

INVESTMENT ADVISORY COMMITTEE MEETING

December 15, 2016

State of Michigan Retirement Systems

Quarterly Investment Review



Nick A. Khouri, State Treasurer

Prepared by Bureau of Investments
Michigan Department of Treasury

INVESTMENT ADVISORY COMMITTEE MEETING

DECEMBER 15, 2016

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 9/1/16 IAC Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 9/30/16
- 10:00 a.m. Current Asset Allocation Review
- Markets Review and Outlook
- 10:15 a.m. KKR ~ Henry McVey, Head of Global Macro and Asset Allocation,
CIO of Balance Sheet
- Review of Investment Reports – *Receive and File*
- Absolute and Real Return/Oppportunistic
 - Domestic Equity
 - Fixed Income
 - International Equity
 - Private Equity
 - Real Estate & Infrastructure
- Basket Clause
- 11:00 a.m. Closing Remarks ~ Adjournment



2017 Meeting Schedule

Thursday, March 9, 2017
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

December 15, 2016



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

INVESTMENT ADVISORY COMMITTEE

The Investment Advisory Committee (IAC) held its quarterly meeting on Thursday, September 1, 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
Allan R. Pohl, LARA

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
Karl Borgquist	Marge McPhee	Janet Sudac

Others in attendance:

Max Kotary	Steve Cummings	Tim McEnery
June Morse	Molly Jason	Mark Guastella
Paul Lerg	Joe Curtin	

Call to Order

Mr. James B. Nicholson called the September 1, 2016, IAC meeting to order at 9:30 a.m.

Approval of Minutes of June 16, 2016

- Mr. Nicholson asked for a motion to approve the minutes of the June 16, 2016, IAC meeting. Mr. Erik Lundberg so moved, seconded by Mr. Reginald Sanders, there were no objections – motion carried.

Executive Summary Tab – Performance Review

- Mr. Braeutigam discussed performance highlighting relative returns versus peers; beating peers over all time periods.
- Mr. Braeutigam noted that ten-year performance figures include the Great Recession.
- Mr. Braeutigam noted that the one-year return is 1.5%, but the fiscal year-to-date it is over 6%.
- Mr. Greg Parker added that over the past ten years, the returns have been higher than peers adding about \$4 billion in value versus median and \$8 billion more than the bottom quartile. He credited staff for their good work.

Asset Allocation & Performance Tabs

- Mr. Parker provided an overview of the asset allocation and how assets are allocated.
- Mr. Parker noted, and referred to a graph from the Wall Street Journal, how much more difficult it is today to earn the actuarial rate of return than just ten or twenty years ago. He noted that there is a lot more risk needed, along with more complexity.
- Mr. Parker discussed the Brexit and how hard this hit the markets; however, the markets have fully recovered.
- Mr. Parker also noted that volatility in the S&P 500 is at 20-years lows.
- Mr. Peter Woodford and Mr. Jim Elkins provided an overview of some new commitments that were made during the past quarter.

Absolute and Real Return / Opportunistic Review

- Mr. Jim Elkins noted that hedge funds portfolios have struggled this past year, specifically fundamental long/short equity.
- Mr. Elkins pointed out that this is a repeat from three years ago, and then they went on to return high teen rates of return over the next few years.
- Mr. Elkins also noted that quant hedge funds are doing very well; and that longer-term returns are in line with expectations.
- Mr. Elkins noted that performance for credit was positive and plans to continue in credit strategies.

Domestic Equity Review

- Mr. Jack Behar discussed active equity and low fees, providing a brief highlight of how the division's lower fee structure began.
- Mr. Behar noted that growth stocks have outperformed value stocks over the past ten years. This has provided a headwind to performance. He also noted that historically value stocks have outperformed growth stocks over extended periods of time.
- Mr. Behar provided information on the PE ratio of several of the holdings noting that they are high quality companies with significant competitive advantages.
- Mr. Behar expects the total active equity portfolio PE ratio to at least partially converge with that of the S&P 500 over the next five years, which will drive annualized outperformance.

Long-Term Fixed Income Review

- Mr. Dan Quigley explained the fixed income performance over the past quarter and discussed the outlook for the near future.
- Mr. Quigley noted that the returns over the past year came from lower rates and lower spreads, noting that this is an unusual combination.
- Mr. Quigley discussed the high-yield spreads, noting that the fund is paring back on exposure in this area.
- Mr. Quigley explained that new money market regulations are providing opportunities at the short end of the yield curve.

- Mr. Quigley noted that an overweight to high quality structured debt is maintained which results in better than benchmark yield to maturity, but with lower interest rate sensitivity.

International Equity Review

- Mr. Richard Holcomb discussed the international equity strategies, which are indexed funds, stock plus funds, and external managers.
- Mr. Holcomb noted that external managers were disadvantaged in the shorter term by the commodity and energy sector rebounds in the second quarter macro events that benefitted emerging market investments.
- Mr. Holcomb discussed the geo political uncertainties that continue to negatively impact global trade.
- Mr. Holcomb also discussed how Brexit concerns caused a sharp decline in the British pound and populist political movements are a concern for the overall European trade outlook.
- Mr. Holcomb commented on the slower growth environment in China which impacts the global outlook and Pacific region suppliers. China continues to slowly reform and open its financial markets.

Private Equity Review

- Mr. Peter Woodford discussed the credit strategy and investment opportunities in the private equity environment.
- Mr. Woodford commented on how the accommodative monetary policy and low interest rates continue to be major issues impacting private equity. He stated that in an attempt to stimulate economic growth, central banks around the world have been flooding markets with liquidity which drive interest rates down and valuations up.
- Mr. Woodford talked about private equity returns and how they lag the public market benchmark return in a strong market.
- Mr. Woodford noted that the best managers are able to easily raise capital and the lower tier managers find this more difficult.
- Mr. Woodford commented that the strategy for the next three to six months will be to continue to focus on credit and opportunistic investing.

Real Estate and Infrastructure Review

- Mr. Brian Liikala discussed the real estate and infrastructure returns noting that credit strategies and unique opportunities have contributed to the overall performance.
- Mr. Liikala noted that being very selective and defensive with new commitments, seeking opportunities that are shorter in duration, deliver more liquidity, and produce consistent cash flow can add value to the fund.
- Mr. Liikala discussed the best times to sell non-strategic properties in secondary markets at attractive values.
- Mr. Liikala talked about the focus on strategy that pursues attractive risk-adjusted returns.

Basket Clause

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

Closing Remarks

Chairman Nicholson thanked everyone for attending.

Next Meeting Date and Adjournment

The next Investment Advisory Committee Meeting is scheduled for Thursday, December 15, 2016. The meeting was adjourned by Chairman Nicholson at 11:15 a.m.

Approved:

James B. Nicholson, Chairman

State of Michigan Retirement Systems

EXECUTIVE SUMMARY

Investment Advisory Committee Meeting

December 15, 2016



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

EXECUTIVE SUMMARY

September 2016

Performance

An overview.

MPSERS Plan (9/30/16)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	7.6%	8.5%	10.2%	9.5%	6.2%
Policy Return	9.8%	8.2%	10.8%	9.8%	6.4%
Peer Median Return	9.6%	6.5%	9.7%	8.8%	5.8%

- The ten-year return includes the impact of the global financial crisis. Over the past three, five, and seven years the annualized returns were higher than the 8% actuarial assumed rate. Over a very long horizon, since 1979, the annualized rate of return on the plan assets have been approximately 9.3%.
- Over the intermediate term, the returns are much higher than peer median returns. Over the past year, however, the median return was 2% higher than the plan return. Favorable asset allocation was offset by overall selectivity. It appears that peer plans have a high exposure to equity beta within their alternatives portfolios, an expensive source for beta. SMRS looks for low equity market risk within the STARR portfolio.
- Compounding even slightly higher than peer returns on \$61.6 billion of SMRS assets, significantly adds up over time. For example, an annualized return of 6.2% compared to the 5.8% peer median return adds roughly \$4.2 billion of value to SMRS over ten years.
- The returns fell below the policy benchmark over the past year by -2.2%. In general, it was a tough market for alpha strategies in the active domestic equity portfolio, private equity, and absolute return portfolios.

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 \$10.7 billion in illiquid assets, primarily private equity. In the September 2016 quarter over \$1.1 billion of new commitments were made.
- The combined systems paid out approximately \$2.1 billion net of contributions over the past twelve months ending in September 2016.
- Over the past year, the allocation to short-term cash decreased by approximately \$100 million. The plans put to work approximately \$850 million in real return/opportunistic strategies, and \$300 million in long-term fixed income, and the plans reduced the allocation to domestic equity by \$1.9 billion, private equity by \$900 million and absolute return by \$400 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.
- Over the last twelve months the broad U.S. stock market return was 15.5%, entirely due to multiple expansion. Safe, low volatility, bond-like equities are near extreme valuations and their returns are very highly correlated (and have become even more so) to changes in interest rates.
- The publicly traded FTSE Nareit REITs Index was up 21% over the past year ending September 2016, out returning the broad domestic equity market by over 5.5%. On an annualized basis, over the past three and five years, the index is up 13.9% and 16.0% respectively.
- The 10-year U.S. Treasury ended September 2016 at 1.6%, about 60 basis points (bps) lower than one year prior. Spreads in both high yield and investment grade fixed income securities continue to narrow and ended the September quarter at slightly higher than average levels.

Economic Backdrop

U.S. economy continues to slowly grow.

- After months of anticipation, at its December 2015 meeting, the Federal Reserve Board voted to increase short-term interest rates by 25 bps. This marks the first time in roughly seven years that the Fed Funds rate is higher than effectively zero percent. By October 2016 the market is pricing an ever increasing probability of a second 25 bps rate hike by December 2016, however much less certain of additional rate increases into 2017.
- The most recent reading of the annualized U.S. GDP growth was 2.9%, above the consensus estimate of 2.6%. Current estimates for 2017 GDP growth for the U.S. is 2.1%. Coincidental economic indicators such as the Institute for Supply Management's Manufacturing and Non-Manufacturing PMI Indexes are above 50, indicating that there currently is still a modest expansion in the U.S. economy.

Investment Update
Highlighting the quarter.

(\$ Millions)

NEW COMMITMENTS

July 1 – September 30, 2016

Asset Class	Fund Name / (Managed By)	Commitment
Private Equity		
	Michigan Growth Capital Partners III, L.P. (Beringea/GCM Grosvenor)	\$100.0
	GCM Grosvenor Fund Investment Program VIII, L.P.	100.0
	HPS Mezzanine Partners III, L.P. (HarbourVest)	50.0
Real Estate & Infrastructure		
	Lone Star Fund X, L.P.	200.0
	M301W ColInvest, L.L.C. (CIM Investment Advisors)	17.0
	Penmain Office, L.L.C. (Domain Advisors)	15.0
Real Return & Opportunistic		
	Apollo Financial Credit Investments Fund III	300.0
	Redding Ridge Holdings, L.P. (Apollo)	100.0
	Sprott Private Resource Lending Fund (U.S.), L.P.	100.0
	Kayne Anderson Energy Fund VII, L.P.	75.0
	RPEP Energy Opp Inst Partner (Ridgewood Energy)	35.0
	Centerbridge SCP III, L.P.	30.0
	Sprott PRL (M), L.P.	25.0
TOTAL		\$1,147.0

State of Michigan Retirement Systems

PERFORMANCE

Investment Advisory Committee Meeting

December 15, 2016



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 September 30, 2016

	% of Portfolio 9/30/16	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	6.2	14	9.5	13	10.2	33	8.5	5	7.6	96	3.4	75
Median - Greater than \$10 Billion ²		5.8		8.8		9.7		6.5		9.6		3.6	
MPSERS Total Plan Policy		6.4		9.8		10.8		8.2		9.8		3.2	
DOMESTIC EQUITIES	25.7	7.2	47	12.7	51	16.2	34	10.3	37	12.2	70	3.6	92
Median ²		7.1		12.7		15.5		9.2		13.5		4.5	
S&P 1500 Index		7.4		13.3		16.4		10.9		15.5		4.0	
INTERNATIONAL EQUITIES	15.9	2.0	85	4.9	58	7.7	60	2.1	28	9.9	49	7.5	26
Median ²		3.0		5.2		7.9		1.5		9.9		6.8	
International Blended Benchmark ³		1.0		3.5		6.3		0.3		9.3		6.9	
PRIVATE EQUITIES	15.3	11.2	6	15.2	5	11.6	19	13.2	14	3.6	77	2.6	56
Median ²		8.9		11.0		9.7		9.2		4.7		2.8	
Alternative Blended Benchmark ⁴		11.2		17.3		15.2		14.8		7.1		3.2	
BONDS	13.2	5.7	19	5.1	58	4.2	53	5.0	25	7.3	44	1.8	26
Median ²		5.2		5.3		4.2		4.4		6.6		1.0	
Barclays Aggregate		4.8		4.1		3.1		4.0		5.2		0.5	
REAL ESTATE & INFRASTRUCTURE	10.6	5.2	26	7.8	69	11.7	36	13.9	17	10.4	57	2.4	41
Median ²		4.1		9.6		11.4		11.1		10.8		1.9	
NCREIF - Property Blended Index ⁵		5.9		9.7		9.8		9.9		7.8		1.4	
NCREIF Open Fund Index Net		5.1		11.4		11.3		11.4		9.1		1.8	
REAL RETURN AND OPPORTUNISTIC	8.8					9.8		12.1		5.4		3.4	
50% (CPI +500 bps) + 50% (8% actuarial rate)						7.2		7.0		7.3		1.7	
ABSOLUTE RETURN	6.5			5.0		4.9		3.2		-1.7		0.8	
HFRI FOF Cons 1 month lagged				2.7		2.6		2.3		-1.3		1.0	
CASH EQUIVALENTS	4.0	0.9		0.5		0.4		0.5		0.7		0.2	
1 Month T-Bill		0.8		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 and SP 500 + 300 bps 3-month lagged 9/30/09 to present.

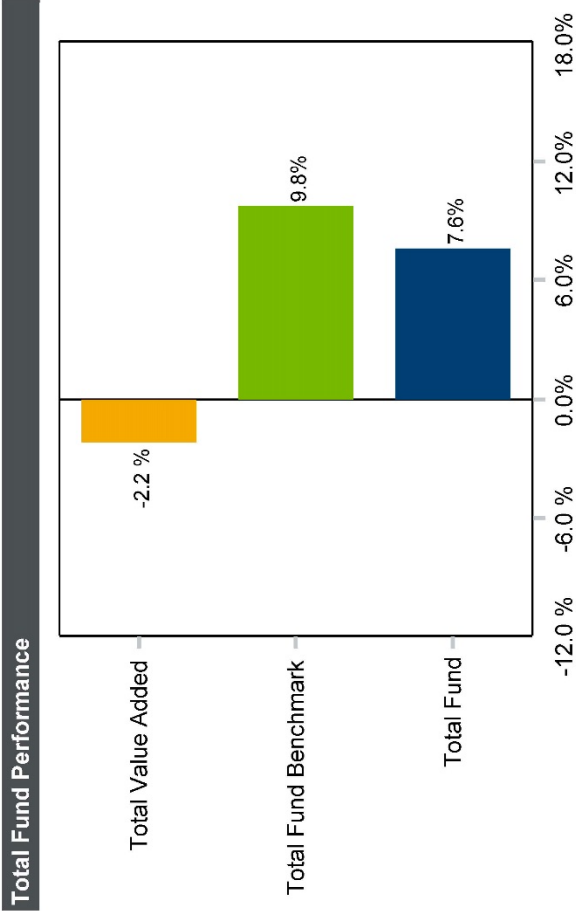
⁵ NCREIF - Property Blended Index is NPI minus 75 bps prior to October 2005, NPI minus 130 bps current.

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

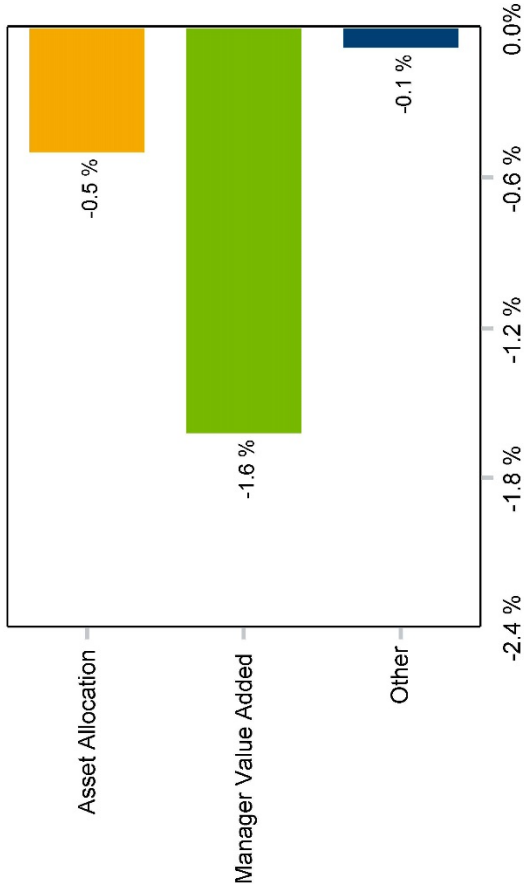
1 Year Ending September 30, 2016

Total Fund Attribution

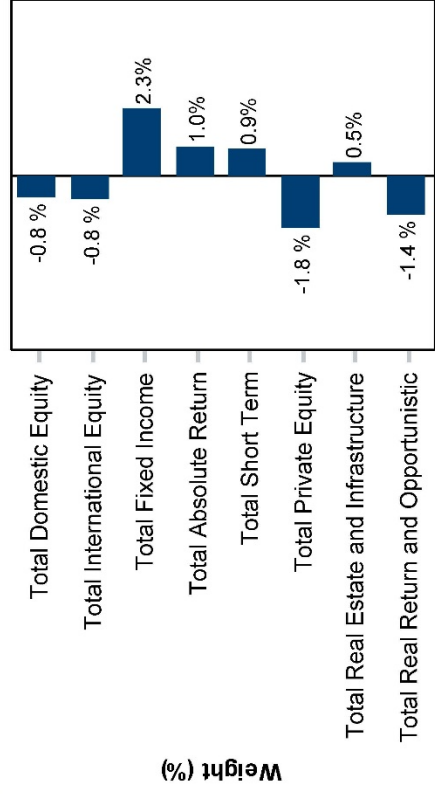
Total Michigan vs. Total Fund Benchmark



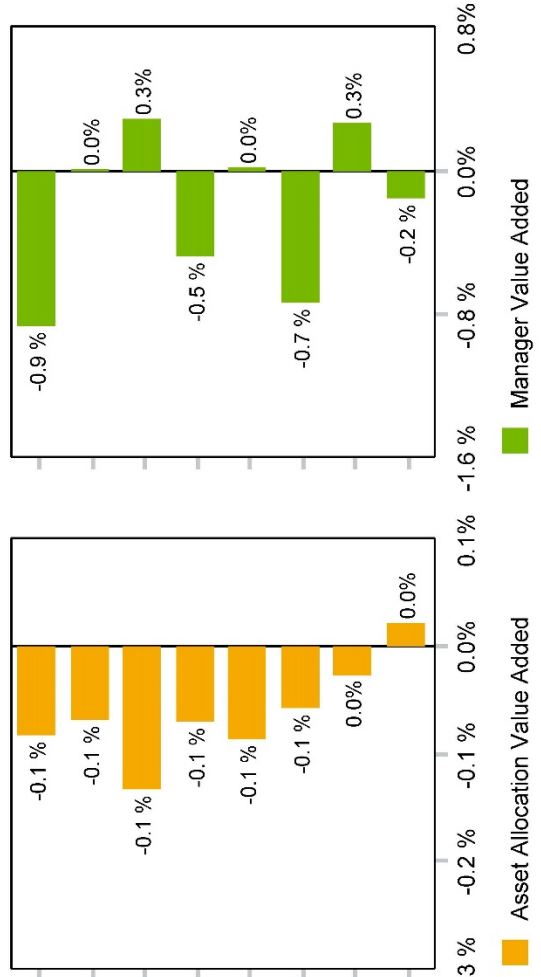
Total Value Added: -2.2%



Total Asset Allocation: -0.5%



Total Manager Value Added: -1.6%



■ Average Active Weight

■ Asset Allocation Value Added

■ Manager Value Added

Cumulative and Consecutive Total Fund Returns

MPSERS										
Cumulative For Years Ending 9/30/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	7.6	5.1	8.5	9.5	10.2	9.6	9.5	7.4	5.0	6.2
Public Plan - Median (> \$10 billion)*	9.6	4.6	6.5	8.2	9.7	8.6	8.8	7.1	4.6	5.8
Rank	96	35	5	8	33	11	13	34	28	14
bp Difference - Median	-201	48	191	121	53	99	74	29	45	39
Consecutive For Years Ending										
	9/16	9/15	9/14	9/13	9/12	9/11	9/10	9/09	9/08	9/07
MPSERS	7.6	2.6	15.6	12.5	13.4	6.6	8.8	-6.1	-12.3	17.2
Public Plan - Median (> \$10 billion)*	9.6	-0.2	11.0	12.6	15.5	2.5	10.2	-0.1	-14.6	16.7
Rank	96	4	3	51	82	4	84	81	22	41
bp Difference - Median	-201	277	457	-5	-208	418	-140	-604	239	48

MSERS										
Cumulative For Years Ending 9/30/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	7.6	5.1	8.4	9.4	10.2	9.6	9.4	7.3	4.9	6.1
Public Plan - Median (> \$1 billion)*	9.8	4.4	6.5	8.2	9.6	8.4	8.7	7.2	4.7	5.8
Rank	89	32	4	8	37	13	15	43	32	26
bp Difference - Median	-221	65	192	125	61	116	69	18	26	32
Consecutive For Years Ending										
	9/16	9/15	9/14	9/13	9/12	9/11	9/10	9/09	9/08	9/07
MSERS	7.6	2.6	15.5	12.5	13.4	6.5	8.5	-6.3	-12.4	17.2
Public Plan - Median (> \$1 billion)*	9.8	-0.3	10.7	12.5	16.0	1.9	10.3	0.2	-14.3	16.3
Rank	89	3	3	52	80	5	85	86	28	37
bp Difference - Median	-221	286	483	-5	-259	452	-181	-643	187	91

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS										
Cumulative For Years Ending 9/30/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	7.6	5.0	8.4	9.4	10.2	9.6	9.4	7.3	4.9	6.1
Public Plan - Median (> \$1 billion)*	9.8	4.4	6.5	8.2	9.6	8.4	8.7	7.2	4.7	5.8
Rank	89	34	4	9	38	13	16	43	32	22
bp Difference - Median	-222	63	188	121	55	116	69	15	27	34
Consecutive For Years Ending										
	9/16	9/15	9/14	9/13	9/12	9/11	9/10	9/09	9/08	9/07
MSPRS	7.6	2.5	15.5	12.4	13.3	6.7	8.5	-6.5	-12.2	17.4
Public Plan - Median (> \$1 billion)*	9.8	-0.3	10.7	12.5	16.0	1.9	10.3	0.2	-14.3	16.3
Rank	89	3	3	52	85	4	85	87	21	32
bp Difference - Median	-222	285	475	-10	-272	478	-182	-665	211	107

MJRS										
Cumulative For Years Ending 9/30/16										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	7.6	5.0	8.2	9.2	10.1	9.4	9.1	7.0	4.8	5.9
Public Plan - Median (> \$1 billion)*	9.8	4.4	6.5	8.2	9.6	8.4	8.7	7.2	4.7	5.8
Rank	89	34	4	18	38	19	33	67	42	40
bp Difference - Median	-221	63	170	99	50	101	34	-13	9	14
Consecutive For Years Ending										
	9/16	9/15	9/14	9/13	9/12	9/11	9/10	9/09	9/08	9/07
MJRS	7.6	2.5	14.9	12.1	13.9	6.1	7.0	-6.4	-11.7	17.0
Public Plan - Median (> \$1 billion)*	9.8	-0.3	10.7	12.5	16.0	1.9	10.3	0.2	-14.3	16.3
Rank	89	3	3	63	70	7	100	86	13	39
bp Difference - Median	-221	283	418	-44	-206	413	-330	-651	261	68

*State Street Public Funds Universe

State of Michigan Retirement Systems

ASSET ALLOCATION REVIEW

Investment Advisory Committee Meeting

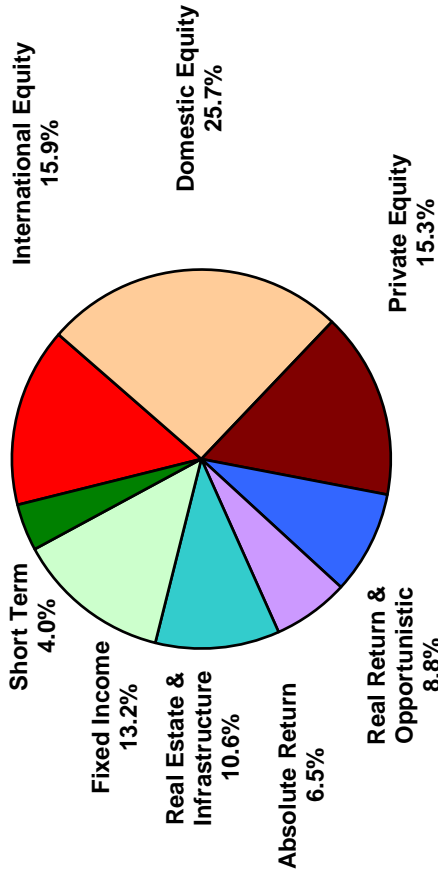
December 15, 2016



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEMS PROFILE - SEPTEMBER 2016

