

INVESTMENT ADVISORY COMMITTEE MEETING

March 9, 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

MARCH 9, 2017

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 12/15/16 IAC Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 12/31/16
- 10:00 a.m. Current Asset Allocation Review
Markets Review and Outlook
- 10:15 a.m. Guest Speaker - - Greg Valliere ~ Horizon Investments
Review of Investment Reports – *Receive and File*
- Absolute and Real Return/Opportunistic
 - Domestic Equity
 - Fixed Income
 - International Equity
 - Private Equity
 - Real Estate & Infrastructure
- Basket Clause
- 11:00 a.m. Closing Remarks ~ Adjournment



2017 Meeting Schedule

Thursday, June 8, 2017
Thursday, September 7, 2017
Tuesday, December 12, 2017

All meetings start at 9:30 a.m.

www.michigan.gov/treasury

State of Michigan Retirement Systems

MINUTES

Investment Advisory Committee Meeting

March 9, 2017



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

INVESTMENT ADVISORY COMMITTEE

The Investment Advisory Committee (IAC) held its quarterly meeting on Thursday, December 15, 2016, 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 (via phone)
Allan R. Pohl, LARA
Kerrie Vanden Bosch, DTMB

In attendance from the Department of Treasury:

Treasurer Nick A. Khouri	Jon M. Braeutigam	Gregory J. Parker
Robert L. Brackenbury	Jim Elkins	Peter Woodford
Jack Behar	Brian Liikala	Richard Holcomb
Dan Quigley	Karen Stout	Woody Tyler
Kevin Fedewa	Tim Reynolds	Ann Storberg
Tom Smith	Lee Logan	Marge McPhee
Janet Sudac		

Others in attendance:

Max Kotary	Tim McEnery	Jamie Callahan
Molly Jason	Mark Guastella	Josh Lieberman
Paul Lerg	Joe Curtin	Jim Baker
JB Kiley	Henry McVey	

Call to Order

Mr. James B. Nicholson called the December 15, 2016, IAC meeting to order at 9:30 a.m.

Mr. Nick Khouri wished everyone happy holidays and expressed a sincere thank you for everyone's time, all the work the staff has done and all those who volunteer on the committee.

Approval of Minutes of September 1, 2016

- Mr. Nicholson asked for a motion to approve the minutes of the September 1, 2016, IAC meeting. Mr. Allan Pohl so moved, seconded by Ms. Kerrie Vanden Bosch, there were no objections – motion carried.

Executive Summary Tab – Performance Review

- Mr. Braeutigam discussed performance highlighting that over the past three, five, and seven years the annualized returns were higher than the 8% actuarial assumed rate of return. The SMRS has been a top performing public fund over these time periods.
- Mr. Braeutigam noted that the ten-year return included the impact of the global financial crises. The one-year performance is 7.6% for the fiscal year ending September 30, 2016.
- Mr. Braeutigam discussed returns, noting that the returns fell below the policy benchmark over the past year by -2.2%. He noted that it was a tough market for alpha strategies in the active domestic equity portfolio, private equity, and absolute return portfolios.
- Mr. Braeutigam noted that the markets have experienced a great bull run. Over the past ten years the BOI has netted over \$4 billion of added contribution over peer returns.

Asset Allocation & Performance Tabs

- Mr. Greg Parker explained that the combined system paid out approximately \$2.1 billion net of contributions over the past twelve months ending September 2016.
- Mr. Parker noted that the plans put to work approximately \$850 million in real return/opportunistic strategies, \$300 million in long-term fixed income, and reduced the allocation to domestic equity by \$1.9 billion, private equity by \$900 million, and hedge fund allocation by \$400 million.
- Mr. Parker discussed that just over \$2.4 billion is allocated to short term, which is equivalent to one year of benefit payments. The short-term asset class portfolio includes commercial paper with an approximate two-month maturity.
- Mr. Parker noted that the long-term fixed income portfolio is more Aggregate-like with higher yield to maturity, lower duration, higher credit exposure, lower volatility, and close to zero equity beta.
- Mr. Parker discussed the returns for absolute return, real return and opportunistic. Several questions were asked and addressed by Mr. Jim Elkins regarding equity beta and liquidity. The discussion included the return of the portfolio in one and two years, noting that hedge funds are the most liquid asset class within these strategies.
- Mr. Parker discussed the performance of domestic equities over the last year, which are positioned very similarly to the S&P 1500 benchmark. The profitability metrics for the portfolio, expected growth rates, measure of risk, and equity beta are very similar to the benchmark. The total portfolio trades at a 10% valuation discount to the benchmark which should converge over time.

Guest Speaker – Henry McVey of KKR

Mr. McVey gave a presentation regarding his views on the macro economy.

Basket Clause

In the spirit of time, this report was received and filed.

Special Mention

Chairman Nicholson noted that Mr. Richard Holcomb was retiring after 33 plus years with the State of Michigan. Mr. Parker presented him with a Resolution acknowledging his years of service, his dedication to his job, and the many contributions he provided for the improvement and growth of the Pension Plan for the Bureau of Investments.

Closing Remarks

Chairman Nicholson thanked everyone for attending.

Next Meeting Date and Adjournment

The next Investment Advisory Committee Meeting is scheduled for Thursday, March 9, 2017. The meeting was adjourned by Chairman Nicholson at 11:05 a.m.

Approved:

James B. Nicholson, Chairman

State of Michigan Retirement Systems

EXECUTIVE SUMMARY

Investment Advisory Committee Meeting

March 9, 2017



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

EXECUTIVE SUMMARY

December 2016

Performance

An overview.

MPSERS Plan (12/31/16)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	7.4%	7.1%	10.0%	9.4%	5.9%
Policy Return	10.0%	7.1%	10.6%	9.6%	6.0%
Peer Median Return	7.9%	5.3%	8.9%	8.4%	5.3%

- 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 \$62.2 billion of SMRS assets, significantly adds up over time. For example, the ten year annualized return of 5.9% compared to the 5.3% peer median return adds roughly \$6.1 billion of value to SMRS over a ten year period.
- The returns fell below the policy benchmark over the past year by -2.6%. It should be noted that the 2016 policy benchmark return of 10.0% was a very tough target to achieve. Had a plan actually achieved this return, it would have ranked in the top percentiles of returns in the State Street greater than \$10 billion peer universe.
- For the year, private equity lagged a very strong publicly traded stock market benchmark. It was a difficult environment for alpha strategies and selectivity in both domestic and international active equities as well as hedge funds, and a slightly more defensive than policy asset allocation were all causes of the underperformance vs. the policy return target.

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 December 2016 quarter, over \$407 million of new commitments were made.
- The combined systems paid out approximately \$2.0 billion net of contributions over the past twelve months ending in December 2016.
- In round numbers, over the past year, the allocation to short-term cash increased by approximately \$1 billion. Real return/opportunistic strategies had a \$400 million allocation increase, while both long-term fixed income and international equity were each increased by \$250 million each. The plans reduced the allocation to domestic equity by \$2.4 billion, private equity by \$800 million, absolute return by \$400 million and real estate by \$200 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.
- The broad U.S. stock market return for 2016 was 13.0%, which was entirely due to multiple expansion.
- The 10-year U.S. Treasury ended December 2016 at 2.4%, about 20 bps higher than one year prior and in line with the December rate hike.
- The price for crude oil was especially volatile in 2016. For the year, the price for crude oil increased from \$37.04 to \$53.72 per barrel from the beginning to end of 2016, and more than doubled from its February 2016 low.

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.
- At its December 2016 meeting, the Federal Reserve Board voted to raise its key interest rate for the second time in as many years, and just its second hike since 2006.
- The most recent reading of the annualized U.S. GDP growth was 1.9%, below the consensus estimate of 2.2%. Current estimates for 2017 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.
- The jobs market is very healthy. The national unemployment rate is 4.9% and the three-month average figures for initial jobless claims is at its lowest level since 1973. In December 2016, there were 5.6 million job openings in the U.S. according to the Labor Department, just below an all-time record. The Federal Reserve Bank of Atlanta tracks wage growth of individuals and the trend in wage growth is accelerating. Its three-month median wage growth hit 3.9% in November 2016, an eight year high.

Investment Update*Highlighting the quarter.*

(\$ Millions)

NEW COMMITMENTS**October 1 – December 31, 2016**

Asset Class	Fund Name / (Managed By)	Commitment
Private Equity		
	Veritas Capital Fund VI, L.P.	\$100
	GSO COF III Co-Investment Fund	50
	Warburg Pincus China, L.P.	45
Real Estate & Infrastructure		
	Principal Separate Account (Principal Real Estate Investors)	37
	Asana Partners Fund I, L.P. (Asana Partners Fund I GP, L.P.)	25
Real Return & Opportunistic		
	TSSP Adjacent Opportunities Partners, L.P. (TPG)	100
	TICP CLO Partners II, L.P. (TPG)	50
TOTAL		\$407

State of Michigan Retirement Systems

PERFORMANCE

Investment Advisory Committee Meeting

March 9, 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 December 31, 2016

	% of Portfolio 12/31/16	Ten Years ¹		Seven Years ¹		Five Years ¹		Three Years ¹		One Year		Current Quarter	
		Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
TOTAL PLAN	100.0	5.9	7	9.4	7	10.0	13	7.1	4	7.4	75	1.9	9
Median - Greater than \$10 Billion ²		5.3		8.4		8.9		5.3		7.9		1.0	
MPSERS Total Plan Policy		6.0		9.6		10.6		7.1		10.0		1.9	
DOMESTIC EQUITIES	25.8	7.0	40	12.5	50	14.7	31	8.2	36	11.5	48	4.8	20
Median ²		6.8		12.4		14.2		8.0		11.5		3.6	
S&P 1500 Index		7.2		13.0		14.8		8.9		13.0		4.3	
INTERNATIONAL EQUITIES	15.6	1.0	87	4.2	52	6.5	59	0.0	23	4.3	37	-1.1	35
Median ²		1.7		4.3		6.7		-0.8		3.8		-1.6	
International Blended Benchmark ³		0.0		3.0		5.3		-1.7		4.5		-1.3	
PRIVATE EQUITIES	15.4	11.4	6	14.7	6	13.7	11	12.5	17	9.1	33	4.0	14
Median ²		8.7		11.1		11.0		8.6		8.3		2.8	
Alternative Blended Benchmark ⁴		10.9		17.0		19.4		14.3		18.8		4.6	
BONDS	12.8	5.4	24	4.7	59	3.6	40	4.3	34	5.7	41	-1.7	44
Median ²		5.0		4.9		3.4		3.6		4.8		-1.9	
Barclays Aggregate		4.3		3.6		2.2		3.0		2.7		-3.0	
REAL ESTATE & INFRASTRUCTURE	10.6	5.2	30	10.8	45	11.9	32	13.2	16	10.3	30	1.8	26
Median ²		3.8		10.6		11.0		10.6		8.6		0.6	
NCREIF - Property Blended Index ⁵		5.6		10.3		9.5		9.6		6.6		1.4	
NCREIF Open Fund Index Net		4.8		12.3		11.2		11.0		7.8		1.9	
REAL RETURN AND OPPORTUNISTIC	8.6					9.8		12.2		6.1		2.5	
50% (CPI +500 bps) + 50% (8% actuarial rate)						7.2		7.1		7.6		1.6	
ABSOLUTE RETURN	6.6			4.4		5.2		2.2		-0.2		0.5	
HFRI FOF Cons 1 month lagged				2.6		3.2		1.8		0.6		1.2	
CASH EQUIVALENTS	4.6	0.8		0.4		0.5		0.5		0.7		0.2	
1 Month T-Bill		0.6		0.1		0.1		0.1		0.2		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 1/1/2010. S&P Developed BMI-EPAC 75 USD / 25 Local, 1/1/2010 to 9/30/10. MSCI ACWI Ex USA Gross 10/1/2010 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.

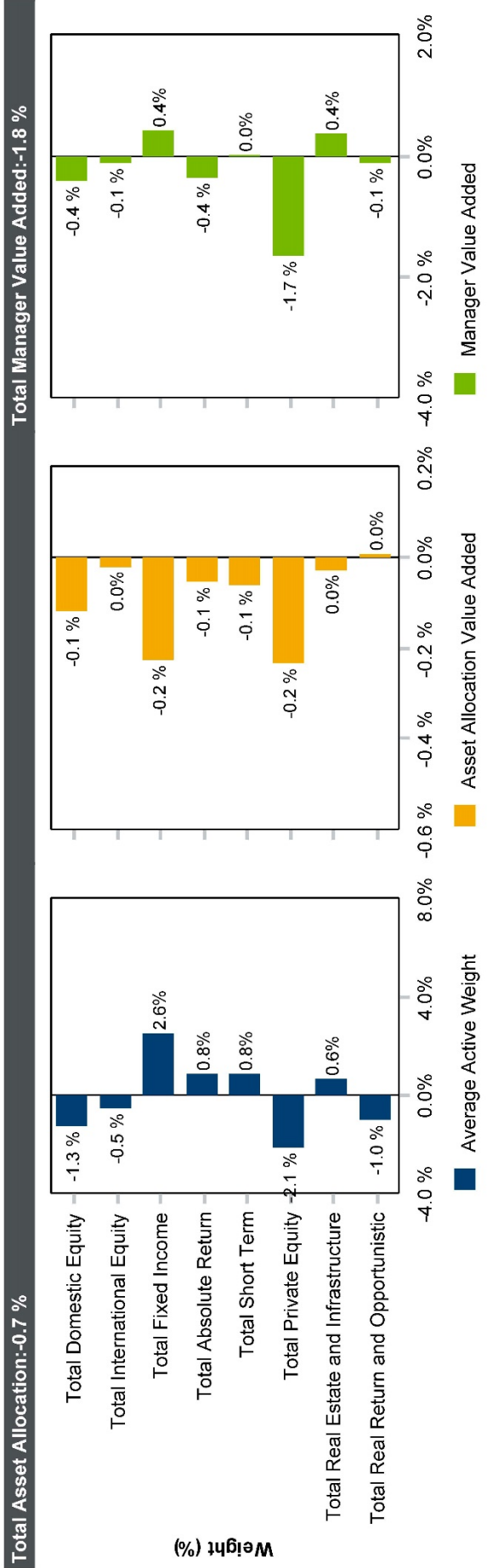
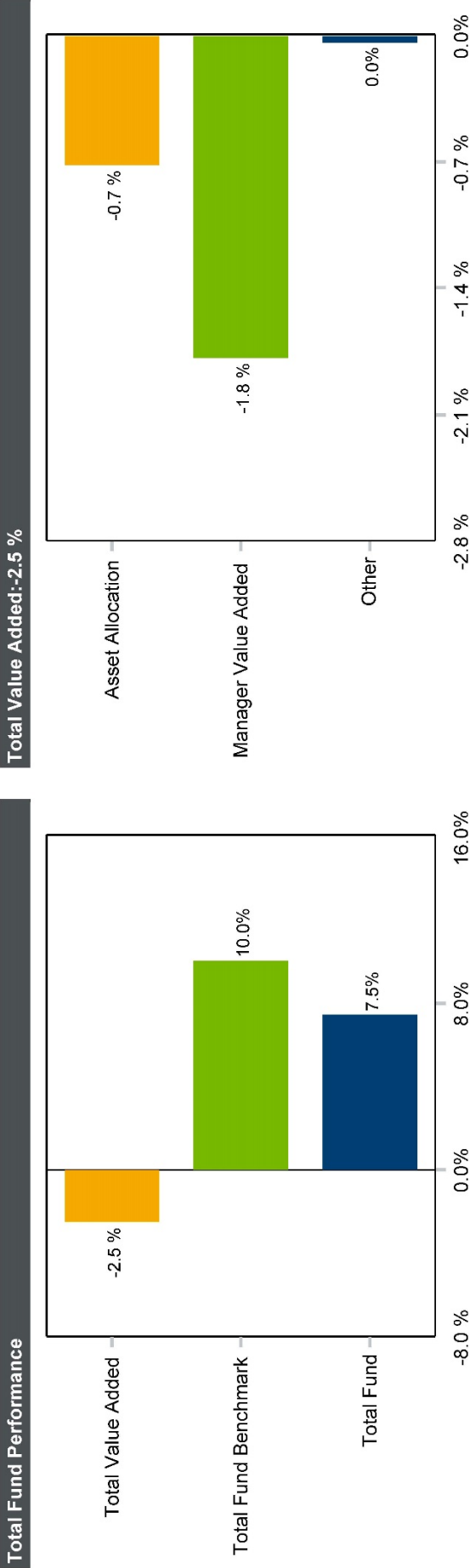
⁵ NCREIF - Property Blended Index is NPI minus 75 bps prior to October 2005, NPI minus 130 bps current.

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 December 31, 2016

Total Fund Attribution

Total Michigan vs. Total Fund Benchmark



Cumulative and Consecutive Total Fund Returns

MPSERS										
Cumulative For Years Ending 12/31/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	7.4	5.1	7.1	9.4	10.0	8.9	9.4	9.7	5.3	5.9
Public Plan - Median (> \$10 billion)*	7.9	4.2	5.3	7.8	8.9	7.6	8.4	9.2	4.8	5.3
Rank	75	13	4	10	13	7	7	22	23	7
bp Difference - Median	-44	92	183	160	109	130	103	56	53	60
Consecutive For Years Ending										
	12/16	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07
MPSERS	7.4	2.8	11.3	16.4	12.6	3.3	12.7	12.1	-24.2	11.1
Public Plan - Median (> \$10 billion)*	7.9	0.5	7.1	15.8	13.3	1.3	12.7	17.5	-25.2	9.5
Rank	75	3	4	39	70	9	54	83	41	18
bp Difference - Median	-44	234	426	57	-71	206	-5	-543	98	161

MSERS										
Cumulative For Years Ending 12/31/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	7.5	5.1	7.1	9.4	10.0	8.8	9.4	9.7	5.2	5.8
Public Plan - Median (> \$1 billion)*	7.9	4.1	5.2	7.8	8.8	7.6	8.4	9.3	4.9	5.4
Rank	66	15	3	8	14	8	9	28	28	15
bp Difference - Median	-40	97	194	157	119	127	91	37	33	40
Consecutive For Years Ending										
	12/16	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07
MSERS	7.5	2.8	11.3	16.3	12.6	3.2	12.5	11.9	-24.4	11.0
Public Plan - Median (> \$1 billion)*	7.9	0.3	6.9	15.4	13.2	1.2	13.1	18.5	-25.6	9.4
Rank	66	2	3	40	68	16	67	86	34	13
bp Difference - Median	-40	245	444	83	-57	193	-57	-663	118	159

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS										
Cumulative For Years Ending 12/31/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	7.5	5.1	7.1	9.3	9.9	8.8	9.4	9.6	5.2	5.8
Public Plan - Median (> \$1 billion)*	7.9	4.1	5.2	7.8	8.8	7.6	8.4	9.3	4.9	5.4
Rank	67	15	4	8	16	8	8	29	28	14
bp Difference - Median	-43	95	192	153	114	126	91	32	32	42
Consecutive For Years Ending										
	12/16	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07
MSPRS	7.5	2.8	11.3	16.2	12.5	3.3	12.6	11.5	-24.2	11.2
Public Plan - Median (> \$1 billion)*	7.9	0.3	6.9	15.4	13.2	1.2	13.1	18.5	-25.6	9.4
Rank	67	3	3	40	72	13	67	89	31	12
bp Difference - Median	-43	244	440	75	-64	208	-50	-701	140	180

MJRS										
Cumulative For Years Ending 12/31/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	7.4	5.1	7.0	9.1	9.8	8.6	9.1	9.2	5.0	5.6
Public Plan - Median (> \$1 billion)*	7.9	4.1	5.2	7.8	8.8	7.6	8.4	9.3	4.9	5.4
Rank	68	16	4	14	19	16	18	53	43	26
bp Difference - Median	-44	95	184	134	98	108	70	-6	14	24
Consecutive For Years Ending										
	12/16	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07
MJRS	7.4	2.8	11.0	15.6	12.5	3.1	12.2	9.9	-23.3	11.0
Public Plan - Median (> \$1 billion)*	7.9	0.3	6.9	15.4	13.2	1.2	13.1	18.5	-25.6	9.4
Rank	68	3	3	49	72	16	73	90	24	13
bp Difference - Median	-44	244	417	18	-68	182	-87	-862	235	160

*State Street Public Funds Universe

State of Michigan Retirement Systems

ASSET ALLOCATION REVIEW

Investment Advisory Committee Meeting

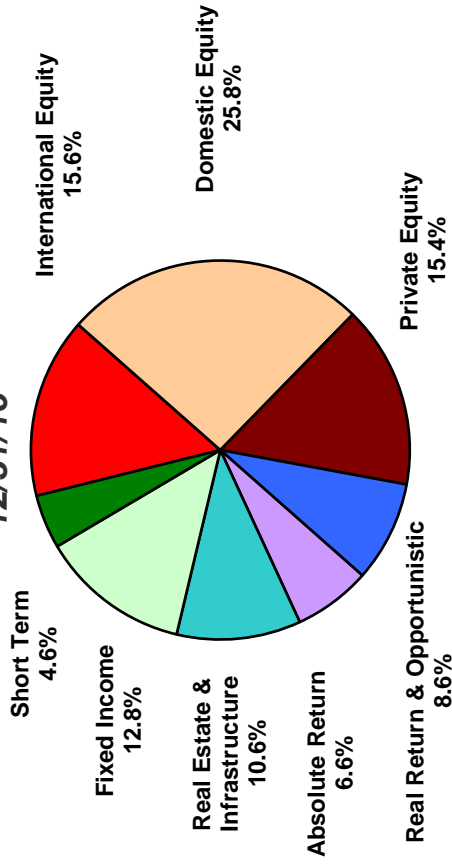
March 9, 2017



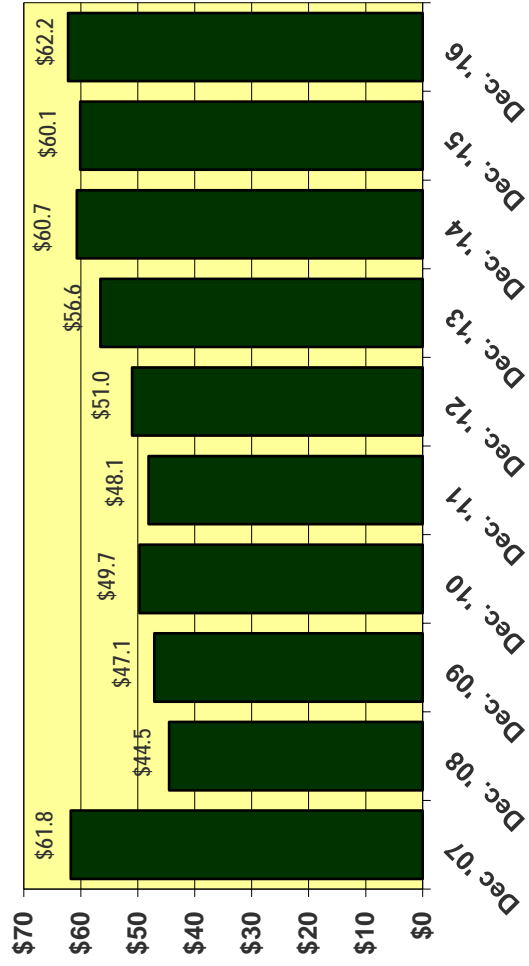
Jon M. Braeutigam
Chief Investment Officer
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STATE OF MICHIGAN RETIREMENT SYSTEMS PROFILE - DECEMBER 2016

Asset Allocation 12/31/16



Market Value* (Billions of Dollars)



Asset Allocation By Market Value (In Millions)

Investment Strategies	12/31/16	9/30/16
Domestic Equity	\$16,059	\$15,842
International Equity	9,687	9,802
Private Equity	9,563	9,457
Fixed Income	7,971	8,112
Real Estate & Infra.	6,562	6,564
Real Return & Opport.	5,366	5,397
Absolute Return	4,077	3,978
Short Term***	2,955	2,459
TOTAL	\$62,240	\$61,611

