

INVESTMENT ADVISORY COMMITTEE MEETING

June 8, 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

JUNE 8, 2017

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 3/9/17 IAC Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 3/31/17
- 10:00 a.m. Current Asset Allocation Review
Markets Review and Outlook
- 10:15 a.m. Review of Investment Reports
- Absolute and Real Return/Opportunistic
 - Fixed Income
 - Real Estate & Infrastructure
 - International Equity
 - Domestic Equity
 - Private Equity
- Basket Clause – *Receive and File*
- 11:00 a.m. Closing Remarks ~ Adjournment



2017 Meeting Schedule

Thursday, September 7, 2017
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

June 8, 2017



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

INVESTMENT ADVISORY COMMITTEE

The Investment Advisory Committee (IAC) held its quarterly meeting on Thursday, March 9, 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

In attendance from the Department of Treasury:

Treasurer Nick A. Khouri
Jim Elkins
Brian Liikala
Travis Haney
Dave Klauka
Bob Anderson
Janet Sudac
Ann Stange

Jon M. Braeutigam
Peter Woodford
Patrick Moraniec
Marybeth Gienapp
Giles Feldpausch
Semone James Howes
Lori Barrett
Lauren Lindemulder

Gregory J. Parker
Jack Behar
Dan Quigley
Woody Tyler
Ann Storberg
Marge McPhee
Annette Russell
Mark Porrell

Others in attendance:

Max Kotary
June Morse
Kerrie Vanden Bosch

Tim McEnery
Molly Jason
Dick Holcomb

Bill Ryan
Paul Lerg
Greg Valliere

Call to Order

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

Approval of Minutes of December 15, 2016

- Mr. Nicholson asked for a motion to approve the minutes of the December 15, 2016, IAC meeting. Mr. Reginald Sanders so moved, seconded by Mr. Al Pscholka, there were no objections – motion carried.

Executive Summary Tab – Performance Review

- Mr. Braeutigam discussed performance, reviewing the returns and noting the superb returns versus peers. There was a discussion of the return differences versus the policy benchmark and how difficult it was to hit the policy benchmark over the past year.

- Mr. Braeutigam noted that private equity is hard to benchmark over short periods of time. The S&P 500 +300 basis points (bps) was tough to achieve in 2016, therefore returns lagged the policy benchmark last year.
- Mr. Braeutigam discussed the ten-year returns versus the peer median, which was 5.9% versus 5.3% annualized, and over a ten-year horizon on \$62.2 billion of assets, that equates to an additional \$6.1 billion in assets.
- Mr. Braeutigam noted that the returns versus peers ranked #1 over the past three years, #4 over the past five years, and #2 over the past seven and ten years. He also noted that the volatility over the past three and five years was the lowest within the State Street Peer Universe.

Asset Allocation & Performance Tabs

- Mr. Greg Parker discussed asset allocation changes for the calendar year 2016, noting that exposure to risk and equities was lowered and cash was raised by about \$1 billion. Also, some high yield and international equity was added to round out the trading. The plan is now positioned slightly defensive to the target allocation.
- Mr. Parker discussed a brief overview of his assessment of the markets and economy.
- Mr. Parker noted that in 2016 it was not surprising that rates increased, that high yield was an opportunity (the high yield index returned 16.7% for 2016, beating the S&P 500 return of 11.9%), or that value beat the growth style. He stated that structured credit strategies like RMBS, CMBS and CLOs are attractive relative to other strategies. Mr. Daniel Quigley and Mr. Brian Liikala provided a good summary of what is being reviewed and why the opportunities exist.
- Mr. Parker discussed the U.S. economy, noting it is his opinion it is not doing well, though not that badly either. He believes that they are at full employment, that the consumer balance sheets are healthy, and that housing is a tailwind. Mr. Parker commented that housing prices are increasing mainly because of a lack in supply of houses and of low rates. He discussed that it is still hard for lower credit borrowers to get a mortgage, but even if they could, there are not enough workers to build new houses.
- Mr. Parker noted that globally, Japan is getting some desirable increase in inflation expectations and Europe is improving.
- Mr. Parker discussed the risk side for most asset classes, which have a lower than normal return expectation. He stated that many of the general partners are reluctant to put capital to work on the private side and that valuations for U.S. equities are stretched. Mr. Parker noted that from December 2013 to December 2016 the market is up ~ 30%, all due to multiple expansion and dividends. The median S&P 500 stock is at historically high price to earnings multiples (rivaling 1999).

- Mr. Parker noted that the Domestic Equity portfolio is cheaper than the market and globally credit spreads are low, especially for high yield. He stated rates are rising in the U.S. and the Federal Reserve is on deck to increase rates. He noted concern that the Federal Reserve may raise rates faster than what the market is pricing in today.
- Mr. Parker stated that there is a great deal of complacency in the marketplace. He stated the VIX index is hovering around 20-year lows and that the S&P 500 recently hit a streak of going ~ 56 consecutive days without a 1% change in value. Mr. Parker stated that this is a record that shattered the previous record of 34 days. He also stated that since Brexit and Trump, that the UK market and the U.S. markets are both up double digits.

Guest Speaker – Gregory Valliere, Horizon Investments

Mr. Valliere gave a presentation about economic policy topics and political considerations for the year ahead. He also fielded several questions from BOI staff and IAC Board members.

Review of Investment Reports – Received and Filed

- Absolute and Real Return/Opportunistic
- Domestic Equity
- Fixed Income
- International Equity
- Private Equity
- Real Estate & Infrastructure
- Basket Clause

Closing Remarks

Chairman Nicholson thanked everyone for attending the March IAC Meeting.

Next Meeting Date and Adjournment

The next IAC Meeting is scheduled for Thursday, June 8, 2017. The meeting was adjourned by Chairman Nicholson at 11:00 a.m.

Approved:

James B. Nicholson, Chair

State of Michigan Retirement Systems

EXECUTIVE SUMMARY

Investment Advisory Committee Meeting

June 8, 2017



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

EXECUTIVE SUMMARY

March 2017

Performance

An overview.

MPSERS Plan (3/31/17)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	11.2%	7.2%	9.5%	9.5%	6.1%
Policy Return	11.6%	7.5%	9.7%	9.7%	6.3%
Percentile Peer Median Return*	11.2%	6.2%	8.2%	8.6%	5.5%

*State Street Universe greater than \$10 billion.

- Over the past three, five, seven, and ten years, the returns are much higher than peer median returns. When compared to the State Street Universe of public pension plans greater than \$10 billion, the returns are among the highest. Perhaps 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 have been approximately 9.3%.
- Compounding even slightly higher than peer returns on \$64.2 billion of SMRS assets, significantly adds up over time. For example, the ten-year annualized return of 6.1% compared to the 5.5% peer median return adds roughly \$6.4 billion of value to SMRS over a ten-year period.
- The returns fell below the policy benchmark over the past year by -0.4%. Many of the asset classes posted results in excess of their performance benchmark, however small allocation differences tipped the performance below the policy benchmark.
- For the year ending March 2017, returns matched the peer median return. Differences in asset allocation compared to peers seemed to even out over this time period. Most asset class returns matched or exceeded peer returns.

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 \$10.6 billion in illiquid assets, primarily private equity. In the March 2017 quarter, over \$500 million of new commitments were made.
- The combined systems paid out approximately \$2.1 billion net of contributions over the past twelve months ending in March 2017.
- Nearly every asset class over the past year was a net seller, with the lone exception of international equity which had a net inflow of less than \$20 million. As a result, over the past year in round numbers, the allocation to short-term cash increased by approximately \$1.2 billion. The allocation to domestic equity was reduced by \$1.9 billion, private equity by \$665 million, absolute return by \$350 million, real estate by \$160 million, and real return opportunistic by \$156 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.
- In the U.S. market, at the end of April 2017, the VIX Index and trailing 30-day price volatility of the S&P 500 Index were both measured in the lowest percentiles going back twenty years.
- At its March 2017 meeting, the Federal Reserve Board voted to raise its key interest rate for the second time in the past twelve months. The market is pricing in the probability of at least two additional rate hikes in 2017. Even with additional Fed tightening, monetary policy is more accommodative today than it was in 2015 when the Fed initially began to tighten.
- Currency has played a major role with the underperformance of international equities compared to U.S. equities as all of the underperformance over the past year has been due to the dollar strengthening.

Economic Backdrop

A pretty good U.S. economy.

- The current economic expansion in the U.S. is into its seventh year, ranking it the fourth longest economic expansion in the past seventy years.
- The jobs market is very healthy. The national unemployment rate is 4.5% and the three-month average figures for initial jobless claims is at its lowest level since 1973. In March 2017, there were 5.7 million job openings in the U.S. according to the Labor Department, just below an all-time record.
- The headline Consumers Price Index hit a level of 2.7% during the first quarter. This is the highest level since 2012.

Investment Update
Highlighting the quarter.

(\$ Millions)

NEW COMMITMENTS

January 1 – March 31, 2017

Asset Class	Fund Name / (Managed By)	Commitment
Private Equity		
	Genstar Capital Partners VIII, L.P. (Genstar Capital Partners, LLC)	\$100.0
	The Huron Fund V, L.P. (Huron Capital Flag GP, LLC)	35.0
	TCW/Crescent Mezzanine Partners III, IVB, VC, Secondary (TCW/Crescent Mezzanine, LLC)	6.2
Real Estate & Infrastructure		
	MWT Holdings, LLC	40.0
	Principal Separate Account (Principal Real Estate Investors)	15.0
	RPEP SMRS, LLC (Ridgewood Private Equity Partners)	13.0
	Paladin Realty Latin America Investors V (Paladin Realty Advisors)	10.0
	AEW Senior Housing III (AEW Partners)	4.5
Real Return & Opportunistic		
	Kayne Solutions Fund, LP	250.0
	Renaissance Venture Capital Fund III, LP	25.0
	SJC Direct Lending Fund IA, LP	10.0
TOTAL		\$508.7

State of Michigan Retirement Systems

PERFORMANCE

Investment Advisory Committee Meeting

June 8, 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 March 31, 2017

	% of Portfolio 3/31/17	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	6.1	7	9.5	10	9.5	11	7.2	7	11.2	50	4.0	79
Median - Greater than \$10 Billion ²		5.5		8.6		8.2		6.2		11.2		4.4	
MPSERS Total Plan Policy		6.3		9.7		9.7		7.5		11.6		4.2	
DOMESTIC EQUITIES	26.4	7.5	33	12.4	46	13.1	32	9.2	46	16.6	62	5.5	54
Median ²		7.3		12.3		12.7		9.2		17.4		5.8	
S&P 1500 Index		7.7		13.0		13.3		10.3		17.7		5.7	
INTERNATIONAL EQUITIES	16.4	1.5	86	5.1	62	5.9	57	2.4	26	13.9	33	8.3	40
Median ²		2.2		5.3		6.0		1.5		13.5		8.2	
International Blended Benchmark ³		0.4		3.8		4.6		0.6		13.1		7.9	
PRIVATE EQUITIES	15.1	11.4	7	14.3	9	13.7	11	10.9	17	10.1	53	2.7	60
Median ²		8.2		11.4		10.7		8.3		10.1		2.9	
Alternative Blended Benchmark ⁴		11.2		16.8		17.8		12.1		15.2		4.6	
BONDS	12.6	5.4	23	4.6	52	3.7	37	4.1	32	4.3	29	1.6	36
Median ²		4.8		4.6		3.3		3.3		2.7		1.3	
Barclays Aggregate		4.3		3.5		2.3		2.7		0.4		0.8	
REAL ESTATE & INFRASTRUCTURE	10.3	4.8	30	12.1	34	11.8	27	12.1	26	8.9	30	1.7	52
Median ²		3.6		11.2		10.7		10.5		7.6		1.7	
NCREIF - Property Blended Index ⁵		5.4		10.4		9.3		9.2		5.9		1.2	
NCREIF Open Fund Index Net		4.6		12.4		10.9		10.8		7.4		1.5	
REAL RETURN AND OPPORTUNISTIC	8.1			9.5		10.2		8.3		11.1		3.2	
50% (CPI +500 bps) + 50% (8% actuarial rate)				7.4		7.1		7.1		7.8		2.1	
ABSOLUTE RETURN	6.4			4.7		5.3		2.5		10.8		4.0	
HFRI FOF Cons 1 month lagged				2.7		3.2		1.6		5.1		1.7	
CASH EQUIVALENTS	4.7	0.7		0.4		0.5		0.6		0.7		0.2	
1 Month T-Bill		0.5		0.1		0.1		0.1		0.3		0.1	

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.

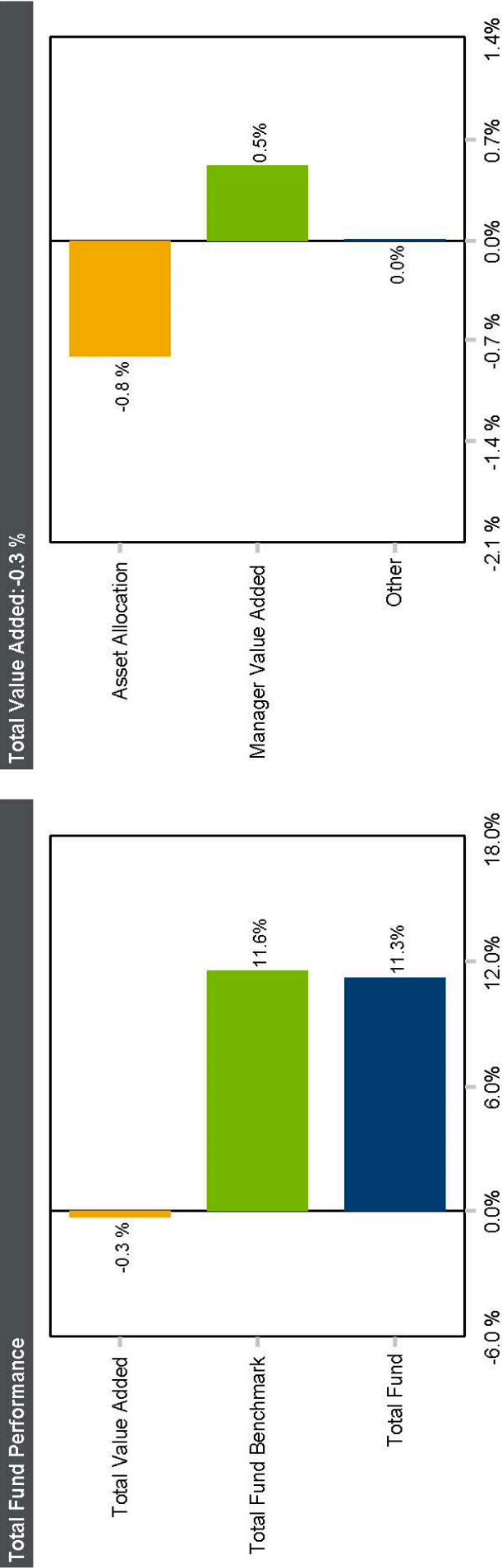
⁴ SP 500 + 300 bps thru 12/31/06. Ending market value (EMV) weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 12/31/06 to 9/30/09. EMV weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 3-month lagged 9/30/09 to present.

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

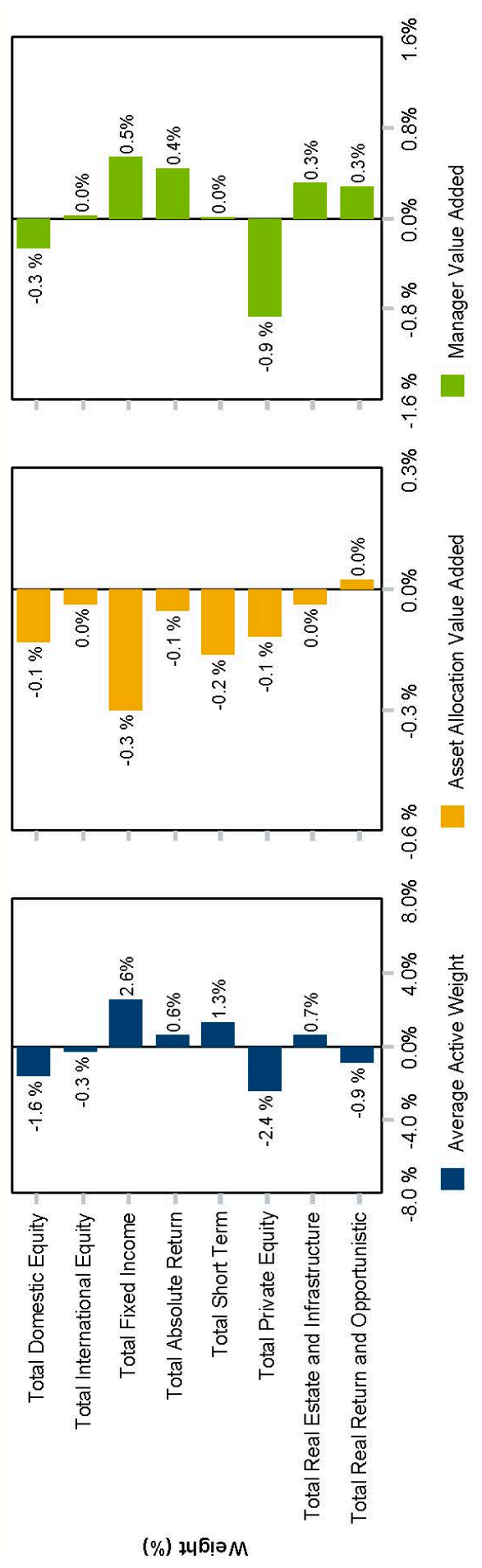
Source: State Street Analytics; the NCREIF - NPI (Property Index) source is NCREIF; the S&P BMI-EPAC Index source is S&P.

1 Year Ending March 31, 2017
Total Fund Attribution

Total Michigan vs. Total Fund Benchmark



Total Asset Allocation: -0.8%



Cumulative and Consecutive Total Fund Returns

MPSERS										
Cumulative For Years Ending 3/31/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	11.2	6.2	7.2	9.3	9.5	8.7	9.5	11.3	6.4	6.1
Public Plan - Median (> \$10 billion)*	11.2	5.3	6.2	7.6	8.2	7.6	8.6	10.9	5.8	5.5
Rank	50	13	7	4	11	7	10	35	15	7
bp Difference - Median	3	84	104	164	127	117	90	38	56	64
Consecutive For Years Ending										
	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10	03/09	03/08
MPSERS	11.2	1.4	9.3	15.7	10.4	5.0	14.2	24.3	-25.5	3.3
Public Plan - Median (> \$10 billion)*	11.2	0.1	7.0	13.0	10.6	4.5	13.5	27.9	-27.9	1.9
Rank	50	10	9	6	55	32	37	84	29	29
bp Difference - Median	3	130	227	265	-17	54	71	-356	242	139

MSERS										
Cumulative For Years Ending 3/31/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	11.3	6.2	7.2	9.2	9.5	8.7	9.5	11.2	6.3	6.0
Public Plan - Median (> \$1 billion)*	11.6	5.3	5.9	7.5	8.1	7.5	8.4	10.9	5.9	5.4
Rank	57	9	3	4	10	9	13	38	26	15
bp Difference - Median	-30	94	133	174	137	118	102	31	45	57
Consecutive For Years Ending										
	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10	03/09	03/08
MSERS	11.3	1.3	9.2	15.6	10.4	4.8	14.1	24.1	-25.7	3.1
Public Plan - Median (> \$1 billion)*	11.6	-0.2	6.9	12.3	10.5	4.4	14.0	29.3	-27.4	1.8
Rank	57	7	10	8	53	33	46	89	34	27
bp Difference - Median	-30	155	233	330	-9	47	16	-520	176	134

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS										
Cumulative For Years Ending 3/31/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	11.2	6.2	7.2	9.2	9.4	8.7	9.5	11.1	6.3	6.0
Public Plan - Median (> \$1 billion)*	11.6	5.3	5.9	7.5	8.1	7.5	8.4	10.9	5.9	5.4
Rank	57	11	7	6	11	10	13	40	27	12
bp Difference - Median	-34	93	131	170	133	116	102	27	44	58
Consecutive For Years Ending										
	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10	03/09	03/08
MSPRS	11.2	1.3	9.2	15.5	10.4	4.9	14.3	23.6	-25.5	3.4
Public Plan - Median (> \$1 billion)*	11.6	-0.2	6.9	12.3	10.5	4.4	14.0	29.3	-27.4	1.8
Rank	57	7	10	10	55	32	45	89	32	25
bp Difference - Median	-34	155	232	320	-13	53	30	-564	191	163

MJRS										
Cumulative For Years Ending 3/31/17										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	11.3	6.2	7.2	9.0	9.3	8.5	9.3	10.8	6.1	5.8
Public Plan - Median (> \$1 billion)*	11.6	5.3	5.9	7.5	8.1	7.5	8.4	10.9	5.9	5.4
Rank	56	9	8	9	15	17	17	58	33	27
bp Difference - Median	-27	95	128	153	116	101	88	-8	23	40
Consecutive For Years Ending										
	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10	03/09	03/08
MJRS	11.3	1.3	9.1	14.9	10.2	4.9	14.2	21.7	-24.9	3.4
Public Plan - Median (> \$1 billion)*	11.6	-0.2	6.9	12.3	10.5	4.4	14.0	29.3	-27.4	1.8
Rank	56	7	10	19	61	32	46	91	28	25
bp Difference - Median	-27	154	218	257	-33	51	24	-761	247	162

