bond portfolio within the long term fixed income portfolio returned 3.4% compared to the benchmark return of -0.3%. The second observation: over the past periods the portfolio is at median or better which is a great accomplishment. And the third observation: historically, going back twenty years or more, the fixed income portfolio has been on a trailing ten year, plus or minus, 20 basis points (bps) annualized to the benchmark. Most recently however long term fixed income has earned over 100 bps annualized on a ten year basis. This is a phenomenal job.
- Mr. Parker explained that within private markets, real estate has beat their peers across all time periods, and private equity has outperformed all time periods with the exception of the one-year.
- Mr. Parker discussed private equity, which had a ten-year return of 10% (net of fees). He noted how valuable private equity has been to the portfolio; if the monies allocated ten years ago to private equity had been allocated to public equities (domestic and international), the plan would be approximately \$5 billion less today.
- Mr. Lundberg noted that private equity stands out as the highest performing asset class over any long period of time. He stated one reason is because it is less liquid, therefore the return is greater if invested prudently.
- There was also discussion on the importance of private equity, negotiating to lower fees, the influx of new investors into the private equity market being good for current investors, the necessity of long-term investing, and keeping good general partner relationships in place. These all play a role in generating good returns from private equity.
- Mr. Parker reviewed asset allocation noting that short-term cash increased by about \$600 million, a little less than one percent over the past twelve months.
- He discussed that over the past twelve months, the net benefit payments to pensioners was approximately \$2 billion.
- He further explained that most asset classes were sources of funds over the past twelve months, with the exception of International Equity in which approximately \$500 million was allocated and real return opportunistic.

- Mr. Braeutigam stated that \$65.6 billion is a record high for the fund, despite the pension plans paying out net benefit payments every year.

**Guest Speaker – Mr. David Lebovitz, Vice President, J.P. Morgan Asset Management Global Market Insights Strategy Team**

- Mr. Lebovitz discussed the growth of the markets in the different sectors. He discussed international equity noting the growth in this sector; the monetary policy; the internal composition of the Fed; fixed income and diversification; real estate and macro funds; hedge fund correlations; private equity and private credit.
- Mr. Lebovitz noted the rising rates in the public markets and what this would mean to equities. He noted the global growth, the opportunities in fixed income, and the upside in equities and international equity exposure.
- Mr. Lebovitz discussed the valuation predictor of future returns.
- There were lengthy discussions on the different topics of his presentation. Several questions were asked and answered during his presentation.

**Fixed Income Review – Mr. Dan Quigley**

- Mr. Quigley briefly discussed performance stating that on a relative basis performance has been strong. Peers were exceeded across all time periods. Last year was especially strong with a relative outperformance of 370 bps.
- Mr. Quigley stated that the division's current position is to reduce high-yield, high-risk assets, moving them into structured assets decreasing loss should crises occur.
- Mr. Quigley further discussed the duration perspective noting avoiding major surprises and major bouts of volatility are a major objective. He also discussed the yield curve.
- Mr. Quigley noted that securities are being considered which pay a better relative value, and have an embedded cheap insurance.

**Domestic Equity Review – Mr. Jack Behar**

- Mr. Behar discussed the portfolio noting that performance has been very good over the past year, ending July 31, 2017, outperforming the S&P 1500 by 80 bps on a one-year basis.
- Mr. Behar discussed the externally managed portfolio, which had a very nice run. He stated they had outperformed the S&P 1500 by 120 bps over the past year due in part to the overlay strategy of the portfolio.
- Mr. Behar reviewed the internally managed portfolios, which are outperforming on a one-year basis ending July 31, 2017.

- Mr. Behar explained how the overlay strategy works and that the results are an increase in the reinvestment rate.

**Review of Investment Reports – Received and Filed**

- The International Equity, Private Equity, Real Estate & Infrastructure, Absolute and Real Return/Opportunistic, and the Basket Clause were received and filed.

**Closing Remarks**

Acting Chair Lundberg thanked everyone for attending the September IAC Meeting.

**Next Meeting Date and Adjournment**

The next IAC Meeting is scheduled for Tuesday, December 12, 2017. The meeting was adjourned by Acting Chair Lundberg at 11:05 a.m.

Approved:

---

James B. Nicholson, Chair

State of Michigan Retirement Systems

# EXECUTIVE SUMMARY

Investment Advisory Committee Meeting

December 12, 2017



Gregory J. Parker, CFA  
Director of Investments – Public Markets  
Director of Asset Allocation  
Bureau of Investments



# EXECUTIVE SUMMARY

September 2017

## Performance

*An overview.*

| <b>MPSERS Plan (9/30/17)</b> | <b>1-Year</b> | <b>3-Years</b> | <b>5-Years</b> | <b>7-Years</b> | <b>10-Years</b> |
|------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns           | 13.8%         | 7.9%           | 10.3%          | 10.2%          | 5.9%            |
| Policy Return                | 13.7%         | 8.5%           | 10.4%          | 10.5%          | 6.2%            |
| Peer Median Return*          | 12.7%         | 7.2%           | 9.0%           | 9.0%           | 5.4%            |

\*State Street Universe greater than \$10 billion.

- Over the past three, five, seven, and ten years, the returns are significantly higher than peer median returns. When compared to the State Street Universe of public pension plans greater than \$10 billion, the returns are mostly within the top quartile of returns. As notable, over the past three and five years, the returns were the least risky, as measured by standard deviation.
- The ten-year return includes the impact of the global financial crisis. Over a very long horizon, since 1979, the annualized rate of return on the plan assets has been approximately 9.4%.
- Compounding even slightly higher than peer returns on \$67.5 billion of SMRS' assets, significantly adds up over time. For example, the ten-year annualized return of 5.9% compared to the 5.4% peer median return would add approximately \$5.5 billion of value to SMRS' assets over a ten-year period.
- The returns beat the policy benchmark over the past year by 0.1%. Many of the asset classes posted results in excess of their performance benchmark, however a slightly defensive allocation offset some of the positive selectivity.
- For the year ending September 2017, returns exceeded the peer median return by 1.1%. The returns of the individual asset classes were better than median returns over this time period and a lower weighting to fixed income also helped to achieve returns higher than peers.

## Asset Allocation

*A low return environment.*

- Given the historically low rates of return available in the capital markets for safe, short-term bonds, and in order for the assets to earn the long-term actuarial rates of returns, additional risks (primarily equity risk) must be assumed.
- Liquidity is another fundamental risk assumed and it is managed through asset allocation. The plans have outstanding capital commitments to fund approximately \$11 billion in illiquid assets, primarily in private equity. In the September 2017 quarter, approximately \$1 billion of new commitments were made.
- The combined systems paid out approximately \$2.2 billion net of contributions over the past twelve months ending in September 2017.
- Over the past year international equity had a net inflow of \$500 million, Real Return / Opportunistic received an allocation of approximately \$70 million and the allocation to short-term cash increased by approximately \$600 million. Over the past year in round numbers, the allocation to domestic equity was reduced by \$2.4 billion, real estate by \$460 million, and absolute return by \$240 million and private equity by \$230 million.

## **Capital Markets**

*Risk assets in focus.*

- Capital market assumptions used for determining strategic asset allocations are being reduced across the board, and especially for safer, publicly traded fixed income securities. This is the general opinion for most consultants, investment banks, and other market participants. The reason for this phenomenon is the low interest rate environment caused by the policies of the Federal Reserve and other central banks, as well as the run-up in prices for most risk assets over the past five years after the depths of the Great Recession.
- While earnings in U.S. equities have made a new plateau, earnings in international markets can grow close to 50% to get back to all-time highs, or 15% to get to longer-term trends. Trading at a valuation multiple discount, and seemingly with some relative strength, international equity represents a leveraged play on continued global growth.
- By the end of October 2017, the S&P 500 had not experienced a pull-back of greater than 3% for almost 250 trading days. The record for such persistent low volatility was set in 1995 at 266 trading days. Extended periods of both low implied and realized market volatility are common, but are rarely a pre-cursor to spikes in volatility. However, its juxtaposition with today's political environment and critical central bank policy changes simply feel wrong to many market participants.

## **Economic Backdrop**

*A pretty good U.S. economy.*

- The current economic expansion in the U.S. is into its eighth year, ranking it the third longest economic expansion in the past seventy years.
- The Federal Reserve Bank of Atlanta tracks wage growth of individuals and the trend in wage growth is steadily increasing. Its three-month median wage growth hit 3.4% in October 2017. Inflation hawks are looking for an acceleration in labor costs, potentially leading to a compression in corporate profit margins, however at this time the fear of such conditions is much greater than actual experiences.
- Housing prices in the U.S. are high. This is good for household balance sheets, but may act as a headwind for household formations. According to the U.S. Bureau of the Census, the median sales price of new houses sold in the U.S. is \$315,200, up over 22% from the 2007 peak. Low interest rates make housing as affordable as it has been in the past eight years, but less affordable compared to historical trends going back to the 1980s.

**Investment Update**  
*Highlighting the quarter.*

(\$ Millions)

**NEW COMMITMENTS**

**July 1 – September 30, 2017**

| <b>Asset Class</b>                                  | <b>Fund Name / (Managed By)</b>  | <b>Commitment</b> |
|---|--|-------------------|
| <b>Private Equity</b>                               |  |                   |
|   | Insight Venture Partners X (Insight Venture Associates X, LP)                  | \$100.0           |
|   | Flagship Pioneering VI (Flagship Pioneering Fund VI GP, LLC)                   | 75.0              |
|   | Apax Digital Fund (Apax Partners)  | 50.0              |
|   | Science Ventures Fund II (Science Ventures Fund II GP, LLC)                    | 20.0              |
| <b>Real Estate &amp; Infrastructure</b>             |  |                   |
|   | Rialto Absolute Partnership I (Rialto Capital Management, LLC)                 | 75.0              |
|   | TSP Fund II, LP (Transwestern Strategic Partners, LLC)                         | 50.0              |
|   | TSP Spartan C-II, LLC, (Transwestern Strategic Partners, LLC)                  | 20.0              |
| <b>Absolute and Real Return &amp; Opportunistic</b> |  |                   |
|   | Barings Asset-Based Income Fund I (Barings Alternative Investments)            | 300.0             |
|   | BSCH Parallel (MLG) I, LP (Blackstone Strategic Capital Holdings)              | 120.0             |
|   | Vida Insurance Credit Opportunity Fund II, LP (Vida Capital Management)        | 100.0             |
|   | SJC Direct Lending Revolver Fund III, LP (Czech Asset Management)              | 100.0             |
|   | Napier Park Aircraft Leasing Rollover Fund I, LLC (Napier Park Global Capital) | 77.3              |
| <b>TOTAL</b>  |  | <b>\$1,087.3</b>  |

State of Michigan Retirement Systems

# PERFORMANCE

Investment Advisory Committee Meeting

December 12, 2017



Jon M. Braeutigam  
Chief Investment Officer  
Bureau of Investments

# ***Bureau of Investments***

## **Mission Statement**

*The Bureau of Investments continually strives to provide quality investment management services, broad professional expertise, and independent advice to the State Treasurer as fiduciary of the State of Michigan Retirement Systems, and various Michigan trust funds and the State's common cash.*

## **SMRS Goals**

*Maintain sufficient liquidity to pay benefits.*

*Meet or exceed the actuarial assumption  
over the long term.*

*Perform in the top half of the public plan  
universe over the long term.*

*Diversify assets to reduce risk.*

*Exceed individual asset class benchmarks  
over the long term.*

# MPERS PENSION

## Time-Weighted Rates of Return

### Periods Ending September 30, 2017

|   | % of Portfolio<br>9/30/17 | Ten<br>Years <sup>1</sup> |           | Seven<br>Years <sup>1</sup> |           | Five<br>Years <sup>1</sup> |           | Three<br>Years <sup>1</sup> |           | One<br>Year |           | Current<br>Quarter |           |
|---|---------------------------|---------------------------|-----------|-----------------------------|-----------|----------------------------|-----------|-----------------------------|-----------|-------------|-----------|--------------------|-----------|
|   |                           | Rate                      | Rank      | Rate                        | Rank      | Rate                       | Rank      | Rate                        | Rank      | Rate        | Rank      | Rate               | Rank      |
|   |                           |                           |           |                             |           |                            |           |                             |           |             |           |                    |           |
| <b>TOTAL PLAN</b>                               | <b>100.0</b>              | <b>5.9</b>                | <b>29</b> | <b>10.2</b>                 | <b>8</b>  | <b>10.3</b>                | <b>8</b>  | <b>7.9</b>                  | <b>22</b> | <b>13.8</b> | <b>25</b> | <b>4.1</b>         | <b>9</b>  |
| Median - Greater than \$10 Billion <sup>2</sup> |                           | 5.4                       |           | 9.0                         |           | 9.0                        |           | 7.2                         |           | 12.7        |           | 3.6                |           |
| MPERS Total Plan Policy                         |                           | 6.2                       |           | 10.5                        |           | 10.4                       |           | 8.5                         |           | 13.7        |           | 3.4                |           |
| <b>DOMESTIC EQUITIES</b>                        | <b>24.8</b>               | <b>7.5</b>                | <b>52</b> | <b>14.0</b>                 | <b>40</b> | <b>14.4</b>                | <b>39</b> | <b>10.1</b>                 | <b>48</b> | <b>19.9</b> | <b>22</b> | <b>5.3</b>         | <b>19</b> |
| Median <sup>2</sup>                             |                           | 7.5                       |           | 13.8                        |           | 13.7                       |           | 10.1                        |           | 18.5        |           | 4.9                |           |
| S&P 1500 Index                                  |                           | 7.6                       |           | 14.4                        |           | 14.3                       |           | 11.0                        |           | 18.6        |           | 4.4                |           |
| <b>INTERNATIONAL EQUITIES</b>                   | <b>18.3</b>               | <b>1.9</b>                | <b>53</b> | <b>6.8</b>                  | <b>45</b> | <b>8.4</b>                 | <b>62</b> | <b>6.7</b>                  | <b>31</b> | <b>21.0</b> | <b>29</b> | <b>6.5</b>         | <b>44</b> |
| Median <sup>2</sup>                             |                           | 2.0                       |           | 6.8                         |           | 8.5                        |           | 6.0                         |           | 19.5        |           | 6.3                |           |
| International Blended Benchmark <sup>3</sup>    |                           | 1.0                       |           | 5.5                         |           | 7.1                        |           | 4.7                         |           | 19.6        |           | 6.2                |           |
| <b>PRIVATE EQUITIES</b>                         | <b>15.7</b>               | <b>9.9</b>                | <b>9</b>  | <b>14.8</b>                 | <b>10</b> | <b>14.2</b>                | <b>13</b> | <b>10.4</b>                 | <b>19</b> | <b>16.4</b> | <b>18</b> | <b>6.0</b>         | <b>3</b>  |
| Median <sup>2</sup>                             |                           | 7.1                       |           | 10.7                        |           | 10.3                       |           | 8.2                         |           | 12.5        |           | 2.7                |           |
| Alternative Blended Benchmark <sup>4</sup>      |                           | 11.4                      |           | 18.5                        |           | 17.8                       |           | 12.8                        |           | 21.3        |           | 3.8                |           |
| <b>BONDS</b>                                    | <b>12.4</b>               | <b>5.5</b>                | <b>15</b> | <b>4.1</b>                  | <b>42</b> | <b>3.5</b>                 | <b>15</b> | <b>4.4</b>                  | <b>20</b> | <b>2.9</b>  | <b>29</b> | <b>1.3</b>         | <b>25</b> |
| Median <sup>2</sup>                             |                           | 4.7                       |           | 3.8                         |           | 2.4                        |           | 3.3                         |           | 1.8         |           | 1.0                |           |
| Barclays Aggregate                              |                           | 4.3                       |           | 3.0                         |           | 2.1                        |           | 2.7                         |           | 0.1         |           | 0.9                |           |
| <b>REAL ESTATE &amp; INFRASTRUCTURE</b>         | <b>9.7</b>                | <b>4.1</b>                | <b>49</b> | <b>11.9</b>                 | <b>41</b> | <b>11.6</b>                | <b>31</b> | <b>10.1</b>                 | <b>44</b> | <b>8.0</b>  | <b>35</b> | <b>1.8</b>         | <b>44</b> |
| Median <sup>2</sup>                             |                           | 3.6                       |           | 11.3                        |           | 10.6                       |           | 9.7                         |           | 6.1         |           | 1.7                |           |
| NCREIF - Property Blended Index <sup>5</sup>    |                           | 4.9                       |           | 9.8                         |           | 8.9                        |           | 8.4                         |           | 5.5         |           | 1.4                |           |
| NCREIF Open Fund Index Net                      |                           | 4.1                       |           | 11.5                        |           | 10.6                       |           | 9.8                         |           | 6.7         |           | 1.6                |           |
| <b>REAL RETURN AND OPPORTUNISTIC</b>            | <b>9.0</b>                |                           |           | <b>9.7</b>                  |           | <b>11.0</b>                |           | <b>8.3</b>                  |           | <b>12.3</b> |           | <b>2.8</b>         |           |
| 50% (CPI +500 bps) + 50% (8% actuarial rate)    |                           |                           |           | <b>7.4</b>                  |           | <b>7.2</b>                 |           | <b>7.1</b>                  |           | <b>7.7</b>  |           | <b>2.0</b>         |           |
| <b>ABSOLUTE RETURN</b>                          | <b>6.0</b>                |                           |           | <b>4.9</b>                  |           | <b>5.5</b>                 |           | <b>2.8</b>                  |           | <b>7.8</b>  |           | <b>1.7</b>         |           |
| HFRI FOF Cons 1 month lagged                    |                           |                           |           | 2.9                         |           | 3.5                        |           | 1.7                         |           | 4.6         |           | 0.8                |           |
| <b>CASH EQUIVALENTS</b>                         | <b>4.1</b>                | <b>0.5</b>                |           | <b>0.5</b>                  |           | <b>0.6</b>                 |           | <b>0.7</b>                  |           | <b>1.0</b>  |           | <b>0.4</b>         |           |
| 1 Month T-Bill                                  |                           | 0.3                       |           | 0.1                         |           | 0.2                        |           | 0.3                         |           | 0.6         |           | 0.2                |           |

<sup>1</sup> Annualized Returns and Percentile Rank.

<sup>2</sup> Comparison universe is the State Street Universe comprised of Public Funds greater than \$10 billion on the total plan level and greater than \$1 billion for asset classes.

<sup>3</sup> International blended benchmark is S&P Developed BMI-EPAC 50/50 prior to 1/1/10. S&P Developed BMI-EPAC 75 USD / 25 Local, 1/1/10 to 9/30/10. MSCI ACWI ex USA Gross 10/1/10 to present.

<sup>4</sup> SP 500 + 300 bps thru 12/31/06. Ending market value (EMV) weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 12/31/06 to 9/30/09. EMV weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 3-month lagged 9/30/09 to present.

<sup>5</sup> NCREIF - Property Blended Index is NPI minus 75 bps prior to October 2005, NPI minus 130 bps current.

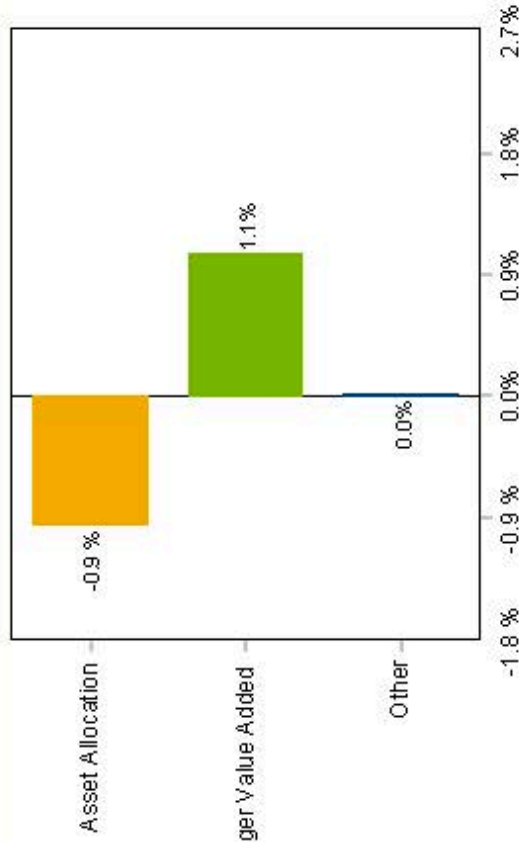
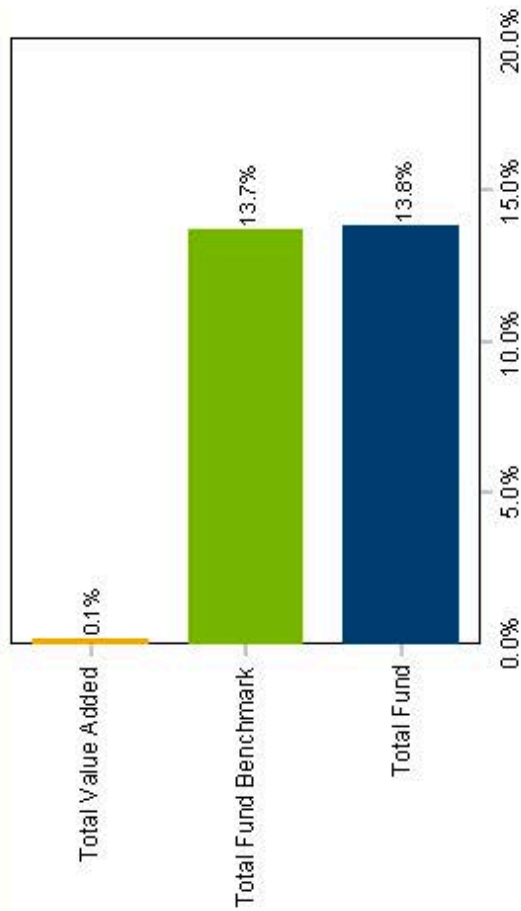
Source: State Street Analytics; the NCREIF - NPI (Property Index) source is NCREIF; the S&P BMI-EPAC Index source is S&P.

**Total Fund Attribution**

**Total Michigan vs. Total Fund Benchmark**

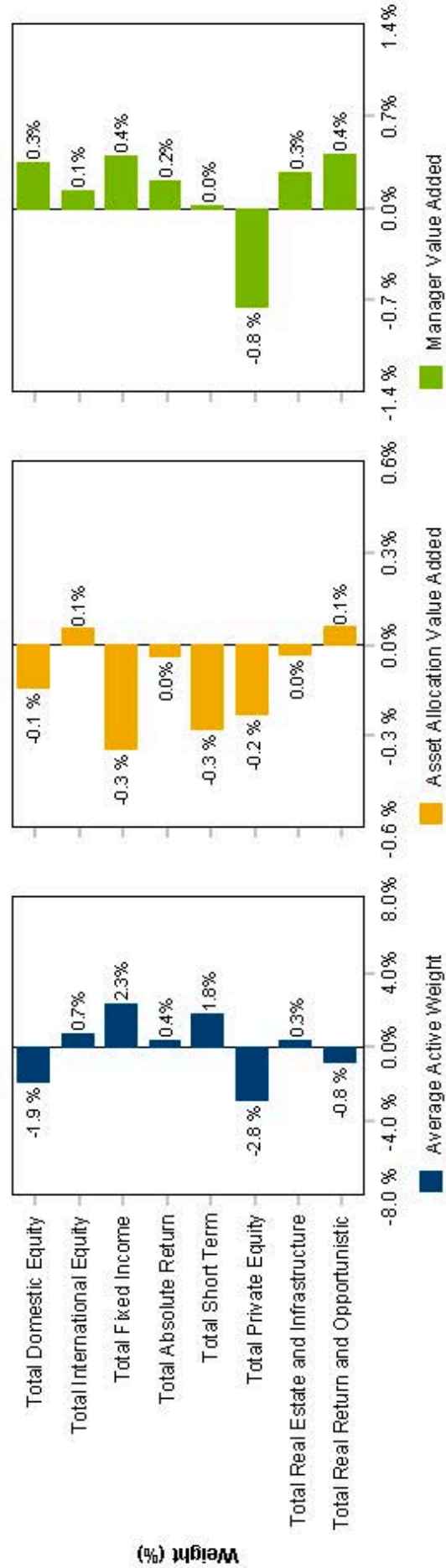
**Total Fund Performance**

Total Value Added: 0.1%



**Total Asset Allocation: -0.9%**

Total Manager Value Added: 1.1%



## Cumulative and Consecutive Total Fund Returns

| <b>MPERS</b>                           |        |        |        |        |        |        |        |        |        |         |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Cumulative For Years Ending 9/30/17    |        |        |        |        |        |        |        |        |        |         |
|  | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
| <b>MPERS</b>                           | 13.8   | 10.6   | 7.9    | 9.8    | 10.3   | 10.8   | 10.2   | 10.0   | 8.1    | 5.9     |
| Public Plan - Median (> \$10 billion)* | 12.7   | 11.1   | 7.2    | 8.1    | 9.0    | 10.1   | 9.0    | 9.1    | 7.7    | 5.4     |
| Rank                                   | 25     | 78     | 22     | 4      | 8      | 36     | 8      | 17     | 25     | 29      |
| bp Difference - Median                 | 108    | -47    | 65     | 162    | 135    | 71     | 125    | 90     | 46     | 45      |
| Consecutive For Years Ending           |        |        |        |        |        |        |        |        |        |         |
|  | 09/17  | 09/16  | 09/15  | 09/14  | 09/13  | 09/12  | 09/11  | 09/10  | 09/09  | 09/08   |
| <b>MPERS</b>                           | 13.8   | 7.6    | 2.6    | 15.6   | 12.5   | 13.4   | 6.6    | 8.8    | -6.1   | -12.3   |
| Public Plan - Median (> \$10 billion)* | 12.7   | 9.8    | -0.2   | 11.0   | 12.7   | 15.9   | 2.3    | 10.3   | -0.2   | -14.6   |
| Rank                                   | 25     | 96     | 4      | 3      | 55     | 84     | 4      | 84     | 83     | 23      |
| bp Difference - Median                 | 108    | -216   | 278    | 458    | -23    | -242   | 429    | -144   | -590   | 234     |

| <b>MSERS</b>                          |        |        |        |        |        |        |        |        |        |         |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Cumulative For Years Ending 9/30/17   |        |        |        |        |        |        |        |        |        |         |
|                                       | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
| <b>MSERS</b>                          | 13.8   | 10.7   | 7.9    | 9.8    | 10.3   | 10.8   | 10.2   | 10.0   | 8.0    | 5.8     |
| Public Plan - Median (> \$1 billion)* | 12.5   | 11.2   | 7.2    | 8.0    | 8.9    | 9.9    | 8.9    | 9.2    | 7.7    | 5.4     |
| Rank                                  | 24     | 76     | 20     | 4      | 12     | 36     | 14     | 20     | 35     | 39      |
| bp Difference - Median                | 132    | -49    | 74     | 174    | 143    | 87     | 126    | 80     | 29     | 36      |
| Consecutive For Years Ending          |        |        |        |        |        |        |        |        |        |         |
|                                       | 09/17  | 09/16  | 09/15  | 09/14  | 09/13  | 09/12  | 09/11  | 09/10  | 09/09  | 09/08   |
| <b>MSERS</b>                          | 13.8   | 7.6    | 2.6    | 15.5   | 12.5   | 13.4   | 6.5    | 8.5    | -6.3   | -12.4   |
| Public Plan - Median (> \$1 billion)* | 12.5   | 9.8    | -0.5   | 10.8   | 12.7   | 16.0   | 1.9    | 10.5   | 0.2    | -14.4   |
| Rank                                  | 24     | 89     | 3      | 3      | 52     | 85     | 5      | 86     | 87     | 29      |
| bp Difference - Median                | 132    | -222   | 302    | 472    | -20    | -259   | 456    | -195   | -643   | 199     |

\*State Street Public Funds Universe



## Cumulative and Consecutive Total Fund Returns

| <b>MSPRS</b>                                    |        |        |        |        |        |        |        |        |        |         |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Cumulative For Years Ending 9/30/17             |        |        |        |        |        |        |        |        |        |         |
|   | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
| <b>MSPRS</b>                                    | 13.8   | 10.7   | 7.9    | 9.7    | 10.3   | 10.8   | 10.2   | 10.0   | 8.0    | 5.8     |
| <b>Public Plan - Median (&gt; \$1 billion)*</b> | 12.5   | 11.2   | 7.2    | 8.0    | 8.9    | 9.9    | 8.9    | 9.2    | 7.7    | 5.4     |
| <b>Rank</b>                                     | 24     | 77     | 21     | 4      | 14     | 37     | 14     | 20     | 35     | 39      |
| <b>bp Difference - Median</b>                   | 132    | -49    | 73     | 171    | 140    | 82     | 126    | 79     | 26     | 36      |
| Consecutive For Years Ending                    |        |        |        |        |        |        |        |        |        |         |
|   | 09/17  | 09/16  | 09/15  | 09/14  | 09/13  | 09/12  | 09/11  | 09/10  | 09/09  | 09/08   |
| <b>MSPRS</b>                                    | 13.8   | 7.6    | 2.5    | 15.5   | 12.4   | 13.3   | 6.7    | 8.5    | -6.5   | -12.2   |
| <b>Public Plan - Median (&gt; \$1 billion)*</b> | 12.5   | 9.8    | -0.5   | 10.8   | 12.7   | 16.0   | 1.9    | 10.5   | 0.2    | -14.4   |
| <b>Rank</b>                                     | 24     | 89     | 3      | 3      | 53     | 89     | 4      | 86     | 88     | 21      |
| <b>bp Difference - Median</b>                   | 132    | -223   | 301    | 464    | -25    | -272   | 482    | -196   | -665   | 223     |

| <b>MJRS</b>                                     |        |        |        |        |        |        |        |        |        |         |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Cumulative For Years Ending 9/30/17             |        |        |        |        |        |        |        |        |        |         |
|   | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
| <b>MJRS</b>                                     | 13.9   | 10.7   | 7.9    | 9.6    | 10.1   | 10.7   | 10.1   | 9.7    | 7.8    | 5.6     |
| <b>Public Plan - Median (&gt; \$1 billion)*</b> | 12.5   | 11.2   | 7.2    | 8.0    | 8.9    | 9.9    | 8.9    | 9.2    | 7.7    | 5.4     |
| <b>Rank</b>                                     | 23     | 75     | 19     | 4      | 16     | 38     | 18     | 38     | 49     | 43      |
| <b>bp Difference - Median</b>                   | 139    | -45    | 75     | 159    | 124    | 79     | 114    | 50     | 2      | 21      |
| Consecutive For Years Ending                    |        |        |        |        |        |        |        |        |        |         |
|   | 09/17  | 09/16  | 09/15  | 09/14  | 09/13  | 09/12  | 09/11  | 09/10  | 09/09  | 09/08   |
| <b>MJRS</b>                                     | 13.9   | 7.6    | 2.5    | 14.9   | 12.1   | 13.9   | 6.1    | 7.0    | -6.4   | -11.7   |
| <b>Public Plan - Median (&gt; \$1 billion)*</b> | 12.5   | 9.8    | -0.5   | 10.8   | 12.7   | 16.0   | 1.9    | 10.5   | 0.2    | -14.4   |
| <b>Rank</b>                                     | 23     | 89     | 3      | 3      | 62     | 77     | 6      | 100    | 87     | 12      |
| <b>bp Difference - Median</b>                   | 139    | -222   | 299    | 407    | -59    | -206   | 417    | -344   | -651   | 273     |

\*State Street Public Funds Universe

State of Michigan Retirement Systems

# ASSET ALLOCATION REVIEW

Investment Advisory Committee Meeting  
December 12, 2017

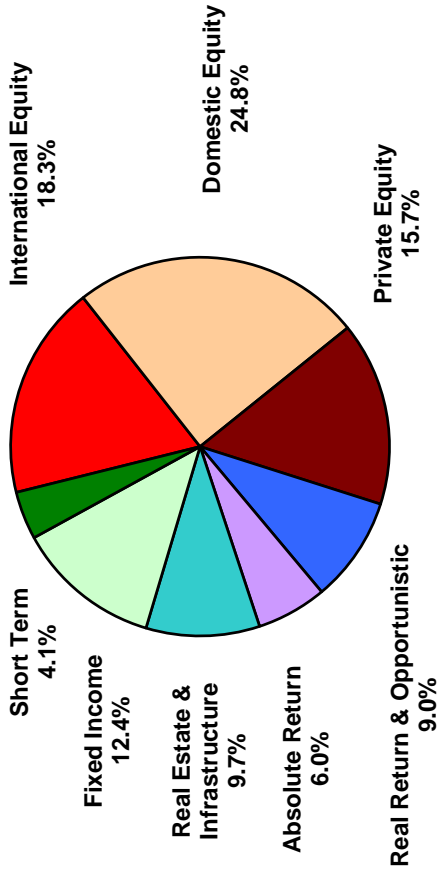


Jon M. Braeutigam  
Chief Investment Officer  
Bureau of Investments

# STATE OF MICHIGAN RETIREMENT SYSTEMS

## PROFILE - SEPTEMBER 2017

### Asset Allocation 9/30/17



### Asset Allocation By Market Value (In Millions)

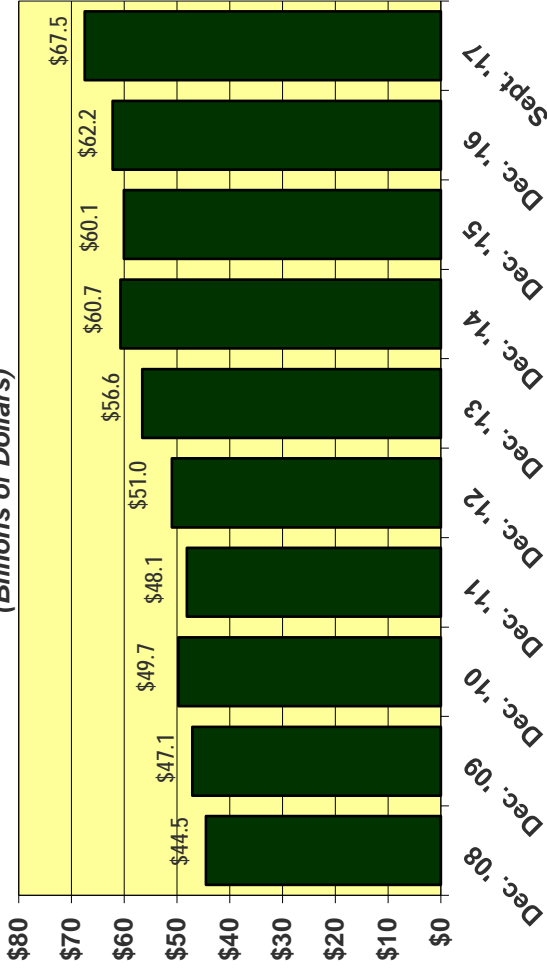
| Investment Strategies | 9/30/17         | 9/30/16         |
|-----------------------|-----------------|-----------------|
| Domestic Equity       | \$16,751        | \$15,842        |
| International Equity  | 12,351          | 9,802           |
| Private Equity        | 10,590          | 9,457           |
| Fixed Income          | 8,341           | 8,112           |
| Real Estate & Infra.  | 6,554           | 6,564           |
| Real Return & Opport. | 6,070           | 5,397           |
| Absolute Return       | 4,038           | 3,978           |
| Short Term***         | 2,801           | 2,459           |
| <b>TOTAL</b>          | <b>\$67,496</b> | <b>\$61,611</b> |

### Short Term Equivalents (in Billions)

|                                     |              |
|-------------------------------------|--------------|
| Short Term Strategy***              | \$2.8        |
| Short Term in Other Inv. Strategies | 1.0          |
| <b>TOTAL SHORT TERM</b>             | <b>\$3.8</b> |

5.6% of Total Funds

### Market Value\* (Billions of Dollars)



### Market Value By Plan ~ 9/30/17 (in Millions)

|                  | Pension Plan<br>Mkt. Value | OPEB**<br>Mkt. Value | Combined<br>Mkt. Value | %             |
|------------------|----------------------------|----------------------|------------------------|---------------|
| MPERS            | \$46,779                   | \$5,245              | \$52,024               | 77.1%         |
| MSERS - (closed) | 11,760                     | 1,917                | 13,677                 | 20.2%         |
| MSPRS            | 1,386                      | 143                  | 1,529                  | 2.3%          |
| MJRS - (closed)  | 265                        | 1                    | 266                    | 0.4%          |
| <b>TOTAL</b>     | <b>\$60,190</b>            | <b>\$7,306</b>       | <b>\$67,496</b>        | <b>100.0%</b> |

MSERS includes the Military Pension Fund

18th Largest DB Public Pension Fund in the U.S.  
19th Largest DB Pension Fund in the U.S.

