

INVESTMENT ADVISORY COMMITTEE MEETING

September 7, 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

SEPTEMBER 7, 2017

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 6/8/17 IAC Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 6/30/17
- 10:00 a.m. Current Asset Allocation Review
Markets Review and Outlook
- 10:15 a.m. Guest Speaker:
- David M. Lebovitz, Vice President ~ Global Market Strategist
- J.P. Morgan Asset Management Global Market Insights Strategy Team
- 10:45 a.m. Review of Investment Reports
- Fixed Income
 - Domestic Equity
 - International Equity – *Receive and File*
 - Private Equity – *Receive and File*
 - Real Estate & Infrastructure – *Receive and File*
 - Absolute and Real Return/Oppportunistic – *Receive and File*
- Basket Clause – *Receive and File*
- 11:00 a.m. Closing Remarks ~ Adjournment



2017 Meeting Schedule

Tuesday, December 12, 2017

TENTATIVE 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

State of Michigan Retirement Systems

MINUTES

Investment Advisory Committee Meeting

September 7, 2017



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

INVESTMENT ADVISORY COMMITTEE

The Investment Advisory Committee (IAC) held its quarterly meeting on Thursday, June 8, 2017, at the Bureau of Investments, Great Lakes Conference Room, 2501 Coolidge Road, Suite 400, East Lansing, Michigan.

Members Present:

James B. Nicholson, Chair
L. Erik Lundberg
Reginald G. Sanders
Al Pscholka, DTMB
Shelly Edgerton, LARA

In attendance from the Department of Treasury:

Gregory J. Parker	Robert Brackenbury	Jim Elkins
Peter Woodford	Jack Behar	Brian Liikala
Patrick Moraniec	Dan Quigley	Travis Haney
Woody Tyler	Travis Gere	Tim Reynolds
Giles Feldpausch	Ann Storberg	Karen Stout
Semone James Howes	Karl Borgquist	Mark Porrell
Janet Sudac	Lori Barrett	Annette Russell
Marge McPhee		

Others in attendance:

Max Kotary	Tim McEnery	Steve Cummings
Molly Jason	Dick Holcomb	Joe Curtin
Craig Sabin	John Ide	

Call to Order

Mr. James B. Nicholson called the June 8, 2017, IAC meeting to order at 9:30 a.m.

Approval of the March 9, 2017, Minutes

- Mr. Nicholson asked for a motion to approve the minutes of the March 9, 2017, IAC meeting. Mr. Erik Lundberg so moved, seconded by Mr. Reginald Sanders, there were no objections – motion carried.

Executive Summary Tab – Performance Review – Mr. Robert Brackenbury

- Mr. Robert Brackenbury discussed performance, noting that in 1990 the SMRS' asset allocation was more conservative and less complex.
- Mr. Brackenbury discussed the SMRS' historical allocation to cash and fixed income, noting that the allocation today is much lower than previous decades.

- Mr. Brackenbury further noted that compared to the policy asset allocation, the SMRS' allocation is more conservative, which has caused some recent underperformance to the policy benchmark.
- Mr. Brackenbury discussed the overall performance, noting that it was good over the past year, and very good over longer periods of time compared to peers.
- Mr. Brackenbury stated that it has been a long bull market but corrections do happen and it is very difficult to time the onset and duration. He noted that the plan will maintain course by keeping fees low, finding the best performing asset managers, and maintaining a well-diversified portfolio.
- Mr. Brackenbury also noted that the Bureau of Investments' (BOI) 60 basis points (bps) outperformance, when compared to average performing peer pension funds, equates to roughly \$6.4 billion in value added to the system. This is due in large part to our retention of some of the nation's best performing pension investment staff here at the BOI.

Performance and Asset Allocation Tabs – Mr. Greg Parker

- Mr. Greg Parker commented on the returns and discussed the markets and the backdrop of the economy.
- Mr. Parker discussed the attribution of the returns verses the policy benchmark for the past year.
- Mr. Parker noted the low volatility of the environment for domestic equity. He noted that mergers / acquisitions year-to-date are at 15-year lows measured by transactions as well as by dollars.
- Mr. Parker discussed interest rates noting that the Federal Reserve is likely to raise the rate in June, the short-term rates are at eight-year highs, and that the outlook for many asset classes depends on the level of long-term interest rates.
- Mr. Parker spoke briefly on valuations on domestic and international equities noting that international equity appears to be a little cheaper, has a little better earnings growth, and a wider equity risk premium.
- Mr. Parker commented on the U.S. economy noting that housing prices are high, the jobs market is tight, and it is his opinion that energy prices are vulnerable to lower prices due to increased production.

Absolute and Real Return/Opportunistic Review – Mr. Jim Elkins

- Mr. Jim Elkins reported that the one-year return for absolute return was 10.8%.
- Mr. Elkins stated that the strategy for the remainder of 2017 is to reduce the asset allocation and over the next quarter, reduce the number of managers to around 70 managers.

- Mr. Elkins reported on the performance of real return and opportunistic, noting that the performance has been good and also very consistent since its inception. He noted that the plan continues to look for new and interesting opportunities.
- Mr. Elkins briefly explained the three new commitments that were made over the last quarter.

Fixed Income Review – Mr. Dan Quigley

- Mr. Dan Quigley reported on the performance of fixed income, noting that has been very good. Fixed income, on a relative and absolute basis, resulted in performance of over 4%. He stated that the returns for the U.S. Aggregate benchmark was flat through the year.
- Mr. Quigley discussed the core-plus strategy which was implemented to meet or exceed the returns of the Bloomberg Barclays US Aggregate Bond Index while meeting the overall characteristics of a core fixed income portfolio.
- Mr. Parker highlighted Fixed Income's strategy which includes four principals: income, liquidity, principal preservation, and diversification.

Real Estate & Infrastructure Review – Mr. Brian Liikala

- Mr. Brian Liikala explained that the Real Estate and Infrastructure Division obtained a total one-year return of 8.9%. This outperformance relative to the one-year benchmark was primarily due to being underweight in retail and office, and overweight in apartments and hotels. This resulted in strong rental income along with appreciation in the medical office and industrial warehouse portfolios.
- Mr. Liikala further explained that credit strategies and unique opportunities sourced by staff had realized gains during the period. Global infrastructure investments in North America and Europe also provided above-average returns.
- There was a discussion regarding the new investments committed this quarter and the Blackstone Energy Fund.

International Equity Review – Mr. Patrick Moraniec

- Mr. Patrick Moraniec stated that relative to the benchmark the portfolio has outperformed across all time periods reported. The long-term absolute return remains challenged; however, it is expected to improve over the next ten years.
- Mr. Moraniec discussed valuation of international markets in both relative and absolute terms.
- Mr. Moraniec noted emerging markets appear more attractive relative to developed markets. Supporting reasons include: wider value spreads in emerging markets and the average company in emerging markets trades at a larger discount.
- Mr. Moraniec stated that the U.S. dollar peaked in January 2017 and has weakened through the remainder of the first quarter of 2017. A continuation of this trend through

the year potentially presents a tailwind for international investment returns, specifically emerging markets.

Domestic Equity Review – Mr. Jack Behar

- Mr. Jack Behar noted that the actively managed and the passively managed portfolios have been combined. It is his opinion that this makes sense from a risk / return standpoint to have the active and passive portfolios combined.
- Mr. Behar explained the outperformance of its peers over the three, five, seven, and ten year periods, while underperforming during the past year. The portfolio is estimated to have a 15-20 basis point cost advantage over its peers.
- Mr. Behar explained that a new manager was hired to implement an overlay strategy with the goal of increasing returns above the benchmark.
- There was a lengthy discussion about investing in large companies. It was noted that a common mistake is to sell these too early.

Private Equity Review – Mr. Peter Woodford

- Mr. Peter Woodford reported on the Private Equity portfolio explaining it had a one-year return of 10.1% that trailed the benchmark due to strong upward market returns. Private Equity returned approximately \$665 million, net of contributions, to the pension fund.
- Mr. Woodford explained the Division's strategy in the current environment, which is to maintain discipline, shift toward the middle market, and to consolidate the portfolio. Also to co-invest where appropriate to average down costs and improve returns. The focus continues to be on risk-adjusted returns.
- Mr. Woodford discussed the three new commitments made during this last quarter.

Review of Investment Reports – *Received and Filed*

- The Basket Clause was received and filed.

Closing Remarks

Chairman Nicholson thanked everyone for attending the June IAC Meeting.

Next Meeting Date and Adjournment

The next IAC Meeting is scheduled for Thursday, September 7, 2017. The meeting was adjourned by Chairman Nicholson at 10:56 a.m.

Approved:

L. Erik Lundberg, Acting Chair

State of Michigan Retirement Systems

EXECUTIVE SUMMARY

Investment Advisory Committee Meeting

September 7, 2017



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

EXECUTIVE SUMMARY

June 2017

Performance

An overview.

MPSERS Plan (6/30/17)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	12.9%	6.8%	10.2%	10.7%	5.7%
Policy Return	13.5%	7.5%	10.4%	11.3%	6.1%
Peer Median Return*	12.9%	5.7%	9.1%	9.8%	5.3%

*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 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 of returns.
- 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 \$65.6 billion of SMRS' assets, significantly adds up over time. For example, the ten-year annualized return of 6.1% compared to the 5.3% peer median return adds approximately \$4.2 billion of value to SMRS' assets over a ten-year period.
- The returns fell below the policy benchmark over the past year by -0.6%. Many of the asset classes posted results in excess of their performance benchmark, however a slightly defensive allocation tipped the performance below the policy benchmark.
- For the year ending June 2017, returns matched the peer median return. The differences in both asset allocation and selectivity compared to peers seemed to even out over this time period.

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 rate of return of 8%, 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 \$10.8 billion in illiquid assets, primarily private equity. In the June 2017 quarter, approximately \$1.1 billion of new commitments were made.
- The combined systems paid out approximately \$2.0 billion net of contributions over the past twelve months ending in June 2017.
- Most asset classes over the past year were net sellers, with the lone exception of international equity which had a net inflow of \$500 million and Real Return / Opportunistic which received an allocation of approximately \$70 million. Over the past year in round numbers, the allocation to short-term cash increased by approximately \$600 million, domestic equity was reduced by \$1.4 billion, private equity by \$950 million, real estate by \$480 million, and absolute return by \$380 million.

Capital Markets

Risk assets in focus.

- Capital market assumptions used for determining strategic asset allocations are being reduced across the board. This is the general opinion for most consultants, investment banks, and other market participants. The reason for this 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 since the depths of the global financial crisis.
- 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.
- 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 feels 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 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.

Investment Update
Highlighting the quarter.

(\$ Millions)

NEW COMMITMENTS

April 1 – June 30, 2017

Asset Class	Fund Name / (Managed By)	Commitment
Private Equity		
	CVC Capital Partners VII (CVC Capital Partners)	\$150.0
	Apollo Investment Fund IX (Apollo Advisors)	100.0
	KKR Asian Fund III (Kohlberg Kravis Roberts & Co.)	100.0
	Silver Lake Partners V (Silver Lake Partners)	67.5
	Vista Equity Endeavor Fund I (Vista Equity Partners)	50.0
	Menlo Ventures XIV (Menlo Ventures)	7.0
Real Estate & Infrastructure		
	Avanath Affordable Housing III (Avanath Affordable Housing III, LLC)	50.0
	Rialto Real Estate Fund III-Property, LP (Rialto Capital Management)	50.0
	ASF VII Infrastructure Fund B, LP (Ardian Investment Group)	30.0
Real Return & Opportunistic		
	Lakewater III, LLC (Barings Alternative Investments); credit co-invest	240.0
	Lakewater III, LLC (Barings Alternative Investments); equity co-invest	200.0
	Orion Mine Finance Co-Fund II, LP	50.0
TOTAL		\$1,094.5

State of Michigan Retirement Systems

PERFORMANCE

Investment Advisory Committee Meeting

September 7, 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.*

MPSERS PENSION

Time-Weighted Rates of Return
Periods Ending June 30, 2017

	% of Portfolio 6/30/17	Ten Years ¹		Seven Years ¹		Five Years ¹		Three Years ¹		One Year		Current Quarter	
		Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
TOTAL PLAN	100.0	5.7	26	10.7	18	10.2	21	6.8	14	12.9	51	3.1	53
Median - Greater than \$10 Billion ²		5.3		9.8		9.1		5.7		12.9		3.1	
MPSERS Total Plan Policy		6.1		11.3		10.4		7.5		13.5		3.6	
DOMESTIC EQUITIES	26.5	7.2	38	14.9	42	14.7	32	8.5	49	17.9	64	3.0	63
Median ²		7.1		14.6		13.9		8.3		18.2		3.1	
S&P 1500 Index		7.3		15.4		14.7		9.5		18.1		3.0	
INTERNATIONAL EQUITIES	17.7	1.4	84	8.0	65	8.6	67	2.7	33	22.1	27	6.1	61
Median ²		1.9		8.1		8.8		2.0		20.3		6.2	
International Blended Benchmark ³		0.3		6.6		7.4		0.8		20.5		5.8	
PRIVATE EQUITIES	14.6	10.0	7	13.9	10	13.0	18	10.0	25	12.7	52	2.8	56
Median ²		7.9		11.9		10.3		8.0		13.1		3.2	
Alternative Blended Benchmark ⁴		11.3		19.7		16.5		13.6		20.6		6.8	
BONDS	12.5	5.6	22	4.3	50	3.7	25	4.0	31	3.4	22	1.7	38
Median ²		4.9		4.3		2.9		3.0		1.7		1.6	
Barclays Aggregate		4.5		3.2		2.2		2.5		-0.3		1.5	
REAL ESTATE & INFRASTRUCTURE	9.8	4.2	45	12.2	40	11.8	41	11.5	36	8.7	26	2.5	49
Median ²		3.8		11.5		11.0		10.5		7.8		2.5	
NCREIF - Property Blended Index ⁵		5.1		10.2		9.1		8.8		5.6		1.4	
NCREIF Open Fund Index Net		4.3		12.0		10.8		10.3		6.9		1.5	
REAL RETURN AND OPPORTUNISTIC	9.0			10.0		10.6		7.9		12.9		3.3	
50% (CPI +500 bps) + 50% (8% actuarial rate)				7.4		7.2		7.0		7.4		1.8	
ABSOLUTE RETURN	6.2			4.7		5.6		2.6		6.8		1.4	
HFRI FOF Cons 1 month lagged				2.8		3.6		1.7		4.8		0.8	
CASH EQUIVALENTS	3.5	0.6		0.5		0.5		0.6		0.8		0.3	
1 Month T-Bill		0.4		0.1		0.1		0.2		0.4		0.2	

¹ Annualized Returns and Percentile Rank.

² 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.

³ 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.

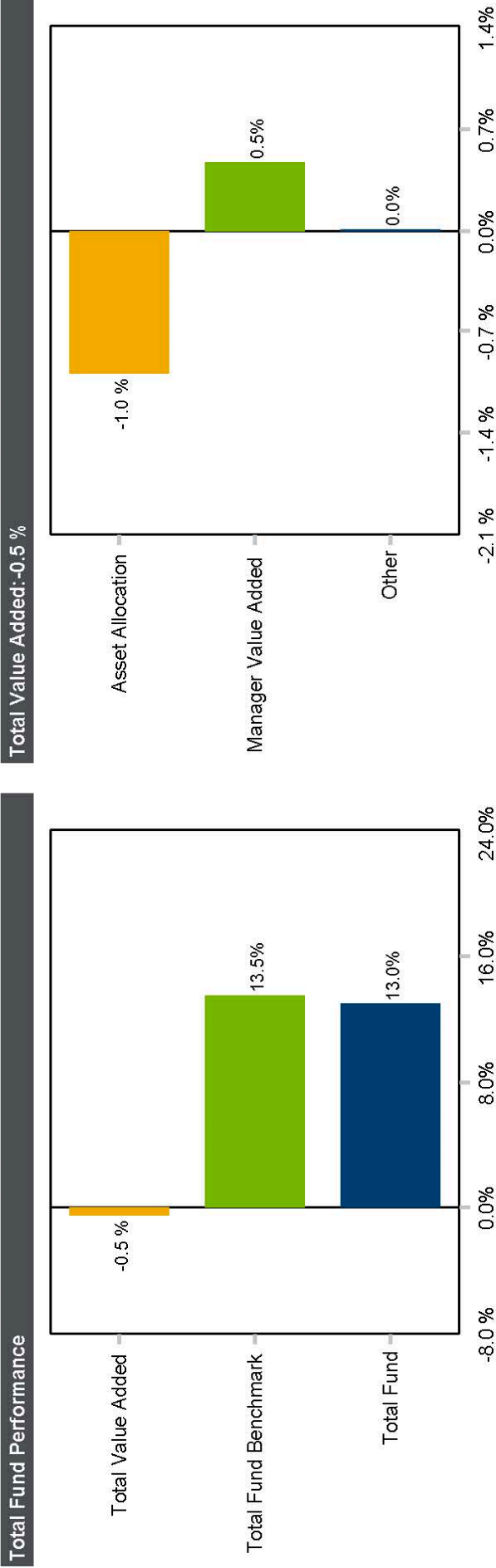
⁴ SP 500 + 300 bps thru 12/31/06. Ending market value (EMV) weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 12/31/06 to 9/30/09. EMV weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 3-month lagged 9/30/09 to present.

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

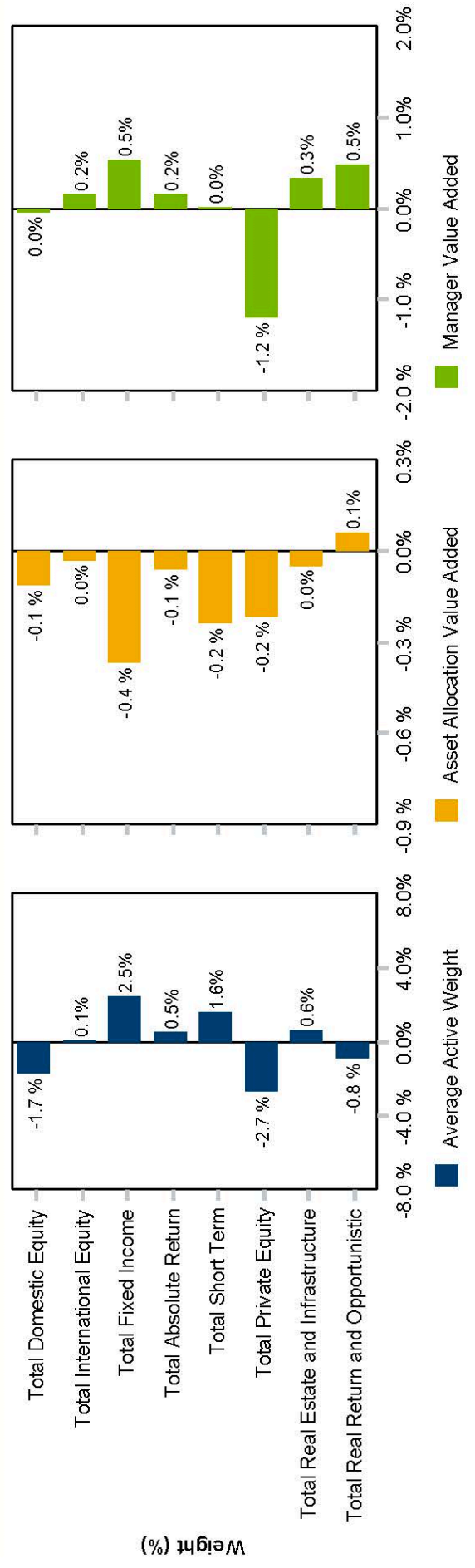
Source: State Street Analytics; the NCREIF - NPI (Property Index) source is NCREIF; the S&P BMI-EPAC Index source is S&P.

Total Fund Attribution

Total Michigan vs. Total Fund Benchmark



Total Asset Allocation: -1.0%



Cumulative and Consecutive Total Fund Returns

MPSERS										
Cumulative For Years Ending 6/30/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	12.9	7.1	6.8	9.8	10.2	8.9	10.7	10.7	6.9	5.7
Public Plan - Median (> \$10 billion)*	12.9	6.9	5.7	8.4	9.1	7.9	9.8	10.0	6.2	5.3
Rank	51	36	14	5	21	8	18	25	18	26
bp Difference - Median	-1	14	105	131	115	105	90	73	63	40
Consecutive For Years Ending										
	06/17	06/16	06/15	06/14	06/13	06/12	06/11	06/10	06/09	06/08
MPSERS	12.9	1.5	6.2	19.1	12.2	2.6	21.7	10.9	-19.3	-4.0
Public Plan - Median (> \$10 billion)*	12.9	1.4	3.2	16.9	12.4	1.5	22.1	12.7	-19.8	-3.3
Rank	51	42	4	9	53	28	56	73	41	65
bp Difference - Median	-1	15	301	225	-18	111	-31	-182	45	-66

MSERS										
Cumulative For Years Ending 6/30/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	13.0	7.1	6.8	9.8	10.2	8.9	10.6	10.6	6.8	5.6
Public Plan - Median (> \$1 billion)*	12.9	6.9	5.7	8.3	9.0	7.8	9.7	9.9	6.3	5.3
Rank	43	31	10	4	19	12	19	28	33	33
bp Difference - Median	7	18	116	146	124	108	95	70	52	33
Consecutive For Years Ending										
	06/17	06/16	06/15	06/14	06/13	06/12	06/11	06/10	06/09	06/08
MSERS	13.0	1.5	6.2	19.1	12.2	2.4	21.7	10.5	-19.5	-4.1
Public Plan - Median (> \$1 billion)*	12.9	1.1	2.9	16.9	12.2	1.1	22.0	13.2	-19.7	-3.1
Rank	43	38	3	9	52	23	56	82	46	65
bp Difference - Median	7	41	335	220	-4	136	-33	-270	24	-98

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS										
Cumulative For Years Ending 6/30/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	13.0	7.1	6.8	9.7	10.2	8.9	10.6	10.6	6.8	5.7
Public Plan - Median (> \$1 billion)*	12.9	6.9	5.7	8.3	9.0	7.8	9.7	9.9	6.3	5.3
Rank	43	32	13	4	20	15	19	28	33	33
bp Difference - Median	6	17	114	143	119	106	93	68	50	34
Consecutive For Years Ending										
	06/17	06/16	06/15	06/14	06/13	06/12	06/11	06/10	06/09	06/08
MSPRS	13.0	1.5	6.2	19.0	12.1	2.5	21.8	10.4	-19.5	-3.9
Public Plan - Median (> \$1 billion)*	12.9	1.1	2.9	16.9	12.2	1.1	22.0	13.2	-19.7	-3.1
Rank	43	38	3	10	53	22	54	82	47	63
bp Difference - Median	6	40	333	212	-15	140	-26	-273	22	-79

MJRS										
Cumulative For Years Ending 6/30/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	13.0	7.1	6.8	9.6	10.1	8.8	10.6	10.2	6.6	5.5
Public Plan - Median (> \$1 billion)*	12.9	6.9	5.7	8.3	9.0	7.8	9.7	9.9	6.3	5.3
Rank	41	31	10	11	23	20	21	41	39	39
bp Difference - Median	13	20	116	126	109	95	89	33	29	18
Consecutive For Years Ending										
	06/17	06/16	06/15	06/14	06/13	06/12	06/11	06/10	06/09	06/08
MJRS	13.0	1.5	6.2	18.2	12.2	2.4	22.1	8.0	-18.9	-3.6
Public Plan - Median (> \$1 billion)*	12.9	1.1	2.9	16.9	12.2	1.1	22.0	13.2	-19.7	-3.1
Rank	41	38	3	24	50	23	47	98	38	58
bp Difference - Median	13	38	332	132	1	130	9	-515	78	-49