*State Street Public Funds Universe

State of Michigan Retirement Systems

ASSET ALLOCATION REVIEW

Investment Advisory Committee Meeting

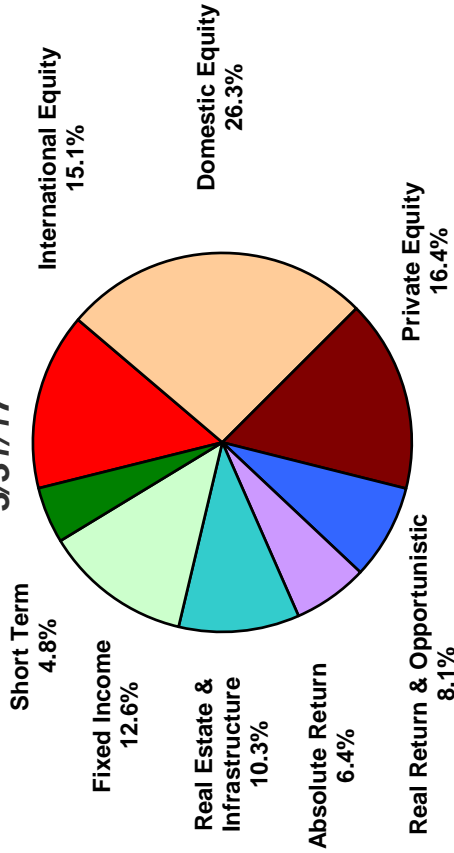
June 8, 2017



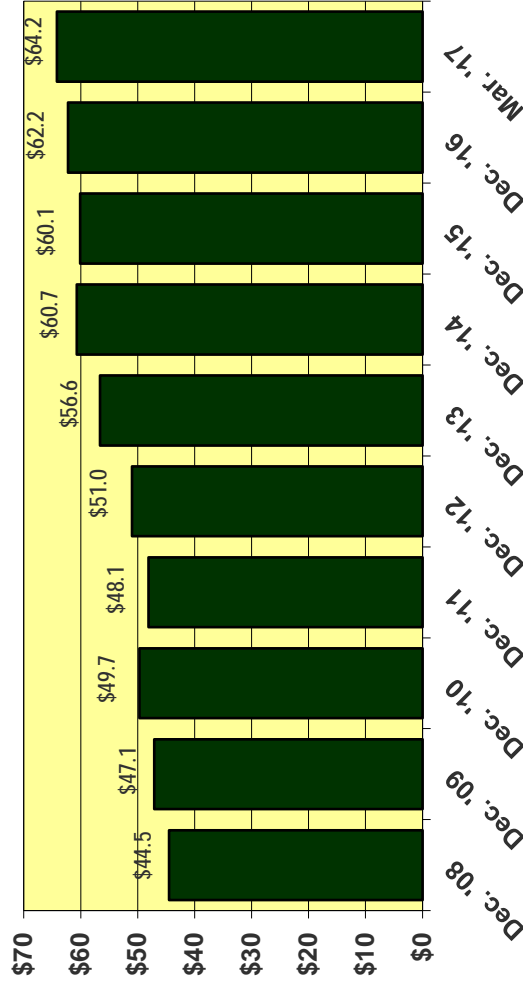
Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEMS PROFILE - MARCH 2017

Asset Allocation 3/31/17



Market Value* (Billions of Dollars)



Asset Allocation By Market Value (In Millions)

Investment Strategies	3/31/17	3/31/16
Domestic Equity	\$16,905	\$16,294
International Equity	10,491	9,208
Private Equity	9,707	8,553
Fixed Income	8,090	7,771
Real Estate & Infra.	6,624	6,276
Real Return & Opport.	5,217	4,852
Absolute Return	4,071	4,012
Short Term***	3,088	1,904
TOTAL	\$64,193	\$58,870

Short Term Equivalents (in Billions)

Short Term Strategy***	\$3.1
Short Term in Other Inv. Strategies	0.8
TOTAL SHORT TERM	\$3.9

6.1% of Total Funds

Market Value By Plan ~ 3/31/17 (in Millions)

	Pension Plan Mkt. Value	OPEB** Mkt. Value	Combined Mkt. Value	%
MPERS	\$44,723	\$4,751	\$49,474	77.1%
MSERS - (closed)	11,270	1,741	13,011	20.3%
MSPRS	1,321	128	1,449	2.2%
MJRS - (closed)	258	1	259	0.4%
TOTAL	\$57,572	\$6,621	\$64,193	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

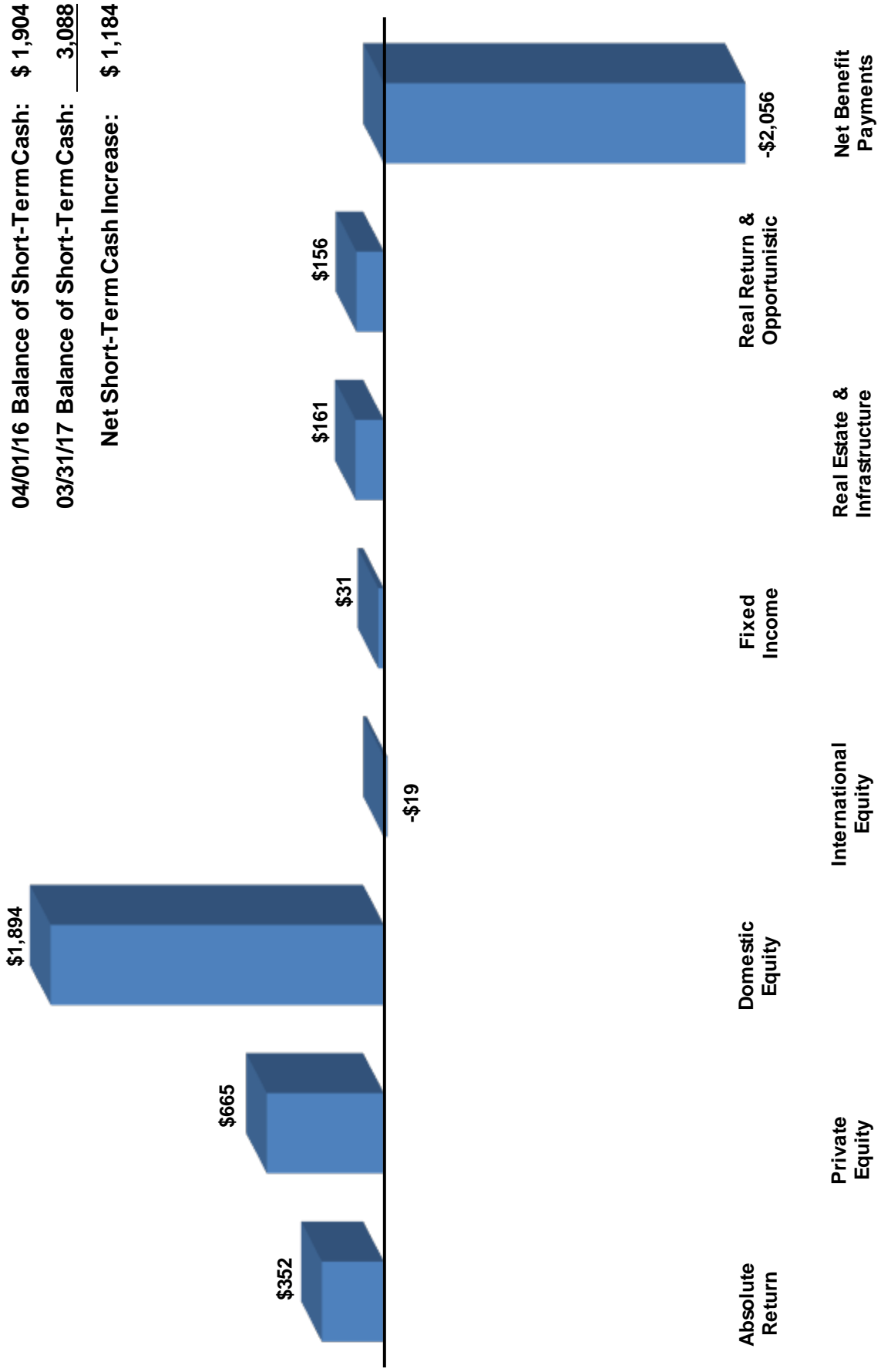
Asset Allocation Targets As of 3/31/17

Asset Class	MPERS			MSERS			MSPRS			MJRS			SMRS
	Actual 3/31/17	Target 9/30/17	Target* 9/30/18	Actual 3/31/17	Target 9/30/17	Target* 9/30/18	Actual 3/31/17	Target 9/30/17	Target* 9/30/18	Actual 3/31/17	Target 9/30/17	Target* 9/30/18	Ranges
Broad U.S. Equity	26.4%	27.0%	28.0%	26.4%	27.0%	28.0%	26.4%	27.0%	28.0%	26.5%	27.0%	28.0%	20% - 50%
Private Equity	15.1%	16.5%	18.0%	15.2%	16.5%	18.0%	15.1%	16.5%	18.0%	15.2%	16.5%	18.0%	10% - 25%
Broad Int'l Equity	16.4%	16.0%	16.0%	16.4%	16.0%	16.0%	16.4%	16.0%	16.0%	16.4%	16.0%	16.0%	10% - 20%
U.S. Fixed Income Core	12.6%	12.0%	10.5%	12.6%	12.0%	10.5%	12.6%	12.0%	10.5%	12.6%	12.0%	10.5%	8% - 25%
Real Estate / Infrastructure	10.3%	10.5%	10.0%	10.3%	10.5%	10.0%	10.3%	10.5%	10.0%	10.3%	10.5%	10.0%	0% - 15%
Real Return / Opportunistic	8.1%	9.0%	9.5%	8.2%	9.0%	9.5%	8.1%	9.0%	9.5%	8.2%	9.0%	9.5%	0% - 15%
Absolute Return	6.4%	6.0%	6.0%	6.4%	6.0%	6.0%	6.4%	6.0%	6.0%	6.4%	6.0%	6.0%	0% - 12%
Cash	4.7%	3.0%	2.0%	4.5%	3.0%	2.0%	4.7%	3.0%	2.0%	4.4%	3.0%	2.0%	1% - 9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

*Complies with basket clause and international restrictions.

Sources and Uses of Cash

April 2016 ~ March 2017



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

State of Michigan Retirement Systems

MARKETS REVIEW AND OUTLOOK

Investment Advisory Committee Meeting

June 8, 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	11.1%	24.0%	12.2%	Hold
International Equity	9.3%	20.0%	1.4%	Add
Domestic Equity	8.0%	17.0%	7.7%	Hold
Real Estate (Core)	6.2%	12.5%	5.4%	Trim
Absolute Return	5.6%	9.0%	-0.8%	Trim
Real Ret/Opportunistic	8.7%	12.1%	7.4%	Add
Long-Term Fixed	3.0%	4.0%	4.3%	Hold
Short-Term	2.5%	1.0%	0.5%	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

Softening the outlook for risk assets.

- 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.
- Perhaps somewhat surprisingly, volatility in the equity market is extremely low. In the U.S. market, at the end of April 2017, the Vix Index and trailing 30-day price volatility of the S&P 500 Index were both measured in the lowest percentiles going back twenty years. Trailing 30-day price volatility for the MSCI ACWI ex USA Index was also low.
- The broad U.S. stock market return for one year ending March 2017 was 17.7%. Growth in earnings and dividend yield accounted for roughly 6.4% of the return, and the rest due to multiple expansion.
- Within international equities, emerging markets have now outperformed developed markets over the past one year, three, and ten years by 5.1%, 0.7% and 1.4% annualized respectively.
- At its March 2017 meeting, the Federal Reserve Board voted to raise its key interest rate for the second time in the past twelve months. The market is pricing in the probability of at least two additional rate hikes in 2017. Even with additional Fed tightening, monetary policy is more accommodative today than it was in 2015 when the Fed initially began to tighten.

Domestic Equity

Some growth in earnings.

- The broad U.S. stock market return for one year ending March 2017 was 17.7%. Growth in earnings and dividend yield accounted for roughly 6.4% of the return, and the rest due to multiple expansion. Year-over-year earnings growth of U.S. equities has actually 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 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 March 2017, small-cap stocks significantly out-returned large-cap stocks by 8.6%. Over the past three, five, seven, and ten years, however, large have higher returns than small-cap stocks by 3.0%, 1.0%, 0.8%, and 0.6% annualized respectively. Small-cap stocks continue to look expensive both relative to large caps and in absolute terms.
- Over the past year, value style beat growth by 3.2%, and may be a sign of things to come. 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.

International Equity

Currency impacting returns.

- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending March 2017, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -4.0%, -9.2%, -8.5%, -8.7%, and -5.9% annualized respectively.
- Currency has played a major role with the underperformance of international equities compared to U.S. equities as all of the underperformance over the past year has been due to the dollar strengthening. Over the past three and five year periods, over half of the underperformance of international equity can be explained by dollar strength.
- Within international equities, emerging markets have now outperformed developed markets over the past one, three, and ten years by 5.1%, 0.7%, and 1.4% annualized respectively. Over the past five and seven years developed has outperformed emerging by 4.7%, and 2.9%.
- International equity small-cap stocks slightly underperformed the broader MSCI ACWI ex USA index last year by -0.5%. However, the returns for international small caps were 1.9%, 2.3%, 2.4% and 1.6% higher over the past three, five, seven, and ten years respectively on an annualized basis. The plan is overweight small caps with an allocation of approximately 27.5%.
- The plan is underweight international equity against a global benchmark (approximately 38% versus 48%) though close to the weight of peers; 16.4% versus 17.3%.
- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international equity markets trade at approximately a 15% discount to the U.S. counterparts, while emerging markets trade at close to a 30% discount.

Interest Rates

Rising rates.

- At its March 2017 meeting, the Federal Reserve Board voted to raise its key interest rate for the second time in the past twelve months. The market is pricing in the probability of at least two additional rate hikes in 2017.
- In December 2015, the Fed first began to raise interest rates since the end of the Global Financial Crisis. At that time, the real rate was approximately -0.5%. Today, as inflation has trended higher, the real rate is -1.5%. Meaning monetary policy today is even more accommodative than it was at the first rate hike.
- The 10-year U.S. Treasury ended March 2017 at 2.4%, about 60 basis points (bps) higher than one year prior and in line with the two rate hikes. The curve is a little bit steeper than average, potentially an indicator of continued economic growth.
- During March 2017, spreads on investment-grade corporates are at historic averages while spreads on high yield bonds are about 100 bps tighter than average. The plan continues to sell into the high yield market strength.
- Inflation expectations are finally being priced below historical averages. The ten-year breakeven rates at the end of March 2017 were priced just below 2.0%, and right at the long-term inflation target of the Federal Reserve. This is 80 bps higher than the low point of 2016.
- The Barclays Aggregate Index's sensitivity to changes in interest rates is fairly high. At the end of March 2017, the Index had a modified duration of 6.0.

Real Estate

Rich valuations.

- The publicly traded FTSE NAREIT REITs Index was up 5.3% over the past year ending March 2017, with about 4% 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.

Commodities

Going nowhere.

- Commodities broadly rebounded sharply in early 2016 but have been mostly flat over the past twelve months ending March 2017. The Thomson Reuters CRB Commodity Index increased more than 20% from the February 2016 lows, and more than 9% from a year ago. However, since the 2008 peak in prices, the index has lost 60% of value and the longer term trend in commodity prices remains to the downside.
- Since its 2008 low, the U.S. dollar has increased in value by more than 40%, though the ascension has not been a steady trip. There have been periods of fierce appreciation, periods of moderation, and periods of steadiness. From March of 2016 through March 2017, the value of the U.S. dollar increased by a modest 6%.

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	3.1	3.3	3.4	3.3
U.S.	2.6	1.6	2.2	2.3	2.2
Developed (G8)	1.9	1.4	1.8	1.8	1.8
Asia	4.9	4.8	4.8	4.8	4.7
EMEA	1.3	1.3	2.2	2.6	2.4
Europe	2.0	1.8	1.6	1.6	1.4
Latin America	-0.4	-1.2	1.4	2.6	2.6
China	6.9	6.7	6.6	6.3	6.0

*Source: Bloomberg

Economic Overview

A very healthy jobs market.

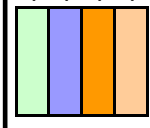
- The most recent reading of the annualized U.S. GDP growth was 0.7%, below the consensus estimate of 1.0%. Current estimates for 2018 GDP growth for the U.S. is 2.3%. Coincidental economic indicators such as the Institute for Supply Management's Manufacturing and Non-Manufacturing PMI Indexes are well 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. This is the highest level since 2012.
- The jobs market is very healthy. The national unemployment rate is 4.5% and the three-month average figures for initial jobless claims is at its lowest level since 1973. In March 2017, there were 5.7 million job openings in the U.S. according to the Labor Department, just below an all-time record.
- Sceptics to the health of the employment landscape point to the four decade low in the participation rate as evidence of slack in the labor force. Much of the participation rate can be explained by changes in demographics and disability. In addition, new research from the Federal Reserve suggests that the lower participation can also be explained as miss-measuring new types of businesses collectively known as the "gig" economy. Examples of these businesses include companies like Uber, Lyft, AirBnB, etc. The study suggests that if these income producing activities were considered as jobs, then the labor participation rate for ages 25 to 54 would be at historic averages going back to 1990.
- 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 3.4% in March 2017.
- Housing prices in the U.S are high. This is good for household balance sheets, but may act as a headwind for household formations. According to the U.S. Bureau of the Census the median sales price of new houses sold in the U.S. is \$315,000, up over 20% 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 March 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 32.94%	U.S. Equity 26.33%	Int'l Equity 26.97%	Gov't Bonds 13.23%	Corp. Bonds 10.40%	Gov't Bonds 11.50%	Int'l Equity 40.82%	Int'l Equity 20.90%	Real Estate 20.06%	Int'l Equity 26.65%	Int'l Equity 16.65%	Gov't Bonds 12.38%	Int'l Equity 41.44%	U.S. Equity 16.38%	Real Estate 14.26%	Int'l Equity 16.83%	U.S. Equity 32.80%	U.S. Equity 13.08%	Real Estate 13.32%	U.S. Equity 11.93%	Worst →
	Hedge Funds 14.95%	Int'l Equity 19.97%	U.S. Equity 20.27%	Real Estate 12.24%	Real Estate 7.28%	Corp. Bonds 10.52%	U.S. Equity 29.58%	Real Estate 14.48%	Int'l Equity 16.62%	Real Estate 16.59%	Real Estate 15.84%	Cash 2.05%	U.S. Equity 27.24%	Real Estate 13.11%	Gov't Bonds 9.02%	U.S. Equity 16.17%	Int'l Equity 15.29%	Real Estate 11.81%	U.S. Equity 1.01%	Real Estate 7.97%	
	Real Estate 13.91%	Gov't Bonds 16.24%	Real Estate 18.93%	Corp. Bonds 9.40%	Gov't Bonds 7.24%	Hedge Funds 6.74%	Real Estate 9.01%	Hedge Funds 11.78%	Hedge Funds 5.65%	Hedge Funds 15.34%	Hedge Funds 8.67%	Corp. Bonds 0.10%	Hedge Funds 16.05%	Corp. Bonds 11.15%	Corp. Bonds 8.35%	Corp. Bonds 10.54%	Hedge Funds 10.99%	Gov't Bonds 7.53%	Gov't Bonds 0.86%	Corp. Bonds 5.63%	
	Corp. Bonds 10.23%	Corp. Bonds 9.85%	Cash 11.36%	Hedge Funds 6.16%	Hedge Funds 4.43%	Hedge Funds 3.57%	Corp. Bonds 8.99%	Corp. Bonds 5.83%	Hedge Funds 5.13%	Hedge Funds 9.21%	Hedge Funds 7.68%	Corp. Bonds -3.07%	Hedge Funds 9.65%	Corp. Bonds 8.46%	Corp. Bonds 2.96%	Corp. Bonds 9.37%	Hedge Funds 7.69%	Gov't Bonds 4.92%	Hedge Funds 0.66%	Int'l Equity 4.50%	
	Gov't Bonds 9.58%	Corp. Bonds 8.59%	Cash 4.83%	Hedge Funds 5.77%	Hedge Funds 3.11%	Int'l Equity 2.39%	Corp. Bonds 7.69%	Corp. Bonds 5.25%	Int'l Equity 3.42%	Cash 4.81%	U.S. Equity 5.47%	Real Estate -6.46%	Int'l Equity 2.72%	Gov't Bonds 5.52%	U.S. Equity 1.75%	Hedge Funds 4.06%	Int'l Equity 1.49%	Hedge Funds 3.41%	Hedge Funds 0.51%	Hedge Funds 2.30%	
	Cash 5.35%	Inflation 5.24%	Inflation 2.68%	Inflation 3.39%	Inflation 1.55%	Cash 1.79%	Gov't Bonds 2.36%	Gov't Bonds 3.48%	Cash 3.06%	Corp. Bonds 4.27%	Corp. Bonds 5.10%	Hedge Funds -19.86%	Cash 0.19%	Hedge Funds 5.07%	Cash 0.10%	Gov't Bonds 2.02%	Cash 0.07%	Inflation 0.68%	Corp. Bonds 0.01%	Inflation 2.10%	
	Int'l Equity 1.77%	Inflation 1.60%	Corp. Bonds -1.94%	U.S. Equity -6.98%	U.S. Equity -10.64%	Int'l Equity -14.95%	Inflation 1.88%	Inflation 3.25%	Gov't Bonds 2.65%	Gov't Bonds 3.46%	Cash 5.03%	U.S. Equity -36.72%	Gov't Bonds -2.19%	Inflation 1.50%	Hedge Funds -3.55%	Gov't Bonds 1.70%	Corp. Bonds -2.01%	Cash 0.04%	Corp. Bonds -0.77%	Cash 1.05%	
	Inflation 1.70%	Hedge Funds -1.61%	Gov't Bonds -2.25%	Int'l Equity -15.31%	Int'l Equity -19.74%	U.S. Equity -21.30%	Cash 1.16%	Cash 1.33%	Corp. Bonds 1.95%	Inflation 2.55%	Inflation 4.06%	Hedge Funds -45.52%	Real Estate -16.86%	Cash 0.13%	Int'l Equity -13.71%	Cash 0.11%	Gov't Bonds -2.60%	Int'l Equity -3.87%	Int'l Equity -5.67%	Cash 0.27%	Worst

		Annualized Returns 1997 - 2016					
Return		Int'l	Gov't	Corp.	US Eq.	R.E.	Return
Risk		4.72%	4.93%	5.93%	7.68%	9.78%	Risk
		17.31%	4.09%	5.07%	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 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

ABSOLUTE AND REAL RETURN REVIEW

Investment Advisory Committee Meeting

June 8, 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	10.8%	2.5%	5.3%	4.7%	N/A
HFRI FOF Conservative*	5.1%	1.6%	3.2%	2.7%	N/A

*One month lag on the index

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 hedge out unwanted risk.
- In terms of strategy allocations, we continue to remain cautious on taking material directional risks in the portfolio and continue to shift towards more diversifying, lower net exposures in fundamental and quantitative strategies. We will continue to pursue opportunities across diversifying and credit strategies while bringing the allocation to equity strategies down.
- 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 largest overall contributor to performance, with most managers performing consistently over the three-month period. Positive performance was driven primarily by managers with broad-based structured credit books, as well as by managers with exposure to select European equities.
- Credit – Performance for credit managers was positive for the quarter, as the strategy closed out the period as a material contributor to performance. Residential mortgage and distressed credit managers contributed more positively to performance than their fundamental credit and trading-oriented counterparts. Managers with meaningful exposure to RPLs and RMBS had a strong quarter, with performance driven by positive carry and cash flow generated by mortgage-backed exposures, as well as by spread tightening.
- Equity – Performance for equity managers over the course of the quarter was strong, with the overall strategy finishing the period as the second largest contributor to performance. Overall, fundamental managers fared better than their trading-oriented counterparts. Managers with net long exposure to Consumer Discretionary, Financials, and Information Technology names exhibited positive performance.
- Diversifying – Performance for diversifying strategies during the period was mixed, but ended slightly positive for the quarter. Gains were driven largely by emerging market managers who delivered consistent, strong returns throughout the period.