Asset Allocation 9/30/16



Asset Allocation By Market Value (In Millions)

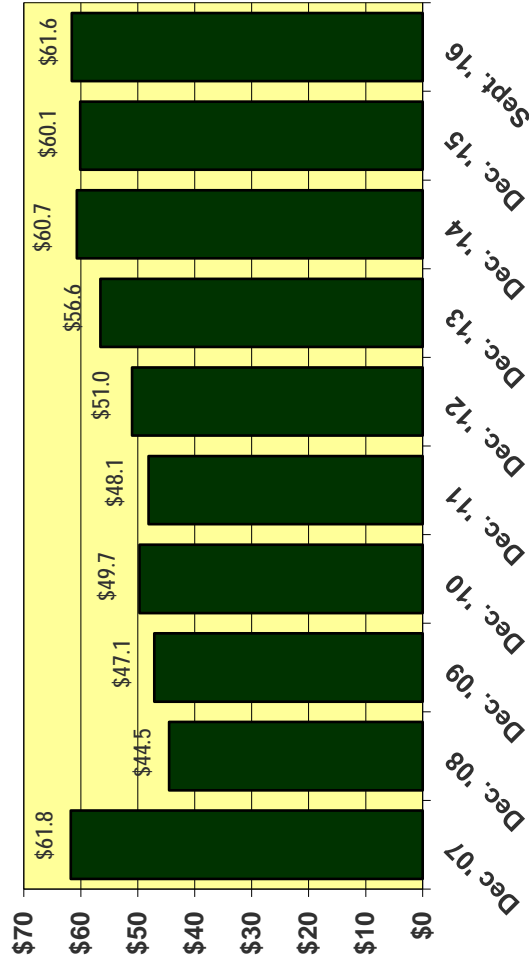
Investment Strategies	9/30/16	6/30/16
Domestic Equity	\$15,842	25.7%
International Equity	9,802	15.9%
Private Equity	9,457	15.3%
Fixed Income	8,112	13.2%
Real Estate & Infra.	6,564	10.6%
Real Return & Opport.	5,397	8.8%
Absolute Return	3,978	6.5%
Short Term***	2,459	4.0%
TOTAL	\$61,611	100.0%

Short Term Equivalents (in Billions)

Short Term Strategy***	\$2.5
Short Term in Other Inv. Strategies	0.5
TOTAL SHORT TERM	\$3.0

4.9% of Total Funds

Market Value* (Billions of Dollars)



Market Value By Plan ~ 9/30/16 (in Millions)

	Pension Plan		OPEB**		Combined	
	Mkt. Value	%	Mkt. Value	%	Mkt. Value	%
MPSERS	\$43,228		\$4,309		\$47,537	77.2%
MSERS - (closed)	10,921		1,512		12,433	20.2%
MSPRS	1,274		111		1,385	2.2%
MJRS - (closed)	255		1		256	0.4%
TOTAL	\$55,678		\$5,933		\$61,611	100.0%



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

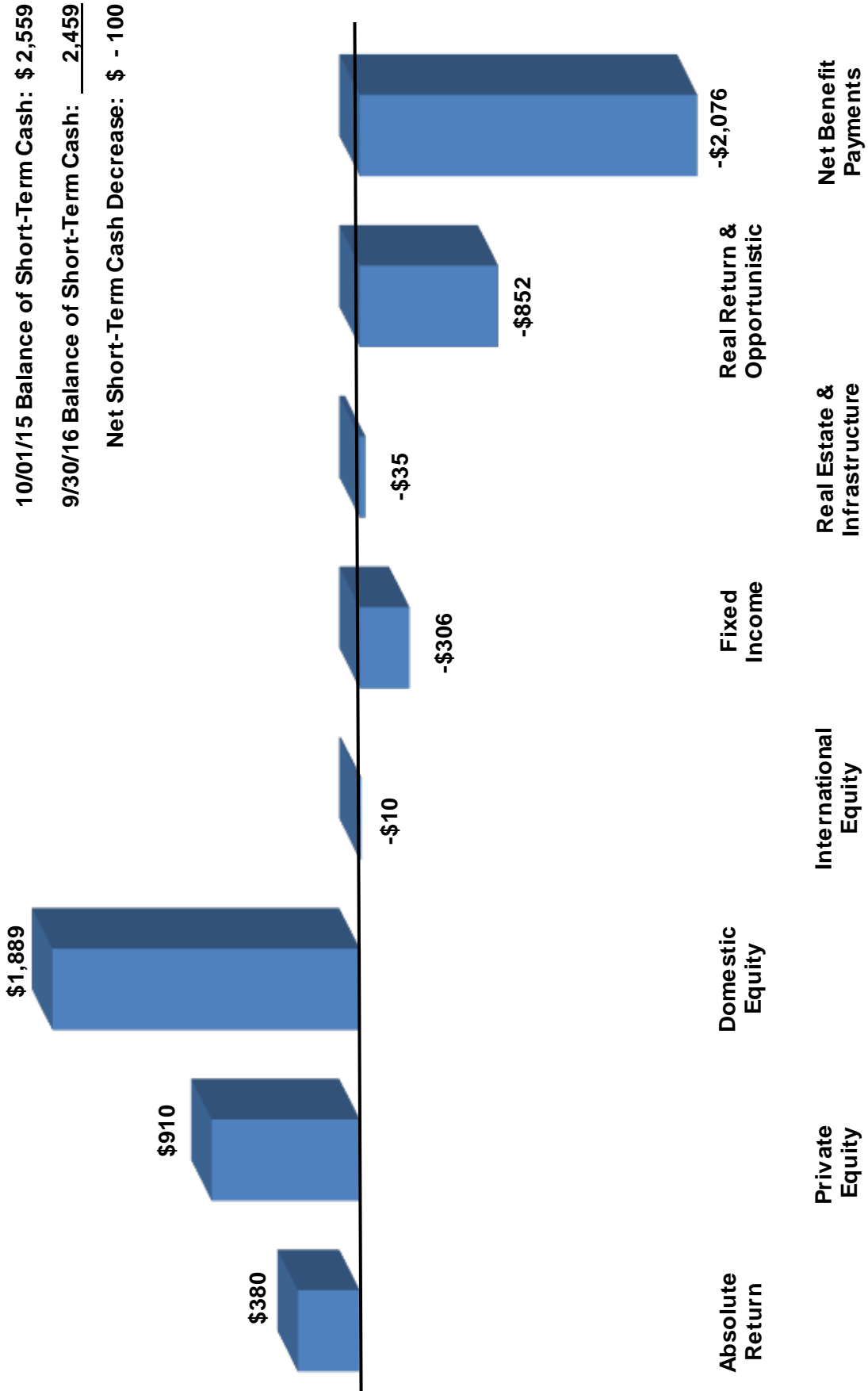


Pensions & Investments Survey - February 8, 2016 Issue

*The combined net payout for the plans for FY 2015 was \$2.2 billion with \$19.9 billion paid out since 2008 (SOMCAFR). This represents the amount paid to beneficiaries in excess of employer and employee contributions.

**OPEB - Other Post Employment Benefits

Sources and Uses of Cash October 2015 ~ September 2016



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

Asset Allocation Targets

As of 9/30/16

Asset Class	MPERS			MSERS			MSPRS			MJRS			SMRS
	Actual 9/30/16	Target 9/30/16	Target* 9/30/17	Actual 9/30/16	Target 9/30/16	Target* 9/30/17	Actual 9/30/16	Target 9/30/16	Target* 9/30/17	Actual 9/30/16	Target 9/30/16	Target* 9/30/17	Ranges
Broad U.S. Equity	25.7%	28.0%	28.0%	25.7%	28.0%	28.0%	25.7%	28.0%	28.0%	25.7%	28.0%	28.0%	20% - 50%
Private Equity	15.3%	17.0%	18.0%	15.3%	17.0%	18.0%	15.3%	17.0%	18.0%	15.3%	17.0%	18.0%	10% - 25%
Broad Int'l Equity	15.9%	15.5%	16.0%	15.9%	15.5%	16.0%	15.9%	15.5%	16.0%	15.9%	15.5%	16.0%	10% - 20%
U.S. Fixed Income Core	13.2%	11.5%	10.5%	13.2%	11.5%	10.5%	13.2%	11.5%	10.5%	13.2%	11.5%	10.5%	8% - 25%
Real Estate / Infrastructure	10.6%	10.0%	10.0%	10.6%	10.0%	10.0%	10.6%	10.0%	10.0%	10.6%	10.0%	10.0%	0% - 15%
Real Return / Opportunistic	8.8%	8.5%	9.5%	8.8%	8.5%	9.5%	8.8%	8.5%	9.5%	8.8%	8.5%	9.5%	0% - 15%
Absolute Return	6.5%	7.0%	6.0%	6.5%	7.0%	6.0%	6.5%	7.0%	6.0%	6.5%	7.0%	6.0%	0% - 12%
Cash	4.0%	2.5%	2.0%	4.0%	2.5%	2.0%	4.0%	2.5%	2.0%	4.0%	2.5%	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.

State of Michigan Retirement Systems

MARKETS REVIEW AND OUTLOOK

Investment Advisory Committee Meeting

December 15, 2016



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

CAPITAL MARKETS

Return and Risk Assumptions, Benchmark and Outlook

A starting point.

MPSERS Plan	Assumed Return* (Arithmetic)	Standard Deviation*	Trailing 10-Year (Benchmark**)	Tactical (Short Term) Expectations***
Private Equity	10.7%	24.0%	11.2%	Hold
International Equity	9.3%	20.9%	1.0%	Hold
Domestic Equity	7.6%	17.4%	7.4%	Trim
Real Estate (Core)	6.1%	11.5%	5.9%	Trim
Absolute Return	5.2%	9.0%	4.8%	Hold
Real Ret/Opportunistic	8.3%	12.1%	7.4%	Add
Long-Term Fixed	2.2%	3.5%	4.8%	Hold
Short-Term	1.7%	1.0%	0.8%	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.
- Over the last twelve months the broad U.S. stock market return was 15.5%, entirely due to multiple expansion. Year over year earnings growth of U.S. equities has averaged 0% over the past few years. Safe, low volatility, bond-like equities are near extreme valuations and their returns are very highly correlated (and have become even more so) to changes in interest rates.
- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending September 2016, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -4.9%, -9.3%, -8.5%, -8.1%, and -4.5% annualized respectively.
- The 10-year U.S. Treasury ended September 2016 at 1.6%, about 60 basis points (bps) lower than one year prior. Spreads in both high yield and investment grade fixed income securities continue to narrow and ended the September quarter at slightly higher than average levels.
- The publicly traded FTSE Nareit REITs Index was up 21% over the past year ending September 2016. The index hit an all-time high in August 2016, though by the end of October 2016 the index has corrected by roughly 11%.
- The U.S. dollar has been range bound over the past year ending September 2016. As measured by the DXY Index, the U.S. dollar has fluctuated around +/- 3.5% and it ended September just slightly below its twelve-month price range.

Domestic Equity

Bond-like equities behaving as bonds.

- Over the last twelve months the broad U.S. stock market return was 15.5%, entirely due to multiple expansion. Year over year earnings growth of U.S. equities has averaged 0% over the past few years. However, perhaps in anticipation of future growth in profits, from a technical perspective the market is attempting to break out of its recent weakening trend. In August, the S&P 500 market index reached a new closing high.
- 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 September 2016, large cap and small-cap stocks delivered nearly the same rate of return. Over the past three, five, seven, and ten years large has outperformed small-cap returns by 4.2%, 0.5%, 0.6%, and 0.2% on an annualized basis. In spite of the performance differences, small-cap stocks continue to look slightly expensive relative to large caps.
- Over the past year, value beat growth by 2.4%; however, over the past three, five, seven, and ten years growth has out earned value by roughly 0.5 - 2.5% annually. The relative returns of value stocks have a long ways to go to get back to historical averages.
- Safe, low volatility, bond-like equities are near extreme valuations and their returns are very highly correlated (and have become even more so) to changes in interest rates. They are also moving more as a pack, rather than a collection of securities.

International Equity

Brexit vote shocks the market.

- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending September 2016, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -4.9%, -9.3%, -8.5%, -8.1%, and -4.5% annualized respectively.
- 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 0.9%, 3.7%, and 1.7% on an annualized basis, though underperforming emerging the past ten years by 2.0%.
- International equity small cap stocks have outperformed the broader MSCI ACWI ex USA index. Last year ending September 2016, the returns for international small caps were 3.8% higher and over the past three, five, seven, and ten years, small caps have outperformed by 2.5% - 3% annually.
- The plan is underweight international equity against a global benchmark (approximately 38% versus 48%) though close to the weight of peers; 15.9% versus 16.2%.
- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international equity markets trade at a 10% discount to the U.S. counterparts, while emerging markets trade at a 30% discount.

Interest Rates

A flattening curve.

- The 10-year U.S. Treasury ended September 2016 at 1.6%, about 60 bps lower than one year prior. The curve is near average in terms of steepness, but it is has not been this flat since October 2007. Since the beginning of the year, the shape of the yield curve has flattened nearly 40 bps.
- Spreads in both high yield and investment grade fixed income securities continue to narrow and ended the September quarter at slightly higher than average levels. Investment grade securities were about 15 bps above and high-yield spreads were about 5 bps above their long-term averages.
- Inflation expectations are being priced lower in the bond markets. The ten-year breakeven rates at the end of September 2016 were priced at 1.6%, 40 bps below the average of the past five years though they have been range bound over the past year. This level is lower than the Fed's target rate of long-term 2% inflation; the market is betting against the Fed.
- 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 September 2016, the Index had a duration of 5.5 compared to 5.8 a year ago.

Real Estate

Rich valuations.

- The publicly traded FTSE Nareit REITs Index was up 21% over the past year ending September 2016, out returning the broad domestic equity market by over 5.5%. On an annualized basis, over the past three and five years, the index is up 13.9% and 16.0% respectively.
- The index hit an all-time high in August 2016, though by the end of October 2016 the index has corrected by roughly 11%.
- The REIT Index is priced modestly cheap relative 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

Rebounding some.

- At the end of September 2016, commodity prices, as measured by the Thomson Reuters CRB Index, were about the same as one year prior, however they are almost 20% higher than the February 2016 lows. Since its peak in 2008, prices are down by about -60%, and prices are now around the March 2009 levels.
- The U.S. dollar has been range bound over the past year ending September 2016. As measured by the DXY Index, the U.S. dollar has fluctuated around +/- 3.5% and it ended September just slightly below its twelve-month price range.

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	2.9	3.2	3.3
U.S.	2.4	2.6	1.5	2.1	2.1
Developed (G8)	1.9	2.2	1.6	1.8	1.9
Asia	4.8	4.9	4.4	4.7	4.6
EMEA	2.2	0.9	1.4	2.4	2.8
Europe	1.2	2.0	1.6	1.3	1.5
Latin America	0.6	-0.4	-1.8	1.8	2.7
China	7.3	6.9	6.7	6.4	6.0

*Source: Bloomberg

Economic Overview

U. S. economy remains the bright spot.

- The most recent reading of the annualized U.S. GDP growth was 2.9%, above the consensus estimate of 2.6%. Current estimates for 2017 GDP growth for the U.S. is 2.1%. Coincidental economic indicators such as the Institute for Supply Management's Manufacturing and Non-Manufacturing PMI Indexes are above 50, indicating that there currently is still a modest expansion in the U.S. economy.
- Interest rates in the U.S. continued to trade at higher levels than those in many developed markets. This is due primarily to the differences in monetary policies.
- The jobs market is fairly healthy. The national unemployment rate is 4.9% and the three-month average figures for both initial jobless and continuing claims continue to stay near the lowest levels in over 40 years. Anecdotally, wages are increasing across the U.S. However, wage growth has been depressed for a number of years prior, so it is difficult to become too concerned about wage-cost inflation right now.
- U.S. housing is a bright spot. At nearly 5.5 million, total existing home sales is near its highest level in nine years, although the level has plateaued over the past year or so. Demand is more robust than supply; housing inventory-to-sales ratios are at the low end of a 25-year range. Existing home sales median price hit \$235 thousand by September 2016.

Annual Total Returns of Key Asset Classes 1996 - 2015

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Best	U.S. Equity	U.S. Equity	U.S. Equity	U.S. 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	Gov't Bonds	Int'l Equity	Real Estate	Int'l Equity	U.S. Equity	U.S. Equity	Real Estate	Best
	22.42%	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%	
	Hedge Funds	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	
	13.73%	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%	
	Real Estate	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	Inflation	Int'l Equity	Corp. Bonds	Real Estate	Real Estate	Corp. Bonds	Gov't Bonds	
	10.31%	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%	
	Int'l Equity	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	
	6.05%	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%	
	Cash	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	
	5.30%	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%	3.41%	0.51%	
	Inflation	Cash	Cash	Inflation	Inflation	Inflation	Cash	Gov't Bonds	Gov't Bonds	Cash	Corp. Bonds	Corp. Bonds	Hedge Funds	Hedge Funds	Hedge Funds	Cash	Gov't Bonds	Cash	Inflation	Inflation	
	3.33%	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%	0.07%	0.68%	0.01%	
	Corp. Bonds	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	Corp. Bonds	Cash	
	3.28%	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%	
	Gov't Bonds	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	
	2.77%	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%	
Worst																					Worst

	Annualized Returns 1996 - 2015	
Return	Hedge	Gov't
Risk	Int'l	U.S. Eq.
	4.80%	5.02%
	7.96%	4.08%
	Corp.	R.E.
	5.82%	9.90%
	5.10%	8.43%

- 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

December 15, 2016



James L. Elkins
Senior Investment Manager
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	-1.7%	3.2%	4.9%	5.0%	N/A
HFRI FOF Conservative*	-1.3%	2.3%	2.6%	2.7%	N/A

*One month lag on the index

- Total Absolute Return value was \$3.9 billion with a total one-year return of -1.7% and a total 7-year annualized net return of 5%. Positive returns in multi-strategy/event, credit, and diversifying strategies were more than offset by poor performance 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 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 dynamics in credit markets giving way to substantial dislocations, we expect credit to be a potential source of opportunity going forward. We intend to tactically shift capital into this space in hopes of better capturing these opportunities.
- Redemption requests of \$700 million have been made in order to fund net benefit payments.
- No new investments were made this quarter.

Market Environment

- Multi-Strategy/Event – The strategy performed positively for the quarter and ended the period as the largest overall contributor to performance, with most managers performing consistently over the three-month period. Positive performance was driven primarily by managers with 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 second largest contributor to performance. Residential mortgage and distressed credit managers fared better than fundamental credit and trading-oriented managers. As the U.S. High Yield market continued to tighten in the third quarter, managers with energy and distressed related credits also contributed positively to performance. That said, fundamentals remain favorable within high yield and the current dislocation in certain credits has given way to a positive environment for continued alpha generation.
- Equity – Performance for equity managers over the course of the third quarter was largely positive, with the overall strategy contributing meaningfully to performance. Long/short equity managers delivered gains both in terms of overall performance and alpha, as most managers witnessed three consecutive months of positive performance against a backdrop of rallying equity markets.
- Diversifying – Performance for diversifying strategies was positive for the quarter, primarily driven by emerging market managers who delivered strong returns at the start of the period.

Real Return and Opportunistic

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Real Return and Opport.	5.4%	12.1%	9.8%	N/A	N/A
Custom Benchmark	7.3%	7.0%	7.2%	N/A	N/A

- Total Real Return and Opportunistic value was \$5.3 billion with a total one-year return of 5.4%. The portfolio held up in a weak performance period for energy and other commodity exposures.

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:
 - \$300 million to Apollo Financial Credit Investments Fund III, a fund focused on life settlements.
 - \$100 million to Redding Ridge Holdings LP, a CLO risk retention vehicle. Managed by Apollo.
 - \$100 million to Sprott Private Resource Lending Fund (US) LP, a fund focused on providing secured lending to mining companies.
 - \$75 million to Kayne Anderson Energy Fund VII LP, a fund focused on energy opportunities.
 - \$35 million to RPEP Energy Opp Inst Partner, a fund focused on small companies across the energy value chain. Managed by Ridgewood Energy.
 - \$30 million to Centerbridge SCP III LP, a fund focused on non-control distressed investments.
 - \$25 million to Sprott PRL (M) LP, a co-investment vehicle focused on capital solutions to mining companies.

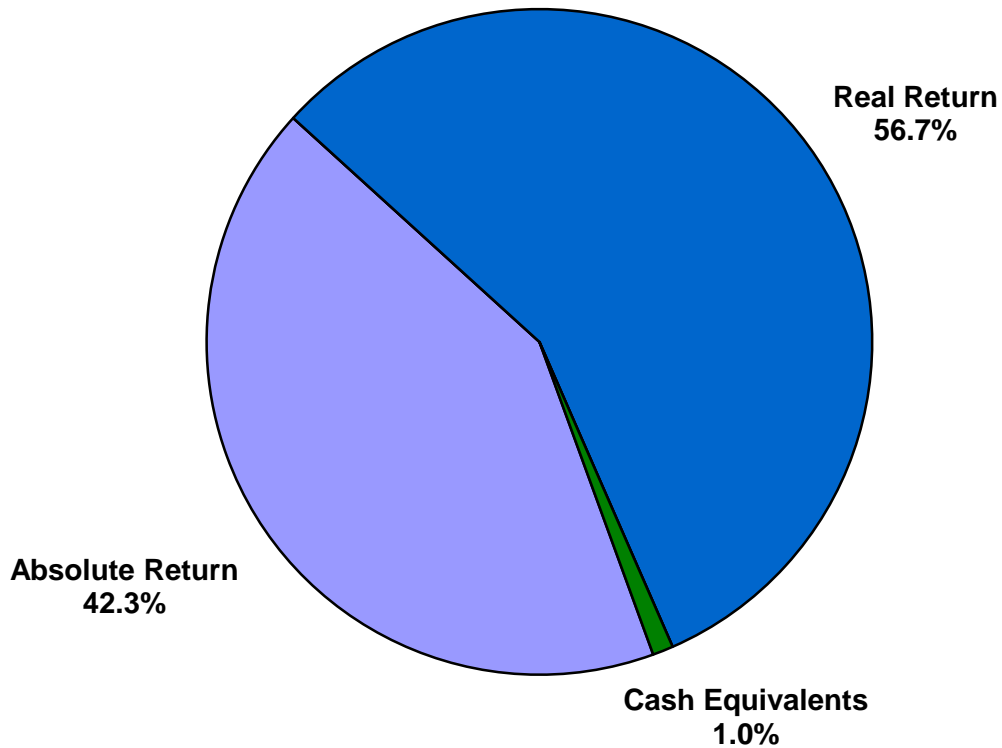
Market Environment

- Senior Secured Credit – The spread on the S&P Leveraged Loan Index was L+480, 143 basis points (bps) tighter than at the start of 2015. Similarly, the yield on the Merrill Lynch High Yield Master II Index was 6.3%, 251 bps tighter than at the beginning of the year. For the second consecutive month, there were no new defaults among S&P/LSTA issuers, which caused the trailing twelve-month default rate by principal amount to fall to 2.0%.
- 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. As capital markets slowed towards a halt, it pushed private loan issuance even higher in the most robust quarter of the year. Direct lending funds have been able to target and lend to much larger companies and improve credit quality while maintaining their returns from the spreads on loans.
- Energy Funds – For the quarter, spot WTI crude prices were down 0.2% with long-dated contracts relatively unchanged for the quarter as well. Spot natural gas prices were down 2.1% for the quarter, while long-dated contracts were down 4-7% for the quarter. STARR was able to invest additional capital in the space during the quarter at attractive levels and on very advantageous terms. With only approximately 34% of our energy commitments presently invested, a substantial amount of uncalled capital remains ready to capitalize on the opportunities presented by lower energy prices should they persist.