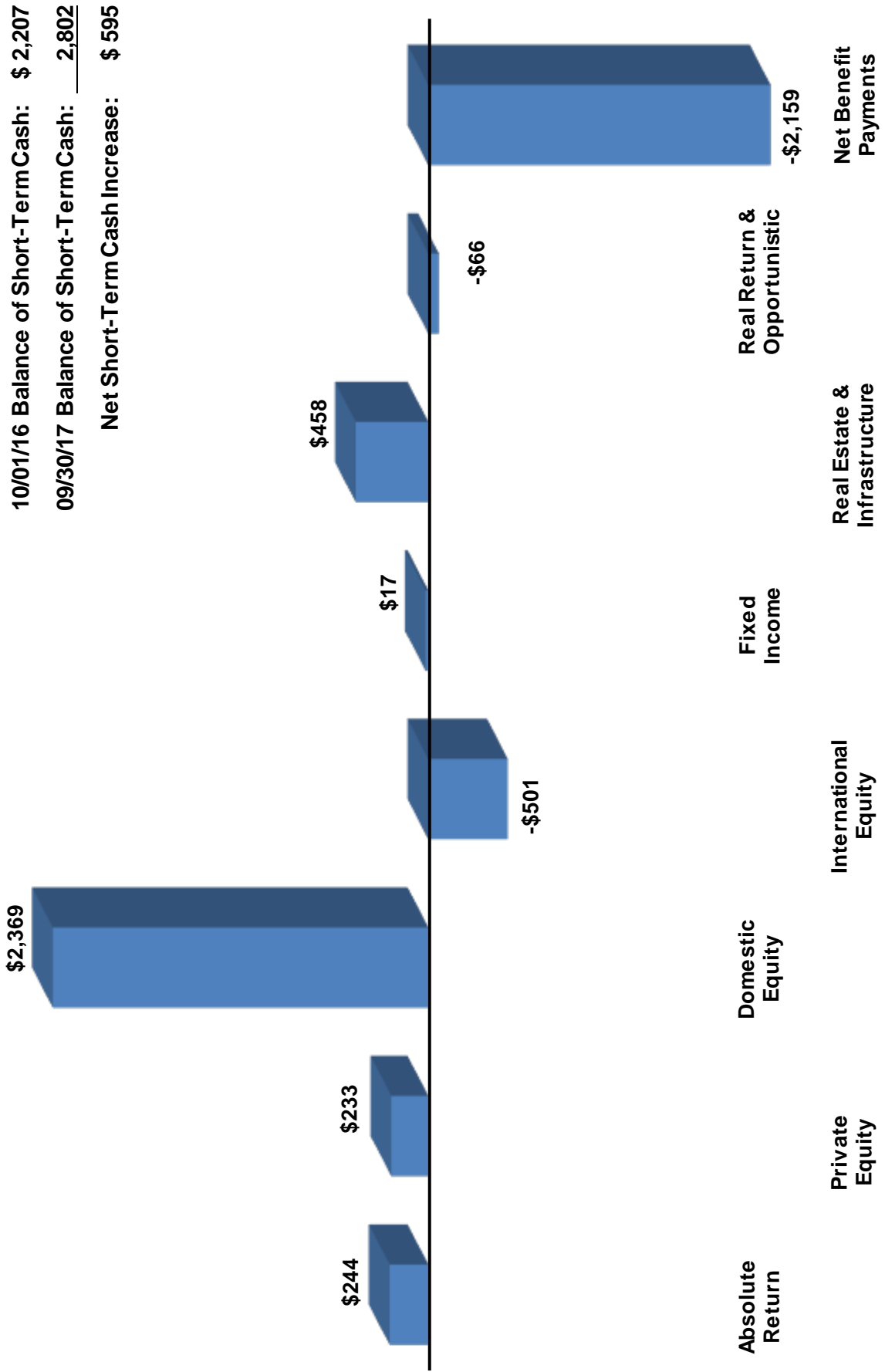
Pensions & Investments Survey - February 6, 2017 Issue

\*The combined net payout for the plans for FY 2016 was \$2.1 billion with \$22 billion paid out since FY 2008 thru FY 2016 (SOMCAFR). This represents the amount paid to beneficiaries in excess of employer and employee contributions.

\*\*OPEB - Other Post Employment Benefits

# Sources and Uses of Cash

## October 2016 ~ September 2017



A negative number in an asset category indicates a use of cash, a positive number indicates a source of cash.  
 Dollars in millions

## Asset Allocation Targets As of 9/30/17

| Asset Class                     | MPERS             |                   |                    | MSERS             |                   |                    | MSPRS             |                   |                    | MJRS              |                   |                    | SMRS      |
|---------------------------------|-------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-----------|
|                                 | Actual<br>9/30/17 | Target<br>9/30/18 | Target*<br>9/30/19 | Actual<br>9/30/17 | Target<br>9/30/18 | Target*<br>9/30/19 | Actual<br>9/30/17 | Target<br>9/30/18 | Target*<br>9/30/19 | Actual<br>9/30/17 | Target<br>9/30/18 | Target*<br>9/30/19 | Ranges    |
| Broad U.S. Equity               | 24.8%             | 27.0%             | 28.0%              | 24.8%             | 27.0%             | 28.0%              | 24.8%             | 27.0%             | 28.0%              | 24.8%             | 27.0%             | 28.0%              | 20% - 50% |
| Private Equity                  | 15.7%             | 16.5%             | 18.0%              | 15.7%             | 16.5%             | 18.0%              | 15.7%             | 16.5%             | 18.0%              | 15.7%             | 16.5%             | 18.0%              | 10% - 25% |
| Broad Int'l Equity              | 18.3%             | 16.0%             | 16.0%              | 18.3%             | 16.0%             | 16.0%              | 18.3%             | 16.0%             | 16.0%              | 18.3%             | 16.0%             | 16.0%              | 10% - 20% |
| U.S. Fixed Income<br>Core       | 12.4%             | 12.0%             | 10.5%              | 12.4%             | 12.0%             | 10.5%              | 12.4%             | 12.0%             | 10.5%              | 12.4%             | 12.0%             | 10.5%              | 8% - 25%  |
| Real Estate /<br>Infrastructure | 9.7%              | 10.5%             | 10.0%              | 9.7%              | 10.5%             | 10.0%              | 9.7%              | 10.5%             | 10.0%              | 9.7%              | 10.5%             | 10.0%              | 0% - 15%  |
| Real Return /<br>Opportunistic  | 9.0%              | 9.0%              | 9.5%               | 9.0%              | 9.0%              | 9.5%               | 9.0%              | 9.0%              | 9.5%               | 9.0%              | 9.0%              | 9.5%               | 0% - 15%  |
| Absolute Return                 | 6.0%              | 6.0%              | 6.0%               | 6.0%              | 6.0%              | 6.0%               | 6.0%              | 6.0%              | 6.0%               | 6.0%              | 6.0%              | 6.0%               | 0% - 12%  |
| Cash                            | 4.1%              | 3.0%              | 2.0%               | 4.1%              | 3.0%              | 2.0%               | 4.1%              | 3.0%              | 2.0%               | 4.1%              | 3.0%              | 2.0%               | 1% - 9%   |
| <b>TOTAL</b>                    | 100.0%            | 100.0%            | 100.0%             | 100.0%            | 100.0%            | 100.0%             | 100.0%            | 100.0%            | 100.0%             | 100.0%            | 100.0%            | 100.0%             |           |

\*Complies with basket clause and international restrictions.

State of Michigan Retirement Systems

# MARKETS REVIEW AND OUTLOOK

Investment Advisory Committee Meeting

December 12, 2017



Gregory J. Parker, CFA  
Director of Investments – Public Markets  
Director of Asset Allocation  
Bureau of Investments

# CAPITAL MARKETS

## Return and Risk Assumptions, Benchmark and Outlook

*A starting point.*

| <b>MPSERS Plan</b>     | <b>Assumed Return* (Arithmetic)</b> | <b>Standard Deviation*</b> | <b>Trailing 10-Year (Benchmark**)</b> | <b>Tactical (Short Term) Expectations***</b> |
|------------------------|-------------------------------------|----------------------------|---------------------------------------|--|
| Private Equity         | 11.5%                               | 24.0%                      | 11.3%                                 | Hold   |
| International Equity   | 9.5%                                | 20.0%                      | 1.1%                                  | Add  |
| Domestic Equity        | 8.0%                                | 17.0%                      | 7.3%                                  | Trim   |
| Real Estate (Core)     | 6.2%                                | 12.5%                      | 5.1%                                  | Hold   |
| Absolute Return        | 5.5%                                | 9.0%                       | 0.9%                                  | Hold   |
| Real Ret/Opportunistic | 8.8%                                | 12.1%                      | 7.3%                                  | Add  |
| Long-Term Fixed        | 2.8%                                | 4.0%                       | 4.5%                                  | Hold   |
| Short-Term             | 2.3%                                | 1.0%                       | 0.6%                                  | Hold   |

\* Aon Hewitt Investment Consultants 2016 Long-Term Return/Risk Assumptions

\*\* Investment Policy Statement; Annualized Returns

\*\*\* Actual investments may differ due to changing conditions and the availability of new information

## Overview

*Fearing a calm market.*

- Capital market assumptions used for determining strategic asset allocations are being reduced across the board, and especially for safer, publicly traded fixed income securities. This is the general opinion for most consultants, investment banks, and other market participants. The reason for this phenomenon is the low interest rate environment caused by the policies of the Federal Reserve and other central banks, as well as the run-up in prices for most risk assets over the past five years after the depths of the Great Recession.
- While earnings in U.S. equities have made a new plateau, earnings in international markets can grow another 40% to get back to all-time highs, or 25% to get to longer-term trends. Trading at a valuation multiple discount, and seemingly with some relative strength, international equity represents a leveraged play on continued global growth.
- For U.S. equities, valuation metrics are very much above average and the absolute returns over the next cycle will not likely be as strong as the historical average of 11 – 12% year-over-year total returns.
- Rather than tighten monetary policy through setting short-term rates, on the near-term horizon the Fed is looking to adjust the size of its balance sheet. Although the pace and scope of the plan is likely to adjust with the market, unwinding the balance sheet is just as unprecedented as the QE programs were originally, which increases the likelihood for at least some market impacts.
- Volatility in the U.S. equity market continues to get priced at historically low levels. Through July 2017, the Vix Index and trailing thirty-day price volatility of the S&P 500 Index were both measured in the lowest percentiles going back twenty years. Extended periods of both low implied and realized market volatility are quite common, and are rarely a pre-cursor to spikes in volatility. However, its juxtaposition with today's political environment and critical central bank policy changes simply feel wrong to many market participants.

## **International Equity**

*A compelling case.*

- For the first time since December 2012, international equities out-returned the domestic market year-over-year, beating it by nearly 3%. Over the past three, five, seven, and ten years ending June 2017, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -8.2%, -7.0%, -8.3%, and -5.7% annualized respectively.
- Within international equities, emerging markets have now outperformed developed markets over the past one, three, and ten years by 4.1%, 0.3%, and 0.7% annualized respectively. Over the past five and seven years, developed has outperformed emerging by 4.3% and 3.8%.
- International equity small-cap stocks slightly beat the broader MSCI ACWI ex USA index last year by 0.3%. However, over the past three, five, seven, and ten years the outperformance of international small caps has been more significant, averaging around 2 – 3% on an annualized basis. The plan is overweight small caps with an allocation of approximately 21.6%.
- The plan is underweight international equity against a global benchmark (approximately 40% versus 48%) though close to the weight of peers; 17.8% versus peer median of 17.7%.
- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international equity markets trade at approximately an 18% discount to the U.S. counterparts, while emerging markets trade at close to a 30% discount.
- While earnings in U.S. equities have made a new plateau, earnings in international markets can grow another 40% to get back to all-time highs, or 25% to get to longer-term trends. Trading at a valuation multiple discount, and seemingly with some relative strength, international equity represents a leveraged play on continued global growth.

## **Domestic Equity**

*High valuations.*

- The broad U.S. stock market return for one year ending June 2017 was 18.1%. Growth in earnings and dividend yield accounted for roughly 11.1% of the return, and the rest due to multiple expansion. Leading up to the second quarter of 2017, year-over-year earnings growth of U.S. equities had averaged close to 0% over the past few years. However, growth in U.S. equity earnings has seemingly resumed as the outsized losses incurred in the energy sector last year have worked their way through the data.
- Valuation metrics are very much above average and the absolute returns over the next cycle will not likely be as strong as the historical average of 11 – 12% year-over-year total returns.
- Over the past year ending June 2017, small-cap stocks significantly out-returned large-cap stocks by 6.7%. Over the past three, five, seven, and ten years, however, large-cap stocks have had higher returns than small-cap stocks by 2.3%, 0.9%, 1.1%, and 0.3% annualized respectively. Small-cap stocks continue to look expensive both relative to large cap-stocks and in absolute terms.
- Over the past year, value style underperformed growth by 4.5%. Timing style factors is difficult at best, however in June 2016 it was remarked that after a ten year period of growth dominance, historically value has outperformed growth for the next five years by 10% annualized. The relative returns of value stocks still have a long way to go to get back to historical averages.



## **Interest Rates**

*New Fed policies.*

- At its June 2017 meeting, the Federal Reserve Board voted to raise its key interest rate for the third time in the past twelve months. At the time of the last hike, the market was pricing in the probability of at least two additional rate hikes in 2017, however since then, economic factors have changed enough that the market is indicating that the June adjustment was the last one for 2017.
- Rather than tighten monetary policy through setting short-term rates, on the near-term horizon the Fed is looking to adjust the size of its balance sheet. Although the pace and scope of the plan is likely to adjust with the market, unwinding the balance sheet is just as unprecedented as the QE programs were originally, which increases the likelihood for at least some market impacts.
- The 10-year U.S. Treasury ended June 2017 at 2.3%, about 80 basis points (bps) higher than one year prior and in line with the three rate hikes. The curve is at average steepness, potentially an indicator of continued economic growth.
- Spreads on both investment-grade and high-yield corporates continue to tighten. Investment-grade spreads are at slightly below historic averages while spreads on high-yield bonds are more than 110 bps tighter than average. The plan continues to sell into the high-yield market strength.
- The ten-year breakeven rates at the end of June 2017 were priced just below 1.7%, and below the long-term inflation target of the Federal Reserve.
- The Barclays Aggregate Index's sensitivity to changes in interest rates is fairly high. At the end of June 2017, the Index had a modified duration of 6.0.

## **Real Estate**

*Bond-like behavior.*

- On a total return basis, the publicly traded FTSE NAREIT REITs Index was up fractionally over the past year ending June 2017, with about 3.8% of the return due to dividends.
- The REIT Index is priced slightly cheap compared to bonds, while other valuation metrics indicate that the index is very expensively priced. In other words, real estate is not expected to deliver high absolute returns over the longer term. However stretched the valuations have become, timing of the softer than normal returns is tricky.
- Due to the importance that dividends play with REITS, the index has acted as a proxy for interest rates over the past several years. As rates have increased, and as the prospect for additional rate increases have gone up, these bond substitutes have predictably struggled in terms of price.

## **Commodities**

*Weakening dollar.*

- Commodities broadly lost approximately 10% in value over the twelve-months ending June 2017 as measured by the Thomson Reuters CRB Commodity Index. Crude oil prices are down approximately 12% year-over-year as production is again outstripping supply. However, recently, energy prices have stabilized as production from Venezuela has gone off-line due to the country's destabilization.
- In the weeks following the U.S. presidential election, the dollar strengthened by more than 5% as it was believed that new stimulative policies would be adopted. Since the start of the year, however, that hope has since faded and the dollar at the end of June 2017 is almost exactly at the same level as it was one year prior as measured by the DXY index. The only difference is that a year ago, the dollar was holding value and perhaps on a slightly positive trend, today the price trend of the dollar is decidedly weaker.

# ECONOMIC OUTLOOK

## Select Historic Economic Growth with Forecasts

*An eye to 2017.*

| <b>Real GDP % Growth Actual/Forecasts</b> | <b>2015</b> | <b>2016</b> | <b>2017</b> | <b>2018</b> | <b>2019</b> |
|---|-------------|-------------|-------------|-------------|-------------|
| World                                     | 3.4         | 3.2         | 3.4         | 3.5         | 3.4         |
| U.S.                                      | 2.9         | 1.5         | 2.1         | 2.3         | 2.1         |
| Developed (G8)                            | 3.1         | 2.6         | 2.9         | 3.1         | 3.1         |
| Asia                                      | 5.0         | 4.9         | 4.7         | 4.8         | 4.8         |
| EMEA                                      | 1.7         | 1.6         | 2.5         | 2.6         | 2.7         |
| Europe                                    | 2.0         | 1.8         | 2.0         | 1.7         | 1.5         |
| Latin America                             | -0.4        | -1.2        | 1.1         | 2.3         | 2.7         |
| China                                     | 6.9         | 6.7         | 6.7         | 6.3         | 6.3         |

\*Source: Bloomberg

## Economic Overview

*A very healthy jobs market.*

- The most recent reading of the annualized U.S. GDP growth was 2.6%, just slightly below the consensus estimate of 2.7%. Current estimates for 2018 GDP growth for the U.S. is 2.3%. Coincidental economic indicators such as the Institute for Supply Management's Manufacturing and Non-Manufacturing PMI Indexes are well above 50, indicating that the U.S. economy is likely to continue to grow.
- Inflation as measured by the headline Consumers Price Index hit a level of 2.7% during the first quarter of 2017, however since that time inflation has trended lower as the latest reading measured 1.7% in July. Most measures of inflation are weak, and inflation is not expected to increase meaningfully in the near term.
- The jobs market is very healthy. The national unemployment rate is 4.3% and the three-month average figure for initial jobless claims is near its lowest level since 1973. In March 2017, there were 6.2 million job openings in the U.S. according to the Labor Department, an all-time record.
- The Federal Reserve Bank of Atlanta tracks wage growth of individuals and the trend in wage growth is accelerating. Its three-month median wage growth hit 3.3% in July 2017. Inflation hawks are looking for an acceleration in labor costs, potentially leading to a compression in corporate profit margins, however at this time the fear of such conditions is much greater than actual experiences.
- Housing prices in the U.S are high. This is good for household balance sheets, but may act as a headwind for household formations. According to the U.S. Bureau of the Census the median sales price of new houses sold in the U.S. is \$310,800, up over 18% from the 2007 peak. Low interest rates make housing as affordable as it has been in the past eight years, but less affordable compared to historical trends going back to the 1980s.
- There are increasing concerns that oil and gas production, particularly from U.S. shale, will increase too much, more than offsetting announced OPEC cuts. The Baker Hughes U.S. rig count bottomed in May 2016, however by the end of June 2017 the number of rigs had doubled.

# Annual Total Returns of Key Asset Classes 1997 - 2016

|               | 1997                  | 1998                   | 1999                   | 2000                    | 2001                    | 2002                    | 2003                   | 2004                   | 2005                   | 2006                   | 2007                   | 2008                   | 2009                   | 2010                  | 2011                    | 2012                   | 2013                   | 2014                   | 2015                   | 2016                  |                |
|---------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|----------------|
| <b>Best</b> ← | U.S. Equity<br>32.94% | U.S. Equity<br>26.33%  | Int'l Equity<br>26.97% | Gov't Bonds<br>13.23%   | Corp. Bonds<br>10.40%   | Gov't Bonds<br>11.50%   | Int'l Equity<br>40.82% | Int'l Equity<br>20.90% | Real Estate<br>20.06%  | Int'l Equity<br>26.65% | Int'l Equity<br>16.65% | Gov't Bonds<br>12.38%  | Int'l Equity<br>41.44% | U.S. Equity<br>16.38% | Real Estate<br>14.26%   | Int'l Equity<br>16.83% | U.S. Equity<br>32.80%  | U.S. Equity<br>13.08%  | Real Estate<br>13.32%  | U.S. Equity<br>11.93% | <b>Worst</b> → |
|               | Hedge Funds<br>14.95% | Int'l Equity<br>19.97% | U.S. Equity<br>20.27%  | Real Estate<br>12.24%   | Real Estate<br>7.28%    | Corp. Bonds<br>10.52%   | U.S. Equity<br>29.58%  | Real Estate<br>14.48%  | Int'l Equity<br>16.62% | Real Estate<br>16.59%  | Real Estate<br>15.84%  | Cash<br>2.05%          | U.S. Equity<br>27.24%  | Real Estate<br>13.11% | Gov't Bonds<br>9.02%    | U.S. Equity<br>16.17%  | Int'l Equity<br>15.29% | Real Estate<br>11.81%  | U.S. Equity<br>1.01%   | Real Estate<br>7.97%  |                |
|               | Real Estate<br>13.91% | Gov't Bonds<br>16.24%  | Real Estate<br>18.93%  | Corp. Bonds<br>9.40%    | Gov't Bonds<br>7.24%    | Hedge Funds<br>6.74%    | Real Estate<br>9.01%   | Hedge Funds<br>11.78%  | Hedge Funds<br>5.65%   | Hedge Funds<br>15.34%  | Hedge Funds<br>8.67%   | Corp. Bonds<br>0.10%   | Hedge Funds<br>16.05%  | Corp. Bonds<br>11.15% | Corp. Bonds<br>8.35%    | Corp. Bonds<br>10.54%  | Hedge Funds<br>10.99%  | Gov't Bonds<br>7.53%   | Gov't Bonds<br>0.86%   | Corp. Bonds<br>5.63%  |                |
|               | Corp. Bonds<br>10.23% | Corp. Bonds<br>9.85%   | Cash<br>11.36%         | Hedge Funds<br>6.16%    | Hedge Funds<br>4.43%    | Hedge Funds<br>3.57%    | Corp. Bonds<br>8.99%   | Corp. Bonds<br>5.83%   | Hedge Funds<br>5.13%   | Hedge Funds<br>9.21%   | Hedge Funds<br>7.68%   | Corp. Bonds<br>-3.07%  | Hedge Funds<br>9.65%   | Corp. Bonds<br>8.46%  | Corp. Bonds<br>2.96%    | Corp. Bonds<br>9.37%   | Hedge Funds<br>7.69%   | Gov't Bonds<br>4.92%   | Hedge Funds<br>0.66%   | Int'l Equity<br>4.50% |                |
|               | Gov't Bonds<br>9.58%  | Corp. Bonds<br>8.59%   | Cash<br>4.83%          | Hedge Funds<br>5.77%    | Hedge Funds<br>3.11%    | Int'l Equity<br>2.39%   | Corp. Bonds<br>7.69%   | Corp. Bonds<br>5.25%   | Int'l Equity<br>3.42%  | Cash<br>4.81%          | U.S. Equity<br>5.47%   | Real Estate<br>-6.46%  | Int'l Equity<br>2.72%  | Gov't Bonds<br>5.52%  | U.S. Equity<br>1.75%    | Hedge Funds<br>4.06%   | Int'l Equity<br>1.49%  | Hedge Funds<br>3.41%   | Hedge Funds<br>0.51%   | Hedge Funds<br>2.30%  |                |
|               | Cash<br>5.35%         | Int'l Equity<br>5.24%  | Int'l Equity<br>2.68%  | Int'l Equity<br>3.39%   | Int'l Equity<br>1.55%   | Cash<br>1.79%           | Gov't Bonds<br>2.36%   | Gov't Bonds<br>3.48%   | Cash<br>3.06%          | Corp. Bonds<br>4.27%   | Corp. Bonds<br>5.10%   | Hedge Funds<br>-19.86% | Cash<br>0.19%          | Hedge Funds<br>5.07%  | Cash<br>0.10%           | Gov't Bonds<br>2.02%   | Cash<br>0.07%          | Cash<br>0.68%          | Corp. Bonds<br>0.01%   | Int'l Equity<br>2.10% |                |
|               | Int'l Equity<br>1.77% | Int'l Equity<br>1.60%  | Corp. Bonds<br>-1.94%  | U.S. Equity<br>-6.98%   | U.S. Equity<br>-10.64%  | Int'l Equity<br>-14.95% | Int'l Equity<br>1.88%  | Int'l Equity<br>3.25%  | Gov't Bonds<br>2.65%   | Gov't Bonds<br>3.46%   | Cash<br>5.03%          | U.S. Equity<br>-36.72% | Gov't Bonds<br>-2.19%  | Int'l Equity<br>1.50% | Hedge Funds<br>-3.55%   | Gov't Bonds<br>1.70%   | Gov't Bonds<br>-2.01%  | Cash<br>0.04%          | Corp. Bonds<br>-0.77%  | Cash<br>1.05%         |                |
|               | Int'l Equity<br>1.70% | Hedge Funds<br>-1.61%  | Gov't Bonds<br>-2.25%  | Int'l Equity<br>-15.31% | Int'l Equity<br>-19.74% | U.S. Equity<br>-21.30%  | Cash<br>1.16%          | Cash<br>1.33%          | Corp. Bonds<br>1.95%   | Int'l Equity<br>2.55%  | Int'l Equity<br>4.06%  | Hedge Funds<br>-45.52% | Real Estate<br>-16.86% | Cash<br>0.13%         | Int'l Equity<br>-13.71% | Cash<br>0.11%          | Gov't Bonds<br>-2.60%  | Int'l Equity<br>-3.87% | Int'l Equity<br>-5.67% | Cash<br>0.27%         | <b>Worst</b>   |

|        |                | Annualized Returns 1997 - 2016 |                 |               |        |
|--------|----------------|--------------------------------|-----------------|---------------|--------|
| Return | Int'l<br>4.72% | Gov't<br>4.93%                 | US Eq.<br>7.68% | R.E.<br>9.78% | Return |
| Risk   | 17.31%         | 4.09%                          | 5.07%           | 8.48%         | Risk   |

- Hedge Funds are represented by the HFRI FOF Conservative Index
- Inflation is represented by the U.S. Consumer Price Index
- International Equity is represented by the MSCI EAFE Index
- 2000 Forward - Int'l Equity is represented MSCI - AC World EX-USA Index
- Cash is represented by 30-day T-Bills

- U.S. Equity is represented by the S&P 1500
- Real Estate is represented by the NPI
- Corporate Bonds are represented by the Barclays Capital - Credit Index
- Government Bonds are represented by the Barclays Capital U.S. Government

State of Michigan Retirement Systems

# FIXED INCOME REVIEW

Investment Advisory Committee Meeting

December 12, 2017



Daniel J. Quigley  
Senior Investment Manager  
Long-Term Fixed Income Division

## EXECUTIVE SUMMARY

### Performance

| Annualized Returns         | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|----------------------------|--------|---------|---------|---------|----------|
| MPSERS Plan                | 2.9%   | 4.4%    | 3.5%    | 4.1%    | 5.5%     |
| Bloomberg Barclays US Agg  | 0.1%   | 2.7%    | 2.1%    | 3.0%    | 4.3%     |
| Peer Median Return         | 1.8%   | 3.3%    | 2.4%    | 3.8%    | 4.7%     |
| Percentile Rank vs. Peers* | 29     | 20      | 15      | 42      | 15       |

\*State Street Universe greater than \$1 billion

- The outperformance to the benchmark over the past year was due to several key allocation decisions. Overweight allocations to corporate credit and structured securities, coupled with an underweight to Treasuries and Agency RMBS, boosted performance. In addition to this, the portfolio had a shorter duration than the benchmark, which helped avoid price declines in a rising rate environment.
- In addition, externally managed strategies such as High Yield Credit and Structured Fixed Income experienced strong returns during the previous year. High Yield had a one year return of 7.8%, while Structured Fixed Income returned 6.1%. Overall, the externally managed portfolio returned 5.0% year-over-year (YOY), accounting for roughly 75% of the one-year outperformance.

### Strategy Update

The goal of the Long-Term Fixed Income Division portfolio is to meet or exceed the returns of the Bloomberg Barclays U.S. Aggregate Bond Index while satisfying the overall characteristics of a core fixed income portfolio; income, liquidity, principal preservation, and diversification from equity market risk.

- The Core-plus strategy implemented to achieve this goal includes:
  - Core: As of September 30, 2017, the allocation to U.S. Treasuries, investment-grade corporate bonds, government-guaranteed U.S. Agency Debentures, Residential Mortgage Backed Securities (RMBS), and Commercial Mortgage Backed Securities (CMBS) was approximately 69.9%. This includes a 19.2% allocation to U.S. Treasuries, TIPS, and cash.
  - Plus: A strategic, out-of-benchmark allocation to high-yield corporate debt, securitized credit, and global fixed income strategies as market opportunities allow. This allocation increases the portfolio yield and total return but will result in lower liquidity.

### Tactical Update

- The allocation to high-yield strategies was 6.8% at the end of the quarter, down from a peak of 14.0% in 2016.

- The allocation to securitized credit, primarily in CMBS, non-agency RMBS, and CLO securities, has increased to 20.6% of the portfolio. The combination of high coupon income (often floating rate) and low duration in these investments is desirable at this point in the interest rate cycle.
- In addition, there is an increased allocation to floating rate securities, including AAA CLO investments and investment-grade floating rate corporate bonds. This allocation accounts for approximately 15% of portfolio assets and should position the portfolio to outperform in a rising interest rate environment.
- The allocation to U.S. TIPS increased during the quarter to 6.2% of the division portfolio. This allocation will outperform nominal U.S. Treasuries in a rising rate environment if increases in interest rates are driven partially by increased inflation expectations.

### **Market Environment and Outlook**

- The U.S. Treasury rates increased across the yield curve on a YOY basis. The yield on the 10-year Treasury increased from 1.6% to 2.3% during the past twelve months while 2-year Treasury yields rose from 0.8% to 1.5%. Short-term rate increases were driven by tightening from the Federal Reserve. The FOMC has increased the Fed Funds rate by 75 bp since December of 2016 to 1.25%. As of September 30, the markets expect a 70% chance of an additional 25 bps of tightening in December of 2017.
- Inflation expectations remain below historical averages, with ten-year breakeven inflation expectations ending September 2017 at 1.9%. The portfolio has maintained an allocation to U.S. TIPS as it is believed that these securities will outperform nominal Treasuries should expectations revert to their long-term average.
- Credit markets have experienced strong performance recently with High Yield total returns exceeding 26% since the market bottomed in February of 2016. High-yield spreads ended the quarter at 347 bps, almost 500 bps tighter over the previous nineteen months. Investment-grade spreads are also lower, tightening roughly 115 bps during the same time period. The portfolio has reduced its allocation to corporate credit by roughly 10% YOY as spread levels have moved below their historical averages.
- The spread securitized assets such as CMBS, ABS, and CLO securities look relatively attractive within the fixed income opportunity set. Spreads on BBB CMBS securities ended the quarter at 353 bps. These spreads are wide of their five-year average and the portfolio has increased its allocation to this sector in 2017.

### **Conclusion**

The portfolio remains defensively positioned for rising interest rates. The duration remains short of the benchmark with a focus on intermediate securities. This position is offset through a larger allocation to structured and corporate debt securities which increases the interest income of the portfolio. The strategy is to continue the targeting of these types of investments that offer attractive yield pick-ups for the portfolio as it is likely that price appreciation opportunities are limited in a low-yield environment.