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Real Return and Opport.	11.1%	8.3%	10.2%	9.5%	N/A
Custom Benchmark	7.8%	7.1%	7.1%	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 \$3.3 billion of unfunded commitments. New commitments closed during the quarter include:
 - \$250 million to Kayne Solutions Fund, LP, a debt fund focused on opportunistic and special situations.
 - \$25 million to Renaissance Venture Capital Fund III, LP, a fund of funds focused on venture capital.
 - \$10 million to SJC Direct Lending Fund IA, LP, a secondary purchase of a fund focused on middle market direct lending.

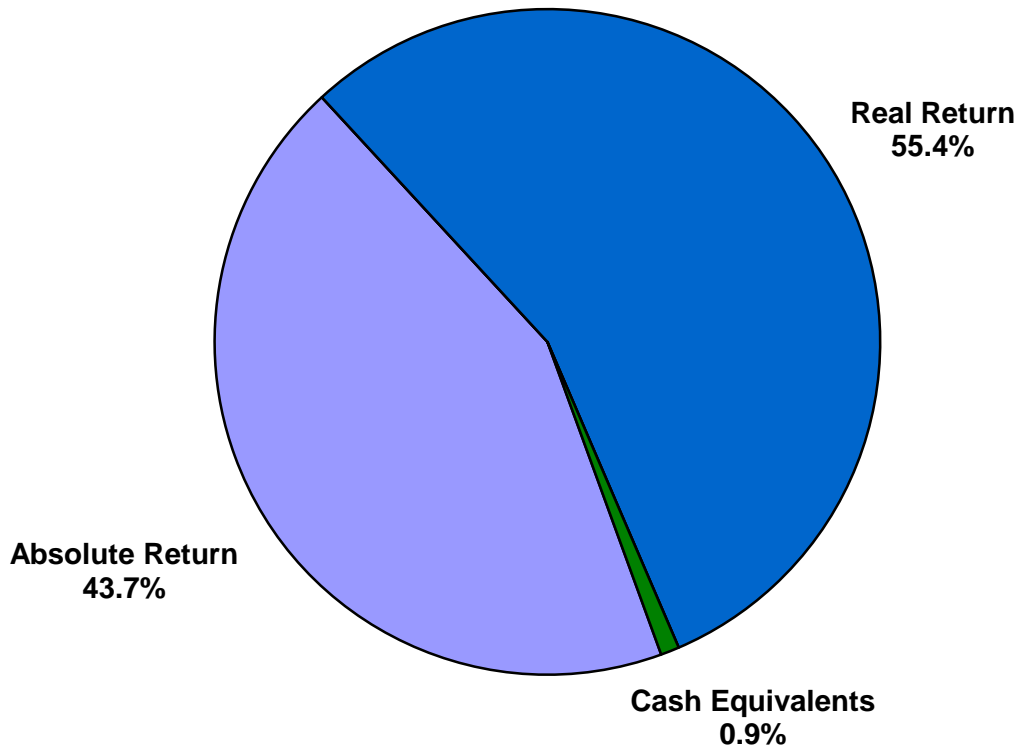
Market Environment

- Senior Secured Credit – We expect 2017 to be marked by increased volatility relative to prior years driven by new leadership in Washington, European elections, and central bank activities. While not immune to that volatility, we do believe that the loan asset class should continue to perform well from a fundamental and technical perspective. We expect defaults in the loan market to remain below trend given the lack of any material catalysts to drive a meaningful increase. Technically, loans should continue to benefit from solid demand given their floating rate nature and senior secured status.
- Direct Lending – Our managers have been active adding new loans to the portfolio however, capital calls were outpaced by distributions during the quarter as activity during the first quarter of each year tends to be more moderate. 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 Funds – For the quarter, spot WTI crude prices was down 5.8% with long-dated contracts down a similar amount as the resiliency of U.S. shale supply has created doubt that the OPEC production cuts announced in November 2016 will be effective in reducing global inventories back to normalized levels. Spot natural gas prices was down 15.8% as the winter proved to be not as cold as anticipated. Long-dated natural gas contracts were down 2% to 6% for the quarter as the market anticipates production growth to resume in the long-term after production declined in 2016 for the first year since 2005. 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 42% 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

3/31/17



Market Value in Millions				
	<u>3/31/17</u>		<u>12/31/16</u>	
Absolute Return	\$4,061	43.7%	\$4,067	43.1%
Real Return	5,142	55.4%	5,271	55.8%
Cash Equivalents	85	0.9%	105	1.1%
Total Investments	<u>\$9,288</u>	<u>100.0%</u>	<u>\$9,443</u>	<u>100.0%</u>

SMRS
Absolute Return
3/31/17

Net Market Values by Entity

	<u>Net Market Value</u>
Apollo Offshore Credit Strategies Fund Ltd.	\$ 107,572,245
Drawbridge Opportunities Fund	210,382,801
* EnTrust White Pine Partners LP	106,149,782
JM IV, LP	66,066,677
MP Securitized Credit Master Fund, LP	70,791,244
Spartan Partner LP	170,254
* Tahquamenon Fund LP	3,495,135,221
Visium Balanced Fund LP	4,329,621
Total Market Value	\$ 4,060,597,845

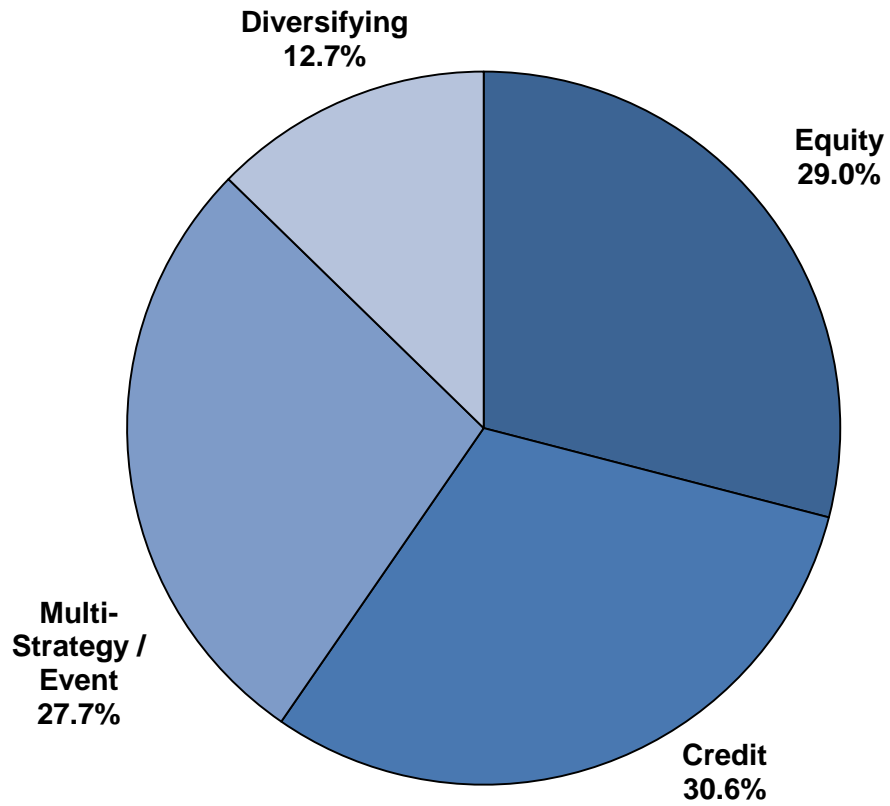
* Fund of Funds

SMRS

Absolute Return

3/31/17

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	83	Median Position Size:	0.4%
Strategies:	4	Average Position Size:	1.1%
Relationships:	8	Largest Position Size:	8.7%

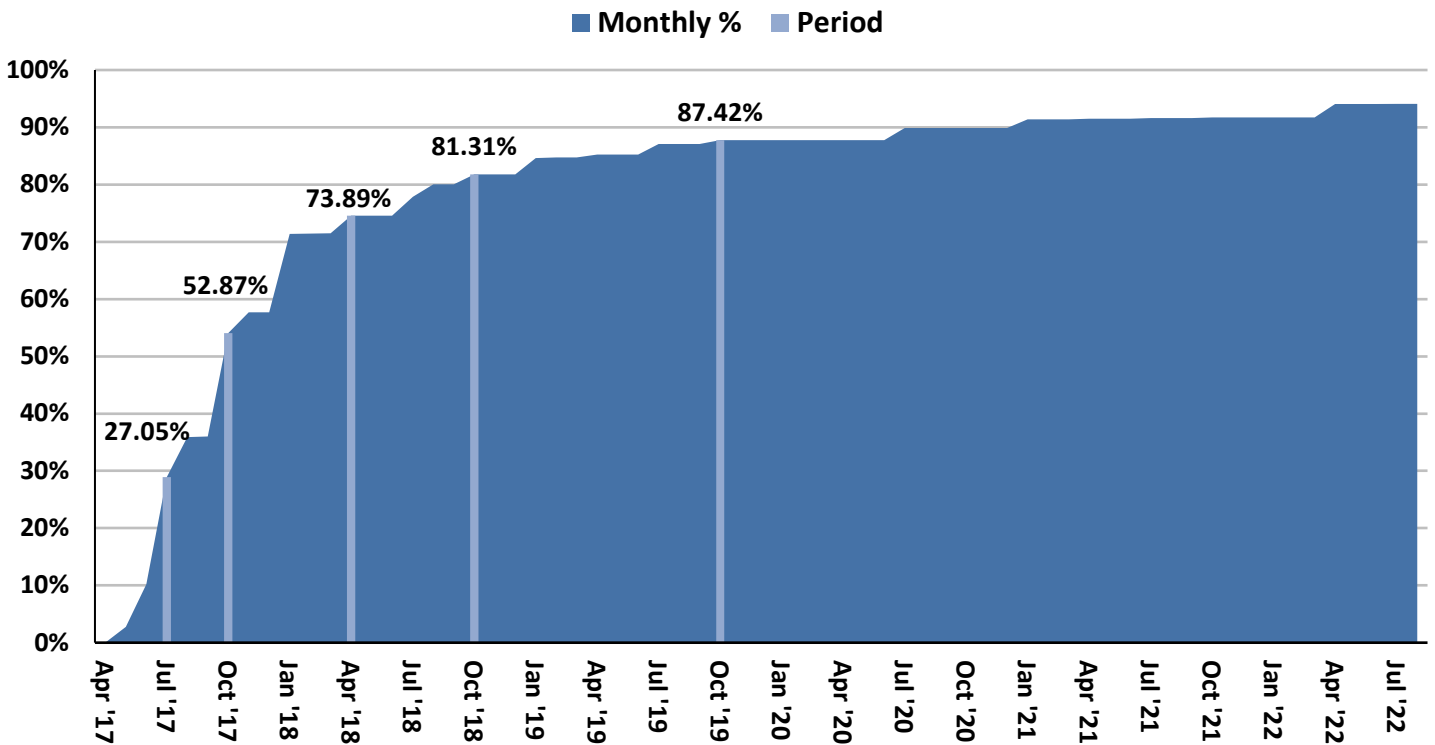
SMRS

Absolute Return

3/31/17

Liquidity Analysis

Redeemable	Marginal Allocation (% each period)	Aggregate Allocation (% since Analysis Date)
By 7/1/17	27.05 %	27.05 %
By 10/1/17	25.82 %	52.87 %
By 4/1/18	21.02 %	73.89 %
By 10/1/18	7.42 %	81.31 %
By 10/1/19	6.12 %	87.42 %
After 10/1/19	6.52 %	93.94 %
Illiquid	6.06 %	100.00 %
Total	100.00 %	N/A



SMRS

Real Return and Opportunistic

3/31/17

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy Fund I, LLC	\$ 148,391,637	\$ 20,152,755
Apollo Credit Opportunities Fund III LP	65,970,058	22,453,858
Apollo European Principal Finance Fund II	50,977,498	9,967,929
Apollo Financial Credit Investments Fund II	356,703,278	129,649,341
Apollo Financial Credit Investments Fund III	-	300,000,000
Apollo HK TMS Investments Holdings LP	19,006,225	-
Apollo Offshore Credit Fund Ltd	263,548,833	-
Apollo Offshore Structured Credit Recovery Fund II	124	-
Apollo Offshore Structured Credit Recovery Fund III	142,225,733	87,397,774
Blackstone Strategic Capital Holdings LP	27,093,211	100,076,978
Blue Peninsula Fund LP	89,240,961	115,627,889
Carlyle Intl Energy Partners LP	14,330,184	41,762,401
Carlyle Energy Mezzanine Opportunity Fund	3,549,730	45,528,094
Centerbridge SCP III, LP	5,968,672	24,000,000
* Content Holdings LLC	504,438,999	52,634,738
Elegantree Fund SPC	68,732,539	4,735,264
Energy Recapitalization and Restructuring Fund LP	34,768,129	18,040,815
ERR Michigan Holdings LP	5,173,001	2,335,070
* Fairfield Settlement Partners, LLC	72,702,534	14,798,035
FCO MA MI LP	63,930,894	137,145,625
Fortress MSR Opportunities Fund I A LP	99,482,491	-
Fortress Transportation & Infrastructure	56,313,922	-
GSO Credit Alpha Fund LP	69,745,291	40,021,313
Highbridge Principal Strategies - Specialty Loan Fund III	100,547,256	18,801,818
Hopen Life Sciences Fund II	4,362,084	2,575,000
HPS Red Cedar Fund	46,499,753	207,802,702
JP Morgan Global Maritime Investment Fund LP	66,692,601	7,640,431
KANG Fund LP	9,950,322	-
Kayne Anderson Energy Fund VII, LP	37,939,091	39,000,000
Kayne P.E. Income Fund	26,251,454	127,573,078
** Kayne Solutions Fund, LP	-	250,000,000
KKR EI&G Fund	35,176,471	24,153,178
KKR Lending Partners I LP	57,040,381	11,930,723
KKR Lending Partners II LP	67,984,007	35,091,606
Lakewater LLC, Series 1	143,294,988	3,413,450
Lakewater LLC, Series 2	250,330,440	13,224,217
Lakewater LLC, Series 3	316,273,131	-
Lakewater LLC, Series 4	69,467,832	10,598,581
Lakewater LLC, Series 5	90,291,173	153,561,141
Merit Energy Partners LP	24,227,017	9,201,857
MidCap FinCo Holdings LTD	298,352,452	-
Napier Park Aircraft Leasing Vehicle I, LLC	41,087,799	57,603,861
New Fortress Energy HLDGS	300,000,000	-

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Orion Coinvest III LP	25,243,776	2,236,552
Orion Mine Finance Fund 1A LP	56,352,938	6,812,977
Orion Mine Finance Fund I LP	115,340,558	7,376,051
Orion Mine Finance II LP	35,548,928	34,105,931
Redding Ridge Holdings, LP	5,962,674	94,037,326
Renaissance Venture Cap Fund II LP	11,522,508	14,250,000
** Renaissance Venture Cap Fund III, LP	-	25,000,000
REOG Fund II Coinvest LP	21,273,544	9,475,056
Ridgewood Energy Oil & Gas II	94,060,128	30,101,889
Ridgewood Energy Oil & Gas III	19,777,482	202,701,050
RPEP Energy Opp Inst Partner	5,653,546	28,616,416
RPEP SMRS Holdings, LLC	79,702,869	1,876,850
SJC Direct Lending Fund I, LP	21,577,124	15,088,120
** SJC Direct Lending Fund IA, LP	4,254,039	3,764,486
SJC Direct Lending Fund II, LP	186,157,588	38,261,315
SJC Direct Lending Fund III, LP	62,879,030	187,500,102
* Social Network Holdings, LLC	97,723,829	25,028,376
Specialty Equity Strategy LP	1,042,024	17,897,000
Sprott PRL (M), LP	15,048,453	9,562,876
Sprott Private Resource Lending Fund (US), LP	5,159,498	94,840,502
Terra Co-Investment LLC	34,075,637	14,000,000
TICP CLO Partners II, LP	9,577,313	40,241,554
TSSP Adjacent Opp Partners, LP	22,132,899	77,273,062
Varo Coinvestment LP	13,391,848	929,066
Warwick Energy Partners III	36,852,597	19,572,723
Warwick (SMRS) Co-Invest, L.P.	13,924,995	12,089,081
Income Accruals	(1)	
Total Market Value	\$ 5,142,298,020	\$ 3,151,137,883

* Fund of Funds

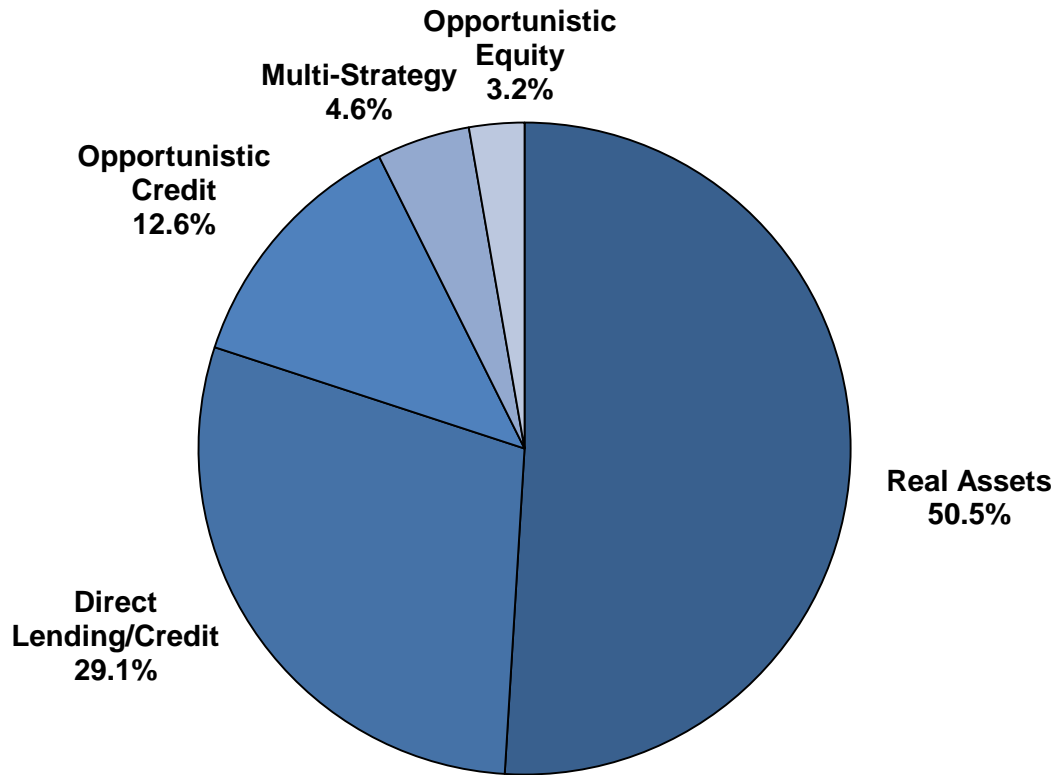
** **New Commitment**

SMRS

Real Return and Opportunistic

3/31/17

Investments By Strategy



Investment Strategy	
Real Assets	\$ 2,621,011,330
Direct Lending/Credit	1,494,354,120
Opportunistic Credit	648,598,340
Multi-Strategy	237,632,598
<u>Opportunistic Equity</u>	<u>140,701,632</u>
<u>Total Market Value</u>	<u>\$ 5,142,298,020</u>

State of Michigan Retirement Systems

FIXED INCOME REVIEW

Investment Advisory Committee Meeting

June 8, 2017



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

EXECUTIVE SUMMARY

Performance

Annualized Returns	1-Year	3-Years	5-Years	7-Years	10-Years
MPSERS Plan	4.3%	4.1%	3.7%	4.6%	5.4%
Bloomberg Barclays US Agg	0.4%	2.7%	2.3%	3.5%	4.3%
Peer Median Return	2.7%	3.3%	3.3%	4.6%	4.8%
Percentile Rank vs. Peers*	29	32	37	52	23

*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 during the rising rate environment. The portfolio also benefitted from having an overweight in corporate bonds compared to relatively safer RMBS and U.S. Treasury securities as riskier securities generally outperformed.
- In addition, high yield returned 11.4% on a year-over-year (YOY) basis and the structured and global components of the portfolio returned 6.6% and 5.9% respectively. Overall, the externally managed portfolio returned 7.5% YOY, accounting for roughly 75% of the one-year outperformance.

Strategy Update

The goal of the Long-Term Fixed Income Division portfolio is to meet or exceed the returns of the Bloomberg Barclays US 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 the end of March 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 64.2%. This includes a 21.1% 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 7.9% at the end of the quarter down from a peak of 14.0% one year prior.