SMRS

Absolute, Real Return and Opportunistic

9/30/16



Market Value in Millions				
	<u>9/30/16</u>		<u>6/30/16</u>	
Absolute Return	\$3,967	42.3%	\$4,181	44.4%
Real Return	5,320	56.7%	5,139	54.6%
Cash Equivalents	88	1.0%	91	1.0%
Total Investments	<u>\$9,375</u>	<u>100.0%</u>	<u>\$9,411</u>	<u>100.0%</u>

SMRS

Absolute Return

9/30/16

Net Market Values by Entity

		<u>Net Market Value</u>
Apollo Offshore Credit Strategies Fund Ltd.	\$	151,647,330
Drawbridge Opportunities Fund (Fortress)		199,315,863
* EnTrust White Pine Partners L.P.		179,987,503
JM IV, LP (Jana)		46,831,458
MP Securitized Credit Master Fund, L.P. (Matlin Patterson)		66,342,628
Spartan Partner LP (PSAM)		170,254
* Tahquamenon Fund L.P. (BAAM)		3,317,755,069
Visium Balanced Fund LP		4,405,099
Total Market Value	\$	3,966,455,203

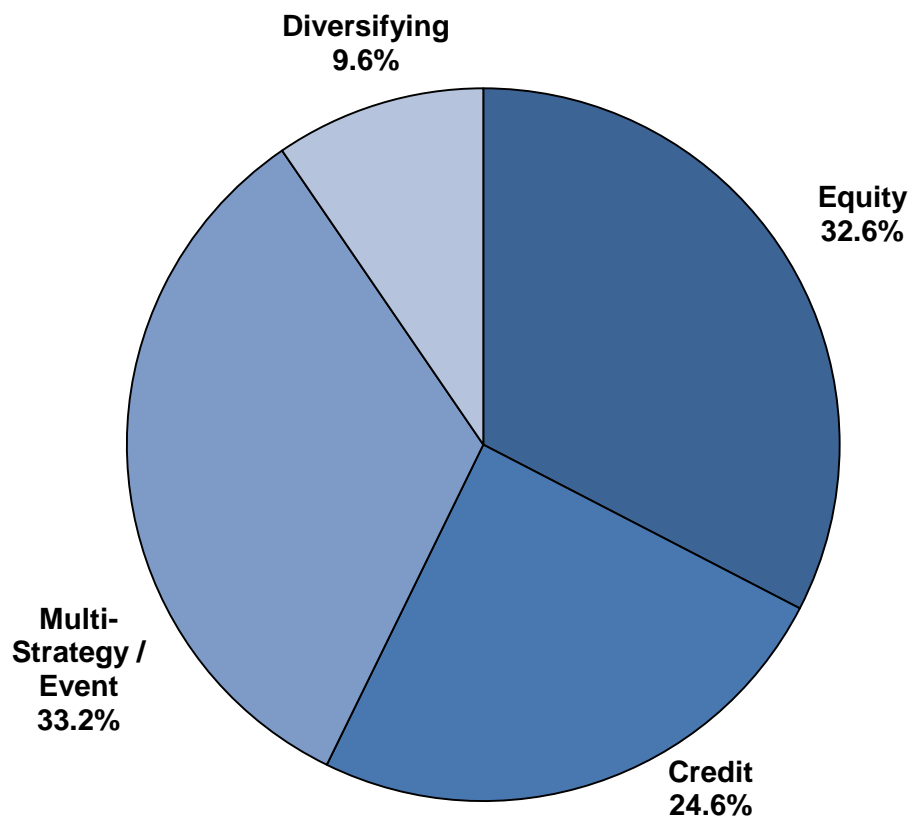
* Fund of Funds

SMRS

Absolute Return

9/30/16

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	90	Median Position Size:	0.3%
Strategies:	4	Average Position Size:	1.1%
Relationships:	8	Largest Position Size:	11.7%

SMRS

Real Return and Opportunistic

9/30/16

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy Fund I, LLC	\$ 208,612,863	\$ 20,487,376
Apollo Credit Opportunities Fund III LP	70,015,599	15,373,221
Apollo European Principal Finance Fund II	48,916,443	10,836,973
Apollo Financial Credit Investments Fund II	372,642,643	103,932,814
** Apollo Financial Credit Investments Fund III	-	300,000,000
Apollo HK TMS Investments Holdings LP	19,449,539	-
Apollo Offshore Credit Fund Ltd	253,747,659	-
Apollo Offshore Structured Credit Recovery Fund II	5,940,938	-
Apollo Offshore Structured Credit Recovery Fund III	135,863,133	79,385,752
Blackstone Strategic Capital Holdings LP	25,969,917	99,563,308
Blue Peninsula Fund LP	68,812,849	126,847,889
Carlyle Intl Energy Partners LP	13,976,807	43,443,168
Carlyle Energy Mezzanine Opportunity Fund	3,815,575	45,745,315
** Centerbridge SCP III, LP	3,000,000	27,000,000
* Content Holdings LLC	490,922,768	48,983,761
Elegantree Fund SPC	70,945,811	5,076,770
Energy Recapitalization and Restructuring Fund LP	33,983,669	18,040,815
ERR Michigan Holdings LP	5,484,198	2,335,070
* Fairfield Settlement Partners, LLC	70,959,752	14,632,764
FCO MA MI LP	54,979,325	146,020,566
Fortress MSR Opportunities Fund I A LP	104,276,703	-
Fortress Transport	47,249,307	-
* Galaxie Ave. Partners, LLC	99,900,000	-
GSO Credit Alpha Fund LP	57,730,734	44,819,608
Highbridge Principal Strategies - Specialty Loan Fund III	107,746,867	28,320,748
Hopen Life Sciences Fund II	5,048,855	2,575,000
HPS Red Cedar Fund	28,595,561	222,765,296
Innocor	30,000,000	-
JP Morgan Global Maritime Investment Fund LP	62,459,928	15,188,749
KANG Fund LP	14,245,533	-
** Kayne Anderson Energy Fund VII, LP	-	75,000,000
Kayne P.E. Income Fund	20,072,089	129,000,000
KKR EI&G Fund	24,195,083	33,187,405
KKR Lending Partners I LP	62,441,531	11,544,493
KKR Lending Partners II LP	82,108,852	19,075,819
Lakewater LLC, Series 1	146,790,367	4,009,715
Lakewater LLC, Series 2	262,616,365	14,111,838
Lakewater LLC, Series 3	321,315,217	-
Lakewater LLC, Series 4	67,438,281	13,542,902
Lakewater LLC, Series 5	55,906,422	195,017,775
Merit Energy Partners LP	25,725,036	9,201,857
MidCap FinCo Holdings LTD	297,399,378	-
Napier Park Aircraft Leasing Vehicle I, LLC	42,739,424	59,500,598
New Fortress Energy HLDGS	300,000,000	-
Orion Coinvest III LP	19,370,332	2,236,552

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Orion Mine Finance Fund 1A LP	48,246,174	4,310,238
Orion Mine Finance Fund I LP	106,418,746	9,884,524
Orion Mine Finance II LP	19,710,709	30,185,740
** Redding Ridge Holdings, LP	-	100,000,000
Renaissance Venture Cap Fund II LP	9,107,059	15,500,000
REOG Fund II Coinvest LP	17,169,316	11,924,817
Ridgewood Energy Oil & Gas II	82,461,975	38,608,297
Ridgewood Energy Oil & Gas III	7,256,964	214,978,864
** RPEP Energy Opp Inst Partner	-	34,174,716
RPEP SMRS Holdings, LLC	66,107,625	1,876,850
SJC Direct Lending Fund I, LP	44,191,625	15,867,189
SJC Direct Lending Fund II, LP	247,756,445	38,261,315
SJC Direct Lending Fund III, LP	57,756,115	192,702,051
Square Inc.	105,572,695	-
* Social Network Holdings, LLC	161,040,215	25,226,043
Specialty Equity Strategy LP	1,752,205	18,387,384
** Sprott PRL (M), LP	6,037	24,516,254
** Sprott Private Resource Lending Fund (US), LP	-	100,000,000
Terra Co-Investment LLC	25,399,994	14,000,000
Twitter Inc.	19,902,914	-
Varo Coinvestment LP	13,393,479	929,066
Warwick Energy Partners III	27,784,888	22,774,349
Warwick (SMRS) Co-Invest, L.P.	12,905,919	12,089,081
Income Accruals	2,663,015	
Total Market Value	\$ 5,320,015,468	\$ 2,913,000,693

* Fund of Funds

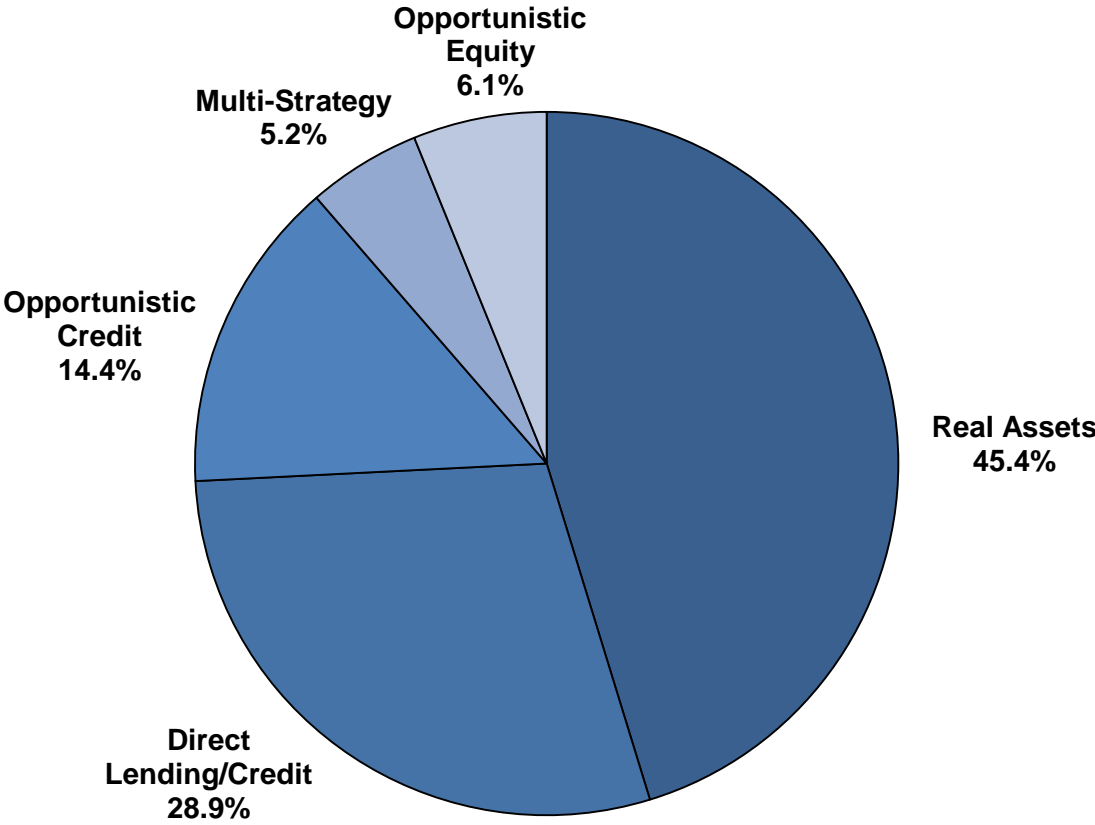
** **New Commitment**

SMRS

Real Return and Opportunistic

9/30/16

Investments By Strategy



Investment Strategy	
Real Assets	\$2,406,369,971
Direct Lending/Credit	\$1,539,273,763
Opportunistic Credit	\$767,641,352
Multi-Strategy	\$277,425,712
Opportunistic Equity	\$326,641,656

State of Michigan Retirement Systems

DOMESTIC EQUITY REVIEW

Investment Advisory Committee Meeting

December 15, 2016



Jack A. Behar, CFA
Senior Investment Manager
Stock Analysis Division

EXECUTIVE SUMMARY

Performance

Total Domestic Equity, Gross	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	12.2%	10.3%	16.1%	12.7%	7.2%
S&P 1500	15.5%	10.9%	16.4%	13.3%	7.4%
Peer Median Return	13.5%	9.2%	15.5%	12.7%	7.1%
Rank vs. Peers	70	37	34	51	47

Total Domestic Equity, Net	1-Year	3-Years	5-Years	7-Years
Annualized Returns	12.1%	10.2%	16.0%	12.5%
S&P 1500	15.5%	10.9%	16.4%	13.3%
Lipper Multi Core	11.2%	8.1%	14.7%	11.6%
Rank vs. Lipper Multi Core	45	25	29	34

Total Active Equity, Net	1-Year	3-Years	5-Years	7-Years
Annualized Returns	9.3%	9.4%	15.5%	11.9%
S&P 1500	15.5%	10.9%	16.4%	13.3%
Lipper Multi Core	11.2%	8.1%	14.7%	11.6%
Rank vs. Lipper Multi Core	74	33	41	47

- In a difficult stretch for active management, Total Domestic Equity (active & passive management combined) trailed the S&P 1500 in all time periods.
 - Gross of fees, Total Domestic Equity's performance was in the top third of its peer group over three and five years, at the median over seven and ten years and below the median over the past year.
 - Net of fees, Total Domestic Equity's performance versus peers was significantly better than described above, because SMRS pays roughly 6 basis points (bps) per year in domestic equity management fees versus its peer group at 30 bps.
- Total active equity underperformed its benchmark in all time periods. Such performance, while not satisfactory, was in the top half of its peer group over three, five, and seven years.
 - 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.
- Growth stocks have outperformed value stocks by a cumulative 60% over the past ten years, which has been a headwind to performance.
- Total active equity remains significantly overweighted to value stocks, which will provide the portfolio with a substantial tailwind if and when this trend reverses.

Strategy Update

- The division is moving towards allocating funds to managers with lower turnover as a means by which to further reduce costs at the division level.
 - Research has shown that, while reducing fees considerably improves the probability of active manager outperformance, turnover costs and cash drag also hinder the results of active managers.
- The domestic equity division pays only 12 bps per year in fees across the division, or less than that of the retail Vanguard S&P 500 Index Fund.
- The division also typically equitizes excess manager cash, negating the impact of such low returning assets on division performance.
- 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 investment approach, which has also been demonstrated to outperform over the long run, gives the division the opportunity to beat the benchmark with a significantly higher probability of success than is the case with most active managers.
- Total Active Equity's portfolio continues to trade at roughly a 20% 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 14X or less. All are high quality companies with significant competitive advantages.
 - The division remains overweight to both the financial sector and to defensive stocks.
 - 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 nonetheless 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 ~18x normalized earnings, equity markets are on the rich side relative to history, but still attractively priced for an environment where bond yields stay abnormally low.
- Assuming a 2.0% normalized dividend yield, expected share count reductions of 1.7% via share buybacks and 4.5% long-term expected earnings growth, the S&P 1500 is poised to return approximately 8.2% over the long term.
 - This compares to the 30-year U.S. Treasury at 2.3%, and a historical average return for the S&P 500 of 9.5% from 1928 - 2015.

SMRS

Domestic Equities

9/30/16

Markets	Amount	Total	% of Total
Internal (in millions)			
Indexed Portfolios	\$7,439		
Total Indexed		\$7,439	47.0%
Internal			
Active Portfolios	\$4,850		
Total Active		\$4,850	31.2%
Active			
Los Angeles Capital	\$1,115		
Fisher Investments	633		
Seizert Capital Partners	501		
Clarkston Capital Partners	501		
ARK Investments	251		
Attucks Asset Management	203		
Bivium Capital	184		
Munder Capital Management	83		
Northpointe Capital	82		
Total Active		\$3,553	22.4%

TOTAL

\$15,842

100.0%

Combined Active Equity Portfolio, Return Expectations

9/30/16

Return Assumption Estimates

	<u>Expected Return ****</u>	<u>Normal Dividend Yield **</u>	<u>LT Growth Rate ***</u>
SAD Combined Active Equity	9.6%	5.1%	4.5%
S&P 1500 All-Cap	8.2%	3.7%	4.5%
S&P 500 Large-Cap	8.2%	3.9%	4.3%
S&P 500 Historical Average	9.5%		
S&P 400 Mid-Cap	8.2%	2.2%	6.0%
S&P 600 Small-Cap	7.8%	0.8%	7.0%
US 30-Year Treasury	2.3%	2.3%	0.0%

Normal Dividend Yield Decomposition

	<u>Normal Price/Earnings</u>	<u>Normal Earnings Yield*</u>	<u>Normal Payout Ratio</u>	<u>Normal Dividend Yield**</u>
SAD Combined Active Equity	14.0	7.2%	71%	5.1%
S&P 1500 All-Cap	18.5	5.4%	68%	3.7%
S&P 500 Large-Cap	18.2	5.5%	71%	3.9%
S&P 400 Mid-Cap	19.8	5.0%	44%	2.2%
S&P 600 Small-Cap	21.4	4.7%	18%	0.8%

Portfolio and Benchmark Risk Estimates

	<u>Expected Return ****</u>	<u>Standard Deviation</u>	<u>Expected Return/Volatility</u>
SAD Combined Active Equity	9.6%	13.8%	0.7
S&P 1500 All-Cap	8.2%	14.1%	0.6
S&P 500 Large-Cap	8.2%	14.0%	0.6
S&P 400 Mid-Cap	8.2%	16.0%	0.5
S&P 600 Small-Cap	7.8%	17.4%	0.5
US 30-Year Treasury	2.3%	26.6%	0.1

*Earnings Yield = Earnings/Price

**Includes Share Buybacks

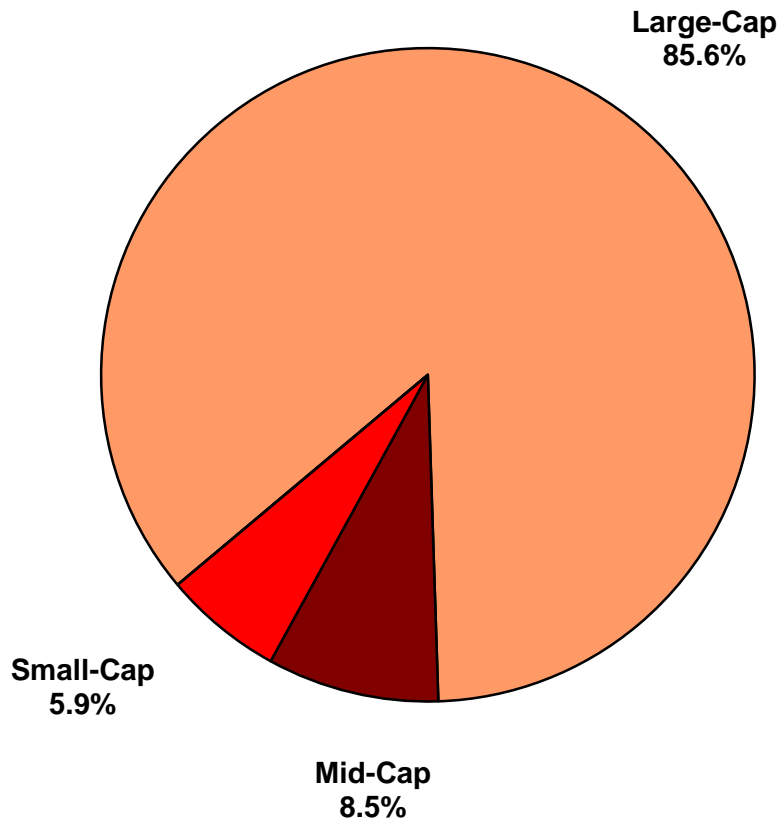
***LT Growth Rate Calculation: Return on Equity * (1-Dividend Payout Ratio)

****Expected Return Formula: Dividend Yield + LT Growth Rate

SMRS

Domestic Equity Exposure By Market Cap

9/30/16



Market Value in Millions			
	<u>9/30/16</u>		
	<u>Assets</u>	<u>Percent</u>	<u>S&P 1500</u>
Large-Cap (>\$10B)	\$13,561	85.6%	84.4%
Mid-Cap (>\$4 <\$10B)	1,346	8.5%	8.2%
Small-Cap (<\$4B)	935	5.9%	7.4%
Total Domestic Equity	<u><u>\$15,842</u></u>	<u><u>100.0%</u></u>	<u><u>100.0%</u></u>

SMRS

Domestic Equities Composite

9/30/16

Date:	<u>9/30/16</u>	<u>6/30/16</u>	<u>3/31/16</u>	<u>12/31/15</u>
Assets (\$million):	\$16,059	\$16,059	\$16,294	\$16,724
Number of Securities:	1,316	1,329	1,305	1,258
Active Share:	34%	33%	34%	34%

Benchmark: S&P 1500

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

Characteristics:	<u>SMRS</u>	<u>S&P 1500</u>
Weighted Average Capitalization (\$billion):	\$148.0	\$131.2
Trailing 12-month P/E:	17.5x	19.8x
Forecast P/E:	16.1x	18.0x
Price/Book:	2.4x	2.7x
Beta:	0.99	1.00
Tracking Error:	1.2%	0
Dividend Yield:	2.1%	2.0%
3-5 Year EPS Growth Estimate:	9.9%	10.5%
Return on Equity:	13.7%	13.6%

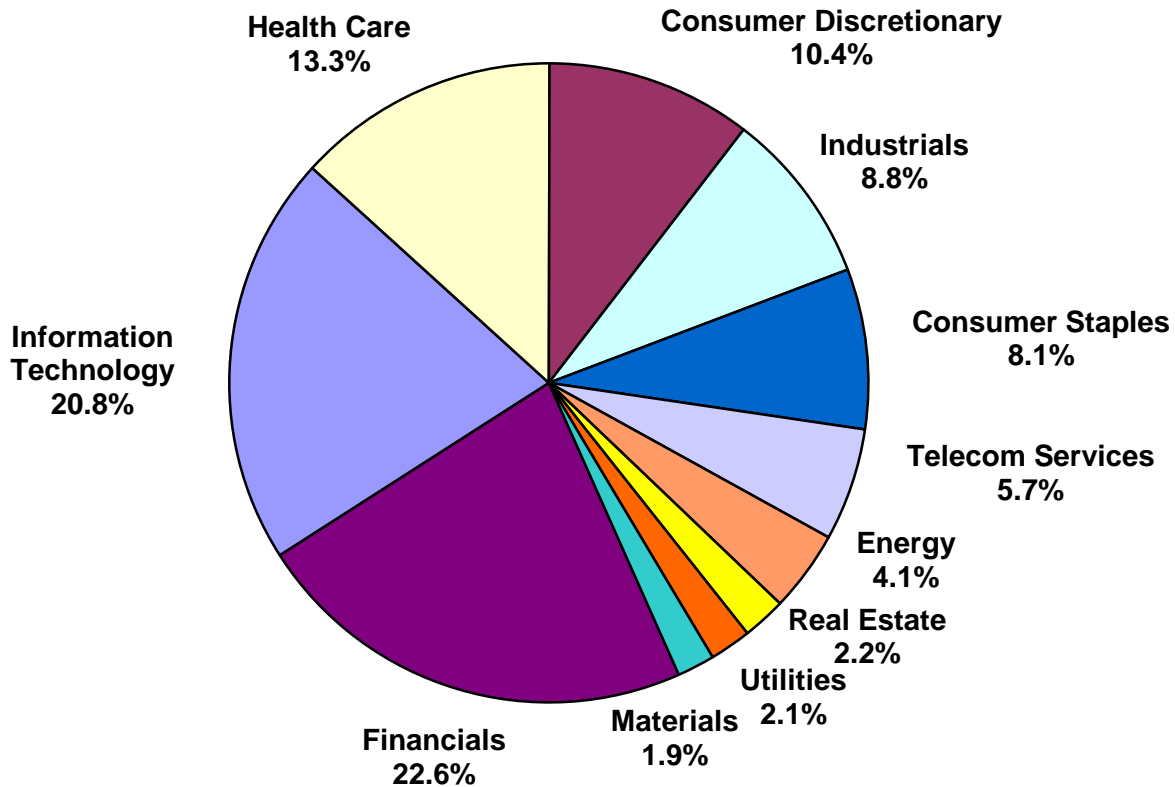
TOP TEN HOLDINGS – Domestic Equities 9/30/16

	<u>Portfolio Weight</u>	<u>Market Capitalization (\$B)</u>	<u>FY1 P/E</u>	<u>YTD Total Return</u>	<u>Market Value</u>
Verizon Communications, Inc.	4.7%	\$211.9	13.3	16.2%	\$739,310,604
Berkshire Hathaway, Inc. Class B	4.4%	\$355.9	19.9	9.4%	689,439,012
Apple, Inc.	3.6%	\$603.3	12.7	9.2%	575,525,228
U.S. Bancorp	2.4%	\$73.4	13.2	2.5%	378,964,803
JPMorgan Chase & Co.	2.2%	\$240.5	11.8	3.1%	351,012,138
Wells Fargo & Co.	2.0%	\$223.4	11.0	-16.6%	314,179,707
Microsoft Corp.	1.7%	\$448.4	19.9	6.0%	273,341,318
Gilead Sciences, Inc.	1.7%	\$104.6	6.7	-20.5%	270,980,936
Facebook, Inc. Class A	1.5%	\$298.0	32.7	22.6%	238,298,723
CVS Health Corp.	<u>1.5%</u>	\$94.9	15.2	-7.8%	<u>237,873,118</u>
TOTAL	<u>25.7%</u>				<u>\$4,068,925,587</u>

SMRS

Domestic Equity By Sector

9/30/16



Market Value in Millions				
9/30/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$3,579	22.6%	13.1%	9.5%
Information Technology	3,291	20.8%	20.8%	0.0%
Health Care	2,100	13.3%	14.1%	-0.8%
Consumer Discretionary	1,648	10.4%	12.3%	-1.9%
Industrials	1,402	8.8%	10.6%	-1.8%
Consumer Staples	1,286	8.1%	9.3%	-1.2%
Telecom Services	898	5.7%	2.4%	3.3%
Energy	653	4.1%	6.9%	-2.8%
Real Estate	355	2.2%	3.8%	-1.6%
Utilities	334	2.1%	3.5%	-1.4%
Materials	296	1.9%	3.2%	-1.3%
Total	<u>\$15,842</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

9/30/16

Date:	<u>9/30/16</u>	<u>6/30/16</u>	<u>3/31/16</u>	<u>12/31/15</u>
Assets (\$million):	\$8,403	\$8,625	\$9,018	\$9,517
Numbers of Securities:	1,015	1,023	969	922
Active Share:	63%	62%	63%	59%

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>
Weighted Average Capitalization (\$billion):	\$159.4	\$131.2
Trailing 12-month P/E:	16.1 x	19.8x
Forecast P/E:	15.0x	18.0x
Price/Book:	2.2x	2.7x
Beta:	0.99	1.00
Tracking Error:	2.3%	0
Dividend Yield:	2.2%	2.0%
3-5 Year EPS Growth Estimate:	9.5%	10.5%
Return on Equity:	13.7%	13.6%