*State Street Public Funds Universe

State of Michigan Retirement Systems

ASSET ALLOCATION REVIEW

Investment Advisory Committee Meeting
September 7, 2017



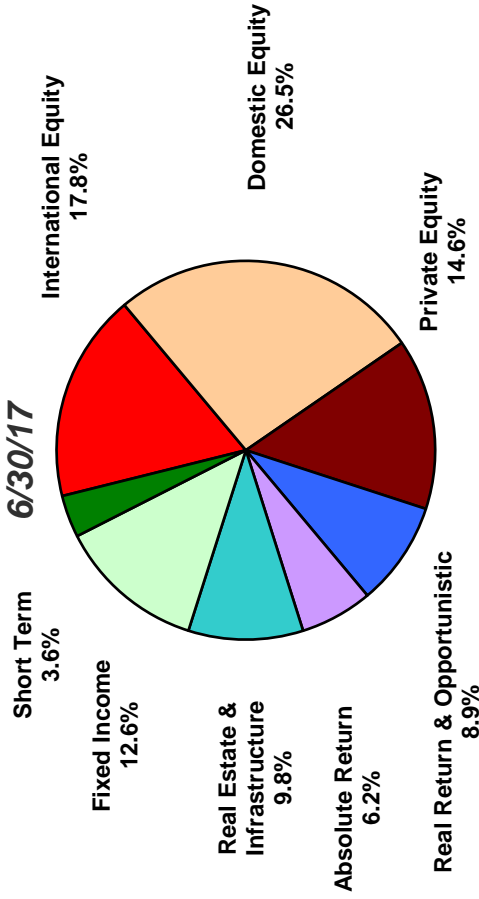
Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEMS

PROFILE - JUNE 2017

Asset Allocation

6/30/17



Asset Allocation By Market Value

(In Millions)

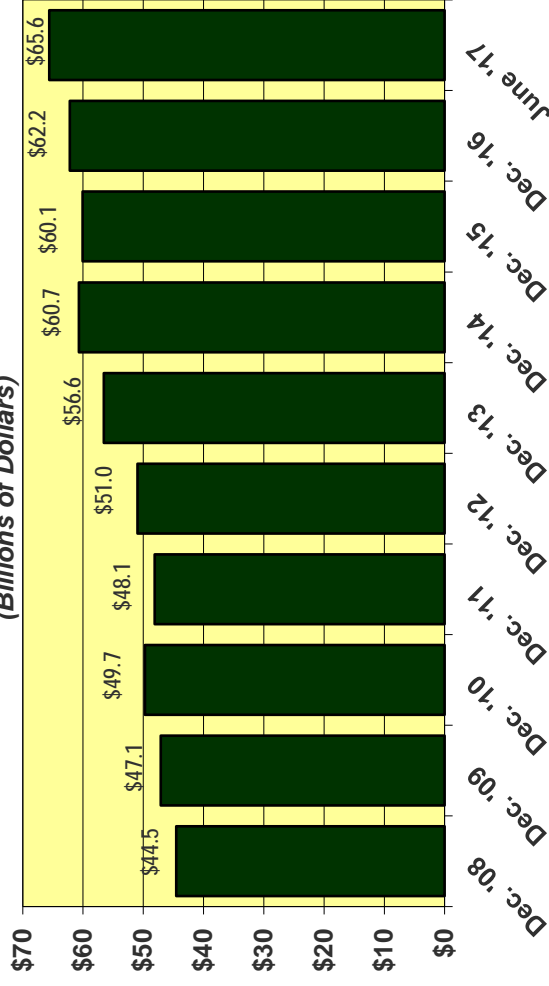
Investment Strategies	6/30/17	6/30/16
Domestic Equity	\$17,392	\$16,059
International Equity	11,637	9,127
Private Equity	9,604	9,506
Fixed Income	8,227	7,973
Real Estate & Infra.	6,459	6,443
Real Return & Opport.	5,905	5,220
Absolute Return	4,071	4,191
Short Term***	2,352	1,743
TOTAL	\$65,647	\$60,262
	100.0%	100.0%

Short Term Equivalents (in Billions)

Short Term Strategy***	\$2.4
Short Term in Other Inv. Strategies	0.7
TOTAL SHORT TERM	\$3.1
	4.7% of Total Funds

Market Value*

(Billions of Dollars)



Market Value By Plan ~ 6/30/17

(in Millions)

	Pension Plan Mkt. Value	OPEB** Mkt. Value	Combined Mkt. Value	%
MPERS	\$45,604	\$5,000	\$50,604	77.1%
MSERS - (closed)	11,470	1,831	13,301	20.2%
MSPRS	1,346	135	1,481	2.3%
MJRS - (closed)	260	1	261	0.4%
TOTAL	\$58,680	\$6,967	\$65,647	100.0%

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

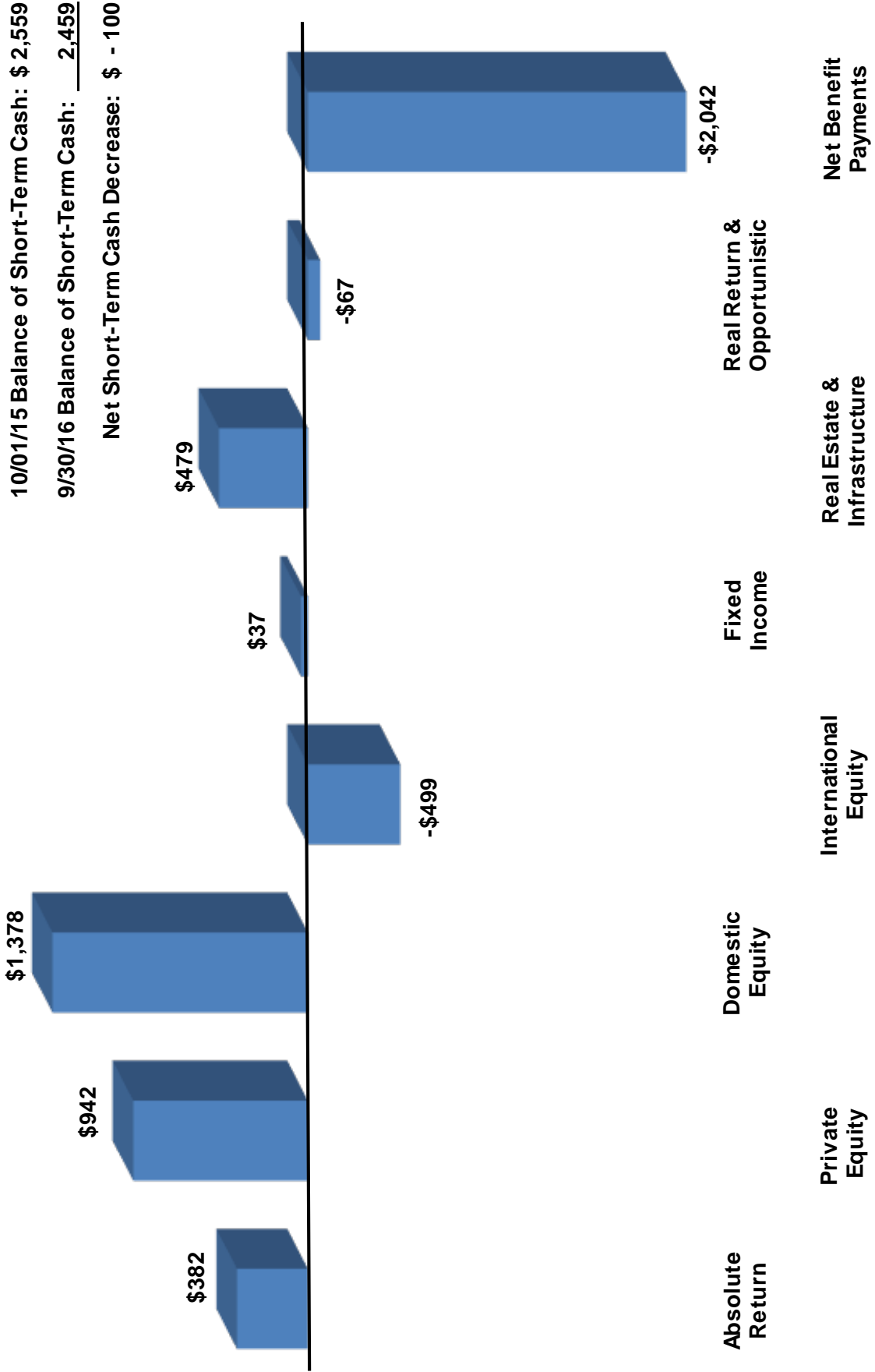
Pensions & Investments Survey - February 6, 2017 Issue

*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 2015 ~ September 2016



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 6/30/17

Asset Class	MPERS		MSERS		MSPRS		MJRS		SMRS
	Actual 6/30/17	Target 9/30/17	Actual 6/30/17	Target 9/30/17	Actual 6/30/17	Target 9/30/17	Actual 6/30/17	Target 9/30/17	Ranges
Broad U.S. Equity	26.5%	27.0%	26.5%	27.0%	26.5%	27.0%	26.7%	27.0%	20% - 50%
Private Equity	14.6%	16.5%	14.7%	16.5%	14.6%	16.5%	14.7%	16.5%	10% - 25%
Broad Int'l Equity	17.8%	16.0%	17.8%	16.0%	17.8%	16.0%	17.8%	16.0%	10% - 20%
U.S. Fixed Income Core	12.6%	12.0%	12.5%	12.0%	12.5%	12.0%	12.6%	12.0%	8% - 25%
Real Estate / Infrastructure	9.8%	10.5%	9.8%	10.5%	9.8%	10.5%	9.9%	10.5%	0% - 15%
Real Return / Opportunistic	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	0% - 15%
Absolute Return	6.2%	6.0%	6.2%	6.0%	6.2%	6.0%	6.2%	6.0%	0% - 12%
Cash	3.5%	3.0%	3.5%	3.0%	3.6%	3.0%	3.1%	3.0%	1% - 9%
TOTAL	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

September 7, 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.

MPSERS Plan	Assumed Return* (Arithmetic)	Standard Deviation*	Trailing 10-Year (Benchmark**)	Tactical (Short Term) Expectations***
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.

Real GDP % Growth Actual/Forecasts	2015	2016	2017	2018	2019
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	
Best	U.S. Equity	U.S. Equity	Int'l Equity	Gov't Bonds	Corp. Bonds	Gov't Bonds	Int'l Equity	Int'l Equity	Real Estate	Int'l Equity	Int'l Equity	Gov't Bonds	Int'l Equity	U.S. Equity	Real Estate	Int'l Equity	U.S. Equity	U.S. Equity	Real Estate	U.S. Equity	Worst
	32.94%	26.33%	26.97%	13.23%	10.40%	11.50%	40.82%	20.90%	20.06%	26.65%	16.65%	12.38%	41.44%	16.38%	14.26%	16.83%	32.80%	13.08%	13.32%	11.93%	
	Hedge Funds	Int'l Equity	U.S. Equity	Real Estate	Real Estate	Corp. Bonds	U.S. Equity	Real Estate	Int'l Equity	Real Estate	Real Estate	Cash	U.S. Equity	Real Estate	Gov't Bonds	U.S. Equity	Int'l Equity	Real Estate	U.S. Equity	Real Estate	
	14.95%	19.97%	20.27%	12.24%	7.28%	10.52%	29.58%	14.48%	16.62%	16.59%	15.84%	2.05%	27.24%	13.11%	9.02%	16.17%	15.29%	11.81%	1.01%	7.97%	
	Real Estate	Real Estate	Hedge Funds	Corp. Bonds	Gov't Bonds	Real Estate	Hedge Funds	U.S. Equity	U.S. Equity	U.S. Equity	Gov't Bonds	Inflation	Corp. Bonds	Int'l Equity	Corp. Bonds	Real Estate	Real Estate	Corp. Bonds	Gov't Bonds	Corp. Bonds	
	13.91%	16.24%	18.93%	9.40%	7.24%	6.74%	9.01%	11.78%	5.65%	15.34%	8.67%	0.10%	16.05%	11.15%	8.35%	10.54%	10.99%	7.53%	0.86%	5.63%	
	Corp. Bonds	Gov't Bonds	Real Estate	Cash	Cash	Hedge Funds	Real Estate	Hedge Funds	Hedge Funds	Hedge Funds	Hedge Funds	Corp. Bonds	Hedge Funds	Corp. Bonds	Inflation	Corp. Bonds	Hedge Funds	Gov't Bonds	Inflation	Inflation	
	10.23%	9.85%	11.36%	6.16%	4.43%	3.57%	8.99%	5.83%	5.13%	9.21%	7.68%	-3.07%	9.65%	8.46%	2.96%	9.37%	7.69%	4.92%	0.66%	4.50%	
	Gov't Bonds	Corp. Bonds	Cash	Hedge Funds	Hedge Funds	Inflation	Corp. Bonds	Corp. Bonds	Inflation	Cash	U.S. Equity	Real Estate	Inflation	Gov't Bonds	U.S. Equity	Hedge Funds	Inflation	Hedge Funds	Hedge Funds	Hedge Funds	
	9.58%	8.59%	4.83%	5.77%	3.11%	2.39%	7.69%	5.25%	3.42%	4.81%	5.47%	-6.46%	2.72%	5.52%	1.75%	4.06%	1.49%	0.51%	0.51%	2.30%	
	Cash	Cash	Inflation	Inflation	Inflation	Cash	Gov't Bonds	Gov't Bonds	Cash	Corp. Bonds	Corp. Bonds	Hedge Funds	Cash	Hedge Funds	Cash	Gov't Bonds	Cash	Inflation	Cash	Inflation	
	5.35%	5.24%	2.68%	3.39%	1.55%	1.79%	2.36%	3.48%	3.06%	4.27%	5.10%	-19.86%	0.19%	5.07%	0.10%	2.02%	0.68%	0.01%	0.01%	2.10%	
	Int'l Equity	Inflation	Corp. Bonds	U.S. Equity	U.S. Equity	Int'l Equity	Inflation	Inflation	Gov't Bonds	Gov't Bonds	Cash	U.S. Equity	Gov't Bonds	Inflation	Hedge Funds	Inflation	Corp. Bonds	Cash	Corp. Bonds	Gov't Bonds	
	1.77%	1.60%	-1.94%	-6.98%	-10.64%	-14.95%	1.88%	3.25%	2.65%	3.46%	5.03%	-36.72%	-2.19%	1.50%	-3.55%	1.70%	-2.01%	0.04%	-0.77%	1.05%	
	Inflation	Hedge Funds	Gov't Bonds	Int'l Equity	Int'l Equity	U.S. Equity	Cash	Cash	Corp. Bonds	Inflation	Inflation	Int'l Equity	Real Estate	Cash	Int'l Equity	Cash	Gov't Bonds	Int'l Equity	Int'l Equity	Cash	
	1.70%	-1.61%	-2.25%	-15.31%	-19.74%	-21.30%	1.16%	1.33%	1.95%	2.55%	4.06%	-45.52%	-16.86%	0.13%	-13.71%	0.11%	-2.60%	-3.87%	-5.67%	0.27%	
Worst																					

		Annualized Returns 1997 - 2016			
Return		Int'l	Gov't	US Eq.	R.E.
Risk		4.72%	4.93%	7.68%	9.78%
		17.31%	4.09%	15.29%	8.48%

- 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 by the 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

September 7, 2017



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	3.4%	4.0%	3.7%	4.3%	5.6%
Bloomberg Barclays US Agg	-0.3%	2.5%	2.2%	3.2%	4.5%
Peer Median Return	1.7%	3.0%	2.9%	4.3%	4.9%
Percentile Rank vs. Peers*	22	31	25	50	22

*State Street Universe greater than \$1 billion

- The outperformance to the benchmark over the past year was due to several key allocation decisions. The portfolio had a shorter duration than the benchmark which helped in a rising rate environment. The portfolio also benefitted from having an overweight to risk assets such as corporate bonds and securitized assets, which generally outperformed safe securities like U.S. Treasuries and Agency RMBS.
- 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 10.6% while Structured Fixed Income returned 7.1%. Overall, the externally managed portfolio returned 6.6% YOY, accounting for roughly 80% 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 June 30, 2017, the allocation to U.S. Treasuries, investment-grade corporate bonds, government-guaranteed Agency Residential Mortgage Backed Securities (RMBS) and Commercial Mortgage Backed Securities (CMBS) was approximately 67.1%. This includes a 19.0% 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 6.7% 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 18.9% 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.

Market Environment and Outlook

- U.S. Treasury rates increased across the yield curve on a YOY basis. The yield on the 10-year Treasury increased from 1.5% to 2.3% during the past twelve months while 2-year Treasury yields rose from 0.6% to 1.4%. Rising short-term rates were due to 75 basis points (bps) of monetary tightening since December of 2016. By the end of June 2017, the upper bound Fed Funds rate was 1.3%. The markets expect a 50% 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 June 2017 at 1.7%. 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 a dramatic recovery during the previous 18 months, especially in the high-yield market. High-yield spreads ended the quarter at 365 bps, which are 475 bps lower than the highest levels experienced during 2016. Investment-grade spreads are also lower, tightening roughly 100 bps since February 2016 to 109 bps. This movement has led to strong outperformance in the credit markets over the past year. Because spread levels are below their historical averages, the portfolio has reduced its allocation in this space.
- 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 376 bps. These spreads are wide of their five-year average and so 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
6/30/17

	Amount	Total	% of Total
Core (\$ in Millions)			
LTFID Internal	\$4,785		
Dodge & Cox	238		
Prudential Investment Grade Credit	228		
Total Core		\$5,251	63.8%
Securitized Debt			
Met West Securitized Ops	\$482		
Principal CMBS	612		
Napier Park ABS Income	148		
Napier Park Strategic Loan	39		
Napier Park CLO Debt	202		
TICP CLO Debt	201		
Total Securitized Debt		\$1,684	20.5%
High Yield			
Columbia Management	\$296		
Prudential High Yield	258		
Total High Yield		\$554	6.7%
Tactical			
Pyramis	\$293		
Loomis Core Plus	222		
Total Tactical		\$515	6.3%
Global			
T. Rowe Global Multi-Sector	\$223		
Total Global		\$223	2.7%
TOTAL		<u>\$8,227</u>	<u>100.0%</u>

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

6/30/17

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Maturity	7.0	7.8
Duration (Yrs)	4.9	6.0
Spread Duration (Yrs)	5.6	6.1
Coupon (%)	3.2	3.1
Yield to Maturity (%)	3.3	2.6
Credit Rating	A	AA-
VaR (%)	3.9	4.9
Tracking Error	98 bps	0
Beta (vs S&P 500)	0.04	-0.02

Commentary

Objectives

Highlights

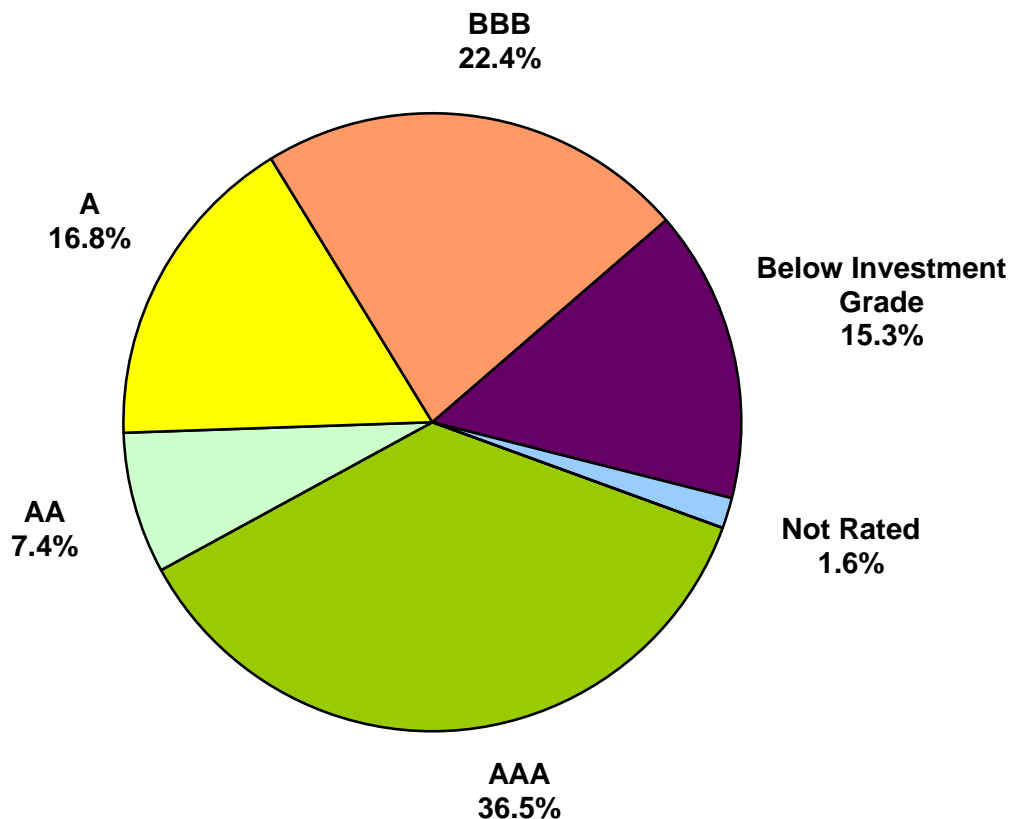
Income:	The coupon income is slightly higher than the benchmark and in addition, the overall portfolio yield-to-maturity is 60 bps higher than the bond index.
Liquidity:	21.1% of the portfolio is invested in cash, U.S. Treasuries, and TIPS. These investments can be liquidated via same-day trading.
Principal Preservation:	The portfolio has a large allocation to U.S. Treasuries and carries an investment-grade credit rating.
Diversification:	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

6/30/17



Market Value in Millions				
6/30/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$3,005	36.5%	71.4%	-34.9%
AA	608	7.4%	4.9%	2.5%
A	1,382	16.8%	10.8%	6.0%
BBB	1,842	22.4%	12.1%	10.3%
Not Rated	132	1.6%	0.8%	0.8%
* Below Investment Grade	1,258	15.3%	0.0%	15.3%
Total Investments	<u>\$8,227</u>	<u>100.0%</u>	<u>100.0%</u>	

* Comprised of approximately 10.7% High Yield Credit and 4.6% High Yield RMBS/ABS

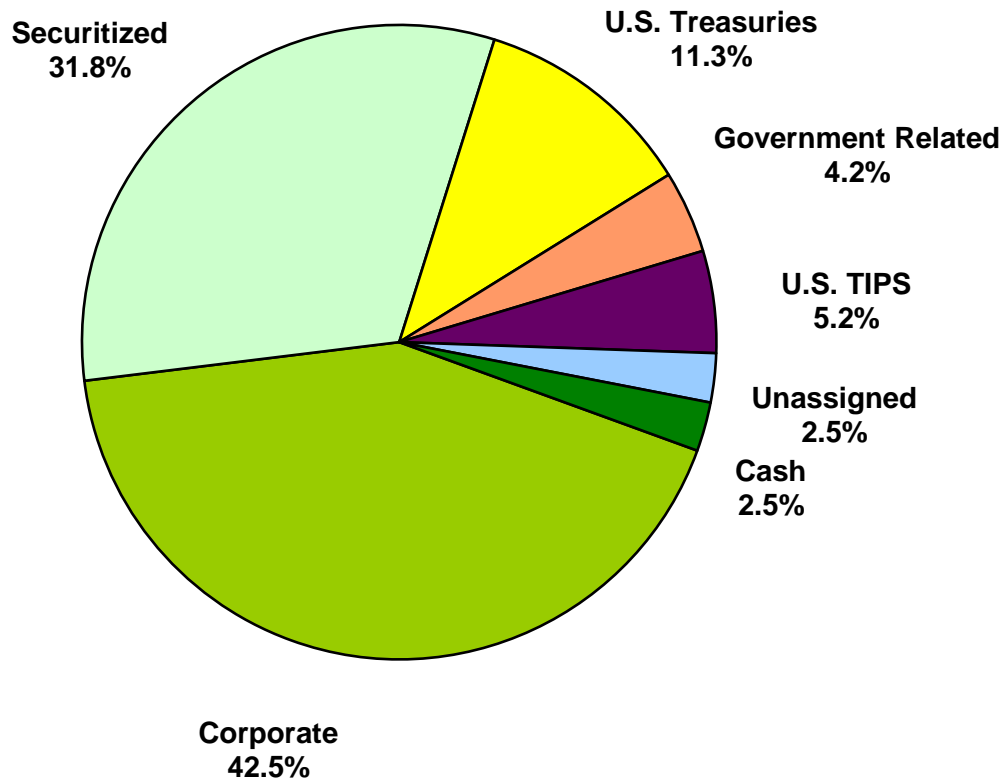
Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