- The allocation to securitized credit, primarily in CMBS, non-agency RMBS, and CLO securities, has increased to 19.0% 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 1.77% to 2.38% during the past twelve months while 2-year Treasury yields rose from 0.72% to 1.26%. Rising short-term rates were due to 50 basis points (bps) of monetary tightening on a YOY basis from the Federal Reserve. By the end of March 2017, the upper bound Fed Funds rate was 1.0% and markets expect an additional 50 bps of tightening during the remainder of 2017.
- Inflation expectations remain below historical averages, with ten-year breakeven inflation expectations ending March 2017 slightly below 2%. With a high degree of conviction, 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.
- Over the previous year, there has been a dramatic recovery in credit, especially in the high-yield market. High-yield spreads ended the quarter at 383 bps, which are over 450 bps lower than the highest levels experienced during 2016. Investment-grade spreads are also lower, tightening roughly 100 bps since February 2016 to 118 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 a reduced position.
- The spread on CMBS bonds, particularly on BBB securities, is an area that looks relatively attractive within the fixed income opportunity set. Spreads on BBB securities ended the quarter at 458 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

3/31/17

	Amount	Total	% of Total
Core (\$ in Millions)			
LTFID Internal	\$4,734		
Dodge & Cox	235		
Prudential Investment Grade Credit	222		
Total Core		\$5,191	64.2%
Securitized Debt			
Met West Securitized Ops	\$471		
Principal CMBS	599		
Napier Park ABS Income	143		
Napier Park Strategic Loan	20		
Napier Park CLO Debt	175		
TICP CLO Debt	125		
Total Securitized Debt		\$1,533	18.9%
High Yield			
Columbia Management	\$338		
Prudential High Yield	301		
Total High Yield		\$639	7.9%
Tactical			
Pyramis	\$288		
Loomis Core Plus	219		
Total Tactical		\$507	6.3%
Global			
T. Rowe Global Multi-Sector	\$220		
Total Global		\$220	2.7%

TOTAL

\$8,090

100.0%

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

3/31/17

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Life	7.1	8.5
Average Life w/Cash Equiv.	6.8	8.5
Duration (Yrs)	5.0	6.0
Duration (Yrs) w/Cash Equiv.	4.8	6.0
Coupon (%)	3.4	3.2
Yield to Maturity (%)	3.6	2.6
Credit Rating	A3/BBB+	Aa2/AA-
VaR (%)	4.3	5.1
Tracking Error	101bp	0
Beta (vs S&P 500)	0.05	-0.02

Commentary

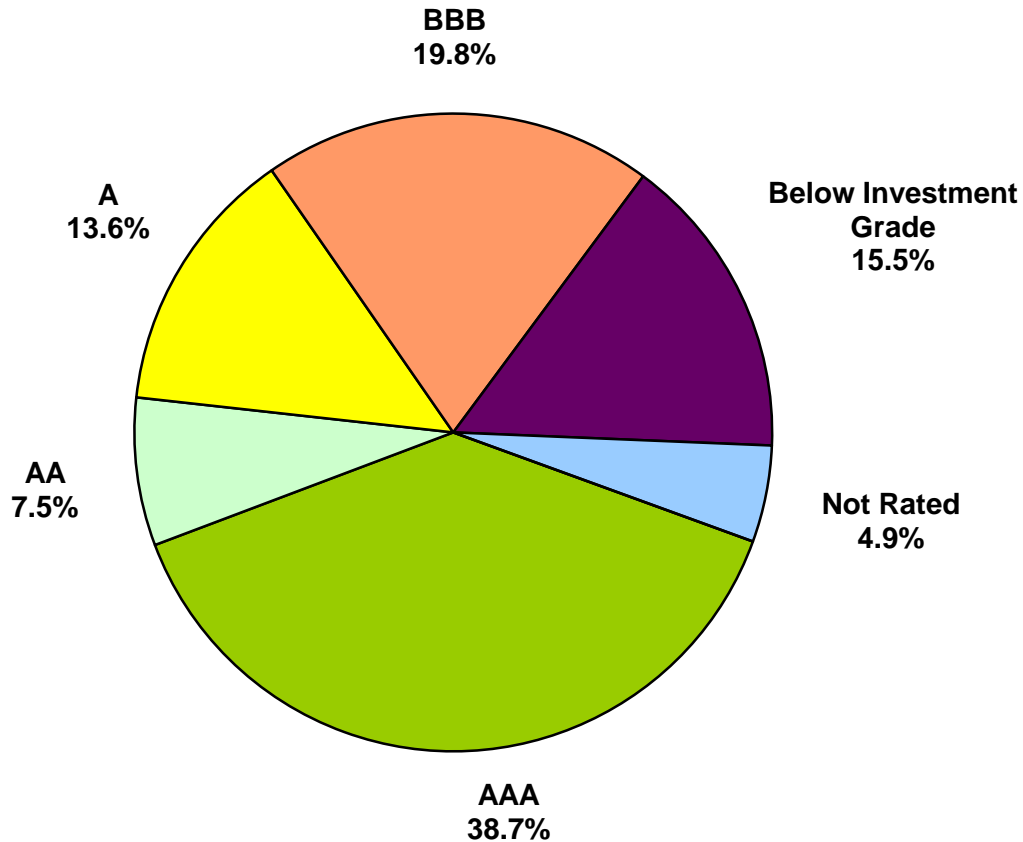
<u>Objective</u>	<u>Highlight</u>
Income:	The coupon income is slightly higher than the benchmark but the overall portfolio yield-to-maturity is 100 bps higher than the bond index.
Liquidity:	21.1% of the portfolio is invested in cash, U.S. Treasuries, and TIPS. These investments can be liquidated via 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

3/31/17



Market Value in Millions				
3/31/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$3,132	38.7%	70.7%	-32.0%
AA	605	7.5%	5.5%	2.0%
A	1,098	13.6%	10.7%	2.9%
BBB	1,606	19.8%	12.2%	7.6%
Not Rated	398	4.9%	0.9%	4.0%
* Below Investment Grade	1,251	15.5%	0.0%	15.5%
Total Investments	<u>\$8,090</u>	<u>100.0%</u>	<u>100.0%</u>	

* Comprised of approximately 10.0% High Yield Credit and 5.5% High Yield RMBS/ABS

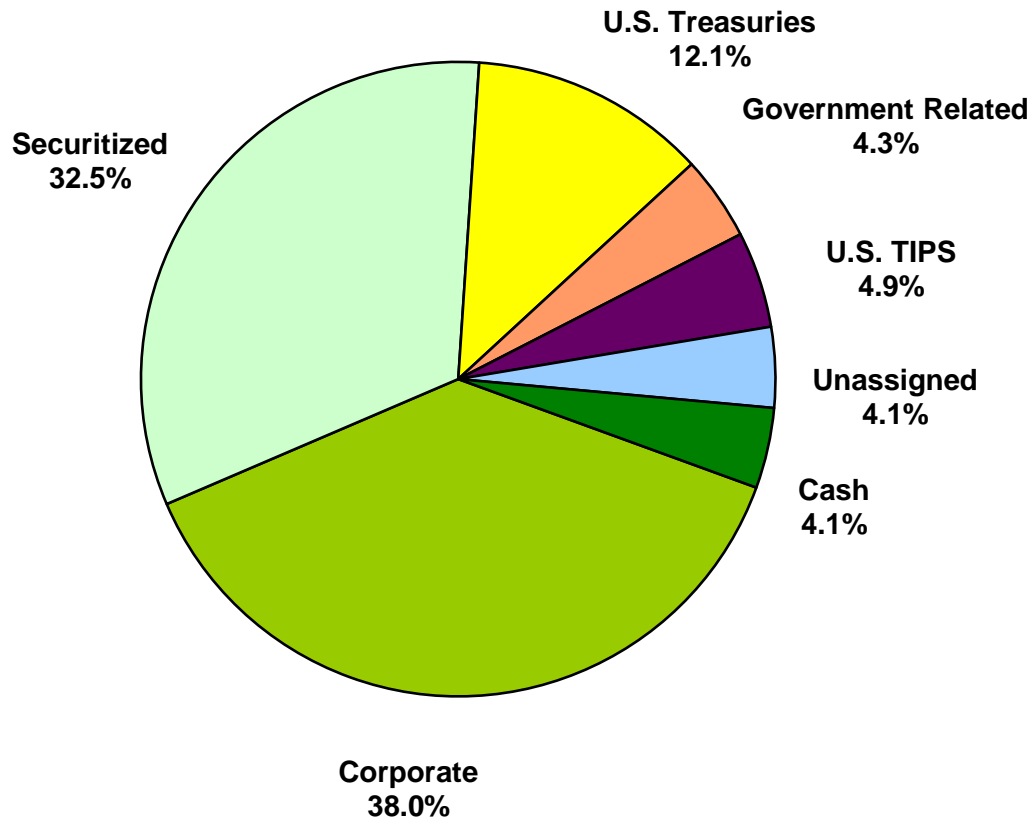
Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

Total U.S. Long-Term Fixed Income

3/31/17



Market Value in Millions				
3/31/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Corporate	\$3,076	38.0%	25.7%	12.3%
Securitized	2,629	32.5%	30.4%	2.1%
U.S. Treasuries	978	12.1%	36.1%	-24.0%
Government Related	345	4.3%	7.8%	-3.5%
U.S. TIPS	396	4.9%	0.0%	4.9%
Unassigned	332	4.1%	0.0%	4.1%
Cash	334	4.1%	0.0%	4.1%
Total Investments	<u>\$8,090</u>	<u>100.0%</u>	<u>100.0%</u>	

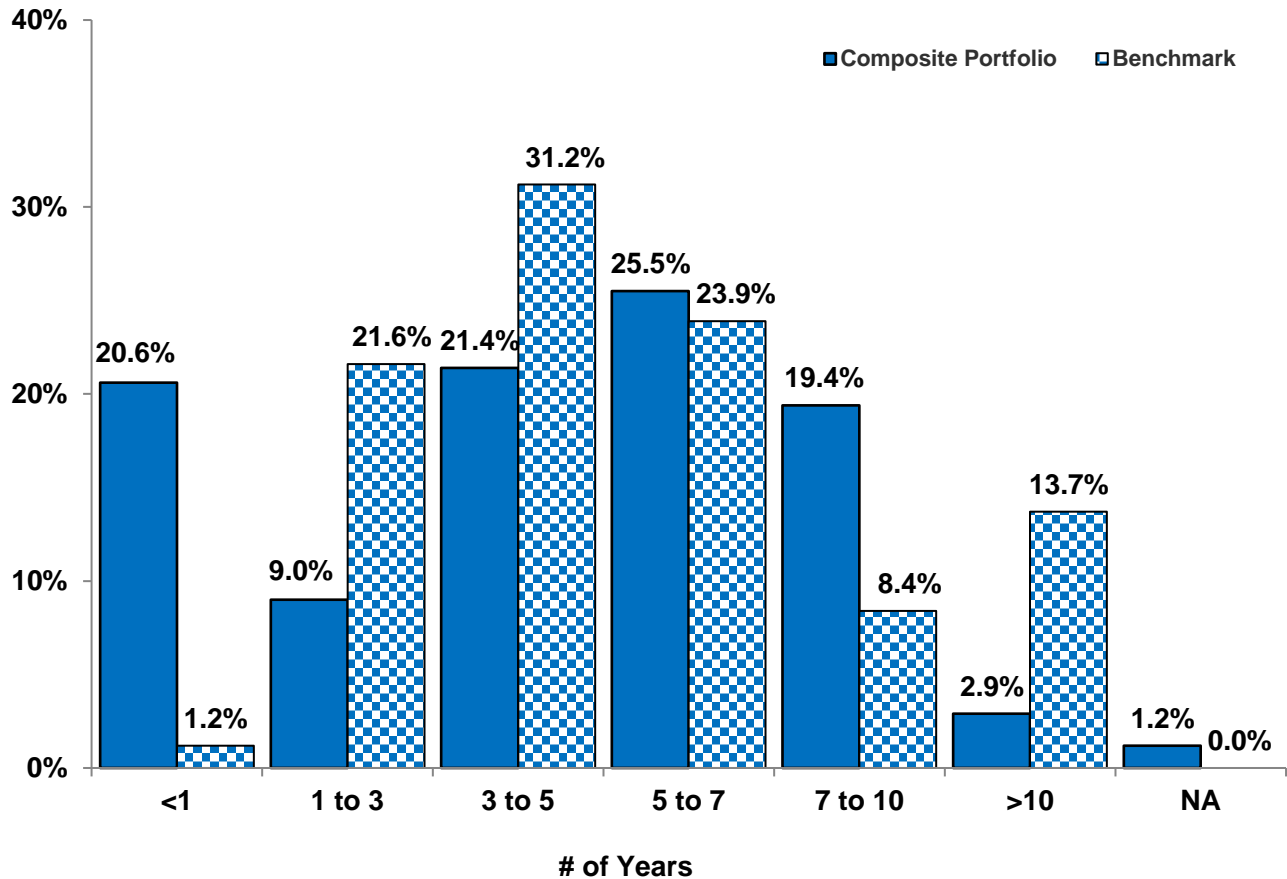
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

3/31/17



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,664	20.6%	1.2%	0.2	1.0
1 to 3	727	9.0%	21.6%	2.1	2.0
3 to 5	1,736	21.4%	31.2%	4.1	4.1
5 to 7	2,066	25.5%	23.9%	6.1	5.9
7 to 10	1,569	19.4%	8.4%	8.1	8.0
>10	232	2.9%	13.7%	15.0	15.8
NA	96	1.2%	0.0%	0.0	0.0
Total	\$8,090	100.0%	100.0%	4.8	6.0

* Effective Duration

SMRS Internal/External Manager Performance – Net of Fees

3/31/17

Total Fixed Income Performance, Net of Fees (MPSEERS)

	<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	\$8,090,247,920	4.1%	4.0%	3.5%	4.5%	5.3%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>0.4%</i>	<i>2.7%</i>	<i>2.3%</i>	<i>3.5%</i>	<i>4.3%</i>
Internal Fixed Income	\$4,733,642,605	2.0%	3.8%	3.1%	4.1%	5.2%
External Fixed Income	\$3,356,605,315	7.5%	4.2%	4.2%	5.1%	5.3%
Fixed Income Core	\$234,815,722	4.1%	3.2%	3.2%	4.2%	4.9%
Dodge & Cox Core	234,815,722	4.1%	3.3%	3.6%	4.4%	5.2%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>0.4%</i>	<i>2.7%</i>	<i>2.3%</i>	<i>3.5%</i>	<i>4.3%</i>
Investment-Grade Credit	\$222,157,109	4.1%	4.0%	4.3%	5.5%	5.5%
Prudential Investment Grade	222,157,109	4.1%	4.0%	4.4%	5.6%	6.3%
<i>Bloomberg/Barclays Credit Index</i>	<i>N/A</i>	<i>3.0%</i>	<i>3.5%</i>	<i>3.7%</i>	<i>5.0%</i>	<i>5.3%</i>
Tactical Fixed Income	\$507,170,417	6.9%	--	--	--	--
Loomis Sayles CorePlus	218,947,007	5.2%	2.9%	--	--	--
Pyramis Tactical Bond Fund	288,223,410	8.7%	--	--	--	--
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>0.4%</i>	<i>2.7%</i>	<i>2.3%</i>	<i>3.5%</i>	<i>4.3%</i>
High Yield Fixed Income	\$639,065,784	11.4%	5.0%	--	--	--
Columbia Management High Yield	338,118,419	10.7%	5.1%	--	--	--
Prudential High Yield	300,947,365	12.4%	5.0%	--	--	--
<i>Bloomberg/Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>13.0%</i>	<i>4.5%</i>	<i>--</i>	<i>--</i>	<i>--</i>
Structured Fixed Income	\$1,533,480,709	--	--	--	--	--
Principal CMBS	599,385,751	4.9%	4.3%	8.1%	13.0%	--
MetWest Securitized Opportunities	471,330,830	6.9%	3.3%	--	--	--
Napier Park ABS Income	142,642,032	12.5%	--	--	--	--
Napier Park Strategic Loan LP	20,000,000	N/A	--	--	--	--
Napier Park CLO Debt	175,129,851	N/A	--	--	--	--
TICP CLO Debt	124,992,245	N/A	--	--	--	--
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>0.4%</i>	<i>2.7%</i>	<i>2.3%</i>	<i>3.5%</i>	<i>4.3%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>0.7%</i>	<i>4.8%</i>	<i>4.5%</i>	<i>6.4%</i>	<i>4.3%</i>
Global Fixed Income	\$219,915,574	5.9%	--	--	--	--
T. Rowe Global Multi-Sector	219,915,574	5.9%	--	--	--	--
<i>Custom GMS Benchmark</i>	<i>N/A</i>	<i>5.0%</i>				

State of Michigan Retirement Systems

REAL ESTATE AND INFRASTRUCTURE REVIEW

Investment Advisory Committee Meeting

June 8, 2017



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Year	5-Year	7-year	10-Year
Annualized Return	8.9%	12.1%	11.8%	12.1%	4.8%
NCREIF NPI	5.9%	9.2%	9.3%	10.4%	5.4%
Peer Median Return	7.6%	10.5%	10.7%	11.2%	3.6%
Percentile Rank vs. Peers*	30	26	27	34	30

*State Street Universe greater than \$1 billion

- Total Real Estate and Infrastructure Division (REID) value was \$6.6 billion with a total one-year return of 8.9%. Outperformance relative to the one-year benchmark was primarily due to REID's strategy to underweight retail and office, and overweight apartments and hotels. This resulted in strong rental income from apartments and hotels, along with appreciation in the medical office and industrial warehouse portfolios. 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.

Strategy Update

- REID has been active in the development of urban apartments and warehouses, acquisition of properties where REID can add value through management and leasing, and investing in various levels of the capital stack through credit strategies. REID has selectively added exposure in Europe 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 to reduce risk by selling stabilized assets at attractive capitalization rates where growth in rental income is expected to be limited. The REID has disposed of suburban properties in favor of developing/redeveloping properties in dense urban areas where rent growth and appreciation are strong. The REID is also working with its advisors in executing the disposition of non-strategic 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:
 - \$40 million in MWT Holdings, LLC, an existing separate account that invests in Class A apartments.
 - \$15 million in Principal Separate Account, for the renovation and re-leasing of an office building located in Minneapolis, MN, managed by Principal Real Estate Investors.
 - \$13 million in RPEP SMRS LLC, for a co-investment in a water line development project in Texas, managed by Ridgewood Private Equity Partners.
 - \$10 million co-investment with Paladin Realty Latin America Investors V, for an investment in shares of a Brazilian office FII (REIT), managed by Paladin Realty Advisors.

- \$4.5 million in AEW Senior Housing III, a closed-end, commingled fund focused on senior living and memory care properties, managed by AEW Partners.
- The division is being very selective and defensive with new commitments, seeking opportunities that are shorter in duration, deliver more liquidity, produce consistent cash flow, and capitalizing on unique opportunities sourced through REID's extensive network.

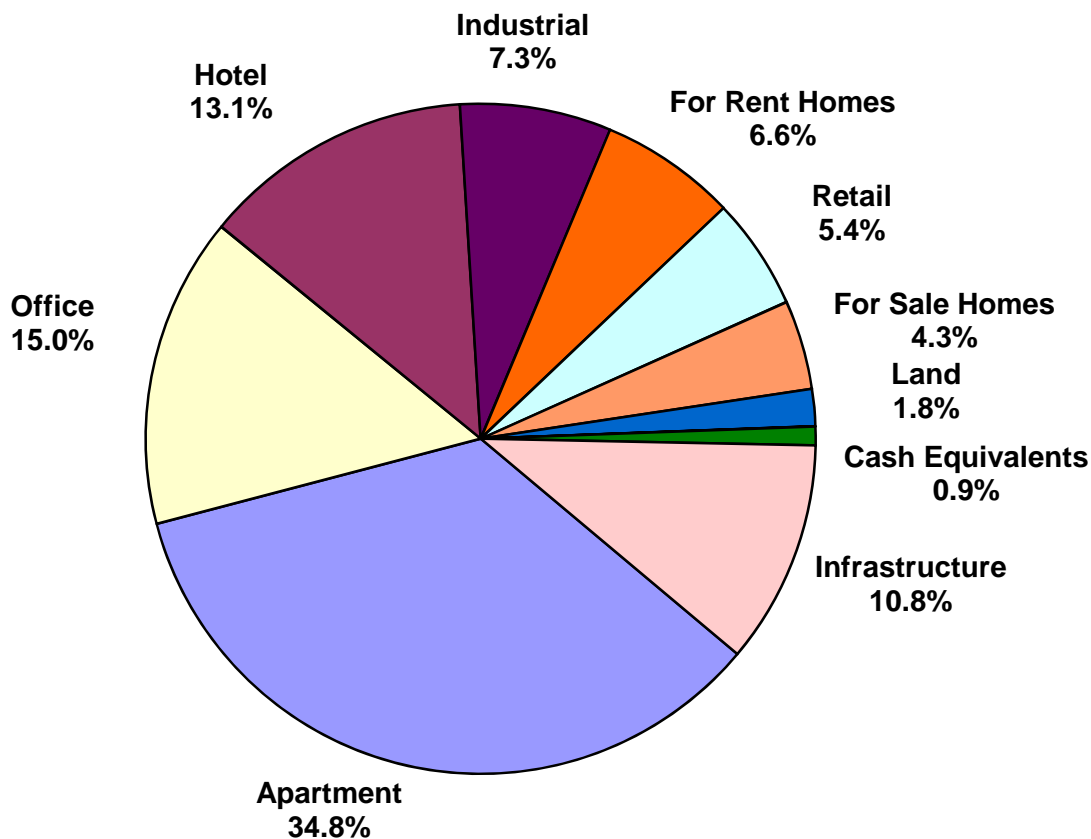
Market Environment

- High quality core assets, although still in demand by both domestic and international investors, have seen pricing beginning to level off. Development of condominiums in major urban markets has begun to ease, as supply becomes a concern in a few markets. Industrial warehouse construction fueled by fulfillment centers continues to meet growing demand. Senior housing, self-storage and student housing 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 decreased 14 basis points (bps) from the prior quarter and now stand at 89 bps. The reduced supply of securities due to risk retention rules caused spreads on high-rated securities to tighten. The lower-rated security spreads remain appropriate for the risk. Commercial Mortgage Alert reported that CMBS issuance is projected to be \$75 billion for 2017, mirroring the \$76 billion in 2016. A wave of refinancing for 2007 ten-year vintage loans is appearing at the same time new banking rules by the federal government are being implemented. This is making it more difficult for borrowers to find adequate financing dollars. However, issuers are hopeful the new Federal Administration will relax these rules, helping regional banks participate. Large banks will 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

3/31/17



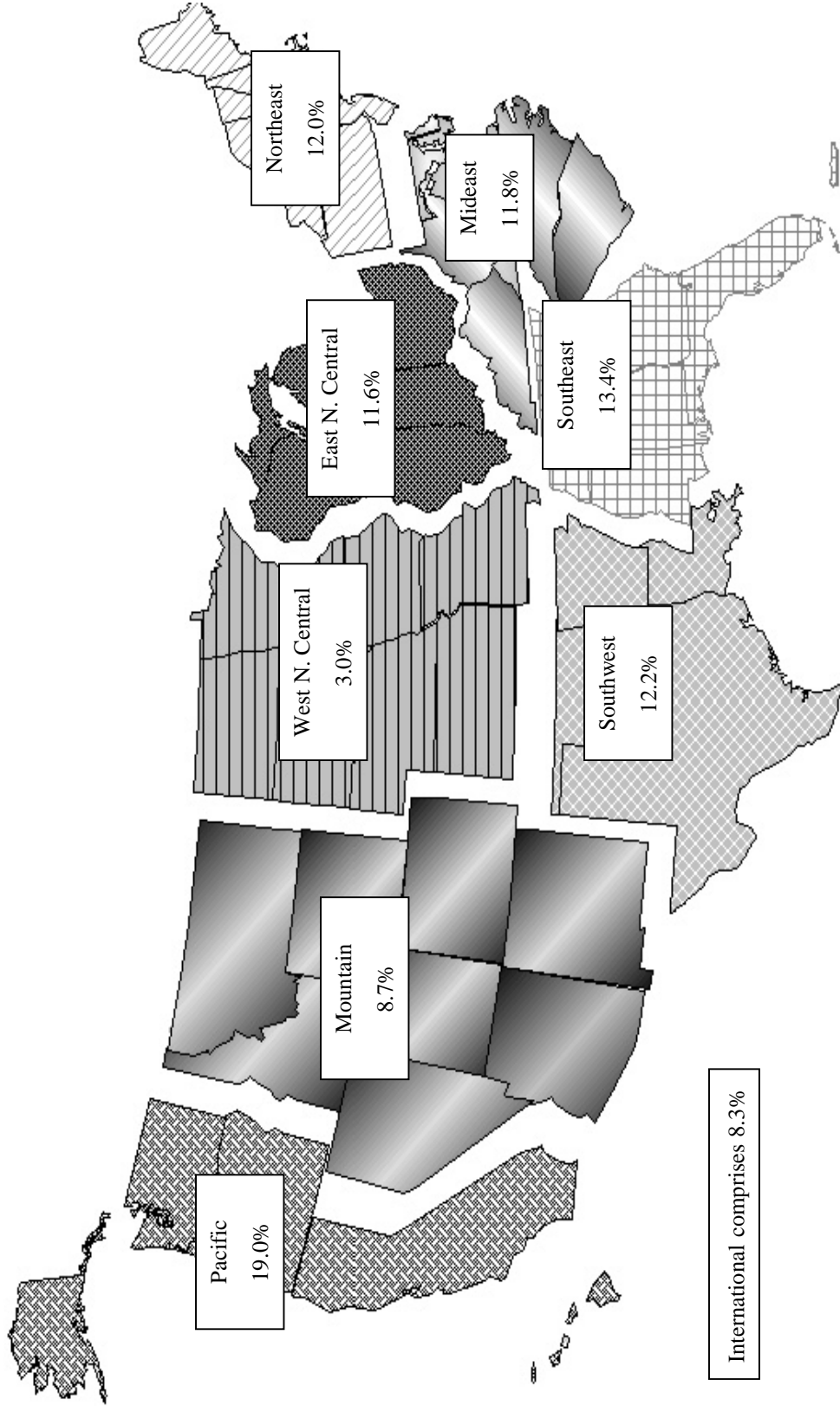
Market Value in Millions				
	<u>3/31/17</u>		<u>12/31/16</u>	
Apartment	\$2,307	34.8%	\$2,281	34.8%
Office	997	15.0%	932	14.2%
Hotel	871	13.1%	918	14.0%
Infrastructure	716	10.8%	649	9.9%
Industrial	481	7.3%	451	6.9%
For Rent Homes	435	6.6%	435	6.6%
Retail	358	5.4%	355	5.4%
For Sale Homes	283	4.3%	341	5.2%
Land	118	1.8%	127	1.9%
	<u>\$6,566</u>	<u>99.1%</u>	<u>\$6,489</u>	<u>98.9%</u>
Cash Equivalents	<u>58</u>	<u>0.9%</u>	<u>73</u>	<u>1.1%</u>
Total Investments	<u>\$6,624</u>	<u>100.0%</u>	<u>\$6,562</u>	<u>100.0%</u>