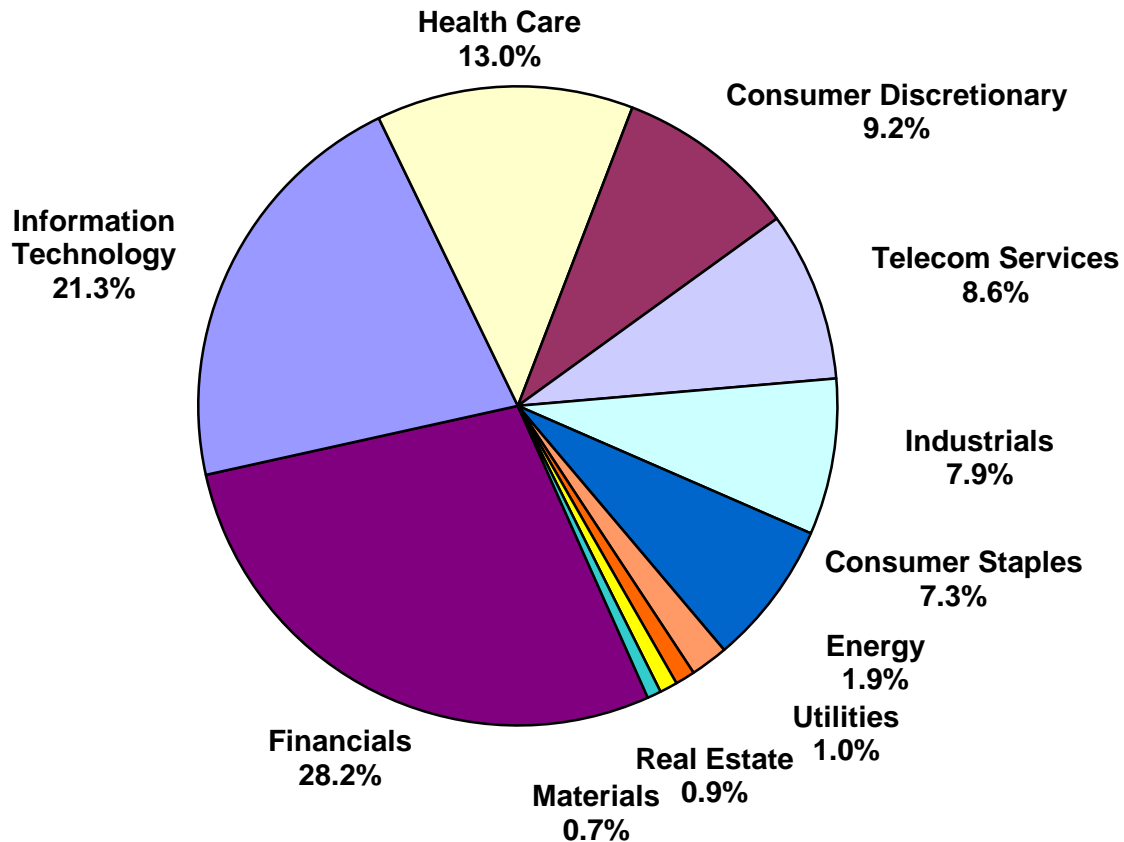
TOP TEN HOLDINGS – Actively Managed 9/30/16

	<u>Portfolio Weight</u>	<u>Market Capitalization (\$B)</u>	<u>FY1 P/E</u>	<u>YTD Total Return</u>	<u>Market Value</u>
Verizon Communications, Inc.	7.9%	\$211.9	13.3	16.2%	\$665,360,166
Berkshire Hathaway, Inc. Class B	7.4%	\$355.9	19.9	9.4%	618,855,882
Apple, Inc.	4.3%	\$603.3	12.7	9.2%	362,931,198
U.S. Bancorp	4.2%	\$73.4	13.2	2.5%	354,884,727
JPMorgan Chase & Co.	3.2%	\$240.5	11.8	3.1%	267,073,778
Wells Fargo & Co.	2.9%	\$223.4	11.0	-16.6%	244,003,257
Gilead Sciences, Inc.	2.8%	\$104.6	6.7	-20.5%	234,454,227
Aflac, Inc.	2.5%	\$29.3	10.5	22.3%	209,749,936
CVS Health Corp.	2.4%	\$94.9	15.2	-7.8%	204,759,939
Validus Holdings, Ltd.	<u>2.1%</u>	\$4.0	12.3	10.0%	<u>175,513,020</u>
TOTAL	<u>39.7%</u>				<u>\$3,337,667,130</u>

SMRS

Active Equity By Sector

9/30/16



Market Value in Millions				
9/30/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$2,368	28.2%	13.1%	15.1%
Information Technology	1,790	21.3%	20.8%	0.5%
Health Care	1,089	13.0%	14.1%	-1.1%
Consumer Discretionary	771	9.2%	12.3%	-3.1%
Telecom Services	722	8.6%	2.4%	6.2%
Industrials	663	7.9%	10.6%	-2.7%
Consumer Staples	613	7.3%	9.3%	-2.0%
Energy	156	1.9%	6.9%	-5.0%
Utilities	86	1.0%	3.5%	-2.5%
Real Estate	83	0.9%	3.8%	-2.9%
Materials	62	0.7%	3.2%	-2.5%
Total	<u>\$8,403</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

Manager Performance - Net of Fees
9/30/16

<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	\$2,066,905,897	1.7%	8.7%	16.0%	11.9%	6.3%	8/31/07
S&P 500		15.4%	11.2%	16.4%	13.2%	6.7%	
Style & Risk Adjusted Benchmark		10.3%	7.6%	14.1%	11.9%	5.8%	
Lipper Large-Cap Core		12.9%	9.2%	14.9%	11.8%	6.0%	
<i>Excess Return</i>		-13.7%	-2.5%	-0.3%	-1.3%	-0.5%	
<i>Alpha</i>		-8.5%	1.1%	2.0%	0.0%	0.5%	
<i>Pct Rank vs Lipper Large-Cap Core</i>		99	66	26	49	40	
SMRS Large-Cap Growth	1,457,892,421	7.1%	11.3%	15.7%	12.9%	8.4%	5/31/05
S&P 500 Growth Index		14.7%	12.8%	16.8%	14.3%	8.9%	
Style & Risk Adjusted Benchmark		16.3%	12.7%	17.3%	14.5%	9.0%	
Lipper Large Growth		10.9%	10.3%	15.6%	12.7%	8.3%	
<i>Excess Return</i>		-7.6%	-1.5%	-1.1%	-1.4%	-0.4%	
<i>Alpha</i>		-9.2%	-1.5%	-1.7%	-1.6%	-0.5%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		88	32	47	50	43	
SMRS All-Cap Garp	954,678,266	8.6%	9.9%	16.7%	--	12.9%	4/30/11
S&P 1500 Super Composite		15.5%	10.9%	16.4%	--	11.6%	
Style & Risk Adjusted Benchmark		12.6%	10.3%	15.7%	--	11.2%	
Lipper Multi Core		11.2%	8.1%	14.7%	--	9.5%	
<i>Excess Return</i>		-6.9%	-1.1%	0.3%	--	1.3%	
<i>Alpha</i>		-4.0%	-0.5%	1.0%	--	1.7%	
<i>Pct. Rank vs. Lipper Multi Core</i>		80	28	12	--	3	
LA Capital Deep Value	657,415,786	13.7%	--	--	--	2.6%	4/1/15
S&P 1500 Value		16.3%	--	--	--	4.3%	
Style & Risk Adjusted Benchmark		16.2%	--	--	--	4.1%	
Lipper Multi-Cap Value		12.8%	--	--	--	1.2%	
<i>Excess Return</i>		-2.6%	--	--	--	-1.7%	
<i>Alpha</i>		-2.5%	--	--	--	-1.5%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		40	--	--	--	37	
Fisher All-Cap	632,989,708	14.2%	11.8%	16.4%	12.4%	9.8%	10/31/04
S&P 1500/S&P 600 Value Blend		15.5%	10.9%	17.4%	13.5%	8.6%	
Style & Risk Adjusted Benchmark		16.3%	12.0%	18.2%	14.7%	9.4%	
Lipper Multi Core		11.2%	8.1%	14.7%	11.6%	7.3%	
<i>Excess Return</i>		-1.3%	0.9%	-1.0%	-1.0%	1.2%	
<i>Alpha</i>		-2.1%	-0.2%	-1.8%	-2.3%	0.4%	
<i>Pct. Rank vs. Lipper Multi Core</i>		23	5	17	36	3	
Seizert Capital Partners	501,475,126	15.9%	7.1%	16.1%	--	14.0%	11/30/09
S&P 1500/S&P 400 Value Blend		15.5%	10.9%	16.4%	--	15.9%	
Style & Risk Adjusted Benchmark		15.7%	9.5%	17.0%	--	13.3%	
Lipper Multi Core		11.2%	8.1%	14.7%	--	12.2%	
<i>Excess Return</i>		0.4%	-3.9%	-0.3%	--	-2.0%	
<i>Alpha</i>		0.3%	-2.4%	-0.9%	--	0.7%	
<i>Pct. Rank vs. Lipper Multi Core</i>		9	73	26	--	15	
LA Capital All-Cap Growth	457,336,175	16.0%	14.0%	19.2%	15.3%	11.3%	5/31/05
S&P 1500 Growth		14.6%	12.4%	16.8%	14.4%	9.0%	
Style & Risk Adjusted Benchmark		11.3%	8.8%	14.2%	13.0%	9.3%	
Lipper Multi-Cap Growth		8.9%	8.1%	14.5%	12.2%	8.3%	
<i>Excess Return</i>		1.4%	1.6%	2.4%	0.9%	2.3%	
<i>Alpha</i>		4.8%	5.2%	4.9%	2.3%	2.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		4	1	2	6	4	

<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 Large-Cap	281,211,565	16.9%	--	--	--	8.4%	4/1/15
S&P 500		15.4%	--	--	--	5.5%	
Style & Risk Adjusted Benchmark		11.5%	--	--	--	3.4%	
Lipper Large-Cap Core		12.9%	--	--	--	3.4%	
<i>Excess Return</i>		1.4%	--	--	--	3.0%	
<i>Alpha</i>		5.4%	--	--	--	5.1%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		10	--	--	--	2	
Ark Investments	251,073,928	--	--	--	--	25.5%	3/1/16
S&P 1500 Growth		--	--	--	--	13.3%	
Style & Risk Adjusted Benchmark		--	--	--	--	13.9%	
Lipper All-Cap Growth		--	--	--	--	12.7%	
<i>Excess Return</i>		--	--	--	--	12.2%	
<i>Alpha</i>		--	--	--	--	11.6%	
<i>Pct. Rank vs. Lipper All-Cap Growth</i>		--	--	--	--	1	
Clarkston Capital Small-Cap	220,520,692	17.0%	--	--	--	12.5%	1/1/14
S&P 600		18.1%	--	--	--	6.2%	
Style & Risk Adjusted Benchmark		14.0%	--	--	--	5.8%	
Lipper Small-Cap Core		13.0%	--	--	--	3.1%	
<i>Excess Return</i>		-1.1%	--	--	--	6.3%	
<i>Alpha</i>		3.0%	--	--	--	6.8%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		15	--	--	--	1	
Attucks Asset Management	202,617,273	11.8%	7.1%	13.9%	11.5%	5.4%	11/30/07
S&P 1500 Super Composite		15.5%	10.9%	16.4%	13.3%	6.3%	
Style & Risk Adjusted Benchmark		16.4%	9.9%	15.9%	12.9%	7.0%	
Lipper Multi Core		11.2%	8.1%	14.7%	11.6%	5.1%	
<i>Excess Return</i>		-3.7%	-3.8%	-2.5%	-1.8%	-1.0%	
<i>Alpha</i>		-4.6%	-2.8%	-1.9%	-1.4%	-1.6%	
<i>Pct. Rank vs. Lipper Multi Core</i>		46	72	69	59	48	
Bivium Capital Partners	183,928,537	8.1%	6.2%	13.5%	11.5%	4.9%	11/30/07
S&P 1500 Value		16.3%	9.3%	16.1%	12.2%	4.7%	
Style & Risk Adjusted Benchmark		18.6%	9.7%	16.2%	13.3%	6.6%	
Lipper Multi Cap Value		12.8%	7.1%	14.2%	11.0%	4.8%	
<i>Excess Return</i>		-8.1%	-3.1%	-2.6%	-0.6%	0.2%	
<i>Alpha</i>		-10.5%	-3.5%	-2.7%	-1.8%	-1.7%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		88	76	67	44	43	
SMRS Large-Cap Value	111,639,487	14.8%	6.7%	12.7%	10.0%	2.8%	7/31/07
S&P 500 Value Index		16.0%	9.3%	15.9%	12.0%	4.3%	
Style & Risk Adjusted Benchmark		13.8%	8.4%	14.3%	11.1%	4.6%	
Lipper Large Value		13.3%	8.1%	14.6%	10.9%	4.1%	
<i>Excess Return</i>		-1.1%	-2.7%	-3.2%	-2.0%	-1.5%	
<i>Alpha</i>		1.1%	-1.8%	-1.6%	-1.1%	-1.7%	
<i>Pct. Rank vs. Lipper Large-Cap Value</i>		35	86	86	69	82	
Concentrated Equity	97,269,916	-1.8%	-6.4%	--	--	-1.6%	4/30/09
S&P 1500 Super Composite		15.5%	10.9%	--	--	11.6%	
Style & Risk Adjusted Benchmark		18.8%	12.1%	--	--	14.2%	
Lipper Multi Core		11.2%	8.1%	--	--	9.6%	
<i>Excess Return</i>		-17.3%	-17.3%	--	--	-13.2%	
<i>Alpha</i>		-20.6%	-18.5%	--	--	-15.8%	
<i>Pct. Rank vs. Lipper Multi Core</i>		99	100	--	--	100	

<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>
Munder Concentrated SMID Cap	83,159,023	2.9%	4.8%	12.7%	11.7%	15.4%	4/30/09
S&P 400 Mid-Cap Growth		12.8%	9.3%	15.6%	14.4%	18.6%	
Style & Risk Adjusted Benchmark		19.7%	9.8%	17.0%	13.3%	17.1%	
Lipper Mid-Cap Growth		8.4%	6.4%	14.0%	12.0%	15.9%	
<i>Excess Return</i>		-9.9%	-4.4%	-2.9%	-2.6%	-3.2%	
<i>Alpha</i>		-16.8%	-4.9%	-4.3%	-1.6%	-1.7%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		88	79	72	59	65	
NorthPointe All-Cap Core	81,896,718	12.7%	6.8%	15.4%	10.2%	6.9%	10/31/04
NorthPointe Blended Benchmark		18.1%	9.0%	17.9%	13.8%	8.8%	
Style & Risk Adjusted Benchmark		19.7%	8.3%	17.0%	14.5%	9.3%	
Lipper Multi Core		11.2%	8.1%	14.7%	11.6%	7.3%	
<i>Excess Return</i>		-5.4%	-2.2%	-2.5%	-3.6%	-1.9%	
<i>Alpha</i>		-7.0%	-1.5%	-1.6%	-4.3%	-2.5%	
<i>Pct. Rank vs. Lipper Multi Core</i>		38	76	43	79	68	
Large-Cap Consistent Growth	34,572,810	8.9%	--	--	--	4.3%	3/1/15
S&P 500		15.4%	--	--	--	4.1%	
Style & Risk Adjusted Benchmark		15.0%	--	--	--	4.0%	
Lipper Large-Cap Core		12.9%	--	--	--	2.2%	
<i>Excess Return</i>		-6.6%	--	--	--	0.2%	
<i>Alpha</i>		-6.1%	--	--	--	0.3%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		90	--	--	--	17	
Concentrated All-Cap Growth	26,828,982	3.8%	-5.8%	--	--	-3.6%	5/31/13
S&P 600		18.1%	9.0%	--	--	12.5%	
Style & Risk Adjusted Benchmark		13.5%	8.0%	--	--	9.1%	
Lipper Small-Cap Core		13.0%	5.9%	--	--	9.1%	
<i>Excess Return</i>		-14.3%	-14.8%	--	--	-16.1%	
<i>Alpha</i>		-9.7%	-13.8%	--	--	-12.7%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		98	100	--	--	100	

State of Michigan Retirement Systems

FIXED INCOME REVIEW

Investment Advisory Committee Meeting

December 15, 2016



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	7.3%	5.0%	4.2%	5.1%	5.7%
Barclays Aggregate	5.2%	4.0%	3.1%	4.1%	4.8%
Peer Median Return	6.6%	4.4%	4.2%	5.3%	5.2%
Rank vs. Peers	44	25	53	58	19

- 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 and overweight to 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 \$306 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 (10.1% of portfolio assets) as well as securitized credit mandates (12.9% 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 (17.4% of portfolio assets). The portfolio also had a 2.7% allocation to cash at the end of the quarter.
- The Division has recently established an out-of-benchmark position in AAA rated CLO securities (2% of portfolio assets). This is due to the attractive spreads of these securities as well as the potential for LIBOR to increase if the Federal Reserve tightens monetary policy.
- 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 yield levels 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 U.S. Treasury yield curve has flattened on a year-over-year (YOY) basis as long-term interest rates have declined while short-term interest rates have increased. The spread between 2-year and 10-year U.S. Treasuries declined by 58 basis points (bps) during the year. Lower inflation, reduced global growth expectations, and central bank intervention have contained long-term interest rates. The Federal Reserve increased short-term interest rates as they tightened monetary policy during their December 2015 FOMC meeting. The market places approximately a 60% chance of an additional 25 bps rate increase during the December 2016 FOMC meeting.
- Investment grade credit spreads in the U.S. continued to narrow during the third quarter. Spreads ended the quarter at 138 bps. These levels have tightened by 27 bps YTD.
- High-yield spreads have decreased by 180 bps YTD despite weakness in the first six weeks of the year. Spreads ended the quarter at 480 bps after reaching a level of 830 bps in February. Energy spreads continued to drive the market, narrowing by 687 bps YTD to 609 bps.
- BBB CMBS spreads remain elevated despite recent strong performance. Spreads ended the quarter 20 bps tighter at 484 bps. These spreads are 122 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 1.61%, lower than the stated 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 the possibility of tightening of monetary policy 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 ten-year yields of -0.09% in Japan and -0.12% 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

9/30/16

Markets	Amount	Total	% of Total
Core (in millions)			
LTFID Internal Dodge & Cox	\$5,068 236		
Total Core		\$5,304	65.3%
Credit			
Prudential	\$225		
Total Credit		\$225	2.8%
Securitized Debt			
Met West Securitized Ops Principal Global Napier Park ABS Income	\$411 498 134		
Total Securitized Debt		\$1,043	12.9%
High Yield			
Columbia Management Prudential High Yield	\$451 365		
Total High Yield		\$816	10.1%
Tactical			
Pyramis Loomis Core Plus	\$286 220		
Total Tactical		\$506	6.2%
Global			
T. Rowe Global Multi-Sector	\$218		
Total Global		\$218	2.7%

TOTAL

\$8,112

100.0%

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

9/30/16

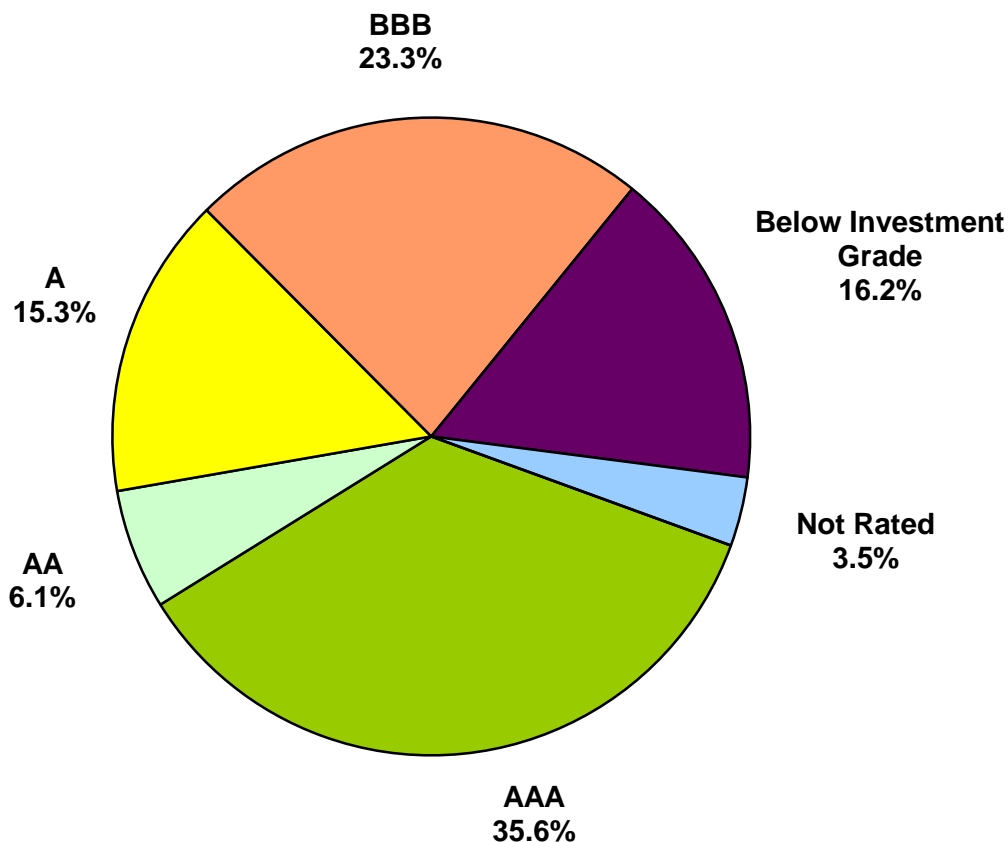
<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Life	6.7	8.7
Average Life w/Cash Equiv.	6.5	8.7
Duration (Yrs)	4.9	5.5
Duration (Yrs) w/Cash Equiv.	4.8	5.5
Coupon (%)	3.4	3.2
Yield to Maturity (%)	3.1	2.0
Credit Rating	A3/BBB	Aa2/AA-
Volatility (%)	2.5	2.7
Tracking Error	130 bp	0
Beta (vs S&P 500)	0.04	-0.02

SMRS

Fixed Income By Rating

Total U.S. Long-Term Fixed Income

9/30/16



Market Value in Millions				
9/30/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$2,890	35.6%	70.4%	-34.8%
AA	495	6.1%	5.6%	0.5%
A	1,242	15.3%	11.1%	4.2%
BBB	1,887	23.3%	11.8%	11.5%
Not Rated	283	3.5%	0.9%	2.6%
* Below Investment Grade	1,315	16.2%	0.2%	16.0%
Total Investments	<u>\$8,112</u>	<u>100.0%</u>	<u>100.0%</u>	

* Comprised of approximately 12.0% High Yield Credit and 4.3% High Yield RMBS/ABS

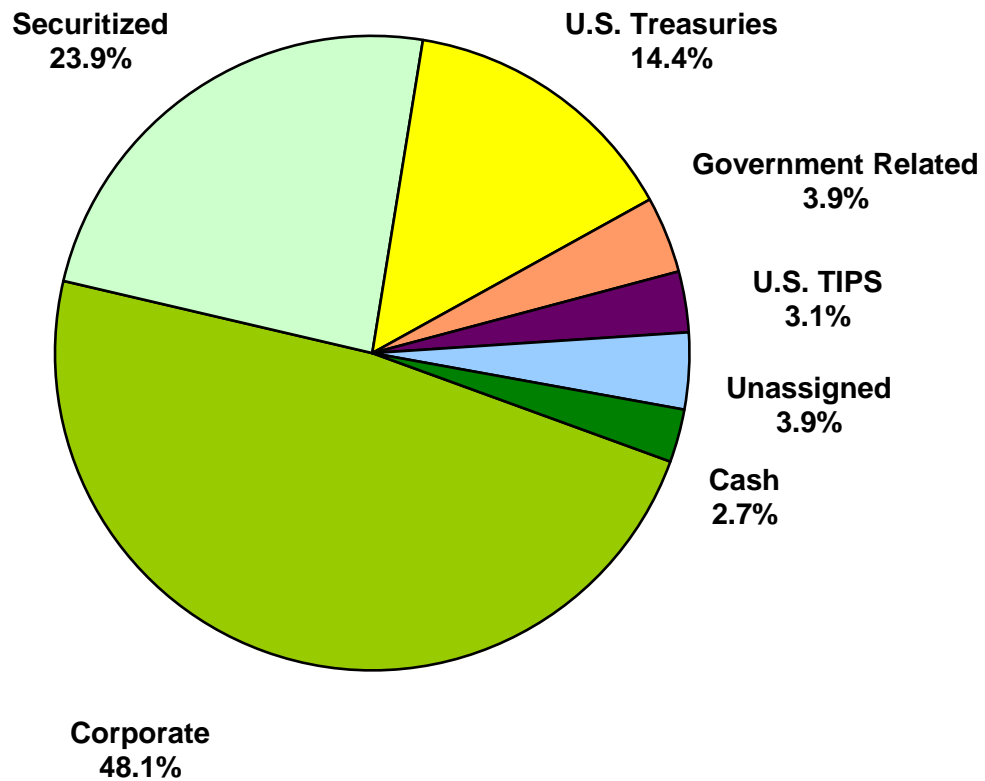
Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