**SMRS**  
**Long-Term Fixed Income by Strategy**  
**9/30/17**

|                                    | Amount  | Total                 | % of Total           |
|------------------------------------|---------|-----------------------|----------------------|
| <b>Core</b> (\$ in Millions)       |         |                       |                      |
| LTFID Internal                     | \$4,838 |                       |                      |
| Dodge & Cox                        | 241     |                       |                      |
| Prudential Investment Grade Credit | 231     |                       |                      |
| <b>Total Core</b>                  |         | <b>\$5,310</b>        | <b>63.7%</b>         |
| <b>Securitized Debt</b>            |         |                       |                      |
| Met West Securitized Ops           | \$491   |                       |                      |
| Principal CMBS                     | 620     |                       |                      |
| Napier Park ABS Income             | 153     |                       |                      |
| Napier Park Strategic Loan         | 49      |                       |                      |
| Napier Park CLO Debt               | 204     |                       |                      |
| TICP CLO Debt                      | 203     |                       |                      |
| <b>Total Securitized Debt</b>      |         | <b>\$1,720</b>        | <b>20.6%</b>         |
| <b>High Yield</b>                  |         |                       |                      |
| Columbia Management                | \$302   |                       |                      |
| Prudential High Yield              | 263     |                       |                      |
| <b>Total High Yield</b>            |         | <b>\$564</b>          | <b>6.8%</b>          |
| <b>Tactical</b>                    |         |                       |                      |
| Pyramis                            | \$296   |                       |                      |
| Loomis Core Plus                   | 225     |                       |                      |
| <b>Total Tactical</b>              |         | <b>\$520</b>          | <b>6.2%</b>          |
| <b>Global</b>                      |         |                       |                      |
| T. Rowe Global Multi-Sector        | \$227   |                       |                      |
| <b>Total Global</b>                |         | <b>\$227</b>          | <b>2.7%</b>          |
| <b>TOTAL</b>                       |         | <b><u>\$8,341</u></b> | <b><u>100.0%</u></b> |

NOTE: Totals may not be exact because of rounding.

# SMRS

## Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

9/30/17

| <u>Characteristic</u>   | <u>Portfolio</u> | <u>Benchmark</u> |
|-------------------------|------------------|------------------|
| Average Maturity (Yrs)  | 7.0              | 7.9              |
| Modified Duration (Yrs) | 4.9              | 5.8              |
| Spread Duration (Yrs)   | 5.6              | 6.4              |
| Coupon (%)              | 3.1              | 3.1              |
| Yield to Maturity (%)   | 3.3              | 2.5              |
| Credit Rating           | A                | AA               |
| VaR (%)                 | 4.2              | 4.6              |
| Tracking Error          | 134 bps          | 0                |
| Beta (vs S&P 500)       | 0.03             | -0.04            |

### Commentary

#### Objectives

Income:

Liquidity:

Principal Preservation:

Diversification:

#### Highlights

The coupon income matches the benchmark. Roughly 15% of the portfolio is invested in floating-rate securities so coupon income would increase relative to the benchmark if the yield curve continues to flatten.

19.2% of the portfolio is invested in cash, U.S. Treasuries, and TIPS. These investments can be liquidated via same-day trading.

The portfolio has a large allocation to U.S. Treasuries and carries an investment-grade credit rating.

The beta of the portfolio is uncorrelated with equity market movements, in line with the bond index.

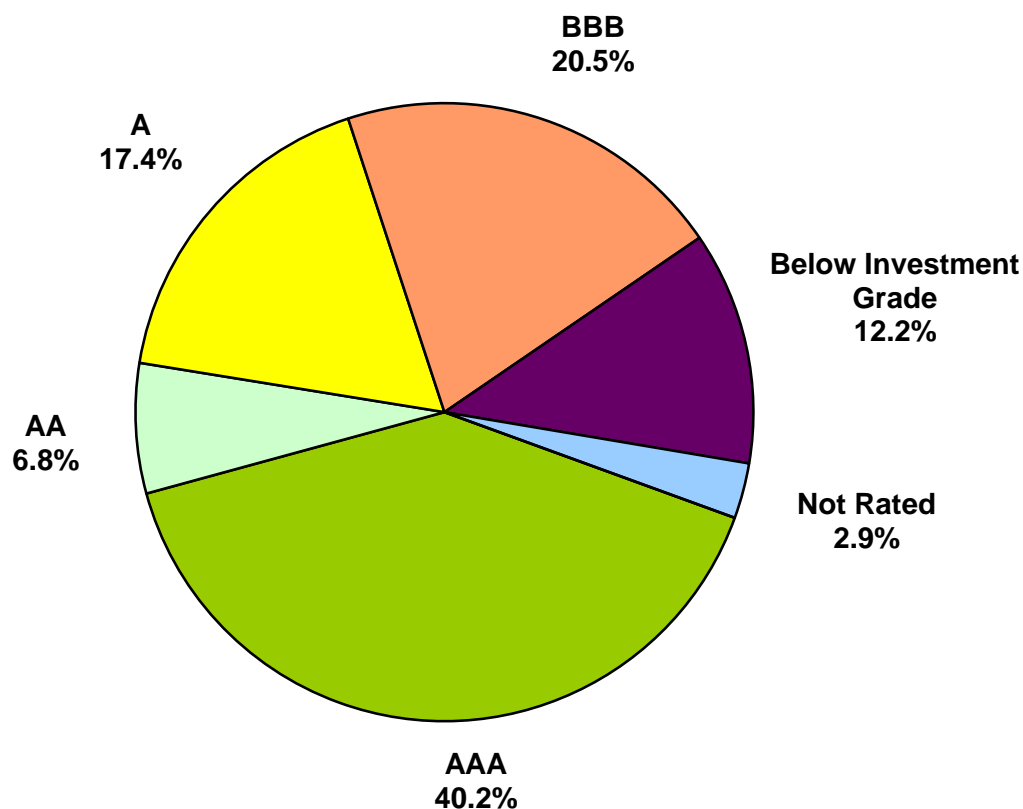


# SMRS

## Fixed Income By Rating

### Total U.S. Long-Term Fixed Income

#### 9/30/17



| <b>Market Value in Millions</b> |                       |                      |                      |                   |
|---------------------------------|-----------------------|----------------------|----------------------|-------------------|
| <b>9/30/17</b>                  |                       |                      |                      |                   |
|                                 | <u>Assets</u>         | <u>Percent</u>       | <u>Benchmark</u>     | <u>Difference</u> |
| AAA                             | \$3,357               | 40.2%                | 70.6%                | -30.4%            |
| AA                              | 565                   | 6.8%                 | 4.9%                 | 1.9%              |
| A                               | 1,447                 | 17.4%                | 10.8%                | 6.6%              |
| BBB                             | 1,710                 | 20.5%                | 12.3%                | 8.2%              |
| Not Rated                       | 240                   | 2.9%                 | 1.4%                 | 1.5%              |
| * Below Investment Grade        | 1,022                 | 12.2%                | 0.0%                 | 12.2%             |
| <b>Total Investments</b>        | <b><u>\$8,341</u></b> | <b><u>100.0%</u></b> | <b><u>100.0%</u></b> |                   |

\* Comprised of approximately 8.1% High Yield Credit and 4.1% High Yield RMBS/ABS

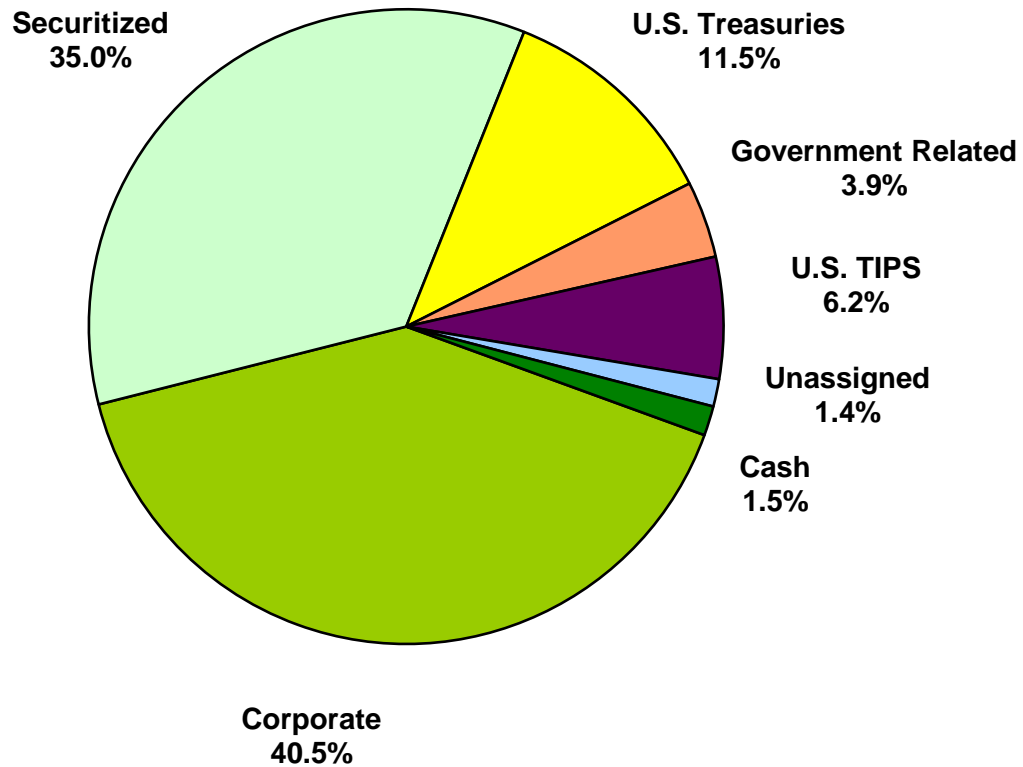
Benchmark: Barclays US Aggregate

# SMRS

## Fixed Income By Asset Type

### Total U.S. Long-Term Fixed Income

9/30/17



| <b>Market Value in Millions</b> |                       |                      |                      |                   |
|---------------------------------|-----------------------|----------------------|----------------------|-------------------|
| <b>9/30/17</b>                  |                       |                      |                      |                   |
|                                 | <u>Assets</u>         | <u>Percent</u>       | <u>Benchmark</u>     | <u>Difference</u> |
| Corporate                       | \$3,380               | 40.5%                | 25.5%                | 15.0%             |
| Securitized                     | 2,914                 | 35.0%                | 30.5%                | 4.5%              |
| U.S. Treasuries                 | 959                   | 11.5%                | 37.0%                | -25.5%            |
| Government Related              | 325                   | 3.9%                 | 7.0%                 | -3.1%             |
| U.S. TIPS                       | 520                   | 6.2%                 | 0.0%                 | 6.2%              |
| Unassigned                      | 119                   | 1.4%                 | 0.0%                 | 1.4%              |
| Cash                            | 124                   | 1.5%                 | 0.0%                 | 1.5%              |
| <b>Total Investments</b>        | <b><u>\$8,341</u></b> | <b><u>100.0%</u></b> | <b><u>100.0%</u></b> |                   |

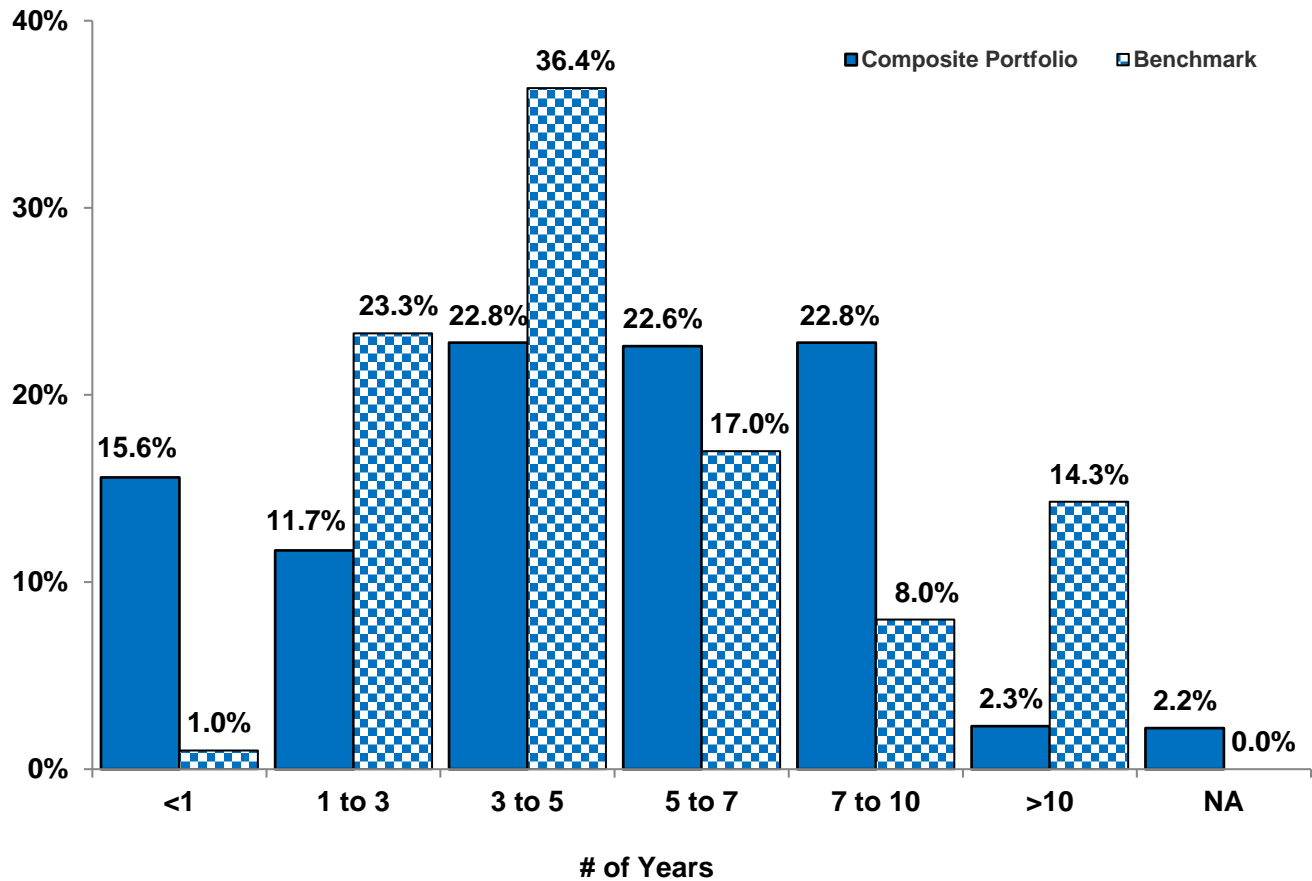
Benchmark: Barclays US Aggregate

# SMRS

## Duration Distribution

### Fixed Income Composite Versus Benchmark

#### 9/30/17



Source: Factset

| Market Value in Millions |                |                  |                  |                     |                     |
|--------------------------|----------------|------------------|------------------|---------------------|---------------------|
| Duration                 | Assets         | Portfolio Weight | Benchmark Weight | Portfolio Duration* | Benchmark Duration* |
| <1                       | \$1,298        | 15.6%            | 1.0%             | 0.8                 | 1.0                 |
| 1 to 3                   | 974            | 11.7%            | 23.3%            | 1.4                 | 2.1                 |
| 3 to 5                   | 1,903          | 22.8%            | 36.4%            | 3.8                 | 4.3                 |
| 5 to 7                   | 1,885          | 22.6%            | 17.0%            | 5.9                 | 6.0                 |
| 7 to 10                  | 1,906          | 22.8%            | 8.0%             | 8.1                 | 7.9                 |
| >10                      | 193            | 2.3%             | 14.3%            | 15.2                | 15.6                |
| NA                       | 182            | 2.2%             | 0.0%             | 0.0                 | 0.0                 |
| <b>Total</b>             | <b>\$8,341</b> | <b>100.0%</b>    | <b>100.0%</b>    | <b>4.8</b>          | <b>5.6</b>          |

\* Effective Duration

## SMRS Internal/External Manager Performance – Net of Fees

9/30/17

### Total Fixed Income Performance, Net of Fees (MPERS)

|  | <u>Market Value</u>    | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>10-Years</u> |
|--|------------------------|---------------|----------------|----------------|----------------|-----------------|
| <b>Total Fixed Income</b>                      | <b>\$8,340,944,562</b> | <b>2.7%</b>   | <b>4.2%</b>    | <b>3.4%</b>    | <b>3.9%</b>    | <b>5.3%</b>     |
| <i>Bloomberg/Barclays Aggregate Bond Index</i> | <i>N/A</i>             | <i>0.1%</i>   | <i>2.7%</i>    | <i>2.1%</i>    | <i>3.0%</i>    | <i>4.3%</i>     |
| <b>Internal Fixed Income</b>                   | <b>\$4,837,547,967</b> | <b>1.4%</b>   | <b>3.9%</b>    | <b>3.0%</b>    | <b>3.5%</b>    | <b>5.1%</b>     |
| <b>External Fixed Income</b>                   | <b>\$3,503,396,595</b> | <b>5.0%</b>   | <b>4.7%</b>    | <b>3.8%</b>    | <b>4.7%</b>    | <b>5.5%</b>     |
| <b>Fixed Income Core</b>                       | <b>\$240,579,528</b>   | <b>2.2%</b>   | <b>3.4%</b>    | <b>2.7%</b>    | <b>3.7%</b>    | <b>5.0%</b>     |
| <b>Dodge &amp; Cox Core</b>                    | 240,579,528            | 2.2%          | 3.4%           | 3.3%           | 4.0%           | 5.2%            |
| <i>Bloomberg/Barclays Aggregate Bond Index</i> | <i>N/A</i>             | <i>0.1%</i>   | <i>2.7%</i>    | <i>2.1%</i>    | <i>3.0%</i>    | <i>4.3%</i>     |
| <b>Investment Grade Credit</b>                 | <b>\$231,115,032</b>   | <b>2.7%</b>   | <b>4.5%</b>    | <b>3.8%</b>    | <b>4.9%</b>    | <b>5.8%</b>     |
| <b>Prudential Investment Grade</b>             | 231,115,032            | 2.7%          | 4.5%           | 4.0%           | 5.1%           | 6.6%            |
| <i>Bloomberg/Barclays Credit Index</i>         | <i>N/A</i>             | <i>2.0%</i>   | <i>3.9%</i>    | <i>3.2%</i>    | <i>4.4%</i>    | <i>5.5%</i>     |
| <b>Tactical Fixed Income</b>                   | <b>\$520,539,572</b>   | <b>4.3%</b>   | <b>3.8%</b>    |                |                | --              |
| <b>Loomis Sayles CorePlus</b>                  | 224,869,630            | 2.4%          | 3.0%           | --             | --             | --              |
| <b>Pyramis Tactical Bond Fund</b>              | 295,669,942            | 3.5%          | 4.8%           | --             | --             | --              |
| <i>Bloomberg/Barclays Aggregate Bond Index</i> | <i>N/A</i>             | <i>0.1%</i>   | <i>2.7%</i>    | <i>2.1%</i>    | <i>3.0%</i>    | <i>4.3%</i>     |
| <b>High Yield Fixed Income</b>                 | <b>\$564,427,510</b>   | <b>7.8%</b>   | <b>6.4%</b>    | --             | --             | --              |
| <b>Columbia Management High Yield</b>          | 301,568,012            | 7.5%          | 6.5%           | --             | --             | --              |
| <b>Prudential High Yield</b>                   | 262,859,498            | 8.1%          | 6.4%           | --             | --             | --              |
| <i>Bloomberg/Barclays US HY BA/B 2% Cap</i>    | <i>N/A</i>             | <i>7.7%</i>   | <i>5.6%</i>    | <i>--</i>      | <i>--</i>      | <i>--</i>       |
| <b>Structured Fixed Income</b>                 | <b>\$1,719,932,826</b> | --            | --             | --             | --             | --              |
| <b>Principal CMBS</b>                          | 619,563,913            | 3.6%          | 4.0%           | 7.0%           | 10.1%          | --              |
| <b>MetWest Securitized Opportunities</b>       | 490,944,188            | 6.7%          | 3.7%           | --             | --             | --              |
| <b>Napier Park ABS Income</b>                  | 153,299,847            | 14.5%         | --             | --             | --             | --              |
| <b>Napier Park Strategic Loan LP</b>           | 49,256,600             | N/A           | --             | --             | --             | --              |
| <b>Napier Park CLO Debt</b>                    | 204,322,790            | N/A           | --             | --             | --             | --              |
| <b>TICP CLO Debt</b>                           | 202,545,487            | N/A           | --             | --             | --             | --              |
| <i>Bloomberg/Barclays Aggregate Bond Index</i> | <i>N/A</i>             | <i>0.1%</i>   | <i>2.7%</i>    | <i>2.1%</i>    | <i>3.0%</i>    | <i>4.3%</i>     |
| <i>Blended CMBS Benchmark</i>                  | <i>N/A</i>             | <i>-1.9%</i>  | <i>4.2%</i>    | <i>3.0%</i>    | <i>5.4%</i>    |                 |
| <b>Global Fixed Income</b>                     | <b>\$226,802,127</b>   | <b>3.9%</b>   | --             | --             | --             | --              |
| <b>T. Rowe Global Multi-Sector</b>             | 226,802,127            | 3.9%          | --             | --             | --             | --              |
| <i>Custom GMS Benchmark</i>                    | <i>N/A</i>             | <i>3.0%</i>   |                |                |                |                 |

State of Michigan Retirement Systems

# DOMESTIC EQUITY REVIEW

Investment Advisory Committee Meeting

December 12, 2017



Jack A. Behar, CFA  
Senior Investment Manager  
Domestic Equity Division

## EXECUTIVE SUMMARY

### Performance

| <b>Total Domestic Equity, Gross</b> | <b>1-Year</b> | <b>3-Years</b> | <b>5-Years</b> | <b>7-Years</b> | <b>10-Years</b> |
|-------------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns                  | 19.9%         | 10.1%          | 14.4%          | 14.0%          | 7.5%            |
| S&P 1500                            | 18.6%         | 11.0%          | 14.3%          | 14.4%          | 7.6%            |
| Peer Median Return                  | 18.5%         | 10.1%          | 13.7%          | 13.8%          | 7.5%            |
| Percent Rank vs. Peers *            | 22            | 48             | 39             | 40             | 52              |

\*State Street Universe greater than \$1 billion

- Total Domestic Equity outperformed its peer group over one, five, and seven years during the period ending September 30, while matching comparable pension funds over the past three and ten years.
  - Based on a recent assessment by Aon, the Total Domestic Equity portfolio is estimated to have a 15-20 basis points (bps) cost advantage over its peers, further improving its relative performance over the past one, three, and five years.
- Total Domestic Equity outperformed the S&P 1500 over the past one and five years, while underperforming over three, seven, and ten year periods.
  - Recent results are being driven by several factors, including:
    - Outperformance of SMRS' internally managed portfolios which, as a group, are outpacing the benchmark by 240 bps over the past year.
    - Outperformance of SMRS' externally managed portfolios, particularly Ark Investments, Fisher Investments, Seizert Capital Partners, and Bivium Capital Partners.
    - The addition of Mellon Capital's overlay strategy to the division's portfolio.
    - Overweight to financial stocks
    - Underweight to the energy sector
- Investments in Apple, JP Morgan, and U.S. Bank helped drive returns over the past year. Detractors included Verizon Communications, CVS Health, and Gilead Sciences.

### Asset Class Goal

To provide the SMRS with long-term equity market returns or better, by investing in a diversified and attractively priced portfolio of companies at an index-like cost.

## **Strategy Update**

- SMRS has an index-like cost structure and a value orientation, both of which are predictors of future relative performance according to academic studies.
- The Domestic Equity Portfolio remains overweight to both the financial sector and to defensive stocks, equal-weighted to technology and underweight commodity related companies.
  - Attractively priced financial and defensive stocks offset each other from an interest rate risk standpoint, paving the way for potential outperformance in any rate environment.
  - Commodity bellwethers such as Exxon Mobil and Chevron are expensive and may struggle in a stronger dollar environment, as the Fed slowly raises rates.
  - The division's exposure to technology stocks with significant competitive advantages such as Apple, Facebook, and Square has helped to propel performance on a year-to-date basis, providing a diversifying source of alpha.
  - Total Domestic Equity's portfolio would outperform the S&P 1500 by ~13% were it to appreciate to the market multiple of 19.4X from where it stands now at 17.1X. It is expected for the Total Domestic Equity multiple to at least partially converge with that of the S&P 1500 over the next five years.
  - If PE ratios do not converge, we expect long-term outperformance based on a higher dividend yield than the benchmark alongside higher rates of earnings reinvestment.

## **Market Environment and Outlook**

- At ~22x normalized levels of profitability, equity markets remain rich relative to history, but are still reasonably priced for an environment where bond yields are 4% or lower.
  - The equity risk premium remains wide relative to its historical norm, giving stocks room to appreciate in a continued low interest rate environment, while potentially providing a valuation cushion in the event of modestly higher rates.
- Assuming 4.5% long term expected earnings growth (roughly in line with nominal GDP), and the market's average long-term return on equity of 14.5%, the S&P 1500 is expected to pay out 70% of its earnings.
  - This equates to a 3.1% total shareholder yield, or 1.2% in share count reductions via buybacks on top of the current 1.9% S&P 1500 dividend yield.
  - The market is thus poised to return an estimated 7.6% (3.1% shareholder yield plus 4.5% earnings growth) in an environment where multiples do not change.
- This compares favorably to the 30-year U.S. Treasury at 2.9%, and unfavorably to the historical compound annual return for the S&P 500 from 1928 – 2016 of 9.5%.

# SMRS

## Domestic Equity Strategies

9/30/17

| Markets                                  | Amount  | Total          | % of Total   |
|--|---------|----------------|--------------|
| <b>Internal Indexed</b> (\$ in Millions) |         |                |              |
| Indexed Portfolios                       | \$7,625 |                |              |
| <b>Total Indexed</b>                     |         | <b>\$7,625</b> | <b>45.5%</b> |
| <b>Internal Active</b>                   |         |                |              |
| Active Portfolios                        | \$4,982 |                |              |
| <b>Total Internal Active</b>             |         | <b>\$4,982</b> | <b>29.7%</b> |
| <b>External Active</b>                   |         |                |              |
| Los Angeles Capital                      | \$1,188 |                |              |
| Fisher Investments                       | 682     |                |              |
| Seizert Capital Partners                 | 535     |                |              |
| Clarkston Capital Partners               | 512     |                |              |
| Mellon Capital                           | 459     |                |              |
| ARK Investments                          | 361     |                |              |
| Bivium Capital                           | 178     |                |              |
| Attucks Asset Management                 | 166     |                |              |
| Munder Capital Management                | 33      |                |              |
| Northpointe Capital                      | 30      |                |              |
| <b>Total External Active</b>             |         | <b>\$4,144</b> | <b>24.8%</b> |

**Total Domestic Equity**

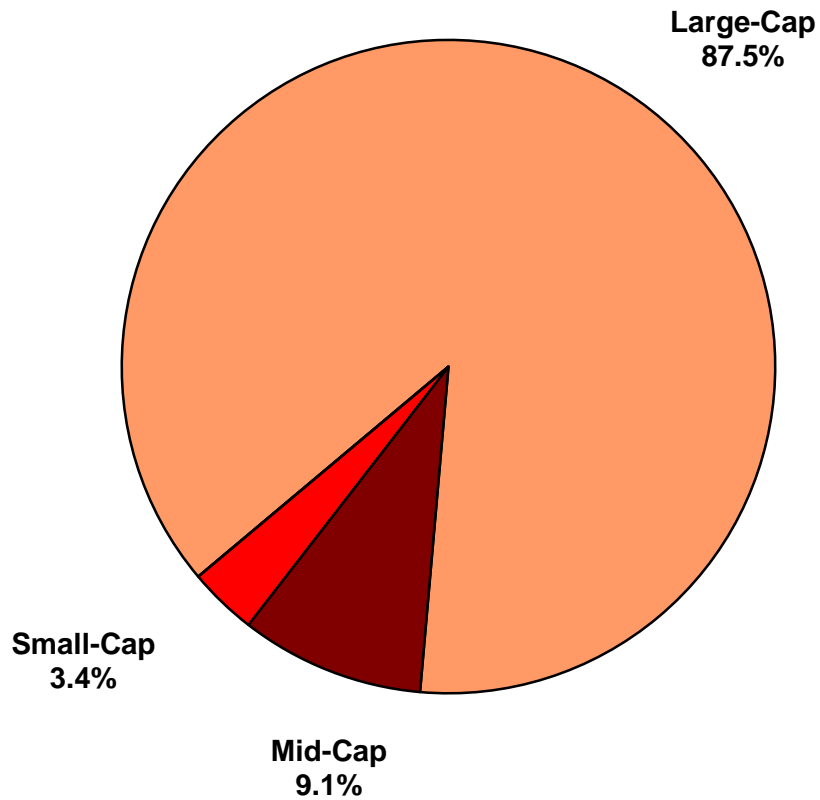
**\$16,751**

**100.0%**



# SMRS

## Domestic Equity Exposure By Market Cap 9/30/17



### Market Value in Millions

|                              | 9/30/17                |                      |                      |
|------------------------------|------------------------|----------------------|----------------------|
|                              | <u>Assets</u>          | <u>Percent</u>       | <u>S&amp;P 1500</u>  |
| Large-Cap (>\$10B)           | \$14,657               | 87.5%                | 89.1%                |
| Mid-Cap (>\$4 <\$10B)        | 1,524                  | 9.1%                 | 5.6%                 |
| Small-Cap (<\$4B)            | 570                    | 3.4%                 | 5.3%                 |
| <b>Total Domestic Equity</b> | <b><u>\$16,751</u></b> | <b><u>100.0%</u></b> | <b><u>100.0%</u></b> |

# SMRS

## Domestic Equities Composite

### 9/30/17

| <b>Date:</b>             | <u>9/30/17</u> | <u>6/30/17</u> | <u>3/31/17</u> | <u>12/31/16</u> |
|--------------------------|----------------|----------------|----------------|-----------------|
| Assets (\$ in Millions): | \$16,751       | \$17,392       | \$16,905       | \$16,059        |
| Number of Securities:    | 1,271          | 1,278          | 1,300          | 1,322           |
| Active Share:            | 41%            | 44%            | 40%            | 37%             |

Benchmark: S&P 1500

Description: The Domestic Equities Composite combines both the SMRS' Actively Managed Composite and its index funds.

| <b>Characteristics:</b>                          | <u>SMRS</u> | <u>S&amp;P 1500</u> | <u>S&amp;P 1500 Value</u> |
|--|-------------|---------------------|---------------------------|
| Weighted Average Capitalization (\$ in Billions) | \$194.7     | \$159.2             | \$120.2                   |
| P/E FY1  | 17.1x       | 19.4x               | 17.0x                     |
| P/E upside to S&P 1500                           | 13.3%       | 0.0                 | 13.6%                     |
| Price/Book                                       | 3.8x        | 3.0x                | 2.0x                      |
| Beta   | 1.12        | 1.00                | 1.01                      |
| Tracking Error                                   | 1.8%        | --                  | 3.2%                      |
| Dividend Yield                                   | 2.1%        | 1.9%                | 2.3%                      |
| Buyback Yield                                    | 1.6%        | 1.7%                | 1.3%                      |
| Reinvestment Rate                                | 6.9%        | 4.4%                | 4.4%                      |
| Return on Equity                                 | 21.5%       | 15.6%               | 11.8%                     |

#### TOP TEN EXPOSURES - Domestic Equities

##### 9/30/17

(\$ in Billions\* - \$ in Millions\*\*)

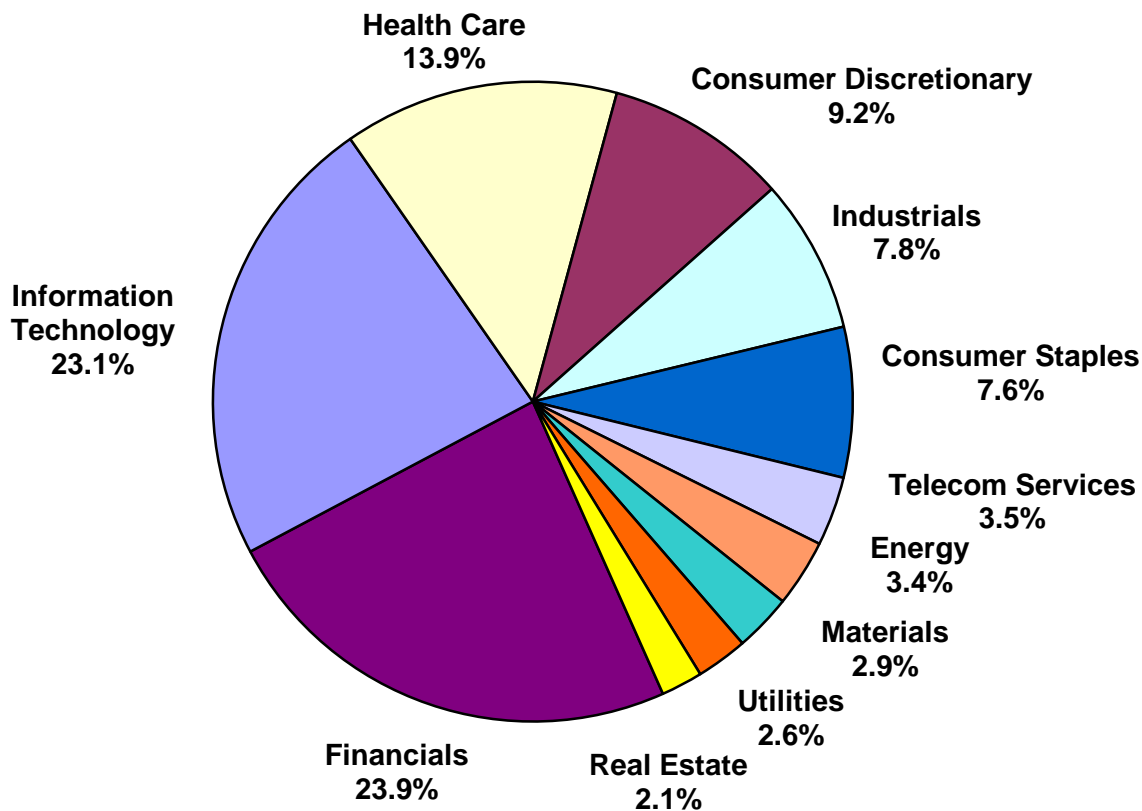
|   | <u>Portfolio Weight</u> | <u>Market Capitalization*</u> | <u>FY1 P/E</u> | <u>Market Value**</u>   |
|---|-------------------------|-------------------------------|----------------|-------------------------|
| SPDR S&P 500 ETF Trust                            | 12.8%                   | \$241.4                       | 19.2           | \$2,144.1               |
| Apple, Inc.                                       | 3.8%                    | 790.1                         | 17.1           | 636.5                   |
| Facebook, Inc. Class A                            | 3.5%                    | 496.5                         | 32.2           | 586.2                   |
| Berkshire Hathaway, Inc. Class B                  | 3.1%                    | 452.3                         | 26.4           | 519.2                   |
| Verizon Communications, Inc.                      | 2.8%                    | 201.9                         | 13.1           | 469.0                   |
| U.S. Bancorp                                      | 2.4%                    | 89.3                          | 15.6           | 402.0                   |
| Aflac, Inc.                                       | 1.9%                    | 32.1                          | 12.2           | 318.2                   |
| Microsoft Corporation                             | 1.8%                    | 575.1                         | 23.4           | 301.5                   |
| SPDR Bloomberg Barclays Long Term Treasury ETF*** | 1.8%                    | N/A                           | 40.4           | 301.5                   |
| Gilead Sciences, Inc.                             | <u>1.8%</u>             | 105.9                         | 9.3            | <u>301.5</u>            |
| <b>TOTAL</b>                                      | <b><u>35.6%</u></b>     |                               |                | <b><u>\$5,979.7</u></b> |

\*\*\*Long-term treasury ETF held in portfolio as part of Mellon Capital overlay strategy.