Total U.S. Long-Term Fixed Income

6/30/17



Market Value in Millions				
6/30/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Corporate	\$3,498	42.5%	25.4%	17.1%
Securitized	2,618	31.8%	30.5%	1.3%
U.S. Treasuries	927	11.3%	36.8%	-25.5%
Government Related	345	4.2%	7.3%	-3.1%
U.S. TIPS	427	5.2%	0.0%	5.2%
Unassigned	207	2.5%	0.0%	2.5%
Cash	205	2.5%	0.0%	2.5%
Total Investments	<u>\$8,227</u>	<u>100.0%</u>	<u>100.0%</u>	

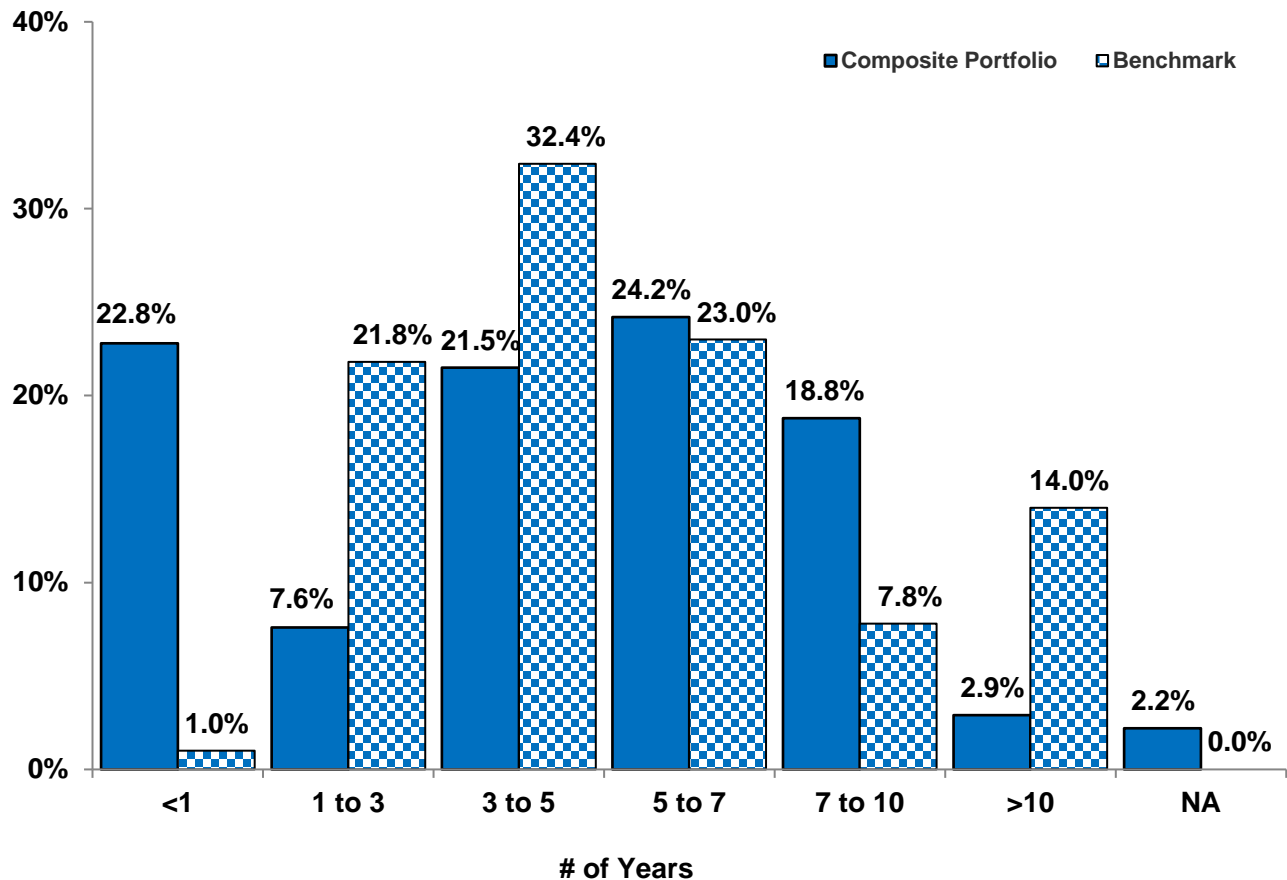
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

6/30/17



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,874	22.8%	1.0%	0.2	0.9
1 to 3	624	7.6%	21.8%	2.0	2.0
3 to 5	1,771	21.5%	32.4%	4.1	4.1
5 to 7	1,989	24.2%	23.0%	6.1	5.8
7 to 10	1,548	18.8%	7.8%	8.0	8.1
>10	235	2.9%	14.0%	15.0	16.0
NA	186	2.2%	0.0%	0.0	0.0
Total	\$8,227	100.0%	100.0%	4.7	6.0

* Effective Duration

SMRS Internal/External Manager Performance – Net of Fees

6/30/17

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>
Total Fixed Income	\$8,227,299,858	3.2%	3.8%	3.5%	4.2%	5.5%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>-0.3%</i>	<i>2.5%</i>	<i>2.2%</i>	<i>3.2%</i>	<i>4.5%</i>
Internal Fixed Income	\$4,785,484,036	1.1%	3.6%	3.1%	3.8%	5.3%
External Fixed Income	\$3,441,815,822	6.6%	4.1%	4.1%	5.0%	5.6%
Fixed Income Core	\$238,028,185	2.7%	3.1%	3.0%	4.0%	5.1%
Dodge & Cox Core	238,028,185	2.7%	3.0%	3.6%	4.3%	5.4%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>-0.3%</i>	<i>2.5%</i>	<i>2.2%</i>	<i>3.2%</i>	<i>4.5%</i>
Investment Grade Credit	\$227,768,612	2.9%	3.9%	4.3%	5.4%	5.8%
Prudential Investment Grade	227,768,612	2.9%	3.9%	4.4%	5.6%	6.7%
<i>Bloomberg/Barclays Credit Index</i>	<i>N/A</i>	<i>1.8%</i>	<i>3.4%</i>	<i>3.7%</i>	<i>4.9%</i>	<i>5.6%</i>
Tactical Fixed Income	\$515,057,688	5.9%	3.8%	--	--	--
Loomis Sayles CorePlus	221,909,616	3.1%	2.3%	--	--	--
Pyramis Tactical Bond Fund	293,148,072	5.7%	4.9%	--	--	--
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>-0.3%</i>	<i>2.5%</i>	<i>2.2%</i>	<i>3.2%</i>	<i>4.5%</i>
High Yield Fixed Income	\$553,533,006	10.6%	5.1%	--	--	--
Columbia Management High Yield	295,766,800	10.2%	5.1%	--	--	--
Prudential High Yield	257,766,206	11.0%	5.1%	--	--	--
<i>Bloomberg/Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>10.9%</i>	<i>4.4%</i>	--	--	--
Structured Fixed Income	\$1,683,985,866	--	--	--	--	--
Principal CMBS	612,127,668	4.7%	3.8%	8.2%	11.5%	--
MetWest Securitized Opportunities	482,095,118	7.8%	3.4%	--	--	--
Napier Park ABS Income	148,180,707	14.7%	--	--	--	--
Napier Park Strategic Loan LP	39,031,300	N/A	--	--	--	--
Napier Park CLO Debt	201,674,404	N/A	--	--	--	--
TICP CLO Debt	200,876,669	N/A	--	--	--	--
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>-0.3%</i>	<i>2.5%</i>	<i>2.2%</i>	<i>3.2%</i>	<i>4.5%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>-1.6%</i>	<i>3.8%</i>	<i>4.2%</i>	<i>5.7%</i>	
Global Fixed Income	\$223,442,465	5.0%	--	--	--	--
T. Rowe Global Multi-Sector	223,442,465	5.0%	--	--	--	--
<i>Custom GMS Benchmark</i>	<i>N/A</i>	<i>3.4%</i>				

State of Michigan Retirement Systems

DOMESTIC EQUITY REVIEW

Investment Advisory Committee Meeting

September 7, 2017



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

EXECUTIVE SUMMARY

Performance

Total Domestic Equity, Gross	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	17.9%	8.5%	14.7%	14.9%	7.2%
S&P 1500	18.1%	9.5%	14.7%	15.4%	7.3%
Peer Median Return	18.2%	8.3%	13.9%	14.6%	7.1%
Percentile Rank vs. Peers*	64	49	32	42	38

*State Street Universe greater than \$1 billion

- Total Domestic Equity outperformed its peer group over three, five, seven, and ten year periods gross of fees, while underperforming during the past year.
 - Based on a recent assessment by Aon-Hewitt, the Total Domestic Equity Portfolio is estimated to have a 15-20 basis points (bps) cost advantage over its peers, further widening its outperformance gap over the past three and five years and narrowing its underperformance over the past year.
- While performance relative to the S&P 1500 was challenged over all time periods as of June 30, the Total Domestic Equity Portfolio's one-year performance finished within 20 bps of the benchmark by quarter end and further improved to approximately 60 bps ahead of the S&P 1500 for the one year period ended July 31. Improved results are being driven by several factors, including:
 - Strength in SMRS' externally managed portfolios, particularly Seizert Capital Partners, Ark Investments and Fisher Investments.
 - The addition of Mellon Capital's overlay strategy to the division's portfolio.
 - Outperformance in SMRS' internally managed portfolios for the one-year period ended July 31.
 - 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 fund-like cost.

Strategy Update

- SMRS has an index fund-like cost structure and a value orientation, both of which are predictors of future relative performance according to academic studies.

- SMRS now also has a specialized overlay manager, Mellon Capital, whose job is to add returns to the portfolio above and beyond that of its member constituents.
 - Since its funding on March 1, 2017, the Mellon Capital Overlay program has added 15 bps to domestic equity returns and 30 bps to actively managed returns.
 - The division is also selectively using options in lieu of physical securities in order to capitalize on the current low volatility environment, inexpensively participating in up-markets while exposing the portfolio to limited downside exposure.
- Domestic Equity's portfolio would outperform the S&P 1500 by ~11% were it to appreciate to the market multiple of 18.5x from where it stands now at 16.7x. It is expected for the Domestic Equity multiple to at least partially converge with that of the S&P 1500 over the next five years.
 - The portfolio also has a higher dividend yield than the benchmark, generating \$40 million more per year in cash, alongside measurably higher rates of capital reinvestment.
- The Domestic Equity Portfolio remains overweight to both the financial sector and to defensive stocks and underweight commodity related exposure.
- If PE ratios do not converge, we expect long-term outperformance based on a higher net dividend yield (dividends + buybacks) than the benchmark alongside higher rates of earnings reinvestment.

Market Environment and Outlook

- At ~21x normalized levels of profitability, equity markets are on the rich side relative to history, but still reasonably priced for an environment where bond yields stay low.
 - Price to earnings multiples should be higher than have been the case historically in an environment where bond yields are lower than they have been historically.
- 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 3.2% total shareholder yield, or 1.2% in share count reductions via buybacks on top of the current 2.0% S&P 1500 dividend yield.
 - The market is thus poised to return an estimated 7.7% (3.2% 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 2.8%, and unfavorably to the historical compound annual return for the S&P 500 from 1928 – 2016 of 9.5%.

SMRS

Domestic Equity Strategies

6/30/17

Markets	Amount	Total	% of Total
Internal Indexed (\$ in Millions)			
Indexed Portfolios	\$7,936		
Total Indexed		\$7,936	45.6%
Internal Active			
Active Portfolios	\$5,089		
Total Internal Active		\$5,089	29.3%
External Active			
Los Angeles Capital	\$1,246		
Fisher Investments	729		
Seizert Capital Partners	577		
Clarkston Capital Partners	546		
Mellon Capital	417		
ARK Investments	310		
Bivium Capital	210		
Attucks Asset Management	201		
Munder Capital Management	68		
Northpointe Capital	63		
Total External Active		\$4,367	25.1%

Total Domestic Equity

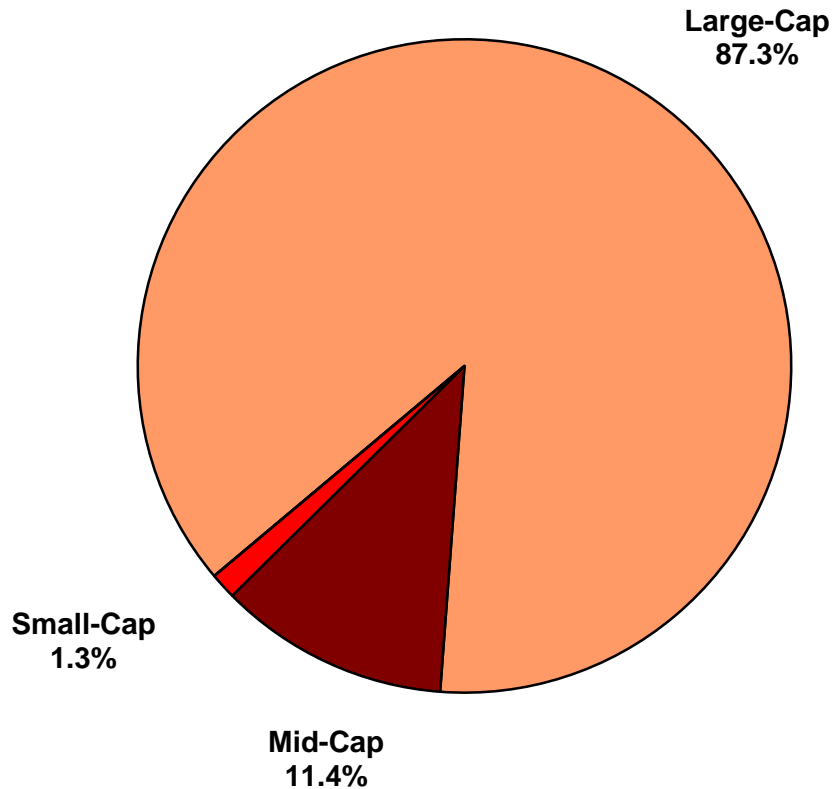
\$17,392

100.0%

SMRS

Domestic Equity Exposure By Market Cap

6/30/17



Market Value in Millions			
	<u>6/30/17</u>		
	<u>Assets</u>	<u>Percent</u>	<u>S&P 1500</u>
Large-Cap (>\$10B)	\$15,183	87.3%	87.6%
Mid-Cap (>\$4 <\$10B)	1,983	11.4%	6.9%
Small-Cap (<\$4B)	226	1.3%	5.5%
Total Domestic Equity	<u>\$17,392</u>	<u>100.0%</u>	<u>100.0%</u>

SMRS

Domestic Equities Composite

6/30/17

Date:	<u>6/30/17</u>	<u>3/31/17</u>	<u>12/31/16</u>	<u>9/30/16</u>
Assets (\$ in Millions):	\$17,392	\$16,905	\$16,059	\$15,842
Number of Securities:	1,278	1,300	1,322	1,316
Active Share:	44%	40%	37%	34%

Benchmark: S&P 1500

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

Characteristics:	<u>SMRS</u>	<u>S&P 1500</u>	<u>S&P 1500 Value</u>
Weighted Average Capitalization (\$ in Billions)	\$186.1	\$148.9	\$113.6
P/E FY1	16.7x	18.5x	16.3x
P/E upside to S&P 1500	10.8%	0.0	13.6%
Price/Book	3.1x	2.9x	2.0x
Beta	1.05	1.00	1.04
Tracking Error	1.3%	--	3.1%
Dividend Yield	2.2%	2.0%	2.3%
Buyback Yield	1.9%	1.7%	1.6%
Reinvestment Rate	5.3%	4.1%	4.2%
Return on Equity	18.1%	15.6%	12.0%

TOP TEN EXPOSURES - Domestic Equities 6/30/17

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

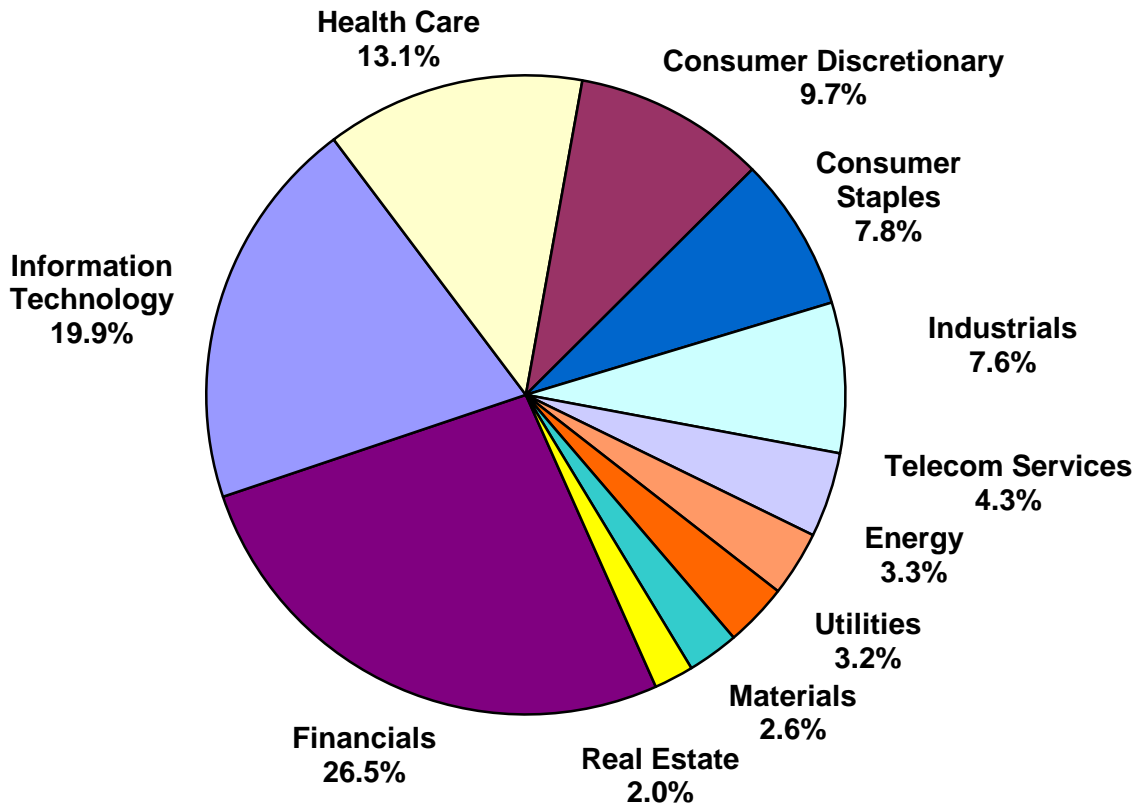
	<u>Portfolio Weight</u>	<u>Market Capitalization*</u>	<u>FY1 P/E</u>	<u>YTD Total Return</u>	<u>Market Value**</u>
SPDR S&P 500 ETF Trust	9.4%	\$236.7	18.5	9.2%	\$1,502.2
Berkshire Hathaway Inc. Class B	5.2%	417.8	22.9	3.9%	842.8
Apple Inc.	4.1%	744.6	16.2	25.4%	663.1
Verizon Communications Inc.	3.9%	182.2	12.0	-14.4%	630.1
JPMorgan Chase & Co.	3.1%	321.6	13.8	7.1%	496.4
SPDR Bloomberg Barclays Long Term Treasury ETF***	2.9%	N/A	40.9	5.8%	466.9
U.S. Bancorp	2.8%	87.2	15.0	2.2%	448.1
Facebook, Inc. Class A	2.1%	438.3	31.2	31.2%	337.4
Wells Fargo & Company	1.9%	275.2	13.4	1.9%	300.5
Microsoft Corporation	<u>1.8%</u>	531.3	22.7	12.2%	<u>291.0</u>
TOTAL	<u>37.2%</u>				<u>\$5,978.5</u>

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

SMRS

Domestic Equity By Sector

6/30/17



Market Value in Millions				
6/30/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$4,609	26.5%	14.7%	11.8%
Information Technology	3,461	19.9%	21.7%	-1.8%
Health Care	2,278	13.1%	14.1%	-1.0%
Consumer Discretionary	1,687	9.7%	12.3%	-2.6%
Consumer Staples	1,356	7.8%	8.5%	-0.7%
Industrials	1,322	7.6%	10.9%	-3.3%
Telecom Services	748	4.3%	2.0%	2.3%
Energy	574	3.3%	5.7%	-2.4%
Utilities	557	3.2%	3.3%	-0.1%
Materials	452	2.6%	3.3%	-0.7%
Real Estate	348	2.0%	3.5%	-1.5%
Total	<u>\$17,392</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

6/30/17

Date:	<u>6/30/17</u>	<u>3/31/17</u>	<u>12/31/16</u>	<u>9/30/16</u>
Assets (\$ in Millions):	\$9,455	\$9,181	\$8,734	\$8,403
Number of Securities:	977	981	980	1,015
Active Share:	78%	72%	66%	63%

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.