Total U.S. Long-Term Fixed Income

9/30/16



Market Value in Millions				
9/30/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Corporate	\$3,905	48.1%	25.8%	22.3%
Securitized	1,943	23.9%	29.9%	-6.0%
U.S. Treasuries	1,167	14.4%	36.2%	-21.8%
Government Related	315	3.9%	8.1%	-4.2%
U.S. TIPS	248	3.1%	0.0%	3.1%
Unassigned	313	3.9%	0.0%	3.9%
Cash	221	2.7%	0.0%	2.7%
Total Investments	<u>\$8,112</u>	<u>100.0%</u>	<u>100.0%</u>	

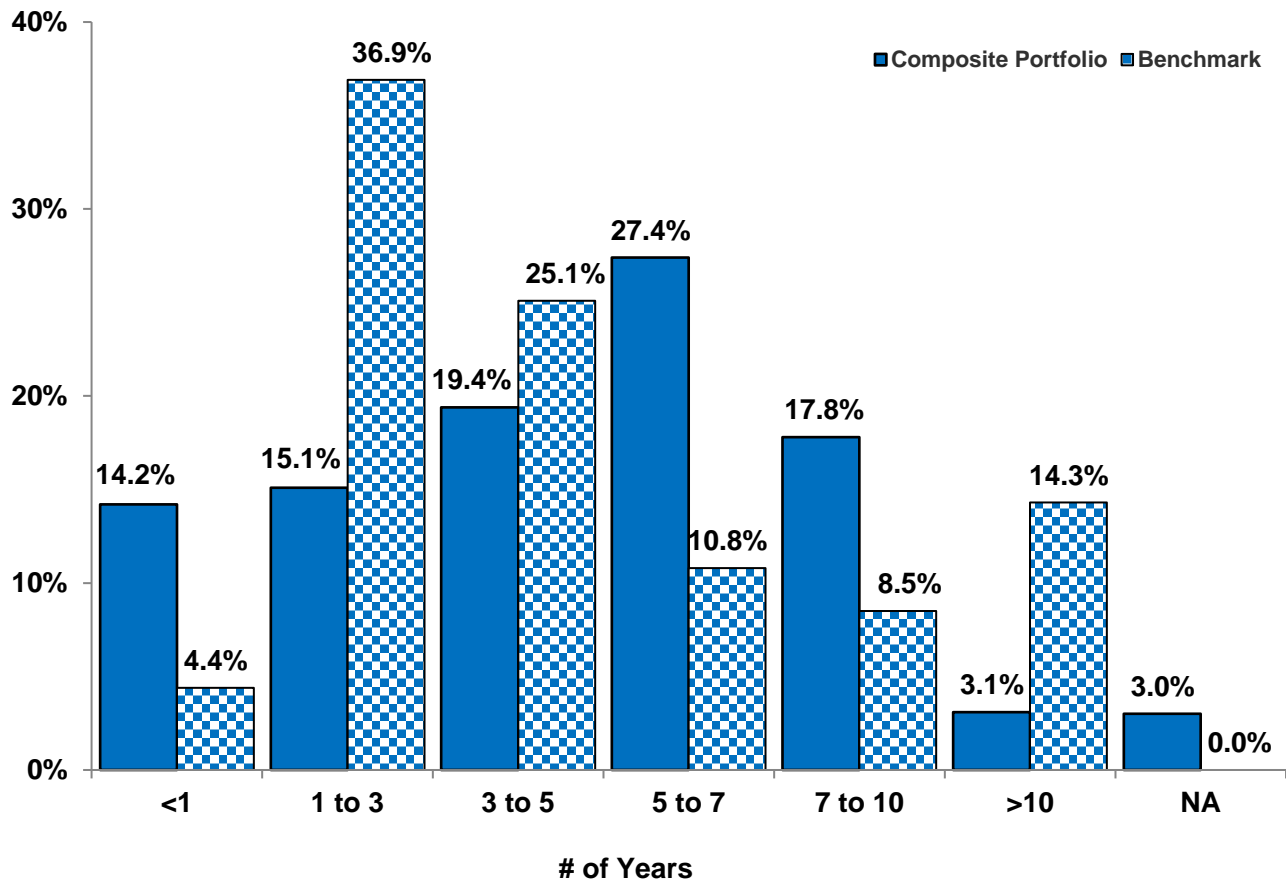
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

9/30/16



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,149	14.2%	4.4%	0.2	0.7
1 to 3	1,228	15.1%	36.9%	2.1	2.1
3 to 5	1,572	19.4%	25.1%	4.1	3.8
5 to 7	2,225	27.4%	10.8%	6.0	6.0
7 to 10	1,447	17.8%	8.5%	7.8	8.1
>10	248	3.1%	14.3%	15.1	16.3
NA	243	3.0%	0.0%	0.0	0.0
Total	\$8,112	100.0%	100.0%	4.8	5.5

* Effective Duration

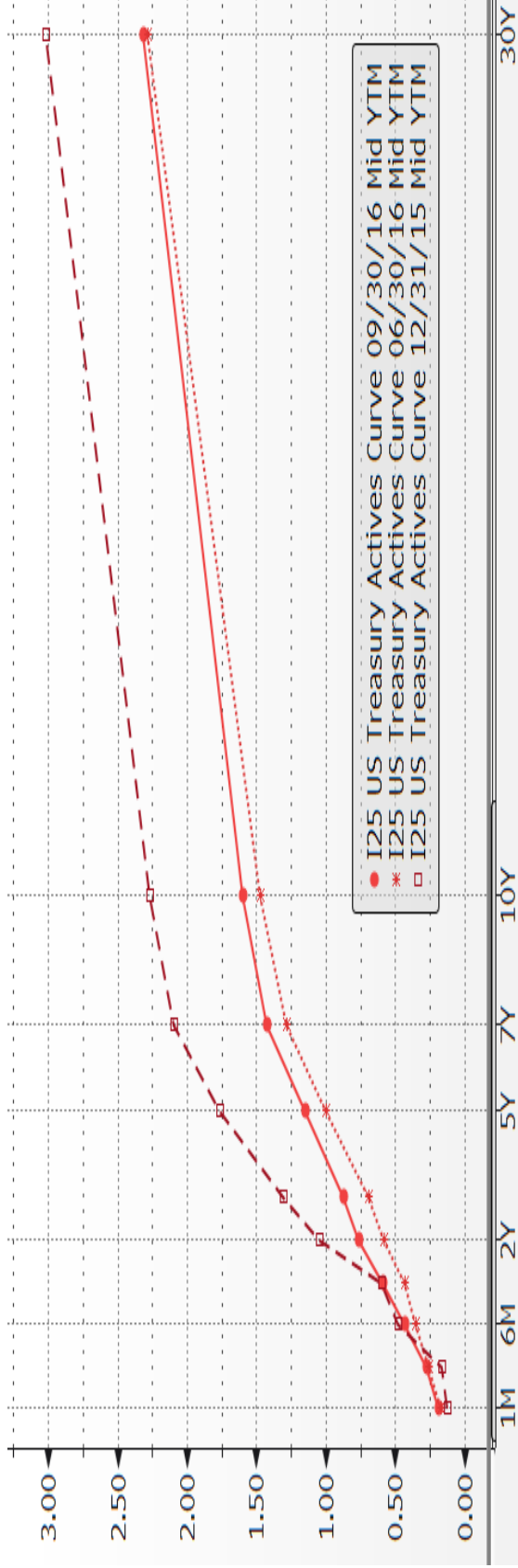
SMRS Internal/External Manager Performance – Net of Fees

9/30/16

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	\$8,111,698,173	7.2%	4.8%	4.1%	5.0%	5.6%
<i>Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>5.2%</i>	<i>4.0%</i>	<i>3.1%</i>	<i>4.1%</i>	<i>4.8%</i>
Internal Fixed Income	\$5,068,231,321	6.7%	4.8%	3.7%	4.6%	5.6%
External Fixed Income	\$3,043,466,852	7.7%	5.0%	4.6%	5.5%	5.4%
MetWest Securitized Opportunities	410,982,780	3.8%	--	--	--	--
Principal CMBS	498,209,333	4.1%	6.3%	10.1%	14.3%	--
Pyramis Tactical Bond Fund	285,644,995	9.4%	--	--	--	--
Prudential Investment Grade	225,140,492	9.4%	6.0%	5.7%	6.4%	6.8%
Dodge & Cox Core	235,515,458	7.2%	4.6%	4.4%	5.0%	5.6%
Loomis Sayles CorePlus	219,632,743	8.8%	4.6%	--	--	--
Napier Park ABS Income	133,842,232	8.8%	--	--	--	--
T. Rowe Global Multi-Sector	218,338,602	N/A	--	--	--	--
<i>Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>5.2%</i>	<i>4.0%</i>	<i>3.1%</i>	<i>4.1%</i>	<i>4.8%</i>
Columbia Management High Yield	451,211,028	11.5%	5.9%	--	--	--
Prudential High Yield	364,949,187	11.0%	--	--	--	--
<i>Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>11.7%</i>	<i>5.5%</i>	<i>--</i>	<i>--</i>	<i>--</i>

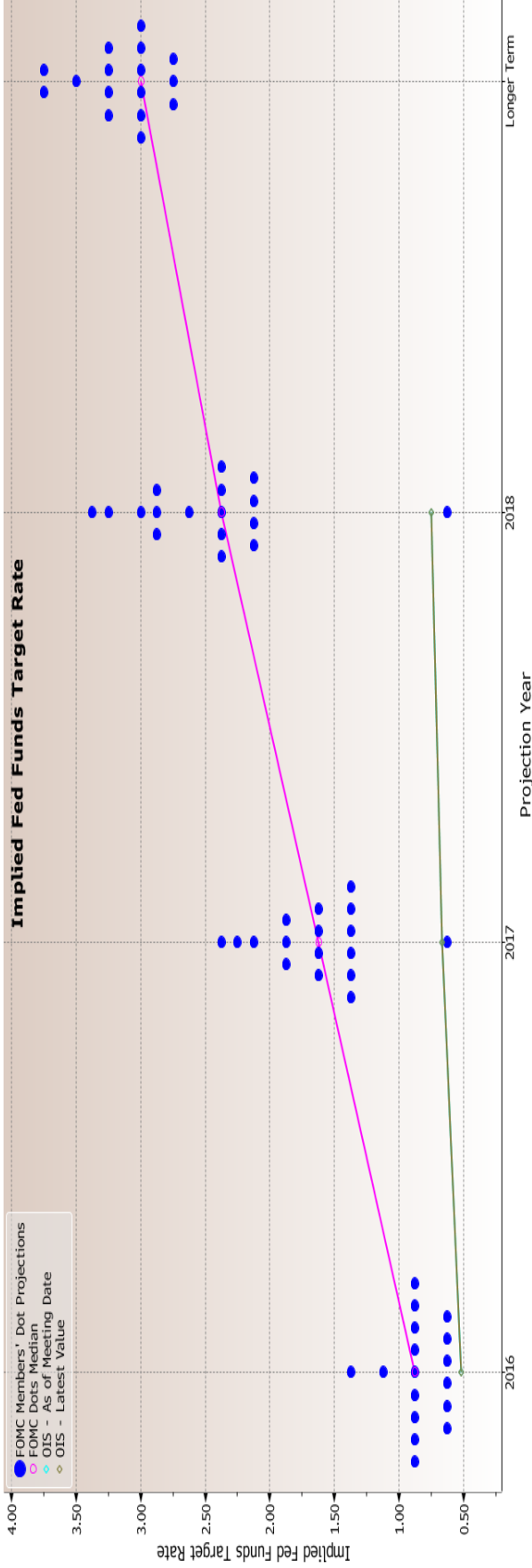
U.S. Yield Movement



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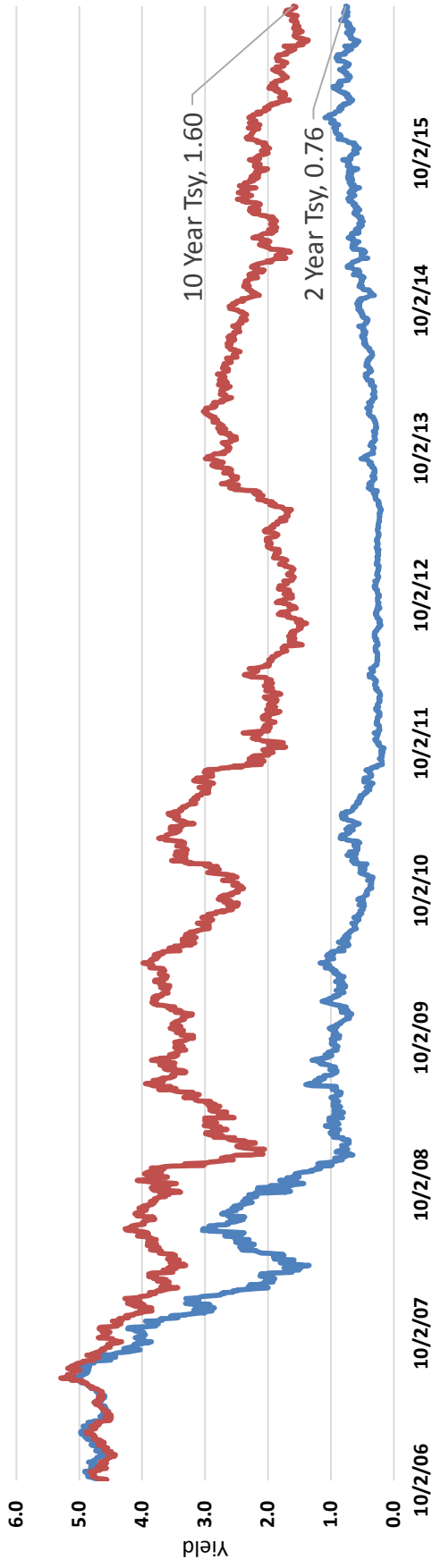
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FOMC DOT PLOT



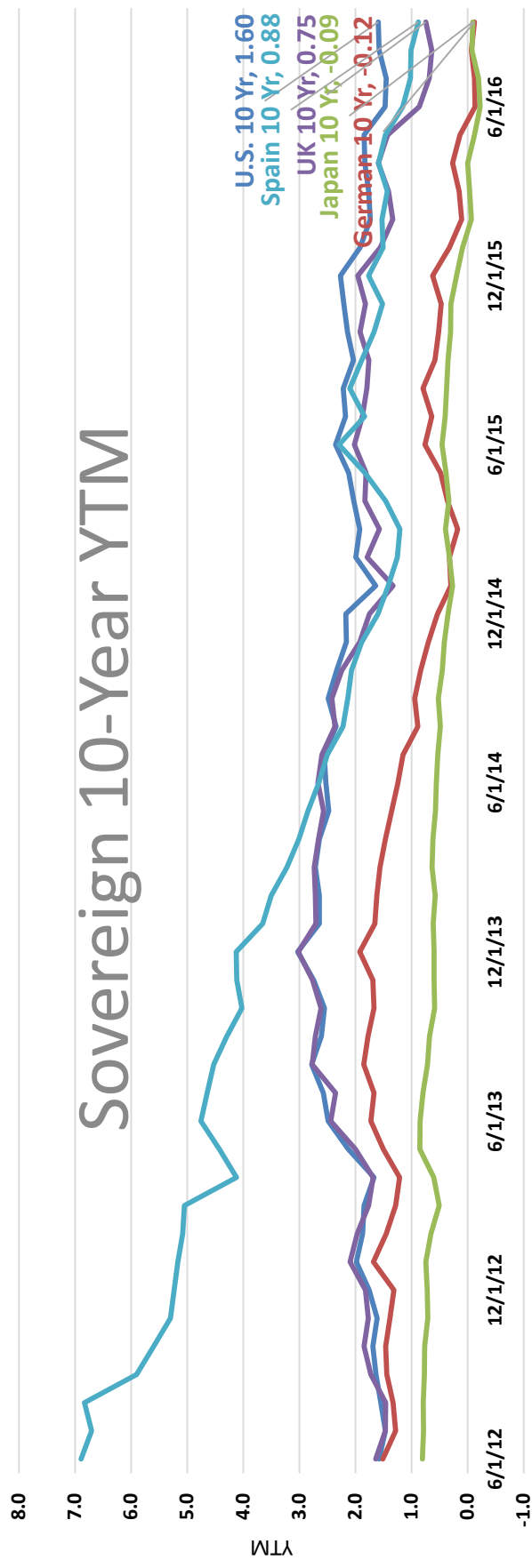
Source: Factset, Bloomberg

Yield Curve Slope



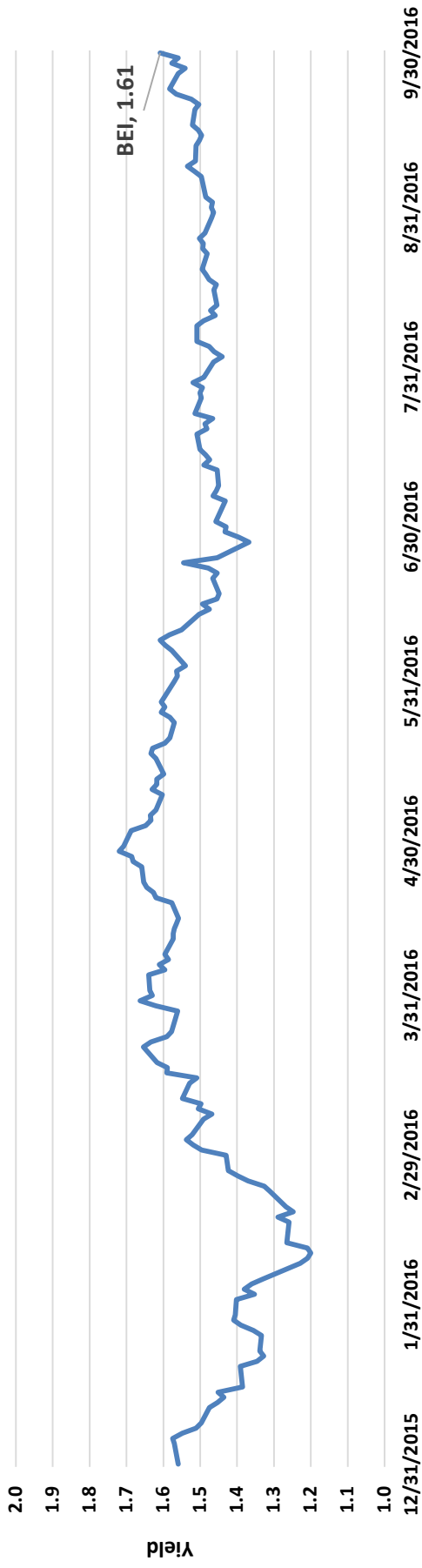
10

Sovereign 10-Year YTM

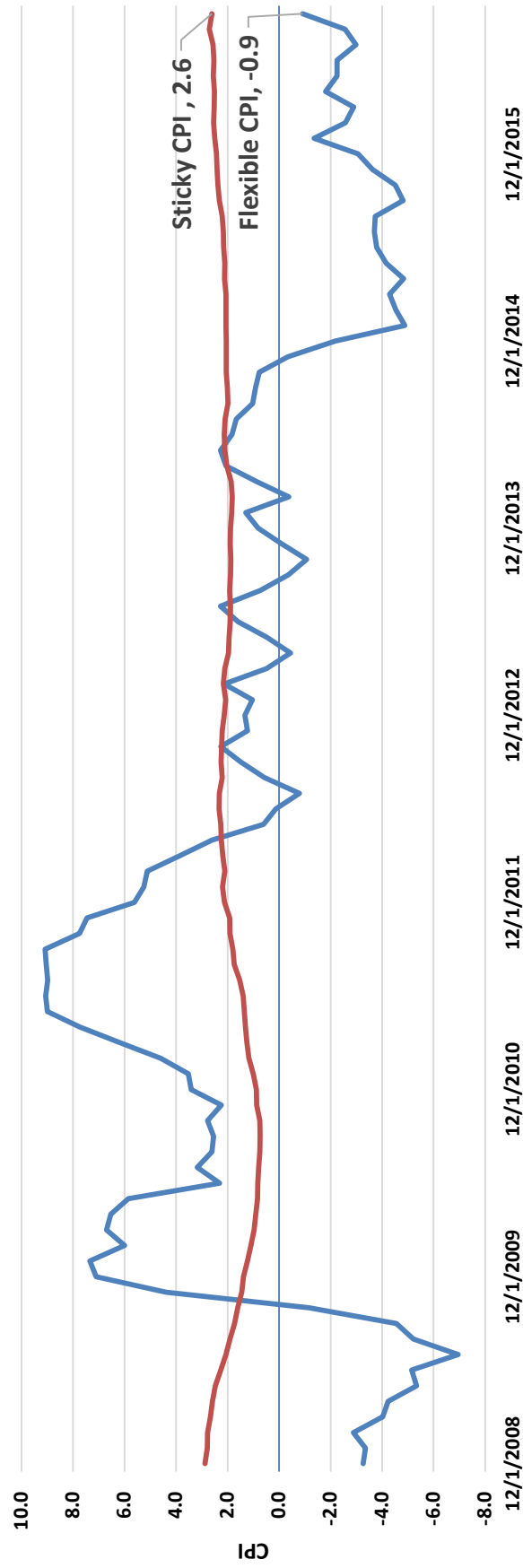


Source: Bloomberg

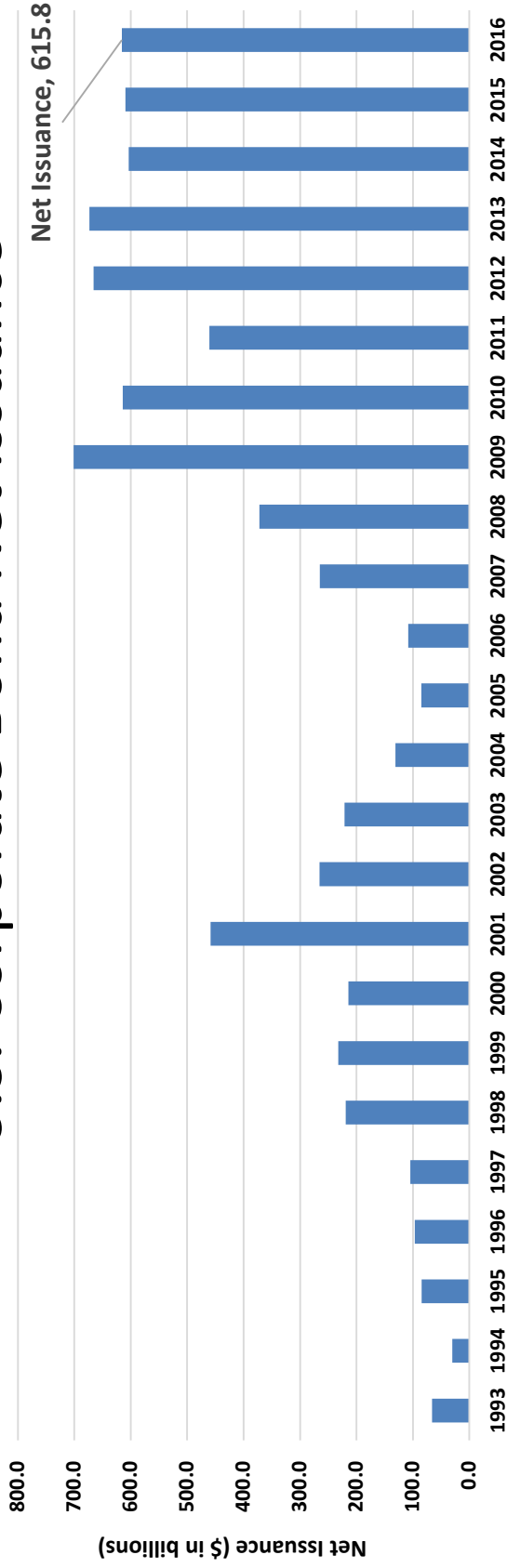
Breakeven Inflation



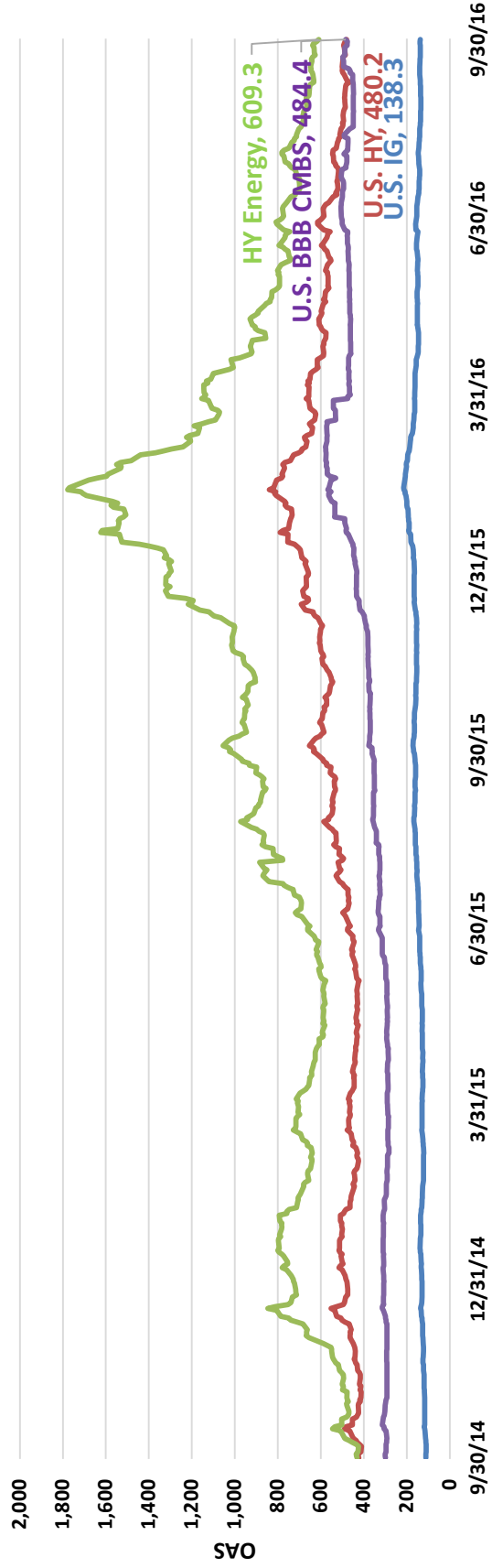
Flexible and Sticky Price CPI (12-Month Annualized)



U.S. Corporate Bond Net Issuance

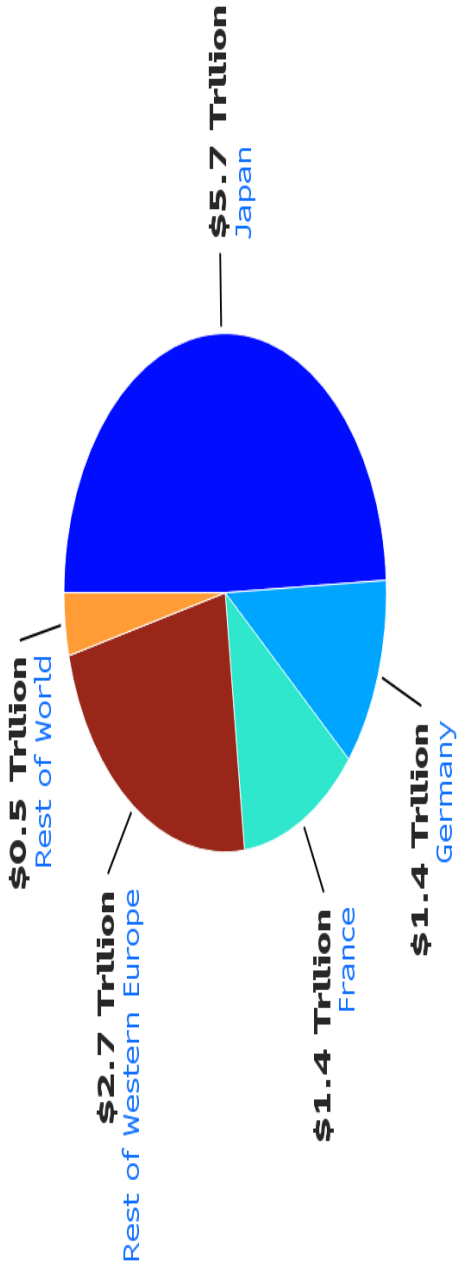


Option-Adjusted Spread Movement



Where Does It All Come From?