Short Term Equivalents (in Billions)

Short Term Strategy***	\$3.0
Short Term in Other Inv. Strategies	0.6
TOTAL SHORT TERM	\$3.6

5.8% of Total Funds

Market Value By Plan ~ 12/31/16

	(in Millions)		
	Pension Plan Mkt. Value	OPEB** Mkt. Value	Combined Mkt. Value
MPSERS	\$43,481	\$4,439	\$47,920
MSERS - (closed)	10,997	1,662	12,659
MSPRS	1,285	121	1,406
MJRS - (closed)	254	1	255
TOTAL	\$56,017	\$6,223	\$62,240



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

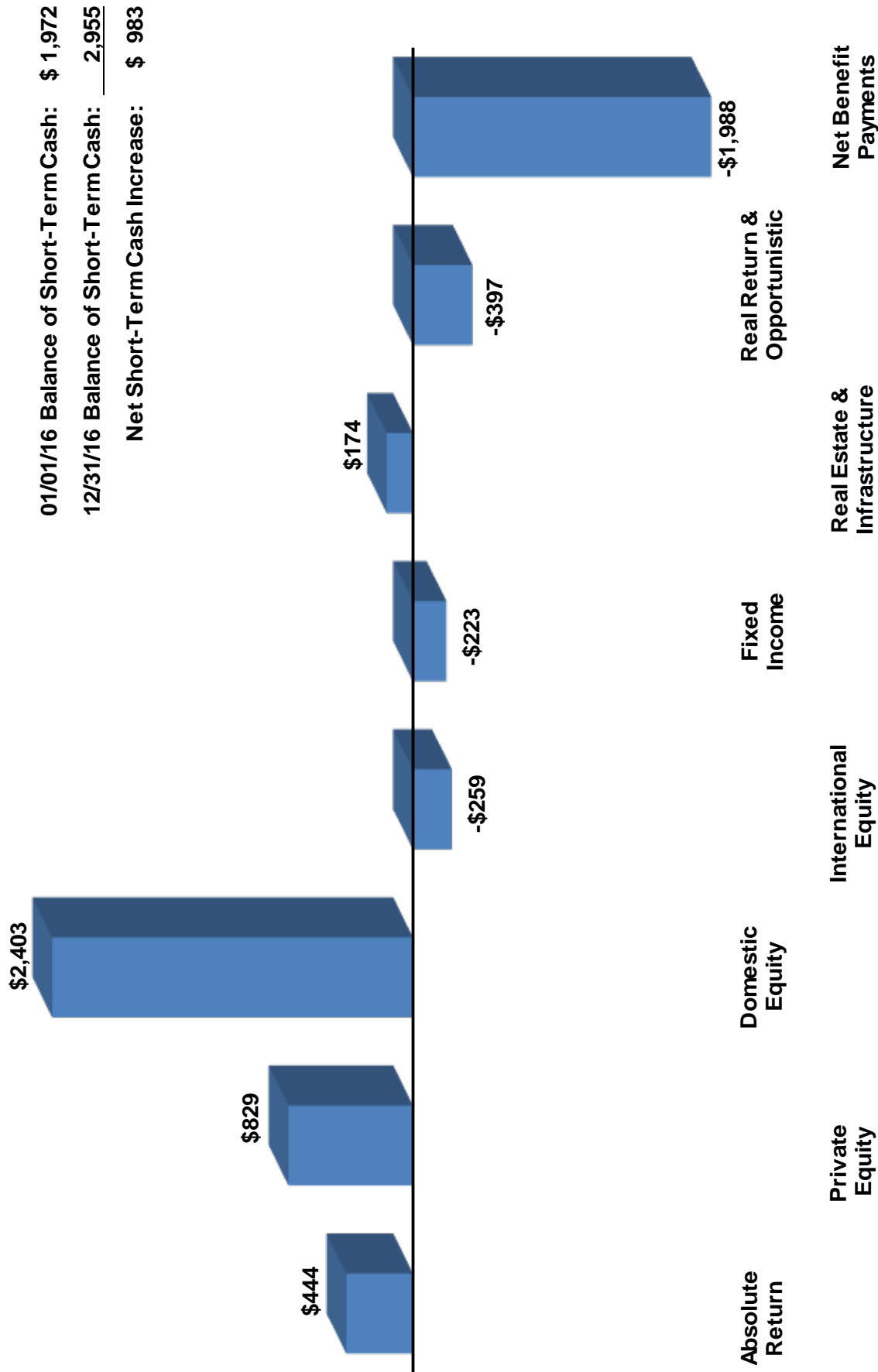
Asset Allocation Targets As of 12/31/16

Asset Class	MPERS			MSERS			MSPRS			MJRS			SMRS
	Actual 12/31/16	Target 9/30/17	Target* 9/30/18	Actual 12/31/16	Target 9/30/17	Target* 9/30/18	Actual 12/31/16	Target 9/30/17	Target* 9/30/18	Actual 12/31/16	Target 9/30/17	Target* 9/30/18	Ranges
Broad U.S. Equity	25.8%	27.0%	28.0%	25.9%	27.0%	28.0%	25.8%	27.0%	28.0%	26.0%	27.0%	28.0%	20% - 50%
Private Equity	15.4%	16.5%	18.0%	15.4%	16.5%	18.0%	15.4%	16.5%	18.0%	15.5%	16.5%	18.0%	10% - 25%
Broad Int'l Equity	15.6%	16.0%	16.0%	15.6%	16.0%	16.0%	15.6%	16.0%	16.0%	15.7%	16.0%	16.0%	10% - 20%
U.S. Fixed Income Core	12.8%	12.0%	10.5%	12.8%	12.0%	10.5%	12.8%	12.0%	10.5%	12.9%	12.0%	10.5%	8% - 25%
Real Estate / Infrastructure	10.6%	10.5%	10.0%	10.6%	10.5%	10.0%	10.6%	10.5%	10.0%	10.6%	10.5%	10.0%	0% - 15%
Real Return / Opportunistic	8.6%	9.0%	9.5%	8.6%	9.0%	9.5%	8.6%	9.0%	9.5%	8.7%	9.0%	9.5%	0% - 15%
Absolute Return	6.6%	6.0%	6.0%	6.6%	6.0%	6.0%	6.6%	6.0%	6.0%	6.6%	6.0%	6.0%	0% - 12%
Cash	4.6%	3.0%	2.0%	4.5%	3.0%	2.0%	4.6%	3.0%	2.0%	4.0%	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

January 2016 ~ December 2016



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

March 9, 2017



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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	11.0%	24.0%	10.2%	Hold
International Equity	9.4%	20.0%	1.0%	Hold
Domestic Equity	7.9%	17.0%	7.2%	Hold
Real Estate (Core)	6.1%	12.5%	5.6%	Trim
Absolute Return	5.7%	9.0%	1.3%	Trim
Real Ret/Opportunistic	8.8%	12.1%	7.4%	Add
Long-Term Fixed	3.1%	4.0%	4.3%	Hold
Short-Term	2.5%	1.0%	0.6%	Hold

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

** Investment Policy Statement; Annualized Returns

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

Overview

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.
- The broad U.S. stock market return for 2016 was 13.0%, which was entirely due to multiple expansion. Year over year earnings growth of U.S. equities has actually averaged close to 0% over the past few years.
- International equities continue to underperform domestic. Currency has played a major role with the underperformance of international equities compared to U.S. equities. Approximately one-quarter of the underperformance over the past one and ten years, and roughly half- to two-thirds of the underperformance over the past three, five, and seven years was due to the strengthening dollar.
- The 10-year U.S. Treasury ended December 2016 at 2.4%, about 20 bps higher than one year prior and in line with the December rate hike. The curve is a little bit steeper than average, potentially an indicator of continued economic growth.
- The publicly traded FTSE NAREIT REITs Index was up 8.8% over the past year ending December 2016. However the index lost nearly 9.6% on a price basis since July 2016 as the market came to the realization that interest rates were on the rise.
- The price for crude oil was especially volatile in 2016. For the year, the price for crude oil increased from \$37.04 to \$53.72 per barrel from the beginning to end of 2016, and more than doubled from its February 2016 low.

Domestic Equity

Value beating growth style.

- The broad U.S. stock market return for 2016 was 13.0%, which was entirely due to multiple expansion. Year-over-year earnings growth of U.S. equities has actually averaged close to 0% over the past few years.
- Nearly half of the 2016 returns were earned after the U.S. presidential election, despite the fact that many market prognosticators predicted a severe market correction should Trump be elected. Though there may be many reasons, many attribute President Trump's proposed economic agenda that includes tax reforms and increased government spending as the reasons why the stock market accelerated into year's end.
- 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 December 2016, small cap stocks significantly out-returned large cap stocks by 9.4%. Over the past five and ten years, only tenths of an annual percentage point separate large and small-cap stocks. Because of 2016 returns, small-cap stocks look expensive both relative to large caps and in absolute terms.
- Over the past year, value style beat growth by 10.6%, 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 December 2016, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -8.2%, -10.9%, -9.3%, -9.8%, and -6.2% annualized respectively.
- Currency has played a major role with the underperformance of international equities compared to U.S. equities. Approximately one-quarter of the underperformance over the past one and ten years, and roughly half- to two-thirds of the underperformance over the past three, five, and seven years was due to the strengthening dollar.
- Within international equities, in a slight reversal of trend, emerging markets outperformed developed markets over the past year by 8.2%. Over the past three, five, and seven years developed has outperformed emerging by 1.0%, 4.5%, and 3.1% on an annualized basis, though underperforming emerging the past ten years by -1.0%.
- International equity small-cap stocks slightly underperformed the broader MSCI ACWI ex USA index last year by -0.6%. However, the returns for international small caps were 2.6%, 2.6%, 2.8% and 1.9% higher over the past three, five, seven, and ten years respectively on an annualized basis.
- The plan is underweight international equity against a global benchmark (approximately 38% versus 48%) though close to the weight of peers; 15.6% versus 17.8%.
- 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 more than a 30% discount.

Interest Rates

Rising rates.

- At its December 2016 meeting, the Federal Reserve Board voted to raise its key interest rate for the second time in as many years, and just its second hike since 2006.
- The 10-year U.S. Treasury ended December 2016 at 2.4%, about 20 bps higher than one year prior and in line with the December rate hike. The curve is a little bit steeper than average, potentially an indicator of continued economic growth.
- By January 2017, spreads in high yield bonds contracted nearly 350 bps since one year prior. By historical standards, they are fairly tight and they now are at levels not seen since August 2014. The plan continues to sell into market strength, and high yield bonds now constitute roughly only 7.5% of the total fixed income portfolio.
- Spreads on investment-grade fixed income securities are at historical averages, having rallied by 65 bps since a year ago. The demand for high-grade corporate debt remains strong especially at longer maturities as corporate pension plans continue to de-risk their investment portfolios.
- Inflation expectations are finally being priced higher in the bond markets. The ten-year breakeven rates at the end of December 2016 were priced just below 2.0%, and right at the long-term inflation target of the Federal Reserve. This is also 80 bps higher than the low point of 2016.
- The Barclays Aggregate Index's sensitivity to changes in interest rates has slightly decreased since last year as measured by the modified adjusted duration. At the end of December 2016, the Index had a duration of 5.9 compared to 6.0 a year ago.

Real Estate

Rich valuations.

- The publicly traded FTSE NAREIT REITs Index was up 8.8% over the past year ending December 2016. However the index lost nearly 9.6% on a price basis since July 2016 as the market came to the realization that interest rates were on the rise. It had been noted before how the movement in the REITs Index and the interest rates were closely related.
- 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

A cyclical rebound.

- Commodities broadly made a cyclical bounce in 2016. The Thomson Reuters CRB Commodity Index increased more than 24% from the February 2016 lows, and more than 9% for the year. However, the longer term trend in commodity prices remains to the downside.
- The price for crude oil was especially volatile in 2016. For the year, the price for crude oil increased from \$37.04 to \$53.72 per barrel from the beginning to end of 2016, and more than doubled from its February 2016 low.
- Since its 2008 all-time low, the U.S. dollar has increased in value by more than 40%. 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 2015 through mid-November 2016, the value of the U.S. dollar was stable. However, by late December 2016, the U.S. dollar hit its highest value since 2002.

ECONOMIC OUTLOOK

Select Historic Economic Growth with Forecasts

An eye to 2017.

Real GDP % Growth Actual/Forecasts	2014	2015	2016	2017	2018
World	3.4	3.2	3.1	3.2	3.4
U.S.	2.4	2.6	1.6	2.3	2.3
Developed (G8)	1.8	1.9	1.4	1.8	1.8
Asia	4.9	5.0	4.5	4.7	4.7
EMEA	2.2	1.2	1.3	2.2	2.6
Europe	1.2	2.0	1.6	1.5	1.5
Latin America	0.8	-0.3	-2.0	1.5	2.6
China	7.3	6.9	6.7	6.5	6.2

*Source: Bloomberg

Economic Overview

U. S. economy continues to expand.

- The most recent reading of the annualized U.S. GDP growth was 1.9%, below the consensus estimate of 2.2%. Current estimates for 2017 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.
- 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 last expansion ending in 2008 was also the longest and lasted another seventeen years. There are however signs of the cycle being in the later innings.
- The jobs market is very healthy. The national unemployment rate is 4.9% and the three-month average figures for initial jobless claims is at its lowest level since 1973. In December 2016, there were 5.6 million job openings in the U.S. according to the Labor Department, just below an all-time record. The Federal Reserve Bank of Atlanta tracks wage growth of individuals and the trend in wage growth is accelerating. Its three-month median wage growth hit 3.9% in November 2016, an eight year high.
- 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 houses sold in the U.S. is \$308,500, up nearly 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.

Annual Total Returns of Key Asset Classes 1997 - 2016

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

		Annualized Returns 1997 - 2016			
Return		Int'l	Gov't	Corp.	U.S. Eq.
Risk		Hedge	Gov't	Corp.	R.E.
		2.14%	4.93%	5.93%	9.78%
		1.27%	4.09%	5.07%	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

March 9, 2017



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

EXECUTIVE SUMMARY

Absolute Return

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Absolute Return	-0.2%	2.2%	5.2%	4.4%	N/A
HFRI FOF Conservative*	0.6%	1.8%	3.2%	2.6%	N/A

*One month lag on the index

- Total Absolute Return value was \$4.1 billion with a total one-year return of -0.2% and a total seven year annualized net return of 4.4%. The underperformance for the year was primarily due to an overweight in the equity long-short space which experienced the most challenged alpha environment in observed history.

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. Given recent shifts in the broader macroeconomic landscape, we will continue to pursue opportunities across diversifying strategies 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 second largest overall contributor to performance, marginally lagging credit, with most managers performing consistently over the three-month period. Positive performance was driven primarily by managers with exposure to select energy, financial, and technology names.
- Credit – Performance for credit managers was positive for the quarter, as the strategy closed out the period as the largest contributor to performance. Residential mortgage and distressed credit managers contributed more positively to performance than their fundamental credit and trading-oriented counterparts. RMBS-focused managers had a strong quarter, as robust collateral performance and upbeat market sentiment led to credit spread tightening across products.
- Equity – Performance for equity managers over the course of the quarter was mixed, with the overall strategy detracting from performance. Overall, trading managers fared better than fundamental managers. Looking at specific sectors, managers with net long exposure to select financials, technology, and healthcare names exhibited positive performance. Offsetting losses, particularly early on in the quarter, were observed in managers with select exposure to consumer-discretionary and materials, both on the long and short side.
- Diversifying – Performance for diversifying strategies was positive for the quarter, primarily driven by global macro managers who delivered consistent, strong returns throughout the period.

Real Return and Opportunistic

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Real Return and Opport.	6.1%	12.2%	9.8%	N/A	N/A
Custom Benchmark	7.6%	7.1%	7.2%	N/A	N/A

- Total Real Return and Opportunistic value was \$5.3 billion with a total one-year return of 6.1%.

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 \$2.9 billion of unfunded commitments. New commitments closed during the quarter include:
 - \$100 million to TSSP Adjacent Opportunities Partners, L.P., a fund focused on opportunistic, special situations, and middle market direct lending.
 - \$50 million to TICP CLO Partners II, L.P., a fund focused on CLO risk retention.

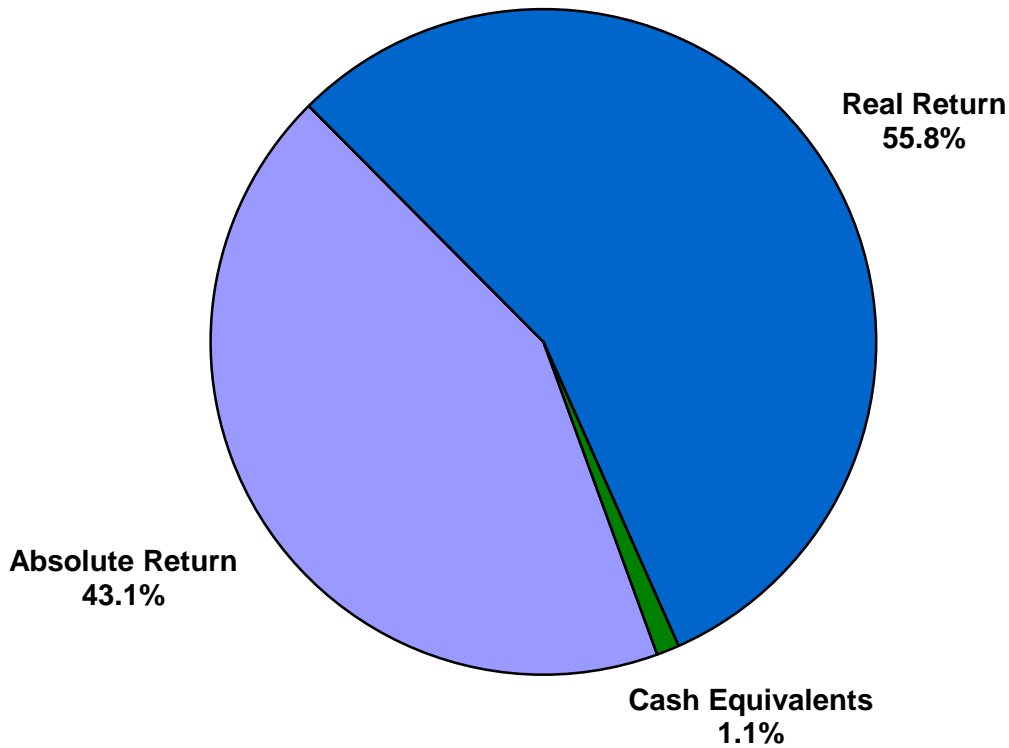
Market Environment

- 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 – Earlier in the year, volatility within the financial markets created uncertainty and forced firms who could typically access the public debt markets to seek out private solutions. After the election, the pipeline for new loans has slowed as many companies are now waiting to see the potential tax changes on the horizon.
- Energy Funds – For the quarter, spot WTI crude prices were up 11.4% with long-dated contracts relatively flat as the OPEC production cuts announced in November led market participants to bid up near-term contracts. Spot natural gas prices were up 29.7% for the quarter as natural gas production in the U.S. posted its first annual decline since 2015, while long-dated contracts were down 2 to 6% for the quarter as the market anticipates production to resume growth in the long-term. 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 43% 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 18 months.

SMRS

Absolute, Real Return and Opportunistic

12/31/16



Market Value in Millions				
	<u>12/31/16</u>		<u>9/30/16</u>	
Absolute Return	\$4,067	43.1%	\$3,967	42.3%
Real Return	5,271	55.8%	5,320	56.7%
Cash Equivalents	105	1.1%	88	1.0%
Total Investments	<u>\$9,443</u>	<u>100.0%</u>	<u>\$9,375</u>	<u>100.0%</u>

SMRS
Absolute Return
12/31/16

Net Market Values by Entity

	<u>Net Market Value</u>
Apollo Offshore Credit Strategies Fund Ltd.	155,509,540
Drawbridge Opportunities Fund	202,546,208
* EnTrust White Pine Partners L.P.	139,794,445
JM IV, LP	49,161,957
MP Securitized Credit Master Fund, L.P.	67,385,162
Spartan Partner LP	170,254
* Tahquamenon Fund L.P.	3,447,862,476
Visium Balanced Fund LP	4,308,453
Total Market Value	\$ 4,066,738,494

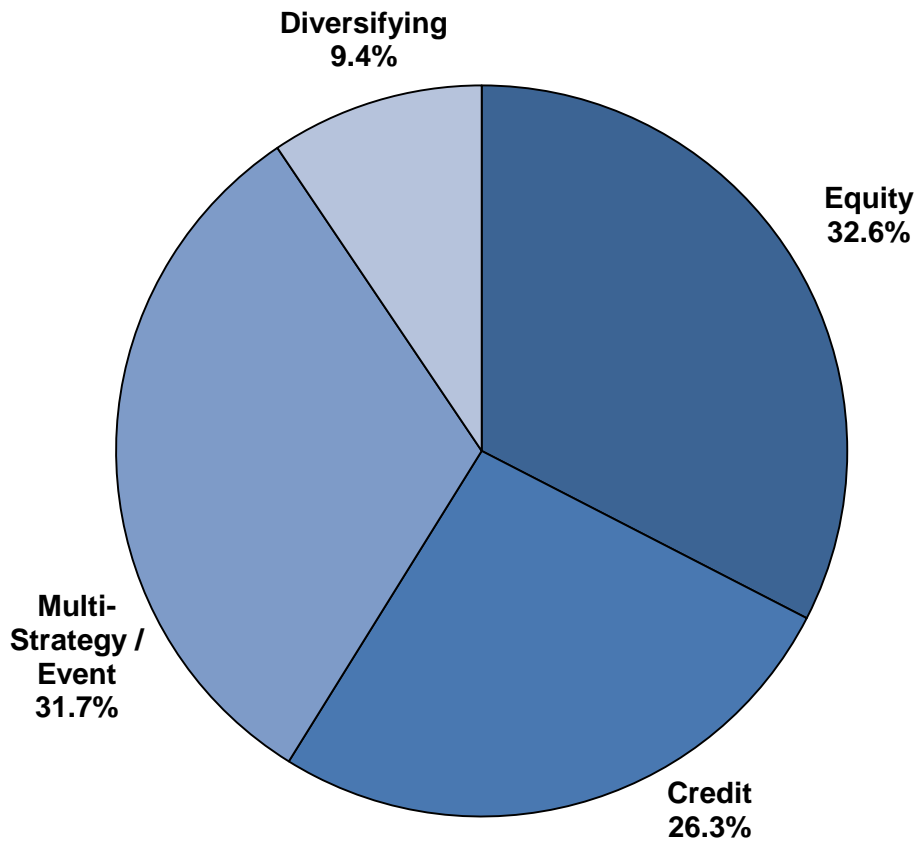
* Fund of Funds

SMRS

Absolute Return

12/31/16

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	86	Median Position Size:	0.4%
Strategies:	4	Average Position Size:	1.1%
Relationships:	8	Largest Position Size:	10.6%