Characteristics:	<u>SMRS</u>	<u>S&P 1500</u>	<u>S&P 1500 Value</u>
Weighted Average Capitalization (\$ in Billions)	\$192.7	\$148.9	\$113.6
P/E FY1	15.2x	18.5x	16.3x
P/E upside to S&P 1500	21.5%	0.0	13.6%
Price/Book	3.1x	2.9x	2.0x
Beta	1.09	1.00	1.04
Tracking Error	2.3%	--	3.1%
Dividend Yield	2.3%	2.0%	2.3%
Buyback Yield	2.0%	1.7%	1.6%
Reinvestment Rate	6.6%	4.1%	4.2%
Return on Equity	19.7%	15.6%	12.0%

TOP TEN EXPOSURES - Actively Managed Equities

6/30/17

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

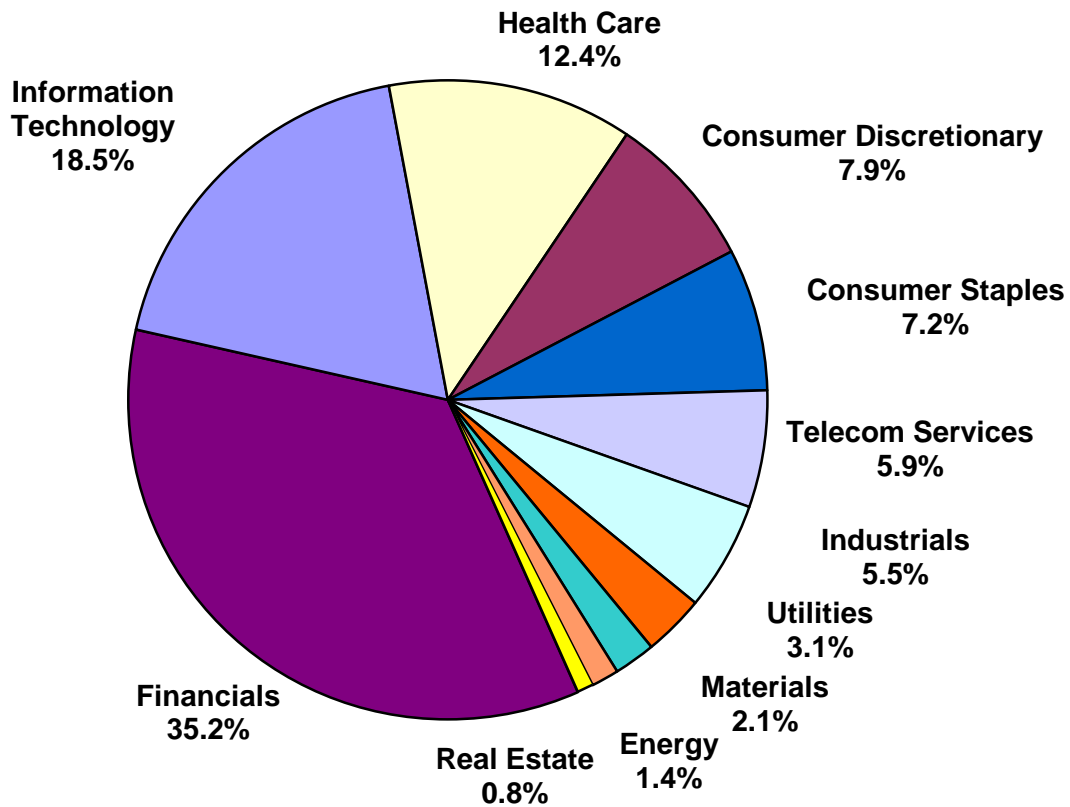
	<u>Portfolio Weight</u>	<u>Market Capitalization*</u>	<u>FY1 P/E</u>	<u>YTD Total Return</u>	<u>Market Value**</u>
SPDR S&P 500 ETF Trust	12.0%	\$236.7	18.5	9.2%	\$1,147.9
Berkshire Hathaway Inc. Class B	8.0%	417.8	22.9	3.9%	765.4
Verizon Communications Inc.	6.0%	182.2	12.0	-14.4%	569.8
SPDR Bloomberg Barclays Long Term Treasury ETF***	4.9%	N/A	40.9	5.8%	466.9
U.S. Bancorp	4.4%	87.2	15.0	2.2%	420.7
Apple Inc.	4.4%	744.6	16.2	25.4%	417.2
JPMorgan Chase & Co.	4.1%	321.6	13.8	7.1%	388.1
Aflac Incorporated	2.6%	30.8	11.9	12.9%	251.7
Exelon Corporation	2.5%	34.6	13.5	3.6%	240.9
Gilead Sciences, Inc.	<u>2.4%</u>	92.4	8.7	0.4%	<u>228.8</u>
TOTAL	<u>51.4%</u>				<u>\$4,897.5</u>

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

SMRS

Active Equity By Sector

6/30/17



Market Value in Millions				
6/30/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$3,328	35.2%	14.7%	20.5%
Information Technology	1,749	18.5%	21.7%	-3.2%
Health Care	1,172	12.4%	14.1%	-1.7%
Consumer Discretionary	747	7.9%	12.3%	-4.4%
Consumer Staples	681	7.2%	8.5%	-1.3%
Telecom Services	558	5.9%	2.0%	3.9%
Industrials	520	5.5%	10.9%	-5.4%
Utilities	293	3.1%	3.3%	-0.2%
Materials	199	2.1%	3.3%	-1.2%
Energy	132	1.4%	5.7%	-4.3%
Real Estate	76	0.8%	3.5%	-2.7%
Total	<u>\$9,455</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

Manager Performance - Net of Fees
6/30/17

<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>
SMRS S&P 500 Index	\$7,191,635,069	18.2%	9.8%	14.9%	15.7%	--	N/A
S&P 500		17.9%	9.6%	14.6%	15.4%	--	
Style & Risk Adjusted Benchmark		17.9%	9.6%	14.6%	15.4%	--	
Lipper Large-Cap Core		17.2%	7.9%	13.4%	14.0%	--	
<i>Excess Return</i>		0.3%	0.2%	0.3%	0.3%	--	
<i>Alpha</i>		0.4%	0.3%	0.3%	0.4%	--	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		39	13	14	7	--	
SMRS Large-Cap Core	2,321,688,387	17.0%	6.0%	14.8%	14.0%	7.3%	8/31/07
S&P 500		17.9%	9.6%	14.6%	15.4%	7.6%	
Style & Risk Adjusted Benchmark		15.7%	6.8%	12.5%	13.5%	7.9%	
Lipper Large-Cap Core		17.2%	7.9%	13.4%	14.0%	6.8%	
<i>Excess Return</i>		-0.9%	-3.7%	0.1%	-1.4%	-0.3%	
<i>Alpha</i>		1.2%	-0.8%	2.3%	0.4%	-0.6%	
<i>Pct Rank vs Lipper Large-Cap Core</i>		54	85	15	56	35	
SMRS Large-Cap Growth	1,591,864,985	14.9%	8.5%	14.4%	15.2%	8.9%	5/31/05
S&P 500 Growth Index		19.3%	11.0%	15.2%	16.6%	9.5%	
Style & Risk Adjusted Benchmark		18.5%	11.6%	16.0%	17.2%	9.6%	
Lipper Large Growth		20.4%	9.8%	14.5%	15.4%	9.0%	
<i>Excess Return</i>		-4.4%	-2.5%	-0.9%	-1.4%	-0.6%	
<i>Alpha</i>		-3.6%	-3.1%	-1.6%	-2.0%	-0.7%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		92	76	54	55	52	
SMRS All-Cap Garp	1,093,004,148	19.4%	8.4%	13.8%	--	13.9%	4/30/11
S&P 1500 Super Composite		18.1%	9.5%	14.7%	--	12.4%	
Style & Risk Adjusted Benchmark		19.4%	9.2%	14.5%	--	12.3%	
Lipper Multi Core		17.4%	6.7%	13.1%	--	10.3%	
<i>Excess Return</i>		1.3%	-1.2%	-0.9%	--	1.5%	
<i>Alpha</i>		0.0%	-0.9%	-0.6%	--	1.6%	
<i>Pct. Rank vs. Lipper Multi Core</i>		32	29	45	--	2	
SMRS Mid-Cap Index	744,583,135	19.6%	9.3%	15.7%	16.3%	--	N/A
S&P 400		18.6%	8.5%	14.9%	15.4%	--	
Style & Risk Adjusted Benchmark		18.5%	8.5%	14.8%	15.3%	--	
Lipper Large-Cap Core		17.4%	6.4%	13.5%	13.8%	--	
<i>Excess Return</i>		1.1%	0.8%	0.8%	0.9%	--	
<i>Alpha</i>		1.1%	0.9%	0.9%	1.0%	--	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		22	7	7	2	--	
LA Capital Deep Value	732,362,010	15.4%	--	--	--	6.7%	4/1/15
S&P 1500 Value		16.2%	--	--	--	8.4%	
Style & Risk Adjusted Benchmark		14.7%	--	--	--	8.5%	
Lipper Multi-Cap Value		17.8%	--	--	--	6.4%	
<i>Excess Return</i>		-0.9%	--	--	--	-1.7%	
<i>Alpha</i>		0.6%	--	--	--	-1.8%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		71	--	--	--	46	
Fisher All-Cap	728,702,841	21.9%	11.2%	14.2%	14.1%	10.4%	10/31/04
S&P 1500/S&P 600 Value Blend		18.1%	9.5%	14.8%	15.1%	9.2%	
Style & Risk Adjusted Benchmark		19.5%	10.8%	15.8%	19.4%	11.1%	
Lipper Multi Core		17.4%	6.7%	13.1%	13.6%	7.9%	
<i>Excess Return</i>		3.8%	1.7%	-0.6%	-0.9%	1.3%	
<i>Alpha</i>		2.4%	0.4%	-1.6%	-5.3%	-0.7%	
<i>Pct. Rank vs. Lipper Multi Core</i>		15	3	36	47	2	
Seizert Capital Partners	577,112,614	25.4%	7.2%	15.7%	15.8%	14.6%	11/30/09
S&P 1500/S&P 400 Value Blend		18.1%	9.5%	14.7%	16.4%	16.2%	
Style & Risk Adjusted Benchmark		17.3%	8.5%	14.5%	15.2%	13.7%	
Lipper Multi Core		17.4%	6.7%	13.1%	13.6%	12.6%	
<i>Excess Return</i>		7.3%	-2.3%	1.0%	-0.5%	-1.6%	
<i>Alpha</i>		8.0%	-1.3%	1.2%	0.7%	0.9%	
<i>Pct. Rank vs. Lipper Multi Core</i>		5	50	8	7	9	

<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>
LA Capital All-Cap Growth	\$513,291,537	13.6%	12.4%	17.1%	17.0%	11.7%	5/31/05
S&P 1500 Growth		19.3%	10.9%	15.2%	16.5%	9.6%	
Style & Risk Adjusted Benchmark		18.1%	8.7%	13.3%	15.6%	10.1%	
Lipper Multi-Cap Growth		19.9%	7.8%	13.4%	14.3%	9.0%	
<i>Excess Return</i>		-5.7%	1.5%	1.9%	0.5%	2.1%	
<i>Alpha</i>		-4.5%	3.7%	3.8%	1.5%	1.5%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		87	6	7	9	7	
Ark Investments	310,466,632	42.0%	--	--	--	39.1%	3/1/16
S&P 1500 Growth		19.3%	--	--	--	21.1%	
Style & Risk Adjusted Benchmark		39.9%	--	--	--	33.0%	
Lipper All-Cap Growth		19.9%	--	--	--	20.4%	
<i>Excess Return</i>		22.7%	--	--	--	18.0%	
<i>Alpha</i>		2.1%	--	--	--	6.0%	
<i>Pct. Rank vs. Lipper All-Cap Growth</i>		1	--	--	--	1	
Clarkston Capital Large-Cap	305,971,913	13.0%	--	--	--	9.6%	4/1/15
S&P 500		17.9%	--	--	--	9.6%	
Style & Risk Adjusted Benchmark		12.8%	--	--	--	6.9%	
Lipper Large-Cap Core		17.2%	--	--	--	7.9%	
<i>Excess Return</i>		-4.9%	--	--	--	0.0%	
<i>Alpha</i>		0.1%	--	--	--	2.7%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		87	--	--	--	19	
Clarkston Capital Small-Cap	239,890,872	15.4%	12.1%	--	--	12.4%	1/1/14
S&P 600		22.5%	9.3%	--	--	8.9%	
Style & Risk Adjusted Benchmark		16.3%	7.2%	--	--	7.9%	
Lipper Small-Cap Core		21.0%	6.0%	--	--	6.2%	
<i>Excess Return</i>		-7.0%	2.8%	--	--	3.5%	
<i>Alpha</i>		-0.9%	5.0%	--	--	4.5%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		91	1	--	--	1	
Bivium Capital Partners	209,797,856	19.0%	6.7%	12.2%	13.7%	5.9%	11/30/07
S&P 1500 Value		16.2%	7.8%	14.0%	14.2%	5.6%	
Style & Risk Adjusted Benchmark		14.1%	8.3%	15.7%	17.0%	7.5%	
Lipper Multi Cap Value		17.8%	5.8%	13.1%	13.1%	5.7%	
<i>Excess Return</i>		2.7%	-1.1%	-1.8%	-0.5%	0.3%	
<i>Alpha</i>		4.9%	-1.6%	-3.5%	-3.3%	-1.5%	
<i>Pct. Rank vs. Lipper Multi Cap Value</i>		42	39	77	45	39	
Attucks Asset Management	200,643,680	16.6%	5.7%	12.3%	13.2%	6.2%	11/30/07
S&P 1500 Super Composite		18.1%	9.5%	14.7%	15.4%	7.2%	
Style & Risk Adjusted Benchmark		13.2%	9.9%	15.3%	16.1%	7.3%	
Lipper Multi Core		17.4%	6.7%	13.1%	13.6%	6.0%	
<i>Excess Return</i>		-1.5%	-3.8%	-2.4%	-2.2%	-1.1%	
<i>Alpha</i>		3.3%	-4.2%	-3.0%	-2.9%	-1.1%	
<i>Pct. Rank vs. Lipper Multi Core</i>		60	72	71	66	52	
Munder Concentrated SMID Cap	68,480,922	16.9%	4.0%	11.2%	12.7%	15.4%	4/30/09
S&P 400 Mid-Cap Growth		17.9%	9.2%	14.6%	15.7%	18.6%	
Style & Risk Adjusted Benchmark		17.8%	10.2%	16.4%	15.6%	17.4%	
Lipper Mid-Cap Growth		19.0%	7.0%	13.0%	13.9%	16.3%	
<i>Excess Return</i>		-1.0%	-5.2%	-3.4%	-3.0%	-3.2%	
<i>Alpha</i>		-0.9%	-6.2%	-5.2%	-2.8%	-2.0%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		62	87	83	78	74	
NorthPointe All-Cap Core	63,166,788	11.0%	5.6%	12.2%	11.6%	7.0%	10/31/04
NorthPointe Blended Benchmark		18.1%	9.5%	14.7%	15.4%	8.7%	
Style & Risk Adjusted Benchmark		15.2%	7.7%	12.3%	16.7%	9.8%	
Lipper Multi Core		17.4%	6.7%	13.1%	13.6%	7.9%	
<i>Excess Return</i>		-7.1%	-3.9%	-2.5%	-3.9%	-1.7%	
<i>Alpha</i>		-4.1%	-2.1%	-0.1%	-5.1%	-2.7%	
<i>Pct. Rank vs. Lipper Multi Core</i>		92	74	73	86	81	

State of Michigan Retirement Systems

INTERNATIONAL EQUITY REVIEW

Investment Advisory Committee Meeting

September 7, 2017



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

EXECUTIVE SUMMARY

Performance

International Equity, Gross	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	22.1%	2.7%	8.6%	8.0%	1.4%
MSCI ACWI ex USA Returns	20.5%	0.8%	7.4%	6.6%	0.3%
Peer Median Return	20.3%	2.0%	8.8%	8.1%	1.9%
Percentile Rank vs. Peers*	27	33	67	65	84

*Source: State Street Universe greater than \$1 billion

- International Equity Division portfolio outperformed the benchmark by 1.6% over the last twelve months. The largest contributing strategy was stock plus which added 0.8% of excess returns.
- Active strategy investments, on a rolling twelve month basis, outperformed the benchmark by 0.7% adding value for the first time since June 30, 2016. The outperformance was driven through exposures to Japan, small capitalization stocks, and emerging markets.

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.
- Quarterly changes to International Equity Division allocation.
 - Allocated \$500 million in May to increase exposure to MSCI ACWI ex USA.

- New funds were allocated to International Equity Division.
- Stock plus strategy received full \$500 million targeting a swap on the MSCI ACWI ex USA.
- Allocated \$330 million in June to increase exposure to emerging markets.
 - Removed emerging markets underweight of approximately 2.9%.
 - Valuation data indicated emerging markets remain statistically cheaper than developed markets.
 - Moved capital from internal developed markets stock plus to internal emerging markets stock plus.

Market Environment and Outlook

- MSCI ACWI ex USA trailing 12-month price-to-earnings ratio is 18.1, slightly lower than the twenty-year average of 19.1.
- Forward looking total return on an annualized basis for the MSCI ACWI ex USA index is estimated to be approximately 8.4%. This assumes an 11.5% ROE, in line with the 20-year index average, long-term developed markets growth of 3.5%, and long-term emerging markets growth of 5.5%.
- Countries with ten-year government bond yields below 1.3% currently make up approximately 58.6% of the benchmark, e.g., Switzerland 0.0%, Japan 0.1%, Germany 0.5%, France 0.7%, and United Kingdom 1.2%.
- A ten-year blended international government yield of 1.8% implies an international equity risk premium of 6.6%. International bond rates are significantly lower than the U.S. ten-year note at 2.3%.
- Emerging market valuation spreads remain wider than developed markets despite price appreciation in many emerging markets over the last twelve months. In addition, the average emerging market company multiple relative to history remains at a larger discount than developed market companies.
- 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.
- The U.S. dollar (USD) peaked in January 2017 and has weakened 9.0% through the second quarter of 2017. A continuation of this trend in 2017 potentially presents a tailwind for international investment returns.

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, a weakening USD and stabilization in commodity prices.

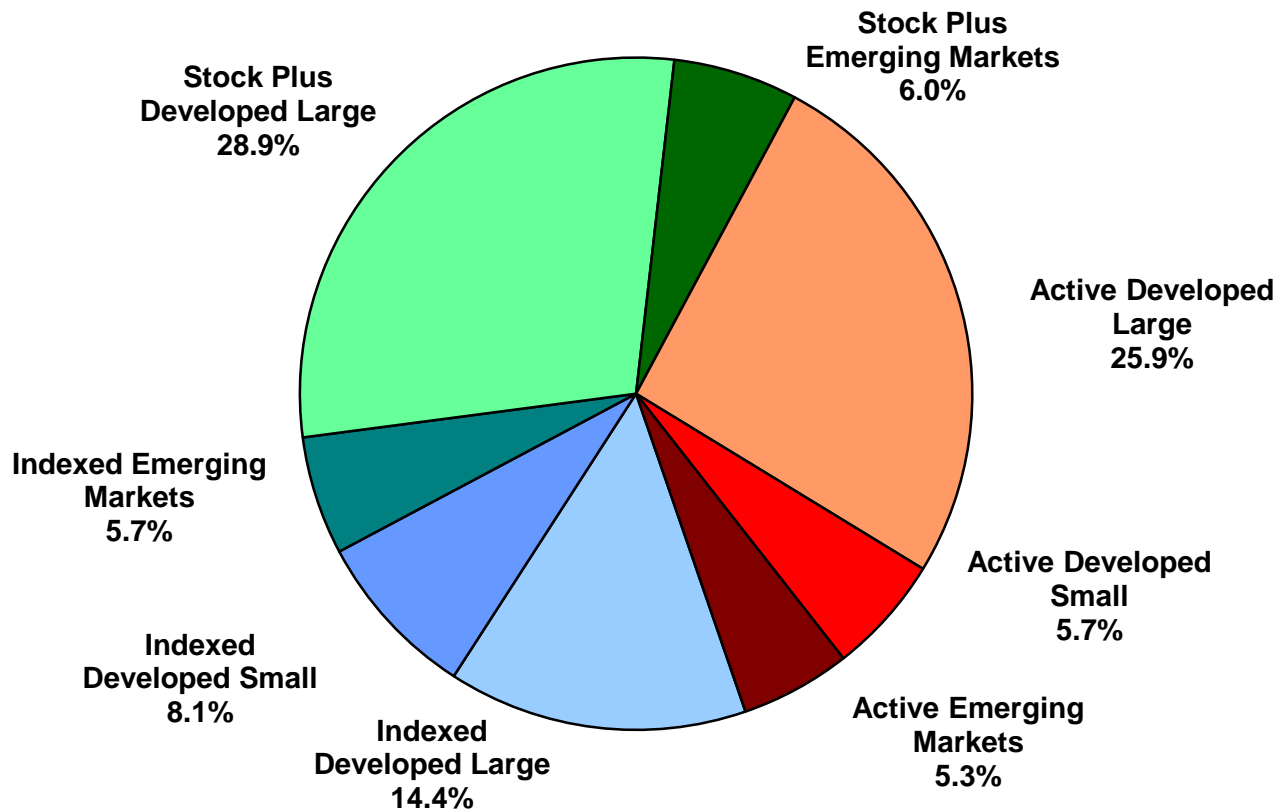
SMRS
International Equity Strategies
6/30/17

Markets	Amount	Total	% of Total
Indexed (\$ in Millions)			
SSgA	\$2,081		
Vanguard	1,196		
Total Indexed		\$3,277	28.2%
Stock Plus			
Internal Swaps	\$2,422		
PIMCO	1,640		
Total Stock Plus		\$4,062	34.9%
Active			
Los Angeles Capital Management	\$1,276		
Wellington	918		
Marathon-London	691		
SSgA	662		
Effissimo Capital Management	297		
Lazard	229		
Martin Currie	225		
Total Active		\$4,298	36.9%
TOTAL		<u>\$11,637</u>	<u>100.0%</u>

SMRS

International Equity Exposure By Category

6/30/17



Market Value in Millions		
	<u>6/30/17</u>	
<u>Indexed</u>		
Developed Large	\$1,674	14.4%
Developed Small	939	8.1%
Emerging Markets	664	5.7%
Total Indexed Equity	<u>\$3,277</u>	<u>28.2%</u>
<u>Stock Plus</u>		
Developed Large	\$3,366	28.9%
Emerging Markets	696	6.0%
Total Stock Plus Equity	<u>\$4,062</u>	<u>34.9%</u>
<u>Active</u>		
Developed Large	\$3,018	25.9%
Developed Small	662	5.7%
Emerging Markets	618	5.3%
Total Active Equity	<u>\$4,298</u>	<u>36.9%</u>
Total International Equity	<u>\$11,637</u>	<u>100.0%</u>

SMRS

International Equities

6/30/17

Date:	<u>6/30/17</u>	<u>3/31/17</u>	<u>12/31/16</u>
Assets (\$ in Millions):	\$11,637	\$10,491	\$9,687
Number of Securities:	9,529	9,190	9,201
Active Share:	33.5%	35.1%	34.2%

Benchmark: MSCI ACWI ex USA

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

Characteristics:	<u>SMRS</u>	<u>MSCI ACWI ex USA</u>
Weighted Average Capitalization (\$ in Billions):	\$31.9	\$46.9
P/E TTM:	17.7x	18.1x
P/E FY1:	14.8x	14.4x
Price/Book:	1.7x	1.7x
Price/Sales:	1.1x	1.2x
Beta:	0.97	1.00
Average Valuation Discount:	4.1%	0.0%
Tracking Error:	1.1%	0.0%
Dividend Yield:	2.5%	2.8%

TOP TEN HOLDINGS

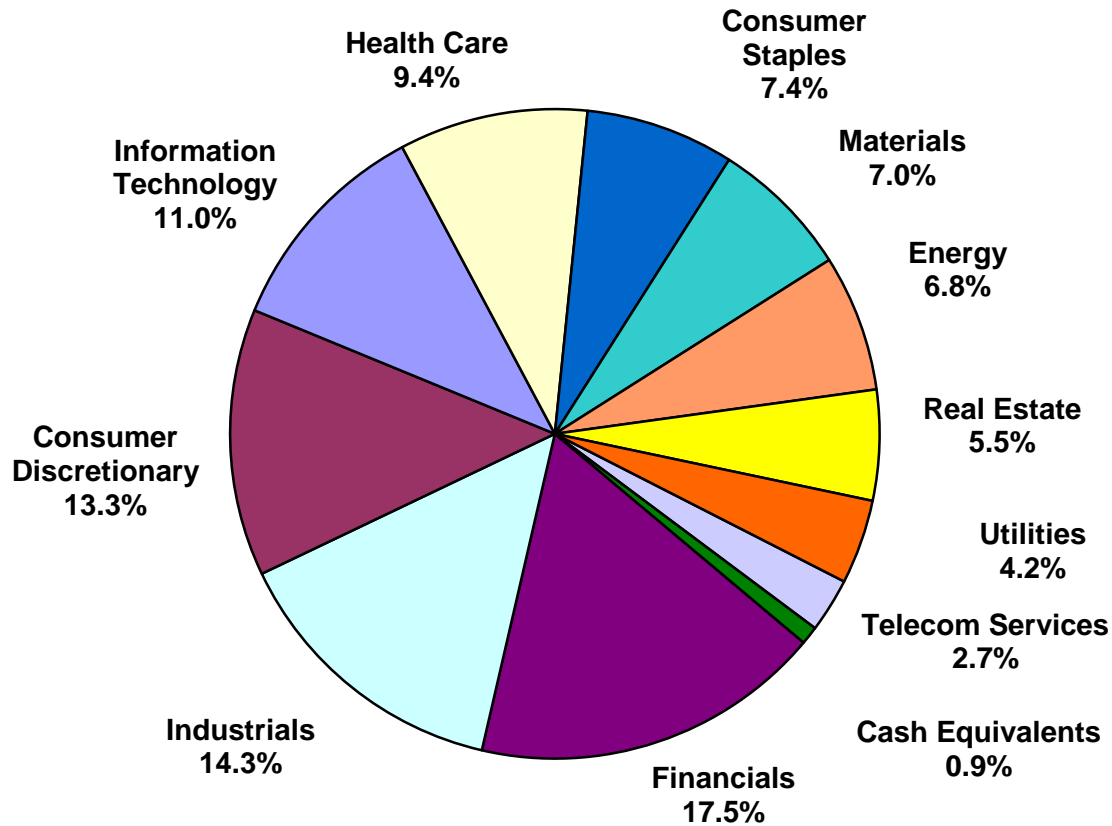
(\$ in Billions)