SMRS

Real Estate Market Value by Region

(excludes cash & cash equivalents)

3/31/17



Geographic regions defined by NCREIF, whose property index composition is: Pacific 31.9%, Mountain 6.5%, West N. Central 1.4%, Southwest 10.4%, East N. Central 7.3%, Southeast 9.3%, Northeast 21.7%, Midwest 11.5%

SMRS
Real Estate and Infrastructure
3/31/17

**Top Ten
Advisors or Entity**

<u>Advisor or Entity</u>	<u>Market Value</u>
MWT Holdings, LLC (SHLP)	\$ 1,392,601,772
Clarion Partners	685,750,446
Blackstone Group	608,348,763
CIM Investment Advisors LLC	270,318,509
Principal Real Estate Investors	261,250,416
Bentall Kennedy LP	251,793,019
Domain Capital Advisors Inc	225,328,099
Kensington Realty Advisors	220,471,452
Rialto Capital Management LLC	211,816,768
Heitman Capital Management	181,734,774
	<u>\$ 4,309,414,018</u>

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	94.1%	85.6%	94.2%	93.7%	78.8%
National Average	93.0%	87.0%	92.0%	94.7%	60.7%

SMRS
Market Values by Ownership Entity
03/31/17
REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 74,573,362	\$ 0
* AEW Senior Housing III	1,306,310	3,193,690
Apollo Asia Real Estate Fund, LP	0	74,437,296
Asana Partners Fund I, LP	3,750,000	21,187,840
Avanath Affordable Housing I, LLC	25,689,375	1,467,911
Avanath Affordable Housing II, LLC	25,211,255	0
Avanath II SMRS Co-Investment Fund LLC	20,624,215	0
Beacon Capital Strategic Partners IV, LP	1,908,718	0
Beacon Capital Strategic Partners V, LP	492,177	0
Blackstone R/E IH3 Co-Inv Partners	435,091,835	0
Blackstone Real Estate Partners V, LP	18,699,310	2,087,026
Blackstone Real Estate Partners VI, LP	30,745,147	3,680,000
Blackstone Real Estate Partners VIII, LP	30,144,162	42,000,000
Capri Select Income II	62,410	0
Capri Urban Investors, LLC	14,636,480	0
CIM Fund III, LP	67,015,741	0
CIM Fund VIII, LP	71,766,938	38,342,263
CIM Urban REIT, LLC	80,283,010	0
CIM VI (Urban REIT), LLC	30,101,394	0
Clarion Gables Multifamily Trust	29,018,273	0
CPI Capital Partners N.A., LP	173,227	0
CPI Capital Partners N.A. Secondary, LP	838,863	0
Crown Small Cap Real Estate	11,051,330	14,000,000
Domain GVA-1, LLC	161,607,023	139,755,738
Domain Hotel Properties, LLC	473,597,593	0
Dynamic Retail Trust	78,723,134	0
Eastport Properties, LLC	19,967,363	0
Gateway Capital R/E Fund II, LP	45,736,624	1,275,000
Great Lakes Property Group Trust	209,006,068	0
IMRF II ColInvest Spiga LP	12,198,667	3,062,796
Invesco Mortgage Recovery Feeder Fund	17,174,088	0
Invesco Mortgage Recovery Fund II, LP	39,706,542	17,543,582
IPF II Co-Invest LP	21,668,091	8,505,897
JBC North LaSalle, LLC	22,696,864	0
JBC Opportunity Fund III, LP	1,317,651	0
JP Morgan India Property Fund II, LLC	32,158,876	8,948,543
KBS/SM Fund III, LP	43,429,158	0
KBS/SM Fund IV, LP	83,126,993	0
L-A Saturn Acquisition, LP	38,200,453	0
Landmark Real Estate Partners V, LP	12,503,934	3,900,000
LaSalle Asia Opportunity Fund II, LP	258,683	0
LaSalle Asia Opportunity Fund III, LP	10,482,321	0
Lion Industrial Trust	174,792,725	0
Lion Mexico Fund, LP	8,341,855	0
Lombard GVA0016	203,367,982	0
Lone Star Fund X, LP	0	200,000,000
Lowe Hospitality Investment Partners	113,317	0
Lubert-Adler Real Estate Fund VII, LP	72,613,580	7,500,000
M1 Westgate ColInvest LLC	9,503,012	1,316,670
M301W ColInvest LLC	11,648,414	6,177,861
MERS Acquisitions, Ltd.	148,588,372	0
MG Alliance, LLC	18,131,760	0
MIP Holdco, LLC	100,041,755	16,000,000
Morgan Stanley R/E Fund V - International	3,242,328	0

	<u>Market Value</u>	<u>Unfunded Commitment</u>
Morgan Stanley R/E Fund VI - International	18,171,272	0
Morgan Stanley R/E Fund V - U.S.	2,972,643	0
Morgan Stanley R/E Special Situations Fund III	29,778,105	0
* MWT Holdings, LLC	1,392,601,772	40,000,000
Northpark-Land Associates, LLLP	28,050,002	64,077,756
Orange Investors LLC	119,484,407	0
Paladin Realty Brazil Investors III (USA), LP	29,794,928	0
Paladin Realty Latin America Investors IV-CI, LP	33,192,208	17,000,000
* Paladin Realty TB COINV V LP	10,000,000	0
Penmain Office LLC	35,671,073	0
* Principal Separate Account	186,677,054	34,182,080
Proprium RE Spec Situations Fund LP	25,729,049	31,096,000
Rialto Credit Partnership LP	89,144,071	133,609,091
Rialto Real Estate Fund, LP	24,401,589	0
Rialto Real Estate Fund II, LP	41,792,325	0
Rialto Real Estate Fund III-Debt, LP	5,744,502	43,966,217
Rialto Mezzanine Partners Fund	50,734,281	0
SM Brell II, LP	52,129,097	0
Stockbridge Real Estate Fund II-C, LP	21,468,323	0
Strategic LP	251,793,019	43,600,000
TPG RE Finance Trust	96,385,067	2,367,810
TPG RE Fund II	24,374,040	32,310,379
TSP Spartan C-I LLC	7,615,156	0
TSP Value and Income Fund LP	45,956,377	4,600,000
Trophy Property Development LP	52,721,086	7,408,100
True North High Yield Investment Fund II	24,710,333	5,000,000
True North Real Estate Fund III	29,934,808	23,346,009
Venture Center, LLC	44,118,607	0
Western National Realty Fund II, LP	28,671,641	0
	<u>\$ 5,850,945,548</u>	<u>\$ 1,096,945,555</u>
Short-Term Investments and Other	46,503,851	0
Total Real Estate Investments	<u>\$ 5,897,449,399</u>	<u>\$ 1,096,945,555</u>
INFRASTRUCTURE		
ArcLight Energy Partners Fund VI, LP	\$ 27,805,014	\$ 28,829,738
ASF VI Infrastructure B LP	19,257,798	18,963,232
ASF Como Co-Investment LP	37,088,506	15,617,476
Basalt Infrastructure Partners, LP	39,578,935	11,224,785
Blackstone Energy Partners, LP	54,061,486	4,209,834
Blackstone Energy Partners II, LP	28,205,822	58,000,000
Brookfield Infrastructure Fund II-B, LP	48,872,215	5,959,378
Customized Infrastructure Strategies, LP	67,016,973	7,648,708
Dalmore Capital Fund	56,501,000	0
First Reserve Energy Infrastructure Fund II, LP	31,886,388	44,000,000
GCM Grosvenor Infrastructure Investment Program, LP	60,036,579	0
GCM Grosvenor Customized Infrastructure Strategies II, LP	20,403,658	48,372,902
GSO Energy Select Opportunities Fund LP	11,401,001	45,462,756
JP Morgan AIRRO India Sidecar Fund US, LLC	66,118,073	5,033,815
JP Morgan AIRRO Fund II US, LLC	10,791,129	83,384,246
KKR Eagle CoInvest LP	27,410,500	10,504,631
KKR Global Infrastructure Investors, LP	51,704,384	7,004,133
* RPEP SMRS, LLC	0	13,000,000
StonePeak Infrastructure Fund LP	57,648,097	15,584,666
	<u>\$ 715,787,559</u>	<u>\$ 422,800,300</u>
Short-Term Investments and Other	11,083,371	0
Total Infrastructure Investments	<u>\$ 726,870,930</u>	<u>\$ 422,800,300</u>
TOTAL INVESTMENTS	<u>\$ 6,624,320,328</u>	<u>\$ 1,519,745,855</u>

* New or additional commitment made during the quarter reported

State of Michigan Retirement Systems

INTERNATIONAL EQUITY REVIEW

Investment Advisory Committee Meeting

June 8, 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	13.9%	2.4%	5.9%	5.1%	1.5%
MSCI ACWI ex USA Returns	13.1%	0.6%	4.6%	3.8%	0.4%
Peer Median Return	13.5%	1.5%	6.0%	5.3%	2.2%
Percentile Rank vs. Peers*	33	26	57	62	86

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

- Stock plus led all three investment categories over the last twelve months with excess returns of 4.5% over the MSCI ACWI ex USA. Excess returns were broad based across both developed, 4.7%, and emerging markets, 4.0%.
- Active investments continued to underperform the benchmark by -1.8%. A contributing factor was portfolio's significant underweight, -7.2%, to 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 technology to continuously improve risk management systems.

Strategy

- General International Equity portfolio strategy.
 - International Equity Division uses three distinct strategies.
 - Index investments, 30% of assets, to gain broad international stock market exposure.
 - Stock plus investments, 32% of assets, to implement a portable alpha strategy.
 - Active investments, 38% of assets, to gain specific international stock market exposure.
 - Company data are aggregated, categorized, filtered and statistically measured to identify investment opportunities across 46 countries, 4 regions, 11 sectors and 6 factors: quality, value, momentum, dividend yield, volatility and size.
 - Quantitative, fundamental and technical processes are used to determine a risk budget and to allocate capital across investment opportunities.
- Quarterly changes to International Equity Division allocation.
 - Allocated \$100 million increasing exposure to quality factor.
 - Total portfolio exposure to quality is in line with the MSCI ACWI ex USA.
 - Increased allocation to build existing relationship with external manager and to increase exposure to quality.

- Quality companies tend to exhibit lower volatility and potentially higher rates of compounding over long investment horizons.
- Moved capital from a developed market index to an active external manager.
- Allocated \$45 million increasing exposure to emerging markets.
 - Portfolio is underweight emerging markets by approximately 2.9%.
 - Valuation data indicates emerging markets remain statistically cheaper than developed markets.
 - Moved capital from internal developed markets stock plus to internal emerging markets stock plus.
 - Underweight remains and plans are in place to further reduce the underweight in the coming quarter(s).

Market Environment and Outlook

- MSCI ACWI ex USA trailing 12-month price-to-earnings ratio is 18.3, slightly lower than the 20-year average of 19.2.
- Forward looking total return on an annualized basis for the MSCI ACWI ex USA index is estimated to be approximately 8.3%. This assumes an 11.5% ROE, in line with the 20-year index average, long-term developed markets growth of 2.5%, and long-term emerging markets growth of 5.0%.
- Countries with ten-year bond yields below 1.3% currently make up approximately 60.0% of the benchmark, e.g., Japan 0.0%, United Kingdom 1.2%, France 0.8%, Germany 0.4%, and Switzerland 0.0%.
- A ten-year blended international government yield of 1.8% implies an international equity risk premium of 6.5%. International bond rates are significantly lower than the United States ten-year note at 2.4%.
- 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 peaked in January 2017 and has weakened through the first 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 and further reduction of the portfolio's underweight potentially increases return while reducing tracking error.

SMRS

International Equity Strategies

3/31/17

Markets	Amount	Total	% of Total
Indexed (\$ in Millions)			
SSgA	\$1,941		
Vanguard	1,141		
Total Indexed		\$3,082	29.4%
Stock Plus			
Internal Swaps	\$1,824		
PIMCO	1,541		
Total Stock Plus		\$3,365	32.1%
Active			
Los Angeles Capital	\$1,219		
Wellington	858		
Marathon London	644		
SSgA	616		
Effissimo	283		
Lazard	216		
Martin Currie	208		
Total Active		\$4,044	38.5%

TOTAL

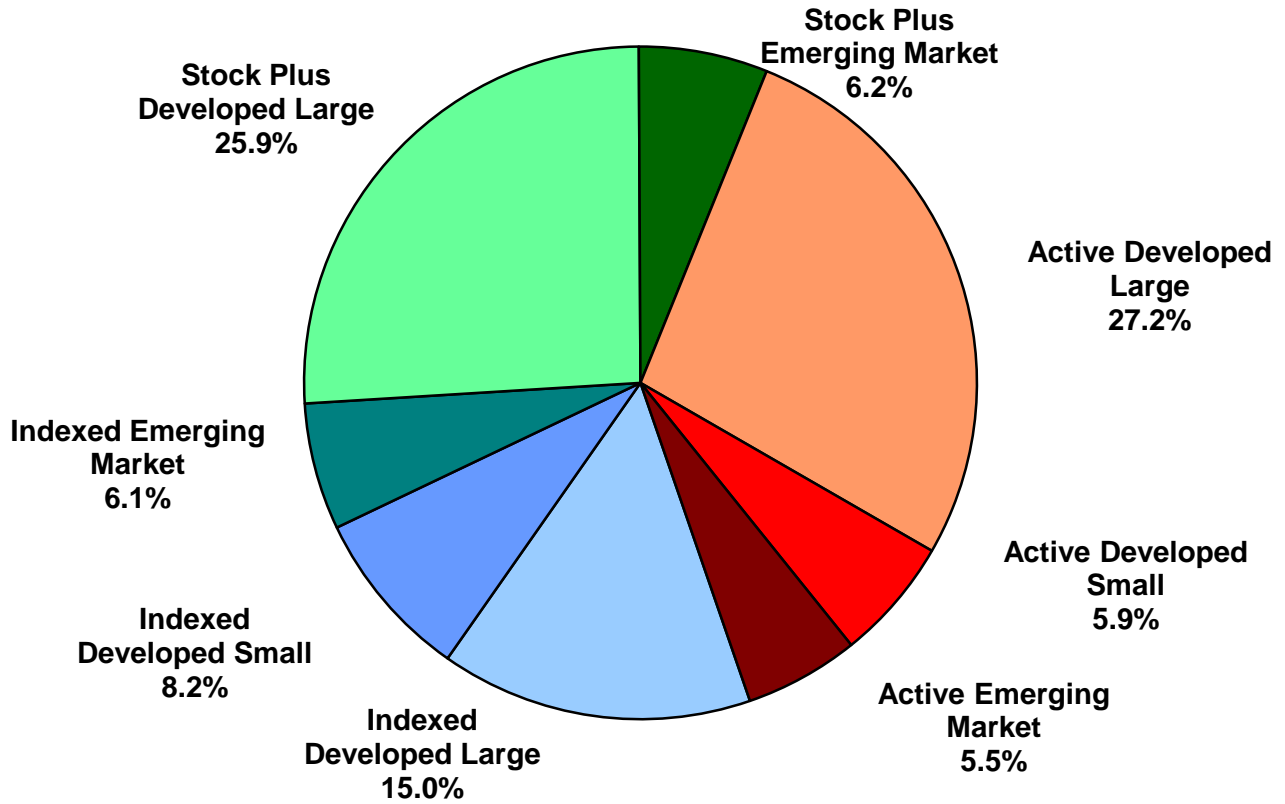
\$10,491

100.0%

SMRS

International Equity Exposure By Category

3/31/17



Market Value in Millions		
	3/31/17	
Indexed		
Developed Large	\$1,578	15.0%
Developed Small	862	8.2%
Emerging Market	642	6.1%
Total Indexed Equity	\$3,082	29.3%
Stock Plus		
Developed Large	\$2,714	25.9%
Emerging Market	651	6.2%
Total Stock Plus Equity	\$3,365	32.1%
Active		
Developed Large	\$2,852	27.2%
Developed Small	616	5.9%
Emerging Market	576	5.5%
Total Active Equity	\$4,044	38.6%
Total International Equity	\$10,491	100.0%

SMRS

International Equities

3/31/17

Date:	<u>3/31/17</u>	<u>9/30/16</u>
Assets (\$ in Millions):	\$10,491	\$9,687
Number of Securities:	9,190	9,201
Active Share:	35%	34%

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):	\$20.2	\$43.4
P/E TTM:	17.8x	18.3x
P/E FY1:	14.9x	14.0x
Price/Book:	1.6	1.7
Price/Sales:	0.9	1.2
Average Valuation Discount to MSCI ACWI ex USA:	7.9%	0.0%
Tracking Error:	1.9%	0.0%
Dividend Yield:	2.4%	2.8%

TOP TEN HOLDINGS –International Equities

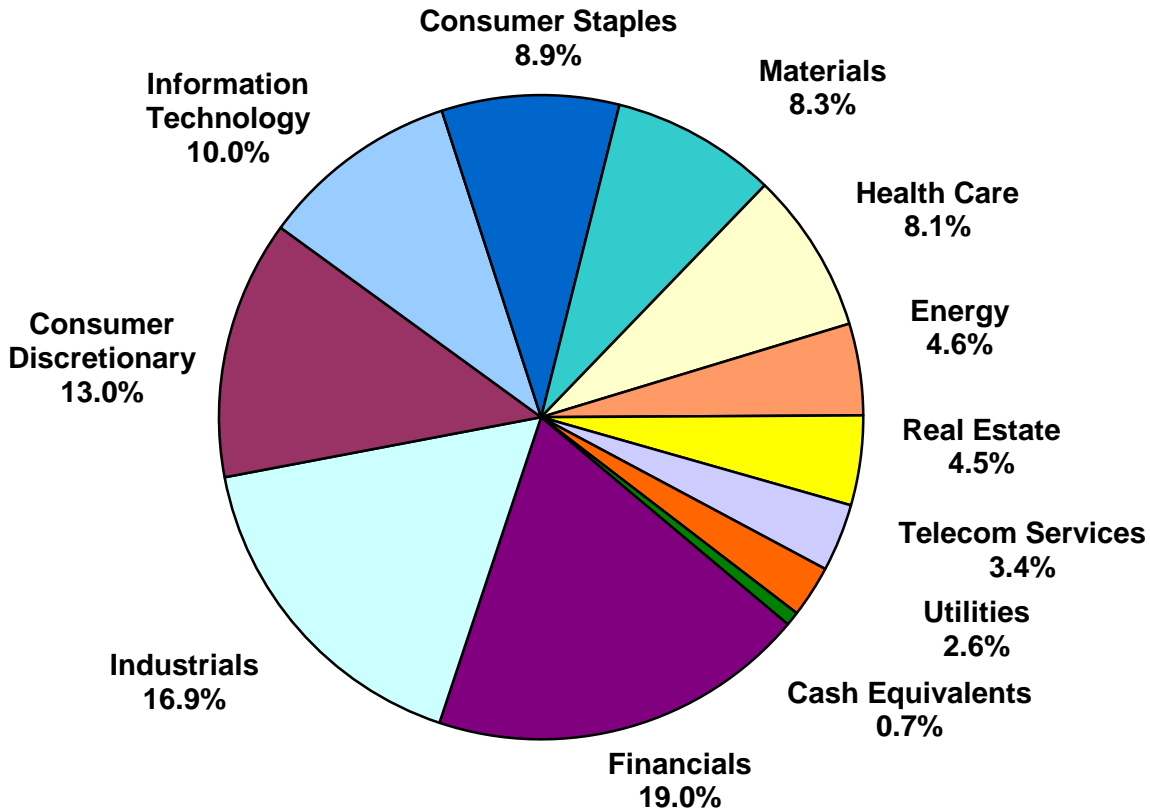
3/31/17
(\$ in Millions)

	<u>Portfolio Weight</u>	<u>Market Value</u>
Kawasaki Kisen Kaisha, Ltd.	2.64%	\$106.8
Yamada Denki Co., Ltd.	1.09%	\$44.0
MESCO, Inc.	0.97%	\$39.2
Dai-ichi Life Holdings, Inc.	0.91%	\$36.9
Ricoh Company, Ltd.	0.85%	\$34.4
Adecco Group AG	0.81%	\$32.8
British American Tobacco p.l.c.	0.74%	\$29.8
Toshiba Corporation	0.69%	\$28.1
Atos SE	0.68%	\$27.3
Kinki Sharyo Co., Ltd.	<u>0.67%</u>	<u>\$27.0</u>
TOTAL	<u>10.04%</u>	<u>\$406.2</u>