SMRS

Real Return and Opportunistic

12/31/16

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy Fund I, LLC	\$ 204,742,725	\$ 22,244,406
Apollo Credit Opportunities Fund III LP	66,843,595	19,385,383
Apollo European Principal Finance Fund II	52,239,058	10,205,781
Apollo Financial Credit Investments Fund II	382,801,812	103,932,814
Apollo Financial Credit Investments Fund III	-	300,000,000
Apollo HK TMS Investments Holdings LP	19,006,225	-
Apollo Offshore Credit Fund Ltd	258,013,760	-
Apollo Offshore Structured Credit Recovery Fund II	4,956,894	-
Apollo Offshore Structured Credit Recovery Fund III	136,567,931	87,397,774
Blackstone Strategic Capital Holdings LP	25,897,581	99,563,308
Blue Peninsula Fund LP	80,000,961	115,627,889
Carlyle Intl Energy Partners LP	13,258,439	43,188,974
Carlyle Energy Mezzanine Opportunity Fund	3,911,717	44,840,799
Centerbridge SCP III, LP	5,534,009	22,500,000
* Content Holdings LLC	480,066,366	50,656,767
Elegantree Fund SPC	71,475,621	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	73,434,664	14,798,035
FCO MA MI LP	62,185,701	137,145,625
Fortress MSR Opportunities Fund I A LP	101,207,681	-
Fortress Transport	50,233,076	-
* Galaxie Ave. Partners, LLC	-	-
GSO Credit Alpha Fund LP	65,219,900	40,021,313
Highbridge Principal Strategies - Specialty Loan Fund III	105,021,278	22,543,037
Hopen Life Sciences Fund II	4,008,720	2,575,000
HPS Red Cedar Fund	29,963,981	222,765,296
Innocor	30,000,000	-
JP Morgan Global Maritime Investment Fund LP	62,687,875	12,145,157
KANG Fund LP	13,579,121	-
Kayne Anderson Energy Fund VII, LP	44,838,349	39,000,000
Kayne P.E. Income Fund	18,524,421	129,000,000
KKR EI&G Fund	26,918,591	33,187,405
KKR Lending Partners I LP	59,025,089	11,930,723
KKR Lending Partners II LP	64,687,219	36,508,261
Lakewater LLC, Series 1	142,007,354	3,475,593
Lakewater LLC, Series 2	260,544,019	13,224,217
Lakewater LLC, Series 3	319,130,674	-
Lakewater LLC, Series 4	67,141,534	12,151,364
Lakewater LLC, Series 5	75,513,695	167,371,513
Merit Energy Partners LP	25,774,734	9,201,857
MidCap FinCo Holdings LTD	304,167,263	-
Napier Park Aircraft Leasing Vehicle I, LLC	42,739,424	59,260,326
New Fortress Energy HLDGS	300,000,000	-
Orion Coinvest III LP	25,243,776	2,236,552

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Orion Mine Finance Fund 1A LP	56,352,938	4,310,238
Orion Mine Finance Fund I LP	115,340,558	7,376,052
Orion Mine Finance II LP	18,968,889	31,587,256
Redding Ridge Holdings, LP	5,962,674	94,037,326
Renaissance Venture Cap Fund II LP	9,196,736	15,500,000
REOG Fund II Coinvest LP	19,794,227	9,475,056
Ridgewood Energy Oil & Gas II	94,551,308	30,101,889
Ridgewood Energy Oil & Gas III	17,368,186	205,103,902
RPEP Energy Opp Inst Partner	-	33,663,741
RPEP SMRS Holdings, LLC	64,993,789	1,876,850
SJC Direct Lending Fund I, LP	36,933,412	15,867,189
SJC Direct Lending Fund II, LP	227,923,925	38,261,315
SJC Direct Lending Fund III, LP	63,968,455	186,293,387
Square Inc.	19,391,401	-
* Social Network Holdings, LLC	150,603,079	25,028,376
Specialty Equity Strategy LP	1,792,024	17,897,000
Sprott PRL (M), LP	13,370,533	11,240,796
Sprott Private Resource Lending Fund (US), LP	5,159,498	94,840,502
Terra Co-Investment LLC	23,555,163	14,000,000
** TICP CLO Partners II, LP	9,498,538	40,277,732
** TSSP Adjacent Opp Partners, LP	21,451,135	77,364,033
Twitter Inc.	14,074,512	-
Varo Coinvestment LP	13,389,097	929,066
Warwick Energy Partners III	34,181,181	22,774,349
Warwick (SMRS) Co-Invest, L.P.	13,924,995	12,089,081
Income Accruals	(2)	
Total Market Value	\$ 5,270,802,215	\$ 2,903,091,453

* Fund of Funds

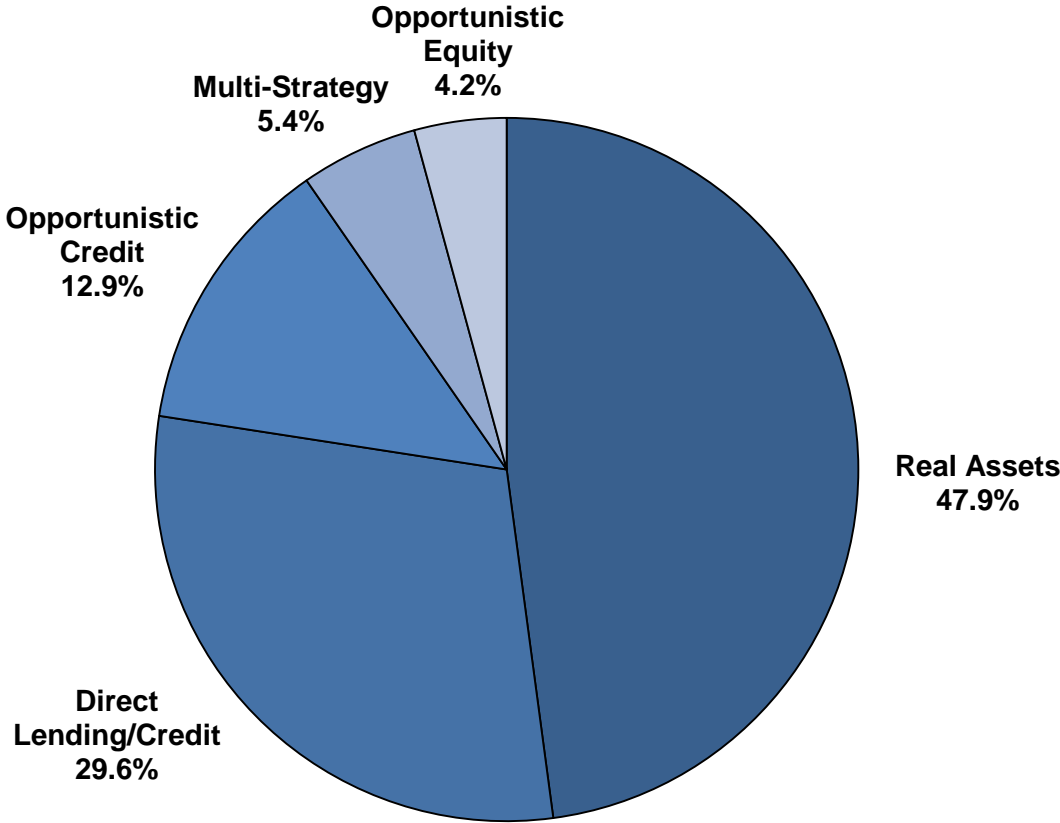
** **New Commitment**

SMRS

Real Return and Opportunistic

12/31/16

Investments By Strategy



Investment Strategy	
Real Assets	\$2,523,802,907
Direct Lending/Credit	\$1,557,924,760
Opportunistic Credit	\$681,158,835
Multi-Strategy	\$284,743,686
Opportunistic Equity	\$223,172,029

State of Michigan Retirement Systems

DOMESTIC EQUITY REVIEW

Investment Advisory Committee Meeting

March 9, 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	11.5%	8.2%	14.7%	12.5%	7.0%
S&P 1500	13.0%	8.9%	14.8%	13.0%	7.2%
Peer Median Return	11.5%	8.0%	14.2%	12.4%	6.8%
Rank vs. Peers	48	36	31	50	40

Total Domestic Equity, Net	1-Year	3-Years	5-Years	7-Years
Annualized Returns	11.5%	8.1%	14.5%	12.3%
S&P 1500	13.0%	8.9%	14.8%	13.0%
Lipper Multi Core	11.0%	6.2%	13.1%	11.4%
Rank vs. Lipper Multi Core	46	22	26	35

Total Active Equity, Net	1-Year	3-Years	5-Years	7-Years
Annualized Returns	10.2%	7.4%	14.1%	11.8%
S&P 1500	13.0%	8.9%	14.8%	13.0%
Lipper Multi Core	11.0%	6.2%	13.1%	11.4%
Rank vs. Lipper Multi Core	56	35	35	45

- Despite performance in the top half to top third of its peer group in all time periods, Total Domestic Equity (active & passive management combined) trailed the S&P 1500.
 - Over the past one and three years Total Domestic Equity's relative performance was likely 25 basis points (bps) better than detailed above. During that time SMRS paid 6 bps per year in domestic equity management fees, while its peer group was measured at 30 bps three years ago.
- The SMRS active management (Total Active Equity) group performed near the top third of its peers over three and five years, but such performance was not enough to outperform the S&P 1500. One year performance was more challenging, as the division was hurt in part by its underweight to commodity sectors as well as by its exposure to the health care sector.
 - Patience is required in order 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.
 - Managers that are successful over the long term have five year performance numbers below the benchmark approximately 40% of the time.
 - Two-thirds of successful managers experience three consecutive years of underperformance along the way to long-term outperformance.

Strategy Update

- The division continues to emphasize allocating funds to managers with lower portfolio turnover as a means by which to further reduce costs at the division level.
 - Available research indicates that for every 100% of portfolio turnover, it costs SMRS 20 bps for large-cap stocks, 50 bps for mid-cap stocks, and 80 bps for small-cap stocks.
 - Not only are buy and hold strategies more cost effective, but they tend to have outperformed more actively managed approaches within our portfolio in recent years, sometimes by a wide margin.
 - By reducing portfolio turnover costs, minimizing fees paid and negating the impact of cash drag, the division aims to leverage the strengths of passive management.
 - This, combined with a value-oriented approach, which has been demonstrated to outperform the indices over the long run, positions the division to beat the benchmark with a significantly higher probability of success than is the case for most active managers.
- Total Active Equity's portfolio trades at roughly a 15% discount to the S&P 1500 on the basis of normalized earnings, with similar volatility and rates of growth going forward.
 - Eight of the division's top ten holdings trade at forward PE ratios of 15x or less, versus the market at 19x normalized earnings. All are high-quality companies with significant competitive advantages.
 - The division remains overweight to both the financial sector and to defensive stocks and underweighted to commodity-related companies.
 - We expect Total Active Equity's PE ratio to at least partially converge with that of the S&P 1500 over the next five years, driving annualized outperformance.
 - If PE ratios do not converge, we expect long-term outperformance on the basis of a higher net dividend yield (dividends + buybacks) than the benchmark alongside similar or faster rates of earnings reinvestment.

Market Environment and Outlook

- At ~19x normalized earnings, equity markets are on the rich side relative to history, but still reasonably priced for an environment where bond yields stay abnormally low.
- Assuming a 2.0% normalized dividend yield, expected share count reductions of 1.6% via share buybacks and 4.5% long-term expected earnings growth, the S&P 1500 is poised to return approximately 8.1% over the long term.
 - This compares to the 30-year U.S. Treasury at 3.1%, and a historical compound annual return for the S&P 500 of 9.5% from 1928 - 2016.

SMRS

Domestic Equities

12/31/16

Markets	Amount	Total	% of Total
Internal Indexed (in millions)			
Indexed Portfolios	\$7,325		
Total Indexed		\$7,325	45.6%
Internal			
Active Portfolios	\$5,018		
Total Active		\$5,018	31.3%
External/Active			
Los Angeles Capital	\$1,177		
Fisher Investments	662		
Seizert Capital Partners	546		
Clarkston Capital Partners	522		
ARK Investments	224		
Attucks Asset Management	213		
Bivium Capital	197		
Munder Capital Management	89		
Northpointe Capital	86		
Total		\$3,716	23.1%

TOTAL

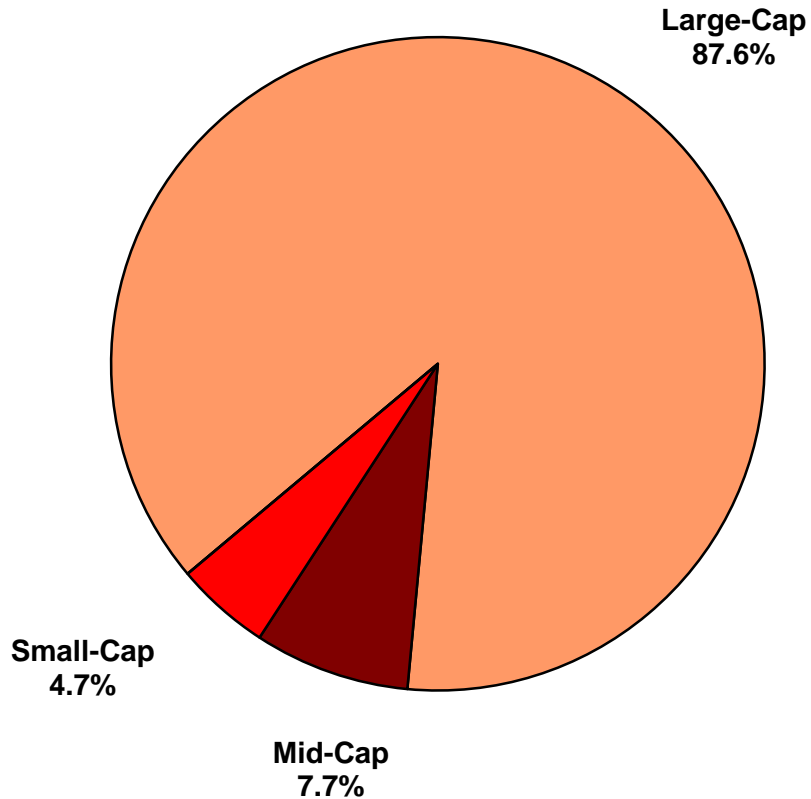
\$16,059

100.0%

SMRS

Domestic Equity Exposure By Market Cap

12/31/16



Market Value in Millions			
	<u>12/31/16</u>		
	<u>Assets</u>	<u>Percent</u>	<u>S&P 1500</u>
Large-Cap (>\$10B)	\$14,068	87.6%	84.9%
Mid-Cap (>\$4 <\$10B)	1,237	7.7%	8.5%
Small-Cap (<\$4B)	754	4.7%	6.6%
Total Domestic Equity	<u>\$16,059</u>	<u>100.0%</u>	<u>100.0%</u>

SMRS

Domestic Equities Composite

12/31/16

Date:	<u>12/31/16</u>	<u>9/30/16</u>	<u>6/30/16</u>	<u>3/31/16</u>
Assets (\$million):	\$16,059	\$15,842	\$16,059	\$16,294
Number of Securities:	1,322	1,316	1,329	1,305
Active Share:	37%	34%	33%	35%

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 (\$billion)	\$155.7	\$133.7	\$112.8
P/E FY1	16.6x	18.4x	16.8x
P/E discount to S&P 1500	9.8%	0	8.7%
Price/Book	2.4x	2.7x	1.9x
Beta	0.98	1.00	1.04
Tracking Error	1.2%	0	3.0%
Dividend Yield	2.1%	2.0%	2.3%
3-5 Year EPS Growth Estimate	9.3%	10.3%	7.8%
Return on Equity	14.5%	14.7%	11.3%

TOP TEN HOLDINGS - Domestic Equities

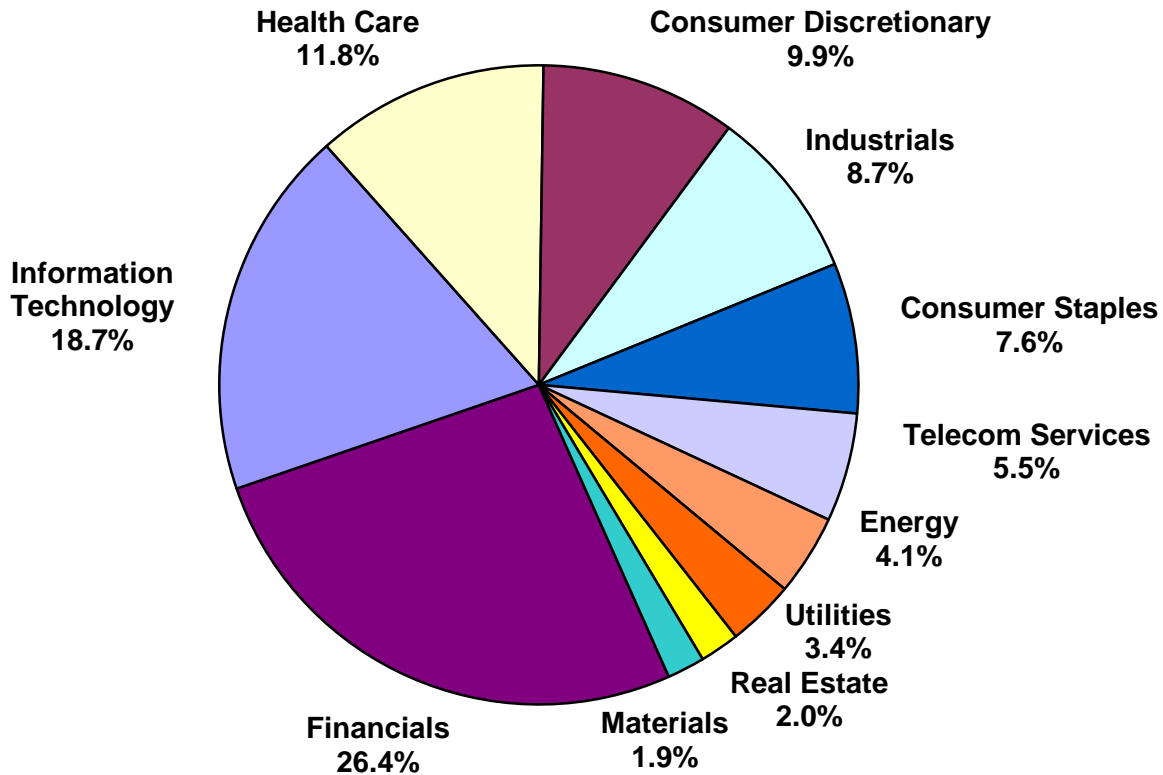
12/31/16

	<u>Portfolio Weight</u>	<u>Market Capitalization (\$B)</u>	<u>FY1 P/E</u>	<u>YTD Total Return</u>	<u>Market Value</u>
Berkshire Hathaway Inc. Class B	5.1%	401.9	22.6	23.4%	\$814,678,510
Verizon Communications Inc.	4.7%	217.6	13.7	20.7%	747,058,278
Apple Inc.	3.6%	608.7	12.9	12.5%	578,401,374
JPMorgan Chase & Co.	2.9%	307.3	14.6	34.6%	464,337,190
U.S. Bancorp	2.8%	87.2	15.9	23.4%	451,688,294
Wells Fargo & Company	2.1%	276.4	13.7	4.7%	333,857,537
SPDR S&P 500 ETF Trust	1.9%	133.7	18.2	12.0%	303,877,859
Microsoft Corporation	1.7%	480.3	20.9	15.1%	269,962,756
Gilead Sciences, Inc.	1.6%	94.7	6.3	-27.6%	249,377,027
Exelon Corporation	<u>1.5%</u>	32.8	13.2	32.8%	<u>246,698,017</u>
TOTAL	<u>27.8%</u>				<u>\$4,459,936,841</u>

SMRS

Domestic Equity By Sector

12/31/16



Market Value in Millions				
12/31/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$4,248	26.4%	15.1%	11.3%
Information Technology	3,001	18.7%	20.4%	-1.7%
Health Care	1,896	11.8%	13.1%	-1.3%
Consumer Discretionary	1,592	9.9%	12.0%	-2.1%
Industrials	1,401	8.7%	10.9%	-2.2%
Consumer Staples	1,223	7.6%	8.8%	-1.2%
Telecom Services	884	5.5%	2.4%	3.1%
Energy	651	4.1%	7.1%	-3.0%
Utilities	544	3.4%	3.3%	0.1%
Real Estate	314	2.0%	3.6%	-1.6%
Materials	305	1.9%	3.3%	-1.4%
Total	<u>\$16,059</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

12/31/16

Date:	<u>12/31/16</u>	<u>9/30/16</u>	<u>6/30/16</u>	<u>3/31/16</u>
Assets (\$million):	\$8,734	\$8,403	\$8,625	\$9,018
Number of Securities:	980	1,015	1,023	969
Active Share:	66%	63%	62%	63%

Benchmark: S&P 1500

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

Characteristics:	<u>SMRS</u>	<u>S&P 1500</u>	<u>S&P 1500 Value</u>
Weighted Average Capitalization (\$billion)	\$169.2	\$133.7	\$112.8
P/E FY1	15.5x	18.4x	16.8x
P/E discount to S&P 1500	15.8%	0	8.7%
Price/Book	2.3x	2.7x	1.9x
Beta	0.96	1.00	1.04
Tracking Error	2.2%	0	3.0%
Dividend Yield	2.2%	2.0%	2.3%
3-5 Year EPS Growth Estimate	8.6%	10.3%	7.8%
Return on Equity	14.8%	14.7%	11.3%

TOP TEN HOLDINGS - Actively Managed

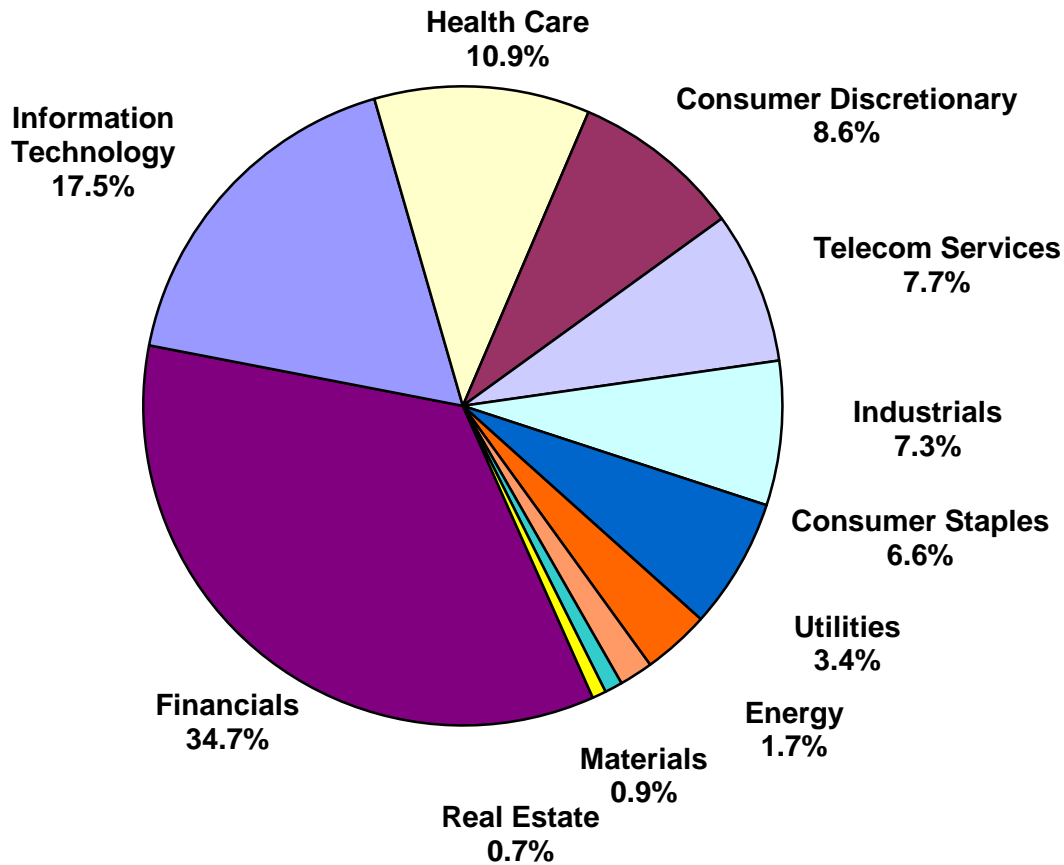
12/31/16

	<u>Portfolio Weight</u>	<u>Market Capitalization (\$B)</u>	<u>FY1 P/E</u>	<u>YTD16 Total Return</u>	<u>Market Value</u>
Berkshire Hathaway Inc. Class B	8.5%	401.9	22.6	23.4%	\$741,767,451
Verizon Communications Inc.	7.7%	217.6	13.7	20.7%	675,892,115
U.S. Bancorp	4.9%	87.2	15.9	23.4%	424,845,311
Apple Inc.	4.3%	608.7	12.9	12.5%	376,423,918
JPMorgan Chase & Co.	4.2%	307.3	14.6	34.6%	363,361,926
Wells Fargo & Company	2.9%	276.4	13.7	4.7%	252,392,282
Exelon Corporation	2.7%	32.8	13.2	32.8%	235,983,692
Gilead Sciences, Inc.	2.5%	94.7	6.3	-27.6%	218,525,720
Aflac Incorporated	2.3%	28.2	10.1	19.1%	201,937,162
Validus Holdings, Ltd.	<u>2.2%</u>	4.4	14.4	22.3%	<u>193,797,094</u>
TOTAL	<u>42.2%</u>				<u>\$3,684,926,673</u>