	<u>Portfolio Weight</u>	<u>Market Capitalization</u>
Tencent Holdings Ltd.	1.0%	\$339.0
Kawasaki Kisen Kaisha, Ltd.	1.0%	2.3
Samsung Electronics Co., Ltd.	0.9%	301.8
Taiwan Semiconductor Manufacturing Co., Ltd.	0.8%	177.7
Novartis AG	0.7%	218.1
Nestle S.A.	0.6%	271.2
Alibaba Group Holding Ltd. Sponsored ADR	0.6%	356.4
British American Tobacco p.l.c.	0.6%	126.8
Roche Holding Ltd Genussch.	0.5%	220.4
Nissan Shatai Co., Ltd.	<u>0.5%</u>	<u>1.6</u>
TOTAL	<u>7.2%</u>	<u>\$2,015.3</u>

SMRS

International Equity By Sector

6/30/17



Market Value in Millions				
6/30/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$2,036	17.5%	23.3%	-5.8%
Industrials	1,664	14.3%	12.0%	2.3%
Consumer Discretionary	1,548	13.3%	11.3%	2.0%
Information Technology	1,279	11.0%	10.8%	0.2%
Health Care	1,100	9.4%	8.1%	1.3%
Consumer Staples	856	7.4%	9.9%	-2.5%
Materials	811	7.0%	7.6%	-0.6%
Energy	791	6.8%	6.3%	0.5%
Real Estate	640	5.5%	3.2%	2.3%
Utilities	490	4.2%	3.1%	1.1%
Telecom Services	317	2.7%	4.4%	-1.7%
Total Investments	<u>\$11,532</u>	<u>99.1%</u>	<u>100.0%</u>	
Cash Equivalents	105	0.9%	0.0%	0.9%
Total	<u>\$11,637</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: MSCI ACWI ex USA

International Manager Performance - Net of Fees
6/30/17

<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>
Total International Equity	\$11,636,898,000	21.9%	2.5%	8.3%	7.8%	5.9%	1/1/04
MSCI ACWI ex USA		20.5%	0.8%	7.4%	6.7%	6.2%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	7.8%	5.5%	
<i>Excess Return</i>		1.4%	1.7%	1.1%	1.1%	-0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		22	26	56	58	30	

Total International Active Strategy	\$4,298,158,000	21.8%	2.3%	8.4%	8.2%	5.1%	5/1/05
MSCI ACWI ex USA		20.5%	0.8%	7.2%	6.7%	5.4%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	7.8%	4.9%	
<i>Excess Return</i>		1.3%	1.5%	1.1%	1.5%	-0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		22	28	54	41	45	
LACM World ex US	924,636,000	15.6%	--	--	--	7.7%	12/1/15
MSCI World ex USA		19.5%	--	--	--	8.5%	
Lipper International Multi-Cap Core		19.8%	--	--	--	9.1%	
<i>Excess Return</i>		-3.9%	--	--	--	-0.8%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		90	--	--	--	76	
Marathon-London International Fund	690,976,000	19.8%	3.9%	11.0%	--	10.1%	2/1/12
MSCI World ex USA		19.5%	0.7%	8.1%	--	6.9%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	--	7.3%	
<i>Excess Return</i>		0.4%	3.3%	2.9%	--	3.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		59	10	6	--	6	
SSGA International Alpha Small Cap	662,296,000	24.8%	4.4%	13.1%	12.3%	4.0%	5/1/07
MSCI World ex USA Small Cap		21.3%	4.0%	11.4%	10.3%	3.0%	
Lipper International Small/Mid-Cap Core		20.9%	2.3%	9.2%	8.1%	2.7%	
<i>Excess Return</i>		3.5%	0.4%	1.7%	2.0%	1.0%	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Core</i>		16	25	10	6	1	
Wellington IRE Fund	651,388,000	20.2%	1.2%	8.7%	8.4%	4.4%	12/1/05
MSCI World ex USA		19.5%	0.7%	8.1%	7.5%	4.2%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	7.8%	4.1%	
<i>Excess Return</i>		0.7%	0.5%	0.5%	1.0%	0.2%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		41	60	39	32	36	
LACM Emerging Markets Fund	350,968,000	22.5%	1.5%	4.0%	5.3%	4.3%	12/8/09
MSCI Emerging Markets		23.7%	1.1%	4.0%	3.9%	3.2%	
Lipper Emerging Markets		19.8%	-0.1%	3.8%	3.7%	3.3%	
<i>Excess Return</i>		-1.2%	0.4%	0.0%	1.4%	1.1%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		41	35	51	28	32	
Effissimo Capital Management Japan	296,701,000	55.1%	--	--	--	11.6%	12/1/15
MSCI Japan		19.2%	--	--	--	8.0%	
Lipper International Small/Mid-Cap Value		21.7%	--	--	--	12.4%	
<i>Excess Return</i>		36.0%	--	--	--	3.6%	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Value</i>		1	--	--	--	55	
Wellington Emerging Markets Local Equity	266,723,000	25.2%	4.0%	7.7%	--	7.6%	12/1/11
MSCI Emerging Markets		23.7%	1.1%	4.0%	--	4.0%	
Lipper Emerging Markets		19.8%	-0.1%	3.8%	--	3.8%	
<i>Excess Return</i>		1.4%	2.9%	3.8%	--	3.6%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		19	10	8	--	10	
Lazard/Wilmington International Equity	229,050,000	11.0%	0.3%	--	--	0.6%	6/1/14
MSCI World ex USA		19.5%	0.7%	--	--	1.1%	
Lipper International Large-Cap Core		19.8%	1.6%	--	--	2.0%	
<i>Excess Return</i>		-8.5%	-0.3%	--	--	-0.5%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		98	82	--	--	84	
Martin Currie International Long-term Unconstrained	225,384,000	--	--	--	--	14.8%	2/1/17
MSCI World ex USA		--	--	--	--	9.6%	
Lipper International Large-Cap Core		--	--	--	--	10.4%	
<i>Excess Return</i>		--	--	--	--	5.2%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		--	--	--	--	1	

<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>
Total International Stock Plus Strategy	\$4,099,352,000	22.8%	3.1%	9.24%	8.5%	7.9%	1/1/09
MSCI ACWI ex USA		20.5%	0.8%	7.2%	6.7%	8.3%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	7.8%	8.4%	
<i>Excess Return</i>		2.3%	2.3%	2.0%	1.8%	-0.5%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		14	22	29	33	63	
Internal Developed Markets Stock Plus	2,277,315,000	19.8%	5.5%	11.9%	10.5%	9.6%	1/1/09
MSCI World ex USA		19.5%	0.7%	8.1%	7.5%	8.1%	
Lipper International Large-Cap Core		19.8%	1.6%	8.4%	7.8%	8.4%	
<i>Excess Return</i>		0.3%	4.8%	3.8%	3.0%	1.5%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		--	--	--	--	--	
PIMCO StockPLUS International TR Fund	1,126,004,000	25.0%	1.2%	9.3%	--	6.9%	10/1/10
MSCI World ex USA		19.5%	0.7%	8.1%	--	5.4%	
Lipper International Large-Cap Core		19.8%	1.6%	8.4%	--	5.7%	
<i>Excess Return</i>		5.5%	0.5%	1.2%	--	1.5%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		6	62	26	--	16	
PIMCO Emerging Markets StockPLUS AR Fund	513,845,000	27.9%	4.2%	--	--	4.4%	4/1/15
MSCI Emerging Markets		23.7%	1.1%	--	--	4.2%	
Lipper Emerging Markets		19.8%	-0.1%	--	--	3.6%	
<i>Excess Return</i>		4.1%	3.1%	--	--	0.3%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		7	8	--	--	32	
Internal Emerging Markets Stock Plus	182,187,000	27.1%	2.6%	--	--	2.3%	2/1/13
MSCI Emerging Markets		23.7%	1.1%	--	--	1.2%	
Lipper Emerging Markets		19.8%	-0.1%	--	--	0.9%	
<i>Excess Return</i>		3.4%	1.6%	--	--	1.1%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		11	20	--	--	29	

Total International Index Strategy	\$3,289,389,000	20.9%	2.4%	7.7%	7.2%	9.6%	7/1/09
MSCI ACWI ex USA		20.5%	0.8%	7.2%	6.7%	7.1%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	7.8%	7.8%	
<i>Excess Return</i>		0.5%	1.6%	0.4%	0.6%	2.4%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		33	26	72	74	24	
SSGA PMI Fund	1,141,724,000	20.3%	1.3%	8.3%	7.8%	5.5%	4/1/10
MSCI World ex USA		19.5%	0.7%	8.1%	7.5%	5.1%	
Lipper International Large-Cap Core		19.8%	1.6%	8.4%	7.8%	5.4%	
<i>Excess Return</i>		0.9%	0.6%	0.2%	0.3%	0.4%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		40	58	56	52	46	
SSGA EMI Fund	939,104,000	23.4%	5.8%	13.1%	11.6%	9.4%	4/1/10
MSCI EAFE SMID Cap		22.0%	4.7%	11.9%	10.4%	8.1%	
Lipper International Small/Mid-Cap Core		20.9%	2.3%	9.2%	6.2%	6.2%	
<i>Excess Return</i>		1.4%	1.2%	1.2%	1.2%	1.3%	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Core</i>		41	5	10	6	6	
Vanguard Emerging Market Fund	664,253,000	19.0%	0.7%	3.4%	3.7%	5.7%	7/1/09
MSCI Emerging Markets		23.7%	1.1%	4.0%	3.9%	6.1%	
Lipper Emerging Markets		19.8%	-0.1%	3.8%	3.7%	6.2%	
<i>Excess Return</i>		-4.8%	-0.4%	-0.5%	-0.2%	-0.4%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		61	48	60	54	62	
Vanguard Developed Markets Index Fund	531,912,000	20.5%	1.9%	9.1%	8.7%	6.0%	4/1/10
MSCI World ex USA		19.5%	0.7%	8.1%	7.5%	5.1%	
Lipper International Multi-Cap Core		19.8%	1.6%	8.4%	7.8%	5.4%	
<i>Excess Return</i>		1.0%	1.2%	0.9%	1.2%	1.0%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		41	38	31	33	37	

State of Michigan Retirement Systems

PRIVATE EQUITY REVIEW

Investment Advisory Committee Meeting

September 7, 2017



Peter A. Woodford
Senior Investment Manager
Private Equity Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	12.7%	10.0%	13.0%	13.9%	10.0%
Benchmark Return	20.6%	13.6%	16.5%	19.7%	11.3%
Peer Median Return	13.1%	8.0%	10.3%	11.9%	7.9%
Percentile Rank vs. Peers*	52	25	18	10	7

*State Street Universe greater than \$1 billion

- Private Equity returns have been strong relative to peer medians and rank in the top quartile over the three, five, seven, and ten-year time periods.
- 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 2.8% annualized excess returns over the S&P 500 (10-year S&P 500 return 7.2%), but underperformed the benchmark by 1.3%.

Strategy Update

For the twelve months ending June 30, 2017, the Private Equity Division returned approximately \$942 million, net of contributions, to the pension fund. The pace of distributions has slowed consistent with the overall market; however, a similar decline in new deal activity should mitigate any impact on net flows in the short term.

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

- Commitments closed during the quarter include:
 - \$150 million to CVC Capital Partners VII, an upper middle market buyout fund
 - \$100 million to Apollo Investment Fund IX, a buyout/distressed fund
 - \$100 million to KKR Asian Fund III, a pan Asia fund
 - \$67.5 million to Silver Lake Partners V, a tech focused buyout fund
 - \$50 million to Vista Equity Endeavor Fund I, a growth equity fund
 - \$7 million to Menlo Ventures XIV, a venture capital fund

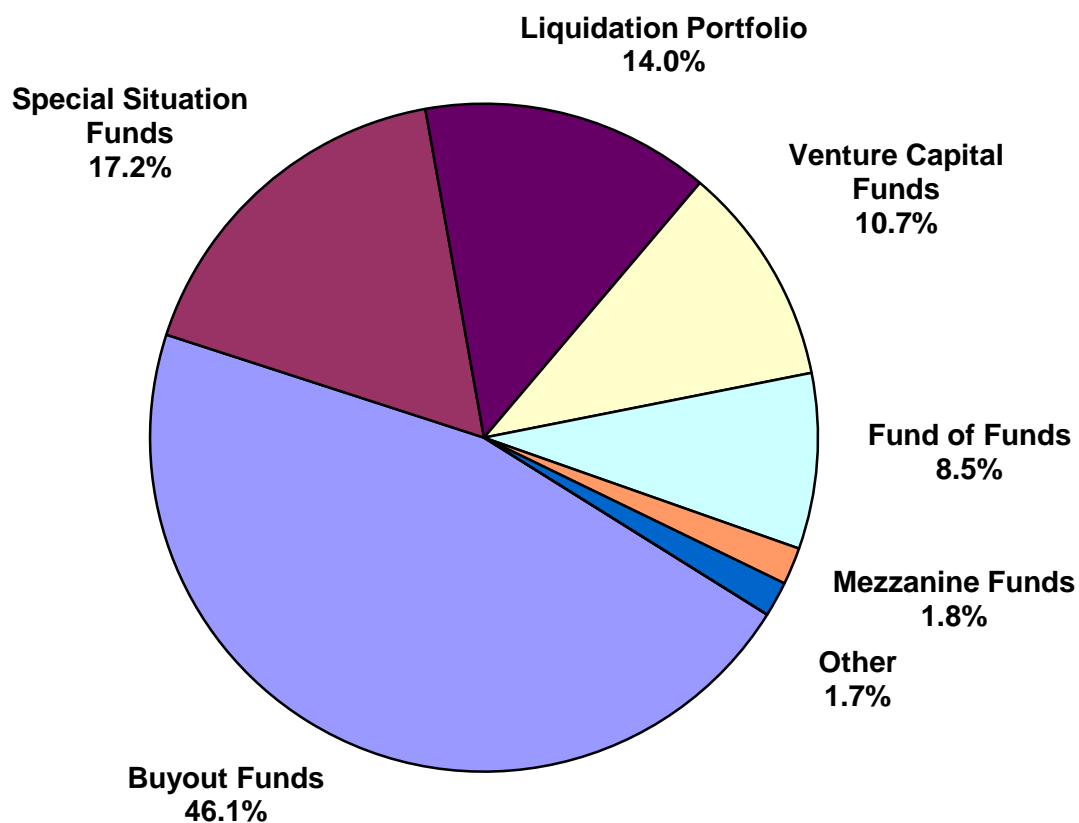
Market Environment

- Concerns persist over record amounts of dry powder (\$906 billion in private equity broadly and \$563 billion in buyouts) and high entry prices for assets (10.5x EBITDA in U.S. buyouts). Despite global aggregate deal value increasing and North American Buyout deal value nearly doubling quarter-over-quarter, both metrics are down roughly 10% for the first half of 2017 and have remained relatively flat since 2014.
- The Federal Reserve's low interest rate policies and global stimulus have made it exceedingly difficult to find investments at attractive entry prices. Fund managers continue to exercise caution and price discipline in this environment. Looking ahead, the strong pricing environment that has facilitated high exit activity, record distributions, and strong fundraising, will also make it challenging for fund managers to put capital to work.
- Notwithstanding a second quarter increase in buyout exit value of 22%, the first half of 2017 is down 28% versus the previous year and the number of exits in the quarter declined 9%, representing the lowest quarterly number of exits since 2010. This decrease is driven by the cyclical nature of the industry and a reduction in company inventory as sponsors have sold off the backlog of companies held through the last recession.
- In the second quarter of 2017, there was continued momentum in private equity fundraising, but the amount of capital raised continues to be spread across fewer funds. Nearly two-thirds of the capital raised in the second quarter was secured by the ten largest funds.
- The Private Equity Division will remain opportunistic and continue to focus on co-investments, direct secondaries, commingled funds, and other market-driven opportunities.

SMRS

Private Equity

6/30/17



Market Value in Millions				
	<u>6/30/17</u>		<u>3/31/17</u>	
Buyout Funds	\$4,427	46.1%	\$4,375	45.1%
Special Situation Funds	1,654	17.2%	1,645	16.9%
Liquidation Portfolio	1,344	14.0%	1,397	14.4%
Venture Capital Funds	1,028	10.7%	1,059	10.9%
Fund of Funds	817	8.5%	769	7.9%
Mezzanine Funds	173	1.8%	157	1.6%
Other	161	1.7%	305	3.2%
Total	<u>\$9,604</u>	<u>100.0%</u>	<u>\$9,707</u>	<u>100.0%</u>

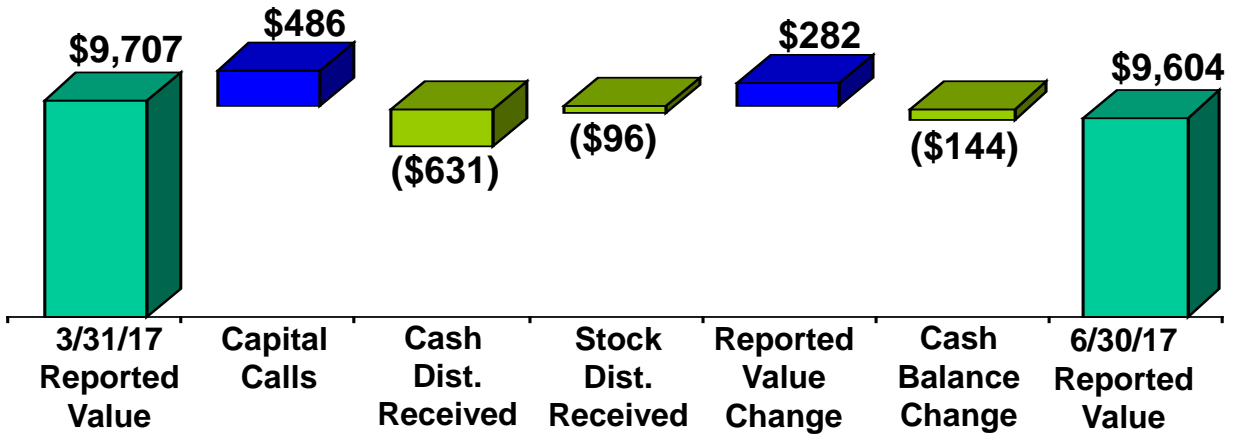
SMRS

Private Equity

6/30/17

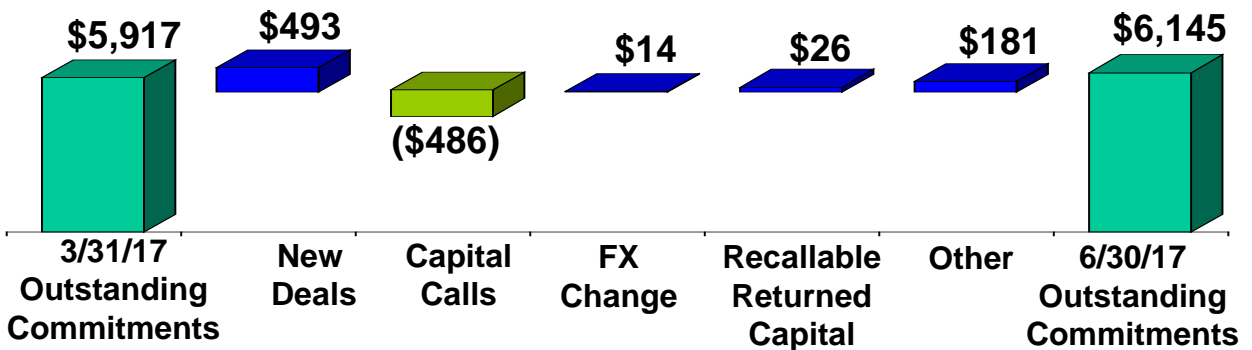
Invested Commitments

(\$ in Millions)



Outstanding Commitments

(\$ in Millions)