SMRS

International Equity By Sector

3/31/17



Market Value in Millions				
3/31/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$1,987	19.0%	23.3%	-4.3%
Industrials	1,773	16.9%	11.9%	5.0%
Consumer Discretionary	1,367	13.0%	11.3%	1.7%
Information Technology	1,052	10.0%	8.0%	2.0%
Consumer Staples	936	8.9%	9.9%	-1.0%
Materials	870	8.3%	9.9%	-1.6%
Health Care	846	8.1%	8.0%	0.1%
Energy	483	4.6%	6.8%	-2.2%
Real Estate	472	4.5%	3.2%	1.3%
Telecom Services	357	3.4%	3.2%	0.2%
Utilities	277	2.6%	4.5%	-1.9%
Total Investments	<u>\$10,420</u>	<u>99.3%</u>	<u>100.0%</u>	<u></u>
Cash Equivalents	71	0.7%	0.0%	0.7%
Total	<u>\$10,491</u>	<u>100.0%</u>	<u>100.0%</u>	<u></u>

Benchmark: MSCI ACWI ex USA

International Active Manager Performance - Net of Fees
3/31/17

<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>10-Years</u>	<u>Inception Date</u>
PIMCO Intl StocksPlus TR Strategy MSCI EAFE Net Div Index (unhedged)	\$1,058,052,664	16.8%	0.7%	7.2%	--	--	10/1/10
		11.7%	0.5%	5.8%	--	--	
LA Capital World MSCI ACWI Ex-US	886,682,185	7.2%	--	--	--	--	10/30/15
		13.7%	--	--	--	--	
Marathon-London Intl Fund MSCI EAFE Net Div Index	643,929,898	8.4%	2.8%	8.2%	--	--	2/1/12
		11.7%	0.5%	5.8%	--	--	
SSGA Small Cap Intl Alpha Strategy S&P Developed Ex-US Small Cap	616,273,497	10.6%	2.4%	9.7%	9.1%	--	5/1/07
		10.8%	2.9%	8.1%	7.5%	--	
Wellington Intl Research Equity S&P BMI World Ex-US Index	614,473,695	11.1%	0.7%	5.8%	5.3%	1.9%	12/1/05
		12.1%	1.0%	5.8%	5.0%	1.6%	
Pimco EM Stock Plus MSCI Emerging Market Index	482,076,014	21.8%	--	--	--	--	3/31/15
		17.2%	--	--	--	--	
LA Capital Emerging Market MSCI Emerging Market Net Div Index	332,007,260	16.1%	2.0%	1.2%	3.5%	--	12/8/09
		17.2%	1.2%	0.8%	1.7%	--	
Effissimo Capital Management Japan MSCI EAFE Net Div Index	283,408,680	27.6%	--	--	--	--	12/1/15
		11.7%	--	--	--	--	
Wellington Emerging Local Equity MSCI EAFE Net Div Index	243,806,485	17.4%	2.7%	4.6%	--	--	10/30/15
		17.2%	1.2%	0.8%	--	--	
Lazard Wilmington Intl Equity Portfolio MSCI EAFE Net Div Index (unhedged)	215,550,000	2.2%	--	--	--	--	5/1/14
		11.7%	--	--	--	--	
Martin Currie International MSCI Emerging Market Net Div Index	208,196,004	--	--	--	--	--	1/10/17
		--	--	--	--	--	

International Indexed Manager Performance, Net of Fees
3/31/17

<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>10-Years</u>	<u>Inception Date</u>
SSgA PMI Fund S&P Developed Ex-US Large/Midcap	\$1,077,796,209	12.8%	1.0%	5.5%	4.8%	--	4/1/10
		12.3%	0.6%	5.3%	4.5%	--	
SSgA EMI Fund - Europe/Pacific S&P EPAC Small Cap	862,718,371	10.3%	3.7%	9.3%	--	--	4/1/10
		10.0%	3.4%	9.0%	--	--	
Vanguard Emerging Market Spliced Emerging Market Index **	641,863,671	17.6%	2.0%	0.9%	--	--	7/1/09
		16.7%	1.8%	0.9%	--	--	
Vanguard Developed Mkts Fund Spliced Developed Ex-US Index *	499,861,207	12.9%	1.2%	6.3%	--	--	4/1/10
		12.2%	1.2%	6.2%	--	--	

* Spliced Developed Ex-US Index: MSCI EAFE Index through May 29, 2013; FTSE Developed Ex North America Index through December 20, 2015; FTSE Developed All-Cap Ex-US Transition Index thereafter. Benchmark returns are adjusted for withholding taxes.

** Spliced Emerging Market Index: Select Emerging Markets Index through August 23, 2006; MSCI Emerging Markets Index through January 9, 2013; FTSE Emerging Transition Index through June 27, 2013; FTSE Emerging Index through November 1, 2015; and FTSE Emerging Markets All-Cap China A Transition Index thereafter. Benchmark returns are adjusted for withholding taxes.

State of Michigan Retirement Systems

DOMESTIC EQUITY REVIEW

Investment Advisory Committee Meeting

June 8, 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	16.6%	9.2%	13.1%	12.4%	7.5%
S&P 1500	17.7%	10.3%	13.3%	13.0%	7.7%
Peer Median Return	17.4%	9.2%	12.7%	12.3%	7.3%
Percentile Rank vs. Peers *	62	46	32	46	33

*State Street Universe greater than >\$1 Billion

- Domestic Equity outperformed its peer group over three, five, seven and ten year periods, while underperforming during the past year. Based on a recent assessment by Aon-Hewitt, the 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.
- Like many active managers, the Active Domestic Equity Portfolio has struggled to outperform the S&P 1500 over the past few years, impacting longer term benchmark performance comparisons.
 - Two years ago at this time, the portfolio was outperforming the S&P 1500 over one, three, seven and ten year time periods. Longer term numbers can and do change quickly because of shorter term performance.
 - A long-term investment horizon is required to have a successful active manager program. Research has shown that most managers that ultimately outperform go through significant periods of underperformance along the way.
 - Two thirds of successful managers experience three consecutive years of underperformance along the way to long-term outperformance.
- Weak relative performance over the past year was in large part due to driven holdings in Verizon Communications, Gilead Sciences and CVS Health. All three of these companies are a force in their respective industries, earn returns on equity at or well above the market's 14.5% long-term average, and yet are priced at a 25%-50% discount to the market multiple.

Asset Class Goal

To provide the SMRS with long-term U.S. equity market returns or better by investing in a diversified and attractively valued portfolio at a low cost.

Strategy Update

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

- In addition, SMRS has begun the process of hiring specialized managers for the purpose of achieving a more consistent relative performance. The goal is to shift the active management performance curve up, such that periods of outperformance are more frequent and periods of underperformance less so.
 - In March of 2017, an options-based overlay program, managed by Mellon Capital, was added to the portfolio. The strategy has delivered excess returns over the S&P 500 of 300 bps since its inception in 1987, and it has done so with relative consistency.
 - At its current allocation, it is estimated that this program can add 20-40 bps per year to annualized returns.
 - The use of low cost portable alpha strategies is also being researched.
- With the addition of Mellon Capital, the domestic equity portfolio would outperform the S&P 1500 by ~12% were it to appreciate to the market multiple of 18x from where it stands now at 16x. It is expected for the multiple to at least partially converge with that of the S&P 1500 over the next five years.
 - Moreover, the portfolio 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 overweighted to both the financial sector and to defensive stocks and underweighted to 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 ~20x normalized levels of earnings, 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 their historical average 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 3.4% total shareholder yield, or 1.4% 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 7.9% (3.4% 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 2.7%, and unfavorably to the historical compound annual return for the S&P 500 from 1928 – 2016 of 9.5%.

SMRS

Domestic Equity Strategies

3/31/17

Markets	Amount	Total	% of Total
Internal Indexed (\$ in Millions)			
Indexed Portfolios	\$7,724		
Total Indexed		\$7,724	45.7%
Internal			
Active Portfolios	\$5,048		
Total Active		\$5,048	29.9%
External/Active			
Los Angeles Capital	\$1,224		
Fisher Investments	706		
Seizert Capital Partners	567		
Clarkston Capital Partners	541		
Mellon Capital	296		
ARK Investments	266		
Bivium Capital	205		
Attucks Asset Management	197		
Munder Capital Management	68		
Northpointe Capital	63		
Total		\$4,133	24.4%

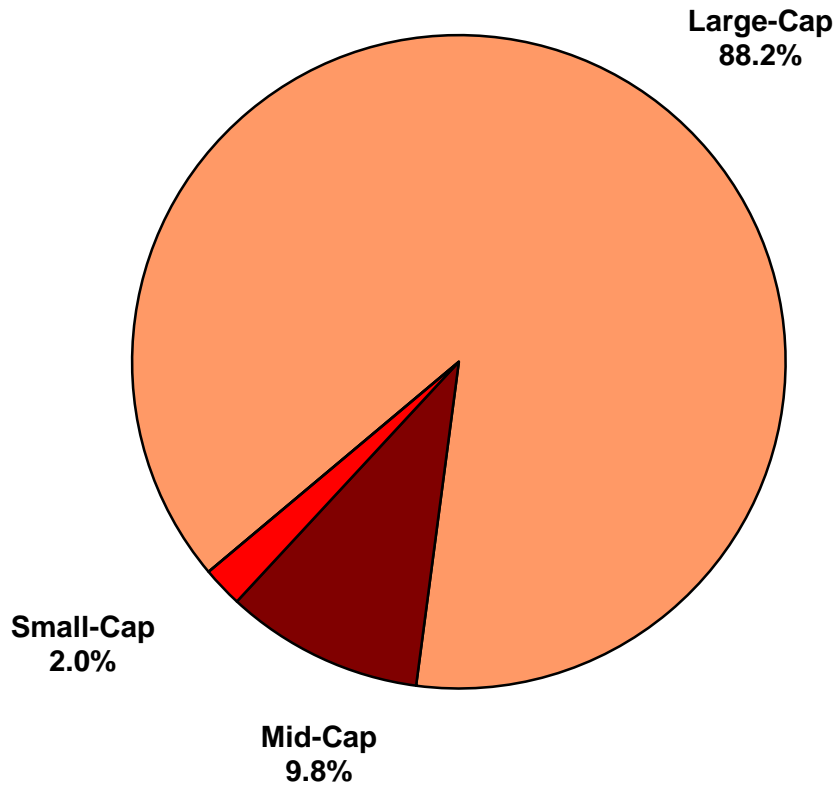
TOTAL

\$16,905

100.0%

SMRS

Domestic Equity Exposure By Market Cap 3/31/17



Market Value in Millions			
<i>3/31/17</i>			
	<u>Assets</u>	<u>Percent</u>	<u>S&P 1500</u>
Large-Cap (>\$10B)	\$14,910	88.2%	86.6%
Mid-Cap (>\$4 <\$10B)	1,657	9.8%	7.6%
Small-Cap (<\$4B)	338	2.0%	5.8%
Total Domestic Equity	<u><u>\$16,905</u></u>	<u><u>100.0%</u></u>	<u><u>100.0%</u></u>

SMRS

Domestic Equities Composite

3/31/17

Date:	<u>3/31/17</u>	<u>12/31/16</u>	<u>9/30/16</u>	<u>6/30/16</u>
Assets (\$ in Millions):	\$16,905	\$16,059	\$15,842	\$16,059
Number of Securities:	1,300	1,322	1,316	1,329
Active Share:	40%	37%	34%	33%

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)	\$181.8	\$147.0	\$112.1
P/E FY1	16.3x	18.1x	16.2x
P/E upside to S&P 1500	11.6%	0.0	12.1%
Price/Book	3.0x	2.9x	2.0x
Beta	1.04	1.00	1.05
Tracking Error	1.2%	--	2.8%
Dividend Yield	2.2%	2.0%	2.3%
Buyback Yield	2.0%	1.8%	2.0%
Reinvestment Rate	4.8%	3.8%	3.3%
Return on Equity	17.6%	15.6%	11.9%

3/31/17

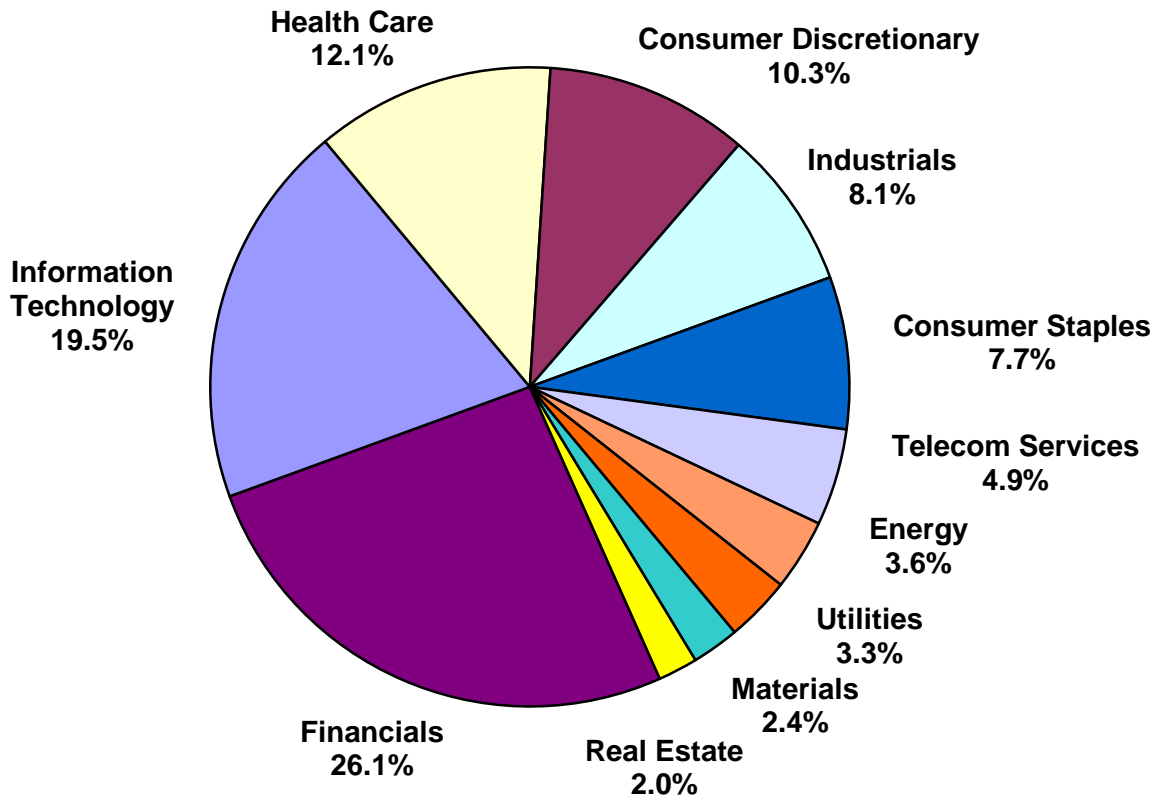
(\$ in Billions* - \$ in Millions**)

	<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	7.4%	\$ 241.1	18.0	5.9%	\$ 1,248.7
Berkshire Hathaway Inc. Class B	4.9%	411.0	21.3	2.3%	825.9
Apple Inc.	4.1%	753.7	16.1	24.6%	700.8
Verizon Communications Inc.	4.1%	198.9	12.7	-7.7%	690.0
JPMorgan Chase & Co.	2.7%	313.8	13.4	2.4%	462.5
SPDR BBG BARC LT Treas ETF	2.7%	0.5	39.9	1.7%	454.4
U.S. Bancorp	2.6%	87.2	14.8	0.8%	436.7
Wells Fargo & Company	1.9%	278.5	13.3	1.7%	323.4
Microsoft Corporation	1.7%	508.9	22.1	6.6%	280.4
Facebook, Inc. Class A	<u>1.6%</u>	334.6	26.2	23.5%	<u>270.6</u>
TOTAL	<u>35.5%</u>				\$ <u>\$5,693.4</u>

SMRS

Domestic Equity By Sector

3/31/17



Market Value in Millions				
3/31/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$4,418	26.1%	14.6%	11.5%
Information Technology	3,299	19.5%	21.6%	-2.1%
Health Care	2,044	12.1%	13.4%	-1.3%
Consumer Discretionary	1,745	10.3%	12.4%	-2.1%
Industrials	1,375	8.1%	10.7%	-2.6%
Consumer Staples	1,295	7.7%	8.8%	-1.1%
Telecom Services	833	4.9%	2.2%	2.7%
Energy	600	3.6%	6.2%	-2.6%
Utilities	558	3.3%	3.3%	0.0%
Materials	409	2.4%	3.3%	-0.9%
Real Estate	329	2.0%	3.5%	-1.5%
Total	<u>\$16,905</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

3/31/17

Date:	<u>3/31/17</u>	<u>12/31/16</u>	<u>9/30/16</u>	<u>6/30/16</u>
Assets (\$ in Millions):	\$9,181	\$8,734	\$8,403	\$8,625
Number of Securities:	981	980	1,015	1,023
Active Share:	72%	66%	63%	62%

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)	\$192.0	\$147.0	\$112.1
P/E FY1	14.7x	18.1x	16.2x
P/E upside to S&P 1500	23.1%	0.0	12.1%
Price/Book	2.9x	2.9x	2.0x
Beta	1.06	1.00	1.05
Tracking Error	2.2%	--	2.8%
Dividend Yield	2.4%	2.0%	2.3%
Buyback Yield	2.1%	1.8%	2.0%
Reinvestment Rate	5.9%	3.8%	3.3%
Return on Equity	18.7%	15.6%	11.9%

TOP TEN EXPOSURES - All Active Equities

3/31/17

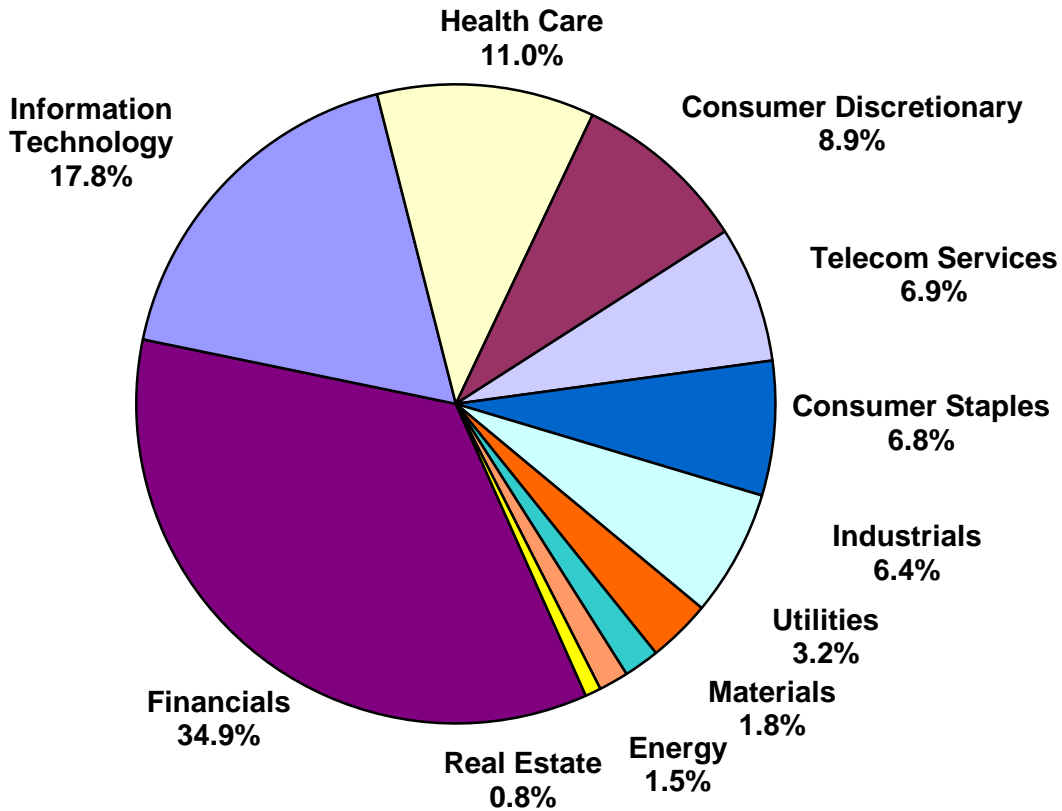
(\$ in Billions* - \$ in Millions**)

	<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	10.1%	\$ 241.1	18.0	5.9%	\$ 928,199,376
Berkshire Hathaway Inc. Class B	8.2%	411.0	21.3	2.3%	750,916,235
Verizon Communications Inc.	6.8%	198.9	12.7	-7.7%	624,733,298
SPDR BBG BARC LT Treas ETF	4.9%	0.5	39.9	1.7%	454,358,460
Apple Inc.	4.9%	753.7	16.1	24.6%	453,214,977
U.S. Bancorp	4.5%	87.2	14.8	0.8%	409,811,765
JPMorgan Chase & Co.	3.9%	313.8	13.4	2.4%	359,481,511
Wells Fargo & Company	2.6%	278.5	13.3	1.7%	241,033,738
Exelon Corporation	2.6%	33.3	13.5	2.3%	240,553,645
Gilead Sciences, Inc.	<u>2.4%</u>	88.8	8.3	-4.4%	<u>218,688,476</u>
TOTAL	<u>51.1%</u>				\$ <u>4,680,991,479</u>

SMRS

Active Equity By Sector

3/31/17



Market Value in Millions				
3/31/17				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$3,207	34.9%	14.6%	20.3%
Information Technology	1,637	17.8%	21.6%	-3.8%
Health Care	1,014	11.0%	13.4%	-2.4%
Consumer Discretionary	816	8.9%	12.4%	-3.5%
Telecom Services	636	6.9%	2.2%	4.7%
Consumer Staples	620	6.8%	8.8%	-2.0%
Industrials	584	6.4%	10.7%	-4.3%
Utilities	294	3.2%	3.3%	-0.1%
Materials	162	1.8%	3.3%	-1.5%
Energy	139	1.5%	6.2%	-4.7%
Real Estate	72	0.8%	3.5%	-2.7%
Total	<u>\$9,181</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