# SMRS

## Domestic Equity By Sector

### 9/30/17



| <b>Market Value in Millions</b> |                 |                |                  |                   |
|---------------------------------|-----------------|----------------|------------------|-------------------|
| <b>9/30/17</b>                  |                 |                |                  |                   |
|                                 | <b>Assets</b>   | <b>Percent</b> | <b>Benchmark</b> | <b>Difference</b> |
| Financials                      | \$4,008         | 23.9%          | 14.8%            | 9.1%              |
| Information Technology          | 3,874           | 23.1%          | 22.6%            | 0.5%              |
| Health Care                     | 2,325           | 13.9%          | 14.0%            | -0.1%             |
| Consumer Discretionary          | 1,542           | 9.2%           | 11.9%            | -2.7%             |
| Industrials                     | 1,313           | 7.8%           | 10.9%            | -3.1%             |
| Consumer Staples                | 1,266           | 7.6%           | 7.8%             | -0.2%             |
| Telecom Services                | 583             | 3.5%           | 2.0%             | 1.5%              |
| Energy                          | 573             | 3.4%           | 5.9%             | -2.5%             |
| Materials                       | 485             | 2.9%           | 3.3%             | -0.4%             |
| Utilities                       | 431             | 2.6%           | 3.3%             | -0.7%             |
| Real Estate                     | 351             | 2.1%           | 3.5%             | -1.4%             |
| <b>Total</b>                    | <b>\$16,751</b> | <b>100.0%</b>  | <b>100.0%</b>    |                   |

Benchmark: S&P 1500

# SMRS

## Actively Managed Composite

### 9/30/17

| <b>Date:</b>             | <u>9/30/17</u> | <u>6/30/17</u> | <u>3/31/17</u> | <u>12/31/16</u> |
|--------------------------|----------------|----------------|----------------|-----------------|
| Assets (\$ in Millions): | \$9,126        | \$9,455        | \$9,181        | \$8,734         |
| Number of Securities:    | 950            | 977            | 981            | 980             |
| Active Share:            | 75%            | 78%            | 72%            | 66%             |

Benchmark: S&P 1500

Description: The Actively Managed Composite is designed to add consistent alpha by investing in managers with value-added, but diverse strategies. While the expectation is that most will outperform over time, the composite is designed such that they do so during differing parts of the business cycle.

| <b>Characteristics:</b>                          | <u>SMRS</u> | <u>S&amp;P 1500</u> | <u>S&amp;P 1500 Value</u> |
|--|-------------|---------------------|---------------------------|
| Weighted Average Capitalization (\$ in Billions) | \$192.8     | \$159.2             | \$120.2                   |
| P/E FY1  | 15.3x       | 19.4x               | 17.0x                     |
| P/E upside to S&P 1500                           | 26.8%       | 0.0                 | 13.6%                     |
| Price/Book                                       | 4.5x        | 3.0x                | 2.0x                      |
| Beta   | 1.21        | 1.00                | 1.01                      |
| Tracking Error                                   | 3.2%        | --                  | 3.2%                      |
| Dividend Yield                                   | 2.3%        | 1.9%                | 2.3%                      |
| Buyback Yield                                    | 1.6%        | 1.7%                | 1.3%                      |
| Reinvestment Rate                                | 10.8%       | 4.4%                | 4.4%                      |
| Return on Equity                                 | 27.9%       | 15.6%               | 11.8%                     |

#### TOP TEN EXPOSURES - Actively Managed Equities

##### 9/30/17

(\$ in Billions\* - \$ in Millions\*\*)

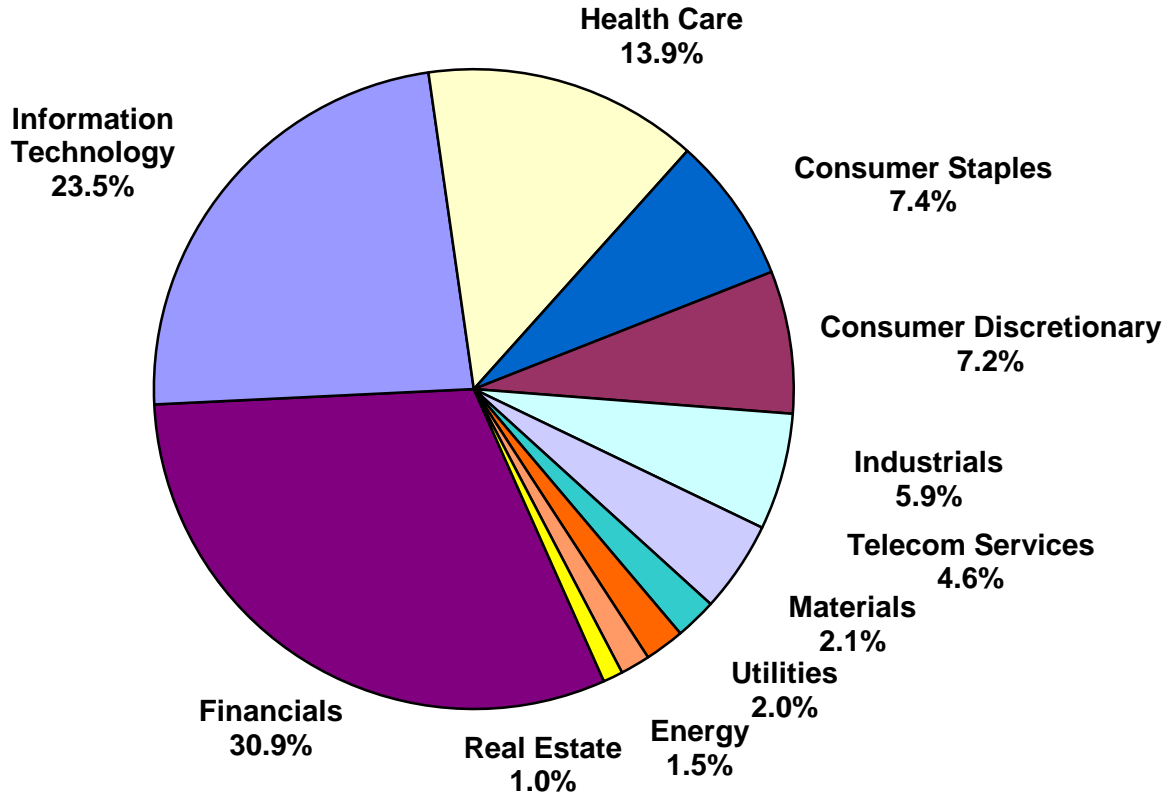
|   | <u>Portfolio Weight</u> | <u>Market Capitalization*</u> | <u>FY1 P/E</u> | <u>Market Value**</u>   |
|---|-------------------------|-------------------------------|----------------|-------------------------|
| SPDR S&P 500 ETF Trust                            | 18.9%                   | \$241.4                       | 19.2           | \$1,724.8               |
| Facebook, Inc. Class A                            | 4.8%                    | 496.5                         | 32.2           | 438.0                   |
| Berkshire Hathaway Inc. Class B                   | 4.7%                    | 452.3                         | 26.4           | 428.9                   |
| Verizon Communications Inc.                       | 4.4%                    | 201.9                         | 13.1           | 401.5                   |
| Apple Inc.  | 4.1%                    | 790.1                         | 17.1           | 374.1                   |
| U.S. Bancorp                                      | 4.0%                    | 89.3                          | 15.6           | 365.0                   |
| Aflac Incorporated                                | 3.4%                    | 32.1                          | 12.2           | 310.2                   |
| SPDR Bloomberg Barclays Long Term Treasury ETF*** | 3.2%                    | NA                            | 40.4           | 292.0                   |
| Gilead Sciences, Inc.                             | 2.8%                    | 105.9                         | 9.3            | 255.5                   |
| CVS Health Corporation                            | <u>2.3%</u>             | 82.4                          | 13.8           | <u>209.8</u>            |
| <b>TOTAL</b>                                      | <b><u>52.5%</u></b>     |                               |                | <b><u>\$4,799.8</u></b> |

\*\*\*Long-term treasury ETF held in portfolio as part of Mellon Capital overlay strategy.

# SMRS

## Active Equity By Sector

9/30/17



| <b>Market Value in Millions</b> |                |                |                  |                   |
|---------------------------------|----------------|----------------|------------------|-------------------|
| <b>9/30/17</b>                  |                |                |                  |                   |
|                                 | <b>Assets</b>  | <b>Percent</b> | <b>Benchmark</b> | <b>Difference</b> |
| Financials                      | \$2,823        | 30.9%          | 14.8%            | 16.1%             |
| Information Technology          | 2,143          | 23.5%          | 22.6%            | 0.9%              |
| Health Care                     | 1,268          | 13.9%          | 14.0%            | -0.1%             |
| Consumer Staples                | 673            | 7.4%           | 7.8%             | -0.4%             |
| Consumer Discretionary          | 658            | 7.2%           | 11.9%            | -4.7%             |
| Industrials                     | 538            | 5.9%           | 10.9%            | -5.0%             |
| Telecom Services                | 421            | 4.6%           | 2.0%             | 2.6%              |
| Materials                       | 189            | 2.1%           | 3.3%             | -1.2%             |
| Utilities                       | 184            | 2.0%           | 3.3%             | -1.3%             |
| Energy                          | 133            | 1.5%           | 5.9%             | -4.4%             |
| Real Estate                     | 96             | 1.0%           | 3.5%             | -2.5%             |
| <b>Total</b>                    | <b>\$9,126</b> | <b>100.0%</b>  | <b>100.0%</b>    |                   |

Benchmark: S&P 1500

**Manager Performance - Net of Fees**  
9/30/17

| <u>Fund Name</u>                            | <u>Market Value</u>    | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Inception</u> | <u>Inception Date</u> |
|---|------------------------|---------------|----------------|----------------|----------------|------------------|-----------------------|
| <b>SMRS S&amp;P 500 Index</b>               | <b>\$6,925,452,735</b> | <b>18.8%</b>  | <b>11.0%</b>   | <b>14.5%</b>   | <b>14.7%</b>   | <b>--</b>        | <b>N/A</b>            |
| S&P 500                                     |                        | 18.6%         | 10.8%          | 14.2%          | 14.4%          | --               |                       |
| Style & Risk Adjusted Benchmark             |                        | 18.6%         | 10.8%          | 14.2%          | 14.3%          | --               |                       |
| Lipper Large-Cap Core                       |                        | 17.6%         | 9.3%           | 13.0%          | 13.0%          | --               |                       |
| <i>Excess Return</i>                        |                        | 0.2%          | 0.2%           | 0.3%           | 0.3%           | --               |                       |
| <i>Alpha</i>                                |                        | 0.2%          | 0.2%           | 0.3%           | 0.4%           | --               |                       |
| <i>Pct. Rank vs. Lipper Large-Cap Core</i>  |                        | 37            | 17             | 13             | 10             | --               |                       |
| <b>SMRS Large-Cap Core</b>                  | <b>2,227,370,256</b>   | <b>22.5%</b>  | <b>7.5%</b>    | <b>14.4%</b>   | <b>13.2%</b>   | <b>7.8%</b>      | <b>8/31/07</b>        |
| S&P 500                                     |                        | 18.6%         | 10.8%          | 14.2%          | 14.4%          | 7.9%             |                       |
| Style & Risk Adjusted Benchmark             |                        | 13.7%         | 7.5%           | 11.6%          | 12.1%          | 8.2%             |                       |
| Lipper Large-Cap Core                       |                        | 17.6%         | 9.3%           | 13.0%          | 13.0%          | 7.1%             |                       |
| <i>Excess Return</i>                        |                        | 3.9%          | -3.3%          | 0.2%           | -1.1%          | -0.1%            |                       |
| <i>Alpha</i>                                |                        | 8.7%          | -0.1%          | 2.8%           | 1.2%           | -0.4%            |                       |
| <i>Pct Rank vs Lipper Large-Cap Core</i>    |                        | 7             | 81             | 16             | 51             | 25               |                       |
| <b>SMRS Large-Cap Growth</b>                | <b>1,597,623,382</b>   | <b>19.6%</b>  | <b>9.6%</b>    | <b>14.4%</b>   | <b>14.3%</b>   | <b>9.3%</b>      | <b>5/31/05</b>        |
| S&P 500 Growth Index                        |                        | 19.9%         | 12.2%          | 15.0%          | 15.5%          | 9.7%             |                       |
| Style & Risk Adjusted Benchmark             |                        | 19.0%         | 12.7%          | 15.8%          | 16.3%          | 9.8%             |                       |
| Lipper Large Growth                         |                        | 20.3%         | 11.2%          | 14.3%          | 14.2%          | 9.3%             |                       |
| <i>Excess Return</i>                        |                        | -0.3%         | -2.6%          | -0.6%          | -1.1%          | -0.4%            |                       |
| <i>Alpha</i>                                |                        | 0.6%          | -3.1%          | -1.4%          | -1.9%          | -0.5%            |                       |
| <i>Pct Rank vs Lipper Large-Cap Growth</i>  |                        | 59            | 78             | 51             | 49             | 49               |                       |
| <b>SMRS All-Cap Garp</b>                    | <b>1,094,331,065</b>   | <b>20.1%</b>  | <b>8.6%</b>    | <b>13.2%</b>   | <b>--</b>      | <b>14.0%</b>     | <b>4/30/11</b>        |
| S&P 1500 Super Composite                    |                        | 18.6%         | 10.9%          | 14.3%          | --             | 12.6%            |                       |
| Style & Risk Adjusted Benchmark             |                        | 11.8%         | 10.6%          | 14.0%          | --             | 12.5%            |                       |
| Lipper Multi Core                           |                        | 17.3%         | 8.5%           | 12.8%          | --             | 10.7%            |                       |
| <i>Excess Return</i>                        |                        | 1.5%          | -2.3%          | -1.1%          | --             | 1.3%             |                       |
| <i>Alpha</i>                                |                        | 8.3%          | -2.0%          | -0.8%          | --             | 1.5%             |                       |
| <i>Pct. Rank vs. Lipper Multi Core</i>      |                        | 20            | 60             | 53             | --             | 2                |                       |
| <b>SMRS Mid-Cap Index</b>                   | <b>699,409,701</b>     | <b>18.4%</b>  | <b>12.0%</b>   | <b>15.2%</b>   | <b>14.8%</b>   | <b>--</b>        | <b>N/A</b>            |
| S&P 400                                     |                        | 17.5%         | 11.2%          | 14.4%          | 13.9%          | --               |                       |
| Style & Risk Adjusted Benchmark             |                        | 17.5%         | 11.1%          | 14.3%          | 13.8%          | --               |                       |
| Lipper Large-Cap Core                       |                        | 16.1%         | 8.6%           | 13.1%          | 12.4%          | --               |                       |
| <i>Excess Return</i>                        |                        | 0.9%          | 0.8%           | 0.7%           | 0.9%           | --               |                       |
| <i>Alpha</i>                                |                        | 0.9%          | 0.9%           | 0.8%           | 1.0%           | --               |                       |
| <i>Pct. Rank vs. Lipper Mid-Cap Core</i>    |                        | 22            | 8              | 7              | 4              | --               |                       |
| <b>LA Capital Deep Value</b>                | <b>731,453,704</b>     | <b>15.2%</b>  | <b>--</b>      | <b>--</b>      | <b>--</b>      | <b>7.5%</b>      | <b>4/1/15</b>         |
| S&P 1500 Value                              |                        | 16.7%         | --             | --             | --             | 9.1%             |                       |
| Style & Risk Adjusted Benchmark             |                        | 16.6%         | --             | --             | --             | 9.2%             |                       |
| Lipper Multi-Cap Value                      |                        | 16.7%         | --             | --             | --             | 7.3%             |                       |
| <i>Excess Return</i>                        |                        | -1.5%         | --             | --             | --             | -1.6%            |                       |
| <i>Alpha</i>                                |                        | -1.4%         | --             | --             | --             | -1.8%            |                       |
| <i>Pct. Rank vs. Lipper Multi-Cap Value</i> |                        | 64            | --             | --             | --             | 51               |                       |
| <b>Fisher All-Cap</b>                       | <b>681,766,576</b>     | <b>22.4%</b>  | <b>12.2%</b>   | <b>14.3%</b>   | <b>13.3%</b>   | <b>10.7%</b>     | <b>10/31/04</b>       |
| S&P 1500/S&P 600 Value Blend                |                        | 18.6%         | 10.9%          | 14.3%          | 14.3%          | 9.4%             |                       |
| Style & Risk Adjusted Benchmark             |                        | 19.6%         | 12.2%          | 15.4%          | 18.0%          | 11.2%            |                       |
| Lipper Multi Core                           |                        | 17.3%         | 8.5%           | 12.8%          | 12.5%          | 8.1%             |                       |
| <i>Excess Return</i>                        |                        | 3.8%          | 1.3%           | 0.0%           | -1.0%          | 1.4%             |                       |
| <i>Alpha</i>                                |                        | 2.8%          | 0.0%           | -1.1%          | -4.7%          | -0.4%            |                       |
| <i>Pct. Rank vs. Lipper Multi Core</i>      |                        | 7             | 3              | 19             | 45             | 1                |                       |
| <b>Seizert Capital Partners</b>             | <b>535,048,451</b>     | <b>20.1%</b>  | <b>8.8%</b>    | <b>14.5%</b>   | <b>14.1%</b>   | <b>14.7%</b>     | <b>11/30/09</b>       |
| S&P 1500/S&P 400 Value Blend                |                        | 18.6%         | 10.9%          | 14.3%          | 15.1%          | 16.3%            |                       |
| Style & Risk Adjusted Benchmark             |                        | 16.7%         | 9.7%           | 13.7%          | 14.2%          | 13.7%            |                       |
| Lipper Multi Core                           |                        | 17.3%         | 8.5%           | 12.8%          | 12.5%          | 12.8%            |                       |
| <i>Excess Return</i>                        |                        | 1.5%          | -2.1%          | 0.2%           | -1.0%          | -1.5%            |                       |
| <i>Alpha</i>                                |                        | 3.5%          | -0.9%          | 0.8%           | -0.1%          | 1.0%             |                       |
| <i>Pct. Rank vs. Lipper Multi Core</i>      |                        | 20            | 57             | 14             | 23             | 7                |                       |

| <u>Fund Name</u>                             | <u>Market Value</u>  | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Inception</u> | <u>Inception Date</u> |
|--|----------------------|---------------|----------------|----------------|----------------|------------------|-----------------------|
| <b>LA Capital All-Cap Growth</b>             | <b>\$456,927,202</b> | <b>15.4%</b>  | <b>13.1%</b>   | <b>16.8%</b>   | <b>15.4%</b>   | <b>11.7%</b>     | <b>5/31/05</b>        |
| S&P 1500 Growth                              |                      | 19.8%         | 12.3%          | 15.0%          | 15.4%          | 9.8%             |                       |
| Style & Risk Adjusted Benchmark              |                      | 18.7%         | 9.3%           | 12.9%          | 14.1%          | 10.2%            |                       |
| Lipper Multi-Cap Growth                      |                      | 19.8%         | 9.9%           | 13.4%          | 13.1%          | 9.3%             |                       |
| <i>Excess Return</i>                         |                      | -4.4%         | 0.8%           | 1.8%           | 0.0%           | 1.8%             |                       |
| <i>Alpha</i>                                 |                      | -3.3%         | 3.8%           | 3.9%           | 1.3%           | 1.5%             |                       |
| <i>Pct. Rank vs. Lipper Multi-Cap Growth</i> |                      | 84            | 12             | 9              | 13             | 9                |                       |
| <b>Ark Investments</b>                       | <b>361,427,099</b>   | <b>44.0%</b>  | --             | --             | --             | <b>45.3%</b>     | <b>3/1/16</b>         |
| S&P 1500 Growth                              |                      | 19.8%         | --             | --             | --             | 21.3%            |                       |
| Style & Risk Adjusted Benchmark              |                      | 49.2%         | --             | --             | --             | 33.1%            |                       |
| Lipper All-Cap Growth                        |                      | 19.8%         | --             | --             | --             | 21.1%            |                       |
| <i>Excess Return</i>                         |                      | 24.2%         | --             | --             | --             | 24.1%            |                       |
| <i>Alpha</i>                                 |                      | -5.2%         | --             | --             | --             | 12.2%            |                       |
| <i>Pct. Rank vs. Lipper All-Cap Growth</i>   |                      | 1             | --             | --             | --             | 1                |                       |
| <b>Clarkston Capital Large-Cap</b>           | <b>294,288,023</b>   | <b>11.8%</b>  | --             | --             | --             | <b>9.8%</b>      | <b>4/1/15</b>         |
| S&P 500                                      |                      | 18.6%         | --             | --             | --             | 10.5%            |                       |
| Style & Risk Adjusted Benchmark              |                      | 14.5%         | --             | --             | --             | 7.5%             |                       |
| Lipper Large-Cap Core                        |                      | 17.6%         | --             | --             | --             | 8.9%             |                       |
| <i>Excess Return</i>                         |                      | -6.8%         | --             | --             | --             | -0.7%            |                       |
| <i>Alpha</i>                                 |                      | -2.6%         | --             | --             | --             | 2.3%             |                       |
| <i>Pct. Rank vs. Lipper Large-Cap Core</i>   |                      | 94            | --             | --             | --             | 35               |                       |
| <b>Clarkston Capital Small-Cap</b>           | <b>217,954,002</b>   | <b>12.8%</b>  | <b>13.6%</b>   | --             | --             | <b>12.6%</b>     | <b>1/1/14</b>         |
| S&P 600                                      |                      | 21.1%         | 14.1%          | --             | --             | 10.0%            |                       |
| Style & Risk Adjusted Benchmark              |                      | 13.8%         | 9.8%           | --             | --             | 8.0%             |                       |
| Lipper Small-Cap Core                        |                      | 18.8%         | 10.2%          | --             | --             | 7.2%             |                       |
| <i>Excess Return</i>                         |                      | -8.2%         | -0.5%          | --             | --             | 2.6%             |                       |
| <i>Alpha</i>                                 |                      | -0.9%         | 3.8%           | --             | --             | 4.6%             |                       |
| <i>Pct. Rank vs. Lipper Small-Cap Core</i>   |                      | 92            | 11             | --             | --             | 1                |                       |
| <b>Bivium Capital Partners</b>               | <b>178,354,744</b>   | <b>19.5%</b>  | <b>8.5%</b>    | <b>11.8%</b>   | <b>12.5%</b>   | <b>6.3%</b>      | <b>11/30/07</b>       |
| S&P 1500 Value                               |                      | 16.7%         | 9.2%           | 13.4%          | 13.2%          | 5.8%             |                       |
| Style & Risk Adjusted Benchmark              |                      | 14.2%         | 9.4%           | 15.3%          | 15.7%          | 7.8%             |                       |
| Lipper Multi Cap Value                       |                      | 16.7%         | 7.7%           | 12.5%          | 12.0%          | 5.8%             |                       |
| <i>Excess Return</i>                         |                      | 2.9%          | -0.7%          | -1.6%          | -0.7%          | 0.4%             |                       |
| <i>Alpha</i>                                 |                      | 5.3%          | -0.9%          | -3.5%          | -3.2%          | -1.5%            |                       |
| <i>Pct. Rank vs. Lipper Multi Cap Value</i>  |                      | 27            | 33             | 71             | 42             | 34               |                       |
| <b>Attucks Asset Management</b>              | <b>166,114,878</b>   | <b>15.1%</b>  | <b>7.3%</b>    | <b>11.8%</b>   | <b>12.0%</b>   | <b>6.3%</b>      | <b>11/30/07</b>       |
| S&P 1500 Super Composite                     |                      | 18.6%         | 10.9%          | 14.3%          | 14.4%          | 7.5%             |                       |
| Style & Risk Adjusted Benchmark              |                      | 13.9%         | 11.3%          | 14.9%          | 15.2%          | 7.6%             |                       |
| Lipper Multi Core                            |                      | 17.3%         | 8.5%           | 12.8%          | 12.5%          | 6.3%             |                       |
| <i>Excess Return</i>                         |                      | -3.5%         | -3.6%          | -2.5%          | -2.4%          | -1.2%            |                       |
| <i>Alpha</i>                                 |                      | 1.3%          | -4.0%          | -3.1%          | -3.2%          | -1.2%            |                       |
| <i>Pct. Rank vs. Lipper Multi Core</i>       |                      | 74            | 76             | 73             | 67             | 57               |                       |
| <b>Munder Concentrated SMID Cap</b>          | <b>32,707,564</b>    | <b>14.8%</b>  | <b>5.3%</b>    | <b>11.0%</b>   | <b>11.4%</b>   | <b>15.3%</b>     | <b>4/30/09</b>        |
| S&P 400 Mid-Cap Growth                       |                      | 17.3%         | 11.5%          | 14.0%          | 13.9%          | 18.5%            |                       |
| Style & Risk Adjusted Benchmark              |                      | 18.6%         | 15.8%          | 16.2%          | 14.6%          | 17.4%            |                       |
| Lipper Mid-Cap Growth                        |                      | 18.4%         | 9.3%           | 12.9%          | 12.7%          | 16.4%            |                       |
| <i>Excess Return</i>                         |                      | -2.5%         | -6.2%          | -3.0%          | -2.5%          | -3.2%            |                       |
| <i>Alpha</i>                                 |                      | -3.9%         | -10.5%         | -5.2%          | -3.2%          | -2.1%            |                       |
| <i>Pct. Rank vs. Lipper Mid-Cap Core</i>     |                      | 83            | 95             | 84             | 76             | 81               |                       |
| <b>NorthPointe All-Cap Core</b>              | <b>29,654,115</b>    | <b>12.2%</b>  | <b>7.8%</b>    | <b>11.8%</b>   | <b>10.8%</b>   | <b>7.3%</b>      | <b>10/31/04</b>       |
| NorthPointe Blended Benchmark                |                      | 18.6%         | 10.9%          | 14.3%          | 14.4%          | 8.9%             |                       |
| Style & Risk Adjusted Benchmark              |                      | 15.9%         | 8.6%           | 13.2%          | 15.2%          | 10.9%            |                       |
| Lipper Multi Core                            |                      | 17.3%         | 8.5%           | 12.8%          | 12.5%          | 8.1%             |                       |
| <i>Excess Return</i>                         |                      | -6.4%         | -3.2%          | -2.5%          | -3.5%          | -1.7%            |                       |
| <i>Alpha</i>                                 |                      | -3.7%         | -0.8%          | -1.4%          | -4.4%          | -3.7%            |                       |
| <i>Pct. Rank vs. Lipper Multi Core</i>       |                      | 91            | 70             | 73             | 82             | 82               |                       |

State of Michigan Retirement Systems

# INTERNATIONAL EQUITY REVIEW

Investment Advisory Committee Meeting

December 12, 2017



Patrick M. Moraniec, CFA  
Senior Investment Manager  
International Equity Division



## EXECUTIVE SUMMARY

### Performance

| <b>International Equity, Gross</b> | <b>1-Year</b> | <b>3-Years</b> | <b>5-Years</b> | <b>7-Years</b> | <b>10-Years</b> |
|------------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns                 | 21.0%         | 6.7%           | 8.4%           | 6.8%           | 1.9%            |
| MSCI ACWI ex USA Returns           | 19.6%         | 4.7%           | 7.1%           | 5.5%           | 1.0%            |
| Peer Median Return                 | 19.5%         | 6.0%           | 8.5%           | 6.8%           | 2.0%            |
| Percentile Rank vs. Peers*         | 29            | 31             | 62             | 45             | 53              |

\*Source: State Street Universe greater than >\$1 Billion

- International Equity Division portfolio outperformed the benchmark by 1.4% over the last twelve months. The outperformance was a result of exposure to smaller capitalization stocks, emerging markets and Japan. The best performing strategy was stock plus which added 0.7% of the total excess return.
- Active strategy investments, over the last twelve months, outperformed the benchmark by 0.6% accounting for 0.2% of the total excess return. Exposure to emerging markets, and Japan were the primary drivers of outperformance.

### Asset Class Goals

- Construct a non-U.S. equity focused portfolio to generate, on a consistent basis, ten-year returns that exceed the MSCI ACWI ex USA by 1.0%.
- Perform in the top half of the public plan peer universe percentile rankings.
- Advance people, processes, and systems to continuously improve risk management decisions.

### Strategy

- General International Equity portfolio strategy.
  - International Equity Division uses three distinct strategies to add value:
    - Index investments, 28.2% of assets, to gain broad international stock market exposure with minimal tracking risk.
    - Stock plus investments, 34.9% of assets, to implement a portable alpha strategy.
    - Active investments, 36.9% of assets, to gain specific international stock market exposure.
  - Company data are aggregated, categorized, and statistically measured to identify investment opportunities across 47 countries, 4 regions, 11 sectors, and 6 factors: quality, value, momentum, dividend yield, volatility, and size.
  - Quantitative, fundamental, and technical processes are used to measure risk and to allocate capital across investment opportunities.
- There were no quarterly changes to International Equity Division allocation.

## **Market Environment and Outlook**

- International equity markets have performed well this year but remain below all-time highs. The MSCI ACWI ex USA is up 21.1% year-to-date. Emerging markets are up 27.8% and have led the developed markets which returned 19.2%. Both markets are approximately 18.0% below their respective highs.
- International stock markets' growth continued in the third quarter. Sales were up 7.2% year-over-year through September 30, 2017 on the MSCI ACWI ex US. The energy, material, health care, and financial sectors all grew sales by double digit rates over the last year.
- As of September 30, 2017, the MSCI ACWI ex USA trailing twelve-month normalized price-to-earnings ratio was 17.9, slightly lower than the twenty-year average of 19.1.
- Forward looking annualized compound rate for the MSCI ACWI ex USA index was estimated to be approximately 9.1%. This rate is based on current price and actual fundamentals over multiple periods to remove fundamental variability better estimating the earnings power of the index.
- Countries with ten-year government bond yields below 1.4% currently make up approximately 58.9% of the benchmark, e.g., Switzerland 0.0%, Japan 0.1%, Germany 0.5%, France 0.7%, and United Kingdom 1.4%.
- A ten-year blended international government yield of 1.8% implies an international equity risk premium of 7.3%. International bond rates are significantly lower than the U.S. ten-year note at 2.3%.
- Emerging markets have performed well year-to-date. Commodity prices are up approximately 43% since the January 2016 low. The U.S. dollar peaked in January 2017 and has weakened 9% through the third quarter of 2017. A continuation of this trend in 2017 potentially presents a tailwind for international investment returns.
- Emerging market valuations remain attractive. First, value spreads remain wider than developed markets despite price appreciation in many emerging markets over the last twelve months. Second, the average emerging market company multiple relative to history remains at a larger discount than developed market companies. Finally, forward looking annualized compound rate for emerging markets was estimated to be approximately 11.4% versus developed markets at 8.2%.
- Emerging market factor valuation spreads have decreased in the last twelve months across the six factors. Emerging market valuation spreads, relative to developed market spreads, still remain wider for the majority of factors, indicating broad based value in emerging markets.

## **Conclusion**

International equity markets continue to offer an attractive equity risk premium relative to international ten-year government bonds. Emerging markets are particularly attractive due to wider valuation spreads, higher annualized returns, stabilizing commodity prices and a weakening U.S. dollar.