SMRS

Active Equity By Sector

12/31/16



Market Value in Millions				
12/31/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$3,031	34.7%	15.1%	19.6%
Information Technology	1,530	17.5%	20.4%	-2.9%
Health Care	950	10.9%	13.1%	-2.2%
Consumer Discretionary	742	8.6%	12.0%	-3.4%
Telecom Services	673	7.7%	2.4%	5.3%
Industrials	637	7.3%	10.9%	-3.6%
Consumer Staples	578	6.6%	8.8%	-2.2%
Utilities	296	3.4%	3.3%	0.1%
Energy	151	1.7%	7.1%	-5.4%
Materials	80	0.9%	3.3%	-2.4%
Real Estate	66	0.7%	3.6%	-2.9%
Total	<u>\$8,734</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

Manager Performance - Net of Fees
12/31/16

<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	\$2,150,814,849	11.0%	7.4%	15.1%	11.8%	6.9%	8/31/07
S&P 500		12.0%	8.9%	14.7%	12.8%	7.0%	
Style & Risk Adjusted Benchmark		16.9%	6.7%	13.0%	12.0%	6.2%	
Lipper Large-Cap Core		10.3%	7.0%	13.3%	11.4%	6.2%	
<i>Excess Return</i>		-1.0%	-1.5%	0.4%	-1.0%	-0.1%	
<i>Alpha</i>		-5.9%	0.7%	2.1%	-0.2%	0.7%	
<i>Pct Rank vs Lipper Large-Cap Core</i>		44	53	12	44	26	
SMRS Large-Cap Growth	1,397,313,422	-3.0%	6.2%	13.7%	11.4%	8.1%	5/31/05
S&P 500 Growth Index		6.9%	9.0%	14.5%	13.1%	8.7%	
Style & Risk Adjusted Benchmark		7.9%	9.4%	15.5%	13.6%	8.8%	
Lipper Large Growth		2.4%	6.2%	13.3%	11.5%	8.0%	
<i>Excess Return</i>		-9.9%	-2.8%	-0.8%	-1.8%	-0.7%	
<i>Alpha</i>		-10.9%	-3.1%	-1.8%	-2.2%	-0.7%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		91	55	43	54	47	
SMRS All-Cap Garp	1,008,966,348	9.1%	8.0%	15.5%	--	13.6%	4/30/11
S&P 1500 Super Composite		13.0%	8.9%	14.8%	--	11.9%	
Style & Risk Adjusted Benchmark		11.7%	7.9%	13.8%	--	11.1%	
Lipper Multi Core		11.0%	6.2%	13.1%	--	9.8%	
<i>Excess Return</i>		-3.9%	-0.9%	0.7%	--	1.7%	
<i>Alpha</i>		-2.5%	0.0%	1.7%	--	2.5%	
<i>Pct. Rank vs. Lipper Multi Core</i>		67	24	10	--	1	
LA Capital Deep Value	709,701,931	16.7%	--	--	--	6.8%	4/1/15
S&P 1500 Value		18.5%	--	--	--	8.2%	
Style & Risk Adjusted Benchmark		16.5%	--	--	--	7.4%	
Lipper Multi-Cap Value		16.4%	--	--	--	5.1%	
<i>Excess Return</i>		-1.8%	--	--	--	-1.4%	
<i>Alpha</i>		0.2%	--	--	--	-0.6%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		49	--	--	--	32	
Fisher All-Cap	662,451,268	10.0%	9.3%	13.6%	12.7%	10.0%	10/31/04
S&P 1500/S&P 600 Value Blend		13.0%	8.9%	14.5%	13.4%	8.8%	
Style & Risk Adjusted Benchmark		13.0%	9.0%	15.1%	15.0%	9.9%	
Lipper Multi Core		11.0%	6.2%	13.1%	11.4%	7.5%	
<i>Excess Return</i>		-3.1%	0.4%	-0.8%	-0.7%	1.2%	
<i>Alpha</i>		-3.0%	0.3%	-1.5%	-2.3%	0.1%	
<i>Pct. Rank vs. Lipper Multi Core</i>		59	8	45	26	2	
Seizert Capital Partners	546,074,744	20.1%	7.1%	15.5%	14.2%	14.8%	11/30/09
S&P 1500/S&P 400 Value Blend		13.0%	8.9%	14.8%	14.8%	16.0%	
Style & Risk Adjusted Benchmark		16.1%	8.7%	15.7%	13.0%	13.8%	
Lipper Multi Core		11.0%	6.2%	13.1%	11.4%	12.4%	
<i>Excess Return</i>		7.1%	-1.8%	0.7%	-0.6%	-1.2%	
<i>Alpha</i>		3.9%	-1.6%	-0.2%	1.2%	1.0%	
<i>Pct. Rank vs. Lipper Multi Core</i>		3	40	10	6	7	
LA Capital All-Cap Growth	467,259,929	11.5%	10.8%	16.8%	15.0%	11.3%	5/31/05
S&P 1500 Growth		7.9%	9.0%	14.6%	13.3%	8.9%	
Style & Risk Adjusted Benchmark		8.1%	6.8%	12.3%	12.9%	9.5%	
Lipper Multi-Cap Growth		3.3%	4.9%	12.4%	11.1%	8.1%	
<i>Excess Return</i>		3.6%	1.9%	2.2%	1.6%	2.4%	
<i>Alpha</i>		3.5%	4.0%	4.5%	2.1%	1.7%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		2	1	3	1	2	
Clarkston Capital Large-Cap	292,091,683	14.0%	--	--	--	9.5%	4/1/15
S&P 500		12.0%	--	--	--	6.9%	
Style & Risk Adjusted Benchmark		8.3%	--	--	--	4.9%	
Lipper Large-Cap Core		10.3%	--	--	--	5.0%	
<i>Excess Return</i>		2.0%	--	--	--	2.6%	
<i>Alpha</i>		5.7%	--	--	--	4.6%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		14	--	--	--	2	

<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>
Clarkston Capital Small-Cap	229,900,929	16.7%	13.0%	--	--	13.0%	1/1/14
S&P 600		26.6%	9.5%	--	--	9.5%	
Style & Risk Adjusted Benchmark		16.8%	7.0%	--	--	7.0%	
Lipper Small-Cap Core		20.6%	6.0%	--	--	6.0%	
<i>Excess Return</i>		-9.8%	3.5%	--	--	3.5%	
<i>Alpha</i>		0.0%	6.0%	--	--	6.0%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		79	1	--	--	1	
Ark Investments	223,614,381	--	--	--	--	11.8%	3/1/16
S&P 1500 Growth		--	--	--	--	14.5%	
Style & Risk Adjusted Benchmark		--	--	--	--	23.8%	
Lipper All-Cap Growth		--	--	--	--	12.6%	
<i>Excess Return</i>		--	--	--	--	-2.7%	
<i>Alpha</i>		--	--	--	--	-11.9%	
<i>Pct. Rank vs. Lipper All-Cap Growth</i>		--	--	--	--	58	
Attucks Asset Management	213,010,446	11.2%	5.7%	12.6%	11.3%	5.8%	11/30/07
S&P 1500 Super Composite		13.0%	8.9%	14.8%	13.0%	6.6%	
Style & Risk Adjusted Benchmark		16.1%	8.2%	14.0%	12.7%	7.2%	
Lipper Multi Core		11.0%	6.2%	13.1%	11.4%	5.5%	
<i>Excess Return</i>		-1.8%	-3.2%	-2.2%	-1.7%	-0.8%	
<i>Alpha</i>		-4.9%	-2.5%	-1.4%	-1.3%	-1.4%	
<i>Pct. Rank vs. Lipper Multi Core</i>		48	64	66	57	47	
Bivium Capital Partners	197,046,688	12.8%	5.7%	12.6%	11.4%	5.5%	11/30/07
S&P 1500 Value		18.5%	8.6%	14.9%	12.7%	5.4%	
Style & Risk Adjusted Benchmark		17.8%	8.6%	14.4%	13.2%	6.9%	
Lipper Multi Cap Value		16.4%	6.4%	13.4%	11.4%	5.4%	
<i>Excess Return</i>		-5.7%	-2.9%	-2.3%	-1.3%	0.1%	
<i>Alpha</i>		-5.0%	-2.8%	-1.8%	-1.8%	-1.3%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		81	71	71	58	38	
Munder Concentrated SMID Cap	88,930,045	8.8%	4.3%	12.1%	11.9%	15.9%	4/30/09
S&P 400 Mid-Cap Growth		14.8%	8.0%	14.4%	14.2%	18.7%	
Style & Risk Adjusted Benchmark		24.7%	9.4%	15.8%	13.9%	17.5%	
Lipper Mid-Cap Growth		6.6%	4.1%	11.8%	11.4%	15.5%	
<i>Excess Return</i>		-6.0%	-3.7%	-2.3%	-2.3%	-2.8%	
<i>Alpha</i>		-16.0%	-5.0%	-3.7%	-2.0%	-1.6%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		28	42	46	39	42	
NorthPointe All-Cap Core	85,779,473	12.2%	4.4%	13.4%	10.6%	7.1%	10/31/04
NorthPointe Blended Benchmark		13.0%	8.9%	14.8%	13.0%	8.4%	
Style & Risk Adjusted Benchmark		16.2%	7.2%	14.4%	14.9%	9.8%	
Lipper Multi Core		11.0%	6.2%	13.1%	11.4%	7.5%	
<i>Excess Return</i>		-0.9%	-4.5%	-1.4%	-2.4%	-1.3%	
<i>Alpha</i>		-4.0%	-2.8%	-1.0%	-4.2%	-2.7%	
<i>Pct. Rank vs. Lipper Multi Core</i>		39	79	53	71	69	
Large-Cap Consistent Growth	49,582,495	0.9%	--	--	--	3.2%	3/1/15
S&P 500		12.0%	--	--	--	5.7%	
Style & Risk Adjusted Benchmark		8.1%	--	--	--	4.4%	
Lipper Large-Cap Core		10.3%	--	--	--	3.9%	
<i>Excess Return</i>		-11.0%	--	--	--	-2.4%	
<i>Alpha</i>		-7.2%	--	--	--	-1.1%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		99	--	--	--	69	

State of Michigan Retirement Systems

FIXED INCOME REVIEW

Investment Advisory Committee Meeting

March 9, 2017



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Long-Term Fixed Income	5.7%	4.3%	3.6%	4.7%	5.4%
Barclays Aggregate	2.7%	3.0%	2.2%	3.6%	4.3%
Peer Median Return	4.8%	3.6%	3.4%	4.9%	5.0%
Rank vs. Peers	41	34	40	59	24

- Long-Term Fixed Income Division (LTFID) outperformed both the Barclay's Aggregate Index and its peer group over recent time periods. The portfolio's allocation to high yield credit, emerging market debt, and investment grade corporate bonds helped to generate this outperformance on a one-year basis. An overweight to structured securities also helped to generate outperformance over longer time periods.

Strategy Update

- Allocation to LTFID has increased by \$223 million over the past twelve months. This increase has been invested primarily in high yield strategies.
- The Division continues to look to increase the overall rate of return by allocating to securities with attractive risk-adjusted yields when the market allows. The portfolio currently maintains an out-of-benchmark exposure to high yield credit managers (9.7% of portfolio assets) and securitized credit mandates (13.1% of portfolio assets). The portfolio also has a modest allocation to a global bond strategy (2.7% of portfolio assets). These strategies increase the credit risk of the portfolio, however, this risk is offset by relatively lower interest rate risk due to the portfolio's lower duration.
- The portfolio addresses liquidity concerns by maintaining an allocation to U.S. Treasuries and U.S. TIPS (20.2% of portfolio assets). The portfolio also had a 1.7% allocation to cash at the end of the quarter.
- The Division has increased its allocation to floating rate securities, including AAA CLO investments and investment grade floating rate corporate bonds. This allocation accounts for roughly 10% of the total portfolio and will protect the portfolio from rising short-term interest rates.
- As opportunities present themselves, the Division will look to diversify from Barclay's Aggregate and Barclay's Investment Grade Credit focused investment strategies. This is due to the relatively lower yields and longer durations of these benchmarks when compared with historical levels. These changes will occur at the margin as the overall characteristics of the fund will continue to meet the diversification requirements of a core bond portfolio.

Market Environment and Outlook

- The year-over-year (YOY) change in U.S. Treasury yields was relatively small despite large interest rate movements during the 2016 calendar year. The yield movement of the

10-year U.S. Treasury highlights this volatility as it started the year with a yield of 2.27%, reached an all-time low of 1.36% in July, and ended the year at 2.45%. The slope of the yield curve was also volatile as the spread between the 2-year and 10-year Treasuries flattened by 47 bps during the first half of the year before ending up 3 bps higher on a YOY basis.

- The Federal Reserve increased short-term interest rates as they tightened monetary policy by 25 bps during their December 2016 FOMC meeting. The market projects two additional rate hikes during the 2017 calendar year.
- Investment grade credit spreads in the U.S. continued to narrow during the fourth quarter. Spreads ended the year at 123 bps. These levels have tightened by 43 bps YTD.
- High-yield spreads have decreased by 251 bps YTD, overcoming initial weakness during the first six weeks of the calendar year. Spreads ended the quarter at 409 bps after reaching a level of 830 bps in February. Energy spreads continued to drive the market, narrowing by 867 bps YTD to 430 bps.
- The BBB CMBS spreads remain elevated despite recent strong performance. Spreads ended the quarter 10 bps tighter at 473 bps. These spreads are 41 bps higher on a YOY basis.
- Inflation expectations remained contained in global developed markets but have increased from lower levels earlier in the year. The breakeven inflation expectation implied by the yield of the 10-year U.S. TIPS ended the quarter at 1.97%, in line with the 2% inflation target of the Federal Reserve. These inflation expectations bottomed at 1.2% earlier in the year. This increase in expectations has led to relative outperformance for TIPS over recent quarters.
- Interest rates in the U.S. continued to trade at higher levels than those in many developed markets. This has been driven by the relative strength of the U.S. economy as well as monetary tightening by the Federal Reserve. This tightening has been contrasted by quantitative easing and lower interest rates by many of the major global central banks. This relative yield pickup is highlighted by 10-year yields of 0.05% in Japan and 0.21% in Germany.
- The portfolio remains defensively positioned for interest rate increases. The duration remains short of the benchmark as we focus on intermediate securities. We have offset this short position by holding a larger allocation to securitized and corporate debt securities in order to increase the interest income of the portfolio.

Conclusion

Given the current level and shape of the yield curve, it seems appropriate to focus on intermediate duration securities. This area of the yield curve offers the best risk-adjusted return in this environment. We will continue to target investments that offer attractive yield pick-up for the portfolio as we believe that price appreciation opportunities are limited in a low yield environment. We will also look to maintain our overweight to securitized assets and high yield bonds within the portfolio.

SMRS
Long-Term Fixed Income
12/31/16

Markets	Amount	Total	% of Total
Core (in millions)			
LTFID Internal	\$4,993		
Dodge & Cox	232		
Total Core		\$5,225	65.5%
Credit			
Prudential	\$219		
Total Credit		\$219	2.7%
Securitized Debt			
Met West Securitized Ops	\$414		
Principal CMBS	490		
Napier Park ABS Income	138		
Total Securitized Debt		\$1,042	13.1%
High Yield			
Columbia Management	\$455		
Prudential High Yield	318		
Total High Yield		\$773	9.7%
Tactical			
Pyramis	\$283		
Loomis Core Plus	215		
Total Tactical		\$498	6.2%
Global			
T. Rowe Global Multi-Sector	\$214		
Total Global		\$214	2.7%

TOTAL

\$7,971

100.0%

Note: All dollar amounts are expressed in millions.

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

12/31/16

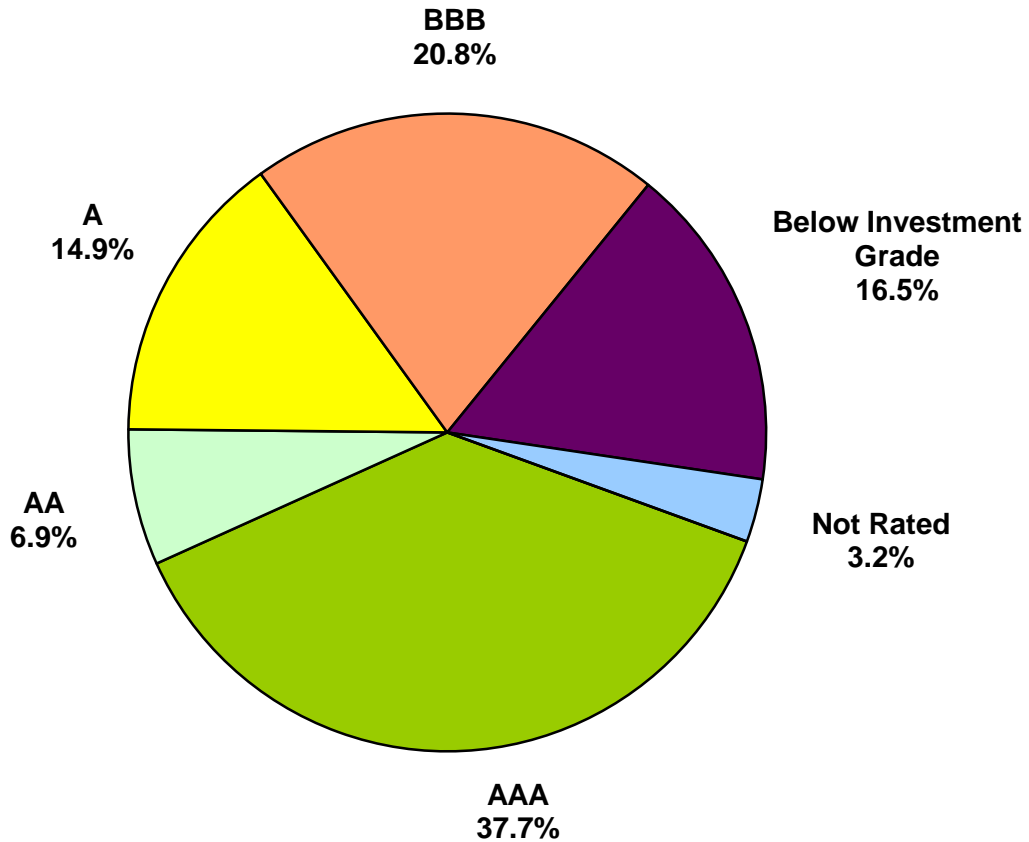
<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Life	6.9	8.6
Average Life w/Cash Equiv.	6.8	8.6
Duration (Yrs)	5.1	5.9
Duration (Yrs) w/Cash Equiv.	5.0	5.9
Coupon (%)	3.4	3.2
Yield to Maturity (%)	3.6	2.6
Credit Rating	A3/BBB+	Aa2/AA-
Volatility (%)	2.9	3.4
Tracking Error	178bp	0
Beta (vs S&P 500)	-0.03	-0.08

SMRS

Fixed Income By Rating

Total U.S. Long-Term Fixed Income

12/31/16



Market Value in Millions				
12/31/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$3,003	37.7%	69.9%	-32.2%
AA	547	6.9%	5.5%	1.4%
A	1,188	14.9%	11.0%	3.9%
BBB	1,658	20.8%	11.9%	8.9%
Not Rated	258	3.2%	1.6%	1.6%
* Below Investment Grade	1,317	16.5%	0.1%	16.4%
Total Investments	<u>\$7,971</u>	<u>100.0%</u>	<u>100.0%</u>	

* Comprised of approximately 12.1% High Yield Credit and 4.4% High Yield RMBS/ABS

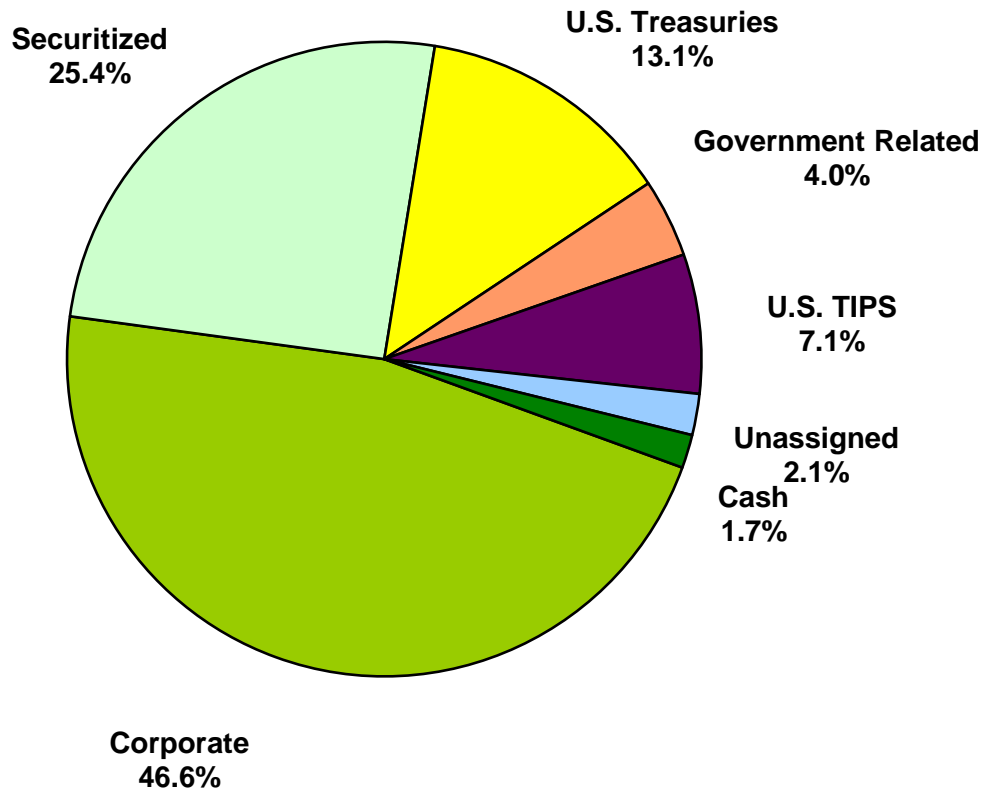
Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

Total U.S. Long-Term Fixed Income

12/31/16



Market Value in Millions				
12/31/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Corporate	\$3,714	46.6%	25.7%	20.9%
Securitized	2,026	25.4%	30.4%	-5.0%
U.S. Treasuries	1,047	13.1%	36.2%	-23.1%
Government Related	316	4.0%	7.7%	-3.7%
U.S. TIPS	566	7.1%	0.0%	7.1%
Unassigned	166	2.1%	0.0%	2.1%
Cash	136	1.7%	0.0%	1.7%
Total Investments	<u>\$7,971</u>	<u>100.0%</u>	<u>100.0%</u>	