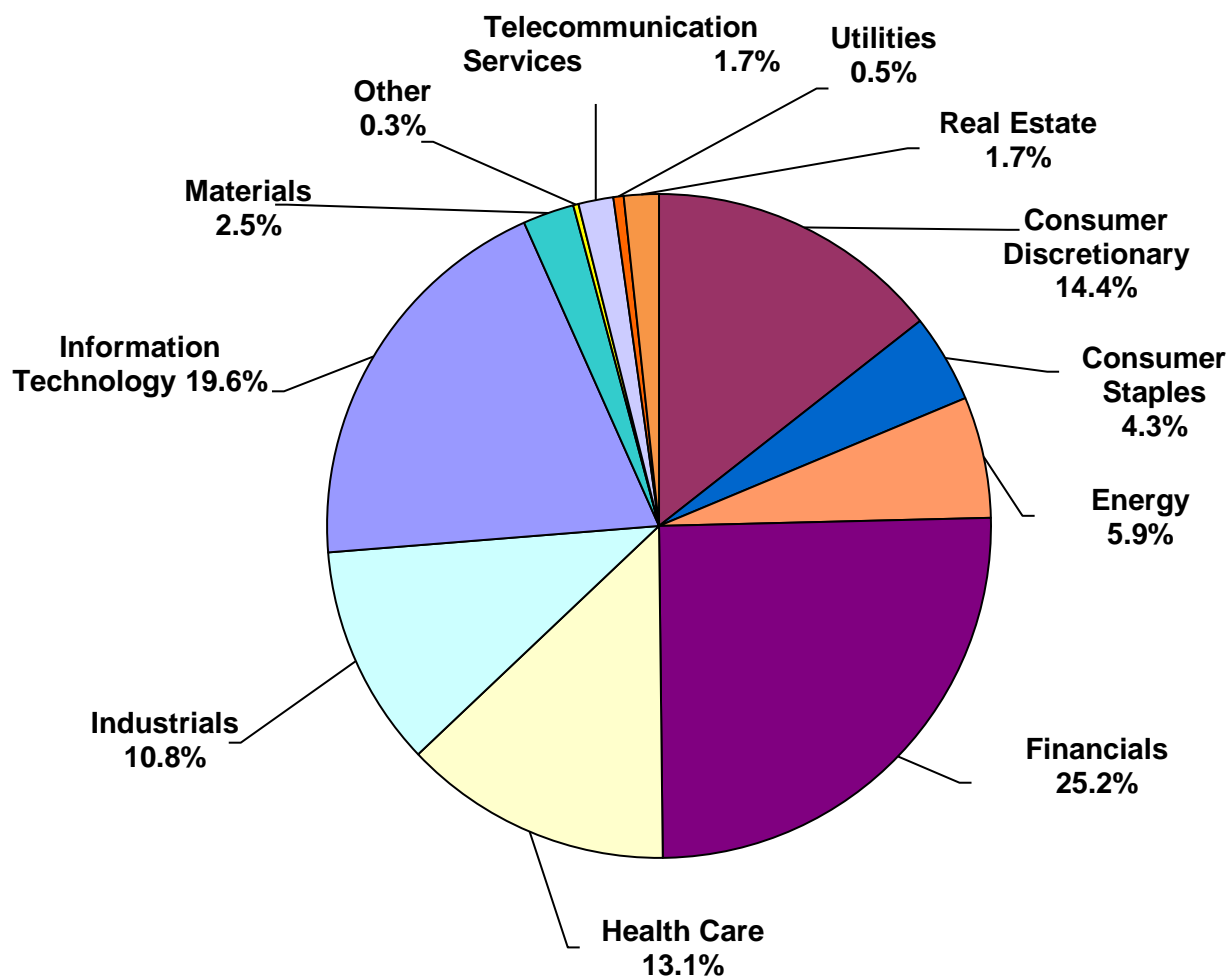


SMRS

Private Equity

6/30/17

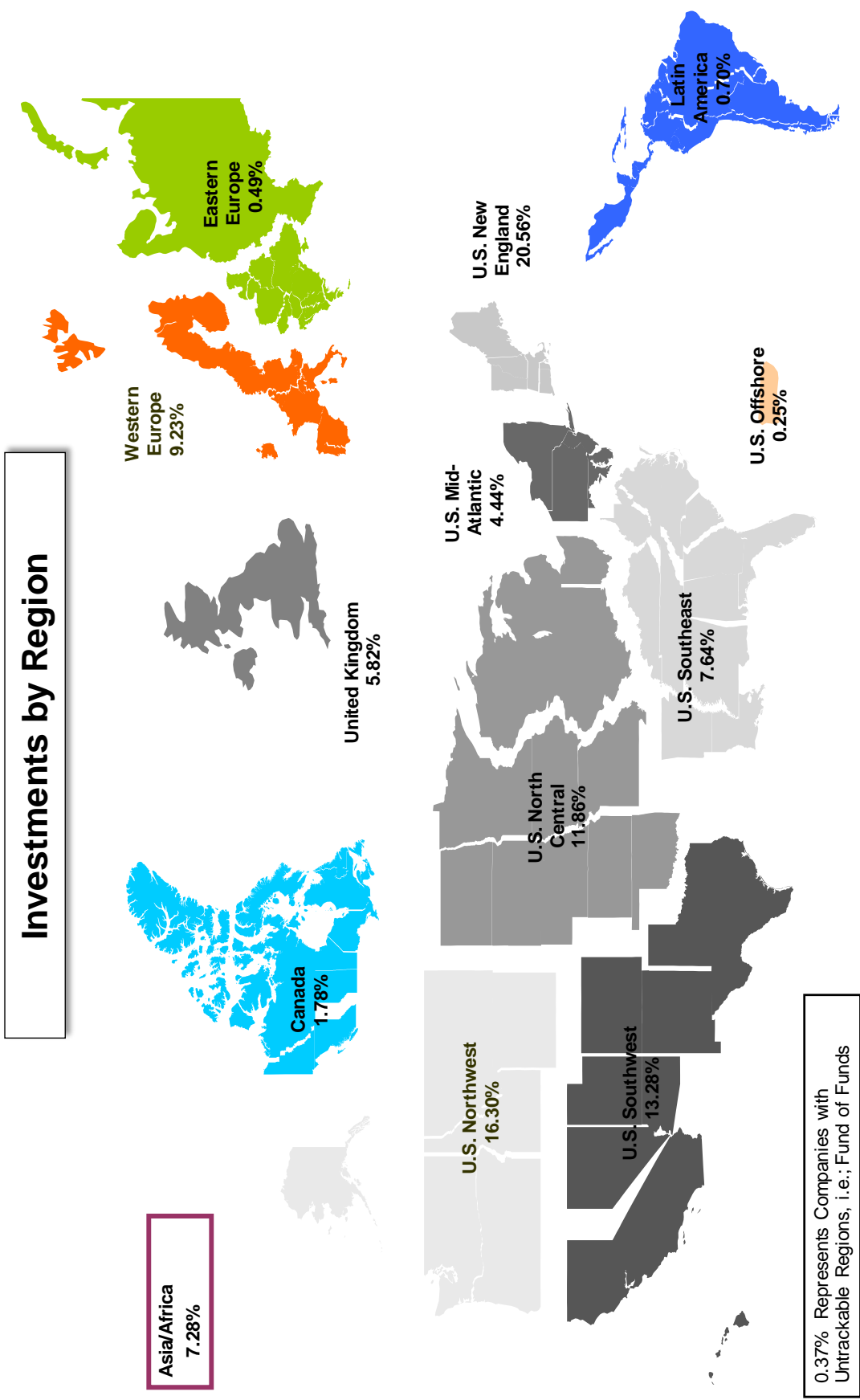
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 6/30/17 and are subject to change.

SMRS Private Equity 6/30/17

Investments by Region



0.37% Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 76%, Europe 16%, Asia 7%, Other 1%

SMRS

Private Equity

6/30/17

Portfolio by Vintage Year

(\$ in Millions)

<u>Asset Vintage</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>
1986-98	\$ 8	\$ 12	\$ 20
1999	21	10	31
2000	69	28	97
2001	149	61	210
2002	43	9	52
2003	14	18	32
2004	108	47	155
2005	321	24	345
2006*	805	256	1,061
2007	771	145	916
2008	889	163	1,052
2009	23	1	24
2010	314	13	327
2011	726	114	840
2012	1,236	238	1,474
2013	423	258	681
2014	933	597	1,530
2015	2,233	1,660	3,893
2016	345	1,866	2,211
2017	12	625	637
Income Accruals	1	0	1
Cash	159	0	159
Act. Small Cap - Stock Dist	1	0	1
Total	\$ 9,604	\$ 6,145	\$ 15,749

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

<u></u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>	<u>Total (USD)</u>
Euro (\$1.14/ €)	€360	€345	€705	\$804

SMRS

Private Equity

6/30/17

Top 10 Sponsors

(\$ in Millions)

<u>Asset Type</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total</u>
HarbourVest Partners	\$ 1,617	\$ 380	\$ 1,997
KKR	542	412	954
Blackstone Capital Partners	395	454	849
Grosvenor Capital Management	618	226	844
Warburg Pincus Capital	503	258	761
Advent International	357	228	585
Leonard Green & Partners	337	217	554
The Carlyle Group	290	203	493
TPG	281	146	427
Berkshire Partners	241	176	417
Top 10 Total Value	<u>\$5,181</u>	<u>\$2,700</u>	<u>\$7,881</u>

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	0.7%	13.0%	9.7%	15.1%	9.7%
Fund of Funds	-1.8%	4.3%	7.3%	9.9%	7.2%
Mezzanine	0.0%	9.5%	4.4%	9.5%	7.8%
Special Situations	-0.1%	10.4%	6.1%	10.5%	8.1%
Venture Capital	0.0%	1.8%	7.5%	11.4%	14.3%

*These numbers are based on most recent available General Partner reported data; primarily 3/31/17 and are subject to change.

SMRS

Private Equity

6/30/17

Net Market Values by Ownership Entity

	Adjusted Reported Value	Unfunded Commitment
Accel Europe I, LP	\$ 8,051,744	\$ 1
Accel Europe II, LP	15,463,741	3,300,000
Accel Growth Fund II, LP	12,982,379	540,000
Accel Growth Fund III, LP	12,090,368	1,540,000
Accel Growth Fund IV, LP	5,437,668	16,500,000
Accel IX, LP	5,258,211	3,000,000
Accel Leaders Fund, LP	1,701,005	3,795,000
Accel London V, LP	2,618,739	9,240,000
Accel VI-S, LP	2,568,990	652,611
Accel VI, LP	1,385,388	-
Accel VII, LP	1,771,205	5,000,000
Accel VIII, LP	4,099,659	4,782,499
Accel X, LP	18,346,852	400,000
Accel XI, LP	7,042,682	1,680,000
Accel XII, LP	5,359,154	2,275,000
Accel XIII, LP	2,253,774	7,700,000
Advent Global Private Equity III, LP	988,970	20
Advent International Global Private Equity V-A, LP	8,120,433	8,700,000
Advent International GPE VI-A, LP	112,357,112	-
Advent International GPE VII-B, LP	176,242,292	20,000,000
Advent International GPE VIII-B, LP	50,128,113	172,350,000
Advent Latin American Private Equity Fund VI, LP	9,749,755	26,932,500
Affinity Asia Pacific Fund II, LP	-	5,288,237
Affinity Asia Pacific Fund III, LP	49,140,540	12,335,055
Affinity Asia Pacific Fund IV, LP	63,696,005	68,385,598
Apax Europe Fund VI, LP	21,669,188	2,412,033
Apax Europe V, LP	203,071	-
Apax Europe VII, LP	47,326,284	2,520,338
Apax Excelsior VI, LP	78,268	1,614,434
Apax IX, LP	5,250,000	144,750,000
Apax US VII, LP	12,318,900	417,509
Apax VIII - B, LP	100,716,696	9,008,764
** Apollo Investment Fund IX, LP	-	100,000,000
Apollo Investment Fund VIII, LP	63,358,067	40,068,352
Arboretum Ventures II, LP	2,209,472	-
Arboretum Ventures III, LP	13,669,398	1,170,000
Arboretum Ventures IV, LP	6,424,280	21,510,000
Ares Corporate Opportunities Fund II, LP	9,199,282	11,423,773

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Ares Corporate Opportunities Fund III, LP	78,628,954	9,162,879
Ares Corporate Opportunities Fund IV, LP	96,796,984	22,555,368
AXA ASF Miller Co-Investment, LP	17,339,758	23,121,187
Axiom Asia IV, LP	9,466,859	39,997,811
Axiom Asia Private Capital Fund III, LP	33,636,272	10,989,264
BC European Capital IX, LP	83,651,883	4,541,768
BC European Capital VII, LP	557,752	-
BC European Capital VIII, LP	32,790,820	8,919,100
Berkshire Fund IX, LP	18,346,024	156,190,238
Berkshire Fund V, LP	104,735	3,281,560
Berkshire Fund VI, LP	49,647,961	6,922,153
Berkshire Fund VII, LP	57,132,360	2,450,793
Berkshire Fund VIII, LP	115,578,362	7,632,176
Blackstone Capital Partners IV, LP	19,905,041	4,864,588
Blackstone Capital Partners V, LP	25,636,134	15,954,599
Blackstone Capital Partners V-S, LP	3,336,852	712,476
Blackstone Capital Partners VI, LP	269,367,488	50,050,161
Blackstone Capital Partners VII, LP	34,206,801	235,776,132
Bridgepoint Europe IV, LP	32,219,831	6,089,730
Carlyle Europe Partners II, LP	1,662,821	4,217,692
Carlyle Europe Partners III, LP	25,944,533	5,905,543
Carlyle Europe Partners IV, LP	46,986,584	64,191,819
Carlyle Partners IV, LP	5,599,959	16,009,296
Carlyle Partners V, LP	95,740,119	54,754,060
Carlyle Partners VI, LP	114,306,686	57,859,980
Castle Harlan Partners IV, LP	6,934,935	5,286,319
Castle Harlan Partners V, LP	48,353,143	29,490,554
CCMP Capital Investors II, LP	28,043,420	10,346,490
CCMP Capital Investors III, LP	39,898,550	16,807,179
Centerbridge Capital Partners III, LP	24,861,383	54,875,353
Cerberus SMRS Partners, LP	74,188,291	27,804,657
CM Liquidity Fund, LP	-	25,000,000
Coller International Partners V, LP	31,582,101	43,600,000
Coller International Partners VI, LP	59,401,140	29,723,267
Coller International Partners VII, LP	11,346,816	142,473,288
Crescent Mezzanine Partners VI, LP	45,963,823	11,784,494
Crescent Mezzanine Partners VII, LP	6,515,536	145,170,882
** CVC Capital Partners VII, LP	-	171,082,485
DLJ Investment Partners II, LP	165,363	-
DLJ Investment Partners III, LP	8,515,446	44,608,850
Dover Street IX, LP	11,249,913	87,000,000
EDF Ventures III, LP	1,038,519	-
EnCap Energy Capital Fund X, LP	20,791,258	24,390,369
Entertainment IP Fund, LP	4,993,265	44,015,694
FIMI Opportunity 6, LP	5,722,455	44,454,546
FirstMark Capital I, LP	80,911,038	196,596

	Adjusted Reported Value	Unfunded Commitment
FirstMark Capital IV, LP	1,400,000	33,600,000
FirstMark Capital OF I, LP	12,131,486	7,100,000
FirstMark Capital OF II, LP	-	35,000,000
FirstMark Capital P2, LP	168,121,041	-
Flagship Ventures Fund 2004, LP	9,301,763	-
Flagship Ventures Fund 2007, LP	20,449,074	-
Flagship Ventures Fund IV, LP	82,562,555	-
Flagship Ventures Fund V, LP	39,568,636	11,200,000
Flagship Ventures Opportunities Fund I, LP	8,397,962	41,500,000
Fox Paine Capital Fund II, LP	30,333,574	15,480,084
FS Equity Partners VII, LP	49,981,744	51,690,300
G-II Acquisition Holdings Note, LLC	7,417,859	-
G-IV Acquisition Holdings, LLC	22,402,220	-
GCM Grosvenor Fund Investment Program I, LP	13,768,364	1,420,934
GCM Grosvenor Fund Investment Program II, LP	44,437,188	15,933,560
GCM Grosvenor Fund Investment Program III - 2004, LP	55,123,244	4,997,823
GCM Grosvenor Fund Investment Program III - 2006, LP	73,424,013	7,579,669
GCM Grosvenor Fund Investment Program V, LP	88,230,891	9,454,524
GCM Grosvenor Fund Investment Program VI, LP	20,220,081	13,772,526
GCM Grosvenor Fund Investment Program VIII, LP	14,950,000	85,050,000
GCM Grosvenor SeasPriFIP LP (PIS06-10), LP	81,389,045	23,975,997
GCM Grosvenor SeasPriFIP LP (PIS14), LP	181,847,560	50,323,949
GCM Grosvenor SeasPriFIP LP (Seed), LP	44,775,182	13,824,219
Genstar Capital Partners VIII PCV, LP	-	50,000,000
Genstar Capital Partners VIII, LP	194,764	49,728,301
Green Equity Investors IV, LP	6,970,662	1,136,036
Green Equity Investors V, LP	182,148,295	25,966,435
Green Equity Investors VI, LP	127,677,749	10,048,547
Green Equity Investors VII, LP	20,463,998	179,536,002
GSO Capital Opportunities Fund II, LP	25,041,624	13,456,931
GSO Capital Opportunities Fund III, LP	17,120,448	83,280,109
GSO COF III Co-Investment Fund, LP	-	50,000,000
HarbourVest Dover Street VIII, LP	43,834,470	9,787,500
HarbourVest Int'l III Direct, LP	-	1,000,000
HarbourVest Int'l III Partnership, LP	697,758	1,200,000
Harbourvest Partners Co-Investment Fund IV, LP	40,914,181	63,750,000
HarbourVest Partners Mezzanine Income Fund, LP	26,162,023	74,310,000
HarbourVest V Partnership, LP	213,988	300,000
HarbourVest VI - Direct Fund, LP	4,071,107	750,000
HarbourVest VI Partnership, LP	8,758,229	2,000,000
Harvest Partners VII, LP	21,492,435	50,449,449
HPS Mezzanine Partners III, LP	5,105,355	44,960,223
Insight Venture Partners Growth-Buyout Coinvestment Fund, LP	38,385,638	15,125,000
Insight Venture Partners IX, LP	67,911,402	33,500,000
Kelso Investment Associates IX, LP	53,931,079	60,648,444
Kelso Investment Associates VII, LP	2,721,945	4,970,176

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Kelso Investment Associates VIII, LP	87,986,269	22,924,277
Khosla Ventures III, LP	14,005,391	1,250,000
Khosla Ventures IV, LP	41,154,499	1,650,000
Khosla Ventures V, LP	23,168,188	25,150,000
KKR 2006 Fund, LP	133,538,682	5,040,754
KKR Americas Fund XII, LP	-	200,000,000
KKR Asian, LP	19,185,156	749,468
KKR Asian Fund II, LP	53,994,515	8,340,173
** KKR Asian Fund III, LP	-	100,000,000
KKR China Growth Fund, LP	41,636,810	-
KKR E2 Investors (Annex) Fund, LP	150,213	-
KKR European Fund II, LP	1,931,617	-
KKR European Fund III, LP	61,939,500	22,975,743
KKR European Fund IV, LP	65,663,626	60,135,560
KKR European Fund 1, LP	-	-
KKR Millennium Fund, LP	26,631,002	-
KKR North America Fund XI, LP	136,886,476	14,278,039
Lightspeed Venture Partners VI, LP	1,679,290	-
Lightspeed Venture Partners VII, LP	32,982,560	510,436
Lion Capital Fund I (HME II), LP	94,588	11,567,865
Lion Capital Fund II, LP	9,600,786	4,720,820
Lion Capital Fund III, LP	71,101,193	11,497,983
MatlinPatterson Global Opportunities Partners II, LP	2,288,854	-
MatlinPatterson Global Opportunities Partners III, LP	61,609,900	3,436,976
Menlo Ventures IX, LP	4,341,103	-
Menlo Ventures X, LP	45,777,272	-
Menlo Ventures XI, LP	78,013,630	1,000,000
** Menlo Ventures XIV, LP	-	7,000,000
MeriTech Capital Partners II, LP	2,686,618	1,850,000
Meritech Capital Partners III, LP	12,224,601	-
Meritech Capital Partners IV, LP	17,674,680	900,000
Meritech Capital Partners V, LP	11,845,725	7,550,000
Michigan Growth Capital Partners II, LP	164,973,507	24,349,523
Michigan Growth Capital Partners III, LP	7,236,413	92,898,804
Michigan Growth Capital Partners, LP	78,013,506	15,630,682
Midtown Fund III, LP	-	-
Midtown II Liquidating Trust, LP	2,337,231	-
New Leaf Growth Fund I, LP	135,504,862	-
New Leaf Ventures II, LP	19,017,904	-
New Leaf Ventures III, LP	16,255,412	16,875,000
Nordic Capital VI, LP	4,025,474	-
Nordic Capital VII, LP	42,300,666	3,140,094
Nordic Capital VIII (Alpha), LP	39,186,730	16,288,858
Oak Investment Partners X, LP	6,817,757	-
Oak Investments Partners IX, LP	817,498	-
Oaktree Opportunities Fund X, LP	11,817,139	21,000,000

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Oaktree Opportunities Fund Xb, LP	-	70,000,000
OCM Opportunities Fund IX, LP	66,518,098	-
OCM Opportunities Fund VII (B), LP	3,614,271	5,000,000
OCM Opportunities Fund VII, LP	4,630,663	-
OCM Opportunities Fund VIII B, LP	23,378,811	-
OCM Opportunities Fund VIII, LP	9,202,668	-
OCM Principal Opportunities Fund IV, LP	3,341,379	5,002,377
Ocqueoc Holdings, LLC	15,276,513	50,000,000
One Liberty Fund III, LP	1,143,941	-
One Liberty Fund IV, LP	1,789,484	-
One Liberty Ventures 2000, LP	5,904,200	-
Parthenon Investors II, LP	2,045,201	3,186,779
Parthenon Investors III, LP	35,635,715	2,732,182
Parthenon Investors IV, LP	42,839,569	6,730,272
Peninsula Capital Fund IV, LP	6,292,885	2,201,026
Peninsula Fund VI, LP	18,802,183	22,424,589
Public Pension Capital, LLC	32,117,657	67,536,267
Questor Partners Fund II, LP	222,778	5,816,186
Rhone Partners V, LP	22,169,463	87,594,074
Riverside Capital Appreciation Fund VI, LP	63,007,521	22,445,153
Riverside Micro Cap Fund I, LP	24,630,202	5,782,975
Riverside Micro-Cap Fund II, LP	43,630,136	2,735,834
Riverside Micro-Cap Fund III, LP	48,329,763	4,483,406
Riverside Micro-Cap Fund IV, LP	15,181,496	32,696,456
Shamrock Growth Capital Fund IV, LP	1,908,493	46,515,466
Silver Lake Partners II, LP	4,345,007	3,531,586
Silver Lake Partners III, LP	71,734,071	13,344,284
Silver Lake Partners IV, LP	40,350,994	17,919,580
** Silver Lake Partners V, LP	-	67,500,000
SM/TCP, LP	34,880,467	12,288,065
SMRS - TOPE, LLC	444,465,624	-
SMRS-NCRP, LLC	1,036,245,525	139,930,389
TCW Shared Op Fund III, LP	86,863	-
TCW/Crescent Mezzanine Partners III Secondary, LP	266,313	-
TCW/Crescent Mezzanine Partners III, LP	2,437,597	29,733,856
TCW/Crescent Mezzanine Partners IV, LP	1,058,232	13,660,773
TCW/Crescent Mezzanine Partners IVB Secondary, LP	613,184	-
TCW/Crescent Mezzanine Partners V, LLC	21,416,422	15,382,013
TCW/Crescent Mezzanine Partners VC Secondary, LP	6,316,047	-
The Huron Fund III, LP	10,574,831	4,542,756
The Huron Fund IV, LP	24,471,574	8,844,718
The Huron Fund V, LP	-	35,000,000
The Shansby Group 4, LP	649,114	520,829
The Shansby Group 5 (TSG5), LP	15,388,759	4,933,611
Thoma Bravo Fund XII, LP	57,972,827	89,251,017
TPG IV (Texas Pacific Group IV), LP	5,106,534	211,725

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
TPG Partners III, LP	2,901,794	2,087,002
TPG Partners VI, LP	135,831,341	16,251,799
TPG Partners, VII, LP	49,814,134	100,863,983
TPG V (Texas Pacific Group V), LP	87,049,625	26,611,195
Trilantic Capital Partners V (North America) Fund A, LP	33,631,559	15,254,330
TSG6, LP	95,547,002	32,100,641
TSG7 A, LP	39,772,235	82,749,771
Turnbridge Capital Partners I , LP	42,154,294	49,383,894
Veritas Capital Fund V, LP	79,786,411	3,364,130
Veritas Capital Fund VI, LP	4,225,352	95,774,648
Veritas V Co-Investors, LP	10,629,970	15,000,000
** Vista Equity Endeavor Fund I, LP	4,638,484	45,361,516
Vista Equity Partners Fund V, LP	48,941,110	9,344,913
Vista Equity Partners Fund VI, LP	35,157,298	39,197,040
Vista Foundation Fund III, LP	3,854,499	20,678,683
Warburg Pincus China, LP	5,882,686	38,835,000
Warburg Pincus Energy MCIP, LP	-	10,396,887
Warburg Pincus Energy, LP	37,380,754	58,600,000
Warburg Pincus Equity Partners, LP	1,172,899	-
Warburg Pincus International Partners, LP	5,970,847	-
Warburg Pincus Private Equity IX, LP	24,809,302	-
Warburg Pincus Private Equity VIII, LP	8,305,765	-
Warburg Pincus Private Equity X, LP	154,544,369	-
Warburg Pincus Private Equity XI, LP	204,226,707	13,200,000
Warburg Pincus Private Equity XII Secondary, LP	7,622,848	17,050,000
Warburg Pincus Private Equity XII, LP	53,517,382	119,350,000
WestAm COREplus Private Equity QP, LP	2,045,260	2,086,719
WestAm Special Private Equity Partners, LP	3,794,108	2,317,427
Total Private Equity	\$ 9,443,694,238	\$ 6,145,408,735
Cash	142,971,286	-
Active Small Cap Cash	15,808,927	-
Active Small Cap	1,286,752	-
Income Accruals	677,785	-
Grand Total	\$ 9,604,438,988	\$ 6,145,408,735

* 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

September 7, 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 Returns	8.7%	11.5%	11.8%	12.2%	4.2%
NCREIF NPI	5.6%	8.8%	9.1%	10.2%	5.1%
Peer Median Return	7.8%	10.5%	11.0%	11.5%	3.8%
Percentile Rank vs. Peers*	26	36	41	40	45

*State Street Universe greater than \$1 billion

- Total Real Estate and Infrastructure Division (REID) value was \$6.5 billion with a total one-year return of 8.7%. Outperformance relative to the one-year benchmark was due to several factors in REID's strategy: 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 America energy also provided 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 stack. The REID continues to selectively acquire properties where the REID can add value through management and leasing, and developing properties at attractive risk-adjusted returns. The REID has selectively committed over \$250 million in Europe and Asia where value-add opportunities are sourced through managers that have an established history and presence in the market.
- The REID has been actively managing the portfolio by selling stabilized assets at attractive capitalization rates where growth in rental income is expected to be limited. 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.
- The REID has approximately \$1.5 billion in unfunded commitments. New commitments closed during the quarter include:
 - \$50 million in Rialto Real Estate Fund III-Property, LP, a U.S. real estate commingled fund, managed by Rialto Capital Management.
 - \$50 million in Avanath Affordable Housing III, a U.S. affordable apartment commingled fund, managed by Avanath Affordable Housing III, LLC.
 - \$30 million in ASF VII Infrastructure Fund B LP, a global infrastructure commingled fund, managed by Ardian Investment Group.