# SMRS

## International Equity Strategies

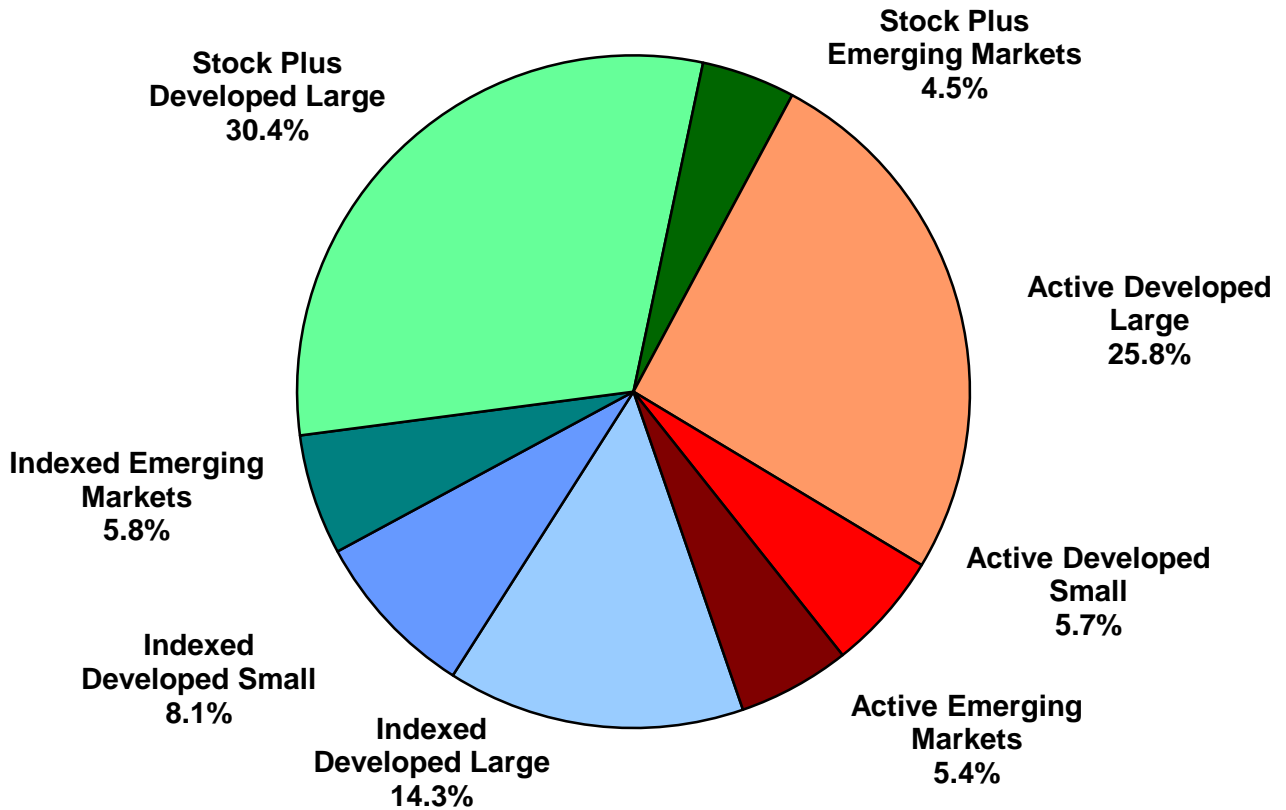
9/30/17

| Markets   | Amount  | Total                  | % of Total           |
|---|---------|------------------------|----------------------|
| Indexed <span style="float: right;">(\$ in Millions)</span> |         |                        |                      |
| SSgA  | \$2,208 |                        |                      |
| Vanguard  | 1,277   |                        |                      |
| <b>Total Indexed</b>  |         | <b>\$3,485</b>         | <b>28.2%</b>         |
| Stock Plus  |         |                        |                      |
| Internal Swaps  | \$2,558 |                        |                      |
| PIMCO   | 1,751   |                        |                      |
| <b>Total Stock Plus</b>                                     |         | <b>\$4,309</b>         | <b>34.9%</b>         |
| Active  |         |                        |                      |
| Los Angeles Capital Management                              | \$1,361 |                        |                      |
| Wellington  | 981     |                        |                      |
| Marathon-London   | 721     |                        |                      |
| SSgA  | 705     |                        |                      |
| Effissimo Capital Management                                | 318     |                        |                      |
| Lazard  | 240     |                        |                      |
| Martin Currie   | 230     |                        |                      |
| <b>Total Active</b>   |         | <b>\$4,556</b>         | <b>36.9%</b>         |
| <b>TOTAL</b>  |         | <b><u>\$12,351</u></b> | <b><u>100.0%</u></b> |

# SMRS

## International Equity Exposure By Category

### 9/30/17



| <b>Market Value in Millions</b>   |                        |                      |
|-----------------------------------|------------------------|----------------------|
|                                   | <u>9/30/17</u>         |                      |
| <b><u>Indexed</u></b>             |                        |                      |
| Developed Large                   | \$1,764                | 14.3%                |
| Developed Small                   | 1,006                  | 8.1%                 |
| Emerging Markets                  | 716                    | 5.8%                 |
| <b>Total Indexed Equity</b>       | <u>\$3,486</u>         | <u>28.2%</u>         |
| <b><u>Stock Plus</u></b>          |                        |                      |
| Developed Large                   | \$3,752                | 30.4%                |
| Emerging Markets                  | 557                    | 4.5%                 |
| <b>Total Stock Plus Equity</b>    | <u>\$4,309</u>         | <u>34.9%</u>         |
| <b><u>Active</u></b>              |                        |                      |
| Developed Large                   | \$3,183                | 25.8%                |
| Developed Small                   | 705                    | 5.7%                 |
| Emerging Markets                  | 668                    | 5.4%                 |
| <b>Total Active Equity</b>        | <u>\$4,556</u>         | <u>36.9%</u>         |
| <b>Total International Equity</b> | <u><b>\$12,351</b></u> | <u><b>100.0%</b></u> |

# SMRS

## International Equities

### 9/30/17

| <b>Date:</b>             | <u>9/30/17</u> | <u>6/30/17</u> | <u>3/31/17</u> | <u>12/31/16</u> |
|--------------------------|----------------|----------------|----------------|-----------------|
| Assets (\$ in Millions): | \$12,351       | \$11,637       | \$10,491       | \$9,687         |
| Number of Securities:    | 9,109          | 9,529          | 9,190          | 9,201           |
| Active Share:            | 33%            | 34%            | 35%            | 34%             |

Benchmark: MSCI ACWI ex USA

Description: The International Equities Composite represents all International Equity Division investments.

| <b>Characteristics:</b>                           | <u>SMRS</u> |                   | <u>MSCI ACWI ex USA</u> |                   |
|---|-------------|-------------------|-------------------------|-------------------|
|   | <b>LTM</b>  | <b>Normalized</b> | <b>LTM</b>              | <b>Normalized</b> |
| Weighted Average Capitalization (\$ in Billions): | \$49.0      | --                | \$67.9                  | --                |
| Price/Earnings:                                   | 17.3        | 19.6              | 16.3                    | 17.9              |
| Price/Book:                                       | 1.7         | 2.0               | 1.7                     | 2.0               |
| Return on Equity:                                 | 9.8%        | 10.0%             | 10.4%                   | 11.2%             |
| Beta:   | 0.99        | --                | 1.00                    | --                |
| Tracking Error:                                   | 1.0%        | --                | --                      | --                |
| Dividend Yield:                                   | 2.0%        | 2.1%              | 2.2%                    | 2.3%              |
| Buyback Yield:                                    | -0.5%       | -0.4%             | -0.3%                   | -0.2%             |
| Sustainable Growth Rate:                          | 7.2%        | 6.7%              | 7.2%                    | 7.0%              |
| Annualized Compound Rate:                         | 8.7%        | 8.4%              | 9.1%                    | 9.1%              |

#### TOP TEN HOLDINGS

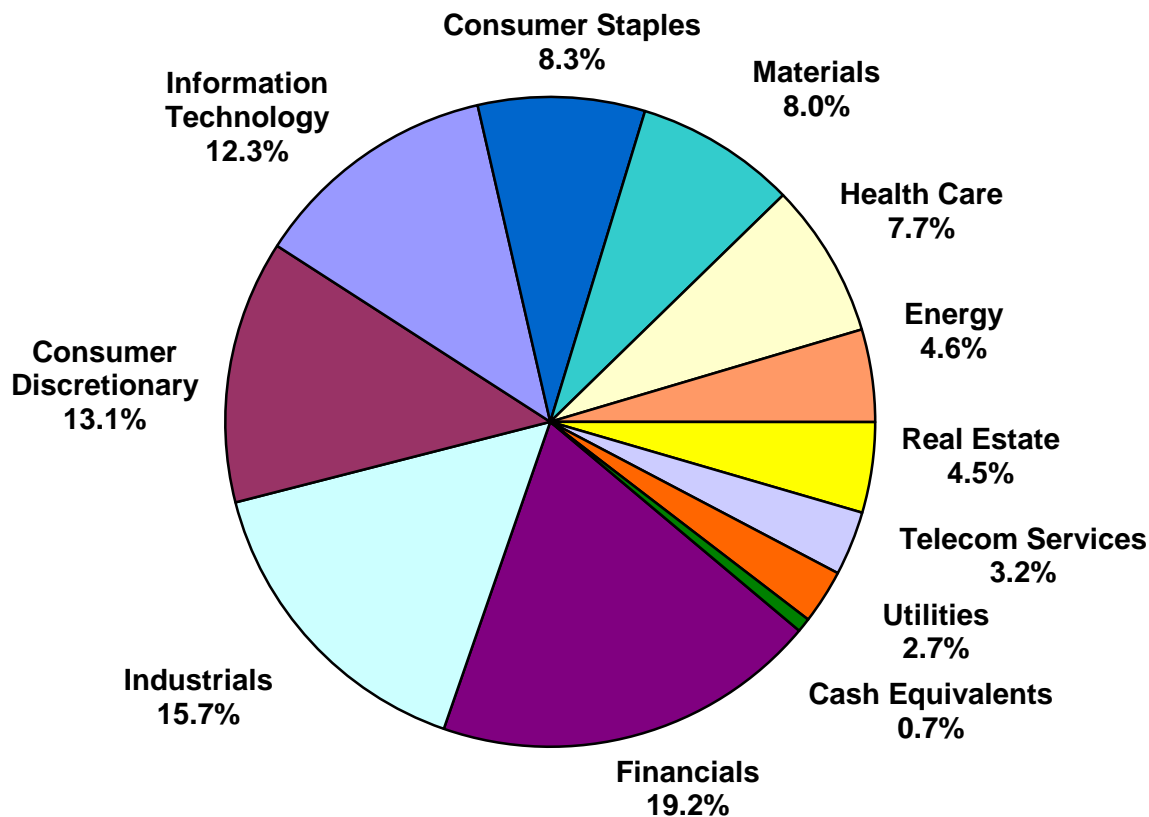
(\$ in Billions\* - \$ in Millions\*\*)

|  | <u>Portfolio Weight</u> | <u>Market Capitalization*</u> | <u>FY1 P/E</u> | <u>Market Value**</u> |
|--|-------------------------|-------------------------------|----------------|-----------------------|
| Kawasaki Kisen Kaisha, Ltd.                  | 1.2%                    | \$2.5                         | 28.8           | \$145.7               |
| Tencent Holdings Ltd.                        | 1.1%                    | 408.9                         | 43.4           | 141.5                 |
| Samsung Electronics Co., Ltd.                | 1.0%                    | 323.7                         | 8.7            | 118.7                 |
| Taiwan Semiconductor Manufacturing Co., Ltd. | 0.8%                    | 185.1                         | 16.5           | 98.2                  |
| Alibaba Group Holding Ltd. Sponsored ADR     | 0.7%                    | 442.3                         | 35.2           | 86.1                  |
| Novartis AG                                  | 0.7%                    | 224.2                         | 18.1           | 82.3                  |
| Nestle S.A.                                  | 0.6%                    | 260.8                         | 23.0           | 78.2                  |
| British American Tobacco p.l.c.              | 0.6%                    | 143.8                         | 16.5           | 69.5                  |
| Roche Holding Ltd Genusssch.                 | 0.5%                    | 220.2                         | 16.1           | 64.6                  |
| HSBC Holdings plc                            | <u>0.5%</u>             | <u>198.4</u>                  | 14.5           | <u>57.1</u>           |
| <b>TOTAL</b>                                 | <b><u>7.7%</u></b>      | <b><u>\$2,409.9</u></b>       |                | <b><u>\$941.8</u></b> |

# SMRS

## International Equity By Sector

### 9/30/17



| <b>Market Value in Millions</b> |                        |                      |                      |                   |
|---------------------------------|------------------------|----------------------|----------------------|-------------------|
| <b>9/30/17</b>                  |                        |                      |                      |                   |
|                                 | <u>Assets</u>          | <u>Percent</u>       | <u>Benchmark</u>     | <u>Difference</u> |
| Financials                      | \$2,372                | 19.2%                | 23.3%                | -4.1%             |
| Industrials                     | 1,941                  | 15.7%                | 11.8%                | 3.9%              |
| Consumer Discretionary          | 1,619                  | 13.1%                | 11.3%                | 1.8%              |
| Information Technology          | 1,522                  | 12.3%                | 11.2%                | 1.1%              |
| Consumer Staples                | 1,029                  | 8.3%                 | 9.6%                 | -1.3%             |
| Materials                       | 988                    | 8.0%                 | 7.8%                 | 0.2%              |
| Health Care                     | 952                    | 7.7%                 | 7.9%                 | -0.2%             |
| Energy                          | 560                    | 4.6%                 | 6.6%                 | -2.0%             |
| Real Estate                     | 555                    | 4.5%                 | 3.2%                 | 1.3%              |
| Telecom Services                | 394                    | 3.2%                 | 4.2%                 | -1.0%             |
| Utilities                       | 336                    | 2.7%                 | 3.1%                 | -0.4%             |
| Total Investments               | <u>\$12,268</u>        | <u>99.3%</u>         | <u>100.0%</u>        | <u></u>           |
| Cash Equivalents                | 83                     | 0.7%                 | 0.0%                 | 0.7%              |
| <b>Total</b>                    | <b><u>\$12,351</u></b> | <b><u>100.0%</u></b> | <b><u>100.0%</u></b> | <b><u></u></b>    |

Benchmark: MSCI ACWI ex USA

**International Manager Performance - Net of Fees**  
9/30/17

| <u>Fund Name</u>  | <u>Market Value</u>     | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Inception</u> | <u>Inception Date</u> |
|---|-------------------------|---------------|----------------|----------------|----------------|------------------|-----------------------|
| <b>Total International Equity</b>                       | <b>\$12,351,064,028</b> | <b>20.8%</b>  | <b>6.5%</b>    | <b>8.2%</b>    | <b>6.6%</b>    | <b>6.2%</b>      | <b>1/1/04</b>         |
| MSCI ACWI ex USA  |                         | 19.6%         | 4.7%           | 7.0%           | 5.5%           | 6.5%             |                       |
| Lipper International Multi-Cap Core                     |                         | 18.9%         | 5.3%           | 8.2%           | 6.2%           | 5.8%             |                       |
| <i>Excess Return</i>                                    |                         | 1.2%          | 1.8%           | 1.2%           | 1.0%           | -0.3%            |                       |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i> |                         | 23            | 25             | 52             | 43             | 28               |                       |

|  |                        |              |             |              |              |              |                |
|--|------------------------|--------------|-------------|--------------|--------------|--------------|----------------|
| <b>Total International Active Strategy</b>                   | <b>\$4,555,303,575</b> | <b>19.8%</b> | <b>6.3%</b> | <b>8.2%</b>  | <b>6.6%</b>  | <b>5.5%</b>  | <b>5/1/05</b>  |
| MSCI ACWI ex USA   |                        | 19.6%        | 4.7%        | 7.0%         | 5.2%         | 5.8%         |                |
| Lipper International Multi-Cap Core                          |                        | 18.9%        | 5.3%        | 8.2%         | 6.2%         | 5.2%         |                |
| <i>Excess Return</i>   |                        | 0.2%         | 1.6%        | 1.1%         | 1.3%         | -0.5%        |                |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>      |                        | 36           | 26          | 54           | 43           | 43           |                |
| <b>LACM World ex US</b>                                      | <b>982,091,348</b>     | <b>16.2%</b> | <b>--</b>   | <b>--</b>    | <b>--</b>    | <b>10.2%</b> | <b>12/1/15</b> |
| MSCI World ex USA  |                        | 18.7%        | --          | --           | --           | 10.6%        |                |
| Lipper International Multi-Cap Core                          |                        | 18.9%        | --          | --           | --           | 11.0%        |                |
| <i>Excess Return</i>   |                        | -2.6%        | --          | --           | --           | -0.4%        |                |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>      |                        | 82           | --          | --           | --           | 63           |                |
| <b>Marathon-London International Fund</b>                    | <b>720,966,727</b>     | <b>17.6%</b> | <b>7.7%</b> | <b>10.5%</b> | <b>--</b>    | <b>10.4%</b> | <b>2/1/12</b>  |
| MSCI World ex USA  |                        | 18.7%        | 4.6%        | 7.8%         | --           | 7.6%         |                |
| Lipper International Multi-Cap Core                          |                        | 18.9%        | 5.3%        | 8.2%         | --           | 8.1%         |                |
| <i>Excess Return</i>   |                        | -1.1%        | 3.1%        | 2.7%         | --           | 2.8%         |                |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>      |                        | 73           | 13          | 10           | --           | 9            |                |
| <b>SSGA International Alpha Small Cap</b>                    | <b>704,838,396</b>     | <b>20.8%</b> | <b>9.8%</b> | <b>12.5%</b> | <b>10.6%</b> | <b>4.5%</b>  | <b>5/1/07</b>  |
| MSCI World ex USA Small Cap                                  |                        | 20.4%        | 9.6%        | 11.2%        | 8.8%         | 3.6%         |                |
| Lipper International Small/Mid-Cap Core                      |                        | 19.9%        | 7.3%        | 9.1%         | 7.0%         | 3.5%         |                |
| <i>Excess Return</i>   |                        | 0.4%         | 0.2%        | 1.3%         | 1.8%         | 0.9%         |                |
| <i>Pct Rank vs. Lipper International Small/Mid-Cap Core</i>  |                        | 54           | 20          | 14           | 6            | 1            |                |
| <b>Wellington IRE Fund</b>                                   | <b>692,050,410</b>     | <b>19.1%</b> | <b>5.2%</b> | <b>8.6%</b>  | <b>6.8%</b>  | <b>4.8%</b>  | <b>12/1/05</b> |
| MSCI World ex USA  |                        | 18.7%        | 4.6%        | 7.8%         | 6.0%         | 4.6%         |                |
| Lipper International Multi-Cap Core                          |                        | 18.9%        | 5.3%        | 8.2%         | 6.2%         | 4.5%         |                |
| <i>Excess Return</i>   |                        | 0.4%         | 0.6%        | 0.8%         | 0.8%         | 0.2%         |                |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>      |                        | 52           | 54          | 36           | 36           | 36           |                |
| <b>LACM Emerging Markets Fund</b>                            | <b>378,619,437</b>     | <b>22.2%</b> | <b>5.5%</b> | <b>4.3%</b>  | <b>3.8%</b>  | <b>5.22%</b> | <b>12/8/09</b> |
| MSCI Emerging Markets  |                        | 22.5%        | 4.9%        | 4.0%         | 2.5%         | 4.1%         |                |
| Lipper Emerging Markets                                      |                        | 19.7%        | 3.4%        | 3.9%         | 2.4%         | 4.2%         |                |
| <i>Excess Return</i>   |                        | -0.2%        | 0.6%        | 0.3%         | 1.3%         | 1.1%         |                |
| <i>Pct Rank vs. Lipper Emerging Markets</i>                  |                        | 37           | 32          | 47           | 32           | 34           |                |
| <b>Effissimo Capital Management Japan</b>                    | <b>317,647,299</b>     | <b>37.7%</b> | <b>--</b>   | <b>--</b>    | <b>--</b>    | <b>14.1%</b> | <b>12/1/15</b> |
| MSCI Japan   |                        | 14.1%        | --          | --           | --           | 9.1%         |                |
| Lipper International Small/Mid-Cap Value                     |                        | 21.1%        | --          | --           | --           | 15.4%        |                |
| <i>Excess Return</i>   |                        | 23.7%        | --          | --           | --           | 5.0%         |                |
| <i>Pct Rank vs. Lipper International Small/Mid-Cap Value</i> |                        | 1            | --          | --           | --           | 73           |                |
| <b>Wellington Emerging Markets Local Equity</b>              | <b>289,212,203</b>     | <b>24.9%</b> | <b>7.2%</b> | <b>7.8%</b>  | <b>--</b>    | <b>8.8%</b>  | <b>12/1/11</b> |
| MSCI Emerging Markets  |                        | 22.5%        | 4.9%        | 4.0%         | --           | 5.2%         |                |
| Lipper Emerging Markets                                      |                        | 19.7%        | 3.4%        | 3.9%         | --           | 5.0%         |                |
| <i>Excess Return</i>   |                        | 2.5%         | 2.3%        | 3.8%         | --           | 3.5%         |                |
| <i>Pct Rank vs. Lipper Emerging Markets</i>                  |                        | 20           | 13          | 9            | --           | 9            |                |
| <b>Lazard/Wilmington International Equity</b>                | <b>240,300,000</b>     | <b>12.4%</b> | <b>3.9%</b> | <b>--</b>    | <b>--</b>    | <b>2.0%</b>  | <b>6/1/14</b>  |
| MSCI World ex USA  |                        | 18.7%        | 4.6%        | --           | --           | 2.7%         |                |
| Lipper International Large-Cap Core                          |                        | 18.9%        | 5.3%        | --           | --           | 3.5%         |                |
| <i>Excess Return</i>   |                        | -6.3%        | -0.6%       | --           | --           | -0.7%        |                |
| <i>Pct Rank vs. Lipper International Large-Cap Core</i>      |                        | 94           | 83          | --           | --           | 90           |                |
| <b>Martin Currie International Long-term Unconstrained</b>   | <b>229,545,889</b>     | <b>--</b>    | <b>--</b>   | <b>--</b>    | <b>--</b>    | <b>16.9%</b> | <b>2/1/17</b>  |
| MSCI ACWI ex USA   |                        | --           | --          | --           | --           | 15.7%        |                |
| Lipper International Multi-Cap Core                          |                        | --           | --          | --           | --           | 16.4%        |                |
| <i>Excess Return</i>   |                        | --           | --          | --           | --           | 1.2%         |                |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>      |                        | --           | --          | --           | --           | 48           |                |

| <u>Fund Name</u>  | <u>Market Value</u>    | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Inception</u> | <u>Inception Date</u> |
|---|------------------------|---------------|----------------|----------------|----------------|------------------|-----------------------|
| <b>Total International Stock Plus Strategy</b>          | <b>\$4,309,635,740</b> | <b>21.5%</b>  | <b>6.5%</b>    | <b>8.8%</b>    | <b>7.5%</b>    | <b>8.4%</b>      | <b>1/1/09</b>         |
| MSCI ACWI ex USA  |                        | 19.6%         | 4.7%           | 7.0%           | 5.2%           | 8.8%             |                       |
| Lipper International Multi-Cap Core                     |                        | 18.9%         | 5.3%           | 8.2%           | 6.2%           | 8.9%             |                       |
| <i>Excess Return</i>                                    |                        | 1.9%          | 1.8%           | 1.8%           | 2.2%           | -0.5%            |                       |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i> |                        | 20            | 26             | 36             | 22             | 60               |                       |
| <b>Internal Stock Plus</b>                              | <b>2,558,468,760</b>   | <b>23.9%</b>  | <b>9.7%</b>    | <b>12.8%</b>   | <b>9.8%</b>    | <b>9.6%</b>      | <b>1/1/09</b>         |
| MSCI ACWI ex USA  |                        | 19.6%         | 4.7%           | 7.0%           | 5.2%           | 5.2%             |                       |
| Lipper International Multi-Cap Core                     |                        | 18.9%         | 5.3%           | 8.2%           | 6.2%           | 5.9%             |                       |
| <i>Excess Return</i>                                    |                        | 4.3%          | 5.0%           | 5.9%           | 4.6%           | 4.4%             |                       |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i> |                        | 6             | 1              | 1              | 2              | 2                |                       |
| <b>PIMCO StockPLUS International TR Fund</b>            | <b>1,193,820,850</b>   | <b>22.8%</b>  | <b>5.5%</b>    | <b>8.7%</b>    | <b>--</b>      | <b>7.5%</b>      | <b>10/1/10</b>        |
| MSCI World ex USA                                       |                        | 18.7%         | 4.6%           | 7.8%           | --             | 6.0%             |                       |
| Lipper International Large-Cap Core                     |                        | 18.9%         | 5.3%           | 8.2%           | --             | 6.2%             |                       |
| <i>Excess Return</i>                                    |                        | 4.1%          | 1.0%           | 0.9%           | --             | 1.5%             |                       |
| <i>Pct Rank vs. Lipper International Large-Cap Core</i> |                        | 10            | 45             | 35             | --             | 17               |                       |
| <b>PIMCO Emerging Markets StockPLUS AR Fund</b>         | <b>557,346,138</b>     | <b>26.1%</b>  | <b>--</b>      | <b>--</b>      | <b>--</b>      | <b>8.5%</b>      | <b>4/1/15</b>         |
| MSCI Emerging Markets                                   |                        | 22.5%         | --             | --             | --             | 6.9%             |                       |
| Lipper Emerging Markets                                 |                        | 19.7%         | --             | --             | --             | 6.2%             |                       |
| <i>Excess Return</i>                                    |                        | 3.7%          | --             | --             | --             | 1.6%             |                       |
| <i>Pct Rank vs. Lipper Emerging Markets</i>             |                        | 15            | --             | --             | --             | 29               |                       |

|   |                        |              |              |              |              |              |               |
|---|------------------------|--------------|--------------|--------------|--------------|--------------|---------------|
| <b>Total International Index Strategy</b>                   | <b>\$3,485,753,160</b> | <b>19.9%</b> | <b>6.5%</b>  | <b>7.6%</b>  | <b>5.7%</b>  | <b>8.9%</b>  | <b>7/1/09</b> |
| MSCI ACWI ex USA  |                        | 19.6%        | 4.7%         | 7.0%         | 5.2%         | 7.7%         |               |
| Lipper International Multi-Cap Core                         |                        | 18.9%        | 5.3%         | 8.2%         | 6.2%         | 8.2%         |               |
| <i>Excess Return</i>  |                        | 0.3%         | 1.8%         | 0.6%         | 0.5%         | 1.2%         |               |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>     |                        | 35           | 24           | 71           | 75           | 22           |               |
| <b>SSGA PMI Fund</b>  | <b>1,203,261,644</b>   | <b>19.1%</b> | <b>5.0%</b>  | <b>7.9%</b>  | <b>6.3%</b>  | <b>6.0%</b>  | <b>4/1/10</b> |
| MSCI World ex USA   |                        | 18.7%        | 4.6%         | 7.8%         | 6.0%         | 5.7%         |               |
| Lipper International Large-Cap Core                         |                        | 18.9%        | 5.3%         | 8.2%         | 6.2%         | 5.9%         |               |
| <i>Excess Return</i>  |                        | 0.3%         | 0.5%         | 0.1%         | 0.3%         | 0.4%         |               |
| <i>Pct Rank vs. Lipper International Large-Cap Core</i>     |                        | 53           | 59           | 66           | 48           | 48           |               |
| <b>SSGA EMI Fund</b>  | <b>1,005,198,367</b>   | <b>21.8%</b> | <b>11.0%</b> | <b>12.9%</b> | <b>10.1%</b> | <b>10.1%</b> | <b>4/1/10</b> |
| MSCI EAFE SMID Cap  |                        | 20.6%        | 9.7%         | 11.7%        | 8.9%         | 8.8%         |               |
| Lipper International Small/Mid-Cap Core                     |                        | 19.9%        | 7.3%         | 9.1%         | 7.3%         | 7.3%         |               |
| <i>Excess Return</i>  |                        | 1.2%         | 1.3%         | 1.2%         | 1.2%         | 1.3%         |               |
| <i>Pct Rank vs. Lipper International Small/Mid-Cap Core</i> |                        | 29           | 4            | 10           | 6            | 6            |               |
| <b>Vanguard Emerging Market Fund</b>                        | <b>715,886,410</b>     | <b>18.9%</b> | <b>4.1%</b>  | <b>3.7%</b>  | <b>2.2%</b>  | <b>6.5%</b>  | <b>7/1/09</b> |
| MSCI Emerging Markets                                       |                        | 22.5%        | 4.9%         | 4.0%         | 2.5%         | 6.9%         |               |
| Lipper Emerging Markets                                     |                        | 19.7%        | 3.4%         | 3.9%         | 2.4%         | 7.1%         |               |
| <i>Excess Return</i>  |                        | -3.5%        | -0.8%        | -0.3%        | -0.4%        | -0.4%        |               |
| <i>Pct Rank vs. Lipper Emerging Markets</i>                 |                        | 62           | 58           | 60           | 58           | 63           |               |
| <b>Vanguard Developed Markets Index Fund</b>                | <b>561,416,760</b>     | <b>19.5%</b> | <b>5.9%</b>  | <b>9.1%</b>  | <b>7.0%</b>  | <b>6.32%</b> | <b>4/1/10</b> |
| MSCI World ex USA   |                        | 18.7%        | 4.6%         | 7.8%         | 6.0%         | 5.7%         |               |
| Lipper International Multi-Cap Core                         |                        | 18.9%        | 5.3%         | 8.2%         | 6.2%         | 5.9%         |               |
| <i>Excess Return</i>  |                        | 0.8%         | 1.3%         | 1.3%         | 1.0%         | 0.7%         |               |
| <i>Pct Rank vs. Lipper International Multi-Cap Core</i>     |                        | 46           | 35           | 30           | 37           | 38           |               |



State of Michigan Retirement Systems

# PRIVATE EQUITY REVIEW

Investment Advisory Committee Meeting

December 12, 2017



Peter A. Woodford  
Senior Investment Manager  
Private Equity Division

## EXECUTIVE SUMMARY

### Performance

| <b>MPSERS Plan</b>         | <b>1-Year</b> | <b>3-Years</b> | <b>5-Years</b> | <b>7-Years</b> | <b>10-Years</b> |
|----------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns         | 16.4%         | 10.4%          | 14.2%          | 14.8%          | 9.9%            |
| Benchmark Return           | 21.3%         | 12.8%          | 17.8%          | 18.5%          | 11.4%           |
| Peer Median Return         | 12.5%         | 8.2%           | 10.3%          | 10.7%          | 7.1%            |
| Percentile Rank vs. Peers* | 18            | 19             | 13             | 10             | 9               |

\*State Street Universe greater than \$1 billion

- Private Equity returns have been strong relative to peer median returns, ranking in the top 9% of peers over the past ten years.
- It is not unusual for private equity returns to lag the public market benchmark return in up markets and lead the public market benchmark in down markets. The past eight years have been no exception due to the third longest expansion in U.S. history. Over the past ten years, a full market cycle, the Private Equity Division has delivered 2.5% annualized excess returns over the S&P 500 (ten year S&P 500 return 7.4%), but underperformed the benchmark by 1.5%.
- For the twelve months ending September 30, 2017, the Private Equity Division returned approximately \$233 million, net of contributions, to the pension fund. Although the pace of distributions continues to slow, distribution activity should remain healthy as long as the economic expansion continues. General Partners are incentivized to exit investments at current valuations.
- Commitments closed during the quarter include:
  - \$100 million to Insight Venture Partners X, LP, a growth equity fund.
  - \$75 million to Flagship Pioneering VI, a venture capital fund.
  - \$50 million to Apax Digital Fund, LP, a lower middle-market buyout fund.
  - \$20 million to Science Ventures Fund II, LP, a venture capital fund.

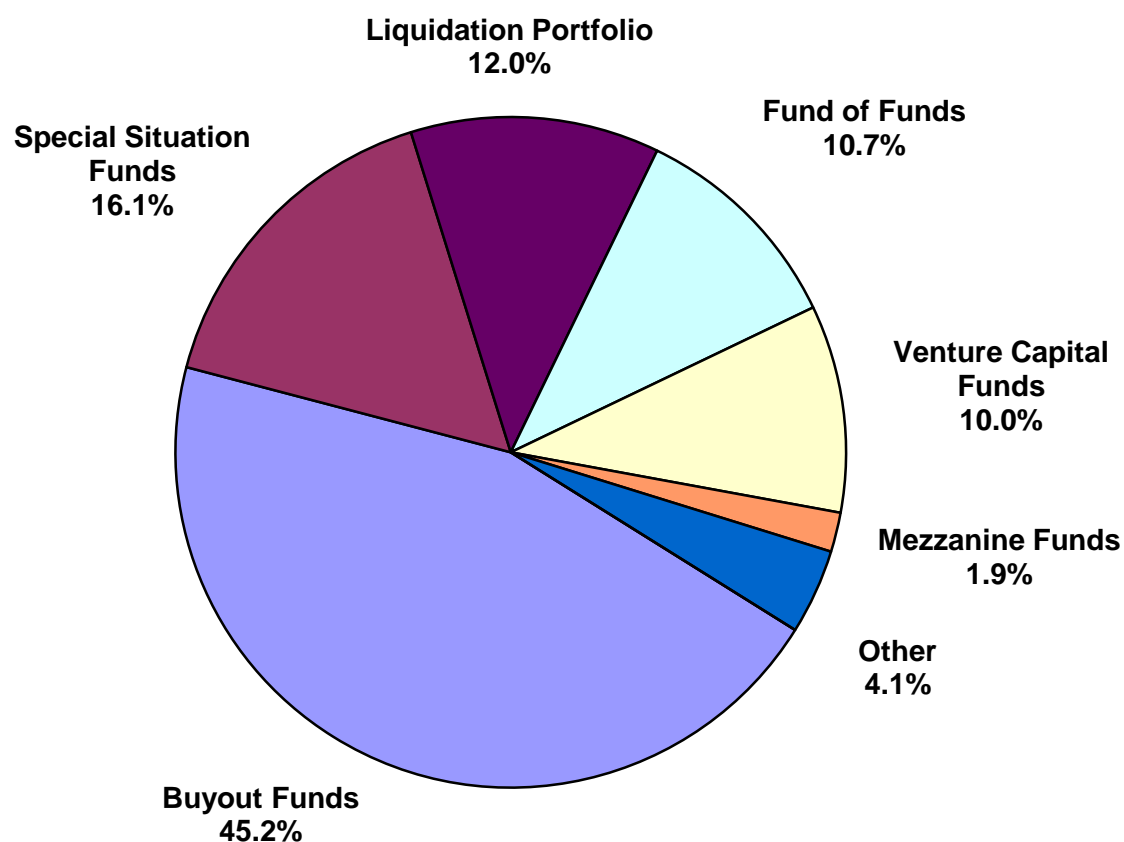
### Strategy Update

The strategy for the next twelve months will focus primarily on existing sponsors raising successor funds. This will be a combination of buyout funds, venture capital funds and growth equity funds seeking new commitments. The Private Equity Division has also tilted slightly toward the middle market in an attempt to diversify its exposure to mega funds. Co-investments will play an increasingly important role in both averaging down costs and targeting specific investments with attractive risk/return characteristics.

