

STATE OF MICHIGAN INVESTMENT BOARD MEETING
June 6, 2019

State of Michigan Retirement System
Quarterly Investment Review



Rachael Eubanks, State Treasurer
Prepared by Bureau of Investments
Michigan Department of Treasury

STATE OF MICHIGAN INVESTMENT BOARD MEETING

JUNE 6, 2019

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 3/7/2019 SMIB Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 3/31/19
- 10:00 a.m. Current Asset Allocation Review
Markets Review and Outlook
- 10:15 a.m. Guest Speaker: Henry McVey, KKR
- Member & Head of Global Macro & Asset Allocation
- CIO of KKR Balance Sheet
- 10:45 a.m. Review of Investment Reports
- Real Estate & Infrastructure – *Receive and File*
 - Private Equity – *Receive and File*
 - Domestic Equity – *Receive and File*
 - Fixed Income – *Receive and File*
 - International Equity – *Receive and File*
 - Real, Opportunistic, & Absolute Return – *Receive and File*
 - Defined Contribution – *Receive and File*
- Basket Clause – *Receive and File*
- 11:00 a.m. Public Comment
- Closing Remarks ~ Adjournment



2019 Meeting Schedule

Thursday, September 12, 2019
Thursday, December 19, 2019

All meetings start at 9:30 a.m.

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State of Michigan Retirement System

MINUTES

State of Michigan Investment Board Meeting

June 6, 2019



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN INVESTMENT BOARD

March 7, 2019 Meeting Minutes

Members Present:

Chairman – Treasurer Rachael Eubanks
Ms. Dina Richard
Mr. Reginald Sanders
Mr. James Nicholson

Members of the Public and Bureau of Investments Staff Present:

Molly Jason	Karen Stout	Jack Behar
Karl Borgquist	Paul Lerg	Richard Holcomb
Mary Pollock	Anthony Estell	Kerrie VandenBosch
Chuck Abshagen	Todd Warstler	Pavel Stolarczyk
Emma Repp	Semone James	Mark Porrell
Ann Stange	Patrick Moraniec	Nick Whitman
Lan Chen	Ann Storberg	Jennifer Yeung
Ron Rolighed	Jon Braeutigam	Robert Brackenbury
Peter Woodford	Woody Tyler	Travis Haney
Greg Parker	Giles Feldpausch	Janet Sudac
Lori Barrett	Annette Russell	Max Kotary
Steve Cummings	Tim McEnery	

Chairman Eubanks called the meeting to order at 9:30 am.

Opening Remarks: Chairman Eubanks explained that she has been Treasurer for the State of Michigan for just about two months. It has been a very busy couple of months.

Approval of the December 11, 2018 SMIB Meeting Minutes – Motion to approve: James Nicholson. Seconded: Dina Richard. The vote was unanimous to approve, with Chairman Eubanks abstaining. (Chairman abstained because she was not on the board at the previous meeting.)

AGENDA

Executive Summary

Jon Braeutigam, Chief Investment Officer for the Bureau of Investments, discussed performance explaining that ten-year returns were 9.6% compared to the peer median return of 8.5%. It was a difficult calendar year, it was good through the fiscal year-end, then the market troughed in December and now has stabilized again. He once again thanked staff for their excellent work in choosing investments and performance of due diligence and explained that the SMRS' excellent performance is a direct product of their dedication to their jobs and their expertise. He explained that the SMRS invests for the long-term.

Asset Allocation Review, Markets Review and Outlook

Gregory Parker, Director of Investments - Public Markets discussed the outlook for fixed income, international equity and domestic equity today in comparison to the market ten years ago. He discussed volatility of the markets explaining that the SMRS tries to keep very tight risk controls in case of volatility. It has been stable over the last couple of years but when it appears it can feel alarming.

Review of Investment Reports

Woody Tyler, Senior Investment Manager of Defined Contribution, Trusts & Agencies presented an overview of the defined contribution plan, describing differences between the defined benefit plan and the defined contribution plan. He explained that all new State of Michigan employees are automatically placed into the defined contribution plan, specifically the Target Date Fund Investment, as this is beneficial to employees and is the industry standard best practice. He described the different investment tiers offered, which include Tier I Target Date Funds and Index Funds, Tier II Active Funds, and Tier III Self-Directed Brokerage Account, which offers extensive options to the investor. He also discussed that his area is exploring options to simplify and reduce the numbers of active equity managers in the line-up.