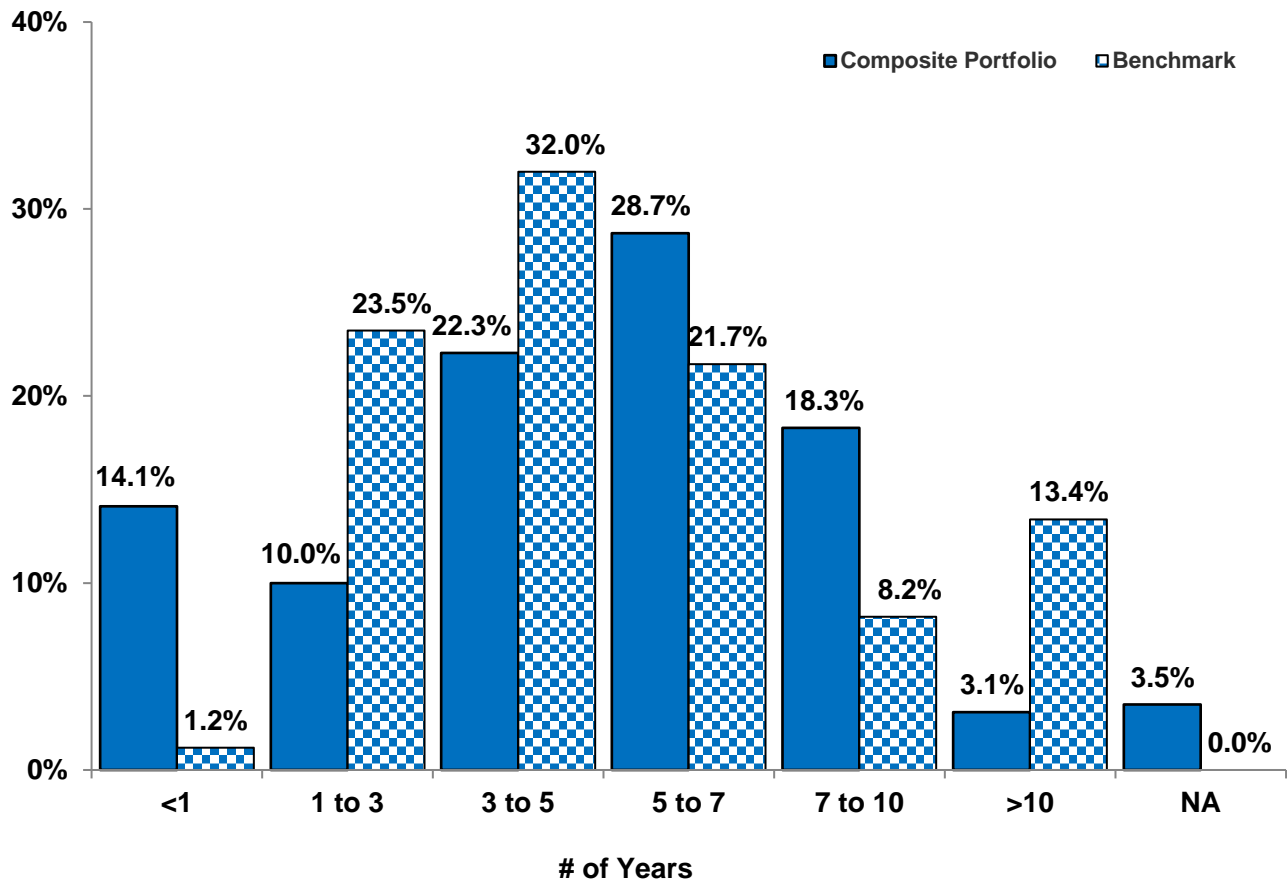
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

12/31/16



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,124	14.1%	1.2%	0.2	0.9
1 to 3	798	10.0%	23.5%	2.2	2.0
3 to 5	1,782	22.3%	32.0%	4.3	4.1
5 to 7	2,285	28.7%	21.7%	6.1	5.8
7 to 10	1,456	18.3%	8.2%	8.0	8.1
>10	244	3.1%	13.4%	13.3	15.8
NA	282	3.5%	0.0%	0.0	0.0
Total	\$7,971	100.0%	100.0%	4.8	5.5

* Effective Duration

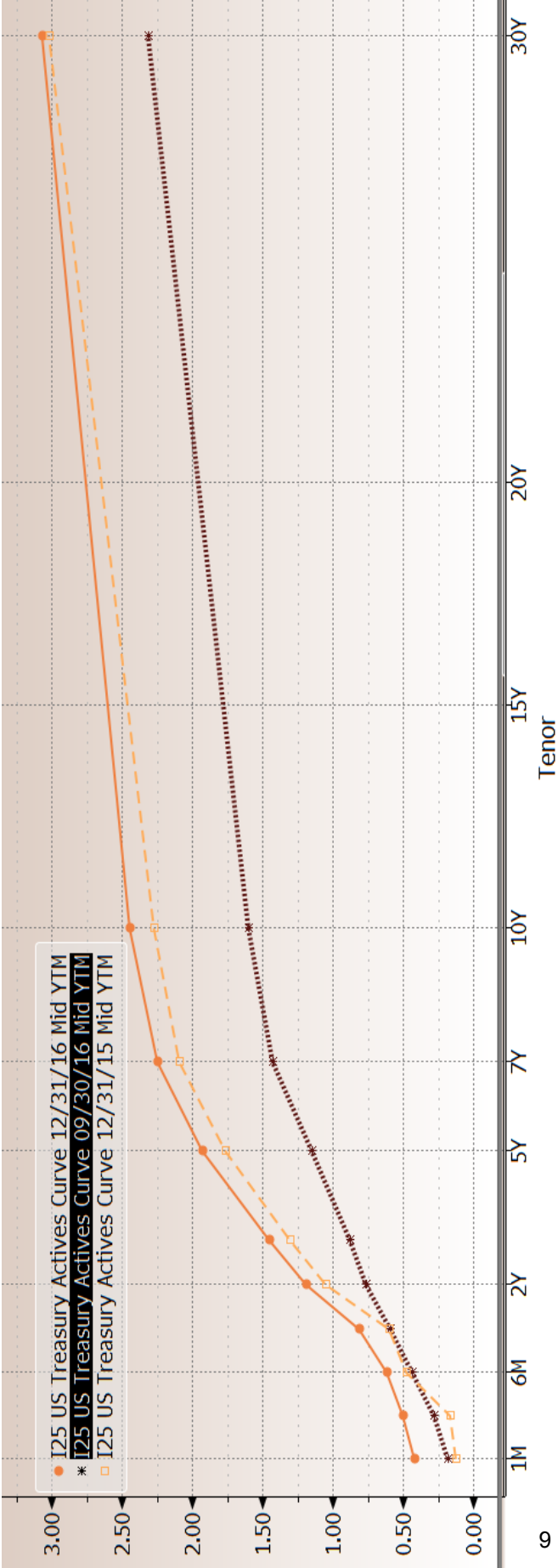
SMRS Internal/External Manager Performance – Net of Fees

12/31/16

Total Fixed Income Performance, Net of Fees (MPSERS)

	<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	\$7,970,921,488	5.5%	4.1%	3.5%	4.6%	5.3%
<i>Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>2.7%</i>	<i>3.0%</i>	<i>2.2%</i>	<i>3.6%</i>	<i>4.3%</i>
Internal Fixed Income	\$4,992,749,705	4.2%	3.9%	3.0%	4.2%	5.2%
External Fixed Income	\$2,978,171,783	7.7%	4.4%	4.2%	5.2%	5.2%
MetWest Securitized Opportunities	414,157,966	4.4%	2.9%	--	--	--
Principal CMBS	489,837,315	3.6%	4.7%	9.5%	14.2%	--
Pyramis Tactical Bond Fund	282,866,819	10.3%	--	--	--	--
Prudential Investment Grade	219,198,690	6.8%	4.6%	4.7%	5.8%	6.4%
Dodge & Cox Core	232,403,484	5.7%	3.8%	3.9%	4.6%	5.3%
Loomis Sayles CorePlus	214,800,292	7.1%	3.4%	--	--	--
Napier Park ABS Income	138,070,260	10.4%	--	--	--	--
T. Rowe Global Multi-Sector	214,368,742	N/A	--	--	--	--
<i>Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>2.7%</i>	<i>3.0%</i>	<i>2.2%</i>	<i>3.6%</i>	<i>4.3%</i>
Columbia Management High Yield	454,568,774	11.6%	5.3%	--	--	--
Prudential High Yield	317,899,441	13.3%	5.2%	--	--	--
<i>Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>14.1%</i>	<i>4.7%</i>	<i>--</i>	<i>--</i>	<i>--</i>

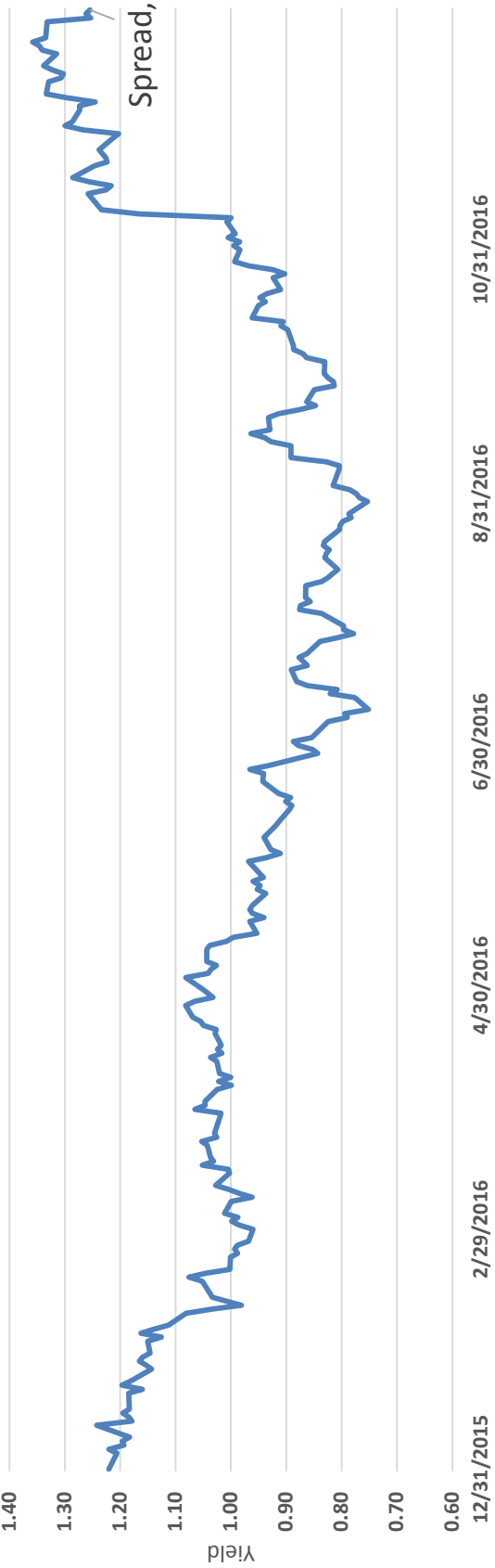
U.S. Yield Movement



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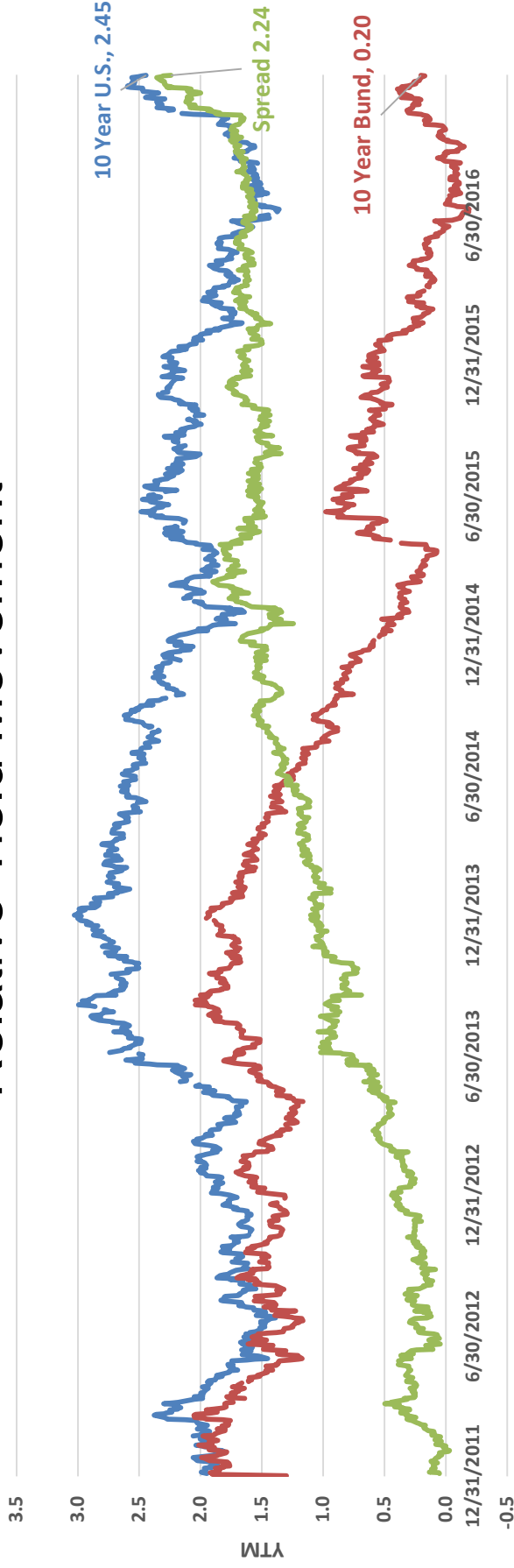
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2-Year/10-Year Yield Spread



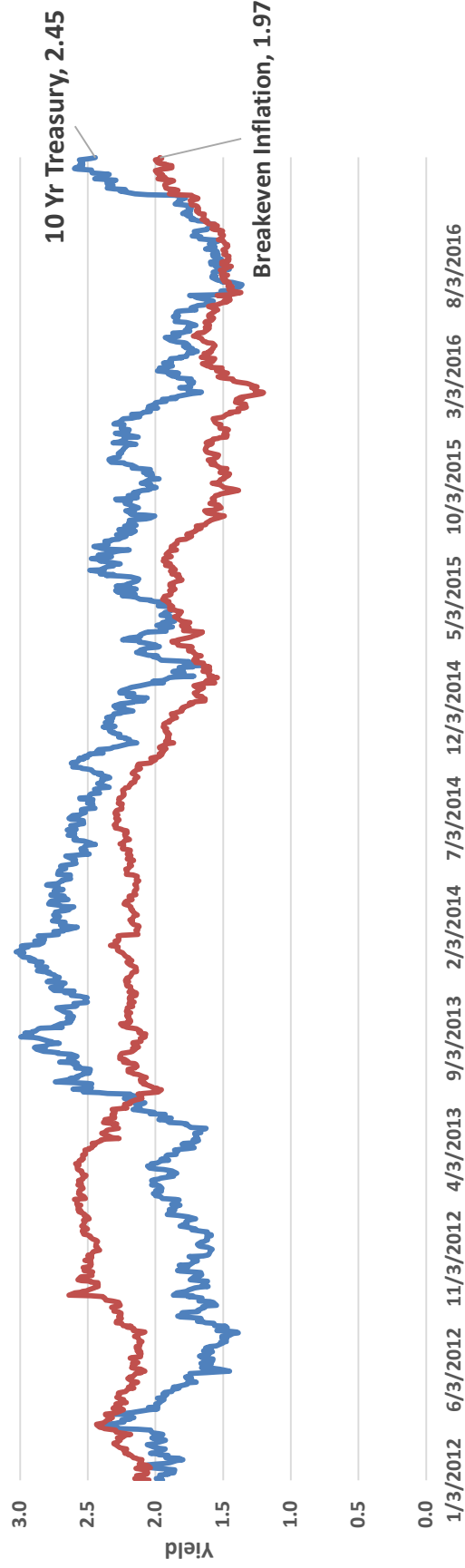
Source: Factset, Bloomberg

Relative Yield Movement



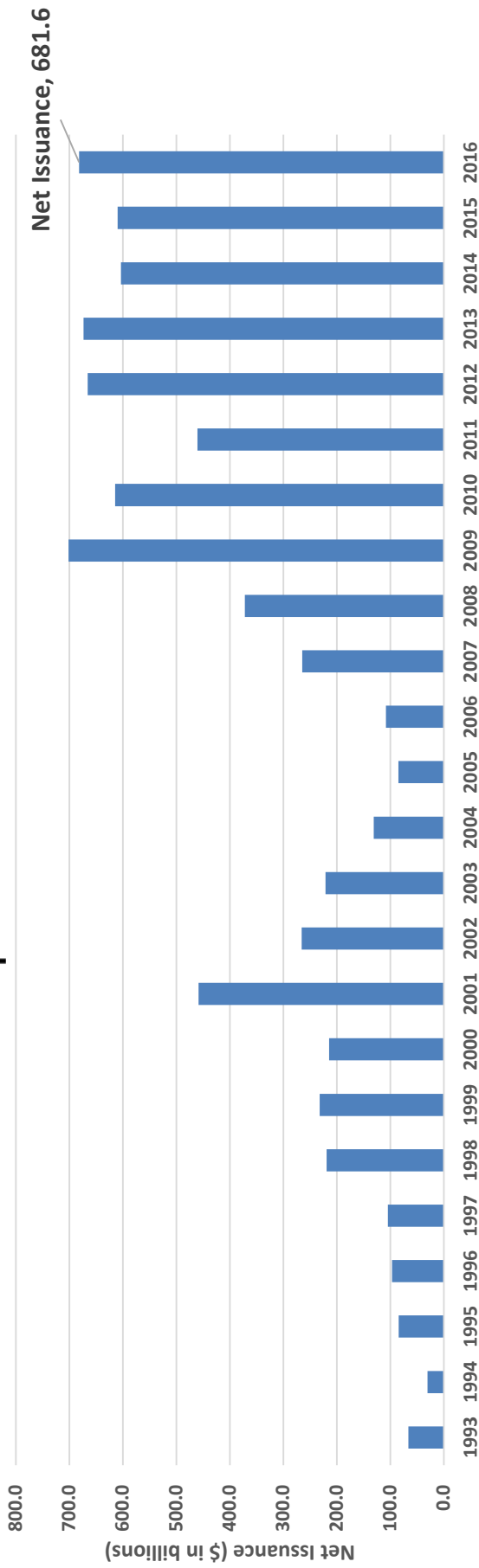
10

Treasury Yield and Inflation Expectations

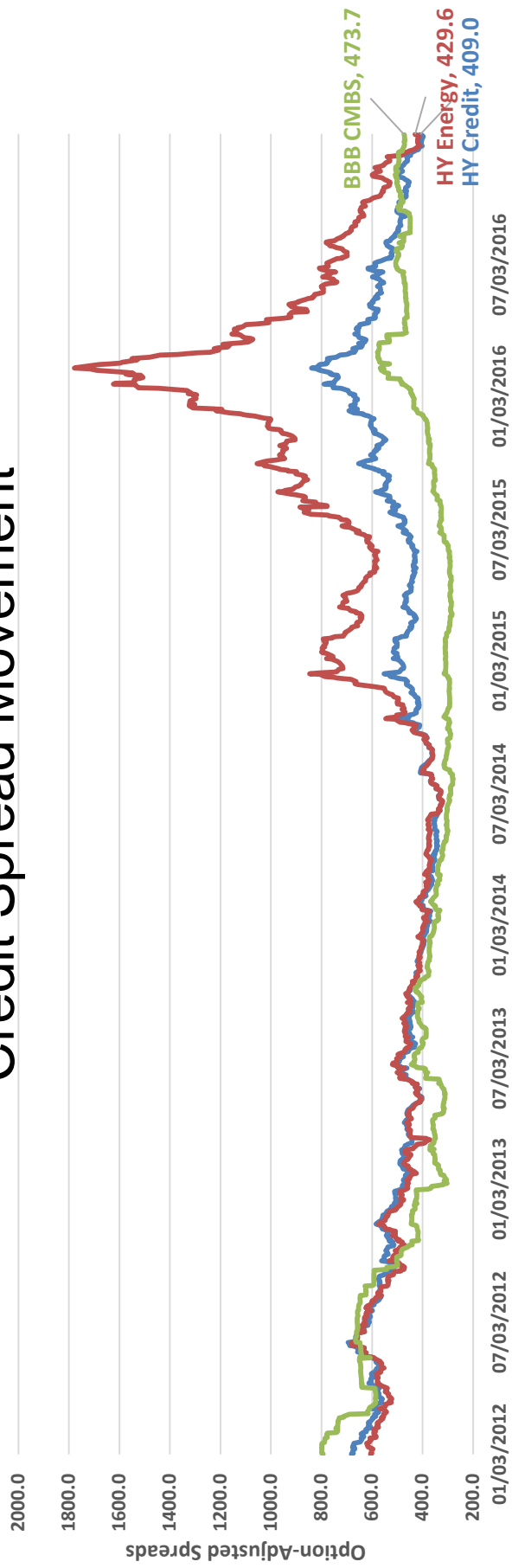


Source: Bloomberg

U.S. Corporate Bond Net Issuance

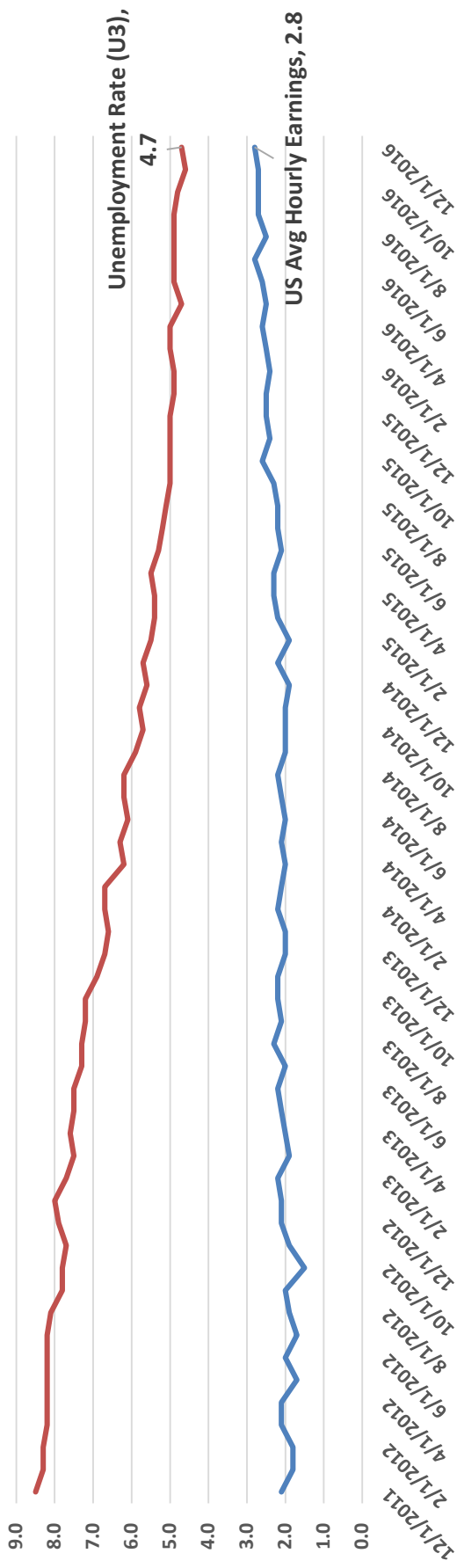


Credit Spread Movement

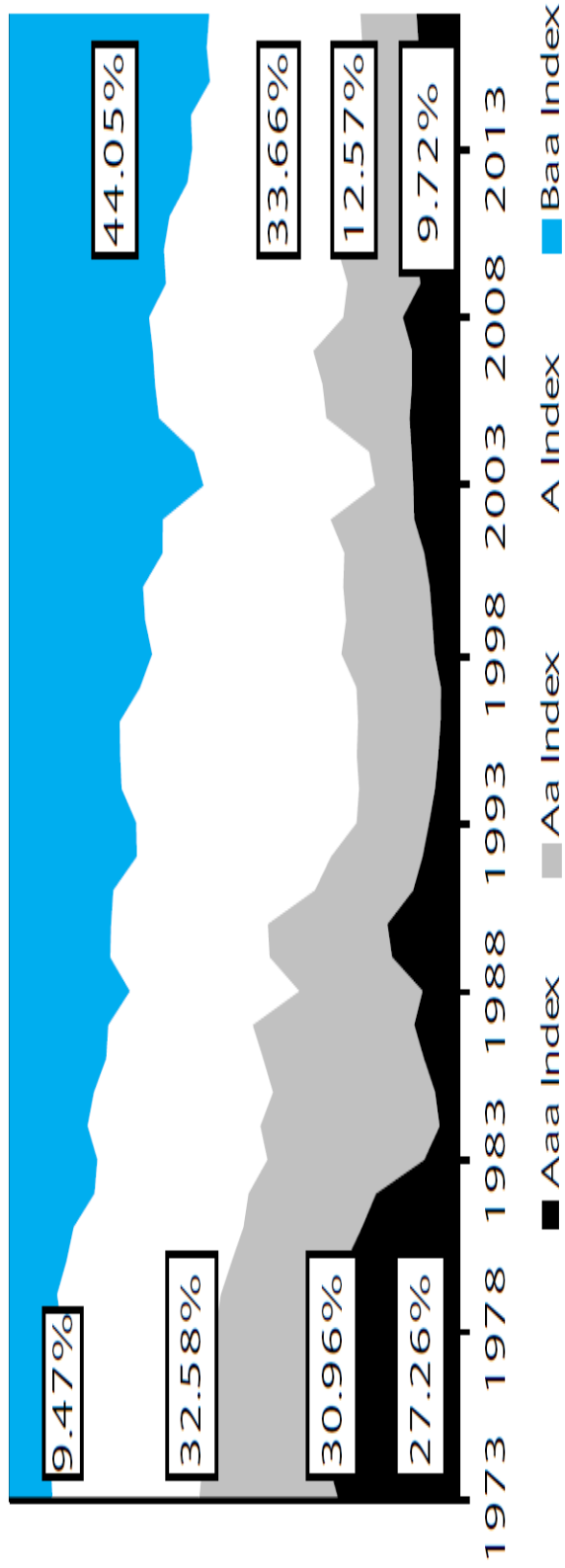


Source: Barclay's

Unemployment Trends



Quality Analysis of Barclays Credit Index, 1973-2017



Source: Bloomberg Barclays Indices, Barclays Research
Sources: Bloomberg

State of Michigan Retirement Systems

INTERNATIONAL EQUITY REVIEW

Investment Advisory Committee Meeting

March 9, 2017



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan, Gross	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	4.3%	0.0%	6.5%	4.2%	1.0%
Benchmark Return	4.5%	-1.7%	5.3%	3.0%	0.0%
Peer Return (> \$1 B)	3.8%	-0.8%	6.7%	4.3%	1.7%
Rank vs. Peers	37	23	59	52	87