Manager Performance - Net of Fees

3/31/17

<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 Large-Cap Core	\$2,247,316,745	14.6%	6.6%	13.3%	11.5%	7.2%	8/31/07
S&P 500		17.2%	10.4%	13.3%	12.9%	7.5%	
Style & Risk Adjusted Benchmark		18.5%	7.7%	11.6%	11.4%	7.8%	
Lipper Large-Cap Core		15.9%	8.4%	11.9%	11.5%	6.7%	
<i>Excess Return</i>		-2.6%	-3.8%	0.0%	-1.4%	-0.2%	
<i>Alpha</i>		-3.9%	-1.1%	1.7%	0.1%	-0.6%	
<i>Pct Rank vs Lipper Large-Cap Core</i>		69	85	14	54	33	
SMRS Large-Cap Growth	1,515,413,407	8.4%	9.0%	11.9%	12.1%	8.6%	5/31/05
S&P 500 Growth Index		15.4%	11.5%	13.8%	13.9%	9.3%	
Style & Risk Adjusted Benchmark		15.7%	12.2%	14.6%	14.4%	9.4%	
Lipper Large Growth		14.7%	9.5%	12.0%	12.3%	8.7%	
<i>Excess Return</i>		-7.0%	-2.5%	-1.9%	-1.8%	-0.6%	
<i>Alpha</i>		-7.3%	-3.2%	-2.8%	-2.3%	-0.7%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		98	64	51	57	50	
SMRS All-Cap Garp	1,068,363,726	17.2%	9.0%	13.3%	--	14.1%	4/30/11
S&P 1500 Super Composite		17.7%	10.2%	13.3%	--	12.4%	
Style & Risk Adjusted Benchmark		20.3%	10.0%	13.0%	--	12.2%	
Lipper Multi Core		15.9%	7.3%	11.6%	--	10.3%	
<i>Excess Return</i>		-0.4%	-1.2%	-0.1%	--	1.7%	
<i>Alpha</i>		-3.1%	-0.9%	0.3%	--	1.8%	
<i>Pct. Rank vs. Lipper Multi Core</i>		36	28	16	--	1	
SMRS Mid-Cap Index	730,593,434	22.0%	10.1%	14.1%	14.4%	--	N/A
S&P 400		20.9%	9.4%	13.3%	13.5%	--	
Style & Risk Adjusted Benchmark		20.8%	9.3%	13.2%	13.3%	--	
Lipper Large-Cap Core		18.1%	7.1%	11.8%	11.8%	--	
<i>Excess Return</i>		1.1%	0.8%	0.8%	0.9%	--	
<i>Alpha</i>		1.2%	0.8%	0.9%	1.0%	--	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		15	7	6	3	--	
LA Capital Deep Value	728,454,182	16.3%	--	--	--	7.3%	4/1/15
S&P 1500 Value		19.1%	--	--	--	8.8%	
Style & Risk Adjusted Benchmark		16.4%	--	--	--	8.7%	
Lipper Multi-Cap Value		18.5%	--	--	--	6.3%	
<i>Excess Return</i>		-2.8%	--	--	--	-1.4%	
<i>Alpha</i>		-0.1%	--	--	--	-1.4%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		73	--	--	--	40	
Fisher All-Cap	705,794,387	20.5%	11.4%	11.7%	12.0%	10.4%	10/31/04
S&P 1500/S&P 600 Value Blend		17.7%	10.2%	13.0%	12.8%	9.1%	
Style & Risk Adjusted Benchmark		19.5%	11.6%	14.5%	16.2%	11.2%	
Lipper Multi Core		15.9%	7.3%	11.6%	11.3%	7.8%	
<i>Excess Return</i>		2.8%	1.2%	-1.3%	-0.8%	1.3%	
<i>Alpha</i>		0.9%	-0.2%	-2.9%	-4.2%	-0.8%	
<i>Pct. Rank vs. Lipper Multi Core</i>		12	3	58	43	2	
SMRS S&P 500 Index	6,993,621,355	17.5%	10.6%	13.6%	13.3%	--	N/A
S&P 500		17.2%	10.4%	13.3%	12.9%	--	
Style & Risk Adjusted Benchmark		17.1%	10.3%	13.3%	12.9%	--	
Lipper Large-Cap Core		15.9%	8.4%	11.9%	11.5%	--	
<i>Excess Return</i>		0.4%	0.2%	0.3%	0.3%	--	
<i>Alpha</i>		0.4%	0.2%	0.3%	0.4%	--	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		29	9	10	5	--	
Seizert Capital Partners	566,721,735	25.1%	7.6%	13.3%	13.6%	14.8%	11/30/09
S&P 1500/S&P 400 Value Blend		17.7%	10.2%	13.3%	14.2%	16.3%	
Style & Risk Adjusted Benchmark		19.2%	9.7%	13.9%	12.6%	15.3%	
Lipper Multi Core		15.9%	7.3%	11.6%	11.3%	12.8%	
<i>Excess Return</i>		7.4%	-2.6%	-0.1%	-0.6%	-1.5%	
<i>Alpha</i>		6.0%	-2.1%	-0.6%	1.1%	-0.4%	
<i>Pct. Rank vs. Lipper Multi Core</i>		4	53	16	6	8	

<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	495,376,087	13.4%	12.7%	15.5%	14.5%	11.6%	5/31/05
S&P 1500 Growth		15.9%	11.3%	13.7%	13.9%	9.4%	
Style & Risk Adjusted Benchmark		16.7%	8.5%	12.2%	13.3%	10.1%	
Lipper Multi-Cap Growth		14.9%	7.5%	11.0%	11.6%	8.7%	
<i>Excess Return</i>		-2.6%	1.4%	1.8%	0.6%	2.2%	
<i>Alpha</i>		-3.3%	4.2%	3.3%	1.2%	1.5%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		65	2	3	8	3	
Clarkston Capital Large-Cap	303,252,064	14.6%	--	--	--	10.4%	4/1/15
S&P 500		17.2%	--	--	--	9.2%	
Style & Risk Adjusted Benchmark		12.1%	--	--	--	6.6%	
Lipper Large-Cap Core		15.9%	--	--	--	7.3%	
<i>Excess Return</i>		-2.5%	--	--	--	1.2%	
<i>Alpha</i>		2.5%	--	--	--	3.7%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		69	--	--	--	5	
Ark Investments	266,190,195	23.6%	--	--	--	30.2%	1/1/14
S&P 1500 Growth		15.9%	--	--	--	21.7%	
Style & Risk Adjusted Benchmark		30.3%	--	--	--	34.6%	
Lipper All-Cap Core		14.9%	--	--	--	20.2%	
<i>Excess Return</i>		7.7%	--	--	--	8.5%	
<i>Alpha</i>		-6.7%	--	--	--	-4.4%	
<i>Pct. Rank vs. Lipper All-Cap Growth</i>		4	--	--	--	2	
Clarkston Capital Small-Cap	237,269,827	15.9%	13.2%	--	--	13.0%	1/1/14
S&P 600		24.6%	9.5%	--	--	9.1%	
Style & Risk Adjusted Benchmark		19.6%	7.8%	--	--	8.0%	
Lipper Small-Cap Core		22.0%	6.2%	--	--	6.1%	
<i>Excess Return</i>		-8.7%	3.7%	--	--	4.0%	
<i>Alpha</i>		-3.7%	5.3%	--	--	5.1%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		91	1	--	--	1	
Bivium Capital Partners	205,408,024	19.5%	7.2%	10.5%	11.3%	5.8%	11/30/07
S&P 1500 Value		19.1%	8.9%	12.8%	12.0%	5.6%	
Style & Risk Adjusted Benchmark		16.7%	11.0%	14.4%	14.2%	7.3%	
Lipper Multi Cap Value		18.5%	6.7%	11.6%	10.8%	5.6%	
<i>Excess Return</i>		0.4%	-1.6%	-2.3%	-0.8%	0.2%	
<i>Alpha</i>		2.9%	-3.8%	-3.9%	-3.0%	-1.5%	
<i>Pct. Rank vs. Lipper Multi Cap Value</i>		39	47	76	44	37	
Attucks Asset Management	197,168,097	16.2%	6.5%	10.7%	11.1%	6.1%	11/30/07
S&P 1500 Super Composite		17.7%	10.2%	13.3%	13.0%	7.1%	
Style & Risk Adjusted Benchmark		15.1%	10.7%	14.0%	13.5%	7.2%	
Lipper Multi Core		15.9%	7.3%	11.6%	11.3%	5.9%	
<i>Excess Return</i>		-1.4%	-3.8%	-2.7%	-2.0%	-1.0%	
<i>Alpha</i>		1.1%	-4.2%	-3.3%	-2.4%	-1.0%	
<i>Pct. Rank vs. Lipper Multi Core</i>		47	69	70	64	49	
Munder Concentrated SMID Cap	68,079,286	20.2%	5.0%	10.1%	11.4%	15.9%	4/30/09
S&P 400 Mid-Cap Growth		19.1%	9.0%	12.6%	13.6%	18.8%	
Style & Risk Adjusted Benchmark		17.3%	11.0%	14.6%	13.3%	17.7%	
Lipper Mid-Cap Growth		16.3%	6.2%	10.6%	11.6%	16.2%	
<i>Excess Return</i>		1.1%	-4.1%	-2.4%	-2.2%	-2.9%	
<i>Alpha</i>		2.8%	-6.0%	-4.5%	-1.9%	-1.8%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		16	74	56	52	59	
NorthPointe All-Cap Core	62,625,075	14.5%	5.0%	10.6%	9.3%	7.1%	10/31/04
NorthPointe Blended Benchmark		17.7%	10.2%	13.3%	13.0%	8.7%	
Style & Risk Adjusted Benchmark		13.0%	8.3%	11.9%	14.6%	9.8%	
Lipper Multi Core		15.9%	7.3%	11.6%	11.3%	7.8%	
<i>Excess Return</i>		-3.2%	-5.3%	-2.7%	-3.8%	-1.6%	
<i>Alpha</i>		1.5%	-3.3%	-1.3%	-5.4%	-2.7%	
<i>Pct. Rank vs. Lipper Multi Core</i>		64	83	73	85	78	

<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>
Large-Cap Consistent Growth	25,018,000	6.1%	--	--	--	5.9%	3/1/15
S&P 500		17.2%	--	--	--	8.0%	
Style & Risk Adjusted Benchmark		15.2%	--	--	--	7.3%	
Lipper Large-Cap Core		15.9%	--	--	--	6.2%	
<i>Excess Return</i>		-11.0%	--	--	--	-2.0%	
<i>Alpha</i>		-9.0%	--	--	--	-1.4%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		99	--	--	--	64	

State of Michigan Retirement Systems

PRIVATE EQUITY REVIEW

Investment Advisory Committee Meeting

June 8, 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	10.1%	10.9%	13.7%	14.3%	11.4%
Benchmark Return	15.2%	12.1%	17.8%	16.8%	11.2%
Peer Median Return	10.1%	8.3%	10.7%	11.4%	8.2%
Percentile Rank vs. Peers*	53	17	11	9	7

*State Street Universe greater than \$1 billion

- Private Equity returns have been strong relative to peer median returns, ranking in the top 7% of peers over the past ten years.
- It is not unusual for private equity returns to lag the public market benchmark return in up markets and lead the public market benchmark in down markets. The past seven years have been no exception due to market volatility and the third longest expansion in U.S. history. However, over the past ten years, a full market cycle, the Private Equity Division has delivered 3.9% annualized excess returns over the S&P 500 (ten year S&P 500 return 7.5%).

Strategy Update

For the twelve months ending 3/31/17, the Private Equity Division returned approximately \$665 million, net of contributions, to the pension fund. Although the pace of distributions has slowed, distribution activity should remain healthy as long as the economic recovery continues. General Partners are incentivized to exit investments at current valuations.

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 towards middle market buyout funds in an attempt to diversify its exposure to mega funds. Co-investments will play an increasingly important role in both averaging down costs and targeting specific investments with attractive risk/return characteristics. An effort to consolidate the portfolio to gain scale and improve performance is in the planning stages.

- Commitments closed during the fourth quarter include:
 - \$100 million to Genstar Capital Partners VIII, a middle market buyout fund
 - \$35 million to The Huron Fund V, a lower middle market buyout fund
 - \$6.2 million for a secondary acquisition of TCW/Crescent Mezzanine Partners (various funds)

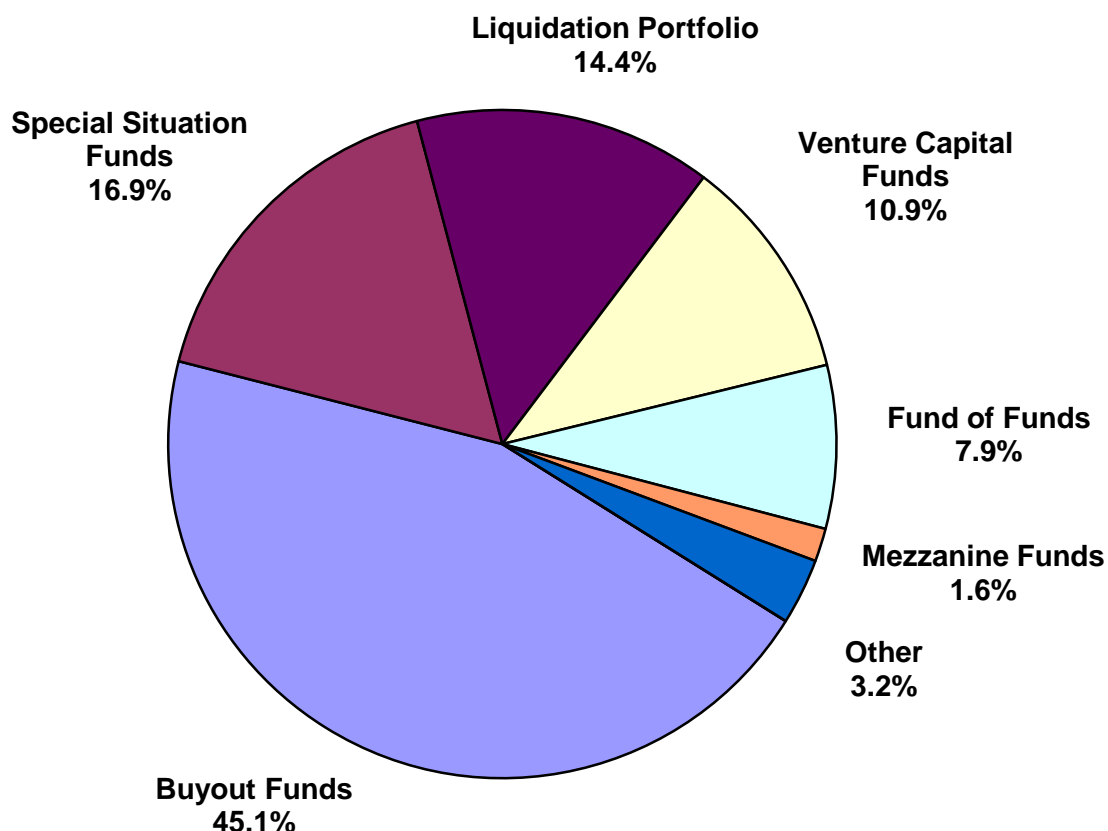
Market Environment

- Private equity investment activity remains muted due to high entry multiples, macroeconomic uncertainty and concerns over market volatility. Private equity valuations were impacted by the continued fallout from the Brexit referendum in June of 2016, the contentious elections in the U.S and France, recent and anticipated Fed rate hikes and the forthcoming election in Germany.
- The Federal Reserve's low interest rate policies and global stimulus have made it exceedingly difficult to invest money into new deals at attractive entry prices. As a result, private equity sponsors have sat largely on the side-lines or have been forced to evaluate non-traditional opportunities to put money to work. According to Preqin, private equity assets under management was \$2.49 trillion, as of June 2016, an all-time high. Dry powder held by private equity funds was \$820 billion as of December 2016. Twenty-six percent of the aggregate capital raised and closed in 2016 is held by 10 funds. There appears to be a significant amount of consolidation taking place within private equity.
- The sell side has been active for the same reason that the buy side has been muted; particularly an environment of lofty valuations and low interest rates. This is clearly still a seller's market. Thirty percent of fund managers queried by Preqin expect exit activity to increase in 2017, while forty-six percent expect it to remain at current levels. That said, distributions have been slowing. Furthermore, increased regulation aimed at limiting risky lending by Wall Street Banks has reduced the amount of debt available, forcing private equity firms to contribute more equity. Looking forward, high entry multiples along with interest rate hikes and multiple compression on exit, will likely diminish returns for private equity.
- Deal pipelines remain robust with some of the best investment opportunities seen in years. However, private equity firms are paying rich multiples for growth companies and unlevered cash flows. 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

3/31/17



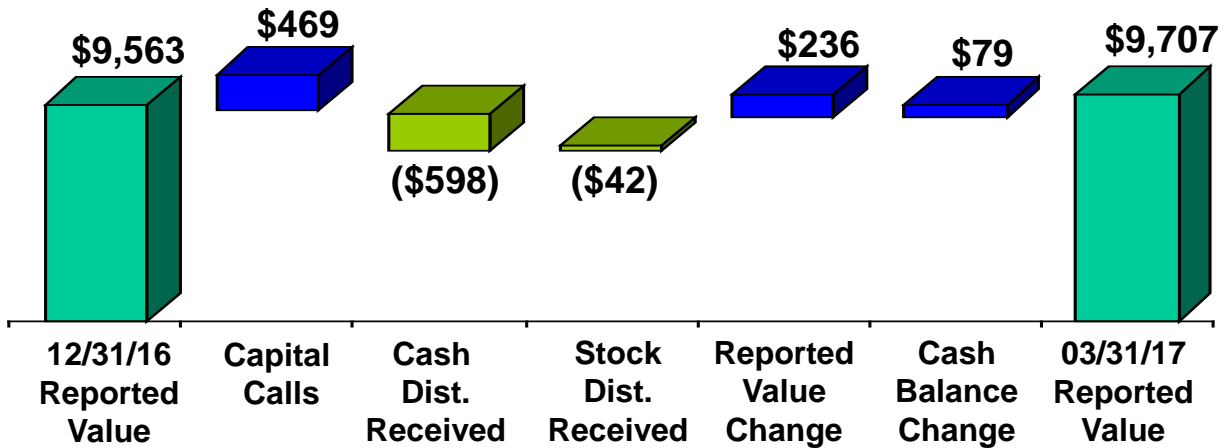
Market Value in Millions				
	<u>3/31/17</u>		<u>12/31/16</u>	
Buyout Funds	\$4,375	45.1%	\$4,314	45.1%
Special Situation Funds	1,645	16.9%	1,648	17.2%
Liquidation Portfolio	1,397	14.4%	1,451	15.2%
Venture Capital Funds	1,059	10.9%	1,095	11.4%
Fund of Funds	769	7.9%	686	7.2%
Mezzanine Funds	157	1.6%	141	1.5%
Other	305	3.2%	228	2.4%
Total	<u>\$9,707</u>	<u>100.0%</u>	<u>\$9,563</u>	<u>100.0%</u>

SMRS

Private Equity 3/31/17

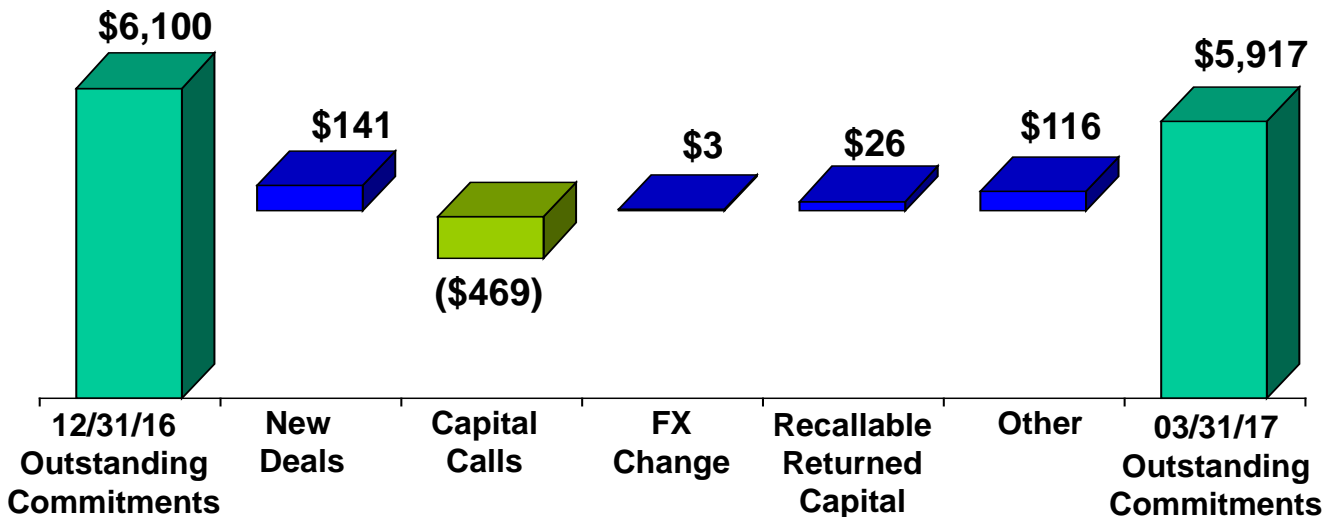
Invested Commitments

(\$ in Millions)



Outstanding Commitments

(\$ in Millions)