# SMRS

## Private Equity

### 9/30/17



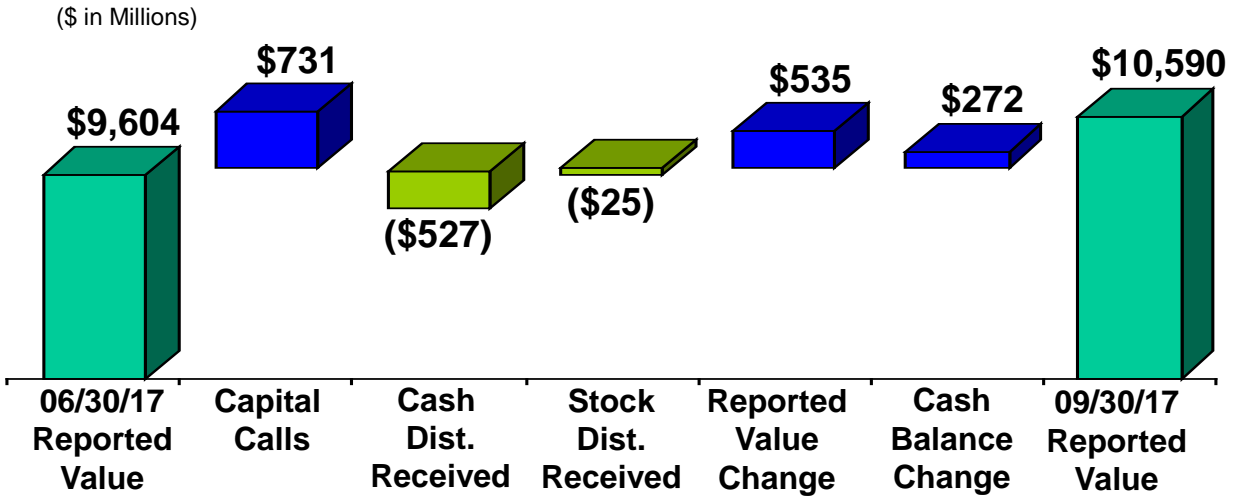
| <b>Market Value in Millions</b> |                        |                      |                       |                      |
|---------------------------------|------------------------|----------------------|-----------------------|----------------------|
|                                 | <u>9/30/17</u>         |                      | <u>9/30/16</u>        |                      |
| Buyout Funds                    | \$4,791                | 45.2%                | \$4,356               | 46.1%                |
| Special Situation Funds         | 1,703                  | 16.1%                | 1,593                 | 16.8%                |
| Liquidation Portfolio           | 1,274                  | 12.0%                | 1,466                 | 15.5%                |
| Fund of Funds                   | 1,131                  | 10.7%                | 654                   | 6.9%                 |
| Venture Capital Funds           | 1,061                  | 10.0%                | 1,061                 | 11.2%                |
| Mezzanine Funds                 | 198                    | 1.9%                 | 168                   | 1.8%                 |
| Other                           | 432                    | 4.1%                 | 159                   | 1.7%                 |
| <b>Total</b>                    | <b><u>\$10,590</u></b> | <b><u>100.0%</u></b> | <b><u>\$9,457</u></b> | <b><u>100.0%</u></b> |

# SMRS

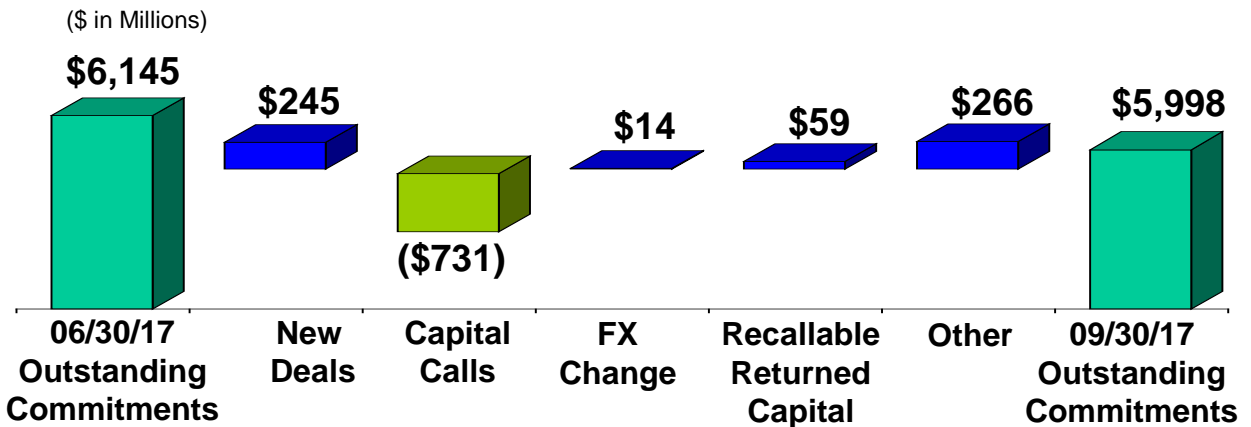
## Private Equity

### 9/30/17

#### Invested Commitments



#### Outstanding Commitments

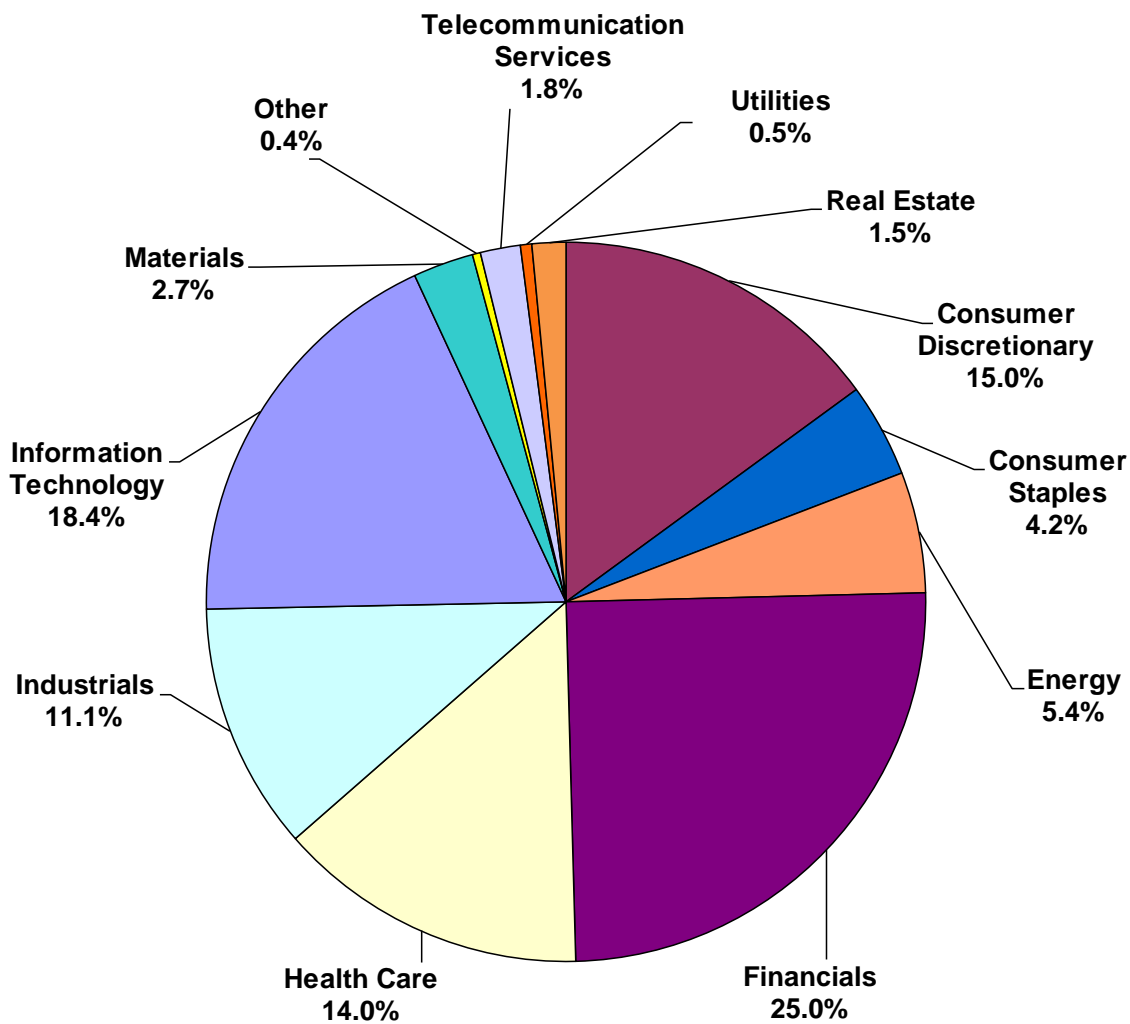


# SMRS

## Private Equity

9/30/17

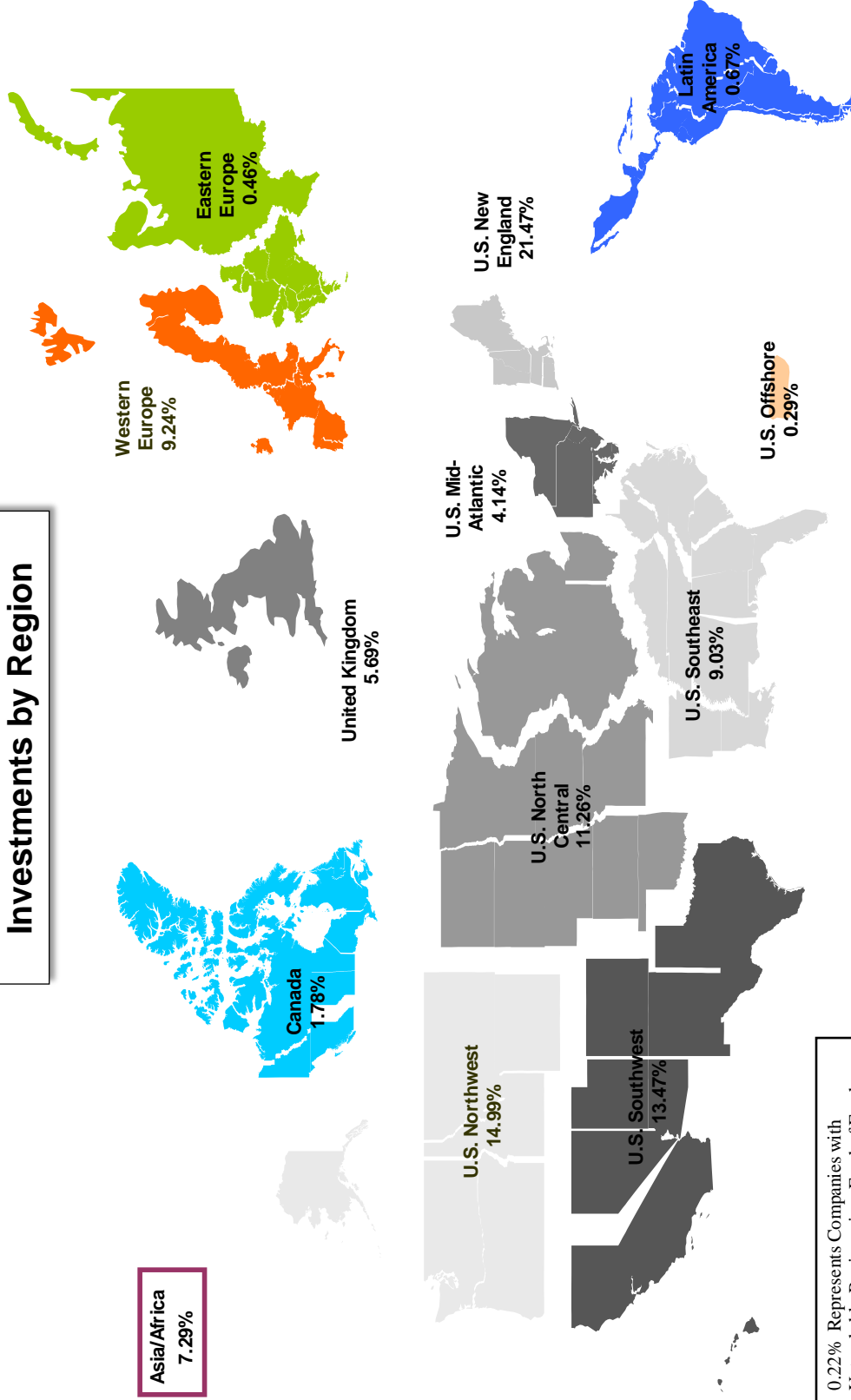
### Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 9/30/17 and are subject to change.

# SMRS Private Equity 9/30/17

## Investments by Region



0.22% Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 76%, Europe 15%, Asia 7%, Other 2%

# SMRS

## Private Equity

### 9/30/17

#### Portfolio by Vintage Year

(\$ in Millions)

| <u>Asset Vintage</u>        | <u>Reported Value</u>   | <u>Outstanding Commitment</u> | <u>Total Exposure</u>   |
|-----------------------------|-------------------------|-------------------------------|-------------------------|
| 1986-98                     | \$ 9                    | \$ 8                          | \$ 17                   |
| 1999                        | 18                      | 10                            | 28                      |
| 2000                        | 67                      | 26                            | 93                      |
| 2001                        | 140                     | 62                            | 202                     |
| 2002                        | 41                      | 9                             | 50                      |
| 2003                        | 13                      | 19                            | 32                      |
| 2004                        | 116                     | 47                            | 163                     |
| 2005                        | 307                     | 24                            | 331                     |
| 2006*                       | 775                     | 256                           | 1,031                   |
| 2007                        | 743                     | 143                           | 886                     |
| 2008                        | 917                     | 166                           | 1,083                   |
| 2009                        | 24                      | 1                             | 25                      |
| 2010                        | 312                     | 13                            | 325                     |
| 2011                        | 728                     | 109                           | 837                     |
| 2012                        | 1,323                   | 195                           | 1,518                   |
| 2013                        | 466                     | 230                           | 696                     |
| 2014                        | 1,036                   | 524                           | 1,560                   |
| 2015                        | 2,621                   | 1,557                         | 4,178                   |
| 2016                        | 480                     | 1,732                         | 2,212                   |
| 2017                        | 21                      | 867                           | 888                     |
| Income Accruals             | 1                       | 0                             | 1                       |
| Cash                        | 431                     | 0                             | 431                     |
| Act. Small Cap - Stock Dist | 1                       | 0                             | 1                       |
| <b>Total</b>                | <b><u>\$ 10,590</u></b> | <b><u>\$ 5,998</u></b>        | <b><u>\$ 16,588</u></b> |

\*Liquidation portfolio is 2006 vintage

#### FX Exposure

(\$ in Millions)

|                  | <u>Reported Value</u> | <u>Outstanding Commitment</u> | <u>Total Exposure</u> | <u>Total (USD)</u> |
|------------------|-----------------------|-------------------------------|-----------------------|--------------------|
| Euro (\$1.18/ €) | € 371                 | € 656                         | € 1,027               | \$1,214            |

# SMRS

## Private Equity

### 9/30/17

#### Top 10 Sponsors

(\$ in Millions)

| <u>Asset Type</u>            | <u>Reported Value</u>  | <u>Outstanding Commitment</u> | <u>Total</u>           |
|------------------------------|------------------------|-------------------------------|------------------------|
| HarbourVest Partners         | \$ 1,854               | \$ 372                        | \$ 2,226               |
| KKR                          | 545                    | 399                           | 944                    |
| Grosvenor Capital Management | 636                    | 219                           | 855                    |
| Blackstone Capital Partners  | 406                    | 443                           | 849                    |
| Warburg Pincus Capital       | 512                    | 221                           | 733                    |
| Advent International         | 450                    | 174                           | 624                    |
| Leonard Green & Partners     | 348                    | 207                           | 555                    |
| The Carlyle Group            | 357                    | 161                           | 518                    |
| TPG                          | 288                    | 141                           | 429                    |
| Berkshire Partners           | 261                    | 167                           | 428                    |
| <b>Top 10 Total Value</b>    | <b><u>\$ 5,657</u></b> | <b><u>\$ 2,504</u></b>        | <b><u>\$ 8,161</u></b> |

#### Cash Weighted Rates of Return\*

| <u>(Net IRR)</u>   | <u>Current Qtr.</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>10-Years</u> |
|--------------------|---------------------|---------------|----------------|----------------|-----------------|
| Buyout             | 0.3%                | 13.7%         | 11.8%          | 14.7%          | 9.8%            |
| Fund of Funds      | 0.0%                | 8.5%          | 9.6%           | 11.1%          | 7.4%            |
| Mezzanine          | -0.4%               | 10.0%         | 5.2%           | 9.1%           | 7.6%            |
| Special Situations | -0.3%               | 11.1%         | 7.6%           | 10.0%          | 8.2%            |
| Venture Capital    | 0.0%                | 1.9%          | 8.3%           | 13.4%          | 14.7%           |

\*These numbers are based on most recent available General Partner reported data; primarily 9/30/17 and are subject to change.



# SMRS

## Private Equity

### 9/30/17

#### Net Market Values by Ownership Entity

|  | Adjusted<br>Reported Value | Unfunded<br>Commitment |
|--|----------------------------|------------------------|
| Accel Europe I, LP                               | \$ 9,233,020               | \$ 1                   |
| Accel Europe II                                  | 15,789,178                 | 3,300,000              |
| Accel Growth Fund II, LP                         | 12,314,199                 | 540,000                |
| Accel Growth Fund III, LP                        | 12,032,229                 | 1,540,000              |
| Accel Growth Fund IV, LP                         | 7,493,075                  | 14,300,000             |
| Accel IX, LP                                     | 4,985,145                  | 3,000,000              |
| Accel Leaders Fund, LP                           | 2,414,239                  | 3,080,000              |
| Accel London V, LP                               | 2,476,386                  | 9,240,000              |
| Accel VI-S                                       | 2,570,639                  | 652,611                |
| Accel VI, LP                                     | 1,384,062                  | -                      |
| Accel VII, LP                                    | 254,201                    | 5,000,000              |
| Accel VIII, LP                                   | 4,099,700                  | 4,782,499              |
| Accel X, LP                                      | 17,342,910                 | 400,000                |
| Accel XI, LP                                     | 6,808,477                  | 1,680,000              |
| Accel XII, LP                                    | 5,807,258                  | 1,925,000              |
| Accel XIII, LP                                   | 2,124,984                  | 7,700,000              |
| Advent Global Private Equity III                 | 1,116,516                  | 20                     |
| Advent Global Private Equity V                   | 10,776,347                 | 8,700,000              |
| Advent International GPE VI-A, LP                | 107,213,324                | -                      |
| Advent International GPE VII-B, LP               | 216,082,539                | 20,000,000             |
| Advent International GPE VIII-B, LP              | 105,104,416                | 123,412,500            |
| Advent Latin American Private Equity Fund VI, LP | 9,386,725                  | 22,347,500             |
| Affinity Asia Pacific Fund II, LP                | -                          | 5,288,237              |
| Affinity Asia Pacific Fund III, LP               | 54,489,950                 | 11,784,109             |
| Affinity Asia Pacific Fund IV, LP                | 80,946,475                 | 66,912,850             |
| ** <b>Apax Digital, LP</b>                       | -                          | 50,000,000             |
| Apax Europe Fund VI                              | 21,910,921                 | 2,500,114              |
| Apax Europe V, LP                                | 210,155                    | -                      |
| Apax Europe VII, LP                              | 44,617,495                 | 2,612,374              |
| Apax IX, LP                                      | 24,124,300                 | 124,200,000            |
| Apax US VII                                      | 12,979,523                 | 417,509                |
| Apax VIII - B, LP                                | 105,962,896                | 9,066,118              |
| Apollo Investment Fund IX, LP                    | -                          | 100,000,000            |
| Apollo Investment Fund VIII, LP                  | 72,267,112                 | 36,793,682             |
| Arboretum Ventures II                            | 2,134,744                  | -                      |
| Arboretum Ventures III, LP                       | 12,558,084                 | 1,170,000              |
| Arboretum Ventures IV, LP                        | 7,166,950                  | 20,790,000             |
| Ares Corporate Opportunities Fund II             | 8,181,560                  | 11,423,773             |
| Ares Corporate Opportunities Fund III, LP        | 100,853,259                | 9,041,168              |
| Ares Corporate Opportunities Fund IV, LP         | 84,513,768                 | 24,058,961             |

|   | <u>Adjusted<br/>Reported Value</u> | <u>Unfunded<br/>Commitment</u> |
|---|------------------------------------|--------------------------------|
| AXA ASF Miller Co-Investment            | 13,853,296                         | 23,121,187                     |
| Axiom Asia IV, LP                       | 9,716,882                          | 39,997,811                     |
| Axiom Asia Private Capital Fund III, LP | 34,247,786                         | 10,989,264                     |
| BC European Capital IX                  | 83,156,895                         | 4,392,846                      |
| BC European Capital VII, LP             | 574,868                            | -                              |
| BC European Capital VIII, LP            | 17,992,357                         | 9,244,804                      |
| Berkshire Fund IX, LP                   | 23,772,481                         | 150,715,053                    |
| Berkshire Fund VI, LP                   | 45,269,442                         | 7,554,903                      |
| Berkshire Fund VII, LP                  | 73,704,467                         | 2,450,793                      |
| Berkshire Fund VIII, LP                 | 118,040,284                        | 6,072,323                      |
| Blackstone Capital Partners IV          | 18,777,785                         | 4,792,430                      |
| Blackstone Capital Partners V           | 27,636,554                         | 15,960,484                     |
| Blackstone Capital Partners V-S         | 3,102,130                          | 712,476                        |
| Blackstone Capital Partners VI, LP      | 272,567,622                        | 51,968,712                     |
| Blackstone Capital Partners VII, LP     | 35,376,948                         | 235,884,150                    |
| Bridgepoint Europe IV                   | 38,043,375                         | 6,312,112                      |
| Carlyle Europe Partners II              | 1,298,819                          | 4,371,712                      |
| Carlyle Europe Partners III             | 27,564,717                         | 6,274,390                      |
| Carlyle Europe Partners IV, LP          | 69,452,932                         | 48,914,671                     |
| Carlyle Partners IV, LP                 | 5,346,720                          | 16,009,296                     |
| Carlyle Partners V, LP                  | 102,364,432                        | 54,261,025                     |
| Carlyle Partners VI, LP                 | 151,300,420                        | 31,007,666                     |
| Castle Harlan Partners IV               | 6,930,777                          | 5,286,319                      |
| Castle Harlan Partners V                | 44,734,016                         | 29,635,422                     |
| CCMP Capital Investors II               | 20,693,610                         | 10,349,690                     |
| CCMP Capital Investors III, LP          | 47,747,814                         | 10,498,610                     |
| Centerbridge Capital Partners III, LP   | 37,147,775                         | 43,203,530                     |
| Cerberus SMRS Partners, LP              | 77,331,940                         | 23,304,657                     |
| CM Liquidity Fund, LP                   | -                                  | 25,000,000                     |
| Coller International Partners V, LP     | 27,457,700                         | 43,600,000                     |
| Coller International Partners VI, LP    | 54,547,143                         | 29,723,267                     |
| Coller International Partners VII, LP   | 34,103,649                         | 121,089,041                    |
| Crescent Mezzanine Partners VI, LP      | 41,140,447                         | 12,002,112                     |
| Crescent Mezzanine Partners VII         | 6,925,653                          | 145,485,470                    |
| CVC Capital Partners VII, LP            | -                                  | 177,329,993                    |
| DLJ Investment Partners II              | 165,445                            | -                              |
| DLJ Investment Partners III             | 3,637,364                          | 44,559,251                     |
| Dover Street IX, LP                     | 18,663,596                         | 84,000,000                     |
| EDF Ventures III                        | 1,138,087                          | -                              |
| EnCap Energy Capital Fund X, LP         | 23,774,275                         | 20,674,835                     |
| Entertainment IP Fund, LP               | 5,028,710                          | 44,015,694                     |
| FIMI Opportunity 6, LP                  | 5,462,000                          | 44,454,546                     |
| FirstMark Capital I, LP                 | 79,218,868                         | 196,596                        |
| FirstMark Capital IV, LP                | 2,239,036                          | 32,550,000                     |
| FirstMark Capital OF I, LP              | 18,390,690                         | 2,000,000                      |
| FirstMark Capital OF II, LP             | -                                  | 35,000,000                     |
| FirstMark Capital P2, LP                | 168,121,041                        | -                              |
| ** <b>Flagship Pioneering VI</b>        | -                                  | 75,000,000                     |

|  | <u>Adjusted<br/>Reported Value</u> | <u>Unfunded<br/>Commitment</u> |
|--|------------------------------------|--------------------------------|
| Flagship Ventures Fund 2004                                  | 9,186,750                          | -                              |
| Flagship Ventures Fund 2007, LP                              | 19,104,079                         | -                              |
| Flagship Ventures Fund IV, LP                                | 85,058,062                         | -                              |
| Flagship Ventures Fund V                                     | 44,315,223                         | 9,275,000                      |
| Flagship Ventures Opportunities Fund I, LP                   | 8,366,988                          | 41,500,000                     |
| Fox Paine Capital Fund II, LP                                | 30,587,981                         | 15,382,699                     |
| FS Equity Partners VII, LP                                   | 67,978,186                         | 36,083,430                     |
| G-IV Acquisition Holdings, LLC                               | 17,921,776                         | -                              |
| GCM Grosvenor Fund Investment Program I, LP                  | 13,247,178                         | 1,383,089                      |
| GCM Grosvenor Fund Investment Program II, LP                 | 39,795,589                         | 15,773,942                     |
| GCM Grosvenor Fund Investment Program III - 2004             | 60,542,441                         | 4,835,931                      |
| GCM Grosvenor Fund Investment Program III - 2006             | 72,884,929                         | 7,447,588                      |
| GCM Grosvenor Fund Investment Program V, LP                  | 91,837,176                         | 11,094,611                     |
| GCM Grosvenor Fund Investment Program VI, LP                 | 20,871,814                         | 13,642,764                     |
| GCM Grosvenor Fund Investment Program VIII, LP               | 25,579,694                         | 76,420,833                     |
| GCM Grosvenor SeasPriFIP, LP (PIS06-10)                      | 79,527,461                         | 23,031,531                     |
| GCM Grosvenor SeasPriFIP, LP (PIS14)                         | 188,356,394                        | 51,642,208                     |
| GCM Grosvenor SeasPriFIP, LP (Seed)                          | 43,677,777                         | 13,824,219                     |
| Genstar Capital Partners VIII, LP                            | 219,389                            | 49,463,226                     |
| Genstar VIII Opportunities Fund I, LP                        | -                                  | 50,000,000                     |
| Green Equity Investors IV                                    | 6,502,953                          | 1,136,036                      |
| Green Equity Investors V                                     | 180,676,916                        | 25,966,435                     |
| Green Equity Investors VI, LP                                | 131,364,336                        | 10,519,889                     |
| Green Equity Investors VII, LP                               | 29,027,309                         | 169,857,913                    |
| GSO Capital Opportunities Fund II, LP                        | 20,973,364                         | 11,479,647                     |
| GSO Capital Opportunities Fund III, LP                       | 24,377,292                         | 75,825,804                     |
| GSO COF III Co-Investment Fund, LP                           | 3,551,389                          | 46,448,611                     |
| HarbourVest Dover Street VIII, LP                            | 43,914,100                         | 9,112,500                      |
| HarbourVest Int'l III Direct                                 | -                                  | 1,000,000                      |
| HarbourVest Int'l III Partnership                            | 333,516                            | 1,200,000                      |
| Harbourvest Partners Co-Investment Fund IV, LP               | 30,848,211                         | 72,500,000                     |
| HarbourVest Partners Mezzanine Income Fund                   | 42,178,798                         | 60,810,000                     |
| HarbourVest V Partnership                                    | 214,316                            | 300,000                        |
| HarbourVest VI - Direct Fund, LP                             | 3,438,153                          | 750,000                        |
| HarbourVest VI Partnership                                   | 7,385,926                          | 2,000,000                      |
| Harvest Partners VII, LP                                     | 20,593,325                         | 52,154,048                     |
| HPS Mezzanine Partners III, LP                               | 15,995,814                         | 34,192,624                     |
| Insight Venture Partners Growth-Buyout Coinvestment Fund, LP | 47,023,697                         | 13,000,000                     |
| Insight Venture Partners IX, LP                              | 82,595,854                         | 28,500,000                     |
| <b>** Insight Venture Partners X, LP</b>                     | -                                  | 100,000,000                    |
| Kelso Investment Associates IX, LP                           | 61,478,898                         | 54,236,827                     |
| Kelso Investment Associates VII                              | 2,432,309                          | 4,970,176                      |
| Kelso Investment Associates VIII                             | 87,172,139                         | 22,759,751                     |
| Khosla Ventures III, LP                                      | 14,691,839                         | 1,250,000                      |
| Khosla Ventures IV, LP                                       | 40,274,157                         | 950,000                        |
| Khosla Ventures V, LP  | 26,500,063                         | 19,150,000                     |
| KKR 2006 Fund, LP  | 110,421,163                        | 5,105,864                      |
| KKR Americas Fund XII, LP                                    | -                                  | 200,000,000                    |

|   | <b>Adjusted<br/>Reported Value</b> | <b>Unfunded<br/>Commitment</b> |
|---|------------------------------------|--------------------------------|
| KKR Asian   | 18,682,231                         | -                              |
| KKR Asian Fund II, LP                             | 56,276,795                         | 8,340,173                      |
| KKR Asian Fund III                                | -                                  | 100,000,000                    |
| KKR China Growth Fund                             | 39,102,654                         | -                              |
| KKR E2 Investors (Annex) Fund                     | 143,290                            | -                              |
| KKR European Fund II                              | 1,750,523                          | -                              |
| KKR European Fund III                             | 66,130,514                         | 22,854,187                     |
| KKR European Fund IV, LP                          | 83,299,466                         | 50,191,837                     |
| KKR European Fund, LP                             | -                                  | -                              |
| KKR Millennium Fund                               | 25,575,495                         | -                              |
| KKR North America Fund XI, LP                     | 143,939,673                        | 11,853,509                     |
| Lightspeed Venture Partners VI                    | 415,156                            | -                              |
| Lightspeed Venture Partners VII, LP               | 34,469,035                         | -                              |
| Lion Capital Fund I (HME II)                      | 97,975                             | 11,990,295                     |
| Lion Capital Fund II                              | 10,229,904                         | 4,797,372                      |
| Lion Capital Fund III, LP                         | 71,419,961                         | 11,497,983                     |
| MatlinPatterson Global Opportunities Partners II  | 2,167,641                          | -                              |
| MatlinPatterson Global Opportunities Partners III | 59,531,296                         | 3,436,976                      |
| Menlo Ventures IX, LP                             | 4,209,194                          | -                              |
| Menlo Ventures X, LP                              | 45,810,483                         | -                              |
| Menlo Ventures XI, LP                             | 77,565,503                         | 1,000,000                      |
| Menlo Ventures XIV, LP                            | -                                  | 7,000,000                      |
| MeriTech Capital Partners II, LP                  | 2,546,816                          | 1,850,000                      |
| Meritech Capital Partners III, LP                 | 10,710,479                         | -                              |
| Meritech Capital Partners IV, LP                  | 17,718,333                         | 900,000                        |
| Meritech Capital Partners V, LP                   | 14,062,732                         | 5,350,000                      |
| Michigan Growth Capital Partners II, LP           | 177,246,137                        | 18,239,212                     |
| Michigan Growth Capital Partners III, LP          | 12,279,827                         | 87,451,304                     |
| Michigan Growth Capital Partners, LP              | 77,975,568                         | 14,803,649                     |
| Midtown Fund III, LP                              | -                                  | -                              |
| Midtown II Liquidating Trust                      | 2,337,231                          | -                              |
| New Leaf Growth Fund I, LP                        | 153,743,977                        | -                              |
| New Leaf Ventures II, LP                          | 17,342,624                         | -                              |
| New Leaf Ventures III, LP                         | 17,717,335                         | 16,875,000                     |
| Nordic Capital VI, LP                             | 4,268,093                          | -                              |
| Nordic Capital VII                                | 46,079,591                         | 3,254,762                      |
| Nordic Capital VIII, LP (Alpha)                   | 45,644,005                         | 16,883,687                     |
| Oak Investment Partners X, LP                     | 6,908,099                          | -                              |
| Oak Investments Partners IX, LP                   | 817,559                            | -                              |
| Oaktree Opportunities Fund X, LP                  | 14,872,078                         | 18,000,000                     |
| Oaktree Opportunities Fund Xb, LP                 | -                                  | 70,000,000                     |
| OCM Opportunities Fund IX, LP                     | 62,580,657                         | -                              |
| OCM Opportunities Fund VII (B), LP                | 3,753,501                          | 5,000,000                      |
| OCM Opportunities Fund VII, LP                    | 4,519,858                          | -                              |
| OCM Opportunities Fund VIII B, LP                 | 20,824,664                         | -                              |
| OCM Opportunities Fund VIII, LP                   | 8,788,335                          | -                              |
| OCM Principal Opportunities Fund IV               | 6,735,104                          | 5,002,377                      |
| Ocqueoc Holdings, LLC                             | 14,895,357                         | 50,000,000                     |