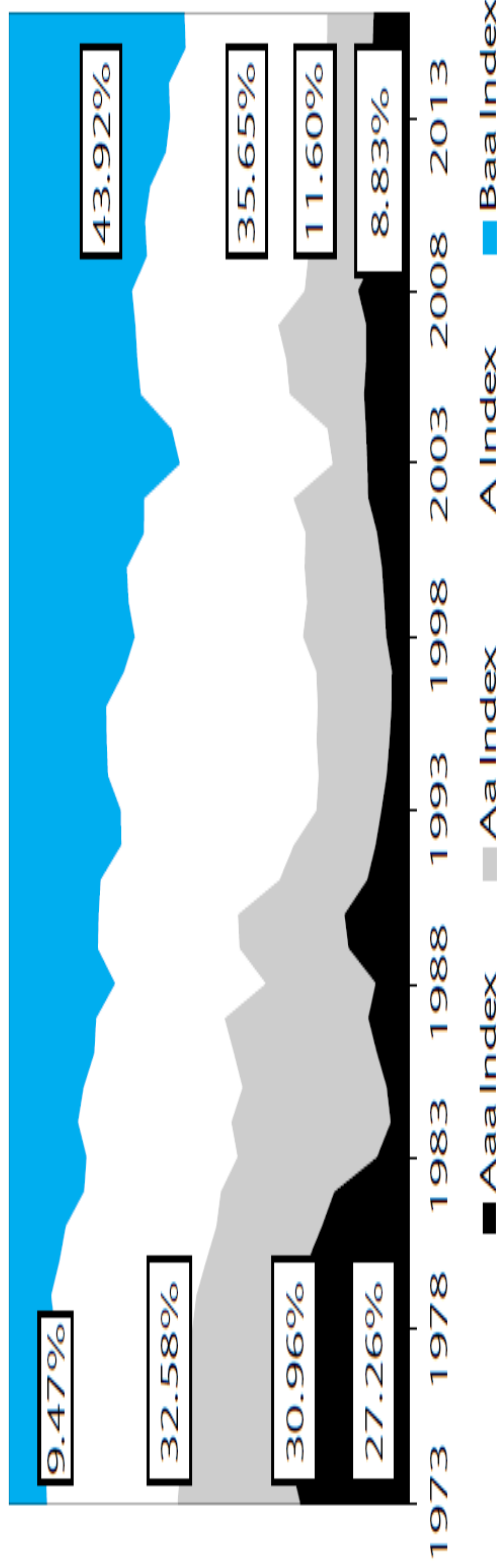
Almost all negative-yielding debt comes from Japan and Europe*



Source: Bloomberg
 *Includes all such bonds in the Bloomberg Barclays Global Aggregate Index; based on as-issued values converted to U.S. dollars

Bloomberg

Quality Analysis of Barclays Credit Index, 1973-2016



Source: Barclays Risk Analytics and Index Solutions and Index Solutions, Barclays Research

State of Michigan Retirement Systems

INTERNATIONAL EQUITY REVIEW

Investment Advisory Committee Meeting

December 15, 2016



Richard J. Holcomb, CFA
Senior Investment Manager
Quantitative Analysis Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	9.9%	2.1%	7.7%	4.9%	2.0%
Benchmark Return	9.3%	0.3%	6.3%	3.5%	1.0%
Peer Return (> \$1 B)	9.9%	1.5%	7.9%	5.2%	3.0%
Rank vs. Peers	49	28	60	58	85

- Third quarter international equity returns in developed markets reflected continuing slow economic growth and the political uncertainties of the British choice to leave the European Union (Brexit). Emerging market returns benefited from some stability in energy and commodity prices, and continued growth in China and India. Japan benefited from Yen strength. The U.S. dollar showed strength against the British Pound. Chinese GDP growth deceleration stabilized, and China “A” share stocks posted low positive returns although trailing the MSCI Emerging Markets Index. Significant geopolitical risks remain unresolved throughout the world, and global trade impacts are uncertain. Our international portfolio returns have exceeded their internal benchmark over all time periods.
- Performance comparisons with peer group returns are stable, and reflect positive contributions from all three strategic investment approaches. Indexed investments have benefited from an overweight to smaller capitalization stocks. Stock Plus strategy returns have benefited from internal fund rebalancing of collateral assets to improve their absolute return. Active managers have taken advantage of a more favorable investment environment for their individual disciplines, but had been negatively affected by underweights to the energy and commodities sectors.
- Internally-managed stock plus funds experienced volatility in dividend stocks and Libor note spreads in the third quarter, but have outperformed their benchmarks in longer periods. Stock plus funds represent 32.5% of international equity exposure, and had a return of 7.1% in the third quarter, and 11.6% for the year. Currency hedging of the internal swap overlay has been reduced to more closely match the 25% hedge level of its internal benchmark. All counterparties used for swap agreements, and all fixed income securities held as collateral continue to be rated investment grade.
- Indexed investments represent 30.8% of international equity exposure, and had a return of 7.3% in the third quarter, and 10.6% for the year. The positive relative performance can be attributed to an overweight of small capitalization stocks in the selection of index fund exposure components.

- Active international managers represent 36.8% of international equity exposure, and had a return of 7.9% for the challenging third quarter and 8.0% for the year. The manager strategies are diversified with a combination of fundamental analysis driven and quantitative factor approaches. The Wellington Emerging Markets Local Equity fund continued to contribute to excess returns for the year through its focus on EM local demand beneficiaries. The cumulative active exposure is designed to produce a positive ensemble alpha through multiple expert processes.

Outlook

- The outlook for international equities is positive based on expected slow improvement in the European economies, continued European Central Bank support and stimulus through QE actions, and attractive valuation with the U.S. market. Emerging markets, which have now discounted lower energy and commodity prices and slower demand will benefit from growing local consumer demand. Political uncertainty and threats to global trade are critical issues that will play out in 2017.
- External managers, diversified by style, are benefiting and will benefit from a good environment for active stock selection with wider universe return dispersion and many opportunities. Small and mid-cap international stocks will continue to experience greater volatility, but will continue to have more of a positive shareholder focus than the larger State owned or influenced group that dominate capitalization-weighted benchmark indices. Stock Plus absolute return strategies have been impacted by interest rate and risk uncertainties, but will continue to achieve returns in excess of overlay costs.
- Emerging markets performance will continue to benefit from growing local consumer demand trends and access to technology. Positive governance, regulation, and financial system changes will gradually improve investment opportunities in many countries. Political instability, systemic corruption, rule of law, and unfavorable tax regimes will remain concerns, and progress uneven. Infrastructure projects should stimulate emerging market economies. Commodity rates will continue to improve as capacity is reduced.

Investment Plan

- Move toward longer term asset allocation objectives as political uncertainties are better defined, a slow global recovery develops and relative valuations of international markets remain positive.
- Take advantage of opportunities to enhance returns in internal stock plus strategies to achieve absolute returns in excess of equity overlay costs. Collaborate with internal fixed income and equities staff for an effective hybrid approach to security research and selection.
- Prepare for derivative market regulatory and structural changes, and focus on further development of counterparty relationships as a strategic advantage.

SMRS
International Equities
9/30/16

Markets	Amount	Total	% of Total
Indexed (in millions)			
SSgA	\$1,837		
Vanguard	1,166		
Total Indexed		\$3,003	30.6%
Stock Plus			
Internal Swaps	\$1,776		
PIMCO	1,414		
Total Stock Plus		\$3,190	32.6%
Active			
Los Angeles Capital	\$1,155		
Wellington	812		
Marathon London	613		
SSgA	584		
Effissimo	231		
Lazard	214		
Total Active		\$3,609	36.8%

TOTAL

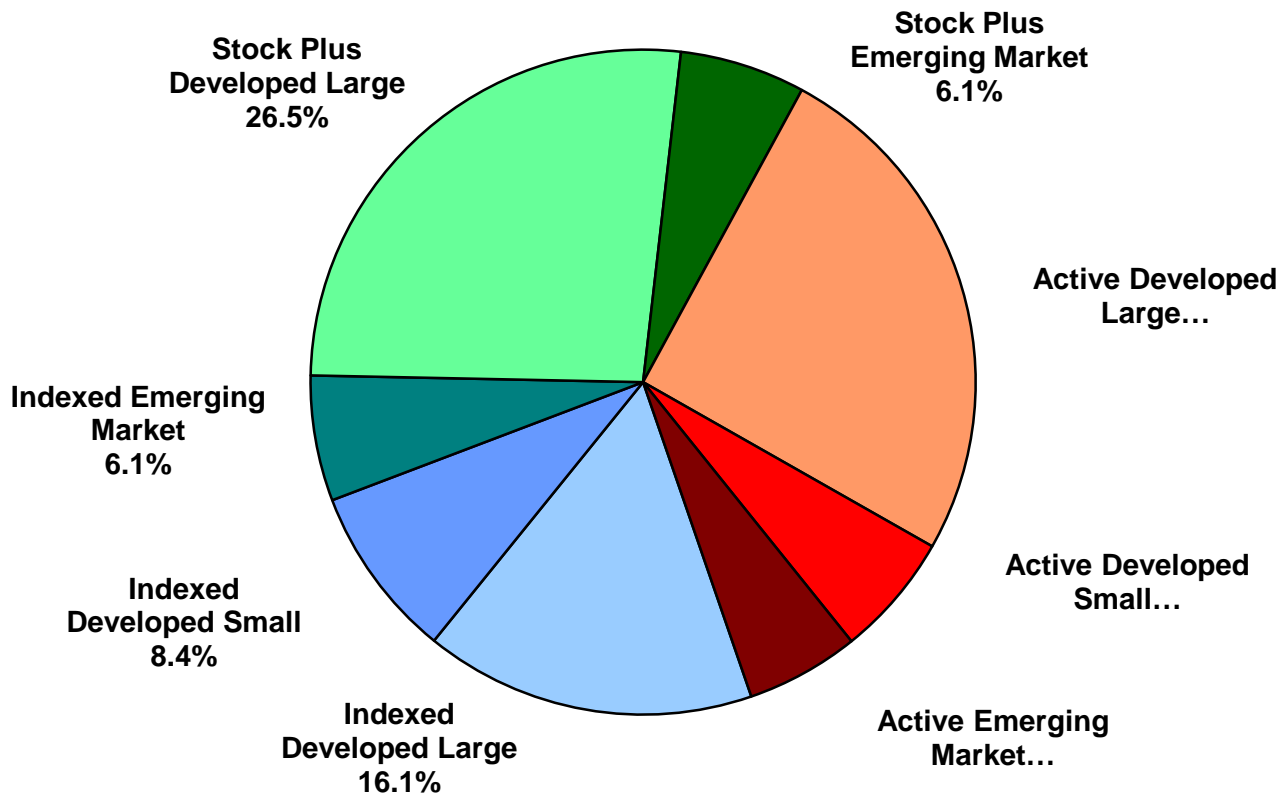
\$9,802

100.0%

SMRS

International Equity Exposure By Category

9/30/16



Market Value in Millions				
	9/30/16		6/30/16	
Indexed				
Developed Large	\$1,575	16.1%	\$1,479	16.2%
Developed Small	826	8.4%	761	8.3%
Emerging Market	602	6.1%	558	6.1%
Total Indexed Equity	\$3,003	30.6%	\$2,798	30.6%
Stock Plus				
Developed Large	\$2,591	26.5%	\$2,437	26.7%
Emerging Market	599	6.1%	545	6.0%
Total Stock Plus Equity	\$3,190	32.6%	\$2,982	32.7%
Active				
Developed Large	\$2,484	25.3%	\$2,316	25.4%
Developed Small	584	6.0%	532	5.8%
Emerging Market	541	5.5%	499	5.5%
Total Active Equity	\$3,609	36.8%	\$3,347	36.7%
Total International Equity	\$9,802	100.0%	\$9,127	100.0%

Michigan Department of Treasury, Bureau of Investments

SMRS

Active International Equities

9/30/16

Date:	<u>9/30/16</u>	<u>6/30/16</u>	<u>3/31/16</u>	<u>12/31/15</u>
Assets (\$million):	\$3,609	\$3,348	\$3,242	\$2,410
Number of Securities:	1,506	1,522	1,558	1,707
Active Share:	63%	62%	63%	57%

Benchmark: MSCI ACWI ex USA

Description: The Active International Equities Composite represents the profile of 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, supported by multiple expert processes, is constructed to produce a positive, long-term ensemble alpha with control of assumed risk.

Characteristics:	<u>SMRS</u>	<u>MSCI ACWI ex USA</u>
Weighted Average Capitalization (\$billion):	\$3.5	\$13.5
Trailing 12-month P/E:	17.2x	10.6x
Forecast P/E:	15.2x	14.0x
Price/Book:	1.4x	1.6x
Beta:	0.93	1.00
Dividend Yield:	2.7%	3.1%
Tracking Error:	3.4%	NA

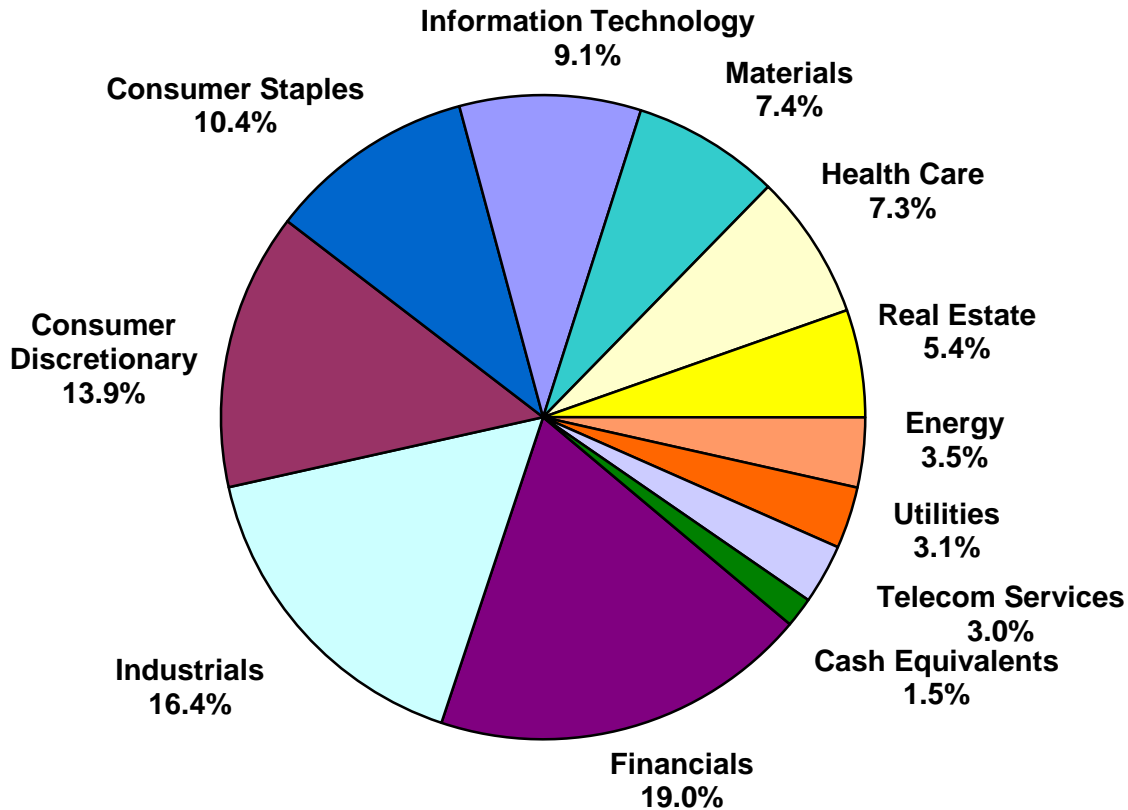
TOP TEN HOLDINGS – Active International Equities 9/30/16

	<u>Portfolio Weight</u>	<u>Market Value</u>
Dai-ichi Life Insurance Co Ltd/The	2.4%	\$85.9
Kawasaki Kisen Kaisha Ltd Ordinary JPY	1.4%	\$51.3
Ricoh Co Ltd	1.3%	\$45.4
Yamada Denki Co Ltd	1.1%	\$38.5
Lonza Group AG	0.8%	\$27.4
Novartis AG	0.7%	\$24.7
Atos SE	0.6%	\$22.8
Adecco Group AG	0.6%	\$21.9
Tencent Holdings Ltd	0.6%	\$21.2
Anheuser-Busch InBev SA/NV	0.6%	\$20.6
TOTAL	<u>10.1%</u>	<u>\$359.7</u>

SMRS

Active International Equity By Sector

9/30/16



Market Value in Millions				
9/30/16				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$684	19.0%	21.6%	-2.6%
Industrials	593	16.4%	11.8%	4.6%
Consumer Discretionary	503	13.9%	11.7%	2.2%
Consumer Staples	375	10.4%	10.8%	-0.4%
Information Technology	329	9.1%	9.6%	-0.5%
Materials	265	7.4%	7.5%	-0.1%
Health Care	264	7.3%	8.6%	-1.3%
Real Estate	195	5.4%	3.5%	1.9%
Energy	127	3.5%	6.6%	-3.1%
Utilities	113	3.1%	3.4%	-0.3%
Telecom Services	107	3.0%	4.9%	-1.9%
Total Investments	<u>\$3,555</u>	<u>98.5%</u>	<u>100.0%</u>	<u></u>
Cash Equivalents	54	1.5%	0.0%	1.5%
Total	<u>\$3,609</u>	<u>100.0%</u>	<u>100.0%</u>	<u></u>

Benchmark: MSCI ACWI ex USA

International Active Manager Performance - Net of Fees
9/30/16

<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)	\$971,990,964	9.0% 6.5%	0.0% 0.5%	9.3% 7.4%	-- --	10/1/10
LA Capital World MSCI ACWI Ex-US	845,351,215	--	--	--	--	10/30/15
Marathon-London Intl Fund MSCI EAFE Index	612,922,789	8.4% 6.5%	3.8% 0.5%	-- --	-- --	2/1/12
SSGA Small Cap Intl Alpha Strategy S&P Developed Ex-US Small Cap	583,508,683	9.5% 12.3%	5.0% 4.6%	12.1% 10.2%	9.2% 7.6%	5/1/07
Wellington Intl Research Equity S&P BMI World Ex-US Index	580,917,456	5.5% 8.5%	1.5% 1.1%	7.8% 7.4%	5.2% 4.7%	12/1/05
Pimco EM Stock Plus MSCI Emerging Market Index	441,953,854	18.6% 16.8%	--	--	--	3/31/15
LA Capital Emerging Market MSCI Emerging Market Index	309,770,987	14.6% 16.8%	-0.3% -0.6%	3.5% 3.0%	-- --	12/8/09
Wellington Emerging Local Equity MSCI Emerging Market Index	231,479,133	15.9% 16.8%	3.5% -0.6%	-- --	-- --	12/1/11
Effissimo Capital Management Japan MSCI EAFE Net Div Index (unhedged)	230,600,332	--	--	--	--	10/30/15
Lazard Wilmington Intl Equity Portfolio MSCI EAFE Net Div Index (unhedged)	213,750,000	4.2% 6.5%	-- --	-- --	-- --	5/1/14

International Indexed Manager Performance, Net of Fees
9/30/16

<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	\$1,010,633,464	8.3% 7.8%	0.8% 0.4%	7.1% 6.9%	-- --	4/1/10
SSgA EMI Fund - Europe/Pacific S&P EPAC Small Cap	825,606,164	11.3% 11.0%	5.5% 5.2%	11.3% 1.1%	-- --	4/1/10
Vanguard Emerging Market Spliced Emerging Market Index **	602,014,383	15.9% 15.7%	0.2% 0.1%	3.5% 3.1%	-- --	7/1/09
Vanguard Developed Mkts Fund Spliced Developed Ex-US Index *	564,101,072	8.1% 8.2%	1.2% 1.1%	8.4% 7.8%	-- --	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

December 15, 2016



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	3.6%	13.2%	11.6%	15.2%	11.2%
Benchmark Return	7.1%	14.8%	15.2%	17.3%	11.2%
Peer Median Return	4.7%	9.2%	9.7%	11.0%	8.9%
Rank vs. Peers	77	14	19	5	6

- The Private Equity Division annualized return was 3.6% for the year, underperforming its benchmark by 350 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 several years have been no exception due to market volatility and the fourth longest expansion in U.S. history. However, over the past ten years, a full market cycle, the Private Equity Division has delivered 4.0% annualized excess returns over the S&P 500 (10 year S&P 500 return 7.2%).
- Private Equity returns have been strong relative to peer median returns, ranking in the top 5% and 6% of peers over the past seven and ten years respectively.

Strategy Update

For the twelve months ending 9/30/16, the Private Equity Division returned approximately \$910 million, net of contributions, to the pension fund (9.6% cash yield on \$9.5 billion AUM). The pace of distributions is expected to slow for the remainder of 2016, as dividend recaps have largely played out.

- Commitments closed during the third quarter include:
 - \$100 million to Michigan Growth Capital Partners III, L.P., a Midwest focused small buyout fund
 - \$100 million to GCM Grosvenor Fund Investment Program VIII, L.P., a fund-of-funds focused on small buyout, venture and co-investment
 - \$50 million to HPS Mezzanine Partners III, L.P., a mezzanine debt fund

Market Environment

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

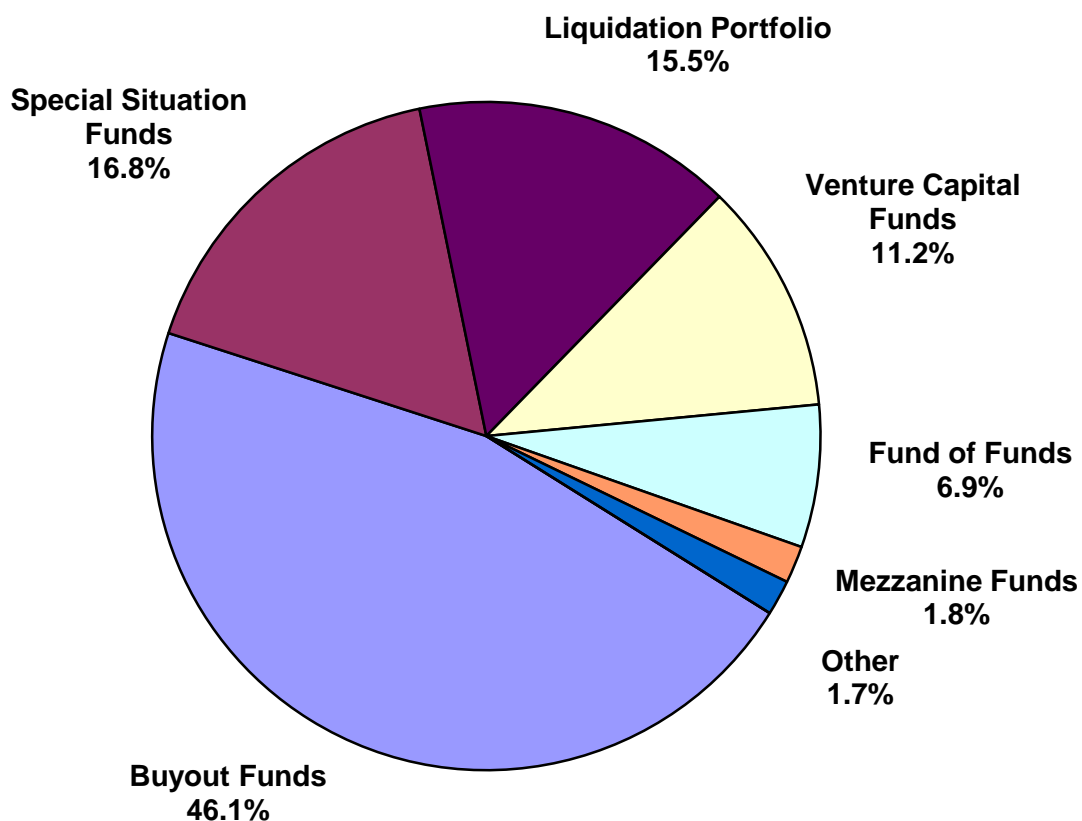
to evaluate non-traditional opportunities to put money to work. “There simply isn’t a lot of value in large leveraged buyouts of publicly traded companies” (Joe Baratta, the Blackstone Group).