- In the fourth quarter of 2016, the International Equity Division portfolio returned -1.1% versus the MSCI ACWI Ex-US Index return of -1.3%, bringing year-to-date performance to 4.3% compared to the index return of 4.5%. Solid outperformance from the Stock Plus portion of the portfolio wasn't enough to offset the underperformance of the division's active investments, thereby causing the International Equity Division's 2016 returns to lag the benchmark.
- During the quarter, there was a sharp contrast in returns between the developed markets and the emerging markets. Prior to election-day in the U.S., developed market returns were down -2.6% quarter to date. Post-election, developed markets rallied to finish the quarter at -0.4%. In contrast, emerging markets were approximately flat quarter-to-date going into the election and then fell over 4.0% to finish the quarter at -4.2%.
- The active investments comprise approximately 37% of the international equity portfolio and delivered a return of -1.5% for the fourth quarter and 1.7% for 2016. While the exposure to small caps and emerging markets hurt performance during the fourth quarter, these areas aided the division's returns for the year. The International Equity Division remains focused on evaluating active managers over the medium to long-term return horizon. The three year returns across all of the active investment categories, e.g. developed markets small-cap, remained ahead of the division's benchmark.
- The stock plus investments in international equity represents approximately 33.0% of the total international portfolio. Returns for the fourth quarter and 2016 were 0.2% and 7.3%, both outpacing the MSCI ACWI Ex-US for the quarter and year to date. The internally managed swap portfolio targeting the developed large-cap market was a relative contributor to performance during the quarter and the year. Whereas the internal and external emerging markets swap portfolios exhibited mid-teens performance for 2016.
- The indexed investments, which account for approximately 30% of international equity, returned -2.2% for the fourth quarter and 4.3% for the year. Emerging markets investments were a drag on performance during the quarter, however, they contributed strongly to the year's returns with performance in the low double digits.

Market Environment and Outlook

- International equity markets continue to represent relative value investment opportunities versus domestic equity markets.
- Emerging markets appear to offer better long-term value even with higher associated risks than developed markets. This emerging market outlook remains despite the strong market-by-market performance in 2016. Eight of the top ten best return countries for 2016, in U.S. dollars, were emerging market countries.
- Uncertainty around changes to global trade policies may create global economic headwinds potentially leading to higher market volatility in countries with low growth and high debt to gross domestic product ratios.
- The U.S. dollar continued to strengthen into the close of 2016. A continuation of this trend in 2017 potentially presents a headwind to international investment returns.

Conclusion

- Move towards long-term asset allocation objectives while remaining aware of potential medium-term investment opportunities.
- Prepare for derivative market regulatory and structural changes, and focus on further development of counterparty relationships as a strategic advantage.

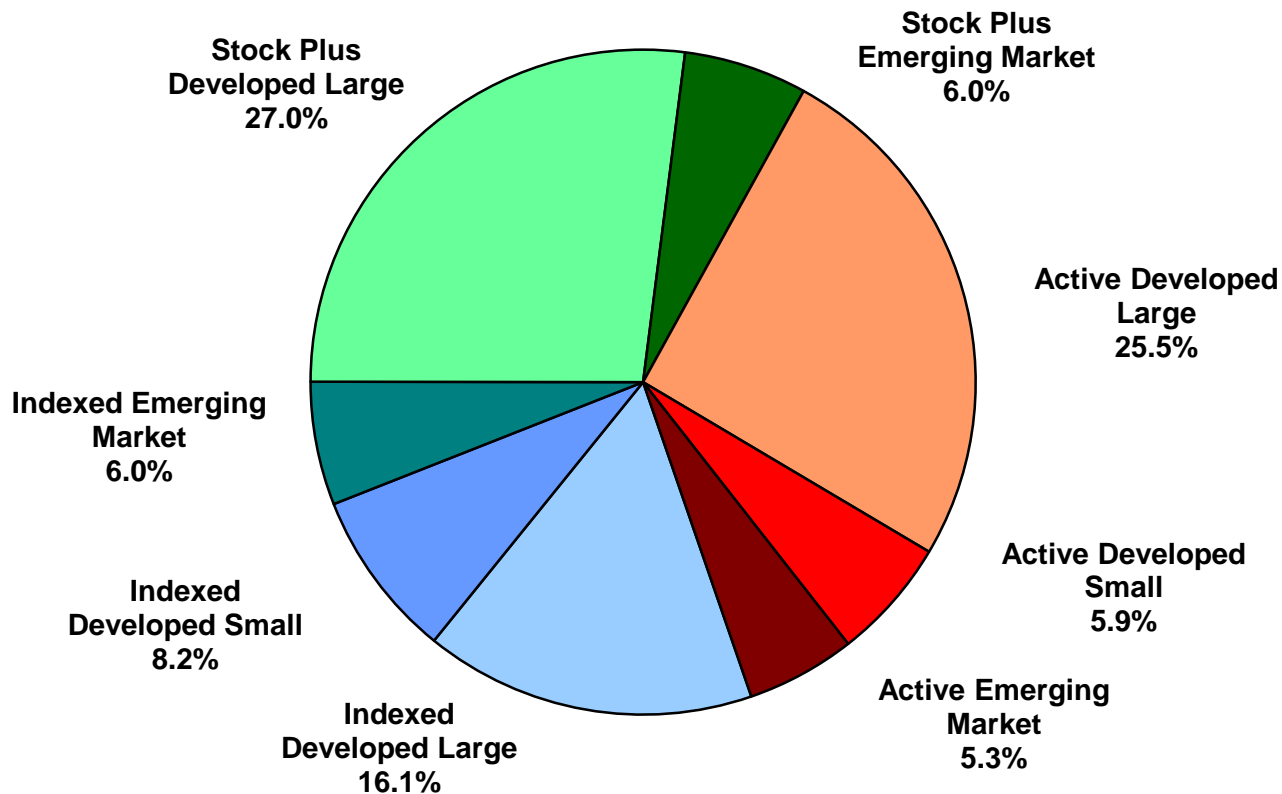
SMRS
International Equities
12/31/16

Markets	Amount	Total	% of Total
Indexed (in millions)			
SSgA	\$1,801		
Vanguard	1,135		
Total Indexed		\$2,936	30.3%
Stock Plus			
Internal Swaps	\$1,791		
PIMCO	1,406		
Total Stock Plus		\$3,197	33.0%
Active			
Los Angeles Capital	\$1,119		
Wellington	788		
Marathon London	605		
SSgA	573		
Effissimo	264		
Lazard	205		
Total Active		\$3,554	36.7%
TOTAL		<u>\$9,687</u>	<u>100.0%</u>

SMRS

International Equity Exposure By Category

12/31/16



Market Value in Millions					
	<u>12/31/16</u>		<u>9/30/16</u>		
Indexed					
Developed Large	\$1,559	16.1%	\$1,575	16.1%	
Developed Small	798	8.2%	826	8.4%	
Emerging Market	579	6.0%	602	6.1%	
Total Indexed Equity	\$2,936	30.3%	\$3,003	30.6%	
Stock Plus					
Developed Large	\$2,617	27.0%	\$2,591	26.5%	
Emerging Market	580	6.0%	599	6.1%	
Total Stock Plus Equity	\$3,197	33.0%	\$3,190	32.6%	
Active					
Developed Large	\$2,467	25.5%	\$2,484	25.3%	
Developed Small	573	5.9%	584	6.0%	
Emerging Market	514	5.3%	541	5.5%	
Total Active Equity	\$3,554	36.7%	\$3,609	36.8%	
Total International Equity	\$9,687	100.0%	\$9,802	100.0%	

Michigan Department of Treasury, Bureau of Investments

SMRS

Active International Equities

12/31/16

Date:	<u>12/31/16</u>	<u>9/30/16</u>	<u>6/30/16</u>	<u>3/31/16</u>
Assets (\$million):	\$3,554	\$3,609	\$3,348	\$3,242
Number of Securities:	1,487	1,506	1,522	1,558
Active Share:	65%	63%	62%	63%

Benchmark: MSCI ACWI ex USA

Description: The Active International Equities Composite represents cumulative investments by active international managers with developed market large and small cap, and emerging market mandates. The manager returns are well diversified and reflect a combination of fundamental analysis driven and quantitative management approaches. The cumulative exposure is constructed to produce a positive, long-term alpha while controlling risk.

Characteristics:	<u>SMRS</u>	<u>MSCI ACWI ex USA</u>
Weighted Average Capitalization (\$billion):	\$17.6	\$40.6
Trailing 12-month P/E:	18.0x	18.4x
Forecast P/E:	16.5x	15.7x
Price/Book:	1.5x	1.6x
Beta:	0.95	1.00
Dividend Yield:	2.7%	3.0%
Tracking Error:	3.5%	NA

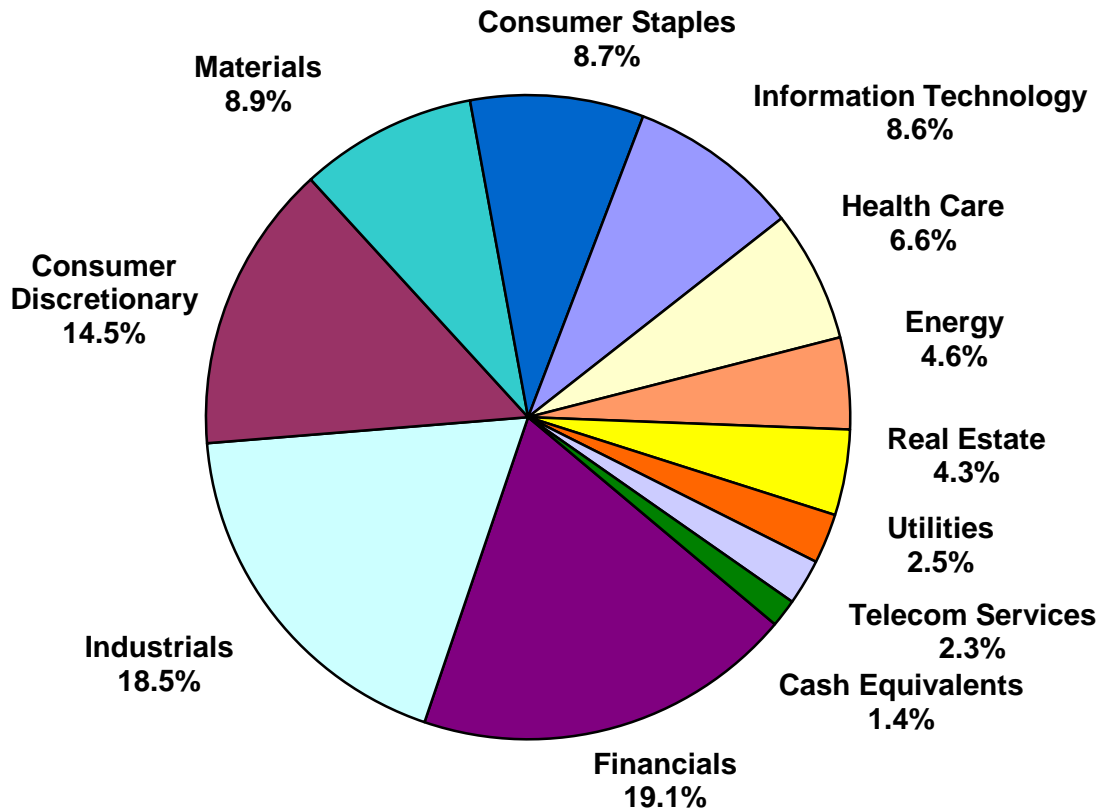
TOP TEN HOLDINGS – Active International Equities 12/31/16

	<u>Portfolio Weight</u>	<u>Market Value</u>
Dai-ichi Life Insurance Co Ltd/The	2.6%	\$93.5
Kawasaki Kisen Kaisha Ltd Ordinary JPY	1.2%	\$42.0
Ricoh Co Ltd	1.2%	\$41.0
Yamada Denki Co Ltd	1.1%	\$39.1
Lonza Group AG	0.7%	\$24.7
Adecco Group AG	0.7%	\$23.9
Atos SE	0.7%	\$23.8
Novartis AG	0.7%	\$23.3
Tencent Holdings Ltd	0.5%	\$18.4
British American Tobacco	<u>0.5%</u>	<u>\$18.4</u>
TOTAL	<u>10.1%</u>	<u>\$348.1</u>

SMRS

Active International Equity By Sector

12/31/16



Market Value in Millions				
12/31/16				
	Assets	Percent	Benchmark	Difference
Financials	\$677	19.1%	23.4%	-4.3%
Industrials	659	18.5%	11.6%	6.9%
Consumer Discretionary	514	14.5%	11.5%	3.0%
Materials	316	8.9%	7.9%	1.0%
Consumer Staples	311	8.7%	9.8%	-1.1%
Information Technology	306	8.6%	9.3%	-0.7%
Health Care	235	6.6%	8.1%	-1.5%
Energy	164	4.6%	7.3%	-2.7%
Real Estate	154	4.3%	3.3%	1.0%
Utilities	90	2.5%	3.2%	-0.7%
Telecom Services	80	2.3%	4.6%	-2.3%
Total Investments	<u>\$3,506</u>	<u>98.6%</u>	<u>100.0%</u>	<u></u>
Cash Equivalents	48	1.4%	0.0%	1.4%
Total	<u>\$3,554</u>	<u>100.0%</u>	<u>100.0%</u>	<u></u>

Benchmark: MSCI ACWI ex USA

International Active Manager Performance - Net of Fees
12/31/16

<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 Date</u>
PIMCO Intl StocksPlus TR Strategy MSCI EAFE Net Div Index (unhedged)	\$977,053,417	3.8% 1.0%	-1.8% -1.6%	8.0% 6.5%	-- --	10/1/10
LA Capital World MSCI ACWI Ex-US	821,006,197	0.6% 5.0%	-- --	-- --	-- --	10/30/15
Marathon-London Intl Fund MSCI EAFE Index	604,808,423	1.2% 1.0%	1.0% -1.6%	-- --	-- --	2/1/12
SSGA Small Cap Intl Alpha Strategy S&P Developed Ex-US Small Cap	573,302,422	0.8% 3.4%	1.9% 1.6%	11.2% 9.2%	8.8% 7.0%	5/1/07
Wellington Intl Research Equity S&P BMI World Ex-US Index	571,582,969	-0.6% 3.0%	-1.3% -1.0%	6.8% 6.5%	4.2% 4.2%	12/1/05
Pimco EM Stock Plus MSCI Emerging Market Index	428,579,799	14.8% 11.2%	-- --	-- --	-- --	3/31/15
LA Capital Emerging Market MSCI Emerging Market Index	297,687,881	11.3% 11.2%	-2.0% -2.6%	1.5% 1.3%	-- --	12/8/09
Effissimo Capital Management Japan MSCI EAFE Net Div Index (unhedged)	264,289,380	5.7% 1.0%	-- --	-- --	-- --	12/1/15
Wellington Emerging Local Equity MSCI EAFE Net Div Index (unhedged)	215,721,456	4.6% 11.2%	-0.7% -2.6%	-- --	-- --	10/30/15
Lazard Wilmington Intl Equity Portfolio MSCI EAFE Net Div Index (unhedged)	204,750,000	-4.1% 1.0%	-- --	-- --	-- --	5/1/14

International Indexed Manager Performance, Net of Fees
12/31/16

<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 Date</u>
SSgA PMI Fund S&P Developed Ex-US Large/Midcap	\$1,003,483,632	3.3% 2.9%	-1.2% -1.6%	6.2% 6.0%	-- --	4/1/10
SSgA EMI Fund - Europe/Pacific S&P EPAC Small Cap	797,733,309	1.6% 1.8%	2.3% 2.1%	10.5% 10.3%	-- --	4/1/10
Vanguard Emerging Market Spliced Emerging Market Index **	578,929,698	11.8% 11.8%	-1.6% -1.0%	1.5% 1.6%	-- --	7/1/09
Vanguard Developed Mkts Fund Spliced Developed Ex-US Index *	555,769,530	2.5% 2.3%	-1.2% 1.1%	7.0% 6.9%	-- --	4/1/10

* 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

PRIVATE EQUITY REVIEW

Investment Advisory Committee Meeting

March 9, 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	9.1%	12.5%	13.7%	14.7%	11.4%
Benchmark Return	18.8%	14.3%	19.4%	17.0%	10.9%
Peer Median Return	8.3%	8.6%	11.0%	11.1%	8.7%
Rank vs. Peers	33	17	11	6	6

- The Private Equity Division annualized return was 9.1% for the year, underperforming its benchmark by 970 basis points.
- 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 4.5% annualized excess returns over the S&P 500 (ten year S&P 500 return 6.9%).
- Private Equity returns have been strong relative to peer median returns, ranking in the top 6% of peers over the past seven and ten years respectively.

Strategy Update

For the twelve months ending 12/31/16, the Private Equity Division returned approximately \$830 million, net of contributions, to the pension fund (8.7% cash yield on \$9.5 billion AUM). Although the pace of distributions is expected to slow, distribution activity will remain healthy as long as the economic recovery continues; General Partners are incentivized to exit investments at current valuations.

- Commitments closed during the fourth quarter include:
 - \$50 million to GSO COF III Co-Investment Fund, L.P., a mezzanine co-investment fund
 - \$45 million to Warburg Pincus China, L.P., a growth equity fund
 - \$100 million to Veritas Capital Fund VI, a middle market buyout fund

Market Environment

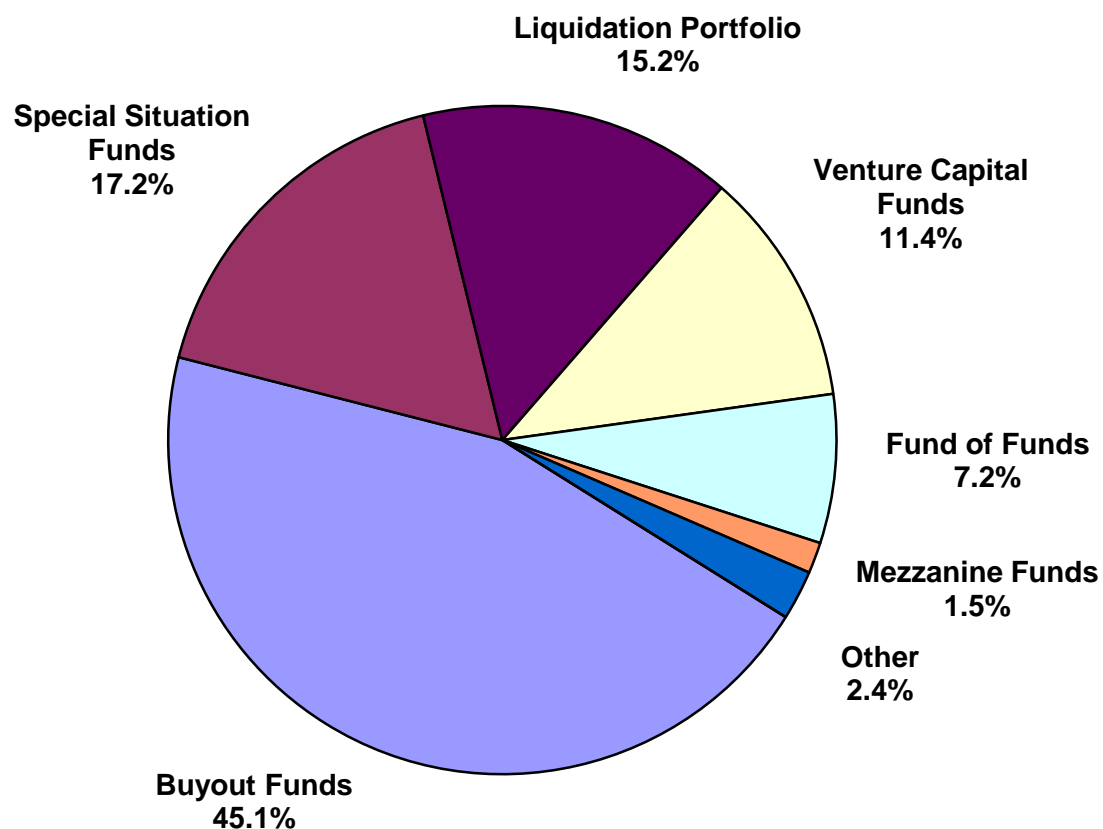
- Private equity investment activity remained muted in the fourth quarter as a result of heightened global macroeconomic uncertainty, high valuations and concerns over market volatility. Fallout from the Brexit referendum in June, Fed rate hike in December and the contentious U.S. election cycle had an adverse impact on private market valuations. The Federal Reserve's near zero 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.