|   | <u>Adjusted<br/>Reported Value</u> | <u>Unfunded<br/>Commitment</u> |
|---|------------------------------------|--------------------------------|
| One Liberty Fund III                                    | 2,542,165                          | -                              |
| One Liberty Fund IV                                     | 1,239,830                          | -                              |
| One Liberty Ventures 2000                               | 5,610,889                          | -                              |
| Parthenon Investors II                                  | 1,666,422                          | 3,186,779                      |
| Parthenon Investors III                                 | 36,967,846                         | 2,732,182                      |
| Parthenon Investors IV, LP                              | 47,749,344                         | 3,441,676                      |
| Peninsula Capital Fund IV                               | 5,962,633                          | 2,201,026                      |
| Peninsula Fund VI, LP                                   | 19,729,180                         | 22,424,589                     |
| Public Pension Capital, LLC                             | 40,983,213                         | 63,706,139                     |
| Questor Partners Fund II                                | 264,732                            | 5,816,186                      |
| Rhone Partners V, LP                                    | 27,576,888                         | 88,800,247                     |
| Riverside Capital Appreciation Fund VI, LP              | 64,171,693                         | 20,652,698                     |
| Riverside Micro Cap Fund I, LP                          | 29,197,106                         | 5,782,975                      |
| Riverside Micro-Cap Fund II, LP                         | 47,703,477                         | 2,735,834                      |
| Riverside Micro-Cap Fund III, LP                        | 57,948,433                         | 4,483,406                      |
| Riverside Micro-Cap Fund IV                             | 20,953,147                         | 29,983,548                     |
| <b>** Science Ventures Fund II, LP</b>                  | -                                  | 20,000,000                     |
| Shamrock Growth Capital Fund IV, LP                     | 1,648,899                          | 46,515,466                     |
| Silver Lake Partners II                                 | 4,472,654                          | 3,531,586                      |
| Silver Lake Partners III                                | 51,087,219                         | 13,199,137                     |
| Silver Lake Partners IV, LP                             | 47,746,830                         | 11,174,353                     |
| Silver Lake Partners V, LP                              | -                                  | 67,500,000                     |
| SM/TCP, LP  | 29,414,926                         | 12,288,065                     |
| SMRS - TOPE, LLC  | 744,767,336                        | -                              |
| SMRS-NCRP, LLC  | 961,917,883                        | 139,930,389                    |
| TCW Shared Op Fund III                                  | 104,787                            | -                              |
| TCW/Crescent Mezzanine Partners III Secondary           | 266,097                            | -                              |
| TCW/Crescent Mezzanine Partners III, LP                 | 2,434,351                          | 29,733,856                     |
| TCW/Crescent Mezzanine Partners IV, LP                  | 940,825                            | 13,660,773                     |
| TCW/Crescent Mezzanine Partners IVB Secondary           | 551,999                            | -                              |
| TCW/Crescent Mezzanine Partners V, LLC                  | 22,265,298                         | 15,382,013                     |
| TCW/Crescent Mezzanine Partners VC Secondary            | 6,555,026                          | -                              |
| The Huron Fund III, LP                                  | 10,168,614                         | 4,542,756                      |
| The Huron Fund IV, LP                                   | 29,531,923                         | 4,544,456                      |
| The Huron Fund V, LP                                    | -                                  | 35,000,000                     |
| The Shansby Group 4                                     | 31,237                             | 521,018                        |
| The Shansby Group 5 (TSG5)                              | 11,028,023                         | 4,905,727                      |
| Thoma Bravo Fund XII, LP                                | 60,816,497                         | 89,251,017                     |
| TPG IV (Texas Pacific Group IV)                         | 5,019,453                          | 211,725                        |
| TPG Partners III, LP                                    | 3,433,790                          | 2,087,002                      |
| TPG Partners VI, LP                                     | 139,335,764                        | 16,905,811                     |
| TPG Partners, VII, LP                                   | 62,499,857                         | 95,504,703                     |
| TPG V (Texas Pacific Group V)                           | 78,111,987                         | 26,611,195                     |
| Trilantic Capital Partners V (North America) Fund A, LP | 36,483,803                         | 10,238,453                     |
| TSG6, LP  | 94,275,205                         | 30,776,741                     |
| TSG7 A, LP  | 40,343,538                         | 82,418,497                     |
| Turnbridge Capital Partners I, LP                       | 48,209,716                         | 39,683,894                     |
| Veritas Capital Fund V, LP                              | 81,862,150                         | 3,364,130                      |

|   | <b>Adjusted<br/>Reported Value</b> | <b>Unfunded<br/>Commitment</b> |
|---|------------------------------------|--------------------------------|
| Veritas Capital Fund VI, LP                     | 4,052,611                          | 95,506,205                     |
| Veritas V Co-Investors, LP                      | 12,247,889                         | 15,000,000                     |
| Vista Equity Endeavor Fund I, LP                | 13,389,192                         | 36,211,291                     |
| Vista Equity Partners Fund V, LP                | 49,389,290                         | 10,878,928                     |
| Vista Equity Partners Fund VI, LP               | 42,496,959                         | 31,900,104                     |
| Vista Foundation Fund III, LP                   | 6,913,217                          | 17,506,476                     |
| Warburg Pincus China, LP                        | 10,639,134                         | 33,885,000                     |
| Warburg Pincus Energy MCIP, LP                  | -                                  | 10,396,887                     |
| Warburg Pincus Energy, LP                       | 43,829,501                         | 50,700,000                     |
| Warburg Pincus Equity Partners, LP              | 1,704,566                          | -                              |
| Warburg Pincus International Partners           | 5,516,671                          | -                              |
| Warburg Pincus Private Equity IX                | 21,788,202                         | -                              |
| Warburg Pincus Private Equity VIII, LP          | 9,577,286                          | -                              |
| Warburg Pincus Private Equity X, LP             | 139,664,167                        | -                              |
| Warburg Pincus Private Equity XI, LP            | 193,840,155                        | 13,200,000                     |
| Warburg Pincus Private Equity XII Secondary, LP | 10,595,730                         | 14,162,500                     |
| Warburg Pincus Private Equity XII, LP           | 74,380,501                         | 99,137,500                     |
| WestAm COREplus Private Equity QP               | 1,972,548                          | 2,086,719                      |
| WestAm Special Private Equity Partners          | 4,400,025                          | 2,317,427                      |
| <b>Total Private Equity</b>                     | <b>\$ 10,157,687,411</b>           | <b>\$ 5,998,494,771</b>        |
| Cash  | 414,823,857                        | -                              |
| Active Small Cap Cash                           | 15,769,475                         | -                              |
| Active Small Cap                                | 981,552                            | -                              |
| Income Accruals                                 | 704,591                            | -                              |
| <b>Grand Total</b>                              | <b>\$ 10,589,966,886</b>           | <b>\$ 5,998,494,771</b>        |

\* Total Private Equity amounts do not include Cash and Active Small Cap

\*\* New Commitments made during quarter reported

State of Michigan Retirement Systems

# REAL ESTATE AND INFRASTRUCTURE REVIEW

Investment Advisory Committee Meeting

December 12, 2017



Brian C. Liikala  
Senior Investment Manager  
Real Estate and Infrastructure Division

## EXECUTIVE SUMMARY

### Performance

| MPSERS Plan                | 1-Year | 3-Year | 5-Year | 7-year | 10-Year |
|----------------------------|--------|--------|--------|--------|---------|
| Annualized Return          | 8.0%   | 10.1%  | 11.6%  | 11.9%  | 4.1%    |
| NCREIF NPI                 | 5.5%   | 8.4%   | 8.9%   | 9.8%   | 4.9%    |
| Peer Median Return         | 6.1%   | 9.7%   | 10.6%  | 11.3%  | 3.6%    |
| Percentile Rank vs. Peers* | 35     | 44     | 31     | 41     | 49      |

\*State Street Universe greater than \$1 billion

- Total Real Estate and Infrastructure Division (REID) value was \$6.6 billion with a total one-year return of 8%. Outperformance relative to the one-year benchmark was the result of REID's strategy in: the underweight of retail and office, and the overweight of apartments and hotels in the portfolio; appreciation in the medical office and industrial warehouse properties; realized gains from dispositions during the period; commitments to investments that distribute income early, thereby reducing the 'J' curve effect; and the increase in investments for credit strategies. Infrastructure investments in North American energy also provided strong above-average returns.

### Strategy Update

- The REID is focusing on sourcing off market opportunities through its extensive network and reducing risk in the portfolio through early income-generating assets with a shorter projected hold period, which includes investing in real estate debt at various levels of the capital structure. The REID has selectively acquired properties where it can add value through management and leasing, and develop properties at attractive risk-adjusted returns. The REID will continue its strategy of assembling portfolios in non-traditional real estate sectors that REID believes will become institutional property types, enabling above market appreciation and returns.
- The REID has been actively managing the portfolio with dispositions of assets in excess of \$1 billion, and funding new investments of nearly \$1 billion as of fiscal year-end. The REID is also working with its advisors in executing the disposition of properties in secondary markets where illiquidity occurs in periods of slower economic growth, and realizing gains from the sale of assets at historically low capitalization rates.
- The REID has approximately \$1.5 billion in unfunded commitments. New commitments closed during the quarter include:
  - \$75 million in Rialto Absolute Partnership I, a mezzanine loan on a portfolio of Class A biomedical office and laboratory buildings totaling 2.1 million square feet, managed by Rialto Capital Management, LLC.
  - \$50 million in TSP Fund II, LP, a diversified portfolio of office, industrial, retail, multi-family and medical office properties located in the U.S. The fund will be managed by Transwestern Strategic Partners LLC.



- \$20 million in TSP Spartan C-II, LLC, a co-investment in a 2.5 million square foot industrial portfolio, which will include nine Class A warehouse properties. The properties will be managed by Transwestern Strategic Partners LLC.

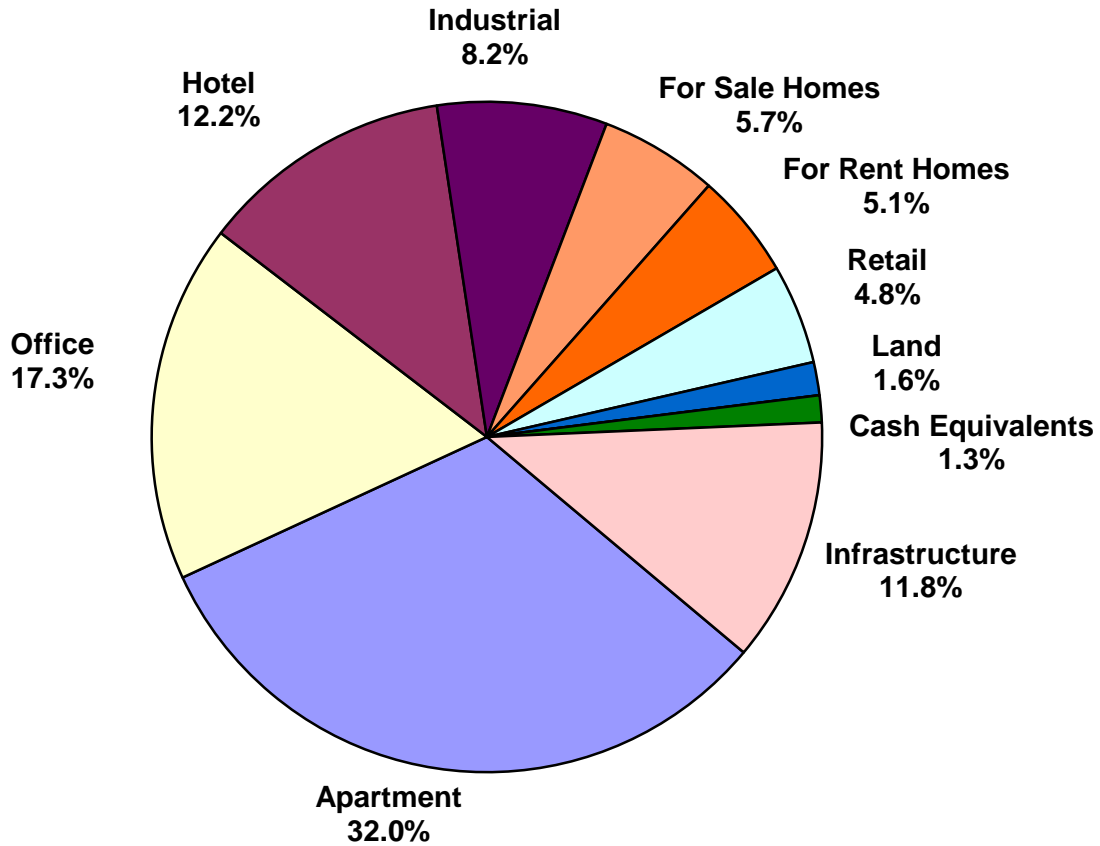
## **Market Environment**

- Disparities in property types and in real estate markets are appearing as we continue through the real estate cycle. Development of condominiums in major urban markets has begun to ease, as supply becomes a concern in markets such as Miami and New York. Industrial warehouse construction fueled by fulfillment centers continues to meet growing demand. Retail properties are less attractive to investors as e-commerce continues to grow. Senior housing and medical office are attracting more investor attention. Lenders have become more selective in quality and location of the collateral and are disciplined in keeping loan-to-value ratios generally below 65%.
- The U.S. has eased FIRPTA Rules to reduce federal taxes on foreign investors for real estate investments. This will likely encourage more offshore pension funds to invest in the U.S., although foreign investors are awaiting the new Federal Administration's policies and their effect on the market.
- Fund flows to the infrastructure sector continue to remain strong, as investor interest in the asset class continues to grow. Opportunities include North American energy, power generation, European transportation, and emerging market fundamental infrastructure projects. The industry has gained attention from the new Federal Administration's intent on rebuilding U.S. infrastructure, however details on investment legal and financial framework are limited and will take time to develop. A tight labor market for construction workers could inhibit timing of completions.
- In the commercial mortgage-backed securities (CMBS) market, spreads over the swap rate for 10-year AAA-rated securities were unchanged from the prior quarter and stand at 90 bps, which has been low historically since late 2012. Spreads continued to tighten after the third quarter ended. The demand for higher rate securities remained strong. The lower-rated security spreads remain appropriate for the risk in comparison to debt metrics in the bond market. Commercial Mortgage Alert reported that CMBS issuance is projected to be \$80 billion in 2017. A wave of refinancing for 2007 ten-year vintage loans, in excess of \$100 billion, are finding enough lenders to complete their refinancing and therefore may not pose a problem. Large banks continue to be the low risk A note lender (<40% LTV), allowing private non-bank lenders to fill the funding gap, where the REID's credit strategy has focused its attention.

# SMRS

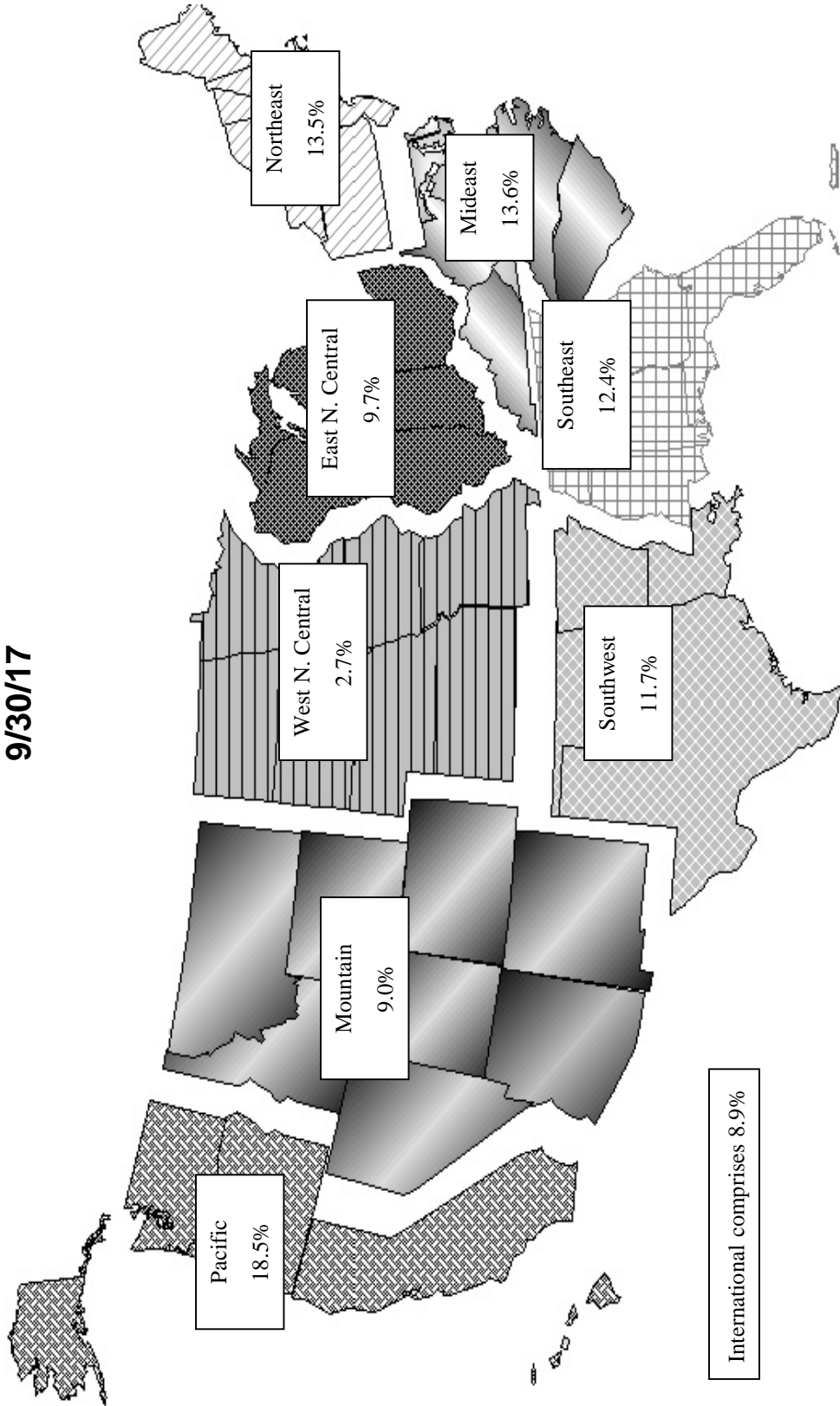
## Real Estate and Infrastructure

### 9/30/17



| <b>Market Value in Millions</b> |                       |                      |                       |                      |
|---------------------------------|-----------------------|----------------------|-----------------------|----------------------|
|                                 | <u>9/30/17</u>        |                      | <u>9/30/16</u>        |                      |
| Apartment                       | \$2,101               | 32.0%                | \$2,273               | 34.6%                |
| Office                          | 1,131                 | 17.3%                | 1,040                 | 15.8%                |
| Hotel                           | 797                   | 12.2%                | 916                   | 14.0%                |
| Infrastructure                  | 776                   | 11.8%                | 625                   | 9.5%                 |
| Industrial                      | 537                   | 8.2%                 | 445                   | 6.8%                 |
| For Sale Homes                  | 374                   | 5.7%                 | 423                   | 6.5%                 |
| For Rent Homes                  | 331                   | 5.1%                 | 335                   | 5.1%                 |
| Retail                          | 314                   | 4.8%                 | 357                   | 5.4%                 |
| Land                            | 105                   | 1.6%                 | 116                   | 1.8%                 |
|                                 | <u>\$6,466</u>        | <u>98.7%</u>         | <u>\$6,530</u>        | <u>99.5%</u>         |
| Cash Equivalents                | <u>88</u>             | <u>1.3%</u>          | <u>34</u>             | <u>0.5%</u>          |
| <b>Total Investments</b>        | <b><u>\$6,554</u></b> | <b><u>100.0%</u></b> | <b><u>\$6,564</u></b> | <b><u>100.0%</u></b> |

**SMRS**  
**Real Estate by Region**  
**Based on Market Value**  
 (excludes cash & cash equivalents)  
**9/30/17**



International comprises 8.9%

Geographic regions defined by NCREIF, whose property index composition is: Pacific 31.9%, Mountain 6.3%, West N. Central 1.3%, Southwest 10.5%, East N. Central 7.3%, Southeast 9.3%, Northeast 21.7%, Midwest 11.7%

**SMRS**  
**Real Estate and Infrastructure**  
**9/30/17**

**Top Ten  
Advisors or Entity**

| <u>Advisor or Entity</u>           | <u>Market Value</u>     |
|------------------------------------|-------------------------|
| MWT Holdings, LLC (SHLP)           | \$ 1,405,079,446        |
| Clarion Partners                   | 687,710,831             |
| Blackstone Group                   | 504,240,615             |
| Rialto Capital Management LLC      | 327,544,276             |
| Principal Real Estate Investors    | 274,694,645             |
| Bentall Kennedy LP                 | 251,453,833             |
| Domain Capital Advisors Inc        | 243,950,729             |
| CIM Investment Advisors LLC        | 233,852,096             |
| Heitman Capital Management         | 192,677,153             |
| Transwestern Investment Management | 192,015,299             |
|                                    | <u>\$ 4,313,218,923</u> |

**Occupancy  
by Property Type**

|                  | Apartment | Office | Industrial | Retail | Hotel |
|------------------|-----------|--------|------------|--------|-------|
| SMRS Portfolio   | 94.7%     | 86.7%  | 94.2%      | 91.3%  | 78.9% |
| National Average | 92.5%     | 87.1%  | 92.3%      | 94.8%  | 71.4% |

# SMRS

## Market Values by Ownership Entity

9/30/17

### REAL ESTATE

|  | <u>Market Value</u> | <u>Unfunded<br/>Commitment</u> |
|--|---------------------|--------------------------------|
| 801 Grand Avenue Capital, LLC            | \$ 75,216,505       | \$ 0                           |
| AEW Senior Housing III                   | 1,491,413           | 3,001,712                      |
| Apollo Asia Real Estate Fund, LP         | 17,752,372          | 55,599,473                     |
| Asana Partners Fund I, LP                | 9,420,385           | 15,502,567                     |
| Avanath Affordable Housing I, LLC        | 24,286,826          | 1,467,911                      |
| Avanath Affordable Housing II, LLC       | 29,339,329          | 0                              |
| Avanath II SMRS Co-Investment Fund LLC   | 17,597,571          | 0                              |
| Avanath Affordable Housing III           | 10,820,345          | 39,020,680                     |
| Beacon Capital Strategic Partners IV, LP | 166,475             | 0                              |
| Beacon Capital Strategic Partners V, LP  | 380,919             | 0                              |
| Blackstone R/E IH3 Co-Inv Partners       | 331,286,698         | 0                              |
| Blackstone Real Estate Partners V, LP    | 16,524,717          | 0                              |
| Blackstone Real Estate Partners VI, LP   | 14,974,454          | 3,680,000                      |
| Blackstone Real Estate Partners VIII, LP | 37,140,158          | 40,023,518                     |
| Capri Select Income II                   | 60,774              | 0                              |
| Capri Urban Investors, LLC               | 9,429,685           | 0                              |
| CIM Fund III, LP                         | 42,004,023          | 0                              |
| CIM Fund VIII, LP                        | 79,871,011          | 33,406,364                     |
| CIM Urban REIT, LLC                      | 53,266,231          | 0                              |
| CIM VI (Urban REIT), LLC                 | 30,217,234          | 0                              |
| Clarion Gables Multifamily Trust         | 29,192,476          | 0                              |
| Columbus Circle Holdings, LLC            | 130,010,743         | 94,821,668                     |
| CPI Capital Partners N.A., LP            | 165,277             | 0                              |
| CPI Capital Partners N.A. Secondary, LP  | 800,752             | 0                              |
| Crown Small Cap Real Estate              | 13,025,506          | 13,000,000                     |
| Domain GVA-1, LLC                        | 49,785,615          | 53,431,029                     |
| Domain Hotel Properties, LLC             | 467,728,487         | 0                              |
| Gateway Capital R/E Fund II, LP          | 48,935,673          | 1,275,000                      |
| Great Lakes Property Group Trust         | 106,191,171         | 0                              |
| IMRF II CoInvest Spiga LP                | 7,177,722           | 7,039,047                      |
| Invesco Mortgage Recovery Feeder Fund    | 6,679,156           | 0                              |
| Invesco Mortgage Recovery Fund II, LP    | 27,815,444          | 17,543,582                     |
| IPF II Co-Invest LP                      | 29,419,344          | 5,677,965                      |
| JBC North LaSalle, LLC                   | 21,512,226          | 0                              |
| JBC Opportunity Fund III, LP             | 495,673             | 0                              |
| JP Morgan India Property Fund II, LLC    | 37,713,324          | 3,110,897                      |
| KBS/SM Fund III, LP                      | 47,405,617          | 0                              |
| KBS/SM Fund IV, LP                       | 91,394,235          | 0                              |
| L-A Saturn Acquisition, LP               | 32,939,785          | 0                              |
| Landmark Real Estate Partners V, LP      | 11,559,162          | 0                              |
| LaSalle Asia Opportunity Fund II, LP     | 257,089             | 0                              |
| LaSalle Asia Opportunity Fund III, LP    | 3,576,683           | 0                              |
| Lion Industrial Trust                    | 183,340,603         | 0                              |
| Lion Mexico Fund, LP                     | 7,449,265           | 0                              |

|  | <u>Market Value</u>            | <u>Unfunded<br/>Commitment</u> |
|--|--------------------------------|--------------------------------|
| Lombard GVA0016                                  | 203,093,725                    | 0                              |
| Lone Star Fund X, LP                             | 0                              | 200,000,000                    |
| Lowes Hospitality Investment Partners            | 89,213                         | 0                              |
| Lubert-Adler Real Estate Fund VII, LP            | 74,749,181                     | 3,750,000                      |
| M1 Westgate CoInvest LLC                         | 9,951,632                      | 1,280,670                      |
| M301W CoInvest LLC                               | 18,541,965                     | 3,473,383                      |
| MERS Acquisitions, Ltd.                          | 148,113,125                    | 34,000,000                     |
| MG Alliance, LLC                                 | 18,279,018                     | 0                              |
| MIP Holdco, LLC                                  | 112,425,856                    | 49,004,940                     |
| Morgan Stanley R/E Fund V - International        | 3,087,056                      | 0                              |
| Morgan Stanley R/E Fund VI - International       | 6,476,892                      | 0                              |
| Morgan Stanley R/E Fund V - U.S.                 | 2,937,581                      | 0                              |
| Morgan Stanley R/E Special Situations Fund III   | 30,000,379                     | 0                              |
| MWT Holdings, LLC                                | 1,405,079,446                  | 0                              |
| Northpark-Land Associates, LLLP                  | 28,254,753                     | 63,777,816                     |
| Orange Investors LLC                             | 129,254,268                    | 0                              |
| Paladin Realty Brazil Investors III (USA), LP    | 27,305,181                     | 0                              |
| Paladin Realty Latin America Investors IV-CI, LP | 36,280,297                     | 17,000,000                     |
| Paladin Realty TB COINV V LP                     | 11,374,327                     | 0                              |
| Penmain Office LLC                               | 35,806,369                     | 0                              |
| Principal Separate Account                       | 199,478,140                    | 29,376,245                     |
| Proprium RE Spec Situations Fund LP              | 30,194,242                     | 29,123,203                     |
| * <b>Rialto Absolute Partnership I</b>           | 75,000,000                     |                                |
| Rialto Credit Partnership LP                     | 127,247,913                    | 101,795,454                    |
| Rialto Real Estate Fund, LP                      | 23,714,696                     | 0                              |
| Rialto Real Estate Fund II, LP                   | 38,638,578                     | 3,000,000                      |
| Rialto Real Estate Fund III-Debt, LP             | 12,473,692                     | 39,038,490                     |
| Rialto Real Estate Fund III-Property, LP         | 8,511,102                      | 45,753,425                     |
| Rialto Mezzanine Partners Fund                   | 41,958,295                     | 0                              |
| SM Brell II, LP                                  | 26,151,883                     | 0                              |
| Stockbridge Real Estate Fund II-C, LP            | 23,851,454                     | 0                              |
| Strategic LP                                     | 251,453,833                    | 43,600,000                     |
| TPG RE Finance Trust                             | 95,375,264                     | 2,103,426                      |
| TPG RE Fund II                                   | 22,299,476                     | 26,775,697                     |
| * <b>TSP Fund II, LP</b>                         | 4,391,509                      | 45,608,491                     |
| TSP Spartan C-I LLC                              | 8,545,631                      | 0                              |
| * <b>TSP Spartan C-II LLC</b>                    | 18,500,000                     | 1,500,000                      |
| TSP Value and Income Fund LP                     | 48,152,303                     | 4,600,000                      |
| Trophy Property Development LP                   | 57,421,329                     | 7,408,100                      |
| True North High Yield Investment Fund II         | 14,283,457                     | 5,000,000                      |
| True North Real Estate Fund III                  | 34,231,809                     | 19,320,180                     |
| Venture Center, LLC                              | 45,143,867                     | 0                              |
| Western National Realty Fund II, LP              | 27,163,855                     | 0                              |
|  | <u>\$ 5,691,100,571</u>        | <u>\$ 1,163,890,933</u>        |
| Short-Term Investments and Other                 | 77,256,378                     | 0                              |
| <b>Total Real Estate Investments</b>             | <u><b>\$ 5,768,356,949</b></u> | <u><b>\$ 1,163,890,933</b></u> |

\* New or additional commitment made during the quarter reported

**SMRS**  
**Market Values by Ownership Entity**  
**9/30/17**

**INFRASTRUCTURE**

|   | <b>Market Value</b>         | <b>Unfunded<br/>Commitment</b> |
|---|-----------------------------|--------------------------------|
| ArcLight Energy Partners Fund VI, LP                      | \$ 30,912,552               | \$ 17,896,686                  |
| ASF VI Infrastructure B LP                                | 22,754,034                  | 15,686,550                     |
| ASF VII Infrastructure Fund B LP                          | 1,771,565                   | 26,123,706                     |
| ASF Como Co-Investment LP                                 | 45,473,296                  | 13,032,074                     |
| Basalt Infrastructure Partners, LP                        | 51,065,889                  | 3,050,413                      |
| Blackstone Energy Partners, LP                            | 51,601,096                  | 4,209,834                      |
| Blackstone Energy Partners II, LP                         | 34,045,244                  | 54,865,224                     |
| Brookfield Infrastructure Fund II-B, LP                   | 49,545,968                  | 5,369,518                      |
| Customized Infrastructure Strategies, LP                  | 63,511,828                  | 7,301,960                      |
| Dalmore Capital Fund                                      | 61,599,000                  | 0                              |
| Global Energy & Power Infrastructure Fund II, LP          | 17,739,994                  | 41,972,352                     |
| GCM Grosvenor Infrastructure Investment Program, LP       | 59,185,677                  | 0                              |
| GCM Grosvenor Customized Infrastructure Strategies II, LP | 25,162,059                  | 39,921,338                     |
| GSO Energy Select Opportunities Fund LP                   | 18,668,248                  | 35,481,176                     |
| JP Morgan AIRRO India Sidecar Fund US, LLC                | 68,335,387                  | 3,835,855                      |
| JP Morgan AIRRO Fund II US, LLC                           | 12,317,116                  | 83,384,246                     |
| KKR Eagle CoInvest LP                                     | 33,446,145                  | 1,917,282                      |
| KKR Global Infrastructure Investors, LP                   | 49,317,687                  | 7,004,133                      |
| RPEP SMRS, LLC  | 12,500,000                  | 500,000                        |
| StonePeak Infrastructure Fund LP                          | 66,688,642                  | 14,520,690                     |
|   | \$ 775,641,427              | \$ 376,073,037                 |
| Short-Term Investments and Other                          | 10,253,753                  | 0                              |
| <b>Total Infrastructure Investments</b>                   | <b>\$ 785,895,180</b>       | <b>\$ 376,073,037</b>          |
| <br><b>TOTAL INVESTMENTS</b>                              | <br><b>\$ 6,554,252,129</b> | <br><b>\$ 1,539,963,970</b>    |

\* New or additional commitment made during the quarter reported

State of Michigan Retirement Systems

# ABSOLUTE AND REAL RETURN REVIEW

Investment Advisory Committee Meeting

December 12, 2017



James L. Elkins  
Director, Private Markets  
Short-Term, Absolute and Real Return Division



## EXECUTIVE SUMMARY

### Performance

| MPSERS Plan            | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|------------------------|--------|---------|---------|---------|----------|
| Absolute Return        | 7.8%   | 2.8%    | 5.5%    | 4.9%    | N/A      |
| HFRI FOF Conservative* | 4.6%   | 1.7%    | 3.5%    | 2.9%    | N/A      |

\* One month lag on the index. Information as of August 31, 2017.

- The value of the Absolute Return portfolio is \$4 billion with a one-year return of 7.8% and 1.7% for the current quarter. The outperformance for the third quarter was driven by overweight exposure to credit and equity strategies.
- Performance for credit managers was positive for the third quarter; the strategy closed out as the largest overall contributor to performance. Managers with meaningful exposure to mortgage and loan securities, specifically residential mortgage-backed securities, nonperforming loans and re-performing loans, had a particularly strong quarter with performance driven by the execution of successful securitizations as well as positive carry and spread tightening.
- Equities were the second largest contributor to performance for the quarter, with trading-oriented managers primarily driving gains. The equity portfolio continues to be managed with very little market exposure. Alpha has been broad-based across strategy types, industries and geographies, with particular strength from technology and healthcare, and Europe and Asia. It has also been a strong quarter for our quantitative strategies, particularly quant equity. We have seen positive performance across all forecast horizons and model types.

### Strategy Update

- The objective of the Absolute Return portfolio is to diversify the total plans' holdings, targeting returns above investment-grade fixed income with lower volatility than the equity portfolio. The portfolio utilizes a diverse mix of managers that invest both long and short to target specific exposures and seek to hedge out unwanted risk.
- New commitments for the quarter include:
  - \$100 million to SJC Direct Lending Revolver Fund III, LP, a debt fund focused on asset based lending.
- Although outperformance for the quarter was driven primarily by credit and equity managers, we remain cautious on directional risks and have shifted towards more diversifying, lower net exposures. We anticipate increasing allocations to special situations and co-investments, which have more idiosyncratic risk and are implemented on a market neutral basis. We also believe that future allocations to opportunities in macro and quant strategies could be well positioned to take advantage of a rising interest rate and higher volatility environment. Overall, we will focus on future opportunities that seek to provide diversification, protect the downside and deliver absolute return.

## **Performance**

| <b>MPSERS Plan</b>      | <b>1-Year</b> | <b>3-Years</b> | <b>5-Years</b> | <b>7-Years</b> | <b>10-Years</b> |
|-------------------------|---------------|----------------|----------------|----------------|-----------------|
| Real Return and Opport. | 12.3%         | 8.3%           | 11.0%          | 9.7%           | N/A             |
| Custom Benchmark        | 7.7%          | 7.1%           | 7.2%           | 7.4%           | N/A             |

- Total Real Return and Opportunistic portfolio value was \$6.1 billion with a total one-year return of 12.3% and 2.8% for the current quarter. Performance for the quarter was driven by strong income from our media and entertainment holdings, as well as solid returns from asset sales in the metals and mining strategy.