- 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.
- Private Equity’s strategy for the next 3-6 months will focus on opportunistic investing. This may include direct co-investments, direct secondaries, co-mingled funds and other market driven opportunities.

SMRS

Private Equity

9/30/16



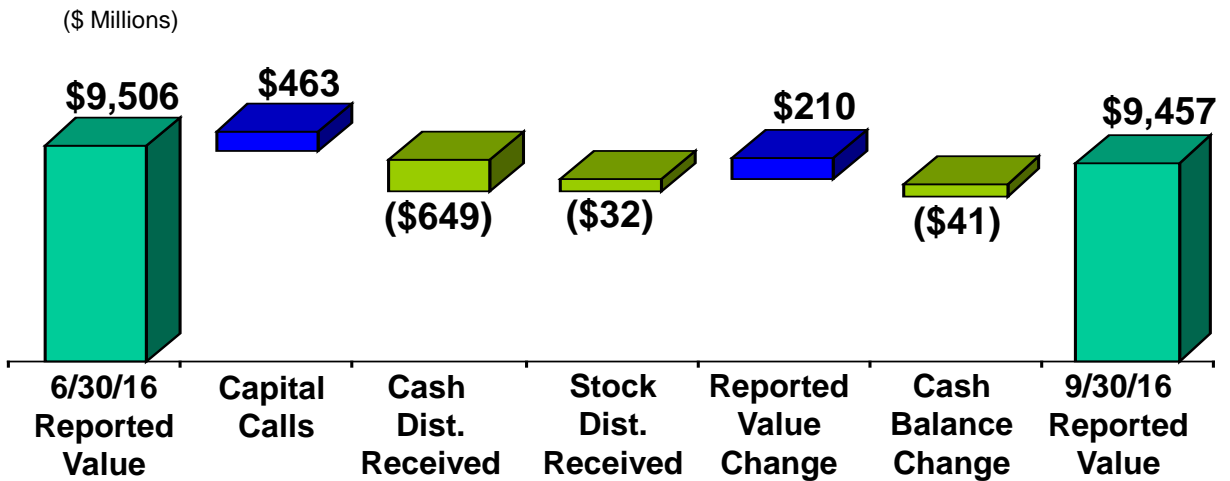
Market Value in Millions				
	<u>9/30/16</u>		<u>6/30/16</u>	
Buyout Funds	\$4,356	46.1%	\$4,404	46.3%
Special Situation Funds	1,593	16.8%	1,590	16.7%
Liquidation Portfolio	1,466	15.5%	1,488	15.7%
Venture Capital Funds	1,061	11.2%	1,056	11.1%
Fund of Funds	654	6.9%	610	6.4%
Mezzanine Funds	168	1.8%	157	1.7%
Other	159	1.7%	201	2.1%
Total	<u>\$9,457</u>	<u>100.0%</u>	<u>\$9,506</u>	<u>100.0%</u>

SMRS

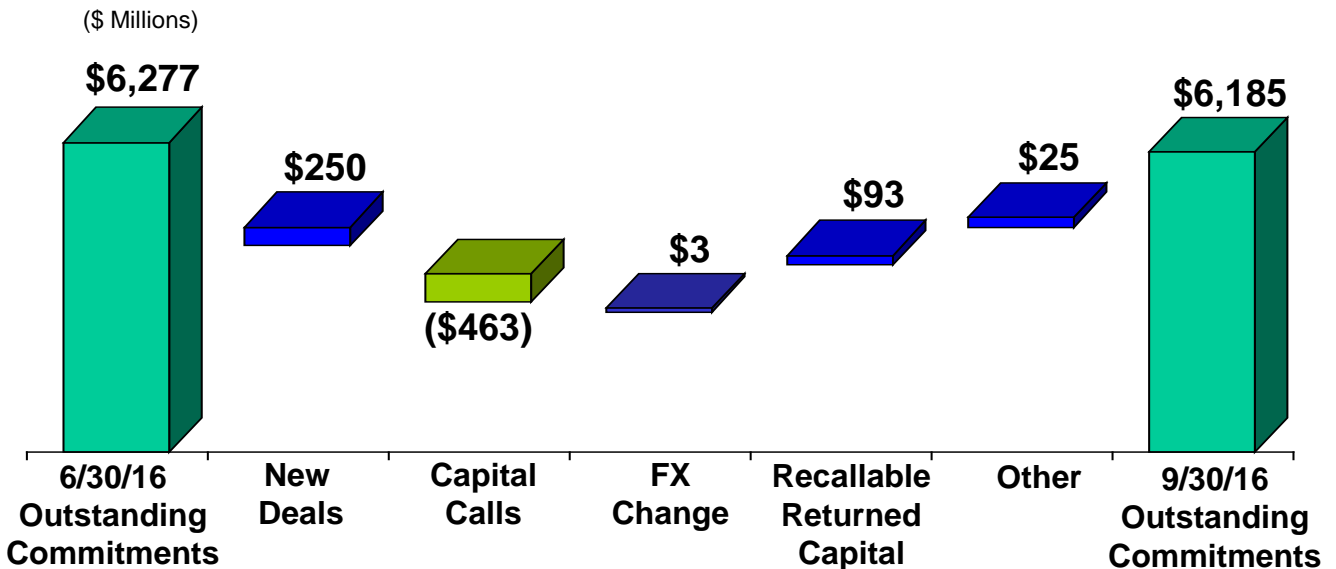
Private Equity

9/30/16

Invested Commitments



Outstanding Commitments

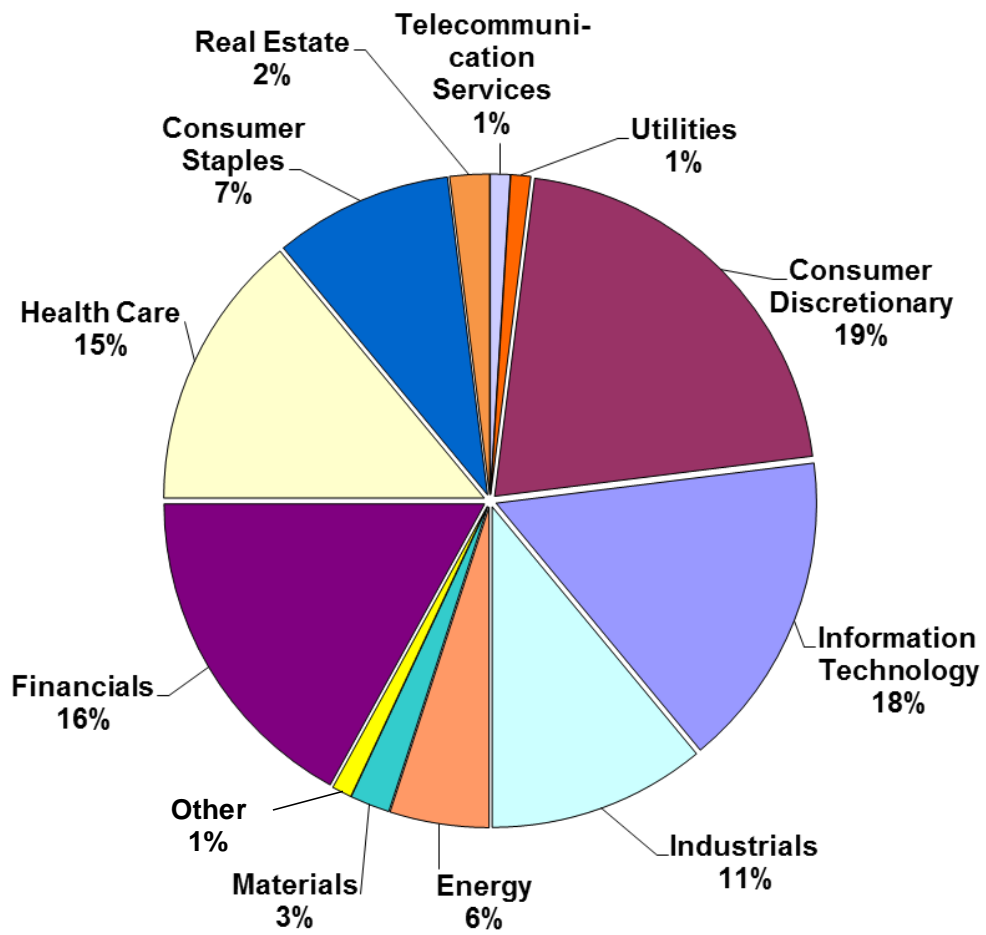


SMRS

Private Equity

9/30/16

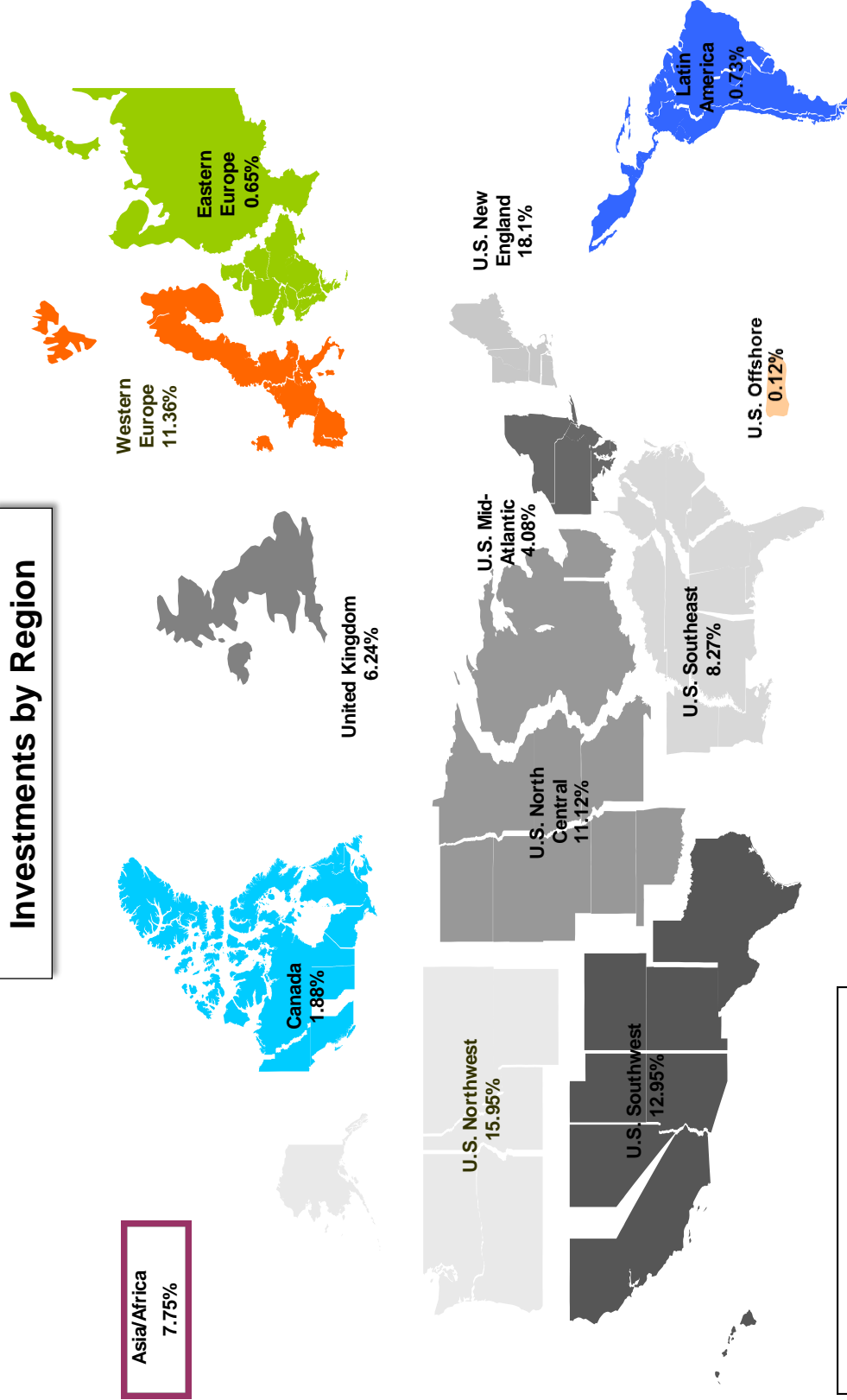
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 9/30/16 and are subject to change.

SMRS Private Equity 9/30/16

Investments by Region



0.80% Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 72%, Europe 18%, Asia 8%, Other 2%

SMRS

Private Equity

9/30/16

Portfolio by Vintage Year

(\$ Millions)

<u>Asset Vintage</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>
1986-98	\$ 13	\$ 12	\$ 25
1999	25	10	35
2000	66	28	94
2001	200	38	238
2002	53	9	62
2003	18	18	36
2004	124	46	170
2005	392	25	417
2006*	1,071	273	1,344
2007	895	154	1,049
2008	1,011	187	1,198
2009	66	1	67
2010	325	26	351
2011	755	167	922
2012	1,122	368	1,490
2013	430	288	718
2014	766	657	1,423
2015	1,882	1,903	3,785
2016	84	1,975	2,059
Income Accruals	1		1
Cash	154	-	154
Act. Small Cap - Stock Dist	4	-	4
Total	<u>\$ 9,457</u>	<u>\$ 6,185</u>	<u>\$15,642</u>

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ Millions)

	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>	<u>Total (USD)</u>
Euro (\$1.12/ €)	€ 379	€ 237	€ 616	\$692
Pound (\$1.29/ £)	£2	£1	£3	\$4

SMRS

Private Equity

9/30/16

Top 10 Sponsors

(\$ Millions)

<u>Asset Type</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total</u>
HarbourVest Partners	\$ 1,509	\$ 401	\$1,910
Grosvenor Capital Management	648	295	943
Blackstone Capital Partners	420	459	879
KKR	568	186	754
Warburg Pincus Capital	453	287	740
Advent International	345	316	661
Leonard Green & Partners	339	244	583
The Carlyle Group	281	254	535
TPG	330	170	500
Berkshire Partners	226	229	455
Top 10 Total Value	<u>\$5,119</u>	<u>\$2,841</u>	<u>\$7,960</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%	7.6%	13.0%	14.9%	12.0%
Fund of Funds	-0.1%	5.2%	12.2%	9.9%	9.3%
Mezzanine	-0.5%	-2.5%	3.7%	11.2%	8.5%
Special Situations	0.4%	4.0%	7.4%	10.9%	8.2%
Venture Capital	0.2%	1.0%	13.9%	13.2%	16.8%

*These numbers are based on most recent available General Partner reported data; primarily 9/30/16 and are subject to change.

SMRS Private Equity 9/30/16

Net Market Values by Ownership Entity

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Accel Europe I, L.P.	\$ 16,252,867	\$ 1
Accel Europe II	16,418,351	3,300,000
Accel Growth Fund II, L.P.	12,244,007	1,260,000
Accel Growth Fund III, L.P.	10,634,378	3,360,000
Accel Growth Fund IV L.P.	-	22,000,000
Accel IX, L.P.	4,607,802	3,000,000
Accel Leaders Fund L.P.	-	5,500,000
Accel London V L.P.	900,000	12,100,000
Accel VI, L.P.	1,386,074	-
Accel VII, L.P.	1,181,843	5,000,000
Accel VIII, L.P.	3,506,727	4,782,499
Accel VI-S	2,567,219	652,611
Accel X, L.P.	19,250,697	400,000
Accel XI, L.P.	6,910,092	1,680,000
Accel XII, L.P.	4,678,226	2,275,000
Accel XIII, L.P.	-	10,000,000
Advent Global Private Equity III	991,889	20
Advent Global Private Equity IV	15,302	-
Advent Global Private Equity V	9,204,062	8,700,000
Advent International GPE VI-A LP	123,392,176	3,999,980
Advent International GPE VII-B, L.P.	199,557,576	29,300,000
Advent International GPE VIII-B, L.P.	4,725,000	245,275,000
Advent Latin American Private Equity Fund VI, L.P.	7,431,990	28,472,500
Affinity Asia Pacific Fund II, L.P.	-	5,288,237
Affinity Asia Pacific Fund III, L.P.	56,387,541	12,860,591
Affinity Asia Pacific Fund IV, L.P.	57,536,759	73,837,623
Apax Europe Fund VI	23,251,686	2,376,610
Apax Europe V, L.P.	208,193	-
Apax Europe VII, L.P.	58,928,613	2,179,852
Apax Excelsior VI	85,022	1,614,434
Apax IX, L.P.	-	150,000,000
Apax US VII	20,555,674	417,509
Apax VIII - B, L.P.	93,534,658	23,445,788
Apollo Investment Fund VIII L.P.	55,929,953	47,358,486
Arboretum Ventures II	2,634,716	-
Arboretum Ventures III, L.P.	11,919,305	1,170,000
Arboretum Ventures IV, L.P.	3,463,935	24,780,000
Ares Corporate Opportunities Fund II	8,590,076	11,423,773
Ares Corporate Opportunities Fund III, LP	84,504,083	9,590,370
Ares Corporate Opportunities Fund IV, L.P.	79,808,615	26,625,983

	Adjusted Reported Value	Unfunded Commitment
AXA ASF Miller Co-Investment	39,559,904	22,721,187
Axiom Asia IV, L.P.	1,892,748	47,795,082
Axiom Asia Private Capital Fund III, L.P.	28,088,548	13,001,764
BC European Capital IX	65,197,704	15,184,962
BC European Capital VII, L.P.	551,145	-
BC European Capital VIII, L.P.	31,784,668	8,788,116
Berkshire Fund IX, L.P.	-	200,000,000
Berkshire Fund V, L.P.	256,268	3,281,560
Berkshire Fund VI, L.P.	48,656,418	6,922,675
Berkshire Fund VII, L.P.	72,486,269	2,453,549
Berkshire Fund VIII, L.P.	104,383,706	16,728,468
Blackstone Capital Partners IV	39,922,166	5,009,715
Blackstone Capital Partners V	68,659,122	16,142,412
Blackstone Capital Partners VI, LP	279,799,686	53,368,484
Blackstone Capital Partners VII, L.P.	-	270,000,000
Blackstone Capital Partners V-S	9,063,021	712,476
Bridgepoint Europe IV	38,072,752	6,328,741
Carlyle Europe Partners II	1,885,797	4,163,986
Carlyle Europe Partners III	40,702,479	12,347,397
Carlyle Europe Partners IV, L.P.	36,029,831	71,296,175
Carlyle Partners IV, L.P.	6,771,346	16,009,296
Carlyle Partners V L.P.	114,270,650	57,309,519
Carlyle Partners VI, L.P.	81,550,713	92,417,786
Castle Harlan Partners IV	7,110,353	5,286,319
Castle Harlan Partners V	38,084,494	38,442,690
CCMP Capital Investors II	61,938,609	10,346,490
CCMP Capital Investors III, L.P.	32,141,451	22,310,139
Centerbridge Capital Partners III, LP	21,039,435	55,819,789
Cerberus SMRS Partners, L.P.	89,548,241	27,804,657
CM Liquidity Fund, L.P.	-	25,000,000
Coller International Partners IV	3,425,842	1,000,000
Coller International Partners V, L.P.	46,552,769	43,600,000
Coller International Partners VI, L.P.	66,149,716	29,723,267
Coller International Partners VII, L.P.	5,782,515	144,720,189
Crescent Mezzanine Partners VI, L.P.	55,593,208	13,886,480
Crescent Mezzanine Partners VII	11,353,297	138,770,871
DLJ Investment Partners II	161,097	-
DLJ Investment Partners III	12,088,488	57,712,985
Dover Street IX, L.P.	-	100,000,000
EDF Ventures III	1,392,549	-
EnCap Energy Capital Fund X, L.P.	11,064,281	33,055,842
Entertainment IP Fund, L.P.	1,930,234	47,086,216
FIMI Opportunity 6, L.P.	1,022,727	48,977,273
FirstMark Capital I, L.P.	77,030,983	196,596
FirstMark Capital IV, L.P.	-	35,000,000
FirstMark Capital OF I, L.P.	10,012,266	9,500,000
FirstMark Capital OF II, L.P.	-	35,000,000
FirstMark Capital P2, L.P.	168,159,757	-

	Adjusted Reported Value	Unfunded Commitment
Flagship Ventures Fund 2004	10,256,550	-
Flagship Ventures Fund 2007, L.P.	32,943,447	-
Flagship Ventures Fund IV, L.P.	79,364,805	-
Flagship Ventures Fund V	25,402,442	18,725,000
Flagship Ventures Opportunities Fund I, L.P.	-	50,000,000
Fox Paine Capital Fund II, LP	22,167,780	15,539,184
FS Equity Partners VII, L.P.	45,643,011	51,690,300
GCM Grosvenor Fund Investment Program I, L.P.	15,280,768	1,422,440
GCM Grosvenor Fund Investment Program II, L.P.	58,901,509	15,958,840
GCM Grosvenor Fund Investment Program III - 2004	65,401,333	5,002,008
GCM Grosvenor Fund Investment Program III - 2006	103,911,015	10,562,946
GCM Grosvenor Fund Investment Program V, L.P.	90,557,353	13,597,826
GCM Grosvenor Fund Investment Program VI, L.P.	16,155,384	18,362,725
** GCM Grosvenor Fund Investment Program VIII, L.P.	-	100,000,000
GCM Grosvenor SeasPriFIP LP (PIS06-10)	83,071,428	26,391,470
GCM Grosvenor SeasPriFIP LP (PIS14)	158,013,667	87,408,234
GCM Grosvenor SeasPriFIP LP (Seed)	56,698,366	15,824,218
G-II Acquisition Holdings Note	6,932,579	-
G-IV Acquisition Holdings, LLC	20,936,296	-
Green Equity Investors IV	7,865,238	1,136,036
Green Equity Investors V	202,835,170	25,966,435
Green Equity Investors VI, L.P.	128,114,931	16,779,471
Green Equity Investors VII, L.P.	-	200,000,000
GSO Capital Opportunities Fund II, L.P.	20,971,109	15,889,384
GSO Capital Opportunities Fund III, L.P.	1,642,846	98,357,154
HarbourVest Dover Street VIII, L.P.	48,145,524	11,812,500
HarbourVest Int'l III Direct	1,192,407	1,000,000
HarbourVest Int'l III Partnership	673,922	1,200,000
Harbourvest Partners Co-Investment Fund IV L.P	-	100,000,000
HarbourVest Partners Mezzanine Income Fund	24,682,059	25,875,000
HarbourVest V Partnership	207,266	300,000
HarbourVest VI - Direct Fund LP	4,030,213	750,000
HarbourVest VI Partnership	11,105,901	2,000,000
Harvest Partners VII, L.P.	1,971,027	73,028,973
** HPS Mezzanine Partners III, L.P.	-	50,000,000
HVST - TOPE LLC	251,447,920	4,892,650
Insight Venture Partners Growth-Buyout Coinvestment Fund, L.I	20,507,044	29,625,000
Insight Venture Partners IX, L.P.	45,440,578	52,000,000
Kelso Investment Associates IX, L.P.	32,507,566	74,774,162
Kelso Investment Associates VII	3,055,740	4,970,176
Kelso Investment Associates VIII	107,703,588	23,901,677
Khosla Ventures III, L.P.	50,843,846	1,250,000
Khosla Ventures IV, L.P.	67,265,237	3,000,000
Khosla Ventures V, L.P.	20,341,000	30,450,000
KKR 2006 Fund, L.P.	155,081,906	7,231,738
KKR Americas Fund XII, L.P.	-	200,000,000
KKR Asian	37,988,774	2,360,055
KKR Asian Fund II, L.P.	35,438,302	26,281,661