- Private equity firms have been much more active on the sell side, particularly in an environment of lofty valuations and low interest rates. But the sell side has largely played-out and distributions appear to have peaked. In addition, 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. These headwinds will likely impact private equity returns.
- 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

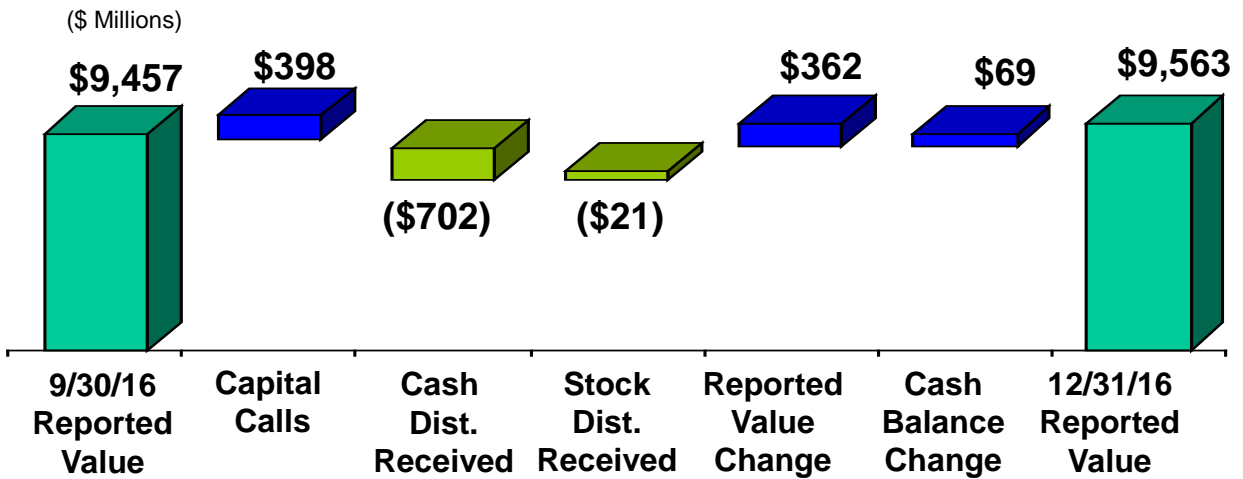
12/31/16



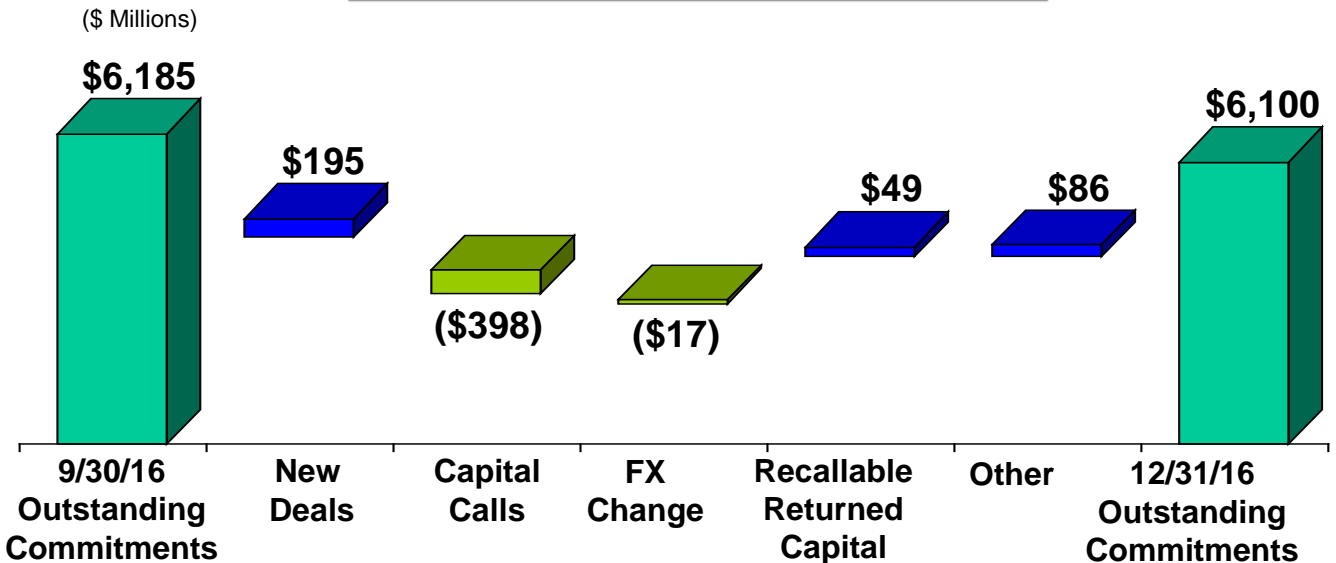
Market Value in Millions				
	<u>12/31/16</u>		<u>9/30/16</u>	
Buyout Funds	\$4,314	45.1%	\$4,356	46.1%
Special Situation Funds	1,648	17.2%	1,593	16.8%
Liquidation Portfolio	1,451	15.2%	1,466	15.5%
Venture Capital Funds	1,095	11.4%	1,061	11.2%
Fund of Funds	686	7.2%	654	6.9%
Mezzanine Funds	141	1.5%	168	1.8%
Other	228	2.4%	159	1.7%
Total	<u>\$9,563</u>	<u>100.0%</u>	<u>\$9,457</u>	<u>100.0%</u>

SMRS Private Equity 12/31/16

Invested Commitments



Outstanding Commitments

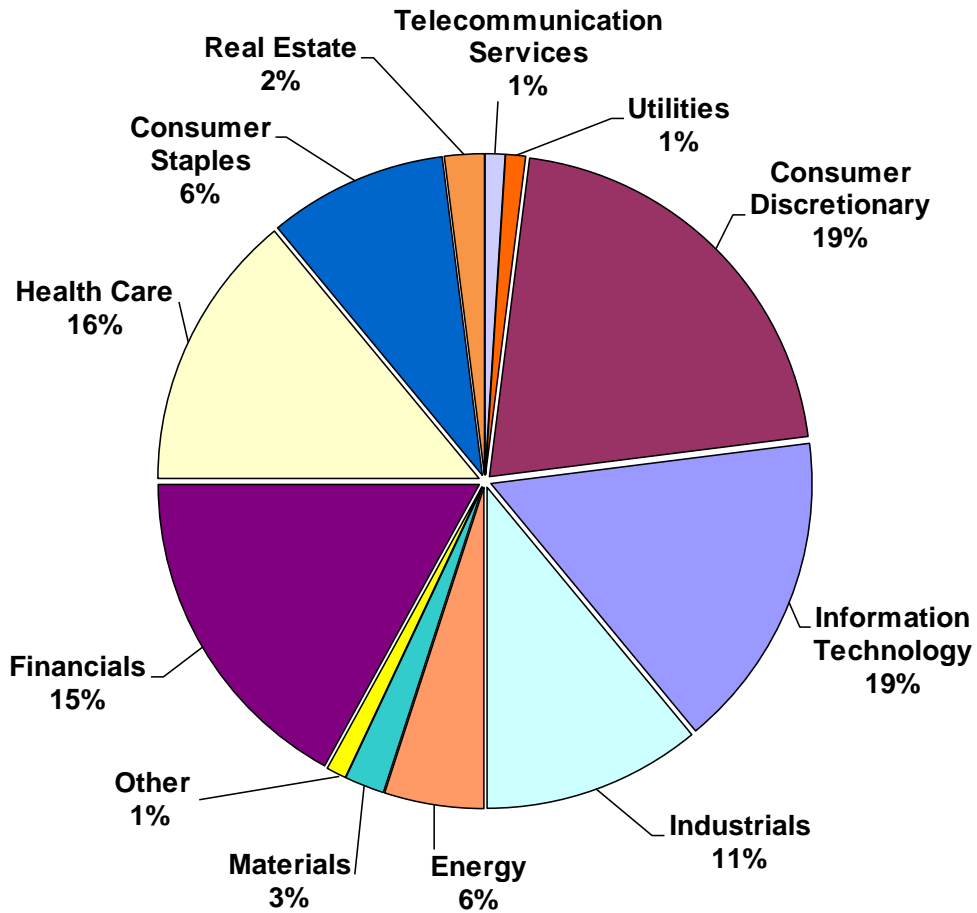


SMRS

Private Equity

12/31/16

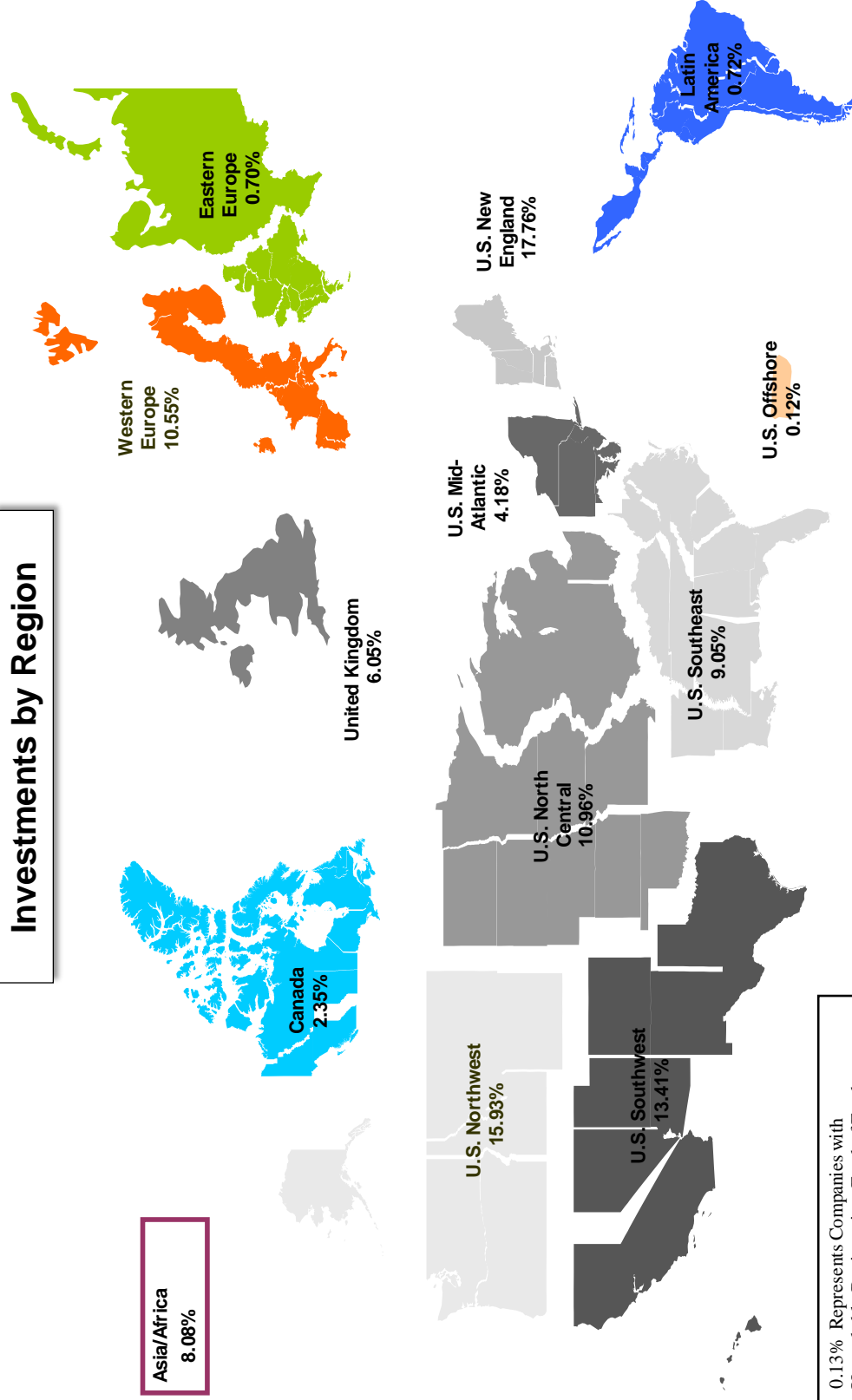
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 12/31/16 and are subject to change.

SMRS Private Equity 12/31/16

Investments by Region



Geographic Report: North America 74%, Europe 17%, Asia 8%, Other 1%

SMRS

Private Equity

12/31/16

Portfolio by Vintage Year

(\$ Millions)

<u>Asset Vintage</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>
1986-98	\$ 9	\$ 12	\$ 21
1999	23	10	33
2000	66	28	94
2001	201	63	264
2002	51	9	60
2003	18	18	36
2004	111	46	157
2005	374	25	399
2006*	995	254	1,249
2007	821	151	972
2008	959	179	1,138
2009	63	1	64
2010	325	20	345
2011	761	145	906
2012	1,145	327	1,472
2013	442	277	719
2014	812	650	1,462
2015	2,011	1,833	3,844
2016	149	2,052	2,201
Income Accruals	1	0	1
Cash	223	0	223
Act. Small Cap - Stock Dist	3	0	3
Total	<u>\$ 9,563</u>	<u>\$ 6,100</u>	<u>\$15,663</u>

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ Millions)

<u></u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>	<u>Total (USD)</u>
Euro (\$1.05/ €)	€ 375	€ 214	€ 589	\$621
Pound (\$1.23/ £)	£2	£1	£3	\$4

SMRS

Private Equity

12/31/16

Top 10 Sponsors

(\$ Millions)

<u>Asset Type</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total</u>
HarbourVest Partners	\$ 1,591	\$ 383	\$ 1,974
Blackstone Group, The	418	501	919
Grosvenor Capital Management	588	264	852
Warburg, Pincus Capital	475	308	783
KKR	523	166	689
Advent International	351	286	637
Leonard Green & Partners	324	245	569
TPG	331	167	498
The Carlyle Group	266	219	485
Berkshire Partners	235	204	439
Top 10 Total Value	<u>\$5,102</u>	<u>\$2,743</u>	<u>\$7,845</u>

Cash Weighted Rates of Return*

<u>(Net IRR)</u>	<u>Current Qtr.</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
Buyout	-0.9%	7.5%	10.5%	14.6%	10.5%
Fund of Funds	0.2%	10.4%	9.0%	10.5%	8.3%
Mezzanine	-0.7%	5.7%	3.6%	9.9%	8.6%
Special Situations	0.7%	7.6%	6.3%	10.2%	8.1%
Venture Capital	0.3%	3.3%	12.8%	13.3%	15.8%

*These numbers are based on most recent available General Partner reported data; primarily 12/31/16 and are subject to change.

SMRS Private Equity 12/31/16

Net Market Values by Ownership Entity

	Adjusted Reported Value	Unfunded Commitment
Accel Europe I, L.P.	\$ 16,075,111	\$ 1
Accel Europe II	16,493,634	3,300,000
Accel Growth Fund II, L.P.	12,954,369	900,000
Accel Growth Fund III, L.P.	10,827,438	3,360,000
Accel Growth Fund IV L.P.	0	22,000,000
Accel IX, L.P.	5,393,313	3,000,000
Accel Leaders Fund L.P.	0	5,500,000
Accel London V L.P.	855,740	11,100,000
Accel VI, L.P.	1,385,716	0
Accel VII, L.P.	1,770,499	5,000,000
Accel VIII, L.P.	3,642,209	4,782,499
Accel VI-S	2,568,144	652,611
Accel X, L.P.	19,263,802	400,000
Accel XI, L.P.	6,626,447	1,680,000
Accel XII, L.P.	5,412,627	2,275,000
Accel XIII, L.P.	1,000,000	9,000,000
Advent Global Private Equity III	991,889	20
Advent Global Private Equity IV	15,302	0
Advent Global Private Equity V	10,171,714	8,700,000
Advent International GPE VI-A LP	135,263,688	3,999,980
Advent International GPE VII-B, L.P.	192,594,792	24,600,000
Advent International GPE VIII-B, L.P.	3,658,037	220,275,000
Advent Latin American Private Equity Fund VI, L.P.	8,579,292	28,122,500
Affinity Asia Pacific Fund II, L.P.	0	5,288,237
Affinity Asia Pacific Fund III, L.P.	55,160,408	12,860,591
Affinity Asia Pacific Fund IV, L.P.	58,381,049	73,837,623
Apax Europe Fund VI	18,259,471	2,230,583
Apax Europe V, L.P.	190,979	0
Apax Europe VII, L.P.	43,657,693	1,810,573
Apax Excelsior VI	80,766	1,614,434
Apax IX, L.P.	0	150,000,000
Apax US VII	12,119,683	417,509
Apax VIII - B, L.P.	111,392,722	8,235,088
Apollo Investment Fund VIII L.P.	60,496,283	45,048,032
Arboretum Ventures II	2,696,978	0
Arboretum Ventures III, L.P.	12,755,404	1,170,000
Arboretum Ventures IV, L.P.	3,301,595	24,780,000
Ares Corporate Opportunities Fund II	11,415,926	11,423,773
Ares Corporate Opportunities Fund III, LP	77,323,159	9,319,400
Ares Corporate Opportunities Fund IV, L.P.	84,944,257	28,919,645

	Adjusted Reported Value	Unfunded Commitment
AXA ASF Miller Co-Investment	40,788,371	22,721,187
Axiom Asia IV, L.P.	5,380,284	44,169,399
Axiom Asia Private Capital Fund III, L.P.	27,915,317	13,001,764
BC European Capital IX	69,313,489	9,863,156
BC European Capital VII, L.P.	517,281	0
BC European Capital VIII, L.P.	30,171,211	8,248,145
Berkshire Fund IX, L.P.	0	175,000,000
Berkshire Fund V, L.P.	254,844	3,281,560
Berkshire Fund VI, L.P.	56,315,865	6,922,153
Berkshire Fund VII, L.P.	72,882,407	2,451,974
Berkshire Fund VIII, L.P.	105,779,277	16,734,278
Blackstone Capital Partners IV	41,694,537	4,983,771
Blackstone Capital Partners V	56,113,410	16,142,412
Blackstone Capital Partners VI, LP	284,076,987	50,004,715
Blackstone Capital Partners VII, L.P.	1,386,404	268,357,288
Blackstone Capital Partners V-S	8,126,373	712,476
Bridgepoint Europe IV	35,535,148	6,366,943
Carlyle Europe Partners II	2,527,467	3,908,137
Carlyle Europe Partners III	33,108,070	5,850,461
Carlyle Europe Partners IV, L.P.	45,610,043	55,276,537
Carlyle Partners IV, L.P.	6,316,343	16,009,296
Carlyle Partners V L.P.	88,381,634	57,928,593
Carlyle Partners VI, L.P.	90,190,349	79,937,779
Castle Harlan Partners IV	7,096,331	5,286,319
Castle Harlan Partners V	38,056,618	38,442,690
CCMP Capital Investors II	64,606,160	10,346,490
CCMP Capital Investors III, L.P.	32,856,425	22,387,393
Centerbridge Capital Partners III, LP	23,095,537	55,451,984
Cerberus SMRS Partners, L.P.	87,038,157	27,804,657
CM Liquidity Fund, L.P.	0	25,000,000
Coller International Partners IV	565,121	1,000,000
Coller International Partners V, L.P.	42,093,964	43,600,000
Coller International Partners VI, L.P.	65,454,193	29,723,267
Coller International Partners VII, L.P.	7,024,555	144,720,189
Crescent Mezzanine Partners VI, L.P.	48,302,764	12,833,704
Crescent Mezzanine Partners VII	7,868,122	143,521,361
DLJ Investment Partners II	161,126	0
DLJ Investment Partners III	7,268,038	44,179,676
Dover Street IX, L.P.	2,597,446	96,000,000
EDF Ventures III	1,322,138	0
EnCap Energy Capital Fund X, L.P.	13,023,685	31,324,428
Entertainment IP Fund, L.P.	1,807,101	47,015,966
FIMI Opportunity 6, L.P.	1,820,727	48,204,546
FirstMark Capital I, L.P.	77,370,616	196,596
FirstMark Capital IV, L.P.	0	35,000,000
FirstMark Capital OF I, L.P.	11,403,990	7,800,000
FirstMark Capital OF II, L.P.	0	35,000,000
FirstMark Capital P2, L.P.	168,159,757	0

	Adjusted Reported Value	Unfunded Commitment
Flagship Ventures Fund 2004	9,994,998	0
Flagship Ventures Fund 2007, L.P.	27,162,438	0
Flagship Ventures Fund IV, L.P.	81,660,484	0
Flagship Ventures Fund V	26,816,723	17,150,000
Flagship Ventures Opportunities Fund I, L.P.	2,000,000	48,000,000
Fox Paine Capital Fund II, LP	23,746,793	15,539,184
FS Equity Partners VII, L.P.	47,935,246	51,690,300
GCM Grosvenor Fund Investment Program I, L.P.	14,097,468	1,422,440
GCM Grosvenor Fund Investment Program II, L.P.	54,049,209	15,954,468
GCM Grosvenor Fund Investment Program III - 2004	56,365,094	5,002,008
GCM Grosvenor Fund Investment Program III - 2006	77,834,495	9,240,364
GCM Grosvenor Fund Investment Program V, L.P.	85,210,308	12,358,065
GCM Grosvenor Fund Investment Program VI, L.P.	17,882,110	16,252,917
GCM Grosvenor Fund Investment Program VIII, L.P.	0	100,000,000
GCM Grosvenor SeasPriFIP LP (PIS06-10)	81,201,099	24,032,160
GCM Grosvenor SeasPriFIP LP (PIS14)	146,084,987	65,821,460
GCM Grosvenor SeasPriFIP LP (Seed)	54,948,185	13,824,219
G-II Acquisition Holdings Note	7,417,859	0
G-IV Acquisition Holdings, LLC	20,936,296	0
Green Equity Investors IV	7,820,513	1,136,036
Green Equity Investors V	191,517,712	25,920,298
Green Equity Investors VI, L.P.	124,765,691	17,623,922
Green Equity Investors VII, L.P.	0	200,000,000
GSO Capital Opportunities Fund II, L.P.	21,780,455	15,614,667
GSO Capital Opportunities Fund III, L.P.	4,717,997	95,261,407
** GSO COF III Co-Investment Fund, L.P.	0	50,000,000
HarbourVest Dover Street VIII, L.P.	47,534,125	11,137,500
HarbourVest Int'l III Direct	588,711	1,000,000
HarbourVest Int'l III Partnership	713,729	1,200,000
Harbourvest Partners Co-Investment Fund IV L.P	19,012,162	80,750,000
HarbourVest Partners Mezzanine Income Fund	12,766,134	37,310,000
HarbourVest V Partnership	210,763	300,000
HarbourVest VI - Direct Fund LP	4,071,107	750,000
HarbourVest VI Partnership	9,561,440	2,000,000
Harvest Partners VII, L.P.	957,540	74,042,460
HPS Mezzanine Partners III, L.P.	0	50,000,000
HVST - TOPE LLC	325,644,124	0
Insight Venture Partners Growth-Buyout Coinvestment Fund, L.I	31,048,421	21,625,000
Insight Venture Partners IX, L.P.	63,430,561	38,500,000
Kelso Investment Associates IX, L.P.	41,430,539	66,836,110
Kelso Investment Associates VII	3,021,682	4,970,176
Kelso Investment Associates VIII	95,587,359	23,917,267
Khosla Ventures III, L.P.	48,262,217	1,250,000
Khosla Ventures IV, L.P.	74,762,844	1,650,000
Khosla Ventures V, L.P.	22,936,146	27,150,000
KKR 2006 Fund, L.P.	145,891,854	5,911,786
KKR Americas Fund XII, L.P.	0	200,000,000
KKR Asian	23,395,178	2,360,055

	Adjusted Reported Value	Unfunded Commitment
KKR Asian Fund II, L.P.	40,889,366	23,678,742
KKR China Growth Fund	43,064,346	5492722
KKR E2 Investors (Annex) Fund	458,556	0
KKR European Fund II	5,611,461	0
KKR European Fund III	73,612,950	22,854,187
KKR European Fund IV L.P.	40,410,169	80,956,703
KKR European Fund LP 1	0	0
KKR Millennium Fund	32,630,304	0
KKR North America Fund XI, L.P.	116,588,792	24,909,783
Lightspeed Venture Partners VI	2,832,700	0
Lightspeed Venture Partners VII, L.P.	53,652,919	510,436
Lion Capital Fund I (HME II)	91,643	10,697,652
Lion Capital Fund II	4,794,644	4,450,156
Lion Capital Fund III, L.P.	81,747,359	12,734,667
MatlinPatterson Global Opportunities Partners II	3,033,624	0
MatlinPatterson Global Opportunities Partners III	68,382,468	4,336,976
Menlo Ventures IX, L.P.	3,900,349	0
Menlo Ventures X, L.P.	45,314,100	0
Menlo Ventures XI, L.P.	75,961,988	1,000,000
MeriTech Capital Partners II, L.P.	2,716,509	1,850,000
Meritech Capital Partners III, L.P.	12,946,208	600,000
Meritech Capital Partners IV, L.P.	17,942,408	900,000
Meritech Capital Partners V, L.P.	6,921,812	12,350,000
Michigan Growth Capital Partners II, L.P.	151,753,994	27,429,217
Michigan Growth Capital Partners III, L.P.	6,130,220	93,703,804
Michigan Growth Capital Partners, LP	74,399,969	16,744,744
Midtown Fund III, L.P.	0	0
Midtown II Liquidating Trust	2,340,346	0
New Leaf Growth Fund I, L.P.	143,826,291	0
New Leaf Ventures II, L.P.	19,008,118	0
New Leaf Ventures III, L.P.	15,194,088	20,812,500
Nordic Capital VI, L.P.	18,858,399	0
Nordic Capital VII	59,324,760	2,878,365
Nordic Capital VIII, L.P. (Alpha)	26,199,405	20011772
Oak Investment Partners X, L.P.	7,433,731	0
Oak Investments Partners IX, L.P.	1,314,995	0
Oaktree Opportunities Fund X, L.P.	11,529,203	19,500,000
Oaktree Opportunities Fund Xb, L.P.	0	70000000
OCM Opportunities Fund IX, L.P.	74,267,110	0
OCM Opportunities Fund VII (B), L.P.	4,488,971	0
OCM Opportunities Fund VII, L.P.	5,654,724	0
OCM Opportunities Fund VIII B, L.P.	24,715,749	0
OCM Opportunities Fund VIII, L.P.	13,850,394	0
OCM Principal Opportunities Fund IV	22,172,690	0
Ocqueoc Holdings, LLC	15,201,164	50,000,000
One Liberty Fund III	1,138,406	0
One Liberty Fund IV	1,813,264	0
One Liberty Ventures 2000	5,950,484	0