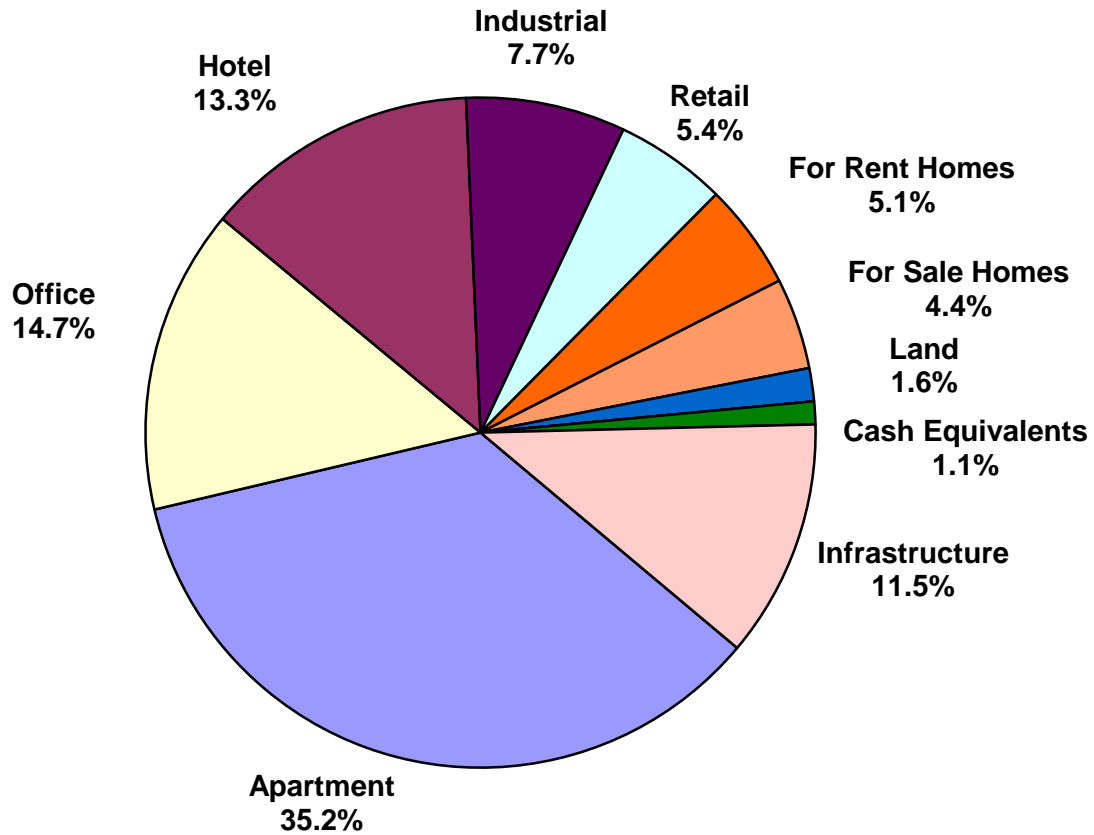
Market Environment

- 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. 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 increased 1 basis point (bps) from the prior quarter and now stand at 90 bps, which has been low historically since late 2012. The reduced supply of securities due to risk retention rules caused spreads on securities to remain tight. 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

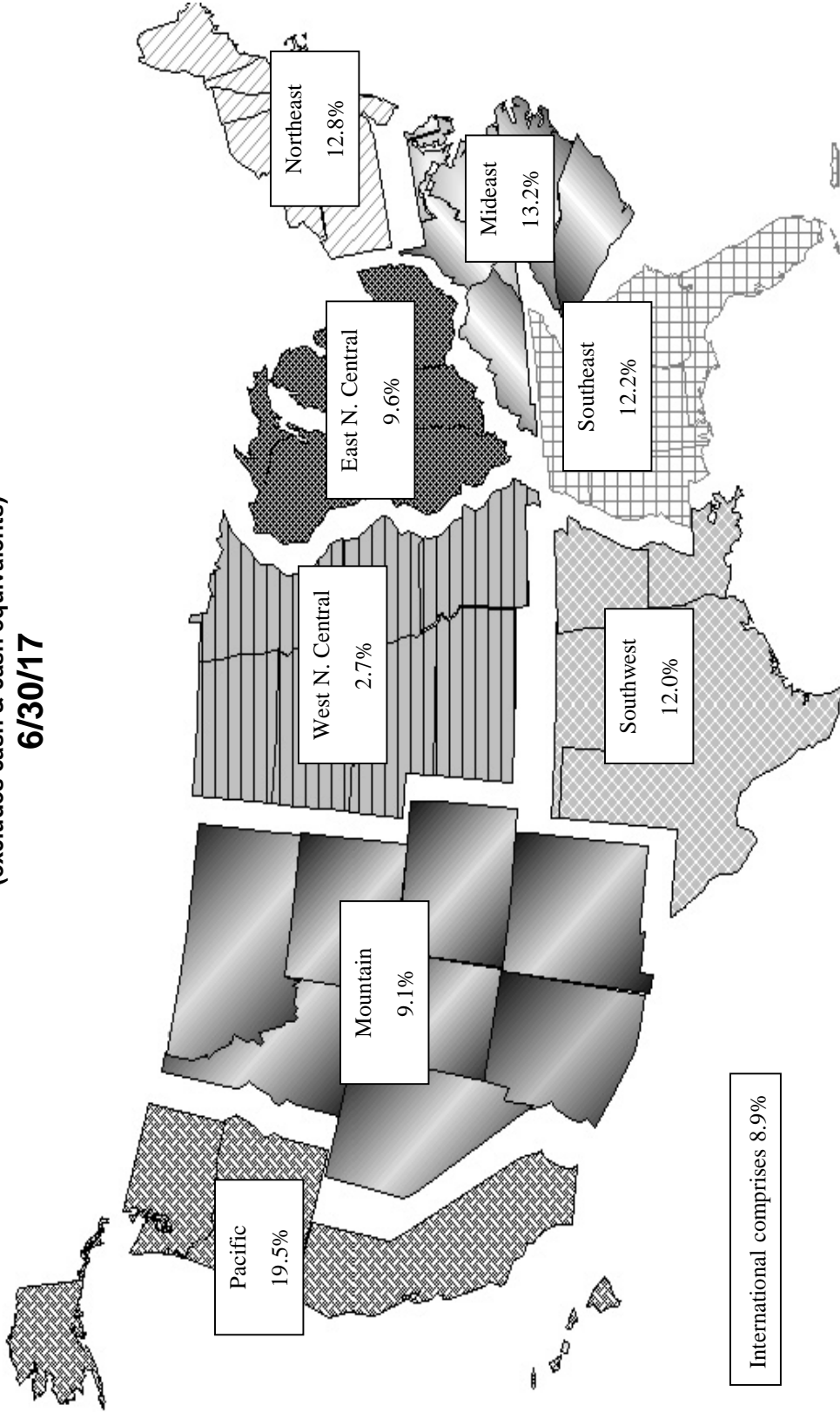
Real Estate and Infrastructure

6/30/17



Market Value in Millions				
	<u>6/30/17</u>		<u>3/31/17</u>	
Apartment	\$2,271	35.2%	\$2,307	34.8%
Office	950	14.7%	997	15.0%
Hotel	860	13.3%	871	13.1%
Infrastructure	741	11.5%	716	10.8%
Industrial	497	7.7%	481	7.3%
Retail	347	5.4%	358	5.4%
For Rent Homes	330	5.1%	435	6.6%
For Sale Homes	287	4.4%	283	4.3%
Land	106	1.6%	118	1.8%
	<u>\$6,389</u>	<u>98.9%</u>	<u>\$6,566</u>	<u>99.1%</u>
Cash Equivalents	<u>70</u>	<u>1.1%</u>	<u>58</u>	<u>0.9%</u>
Total Investments	<u>\$6,459</u>	<u>100.0%</u>	<u>\$6,624</u>	<u>100.0%</u>

SMRS
Real Estate by Region
Based on Market Value
(excludes cash & cash equivalents)
6/30/17



Geographic regions defined by NCREIF, whose property index composition is: Pacific 32.0%, Mountain 6.4%, West N. Central 1.3%, Southwest 10.6%, East N. Central 7.3%, Southeast 9.3%, Northeast 9.6%, Midwest 11.6%

SMRS
Real Estate and Infrastructure
6/30/17

**Top Ten
 Advisors or Entity**

<u>Advisor or Entity</u>	<u>Market Value</u>
MWT Holdings, LLC (SHLP)	\$ 1,401,961,758
Clarion Partners	690,784,333
Blackstone Group	500,423,075
Principal Real Estate Investors	268,961,792
Bentall Kennedy LP	251,934,323
CIM Investment Advisors LLC	233,251,713
Rialto Capital Management LLC	227,941,029
Domain Capital Advisors Inc	227,910,105
Heitman Capital Management	182,371,802
Five Star Realty Partners LLC	179,798,961
	<u>\$ 4,165,338,891</u>

**Occupancy
 by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	94.3%	86.5%	94.2%	91.2%	79.1%
National Average	92.7%	87.0%	92.0%	94.8%	69.5%

SMRS
Market Values by Ownership Entity
6/30/17

REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 75,323,960	\$ 0
AEW Senior Housing III	1,369,140	3,106,567
Apollo Asia Real Estate Fund, LP	17,496,542	55,805,723
Asana Partners Fund I, LP	6,924,827	18,187,840
Avanath Affordable Housing I, LLC	24,165,501	1,467,911
Avanath Affordable Housing II, LLC	29,258,023	0
Avanath II SMRS Co-Investment Fund LLC	20,624,215	0
* Avanath Affordable Housing III	10,979,320	39,020,680
Beacon Capital Strategic Partners IV, LP	156,456	0
Beacon Capital Strategic Partners V, LP	387,378	0
Blackstone R/E IH3 Co-Inv Partners	329,780,026	0
Blackstone Real Estate Partners V, LP	18,781,547	0
Blackstone Real Estate Partners VI, LP	18,532,162	3,680,000
Blackstone Real Estate Partners VIII, LP	34,303,935	46,100,000
Capri Select Income II	61,329	0
Capri Urban Investors, LLC	12,230,275	0
CIM Fund III, LP	47,453,522	0
CIM Fund VIII, LP	74,570,249	36,079,977
CIM Urban REIT, LLC	55,901,313	0
CIM VI (Urban REIT), LLC	30,095,821	0
Clarion Gables Multifamily Trust	29,042,221	0
Columbus Circle Holdings, LLC	116,533,812	96,387,429
CPI Capital Partners N.A., LP	169,643	0
CPI Capital Partners N.A. Secondary, LP	820,727	0
Crown Small Cap Real Estate	12,241,449	13,000,000
Domain GVA-1, LLC	48,121,789	45,119,760
Domain Hotel Properties, LLC	475,493,767	0
Dynamic Retail Trust	78,723,134	0
Eastport Properties, LLC	19,966,120	0
Gateway Capital R/E Fund II, LP	47,846,833	1,275,000
Great Lakes Property Group Trust	105,421,976	0
IMRF II CoInvest Spiga LP	6,526,537	7,042,797
Invesco Mortgage Recovery Feeder Fund	10,954,393	0
Invesco Mortgage Recovery Fund II, LP	33,637,982	17,543,582
IPF II Co-Invest LP	26,080,466	5,677,965
JBC North LaSalle, LLC	17,598,654	0
JBC Opportunity Fund III, LP	496,985	0
JP Morgan India Property Fund II, LLC	36,171,495	3,110,897
KBS/SM Fund III, LP	46,939,684	0
KBS/SM Fund IV, LP	82,824,613	0
L-A Saturn Acquisition, LP	38,198,757	0

	<u>Market Value</u>	<u>Unfunded Commitment</u>
Landmark Real Estate Partners V, LP	10,968,127	0
LaSalle Asia Opportunity Fund II, LP	257,958	0
LaSalle Asia Opportunity Fund III, LP	4,701,867	0
Lion Industrial Trust	178,683,791	0
Lion Mexico Fund, LP	7,564,554	0
Lombard GVA0016	203,367,982	0
Lone Star Fund X, LP	0	200,000,000
Lowes Hospitality Investment Partners	105,359	0
Lubert-Adler Real Estate Fund VII, LP	73,510,419	7,500,000
M1 Westgate CoInvest LLC	9,531,072	1,316,670
M301W CoInvest LLC	15,699,736	4,638,947
MERS Acquisitions, Ltd.	149,265,449	0
MG Alliance, LLC	18,175,779	0
MIP Holdco, LLC	107,295,193	55,887,509
Morgan Stanley R/E Fund V - International	3,332,581	0
Morgan Stanley R/E Fund VI - International	18,101,201	0
Morgan Stanley R/E Fund V - U.S.	2,947,186	0
Morgan Stanley R/E Special Situations Fund III	30,111,648	0
MWT Holdings, LLC	1,401,961,758	40,000,000
Northpark-Land Associates, LLLP	28,126,696	63,927,786
Orange Investors LLC	118,994,068	0
Paladin Realty Brazil Investors III (USA), LP	28,898,912	0
Paladin Realty Latin America Investors IV-CI, LP	37,289,236	17,000,000
Paladin Realty TB COINV V LP	11,726,356	0
Penmain Office LLC	35,034,559	0
Principal Separate Account	193,637,832	31,253,245
Proprium RE Spec Situations Fund LP	27,993,557	29,123,203
Rialto Credit Partnership LP	102,317,426	112,086,364
Rialto Real Estate Fund, LP	24,241,971	0
Rialto Real Estate Fund II, LP	39,128,935	0
Rialto Real Estate Fund III-Debt, LP	10,625,345	39,038,490
* Rialto Real Estate Fund III-Property, LP	4,246,575	45,753,425
Rialto Mezzanine Partners Fund	47,380,777	0
SM Brell II, LP	24,852,170	0
Stockbridge Real Estate Fund II-C, LP	23,573,466	0
Strategic LP	251,934,323	43,600,000
TPG RE Finance Trust	97,130,342	2,103,426
TPG RE Fund II	24,674,703	28,436,586
TSP Spartan C-I LLC	8,466,745	0
TSP Value and Income Fund LP	46,505,254	4,600,000
Trophy Property Development LP	56,097,978	7,408,100
True North High Yield Investment Fund II	19,574,676	5,000,000
True North Real Estate Fund III	33,322,686	19,320,180
Venture Center, LLC	45,201,955	0
Western National Realty Fund II, LP	28,884,454	0
	<u>\$ 5,647,649,236</u>	<u>\$ 1,150,600,059</u>
Short-Term Investments and Other	55,448,045	0
Total Real Estate Investments	<u>\$ 5,703,097,281</u>	<u>\$ 1,150,600,059</u>

* New or additional commitment made during the quarter reported

SMRS
Market Values by Ownership Entity
6/30/17

INFRASTRUCTURE

	Market Value	Unfunded Commitment
ArcLight Energy Partners Fund VI, LP	\$ 28,775,084	\$ 21,713,076
ASF VI Infrastructure B LP	19,821,737	18,686,509
* ASF VII Infrastructure Fund B LP	3,000	29,997,000
ASF Como Co-Investment LP	37,673,412	14,530,338
Basalt Infrastructure Partners, LP	44,076,095	6,913,198
Blackstone Energy Partners, LP	53,462,584	4,209,834
Blackstone Energy Partners II, LP	31,050,564	57,120,574
Brookfield Infrastructure Fund II-B, LP	49,730,703	5,698,875
Customized Infrastructure Strategies, LP	61,345,291	9,235,635
Dalmore Capital Fund	59,932,000	0
First Reserve Energy Infrastructure Fund II, LP	24,791,322	42,315,130
GCM Grosvenor Infrastructure Investment Program, LP	58,492,857	0
GCM Grosvenor Customized Infrastructure Strategies II, LP	16,724,162	39,928,858
GSO Energy Select Opportunities Fund LP	14,512,257	40,276,749
JP Morgan AIRRO India Sidecar Fund US, LLC	68,332,650	3,835,855
JP Morgan AIRRO Fund II US, LLC	10,993,212	83,384,246
KKR Eagle CoInvest LP	27,804,360	1,917,282
KKR Global Infrastructure Investors, LP	54,161,581	7,004,133
RPEP SMRS, LLC	12,500,000	500,000
StonePeak Infrastructure Fund LP	66,602,262	15,234,742
	<u>\$ 740,785,135</u>	<u>\$ 402,502,034</u>
Short-Term Investments and Other	14,859,258	0
Total Infrastructure Investments	<u>\$ 755,644,393</u>	<u>\$ 402,502,034</u>
TOTAL INVESTMENTS	<u>\$ 6,458,741,674</u>	<u>\$ 1,456,714,664</u>

* New or additional commitment made during the quarter reported

State of Michigan Retirement Systems

ABSOLUTE AND REAL RETURN REVIEW

Investment Advisory Committee Meeting

September 7, 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	6.8%	2.6%	5.6%	4.7%	N/A
HFRI FOF Conservative*	4.8%	1.7%	3.6%	2.8%	N/A

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

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.
- In terms of strategy allocations, we continue to remain cautious on directional risks in both equity and credit markets and will continue to shift toward more diversifying, lower net exposures in macro and quantitative strategies. Despite disappointing year-to-date performance, we remain particularly bullish on discretionary macro strategies. With both implied and realized volatility in interest rates and FX near all-time lows, these strategies are well positioned to take advantage of rising interest rates, higher volatility, distressed markets, regime changes, and volatility and correlation shocks.
- No new investments were made this quarter.

Market Environment

- Multi-Strategy/Event – The strategy performed positively for the quarter and ended the period as the second largest contributor to performance. Positive performance was driven primarily by event-driven managers with long exposures in Europe, and long exposures to several catalyst-driven corporate situations.
- Credit – Performance for credit managers was positive for the quarter, as the strategy closed out the period as the largest overall contributor. Residential mortgage and distressed credit managers contributed more positively to performance than their fundamental credit and trading-oriented counterparts.
- Equity – Equity managers had a positive contribution for the second quarter, with trading-oriented managers faring better than fundamental equity managers. Looking at specific sectors, managers with select net long exposure to healthcare and technology names exhibited positive performance.
- Diversifying – Performance for diversifying strategies during the period was mixed, ending slightly negative for the quarter. Losses were driven by moves in both FX and rates markets.

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Real Return and Opport.	12.9%	7.9%	10.6%	10.0%	N/A
Custom Benchmark	7.4%	7.0%	7.2%	7.4%	N/A

Strategy Update

- The objective of the Real Return & Opportunistic portfolio is to provide an inflation hedge or to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- In terms of strategy allocations, we continue to favor private credit opportunities over equity in most situations due to the expected return for the level of risk.
- The Real Return & Opportunistic portfolio has approximately \$3.2 billion of unfunded commitments. New commitments closed during the quarter include:
 - \$240 million to Lakewater III, a co-investment in a short term credit opportunity, managed by Barings Alternative Investments.
 - \$200 million to Lakewater III, a co-investment in a music publishing business, managed by Barings Alternative Investments.
 - \$50 million to Orion Mine Finance Co-Fund II, LP, a co-investment vehicle that invests in select opportunities alongside Orion Mine Finance Fund II.

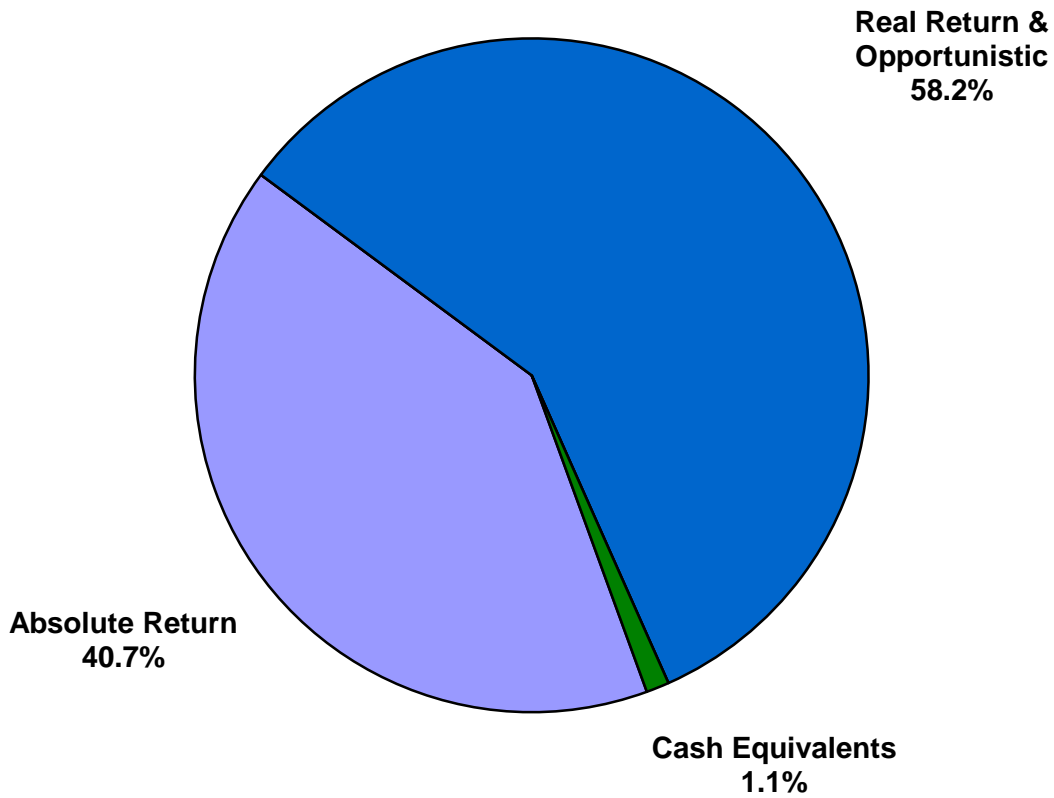
Market Environment

- Senior Secured Credit – The rally across credit markets that began during the first quarter of 2016 showed signs of cooling in June. High yield produced a modest gain despite an uptick in volatility during the month, while leveraged loans modestly declined for the first time in fifteen months amidst increased instability in rates and bond prices. Volatility was driven by interest rates and weakness in the oil and gas sector as WTI prices dipped below \$43 per barrel, a ten-month low. The S&P Leveraged Loan, and Merrill Lynch High Yield Master II Indices returned 0.8%, and 2.1%, respectively, for the second quarter.
- Direct Lending – Our managers have been active adding new loans to the portfolio as capital calls outpaced distributions during the quarter and investment activity remains stable. Managers continue to have a healthy pipeline of opportunities and expect transactions to progress at a steady pace as we move into the remainder of the year.
- Energy – For the quarter, spot WTI crude prices were down 9%. Oil prices sold off during the quarter largely as a result of stronger than expected production in U.S. shale plays, a 14% increase in active U.S. drilling rigs, and OPECs announcement of lower than expected productions cuts. Subsequent to the end of the quarter, multiple U.S. shale producers announced significant capital expenditure cuts for the rest of this year as a result of low oil prices, indicating that low oil prices were impacting producer behavior, potentially providing downside support for oil prices. Spot natural gas prices were down 5% driven by mild weather and an increase in associated gas production. Long-dated natural gas contracts were up 2% to 5% for the quarter as market participants became more constructive on the long-term demand outlook for natural gas largely as a result of demand for liquefied natural gas exports.
- The STARR Division was able to invest additional capital in the space during the quarter at attractive levels and on very advantageous terms. With only approximately 41% of our energy commitments presently invested, a substantial amount of uncalled capital remains ready to capitalize on the opportunities presented by lower oilfield services costs that persist as our managers drill the acreage they leased at distressed prices over the past two years.