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
KKR China Growth Fund	34,630,292	11,862,295
KKR E2 Investors (Annex) Fund	832,904	-
KKR European Fund II	22,442,066	-
KKR European Fund III	99,326,328	22,854,187
KKR European Fund IV L.P.	40,441,304	81,062,814
KKR European Fund LP 1	-	-
KKR Millennium Fund	35,820,483	-
KKR North America Fund XI, L.P.	105,597,977	34,729,508
Lightspeed Venture Partners VI	2,832,700	-
Lightspeed Venture Partners VII, L.P.	48,872,353	510,436
Lion Capital Fund I (HME II)	107,638	11,397,982
Lion Capital Fund II	4,490,534	4,678,387
Lion Capital Fund III, L.P.	92,032,216	12,714,252
MatlinPatterson Global Opportunities Partners II	3,048,606	-
MatlinPatterson Global Opportunities Partners III	67,430,400	4,336,976
Menlo Ventures IX, L.P.	3,865,721	-
Menlo Ventures X, L.P.	45,324,806	-
Menlo Ventures XI, L.P.	75,785,451	1,000,000
MeriTech Capital Partners II, L.P.	2,576,937	1,850,000
Meritech Capital Partners III, L.P.	10,835,142	600,000
Meritech Capital Partners IV, L.P.	16,454,110	25,000
Meritech Capital Partners V, L.P.	7,035,281	12,350,000
Michigan Growth Capital Partners II, L.P.	151,623,415	33,046,585
** Michigan Growth Capital Partners III, L.P.	-	99,877,853
Michigan Growth Capital Partners, LP	101,445,599	16,986,886
Midtown Fund III, L.P.	970,960	-
Midtown II Liquidating Trust	2,340,346	-
New Leaf Growth Fund I, L.P.	132,492,309	-
New Leaf Ventures II, L.P.	19,357,686	-
New Leaf Ventures III, L.P.	13,946,443	21,750,000
Nordic Capital VI, L.P.	27,935,895	-
Nordic Capital VII	63,486,210	5,610,520
Nordic Capital VIII, L.P. (Alpha)	25,160,747	21,321,859
Oak Investment Partners X, L.P.	6,922,621	-
Oak Investments Partners IX, L.P.	907,021	-
Oaktree Opportunities Fund X, L.P.	5,000,286	25,500,000
Oaktree Opportunities Fund Xb, L.P.	-	70,000,000
OCM Opportunities Fund IX, L.P.	71,803,644	-
OCM Opportunities Fund VII (B), L.P.	4,718,539	-
OCM Opportunities Fund VII, L.P.	5,691,586	-
OCM Opportunities Fund VIII B, L.P.	26,905,150	-
OCM Opportunities Fund VIII, L.P.	14,355,590	-
OCM Principal Opportunities Fund IV	19,084,711	-
Ocqueoc Holdings, LLC	15,201,164	-
One Liberty Fund III	1,138,406	-
One Liberty Fund IV	1,813,264	-
One Liberty Ventures 2000	5,950,484	-
Parthenon Investors II	1,104,681	3,186,779

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Parthenon Investors III	43,901,502	2,779,682
Parthenon Investors IV, L.P.	40,956,616	12,799,878
Peninsula Capital Fund IV	6,727,358	2,201,026
Peninsula Fund VI, L.P.	11,919,154	28,670,000
Phoenix Equity Partners IV	3,042,552	776,432
Public Pension Capital, LLC	5,384,435	44,960,306
Questor Partners Fund II	520,547	5,744,192
Rhone Partners V, L.P.	8,035,191	101,059,598
Riverside Capital Appreciation Fund VI, LP	58,828,091	22,808,926
Riverside Micro Cap Fund I, LP	27,451,196	6,363,307
Riverside Micro-Cap Fund II, L.P.	50,470,107	2,735,834
Riverside Micro-Cap Fund III, L.P.	42,777,547	4,483,406
Riverside Micro-Cap Fund IV	7,852,799	42,147,201
Shamrock Growth Capital Fund IV, L.P.	257,195	48,949,052
Silver Lake Partners II	5,811,471	3,531,586
Silver Lake Partners III	74,898,232	13,153,225
Silver Lake Partners IV, L.P.	35,925,204	20,982,651
SM/TCP L.P.	32,289,392	14,918,007
SMRS-NCRP LLC	1,167,830,768	152,837,842
TCW Shared Op Fund III	1,127,290	-
TCW/Crescent Mezzanine Partners III, L.P.	2,407,490	4,552,763
TCW/Crescent Mezzanine Partners IV, L.P.	3,750,798	6,030,737
TCW/Crescent Mezzanine Partners V, LLC	28,149,716	13,232,460
The Huron Fund III, L.P.	15,786,655	4,992,756
The Huron Fund IV, L.P.	21,167,857	13,150,346
The Shansby Group 4	610,132	520,829
The Shansby Group 5 (TSG5)	15,600,790	7,443,077
Thoma Bravo Fund XII, L.P.	24,124,514	124,940,207
TPG IV (Texas Pacific Group IV)	7,472,411	211,725
TPG Partners III, LP	5,550,857	2,087,002
TPG Partners VI, L.P.	170,992,221	23,016,824
TPG Partners, VII, L.P.	31,173,248	118,051,217
TPG V (Texas Pacific Group V)	114,744,274	26,611,195
Trilantic Capital Partners V (North America) Fund A, L.P.	26,489,114	21,590,268
TSG6, L.P.	128,102,012	39,545,079
TSG7 A L.P.	18,212,920	106,036,148
Turnbridge Capital Partners I , LP	30,528,413	62,565,261
Veritas Capital Fund V, L.P.	50,847,812	24,086,040
Veritas V Co-Investors, L.P.	9,947,963	15,000,000
Vista Equity Partners Fund V, L.P.	43,816,177	10,164,258
Vista Equity Partners Fund VI, L.P.	16,082,319	59,005,059
Vista Foundation Fund III, L.P.	1,660,976	17,157,142
Warburg Pincus Energy MCIP, L.P.	14,065,422	11,030,096
Warburg Pincus Energy, L.P.	24,617,942	72,800,000
Warburg Pincus Equity Partners, L.P.	4,074,643	-
Warburg Pincus International Partners	8,135,234	-
Warburg Pincus Private Equity IX	24,009,287	-
Warburg Pincus Private Equity VIII, L.P	13,062,124	-

	Adjusted Reported Value	Unfunded Commitment
Warburg Pincus Private Equity X, L.P.	149,752,397	-
Warburg Pincus Private Equity XI, L.P.	194,528,010	25,000,000
Warburg Pincus Private Equity XII Secondary, L.P.	2,644,417	22,355,583
Warburg Pincus Private Equity XII, L.P.	17,693,177	155,487,500
WestAm COREplus Private Equity QP	1,805,620	2,086,719
WestAm Special Private Equity Partners	3,759,542	2,317,427
Total Private Equity	\$ 9,297,572,344	\$ 6,184,789,471
Cash	132,734,700	-
Active Small Cap Cash	21,125,092	-
Active Small Cap	4,024,414	-
Income Accruals	1,125,207	-
Grand Total	\$ 9,456,581,757	\$ 6,184,789,471

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

** New Commitments made during quarter reported

State of Michigan Retirement Systems

REAL ESTATE AND INFRASTRUCTURE REVIEW

Investment Advisory Committee Meeting

December 15, 2016



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Return	10.4%	13.9%	11.7%	7.8%	5.2%
NCREIF NPI	7.8%	9.9%	9.8%	9.7%	59%
Peer Median Return	10.8%	11.1%	11.4%	9.6%	4.1%
Rank vs. Peers	57	17	36	69	26

- Total Real Estate and Infrastructure Division (REID) value was \$6.6 billion with a total one-year return of 10.4%. Strong performance was the result of increased rental income in for-rent housing, and the lease-up of apartment developments. Hospitality assets, revenue per available room (RevPAR) continued to increase. Credit strategies and unique opportunities sourced by staff have also contributed to 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 an established history and presence in the market.
- The REID has been actively managing the portfolio by selling stabilized assets at attractive capitalization rates where growth in rental income is expected to be limited. The REID 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:
 - \$200 million in Lone Star Fund X LP, a commingled fund specializing in global opportunistic credit strategies, managed by Lone Star.
 - \$17 million in M301W CoInvest LLC, a co-investment in a condo development in Austin, TX, managed by CIM Investment Advisors.
 - \$15 million in Penmain Office LLC, a separate account for a value-add office acquisition in Washington, DC area, managed by Domain Capital Advisors.
- 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.

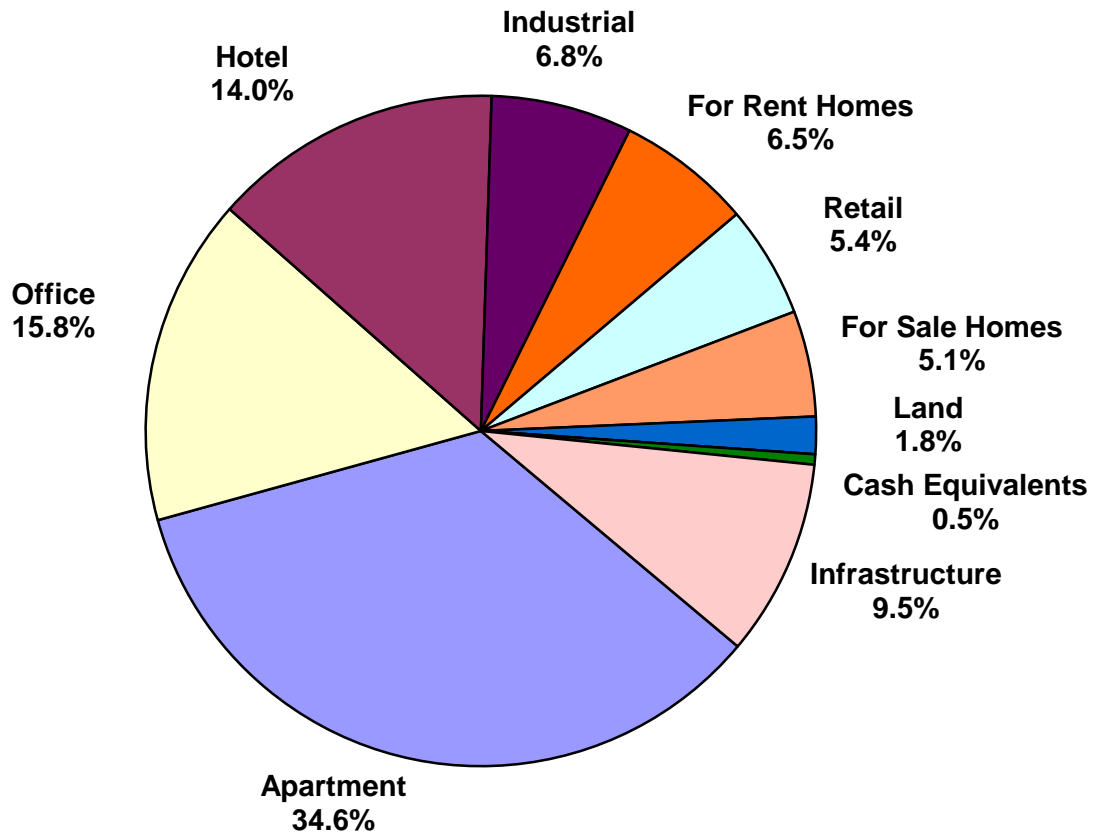
Market Environment

- Although still in demand by both domestic and international investors, high quality core asset pricing is beginning to level off. Lenders have become more selective in quality and location of the collateral and are disciplined in keeping loan-to-value ratios generally below 65%. 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. 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 currency exchange rates may limit the amount.
- 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 where distressed pricing is appearing, power generation, European transportation, and emerging market fundamental infrastructure projects. Investors are prudently managing capital and only pursuing select opportunities.
- In the commercial mortgage-backed securities (CMBS) market, spreads over the swap rate for 10-year AAA-rated securities decreased 10 basis points (bps) from the prior quarter and now stand at 109 bps. The reduced supply of securities caused spreads on high-rated securities to tighten, the lower-rated securities spreads remain appropriate for the risk. This demonstrates a flight to quality for investors. Commercial Mortgage Alert reported that CMBS issuance is projected to be only \$70 billion for 2016 compared to \$106 billion in 2015. A wave of refinancing for 2007 ten-year vintage loans is on the horizon. New banking rules by the federal government will negatively impact traditional bank lenders in 2017 and beyond. This could make it difficult for borrowers to refinance properties, with borrowing costs expected to rise due to the new rules. However, this provides opportunities for non-bank lenders, where the REID's credit strategy has focused its attention.

SMRS

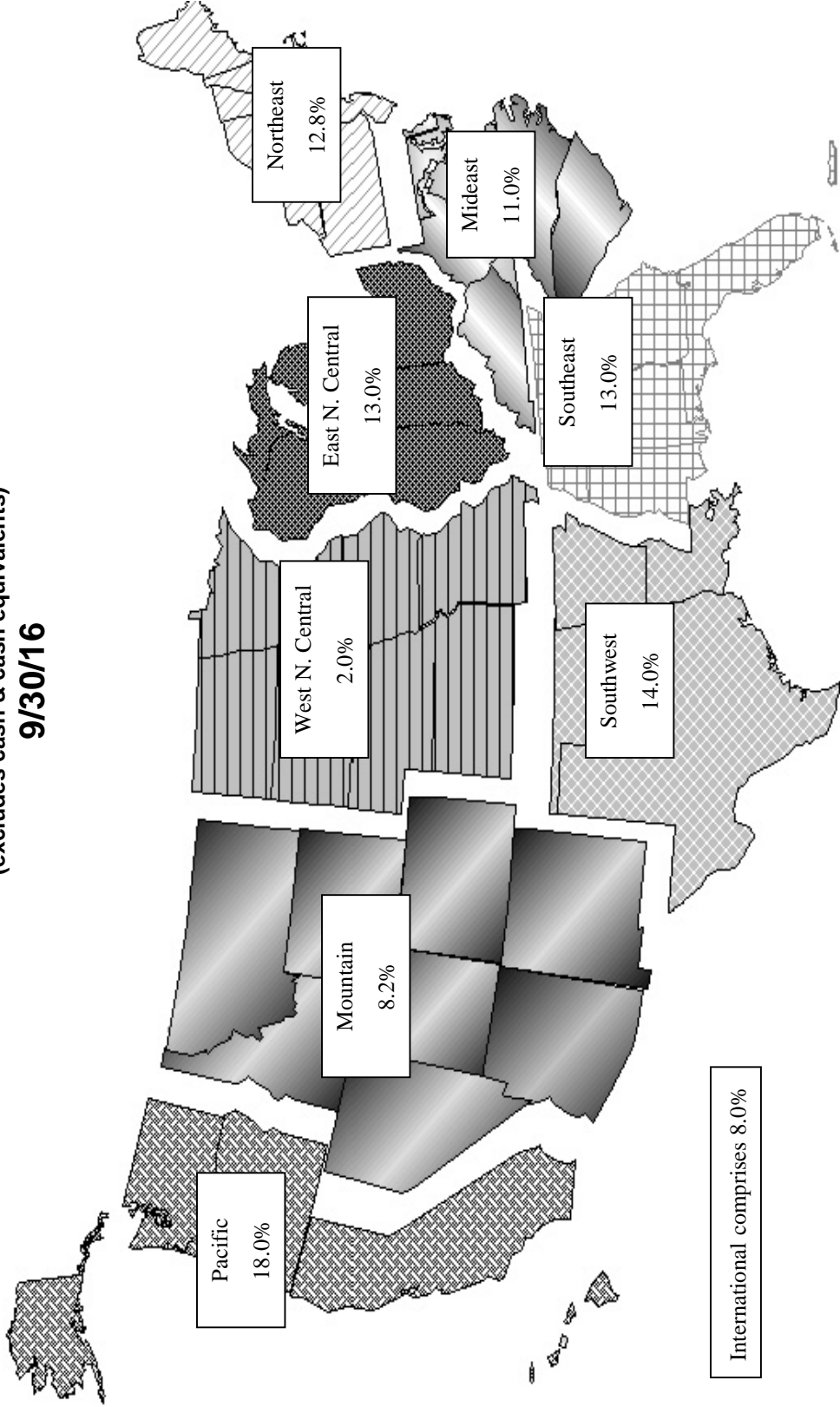
Real Estate and Infrastructure

9/30/16



Market Value in Millions				
	<u>9/30/16</u>		<u>6/30/16</u>	
Apartment	\$2,273	34.6%	\$2,195	34.1%
Office	1,040	15.8%	985	15.3%
Hotel	916	14.0%	900	14.0%
Infrastructure	625	9.5%	616	9.6%
Industrial	445	6.8%	437	6.8%
For Rent Homes	423	6.5%	422	6.5%
Retail	357	5.4%	362	5.6%
For Sale Homes	335	5.1%	296	4.6%
Land	116	1.8%	97	1.5%
	<u>\$6,530</u>	<u>99.5%</u>	<u>\$6,310</u>	<u>98.0%</u>
Cash Equivalents	<u>34</u>	<u>0.5%</u>	<u>133</u>	<u>2.0%</u>
Total Investments	<u>\$6,564</u>	<u>100.0%</u>	<u>\$6,443</u>	<u>100.0%</u>

SMRS
Real Estate by Region
Based on Market Value
 (excludes cash & cash equivalents)
9/30/16



Geographic regions defined by NCREIF, whose property index composition is: Pacific 32.0%, Mountain 5.8%, West N. Central 1.4%, Southwest 10.5%, East N. Central 7.6%, Southeast 9.4%, Northeast 21.3%, Midwest 12.0%

SMRS
Real Estate and Infrastructure
9/30/16

**Top Ten
Advisors or Entity**

<u>Advisor or Entity</u>	<u>Market Value</u>
MWT Holdings, LLC (SHLP)	\$ 1,373,506,347
Clarion Partners	677,495,448
Blackstone Group	579,917,512
Kensington Realty Advisors, Inc.	318,004,118
CIM Investment Advisors LLC	263,598,172
Domain Capital Advisors Inc	255,441,882
KBS Realty Advisors	249,788,060
Bentall Kennedy LP	244,795,818
Principal Real Estate Investors	236,626,597
Five Star Realty Partners, LLC	206,528,206
	<u>\$ 4,405,702,160</u>

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	94.2%	86.1%	92.2%	93.6%	79.7%
National Average	93.2%	87.0%	91.9%	94.6%	69.4%

SMRS
Market Values by Ownership Entity
9/30/16

REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 78,486,596	\$ 0
Apollo Asia Real Estate Fund, L.P.	0	75,000,000
Avanath Affordable Housing I, LLC	23,567,840	2,492,748
Avanath Affordable Housing II, LLC	25,095,429	0
Avanath II SMRS Co-Investment Fund LLC	20,463,113	0
Beacon Capital Strategic Partners IV, LP	1,163,557	0
Beacon Capital Strategic Partners V, LP	3,416,003	2,500,000
Blackstone R/E IH3 Co-Inv Partners	422,541,884	0
Blackstone Real Estate Partners V, LP	26,203,455	2,087,026
Blackstone Real Estate Partners VI, LP	40,443,940	3,680,000
Blackstone Real Estate Partners VIII, LP	30,215,889	46,400,000
Capri Select Income II	67,002	0
Capri Urban Investors, LLC	19,150,870	0
CIM Fund III, LP	72,335,388	0
CIM Fund VIII, LP	65,089,306	43,854,172
CIM Urban REIT, LLC	80,011,867	0
CIM VI (Urban REIT), LLC	30,999,470	0
Clarion Gables Multifamily Trust	28,778,554	0
CPI Capital Partners N.A., LP	179,019	0
CPI Capital Partners N.A. Secondary, LP	1,554,104	0
Crown Small Cap Real Estate	9,240,157	15,750,000
Domain GVA-1, LLC	190,557,501	165,396,752
Domain Hotel Properties, LLC	471,586,092	0
Dynamic Retail Trust	77,986,953	0
Eastport Properties, LLC	20,111,596	0
Gateway Capital R/E Fund II, LP	48,592,614	1,275,000
Great Lakes Property Group Trust	306,495,207	0
IMRF II ColInvest Spiga LP	12,486,230	1,500,000
Invesco Mortgage Recovery Feeder Fund	18,969,023	0
Invesco Mortgage Recovery Fund II, LP	51,127,565	17,543,582
IPF II Co-Invest LP	19,302,397	12,514,730
JBC North LaSalle, LLC	23,832,936	3,965,000
JBC Opportunity Fund III, LP	1,317,817	0
JP Morgan India Property Fund II, LLC	28,745,132	10,034,310
KBS/SM Fund III, LP	70,543,588	0
KBS/SM Fund IV, LP	122,760,000	0
L-A Saturn Acquisition, LP	42,169,517	0
Landmark Real Estate Partners V, LP	15,575,663	3,900,000
LaSalle Asia Opportunity Fund II, LP	262,623	0
LaSalle Asia Opportunity Fund III, LP	10,473,061	1,250,000
Lion Industrial Trust	165,786,263	0
Lion Mexico Fund, LP	11,344,539	0
Lombard GVA0016	232,534,671	0
* Lone Star Fund X, LP	0	200,000,000
Lowe Hospitality Investment Partners	65,889	0
Lubert-Adler Real Estate Fund VII, LP	52,716,252	11,250,000
M1 Westgate ColInvest LLC	9,056,761	2,403,623
* M301W ColInvest LLC	6,105,380	10,515,644
MERS Acquisitions, Ltd.	143,676,117	0
MG Alliance, LLC	18,578,936	0

	<u>Market Value</u>	<u>Unfunded Commitment</u>
MIP Holdco, LLC	71,150,743	28,600,000
Morgan Stanley R/E Fund V - International	3,069,717	0
Morgan Stanley R/E Fund VI - International	21,493,450	0
Morgan Stanley R/E Fund V - U.S.	2,945,505	0
Morgan Stanley R/E Special Situations Fund III	43,919,612	0
MWT Holdings, LLC	1,373,506,347	0
Northpark-Land Associates, LLLP	30,010,224	64,350,030
Orange Investors LLC	94,773,884	0
Paladin Realty Brazil Investors III (USA), LP	32,033,641	0
Paladin Realty Latin America Investors IV-CI, LP	31,911,697	17,500,000
* Penmain Office LLC	34,874,157	0
Principal Separate Account	158,140,001	0
Proprium RE Spec Situations Fund LP	22,950,171	21,214,477
Rialto Credit Partnership LP	46,500,000	167,772,727
Rialto Real Estate Fund, LP	29,253,140	0
Rialto Real Estate Fund II, LP	44,808,330	0
Rialto Real Estate Fund III-Debt, LP	2,398,874	47,600,000
Rialto Mezzanine Partners Fund	59,257,084	0
SM Brell II, LP	56,484,472	0
Stockbridge Real Estate Fund II-C, LP	20,562,735	0
Strategic LP	244,795,818	43,600,000
TPG RE Finance Trust	96,145,362	4,333,381
TPG RE Fund II	16,279,169	35,521,168
TSP Spartan C-I LLC	7,900,351	0
TSP Value and Income Fund LP	41,226,826	6,400,000
Trophy Property Development LP	50,932,164	7,408,100
True North High Yield Investment Fund II	22,125,169	5,000,000
True North Real Estate Fund III	25,603,563	29,867,783
Venture Center, LLC	41,276,544	0
Western National Realty Fund II, LP	26,486,836	0
	<u>\$ 5,904,579,352</u>	<u>\$ 1,112,480,253</u>
Short-Term Investments and Other	16,204,763	0
Total Real Estate Investments	<u>\$ 5,920,784,115</u>	<u>\$ 1,112,480,253</u>

INFRASTRUCTURE

ArcLight Energy Partners Fund VI, LP	\$ 20,697,829	\$ 28,333,181
ASF VI Infrastructure B LP	18,041,102	18,030,022
ASF Como Co-Investment LP	36,250,149	15,565,404
Basalt Infrastructure Partners, LP	30,475,874	19,314,545
Blackstone Energy Partners, LP	51,580,676	5,047,629
Blackstone Energy Partners II, LP	4,017,464	80,001,372
Brookfield Infrastructure Fund II-B, LP	47,898,533	5,983,982
Customized Infrastructure Strategies, LP	75,390,687	9,157,654
Dalmore Capital Fund	61,011,000	0
First Reserve Energy Infrastructure Fund II, LP	15,753,075	62,642,234
GCM Grosvenor Infrastructure Investment Program, LP	45,437,024	0
GCM Grosvenor Customized Infrastructure Strategies II, LP	5,864,883	45,438,714
GSO Energy Select Opportunities Fund LP	4,914,204	46,093,622
JP Morgan AIRRO India Sidecar Fund US, LLC	65,280,208	5,033,815
JP Morgan AIRRO Fund II US, LLC	10,836,429	83,384,246
KKR Eagle CoInvest L.P.	24,035,338	10,504,631
KKR Global Infrastructure Investors, LP	51,887,418	7,181,281
StonePeak Infrastructure Fund LP	56,124,202	12,227,536
	<u>\$ 625,496,095</u>	<u>\$ 453,939,868</u>
Short-Term Investments and Other	17,539,489	0
Total Infrastructure Investments	<u>\$ 643,035,584</u>	<u>\$ 453,939,868</u>
TOTAL INVESTMENTS	<u>\$ 6,563,819,700</u>	<u>\$ 1,566,420,121</u>

* New or additional commitment made during the quarter reported

State of Michigan Retirement Systems

BASKET CLAUSE REVIEW

Investment Advisory Committee Meeting

December 15, 2016



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

SMRS

Basket Clause Investments

9/30/16

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	3,966,455,203
Total Real Return and Opportunistic	943,430,827
Total International Equity	540,371,320
Total Long-Term Fixed Income	<u>54,381,725</u>
Total Basket Clause Investments	<u>5,504,639,075</u>

The basket clause investments at September 30, 2016, were \$5.5 billion or 8.9% of the total portfolio value of \$61.6 billion.

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

Disclaimer



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