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Parthenon Investors II	1,733,619	3,186,779
Parthenon Investors III	43,355,755	2,779,682
Parthenon Investors IV, L.P.	46,204,255	9,495,012
Peninsula Capital Fund IV	6,875,553	2,201,026
Peninsula Fund VI, L.P.	12,261,655	28,670,000
Phoenix Equity Partners IV	2,894,171	738,567
Public Pension Capital, LLC	15,269,390	35,005,222
Questor Partners Fund II	0	5,816,186
Rhone Partners V, L.P.	7,478,159	94,516,679
Riverside Capital Appreciation Fund VI, LP	56,395,946	22,399,709
Riverside Micro Cap Fund I, LP	29,020,281	6,363,307
Riverside Micro-Cap Fund II, L.P.	51,531,951	1,755,585
Riverside Micro-Cap Fund III, L.P.	43,072,123	4,483,406
Riverside Micro-Cap Fund IV	5,683,970	42,147,201
Shamrock Growth Capital Fund IV, L.P.	2,080,727	46,869,093
Silver Lake Partners II	6,072,343	3,531,586
Silver Lake Partners III	78,729,521	13,344,284
Silver Lake Partners IV, L.P.	32,803,086	21,866,010
SM/TCP L.P.	32,289,392	14,918,007
SMRS-NCRP LLC	1,168,467,408	152,837,842
TCW Shared Op Fund III	723,713	0
TCW/Crescent Mezzanine Partners III, L.P.	2,390,846	29,733,856
TCW/Crescent Mezzanine Partners IV, L.P.	3,641,449	13,660,773
TCW/Crescent Mezzanine Partners V, LLC	24,930,802	15,382,013
The Huron Fund III, L.P.	13,814,819	4,992,756
The Huron Fund IV, L.P.	23,812,784	11,008,346
The Shansby Group 4	945,932	520,829
The Shansby Group 5 (TSG5)	19,111,581	4,933,611
Thoma Bravo Fund XII, L.P.	45,947,636	101,681,739
TPG IV (Texas Pacific Group IV)	6,225,428	211,725
TPG Partners III, LP	4,098,350	2,087,002
TPG Partners VI, L.P.	169,875,376	20,536,222
TPG Partners, VII, L.P.	32,430,777	117,741,008
TPG V (Texas Pacific Group V)	117,686,800	26,611,195
Trilantic Capital Partners V (North America) Fund A, L.P.	34,427,566	16,075,184
TSG6, L.P.	103,588,709	40,188,287
TSG7 A L.P.	18,216,578	105,153,898
Turnbridge Capital Partners I , LP	33,993,920	58,276,322
Veritas Capital Fund V, L.P.	54,852,353	23,884,502
** Veritas Capital Fund VI, L.P.	0	100,000,000
Veritas V Co-Investors, L.P.	10,843,953	15,000,000
Vista Equity Partners Fund V, L.P.	44,825,731	10,701,496
Vista Equity Partners Fund VI, L.P.	26,639,818	48,400,391
Vista Foundation Fund III, L.P.	1,942,863	16,686,088
** Warburg Pincus China, L.P.	3,825,000	41,175,000
Warburg Pincus Energy MCIP, L.P.	14,365,482	10730036
Warburg Pincus Energy, L.P.	29,651,963	67,800,000
Warburg Pincus Equity Partners, L.P.	1,178,227	0

	Adjusted Reported Value	Unfunded Commitment
Warburg Pincus International Partners	8,795,856	0
Warburg Pincus Private Equity IX	26,738,127	0
Warburg Pincus Private Equity VIII, L.P.	10,948,411	0
Warburg Pincus Private Equity X, L.P.	152,898,342	0
Warburg Pincus Private Equity XI, L.P.	194,618,450	24,200,000
Warburg Pincus Private Equity XII Secondary, L.P.	4,119,892	20,512,500
Warburg Pincus Private Equity XII, L.P.	28,227,254	143,587,500
WestAm COREplus Private Equity QP	2,603,860	2,086,719
WestAm Special Private Equity Partners	4,015,455	2,317,427
Total Private Equity	\$ 9,335,115,172	\$ 6,100,022,692
Cash	206,271,624	-
Active Small Cap Cash	17,111,301	-
Active Small Cap	3,315,961	-
Income Accruals	1,138,846	-
Grand Total	\$ 9,562,952,904	\$ 6,100,022,692

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

** New Commitments made during quarter reported

State of Michigan Retirement Systems

REAL ESTATE AND INFRASTRUCTURE REVIEW

Investment Advisory Committee Meeting

March 9, 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	10.3%	13.2%	11.9%	10.8%	5.2%
NCREIF NPI	6.5%	9.6%	9.5%	10.2%	5.5%
Peer Median Return	8.6%	10.5%	11.0%	10.6%	3.7%
Rank vs. Peers	30	16	32	45	30

- Total Real Estate and Infrastructure Division (REID) value was \$6.6 billion with a total one-year return of 10.3%. Increased rental income throughout the portfolio drove performance in the period. Development and lease-up of apartments, warehouse, and office properties continued on schedule. Credit strategies and unique opportunities sourced by staff also contributed to the overall performance.

Strategy Update

- The REID has a focused strategy that pursues attractive risk-adjusted returns. This includes development of urban apartments and warehouses, acquisition of office buildings where REID can add value through management and leasing, and investing in various levels of the capital stack through its credit strategies. Also, REID has selectively added exposure in Europe where value-add opportunities are sourced through managers that have established history and presence in the market.
- The REID has been actively managing the portfolio by selling stabilized assets at attractive capitalization rates where growth in rental income is expected to be limited. The REID 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 at attractive values.
- The REID has approximately \$1.6 billion in unfunded commitments. New commitments closed during the quarter include:
 - \$25 million in Asana Partners Fund I, LP, a closed-end, commingled fund focused on retail properties, managed by Asana Partners Fund I GP, LLC.
 - \$37 million in Principal Separate Account, a separate account, for the development of a data center in Dallas, TX, managed by Principal Real Estate Investors.
- 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.

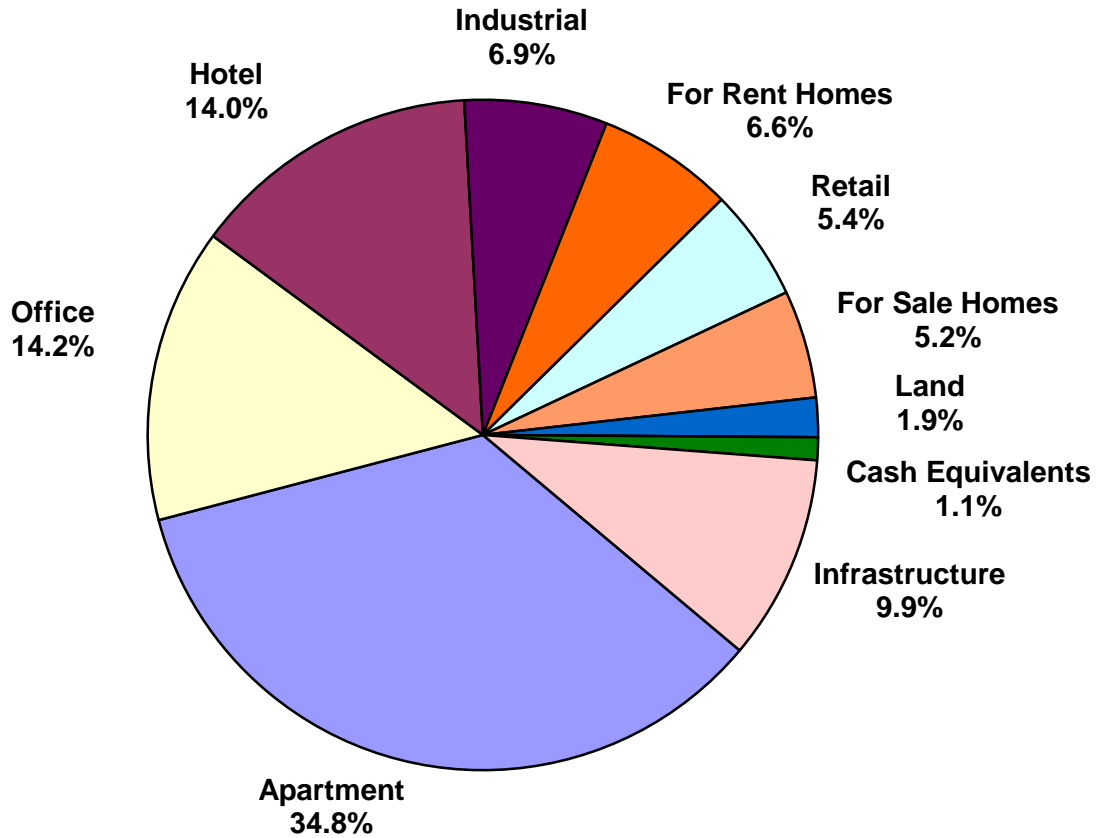
Market Environment

- 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.
- In the commercial mortgage-backed securities (CMBS) market, spreads over the swap rate for 10-year AAA-rated securities decreased 6 basis points (bps) from the prior quarter and now stand at 103 bps. The reduced supply of securities 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. 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

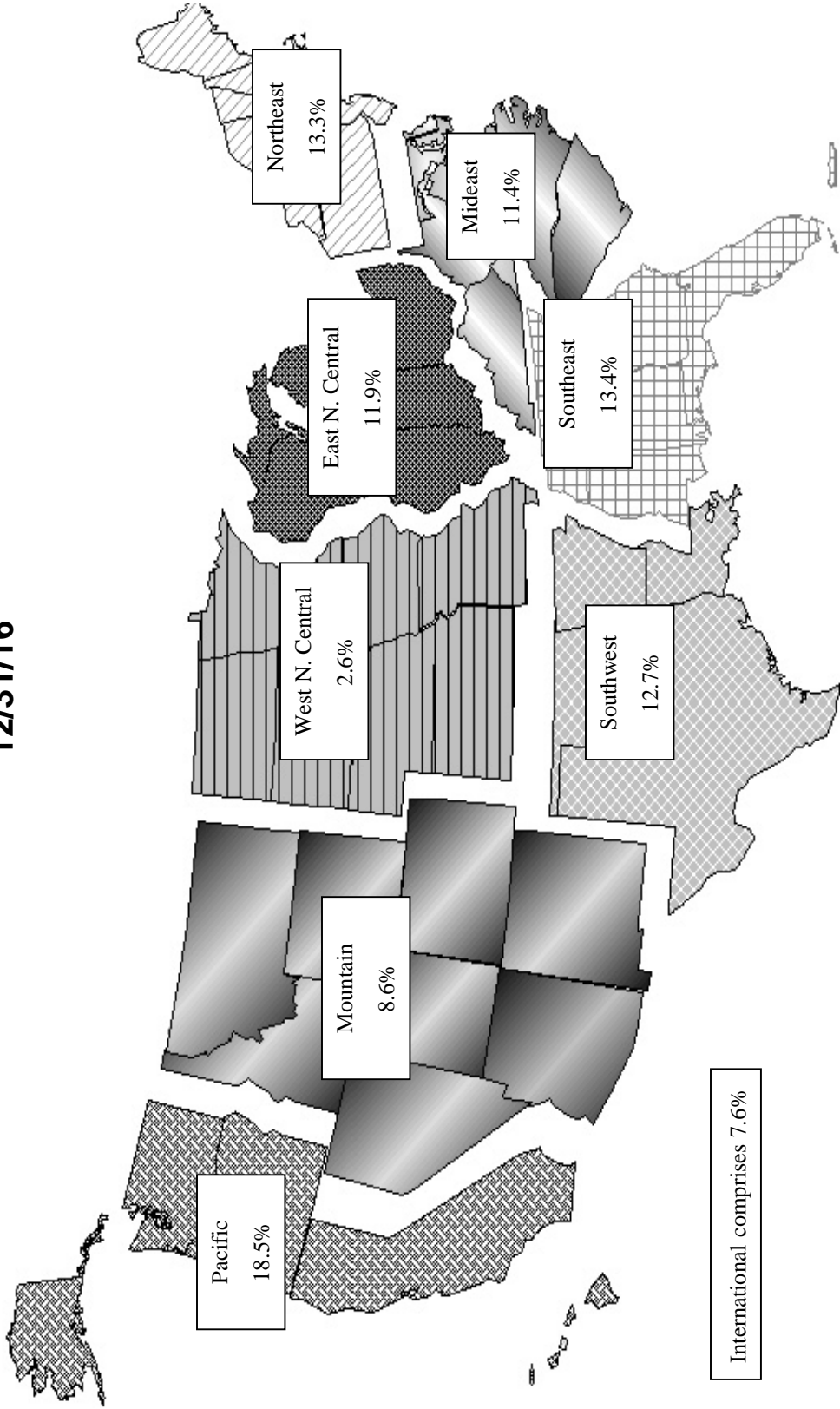
Real Estate and Infrastructure

12/31/16



Market Value in Millions				
	<u>12/31/16</u>		<u>9/30/16</u>	
Apartment	\$2,281	34.8%	\$2,273	34.6%
Office	932	14.2%	1,040	15.8%
Hotel	918	14.0%	916	14.0%
Infrastructure	649	9.9%	625	9.5%
Industrial	451	6.9%	445	6.8%
For Rent Homes	435	6.6%	423	6.5%
Retail	355	5.4%	357	5.4%
For Sale Homes	341	5.2%	335	5.1%
Land	127	1.9%	116	1.8%
	<u>\$6,489</u>	<u>98.9%</u>	<u>\$6,530</u>	<u>99.5%</u>
Cash Equivalents	<u>73</u>	<u>1.1%</u>	<u>34</u>	<u>0.5%</u>
Total Investments	<u>\$6,562</u>	<u>100.0%</u>	<u>\$6,564</u>	<u>100.0%</u>

SMRS
Real Estate by Region
Based on Market Value
(excludes cash & cash equivalents)
12/31/16



Geographic regions defined by NCREIF, whose property index composition is: Pacific 31.5%, Mountain 6.2%, West N. Central 1.4%, Southwest 10.4%, East N. Central 7.6%, Southeast 9.3%, Northeast 21.9%, Midwest 11.8%

SMRS
Real Estate and Infrastructure
12/31/16

**Top Ten
Advisors or Entity**

<u>Advisor or Entity</u>	<u>Market Value</u>
MWT Holdings, LLC (SHLP)	\$ 1,393,392,556
Clarion Partners	683,480,347
Blackstone Group	587,942,944
Domain Capital Advisors Inc	269,421,216
CIM Investment Advisors LLC	266,208,541
Kensington Realty Advisors	250,808,452
Principal Real Estate Investors	242,459,368
Bentall Kennedy LP	236,729,397
Five Star Realty Partners LLC	206,642,583
Rialto Capital Management LLC	199,786,714
	<u>\$ 4,336,872,118</u>

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	95.3%	86.6%	94.2%	93.9%	78.8%
National Average	93.1%	87.0%	91.6%	94.7%	69.3%

SMRS
Market Values by Ownership Entity
12/31/16

REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 77,859,367	\$ 0
Apollo Asia Real Estate Fund, L.P.	0	74,437,296
* Asana Partners Fund I, LP	0	25,000,000
Avanath Affordable Housing I, LLC	24,592,677	1,467,911
Avanath Affordable Housing II, LLC	25,305,084	0
Avanath II SMRS Co-Investment Fund LLC	20,463,113	0
Beacon Capital Strategic Partners IV, LP	1,887,839	0
Beacon Capital Strategic Partners V, LP	2,307,680	0
Blackstone R/E IH3 Co-Inv Partners	435,091,835	0
Blackstone Real Estate Partners V, LP	22,137,080	2,087,026
Blackstone Real Estate Partners VI, LP	34,575,257	3,680,000
Blackstone Real Estate Partners VIII, LP	29,632,945	48,300,000
Capri Select Income II	66,567	0
Capri Urban Investors, LLC	14,459,485	0
CIM Fund III, LP	67,056,383	0
CIM Fund VIII, LP	70,601,215	38,342,263
CIM Urban REIT, LLC	79,798,915	0
CIM VI (Urban REIT), LLC	30,999,470	0
Clarion Gables Multifamily Trust	29,006,695	0
CPI Capital Partners N.A., LP	173,316	0
CPI Capital Partners N.A. Secondary, LP	835,367	0
Crown Small Cap Real Estate	10,017,722	15,000,000
Domain GVA-1, LLC	206,532,855	148,149,052
Domain Hotel Properties, LLC	473,597,593	0
Dynamic Retail Trust	78,723,134	0
Eastport Properties, LLC	19,970,739	0
Gateway Capital R/E Fund II, LP	45,669,028	1,275,000
Great Lakes Property Group Trust	239,299,541	0
IMRF II CoInvest Spiga LP	12,170,239	3,120,792
Invesco Mortgage Recovery Feeder Fund	17,174,088	0
Invesco Mortgage Recovery Fund II, LP	49,137,148	17,543,582
IPF II Co-Invest LP	17,748,091	12,505,897
JBC North LaSalle, LLC	23,832,936	2,275,000
JBC Opportunity Fund III, LP	1,317,651	0
JP Morgan India Property Fund II, LLC	30,206,795	12,315,000
KBS/SM Fund III, LP	41,452,960	0
KBS/SM Fund IV, LP	85,508,025	0
L-A Saturn Acquisition, LP	42,161,964	0
Landmark Real Estate Partners V, LP	14,148,815	3,900,000
LaSalle Asia Opportunity Fund II, LP	261,731	0
LaSalle Asia Opportunity Fund III, LP	10,077,469	1,250,000
Lion Industrial Trust	169,897,672	0
Lion Mexico Fund, LP	10,978,387	0
Lombard GVA0016	232,649,048	0
Lone Star Fund X, LP	0	200,000,000
Lowe Hospitality Investment Partners	199,835	0
Lubert-Adler Real Estate Fund VII, LP	63,921,581	22,500,000
M1 Westgate CoInvest LLC	9,503,012	1,316,670
M301W CoInvest LLC	8,249,546	8,020,612
MERS Acquisitions, Ltd.	144,428,961	0
MG Alliance, LLC	18,578,936	0
MIP Holdco, LLC	85,080,084	25,000,000
Morgan Stanley R/E Fund V - International	3,141,388	0

	<u>Market Value</u>	<u>Unfunded Commitment</u>
Morgan Stanley R/E Fund VI - International	17,424,638	0
Morgan Stanley R/E Fund V - U.S.	2,945,505	0
Morgan Stanley R/E Special Situations Fund III	39,914,749	0
MWT Holdings, LLC	1,393,392,556	0
Northpark-Land Associates, LLLP	27,217,287	64,150,070
Orange Investors LLC	95,844,379	0
Paladin Realty Brazil Investors III (USA), LP	32,033,641	0
Paladin Realty Latin America Investors IV-CI, LP	31,911,697	27,500,000
Penmain Office LLC	35,671,073	0
* Principal Separate Account	164,600,001	36,500,000
Proprium RE Spec Situations Fund LP	23,283,095	21,214,477
Rialto Credit Partnership LP	74,245,739	139,900,000
Rialto Real Estate Fund, LP	26,619,311	0
Rialto Real Estate Fund II, LP	42,325,885	0
Rialto Real Estate Fund III-Debt, LP	5,805,528	43,966,217
Rialto Mezzanine Partners Fund	50,790,251	0
SM Brell II, LP	53,869,361	0
Stockbridge Real Estate Fund II-C, LP	20,726,505	0
Strategic LP	236,729,397	43,600,000
TPG RE Finance Trust	96,470,865	4,333,381
TPG RE Fund II	19,371,441	29,036,575
TSP Spartan C-I LLC	7,800,901	0
TSP Value and Income Fund LP	41,060,924	6,400,000
Trophy Property Development LP	50,932,164	7,408,100
True North High Yield Investment Fund II	24,710,333	5,000,000
True North Real Estate Fund III	22,903,735	29,867,783
Venture Center, LLC	41,276,544	0
Western National Realty Fund II, LP	27,268,820	0
	<u>\$ 5,839,633,591</u>	<u>\$ 1,126,362,704</u>
Short-Term Investments and Other	52,964,851	0
Total Real Estate Investments	<u>\$ 5,892,598,442</u>	<u>\$ 1,126,362,704</u>
INFRASTRUCTURE		
ArcLight Energy Partners Fund VI, LP	\$ 21,628,431	\$ 28,333,181
ASF VI Infrastructure B LP	17,875,468	17,230,011
ASF Como Co-Investment LP	39,149,294	13,188,030
Basalt Infrastructure Partners, LP	36,166,981	12,313,734
Blackstone Energy Partners, LP	52,491,628	4,213,042
Blackstone Energy Partners II, LP	8,094,543	77,468,362
Brookfield Infrastructure Fund II-B, LP	48,678,173	5,801,803
Customized Infrastructure Strategies, LP	67,016,973	9,230,034
Dalmore Capital Fund	60,128,000	0
First Reserve Energy Infrastructure Fund II, LP	25,667,183	52,939,068
GCM Grosvenor Infrastructure Investment Program, LP	45,046,579	0
GCM Grosvenor Customized Infrastructure Strategies II, LP	12,175,524	39,477,346
GSO Energy Select Opportunities Fund LP	5,919,656	45,462,756
JP Morgan AIRRO India Sidecar Fund US, LLC	66,118,073	5,033,815
JP Morgan AIRRO Fund II US, LLC	10,624,272	83,384,246
KKR Eagle CoInvest L.P.	24,119,780	10,504,631
KKR Global Infrastructure Investors, LP	50,663,704	7,181,281
StonePeak Infrastructure Fund LP	57,588,799	15,584,666
	<u>\$ 649,153,061</u>	<u>\$ 427,346,006</u>
Short-Term Investments and Other	20,527,609	0
Total Infrastructure Investments	<u>\$ 669,680,670</u>	<u>\$ 427,346,006</u>
TOTAL INVESTMENTS	<u>\$ 6,562,279,112</u>	<u>\$ 1,553,708,710</u>

* New or additional commitment made during the quarter reported

State of Michigan Retirement Systems

BASKET CLAUSE REVIEW

Investment Advisory Committee Meeting

March 9, 2017



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

SMRS

Basket Clause Investments

12/31/16

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$4,066,738,494
Total Real Return and Opportunistic	956,982,743
Total International Equity	561,977,253
Total Long-Term Fixed Income	<u>54,296,213</u>
Total Basket Clause Investments	<u>\$5,639,994,703</u>

The basket clause investments at December 31, 2016, were \$5.6 billion or 9.1% of the total portfolio value of \$62.2 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.