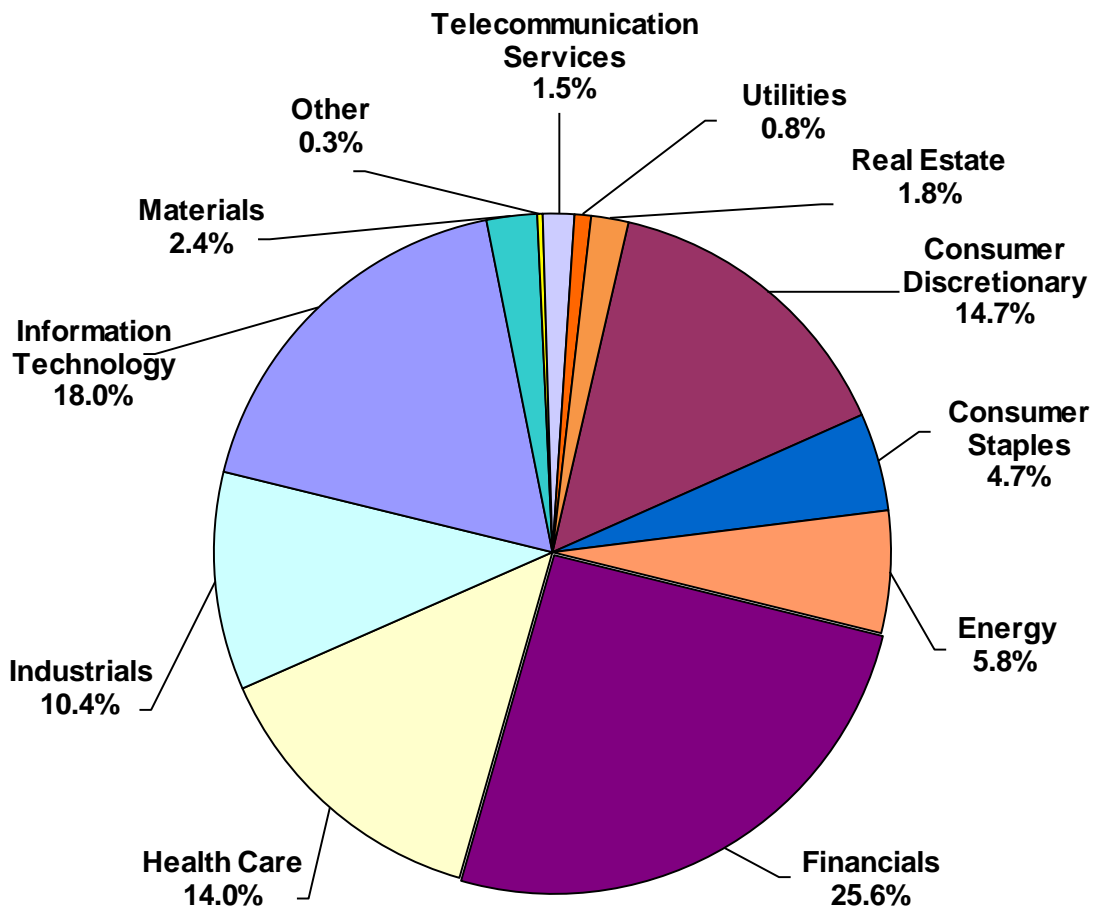


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Private Equity

3/31/17

Investments by Industry



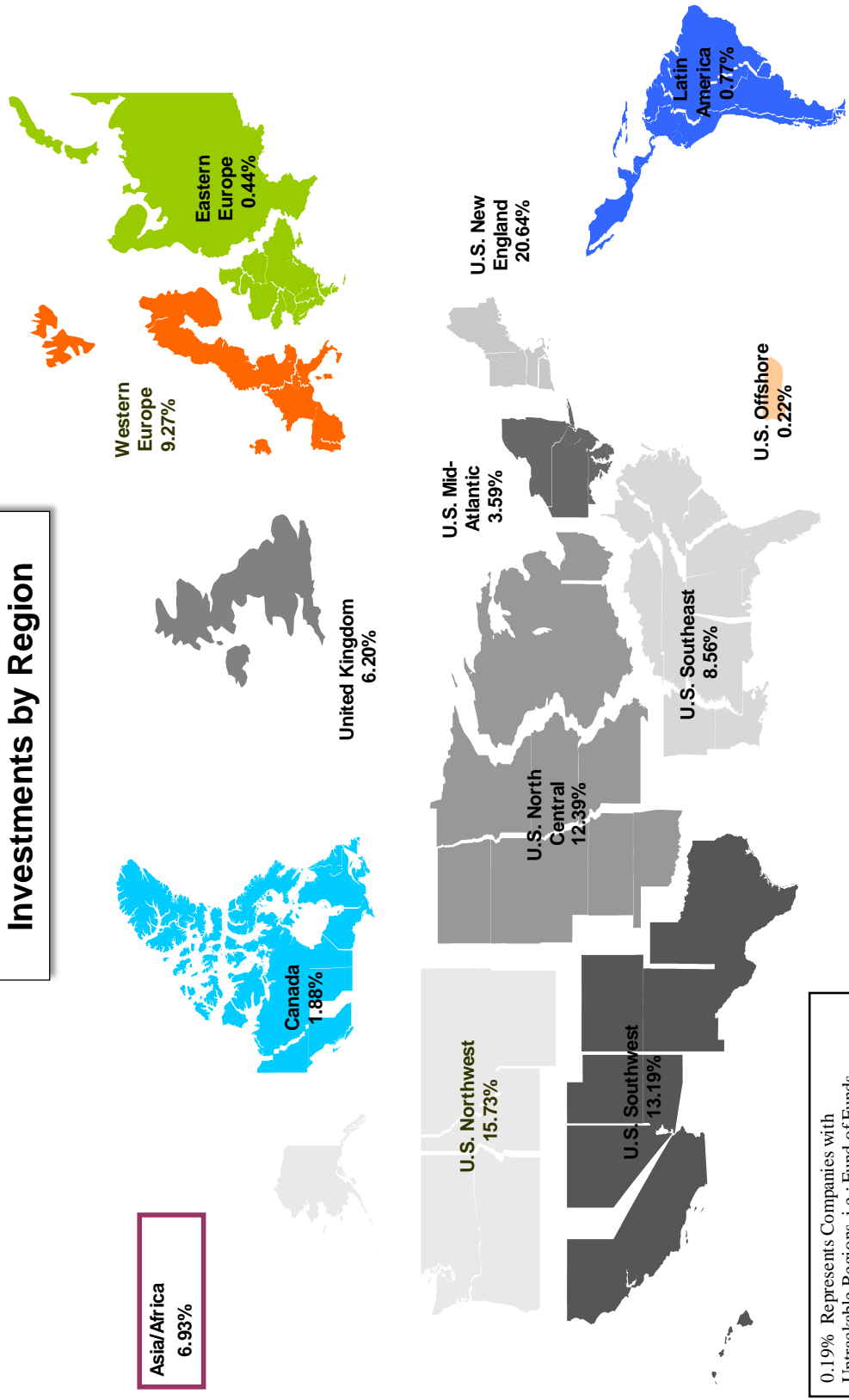
These numbers are based on the most recent available General Partner Data; primarily 3/31/17 and are subject to change.

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Investments by Region



0.19% Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 73%, Europe 16%, Asia 9%, Other 2%

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3/31/17

Portfolio by Vintage Year

(\$ in Millions)

Asset Vintage	Reported Value	Outstanding Commitment	Total Exposure
1986-98	\$ 8	\$ 12	\$ 20
1999	21	10	31
2000	72	27	99
2001	170	63	233
2002	42	9	51
2003	17	18	35
2004	110	46	156
2005	315	24	339
2006*	930	258	1,188
2007	789	148	937
2008	928	171	1,099
2009	48	1	49
2010	316	14	330
2011	794	119	913
2012	1,165	285	1,450
2013	429	260	689
2014	865	618	1,483
2015	2,125	1,747	3,872
2016	253	1,952	2,205
2017	5	135	140
Income Accruals	1	0	1
Cash	302	0	302
Act. Small Cap - Stock Dist	2	0	2
Total	\$ 9,707	\$ 5,917	\$ 15,624

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

	Reported Value	Outstanding Commitment	Total Exposure	Total (USD)
Euro (\$1.06/ €)	€373	€197	€570	\$610
Pound (\$1.25/ £)	£19	£1	£20	\$25

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Private Equity

3/31/17

Top 10 Sponsors

(\$ in Millions)

<u>Asset Type</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total</u>
HarbourVest Partners	\$ 1,623	\$ 361	\$ 1,984
KKR	531	343	874
Grosvenor Capital Management	603	261	864
Blackstone Capital Partners	389	465	854
Warburg Pincus Capital	479	289	768
Advent International	357	238	595
Leonard Green & Partners	343	238	581
The Carlyle Group	278	205	483
TPG	309	161	470
Berkshire Partners	251	189	440
Top 10 Total Value	<u>\$5,163</u>	<u>\$2,750</u>	<u>\$7,913</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	1.3%	11.2%	10.7%	13.9%	10.3%
Fund of Funds	-0.1%	8.2%	11.2%	11.0%	8.3%
Mezzanine	-0.1%	5.6%	3.1%	8.9%	7.5%
Special Situations	0.1%	8.1%	6.0%	9.4%	7.9%
Venture Capital	0.4%	6.0%	10.3%	12.8%	15.7%

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

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Private Equity

3/31/17

Net Market Values by Ownership Entity

	Adjusted Reported Value	Unfunded Commitment
Accel Europe I, LP	\$ 13,645,031	\$ 1
Accel Europe II	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	1,650,000	20,350,000
Accel IX, LP	5,258,211	3,000,000
Accel Leaders Fund LP	1,705,000	3,795,000
Accel London V LP	1,718,739	10,140,000
Accel VI-S	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	953,774	9,000,000
Advent Global Private Equity III	988,970	20
Advent Global Private Equity IV	3	-
Advent Global Private Equity V	8,120,433	8,700,000
Advent International GPE VI-A LP	116,198,628	3,999,980
Advent International GPE VII-B, LP	173,242,292	24,600,000
Advent International GPE VIII-B, LP	50,128,113	172,350,000
Advent Latin American Private Equity Fund VI, LP	8,559,755	28,122,500
Affinity Asia Pacific Fund II, LP	-	5,288,237
Affinity Asia Pacific Fund III, LP	50,797,880	12,335,055
Affinity Asia Pacific Fund IV, LP	63,655,478	68,283,821
Apax Europe Fund VI	20,320,269	2,261,882
Apax Europe V, LP	191,463	-
Apax Europe VII, LP	44,380,197	2,363,445
Apax Excelsior VI	83,526	1,614,434
Apax IX, LP	-	150,000,000
Apax US VII	12,318,900	417,509
Apax VIII - B, LP	109,025,823	9,008,764
Apollo Investment Fund VIII LP	64,871,969	39,946,545
Arboretum Ventures II	2,209,472	-
Arboretum Ventures III, LP	13,669,398	1,170,000
Arboretum Ventures IV, LP	4,084,280	23,850,000
Ares Corporate Opportunities Fund II	10,426,521	11,423,773
Ares Corporate Opportunities Fund III, LP	85,894,257	9,319,400
Ares Corporate Opportunities Fund IV, LP	92,526,766	26,708,683

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
AXA ASF Miller Co-Investment	27,529,096	22,721,187
Axiom Asia IV, LP	4,843,147	44,169,399
Axiom Asia Private Capital Fund III, LP	28,067,143	13,001,764
BC European Capital IX	77,858,555	7,132,721
BC European Capital VII, LP	523,031	-
BC European Capital VIII, LP	30,749,573	8,363,881
Berkshire Fund IX, LP	9,877,611	165,122,389
Berkshire Fund V, LP	259,376	3,281,560
Berkshire Fund VI, LP	50,750,284	6,922,153
Berkshire Fund VII, LP	79,430,040	2,451,974
Berkshire Fund VIII, LP	110,157,563	11,239,165
Blackstone Capital Partners IV	25,383,400	4,946,475
Blackstone Capital Partners V	38,430,190	15,936,245
Blackstone Capital Partners V-S	4,407,730	711,079
Blackstone Capital Partners VI, LP	258,817,506	48,584,125
Blackstone Capital Partners VII, LP	23,615,749	246,385,084
Bridgepoint Europe IV	32,439,909	5,710,641
Carlyle Europe Partners II	3,884,880	3,955,138
Carlyle Europe Partners III	28,361,128	5,929,369
Carlyle Europe Partners IV, LP	46,250,036	56,052,168
Carlyle Partners IV, LP	6,316,343	16,009,296
Carlyle Partners V LP	88,733,802	57,576,425
Carlyle Partners VI, LP	104,570,086	65,558,042
Castle Harlan Partners IV	6,929,186	5,286,319
Castle Harlan Partners V	46,748,448	29,490,554
CCMP Capital Investors II	40,169,231	10,346,490
CCMP Capital Investors III, LP	33,061,331	21,997,774
Centerbridge Capital Partners III, LP	23,458,207	54,875,353
Cerberus SMRS Partners, LP	76,081,275	27,804,657
CM Liquidity Fund, LP	-	25,000,000
Coller International Partners IV	186,362	1,000,000
Coller International Partners V, LP	35,649,108	43,600,000
Coller International Partners VI, LP	60,365,797	29,228,731
Coller International Partners VII, LP	9,577,239	142,473,288
Crescent Mezzanine Partners VI, LP	47,740,384	12,113,862
Crescent Mezzanine Partners VII	6,104,686	145,170,882
DLJ Investment Partners II	165,591	-
DLJ Investment Partners III	7,268,038	44,608,850
Dover Street IX, LP	7,249,913	92,000,000
EDF Ventures III	1,283,709	-
EnCap Energy Capital Fund X, LP	14,325,773	30,551,823
Entertainment IP Fund, LP	2,197,201	46,870,571
FIMI Opportunity 6, LP	3,421,545	46,477,274
FirstMark Capital I, LP	81,158,451	196,596
FirstMark Capital IV, LP	-	35,000,000
FirstMark Capital OF I, LP	12,084,401	7,100,000
FirstMark Capital OF II, LP	-	35,000,000
FirstMark Capital P2, LP	168,121,041	-

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Flagship Ventures Fund 2004	9,367,434	-
Flagship Ventures Fund 2007, LP	25,341,148	-
Flagship Ventures Fund IV, LP	80,951,241	-
Flagship Ventures Fund V	33,135,887	13,125,000
Flagship Ventures Opportunities Fund I, LP	3,660,870	46,250,000
Fox Paine Capital Fund II, LP	30,184,028	15,480,084
FS Equity Partners VII, LP	47,853,614	51,690,300
G-II Acquisition Holdings Note	7,417,859	-
G-IV Acquisition Holdings, LLC	20,936,296	-
GCM Grosvenor Fund Investment Program I, LP	14,576,600	1,425,343
GCM Grosvenor Fund Investment Program II, LP	48,614,031	15,933,560
GCM Grosvenor Fund Investment Program III - 2004	57,306,269	5,002,008
GCM Grosvenor Fund Investment Program III - 2006	83,927,378	9,240,364
GCM Grosvenor Fund Investment Program V, LP	90,104,684	11,485,629
GCM Grosvenor Fund Investment Program VI, LP	18,307,760	15,822,526
GCM Grosvenor Fund Investment Program VIII, LP	1,550,000	98,450,000
GCM Grosvenor SeasPriFIP LP (PIS06-10)	82,903,258	24,032,160
GCM Grosvenor SeasPriFIP LP (PIS14)	160,065,467	65,821,460
GCM Grosvenor SeasPriFIP LP (Seed)	45,849,219	13,824,219
** Genstar Capital Partners VIII PCV, LP	-	50,000,000
** Genstar Capital Partners VIII, LP	-	50,000,000
Green Equity Investors IV	6,934,531	1,136,036
Green Equity Investors V	197,217,918	25,966,435
Green Equity Investors VI, LP	139,594,711	10,433,690
Green Equity Investors VII, LP	-	200,000,000
GSO Capital Opportunities Fund II, LP	24,060,926	13,595,715
GSO Capital Opportunities Fund III, LP	14,635,739	85,420,542
GSO COF III Co-Investment Fund, LP	-	50,000,000
HarbourVest Dover Street VIII, LP	44,451,971	9,787,500
HarbourVest Int'l III Direct	-	1,000,000
HarbourVest Int'l III Partnership	713,729	1,200,000
Harbourvest Partners Co-Investment Fund IV LP	36,012,162	63,750,000
HarbourVest Partners Mezzanine Income Fund	11,590,378	37,310,000
HarbourVest V Partnership	210,763	300,000
HarbourVest VI - Direct Fund LP	4,071,107	750,000
HarbourVest VI Partnership	8,919,278	2,000,000
Harvest Partners VII, LP	12,439,186	62,560,814
HPS Mezzanine Partners III, LP	5,039,777	44,960,223
Insight Venture Partners Growth-Buyout Coinvestment Fund, LP	39,455,319	15,500,000
Insight Venture Partners IX, LP	65,518,214	38,500,000
Kelso Investment Associates IX, LP	51,047,890	60,925,052
Kelso Investment Associates VII	2,782,499	4,970,176
Kelso Investment Associates VIII	93,071,231	23,473,133
Khosla Ventures III, LP	36,492,145	1,250,000
Khosla Ventures IV, LP	72,030,897	1,650,000
Khosla Ventures V, LP	27,666,749	25,150,000
KKR 2006 Fund, LP	143,875,230	5,040,754
KKR Americas Fund XII, LP	-	200,000,000

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
KKR Asian	21,218,904	749,468
KKR Asian Fund II, LP	47,348,144	17,136,900
KKR China Growth Fund	44,334,597	-
KKR E2 Investors (Annex) Fund	458,043	-
KKR European Fund II	2,247,135	-
KKR European Fund III	74,982,379	22,854,187
KKR European Fund IV LP	43,820,707	80,956,703
KKR European Fund LP 1	-	-
KKR Millennium Fund	24,955,422	-
KKR North America Fund XI, LP	127,443,062	16,754,180
Lightspeed Venture Partners VI	1,662,125	-
Lightspeed Venture Partners VII, LP	17,807,841	510,436
Lion Capital Fund I (HME II)	89,465	10,847,759
Lion Capital Fund II	9,603,552	4,426,946
Lion Capital Fund III, LP	70,353,402	12,484,900
MatlinPatterson Global Opportunities Partners II	2,424,586	-
MatlinPatterson Global Opportunities Partners III	66,483,494	4,336,976
Menlo Ventures IX, LP	4,341,103	-
Menlo Ventures X, LP	45,777,272	-
Menlo Ventures XI, LP	78,013,630	1,000,000
MeriTech Capital Partners II, LP	2,685,706	1,850,000
Meritech Capital Partners III, LP	9,751,651	-
Meritech Capital Partners IV, LP	18,582,519	900,000
Meritech Capital Partners V, LP	9,067,895	10,050,000
Michigan Growth Capital Partners II, LP	153,757,806	24,890,568
Michigan Growth Capital Partners III, LP	6,517,720	93,316,304
Michigan Growth Capital Partners, LP	74,399,969	16,744,744
Midtown Fund III, LP	-	-
Midtown II Liquidating Trust	2,337,231	-
New Leaf Growth Fund I, LP	138,394,907	-
New Leaf Ventures II, LP	20,746,656	-
New Leaf Ventures III, LP	15,553,430	19,125,000
Nordic Capital VI, LP	13,635,123	-
Nordic Capital VII	56,668,954	2,780,779
Nordic Capital VIII, L.P. (Alpha)	31,452,676	17,804,773
Oak Investment Partners X, LP	6,888,444	-
Oak Investments Partners IX, LP	925,288	-
Oaktree Opportunities Fund X, LP	9,823,962	22,500,000
Oaktree Opportunities Fund Xb, LP	-	70,000,000
OCM Opportunities Fund IX, LP	70,900,837	-
OCM Opportunities Fund VII (B), LP	3,737,425	5,000,000
OCM Opportunities Fund VII, LP	5,156,429	-
OCM Opportunities Fund VIII B, LP	23,382,019	-
OCM Opportunities Fund VIII, LP	10,698,517	-
OCM Principal Opportunities Fund IV	18,325,817	5,002,377
Ocqueoc Holdings, LLC	15,195,607	50,000,000
One Liberty Fund III	1,143,941	-
One Liberty Fund IV	1,789,484	-

	Adjusted Reported Value	Unfunded Commitment
One Liberty Ventures 2000	5,904,200	-
Parthenon Investors II	1,613,415	3,186,779
Parthenon Investors III	41,948,311	2,767,182
Parthenon Investors IV, LP	41,588,638	9,509,112
Peninsula Capital Fund IV	6,397,025	2,201,026
Peninsula Fund VI, LP	18,003,421	23,470,000
Phoenix Equity Partners IV	2,928,837	747,413
Public Pension Capital, LLC	21,911,775	28,549,108
Questor Partners Fund II	228,674	5,816,186
Rhone Partners V, LP	20,845,454	82,563,672
Riverside Capital Appreciation Fund VI, LP	63,388,663	18,353,668
Riverside Micro Cap Fund I, LP	21,737,725	5,958,050
Riverside Micro-Cap Fund II, LP	41,116,282	392,544
Riverside Micro-Cap Fund III, LP	45,924,948	4,483,406
Riverside Micro-Cap Fund IV	12,866,718	34,966,320
Shamrock Growth Capital Fund IV, LP	1,812,719	46,869,093
Silver Lake Partners II	4,904,580	3,531,586
Silver Lake Partners III	67,531,977	13,344,284
Silver Lake Partners IV, LP	34,809,234	19,399,986
SM/TCP LP	32,263,208	14,918,007
SMRS - TOPE LLC	401,530,124	-
SMRS-NCRP LLC	1,108,129,566	152,837,842
TCW Shared Op Fund III	-	-
** TCW/Crescent Mezzanine Partners III Secondary	171,632	-
TCW/Crescent Mezzanine Partners III, LP	2,390,846	29,733,856
TCW/Crescent Mezzanine Partners IV, LP	3,641,449	13,660,773
** TCW/Crescent Mezzanine Partners IVB Secondary	1,243,229	-
TCW/Crescent Mezzanine Partners V, LLC	22,172,165	15,382,013
** TCW/Crescent Mezzanine Partners VC Secondary	3,997,369	-
The Huron Fund III, LP	14,451,962	4,542,756
The Huron Fund IV, LP	23,154,045	10,201,668
** The Huron Fund V, LP	-	35,000,000
The Shansby Group 4	652,614	520,829
The Shansby Group 5 (TSG5)	19,111,581	4,933,611
Thoma Bravo Fund XII, LP	52,765,768	94,801,808
TPG IV (Texas Pacific Group IV)	5,220,154	211,725
TPG Partners III, LP	2,901,794	2,087,002
TPG Partners VI, LP	160,294,870	19,421,157
TPG Partners, VII, LP	38,108,397	112,569,720
TPG V (Texas Pacific Group V)	102,002,547	26,611,195
Trilantic Capital Partners V (North America) Fund A, LP	32,806,918	16,228,098
TSG6, LP	125,938,031	32,826,811
TSG7 A LP	18,778,232	104,158,044
Turnbridge Capital Partners I , LP	33,449,941	58,751,502
Veritas Capital Fund V, LP	60,152,385	23,533,132
Veritas Capital Fund VI, LP	-	100,000,000
Veritas V Co-Investors, LP	10,638,454	15,000,000
Vista Equity Partners Fund V, LP	47,282,885	9,275,801

	Adjusted Reported Value	Unfunded Commitment
Vista Equity Partners Fund VI, LP	27,977,163	46,567,646
Vista Foundation Fund III, LP	2,620,021	22,200,312
Warburg Pincus China, LP	4,015,735	40,873,586
Warburg Pincus Energy MCIP, LP	14,577,486	10,518,032
Warburg Pincus Energy, LP	32,066,709	63,800,000
Warburg Pincus Equity Partners, LP	1,172,899	-
Warburg Pincus International Partners	8,520,809	-
Warburg Pincus Private Equity IX	23,744,222	-
Warburg Pincus Private Equity VIII, LP	10,347,496	-
Warburg Pincus Private Equity X, LP	147,433,309	-
Warburg Pincus Private Equity XI, LP	193,508,113	21,200,000
Warburg Pincus Private Equity XII Secondary, LP	5,561,298	19,025,000
Warburg Pincus Private Equity XII, LP	38,401,585	133,175,000
WestAm COREplus Private Equity LP	2,063,222	2,086,719
WestAm Special Private Equity Partners	4,015,455	2,317,427
Total Private Equity	\$ 9,401,847,214	\$ 5,917,488,673
Cash	282,180,024	-
Active Small Cap Cash	19,714,152	-
Active Small Cap	1,778,572	-
Income Accruals	1,628,248	-
Grand Total	\$ 9,707,148,210	\$ 5,917,488,673

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

** New Commitments made during quarter reported

State of Michigan Retirement Systems

BASKET CLAUSE REVIEW

Investment Advisory Committee Meeting

June 8, 2017



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

SMRS

Basket Clause Investments

3/31/17

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$4,060,597,845
Total Real Return and Opportunistic	934,662,992
Total International Equity	283,408,680
Total Long-Term Fixed Income	<u>60,169,834</u>
Total Basket Clause Investments	<u>\$5,338,839,351</u>

The basket clause investments at March 31, 2017, were \$5.3 billion or 8.3% of the total portfolio value of \$64.2 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.