SMRS

Absolute, Real Return and Opportunistic

6/30/17



Market Value in Millions				
	<u>6/30/17</u>		<u>3/31/17</u>	
Absolute Return	\$4,061	40.7%	\$4,061	43.7%
Real Return and Opportunistic	5,805	58.2%	5,142	55.4%
Cash Equivalents	110	1.1%	85	0.9%
Total Investments	<u><u>\$9,976</u></u>	<u><u>100.0%</u></u>	<u><u>\$9,288</u></u>	<u><u>100.0%</u></u>

SMRS

Absolute Return

6/30/17

Net Market Values by Entity

	Net Market Value
Apollo Offshore Credit Strategies Fund Ltd.	\$ 92,940,619
Drawbridge Opportunities Fund	212,913,389
* EnTrust White Pine Partners LP	74,851,800
JM IV, LP	89,559,966
MP Securitized Credit Master Fund, LP	73,363,500
Spartan Partner LP	170,254
* Tahquamenon Fund LP	3,514,153,099
Visium Balanced Fund LP	3,276,321
Total Absolute Return	\$ 4,061,228,948
Short-Term Investments & Other	10,048,313
Grand Total	\$ 4,071,277,261

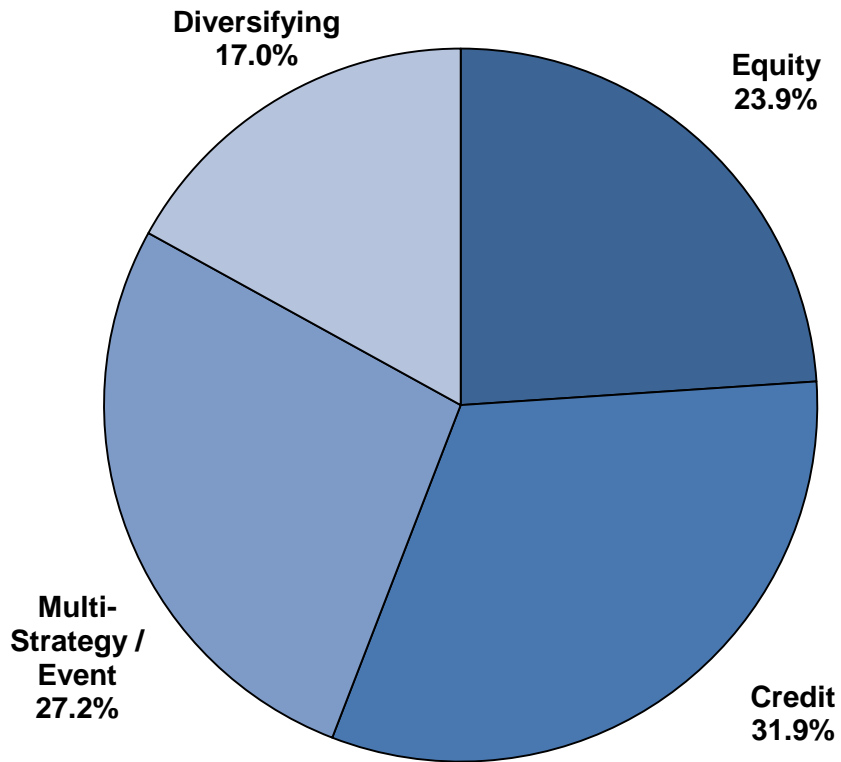
* Fund of Funds

SMRS

Absolute Return

6/30/17

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	83	Median Position Size:	0.4%
Strategies:	4	Average Position Size:	1.2%
Relationships:	8	Largest Position Size:	8.5%

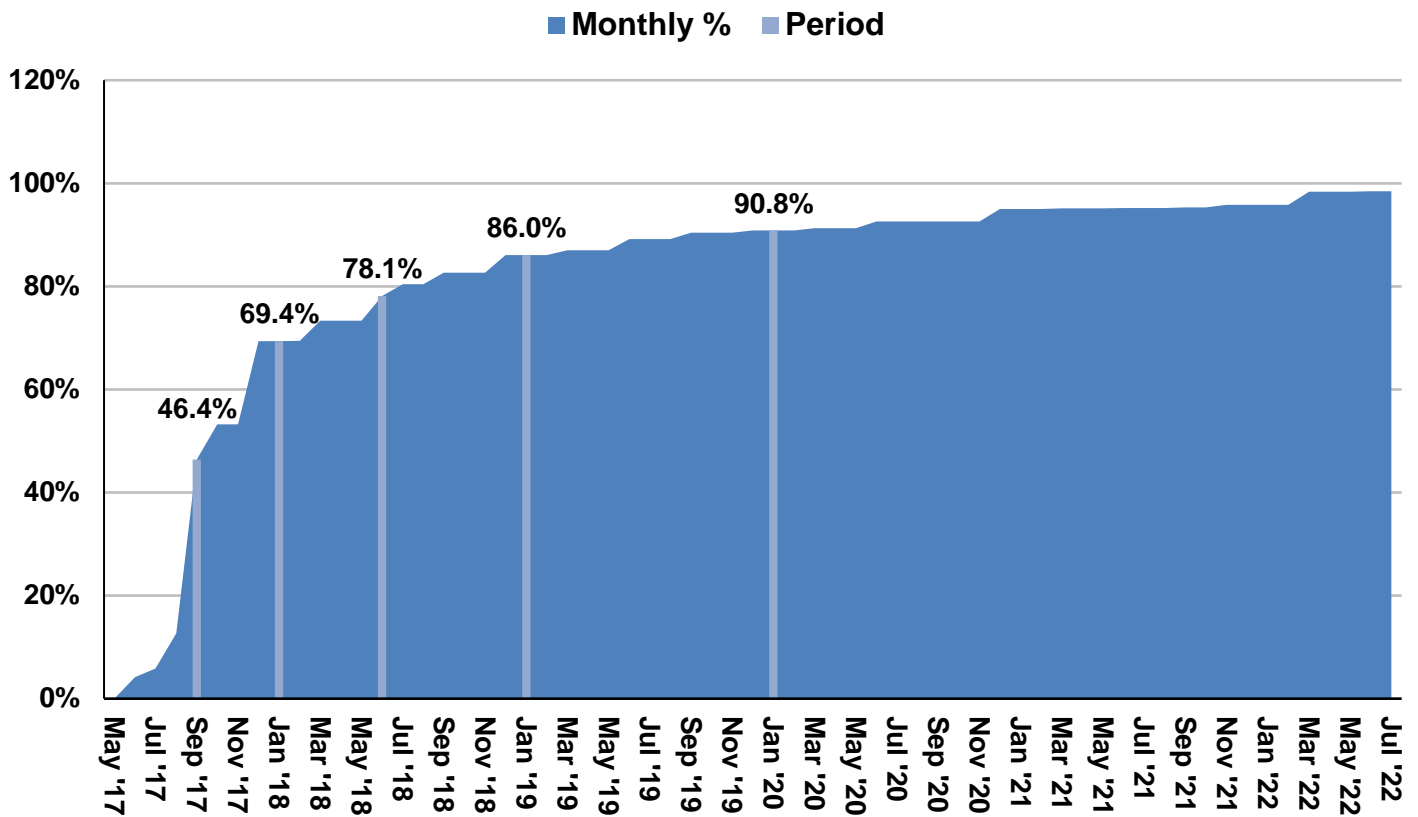
SMRS

Absolute Return

6/30/17

Liquidity Analysis

Redeemable	Marginal Allocation (% each period)	Aggregate Allocation (% since Analysis Date)
By 10/1/17	46.4 %	46.4 %
By 01/1/18	23.0 %	69.4 %
By 07/1/18	8.8 %	78.2 %
By 01/1/19	7.9 %	86.0 %
By 01/1/20	4.8 %	90.8 %
After 01/1/20	7.6 %	98.5 %
Illiquid	1.6 %	100.0 %
Total	100.0 %	N/A



SMRS

Real Return and Opportunistic

6/30/17

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy Fund I, LLC	\$ 156,832,696	\$ 90,199,806
Apollo Credit Opportunities Fund III LP	64,771,245	24,268,095
Apollo European Principal Finance Fund II	50,070,673	8,868,567
Apollo Financial Credit Investments Fund II	297,550,796	188,797,353
Apollo Financial Credit Investments Fund III	-	300,000,000
Apollo HK TMS Investments Holdings LP	15,905,437	-
Apollo Offshore Credit Fund Ltd	266,250,249	-
Apollo Offshore Structured Credit Recovery Fund III	106,825,981	111,626,113
Blackstone Strategic Capital Holdings LP	25,645,644	100,075,842
Blue Peninsula Fund LP	93,932,901	103,635,973
Carlyle Intl Energy Partners LP	16,158,874	41,136,611
Carlyle Energy Mezzanine Opportunity Fund	3,792,534	45,528,094
Centerbridge SCP III, LP	7,271,640	22,500,000
* Content Holdings LLC	517,670,637	47,068,363
Elegantree Fund SPC	64,760,907	4,735,264
Energy Recapitalization and Restructuring Fund LP	26,694,607	16,536,642
ERR Michigan Holdings LP	5,148,478	2,335,070
* Fairfield Settlement Partners, LLC	74,258,023	14,798,035
FCO MA MI LP	79,327,398	122,958,433
Fortress MSR Opportunities Fund I A LP	97,069,837	-
Fortress Transportation & Infrastructure	60,204,153	-
GSO Credit Alpha Fund LP	70,214,881	40,021,313
Highbridge Principal Strategies - Specialty Loan Fund III	97,493,231	15,215,165
Hopen Life Sciences Fund II	4,362,084	2,575,000
HPS Red Cedar Fund	92,879,003	213,876,488
JP Morgan Global Maritime Investment Fund LP	68,711,888	3,956,083
KANG Fund LP	6,180,333	-
Kayne Anderson Energy Fund VII, LP	42,132,288	33,328,409
Kayne P.E. Income Fund	25,659,465	128,483,708
Kayne Solutions Fund, LP	12,324,283	237,675,717
KKR EI&G Fund	49,162,360	14,919,836
KKR Lending Partners I LP	55,395,616	11,930,723
KKR Lending Partners II LP	87,646,311	14,907,287
Lakewater LLC, Series 1	166,587,736	2,560,839
Lakewater LLC, Series 2	270,259,209	13,055,859
** Lakewater LLC, Series 3	764,968,063	-
Lakewater LLC, Series 4	65,006,959	10,000,359
Lakewater LLC, Series 5	184,804,639	58,444,039
Merit Energy Partners LP	27,938,980	9,201,857
MidCap FinCo Holdings LTD	300,078,305	-
Napier Park Aircraft Leasing Vehicle I, LLC	40,816,347	57,603,861
New Fortress Energy HLDGS	300,000,000	-
Orion Coinvest III LP	28,216,661	2,236,552

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Orion Mine Finance Fund 1A LP	\$ 72,780,760	\$ 6,812,977
Orion Mine Finance Fund I LP	138,421,489	7,376,051
Orion Mine Finance II LP	28,985,079	71,242,108
** Orion Mine Finance Co-Fund II LP	3,333,333	46,666,667
Redding Ridge Holdings, LP	16,062,557	82,111,979
* Renaissance Venture Cap Fund II LP	12,470,465	14,250,000
* Renaissance Venture Cap Fund III, LP	750,000	24,250,000
REOG Fund II Coinvest LP	20,352,171	9,475,056
Ridgewood Energy Oil & Gas II	92,033,653	29,758,760
Ridgewood Energy Oil & Gas III	19,922,251	202,194,800
RPEP Energy Opp Inst Partner	10,668,420	28,476,888
RPEP SMRS Holdings, LLC	77,938,259	1,876,850
SJC Direct Lending Fund I, LP	13,148,524	15,088,120
SJC Direct Lending Fund IA, LP	3,074,348	3,764,486
SJC Direct Lending Fund II, LP	176,526,760	38,261,315
SJC Direct Lending Fund III, LP	61,657,420	187,669,167
* Social Network Holdings, LLC	99,858,079	26,827,127
Specialty Equity Strategy LP	1,114,421	17,897,000
Sprott PRL (M), LP	16,311,087	9,401,700
Sprott Private Resource Lending Fund (US), LP	3,826,929	94,160,784
Terra Co-Investment LLC	32,806,945	14,000,000
TICP CLO Partners II, LP	9,096,828	40,249,004
TSSP Adjacent Opp Partners, LP	25,185,868	75,472,208
Varo Coinvestment LP	14,957,039	913,650
Warwick Energy Partners III	44,759,454	16,206,756
Warwick (SMRS) Co-Invest, L.P.	17,611,920	12,089,081
Total Real Return and Opportunistic	\$ 5,804,635,409	\$ 3,191,553,890
Short-Term Investments & Other	100,008,883	-
Grand Total	\$ 5,904,644,292	\$ 3,191,553,890

* Fund of Funds

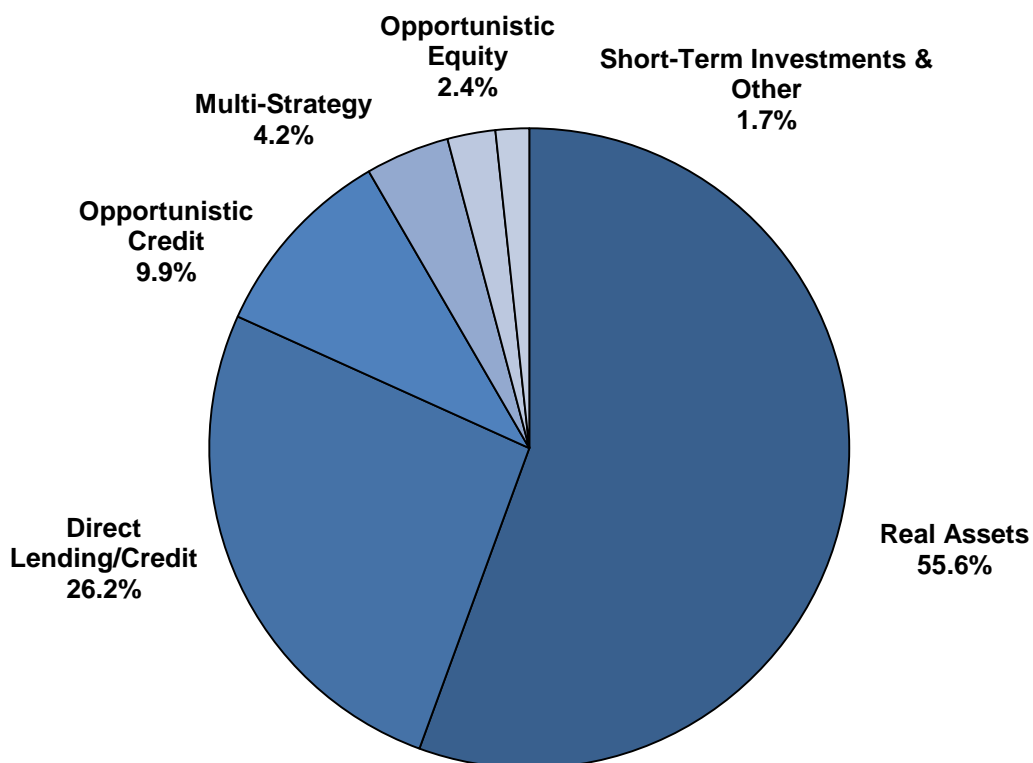
** New Commitment

SMRS

Real Return and Opportunistic

6/30/17

Investments By Strategy



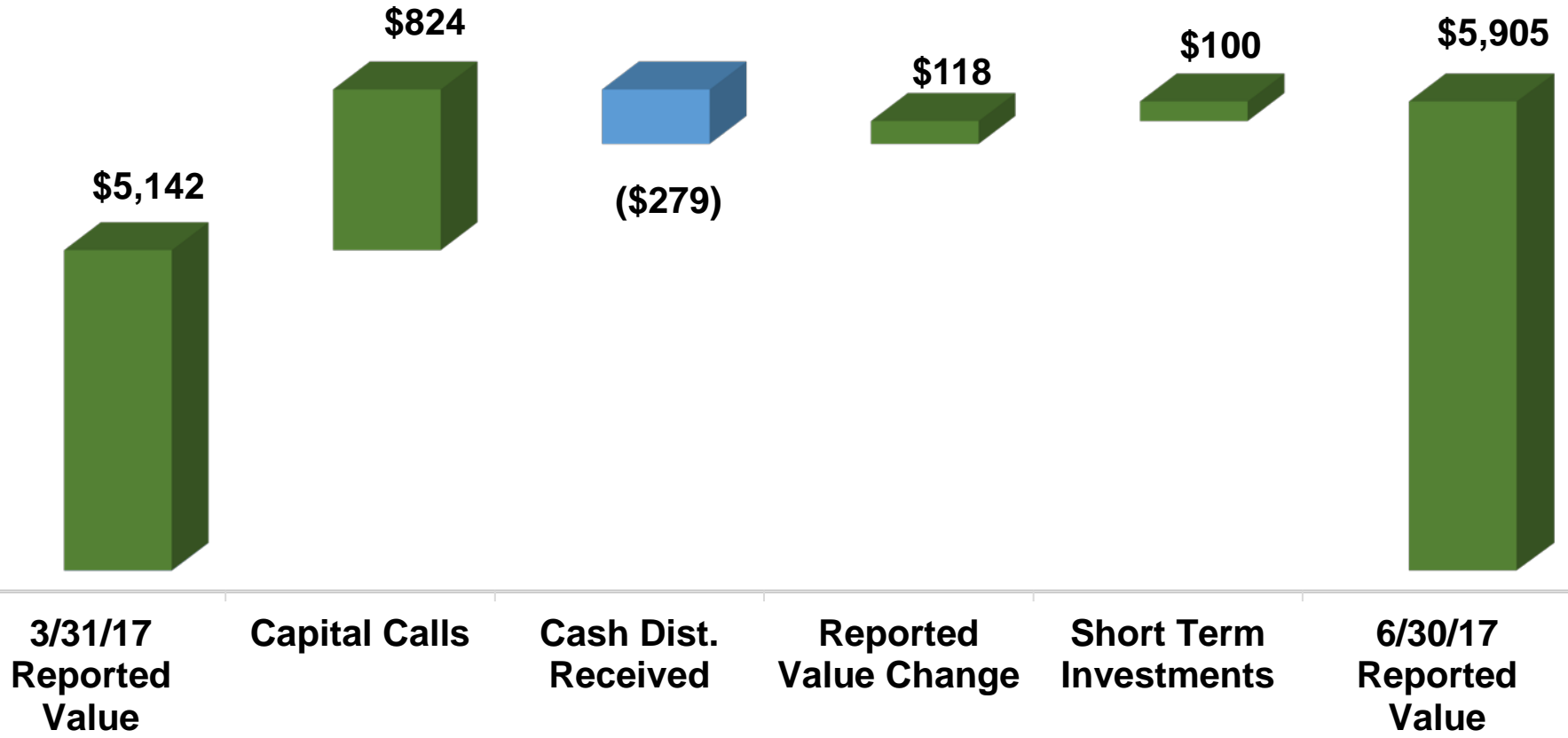
Investment Strategy	
Real Assets	\$3,281,842,858
Direct Lending/Credit	1,545,230,447
Opportunistic Credit	583,710,236
Multi-Strategy	250,765,597
Opportunistic Equity	143,086,272
Short-Term Investments & Other	100,008,883
Total Market Value	\$5,904,644,292

SMRS

Real Return and Opportunistic 6/30/17

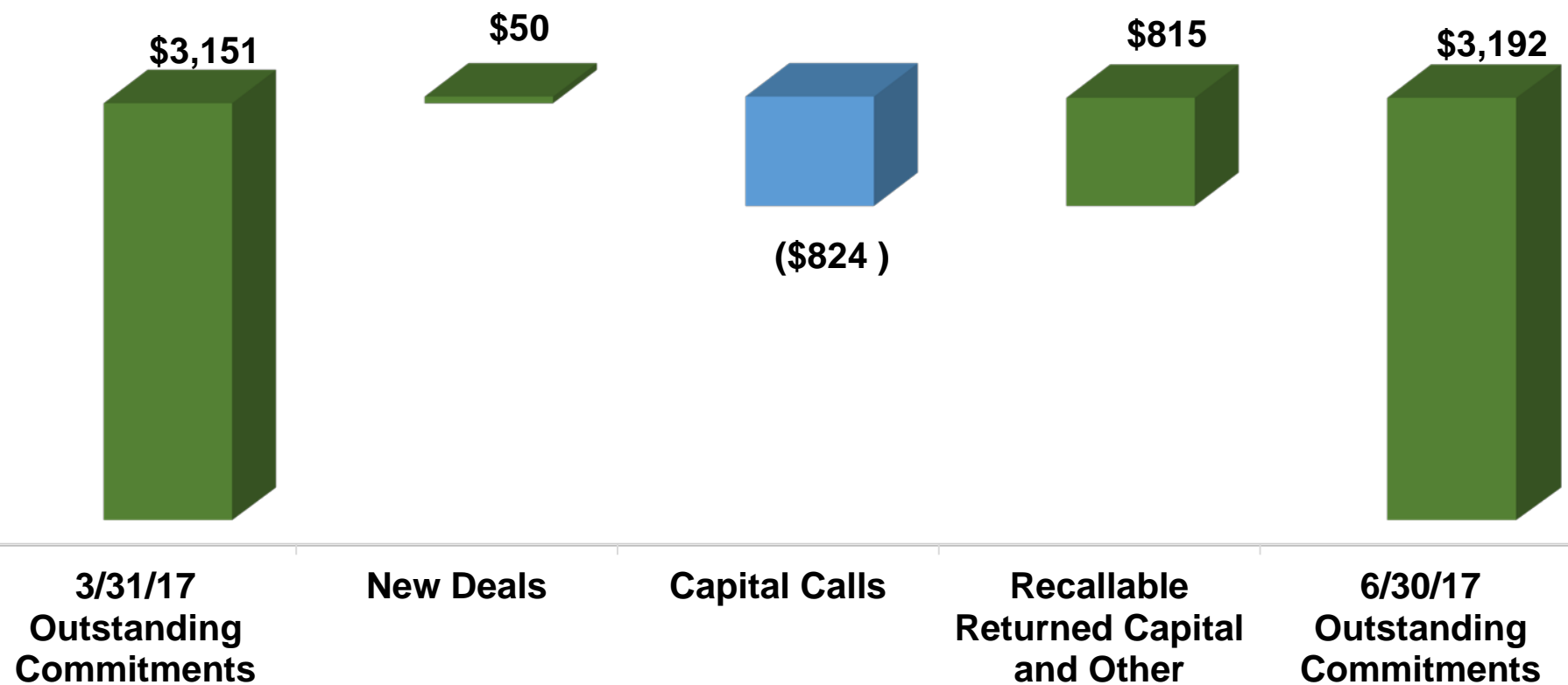
Invested Commitments

(\$ in Millions)



Outstanding Commitments

(\$ in Millions)



SMRS

Real Return and Opportunistic

6/30/17

Top Ten Advisors or Entities

<u>Advisor or Entity</u>	<u>Market Value</u>
Barings Alternative Investments	\$ 1,451,626,606
Apollo Global Management	1,117,515,242
Domain Capital Advisors	848,619,435
Fortress Investment Group	476,397,235
Orion Resource Partners	271,737,322
Czech Asset Management	254,407,052
Ridgewood Energy	220,914,754
KKR Asset Management	192,204,287
HPS Investment Partners	190,372,233
Kayne Anderson Capital Advisors	119,103,314
<u>Total Market Value</u>	<u>\$ 5,142,897,480</u>

State of Michigan Retirement Systems

BASKET CLAUSE REVIEW

Investment Advisory Committee Meeting

September 7, 2017



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

SMRS

Basket Clause Investments

6/30/17

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$4,061,228,948
Total Real Return and Opportunistic	841,954,886
Total International Equity	296,700,685
Total Long-Term Fixed Income	<u>38,849,698</u>
Total Basket Clause Investments	<u>\$5,238,734,217</u>

The basket clause investments at June 30, 2017, were \$5.2 billion or 8.0% of the total portfolio value of \$65.6 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.