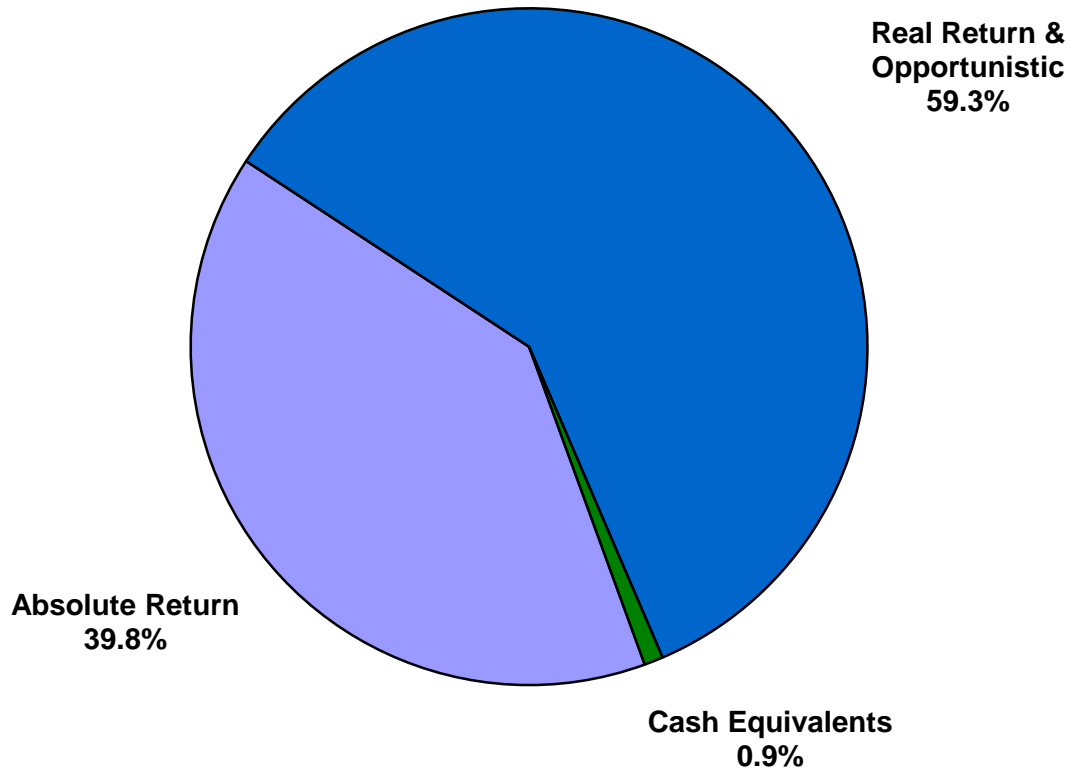
## **Strategy Update**

- The objective of the Real Return portfolio is to provide an inflation hedge and in the Opportunistic Portfolio to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- The STARR division is focused on finding differentiated strategies that are additive to the current portfolio mix. In terms of strategy allocations, we have been reviewing many insurance related opportunities, especially those that are uncorrelated with traditional asset classes. With the many opportunities under review, we continue to favor private credit investments over equity due to the expected return for the level of risk.
- The Real Return & Opportunistic portfolio has approximately \$3.5 billion of unfunded commitments. New commitments closed during the quarter include:
  - \$300 million to Barings Asset-Based Income Fund, LP, a commingled fund that focuses on capital assets, infrastructure, intangible assets, and natural resources.
  - \$120 million to BSCH Parallel (MLG) I, LP, a co-investment in equity minority stakes, managed by Blackstone Strategic Capital Holdings.
  - \$100 million to Vida Insurance Credit Opportunities Fund II, LP, a commingled fund that focuses on insurance linked securities.
  - \$77.3 million to Napier Park Aircraft Leasing Rollover Fund I, LLC, a commingled fund that focuses on aircraft leasing.

# SMRS

## Absolute, Real Return and Opportunistic

### 9/30/17



| <b>Market Value in Millions</b> |                               |                             |                              |                             |
|---------------------------------|-------------------------------|-----------------------------|------------------------------|-----------------------------|
|                                 | <u>9/30/17</u>                |                             | <u>9/30/16</u>               |                             |
| Absolute Return                 | \$4,028                       | 39.8%                       | \$3,967                      | 42.3%                       |
| Real Return and Opportunistic   | 5,994                         | 59.3%                       | 5,317                        | 56.7%                       |
| Cash Equivalents                | <u>86</u>                     | <u>0.9%</u>                 | <u>91</u>                    | <u>1.0%</u>                 |
| <b>Total Investments</b>        | <b><u><u>\$10,108</u></u></b> | <b><u><u>100.0%</u></u></b> | <b><u><u>\$9,375</u></u></b> | <b><u><u>100.0%</u></u></b> |

# SMRS

## Absolute Return

### 9/30/17

#### Net Market Values by Entity

|  | <b>Net Market Value</b> |
|--|-------------------------|
| Apollo Offshore Credit Strategies Fund Ltd.        | \$ 7,996,821            |
| Drawbridge Opportunities Fund                      | 216,944,855             |
| * EnTrust White Pine Partners, LP                  | 71,815,201              |
| JM IV, LP  | 82,963,649              |
| MP Securitized Credit Master Fund, LP              | 74,529,097              |
| ** <b>SJC Direct Lending Revolver Fund III, LP</b> | -                       |
| * Tahquamenon Fund, LP                             | 3,571,108,694           |
| Visium Balanced Fund, LP                           | 2,442,554               |
| <b>Total Absolute Return</b>                       | <b>\$ 4,027,800,872</b> |
| Short-Term Investments & Other                     | 10,594,684              |
| <b>Grand Total</b>                                 | <b>\$ 4,038,395,556</b> |

\* Fund of Funds

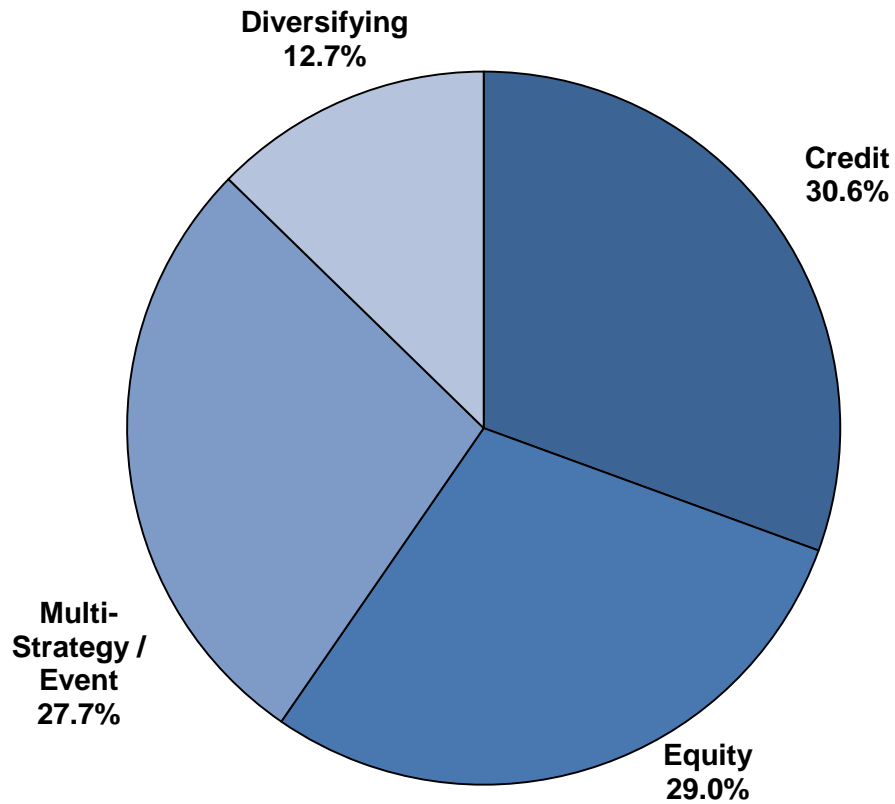
\*\* **New Commitment**

# SMRS

## Absolute Return

### 9/30/17

### Investments By Strategy



| <b>Strategy Breakdown</b> |    |                        |      |
|---------------------------|----|------------------------|------|
| Underlying Funds:         | 83 | Median Position Size:  | 0.4% |
| Strategies:               | 4  | Average Position Size: | 1.1% |
| Relationships:            | 7  | Largest Position Size: | 8.7% |

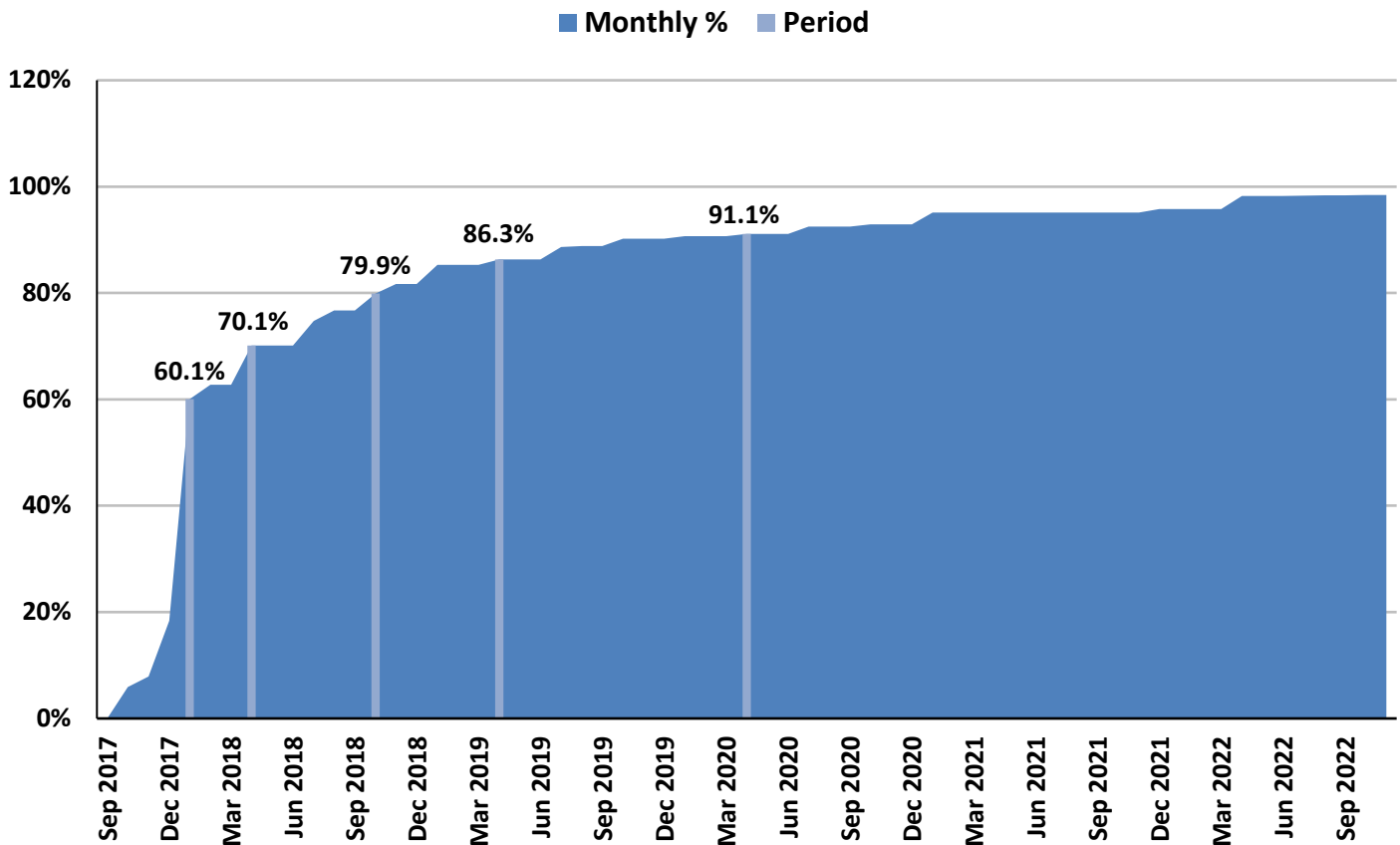
# SMRS

## Absolute Return

### 9/30/17

### Liquidity Analysis

| Redeemable   | Marginal Allocation<br>(% each period) | Aggregate Allocation<br>(% since Analysis Date) |
|--------------|--|---|
| By 1/1/18    | 60.0%                                  | 60.0%   |
| By 4/1/18    | 10.1%                                  | 70.1%   |
| By 10/1/18   | 9.8%                                   | 79.9%   |
| By 4/1/19    | 6.4%                                   | 86.3%   |
| By 4/1/20    | 4.8%                                   | 91.1%   |
| After 4/1/20 | 7.3%                                   | 98.4%   |
| Illiquid     | 1.6%                                   | 100.0%  |
| <b>Total</b> | <b>100.0%</b>                          | <b>N/A</b>                                      |



# SMRS

## Real Return and Opportunistic

### 9/30/17

#### Net Market Value by Entity

|   | <u>Net Market Value</u> | <u>Unfunded<br/>Commitment</u> |
|---|-------------------------|--------------------------------|
| * Abernathy Fund I, LLC                                   | \$ 166,225,286          | \$ 75,405,176                  |
| Apollo Credit Opportunities Fund III, LP                  | 63,953,173              | 26,330,152                     |
| Apollo European Principal Finance Fund II                 | 44,975,481              | 8,746,667                      |
| Apollo Financial Credit Investments Fund II               | 300,006,347             | 196,512,311                    |
| Apollo Financial Credit Investments Fund III              | 5,155,344               | 291,142,204                    |
| Apollo HK TMS Investments Holdings, LP                    | 15,497,856              | -                              |
| Apollo Offshore Credit Fund Ltd                           | 269,230,189             | -                              |
| Apollo Offshore Structured Credit Recovery Fund III       | 102,646,995             | 115,953,390                    |
| ** <b>Barings Asset-Based Income Fund, LP</b>             | -                       | <b>300,000,000</b>             |
| Blackstone Strategic Capital Holdings, LP                 | 27,561,351              | 98,561,931                     |
| ** <b>BSCH Parallel (MLG) I, LP</b>                       | <b>12,000,000</b>       | <b>108,000,000</b>             |
| Blue Peninsula Fund, LP                                   | 107,868,050             | 97,055,973                     |
| Carlyle Intl Energy Partners, LP                          | 18,238,271              | 41,482,158                     |
| Carlyle Energy Mezzanine Opportunity Fund                 | 8,420,923               | 45,528,094                     |
| Centerbridge SCP III, LP                                  | 14,443,568              | 15,000,000                     |
| * Content Holdings, LLC                                   | 501,909,134             | 50,303,931                     |
| Elegantree Fund SPC                                       | 56,756,933              | 4,735,264                      |
| Energy Recapitalization and Restructuring Fund, LP        | 26,326,701              | 15,648,065                     |
| ERR Michigan Holdings, LP                                 | 4,678,041               | 2,335,070                      |
| * Fairfield Settlement Partners, LLC                      | 63,613,299              | 14,608,913                     |
| FCO MA MI, LP   | 89,468,887              | 112,813,104                    |
| Fortress MSR Opportunities Fund I A, LP                   | 94,381,629              | -                              |
| Fortress Transportation & Infrastructure                  | 68,135,691              | -                              |
| GSO Credit Alpha Fund, LP                                 | 71,367,634              | 40,021,313                     |
| Highbridge Principal Strategies - Specialty Loan Fund III | 88,331,397              | 13,364,187                     |
| Hopen Life Sciences Fund II                               | 4,512,084               | 1,925,000                      |
| HPS Red Cedar Fund  | 95,999,551              | 213,876,488                    |
| JP Morgan Global Maritime Investment Fund, LP             | 76,566,778              | 2,914,854                      |
| KANG Fund, LP   | 7,070,005               | -                              |
| Kayne Anderson Energy Fund VII, LP                        | 50,252,005              | 28,828,409                     |
| Kayne P.E. Income Fund                                    | 92,523,190              | 62,483,708                     |
| Kayne Solutions Fund, LP                                  | 78,694,621              | 164,698,873                    |
| KKR EI&G Fund   | 40,937,271              | 22,079,606                     |
| KKR Lending Partners I, LP                                | 38,232,290              | 11,930,723                     |
| KKR Lending Partners II, LP                               | 83,486,195              | 14,907,287                     |
| Lakewater, LLC, Series 1                                  | 102,709,404             | 2,059,813                      |
| Lakewater, LLC, Series 2                                  | 276,725,323             | 13,055,859                     |
| Lakewater, LLC, Series 3                                  | 775,939,666             | -                              |
| Lakewater, LLC, Series 4                                  | 50,303,259              | 16,516,348                     |
| Lakewater, LLC, Series 5                                  | 194,167,009             | 55,461,411                     |
| Merit Energy Partners, LP                                 | 29,890,668              | 9,201,857                      |
| MidCap FinCo Holdings LTD                                 | 299,487,354             | -                              |

|   | <u>Net Market Value</u> | <u>Unfunded<br/>Commitment</u> |
|---|-------------------------|--------------------------------|
| Napier Park Aircraft Leasing Vehicle I, LLC                 | 40,921,646              | 15,303,861                     |
| <b>** Napier Park Aircraft Leasing Rollover Fund I, LLC</b> | <b>10,228,020</b>       | <b>66,582,608</b>              |
| Nash Co-Investment  | -                       | 14,946,904                     |
| New Fortress Energy HLDGS                                   | 300,000,000             | -                              |
| Orion Coinvest III, LP                                      | 30,079,902              | 2,236,552                      |
| Orion Mine Finance Fund 1A, LP                              | 78,525,437              | 6,812,977                      |
| Orion Mine Finance Fund I, LP                               | 138,374,944             | 7,376,051                      |
| Orion Mine Finance II, LP                                   | 46,408,740              | 51,708,476                     |
| Orion Mine Finance Co-Fund II, LP                           | 3,297,029               | 46,666,667                     |
| Redding Ridge Holdings, LP                                  | 29,526,012              | 69,638,485                     |
| * Renaissance Venture Cap Fund II, LP                       | 14,261,448              | 13,215,455                     |
| * Renaissance Venture Cap Fund III, LP                      | 750,000                 | 24,250,000                     |
| REOG Fund II Coinvest, LP                                   | 20,121,789              | 9,475,056                      |
| Ridgewood Energy Oil & Gas II                               | 89,982,494              | 29,758,760                     |
| Ridgewood Energy Oil & Gas III                              | 21,786,535              | 201,688,550                    |
| RPEP Energy Opp Inst Partner                                | 14,279,762              | 27,727,243                     |
| RPEP SMRS Holdings, LLC                                     | 77,938,259              | 1,876,850                      |
| SJC Direct Lending Fund I, LP                               | 8,780,314               | 15,088,120                     |
| SJC Direct Lending Fund IA, LP                              | 1,969,185               | 3,764,486                      |
| SJC Direct Lending Fund II, LP                              | 162,066,765             | 38,261,315                     |
| SJC Direct Lending Fund III, LP                             | 68,792,439              | 180,543,148                    |
| * Social Network Holdings, LLC                              | 95,477,389              | 24,718,594                     |
| Specialty Equity Strategy, LP                               | 267,077                 | 24,718,594                     |
| Sprott PRL (M), LP  | 16,896,248              | 9,063,814                      |
| Sprott PRL (M-Co-Invest)                                    | 10,000,000              | 15,000,000                     |
| Sprott Private Resource Lending Fund (US), LP               | 22,232,826              | 76,619,890                     |
| Terra Co-Investment, LLC                                    | 34,356,556              | 14,000,000                     |
| TICP CLO Partners II, LP                                    | 15,125,755              | 34,106,472                     |
| TSSP Adjacent Opp Partners, LP                              | 30,747,340              | 69,964,487                     |
| Varo Coinvestment, LP                                       | 14,827,153              | 912,073                        |
| <b>** Vida Insurance Credit Opportunity Fund II, LP</b>     | <b>-</b>                | <b>100,000,000</b>             |
| Warwick Energy Partners III                                 | 50,973,864              | 11,470,665                     |
| Warwick (SMRS) Co-Invest, LP                                | 26,285,289              | 2,732,720                      |
| <b>Total Real Return and Opportunistic</b>                  | <b>\$ 5,993,969,070</b> | <b>\$ 3,503,717,013</b>        |
| Short-Term Investments & Other                              | 75,448,967              | -                              |
| <b>Grand Total</b>  | <b>\$ 6,069,418,037</b> | <b>\$ 3,503,717,013</b>        |

\* Fund of Funds

\*\* New Commitment

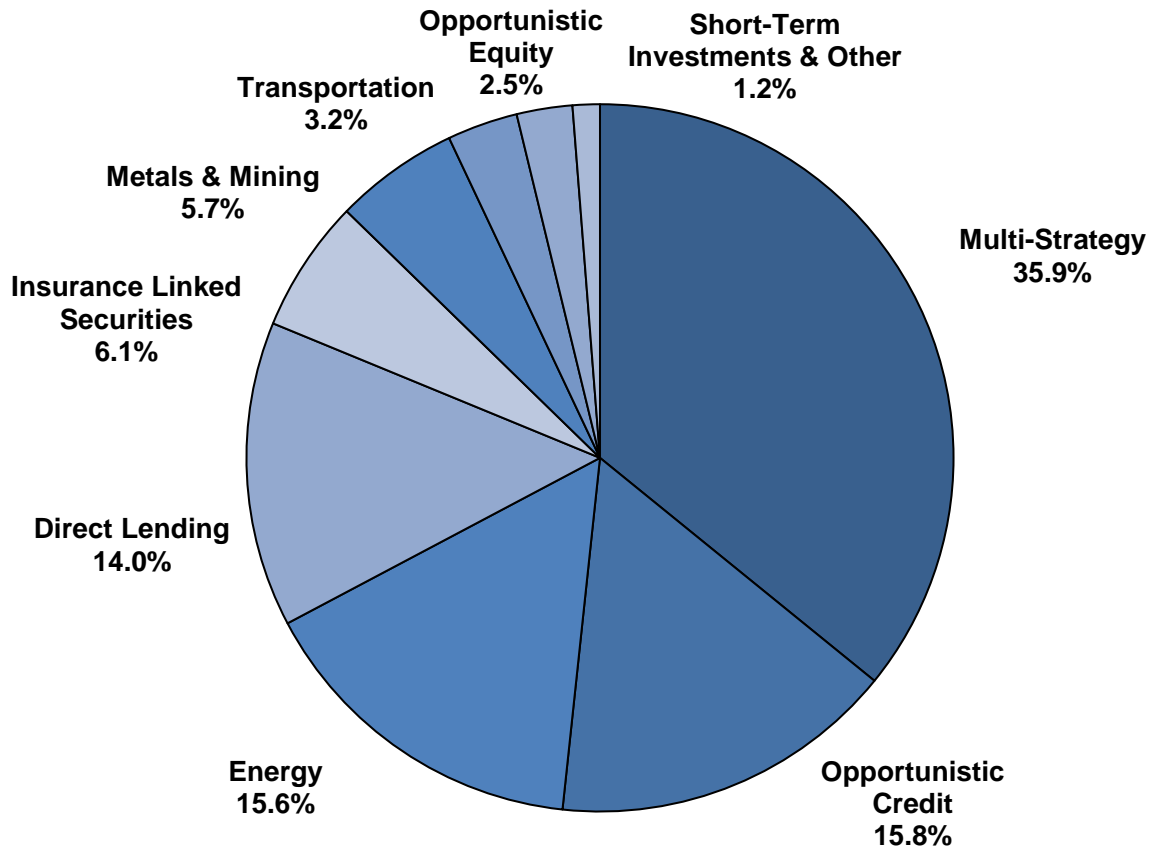


# SMRS

## Real Return and Opportunistic

### 9/30/17

### Investments By Strategy

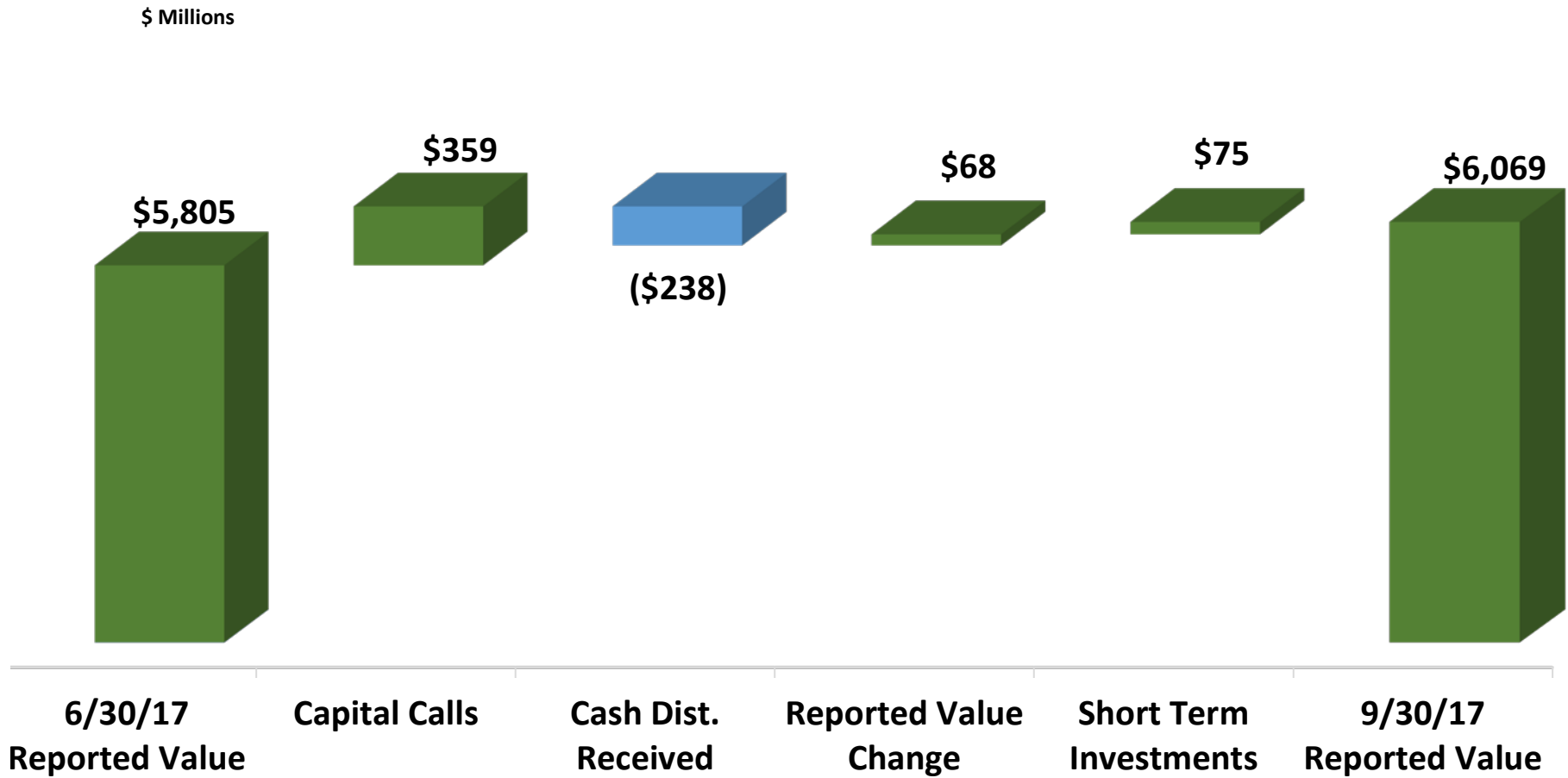


| <b>Investment Strategy</b>     |                         |
|--------------------------------|-------------------------|
| Multi-Strategy                 | \$ 2,176,114,208        |
| Opportunistic Credit           | 961,318,218             |
| Energy                         | 944,386,632             |
| Direct Lending                 | 847,145,490             |
| Insurance Linked Securities    | 368,774,990             |
| Metals & Mining                | 345,815,126             |
| Transportation                 | 195,852,135             |
| Opportunistic Equity           | 154,562,271             |
| Short-Term Investments & Other | 75,448,967              |
| <b>Total Market Value</b>      | <b>\$ 6,069,418,037</b> |

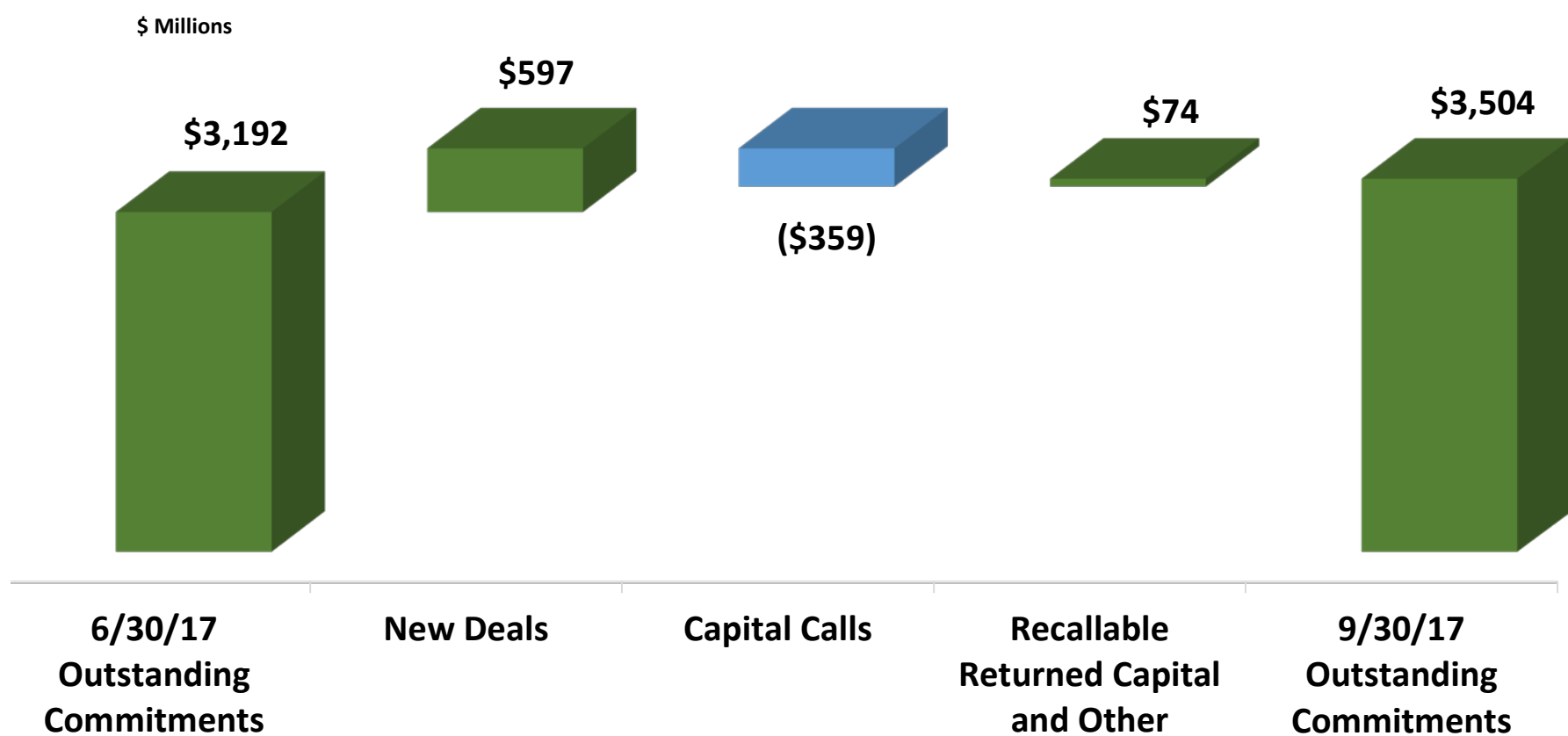
# SMRS

## Real Return and Opportunistic 9/30/17

### Invested Commitments



### Outstanding Commitments



# SMRS

## Real Return and Opportunistic

### 9/30/17

### Top Ten Advisors or Entities

| <b>Advisor or Entity</b>        | <b>Market Value</b>     |
|---------------------------------|-------------------------|
| Barings Alternative Investments | \$ 1,399,844,661        |
| Apollo Global Management        | 1,130,478,751           |
| Domain Capital Advisors         | 827,225,107             |
| Fortress Investment Group       | 483,850,517             |
| Orion Resource Partners         | 296,686,052             |
| Kayne Anderson Capital Advisors | 262,896,377             |
| Czech Asset Management          | 241,608,703             |
| Ridgewood Energy                | 224,108,839             |
| HPS Investment Partners         | 184,330,949             |
| KKR Asset Management            | 162,655,755             |
| <b>Total Market Value</b>       | <b>\$ 5,213,685,711</b> |

State of Michigan Retirement Systems

# BASKET CLAUSE REVIEW

Investment Advisory Committee Meeting

December 12, 2017



Karen M. Stout, CPA, CGFM  
Administrator  
Trust Accounting Division

# SMRS

## Basket Clause Investments

### 9/30/17

| <u>Asset Class</u>                     | <u>Value</u>                  |
|--|-------------------------------|
| Total Absolute Return                  | \$4,027,800,872               |
| Total Real Return and Opportunistic    | 835,033,804                   |
| Total International Equity             | 317,647,298                   |
| Total Long-Term Fixed Income           | <u>43,503,073</u>             |
| <b>Total Basket Clause Investments</b> | <b><u>\$5,223,985,047</u></b> |

The basket clause investments at September 30, 2017, were \$5.2 billion or 7.7% of the total portfolio value of \$67.5 billion.

The Public Employee Retirement System Investment Act, 1965 PA 314, MCL 38.1132 *et seq*, authorizes the State Treasurer to invest up to 30% of the system's assets in investments "not otherwise qualified under the act." MCL 38.1140d(1). Commonly referred to as Section 20d (after the authorizing section of PA 314) or Basket Clause investments, this provision gives the State Treasurer the flexibility to take advantage of market opportunities not specifically authorized in PA 314 while conserving protections against imprudent investment.

# Disclaimer



**This presentation was given solely for the purpose of explaining the structure, investment process, and returns for the State of Michigan Retirement Systems. It should not be interpreted in any way as financial advice.**