Daniel Quigley, Senior Investment Manager of the Fixed Income Division explained that performance was strong on a relative basis as the fixed income portfolio has outperformed peer group and the benchmark across all time periods. The division returned 1.2% gross versus 0.0% return for the Barclays US Aggregate. This was led by a 3.2% return in the Structured Fixed Income Portfolio and strong security selection in the internal core bond portfolio. He further explained strategies going forward and the current market outlook.

Jennifer Yeung, Senior Investment Manager of the Real, Opportunistic, & Absolute Return Division presented an overview of the division, explaining the two portfolios that are managed within the division totaling \$12.3 billion in value. The Absolute Return portfolio with a current value of \$4.3 billion and the Real Return & Opportunistic portfolio with a current value of \$8 billion. She further explained the characteristics and strategies of the portfolios and discussed new commitments made in the last quarter. Jennifer described the goals of each of these two portfolios and how they fit in the funds overall asset allocation.

Jack Behar, Senior Investment Manager of the Domestic Equity Division explained that the division outperformed the S&P 1500 during the past year, driven by a strong performance from its internal management team. Low cost management continues to be a priority, with equity implementation costs at approximately 8 basis points, which is similar to what a retail investor would pay for an S&P 500 index fund. He reported that the division's current allocation is comprised of 45% index funds, 29% active internal management, and 26% active external management. The division drives costs lower in its external manager portfolio by using its scale and by seeking to be a good strategic partner to its managers.

Public Comment

Treasurer Eubanks asked that any attendees wishing to address the Board come forward. No public comment.

Treasurer Eubanks adjourned the meeting at 11:13 am. Motion to adjourn by James Nicholson. Seconded: Dina Richard. The vote was unanimous to adjourn.

Approved:

Rachael Eubanks, Chairman

State of Michigan Retirement System
EXECUTIVE SUMMARY

State of Michigan Investment Board Meeting
June 6, 2019



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

EXECUTIVE SUMMARY

March 2019

Performance

Great peer comparison.

MPSERS Plan (03/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	6.1%	10.3%	8.3%	9.6%	11.0%
Policy Returns	4.2%	9.4%	7.8%	9.4%	11.6%
Peer Median Returns*	4.3%	8.9%	6.7%	8.0%	10.0%

*State Street Universe greater than \$10 billion.

- Over the past one, three, five, seven, and ten years, the returns are much higher than peer median returns. Compared to the State Street Universe of public pension plans greater than \$10 billion, the returns are mostly within the top decile of returns. Also, the plans' returns were among the least risky, as measured by standard deviation.
- The ten-year return begins at the cyclical low of the global financial crisis and because risk assets were trading at depressed prices, the trailing 10-year returns are above average. Over a very long horizon, since 1979, the annualized rate of return on the plan assets has been approximately 9.4%.
- Compounding at higher than peer returns can add significant value. For example, based on the \$40.9 billion March 2009 market value, a ten-year annualized return of 11.0% compared to the 10.0% peer median return would add about \$10.1 billion in excess value.
- The returns beat the policy benchmark over the past year by 1.9%. Most of the asset class results were higher than their performance benchmarks; selectivity in private equity was a big driver of excess return. A slightly defensive allocation offset some of the positive selectivity.
- For the year ending March 2019, returns exceeded the peer median return by 1.8%, earning the second highest return in the peer universe. Most of the individual asset class returns were better than median over this time-period, and fixed income, domestic equity and private equity returns were in the top quartile of returns for their respective asset classes.

Asset Allocation

A low return environment.

- Given the low rates of return available in the capital markets for safe assets, and in order to earn the actuarial rates of returns, additional risks (primarily equity risk) must be assumed. However, at the end of March 2019, the equity risk (beta) is approximately 0.4 which is the lowest measurement in three decades, and it is lower than peer median at approximately 0.6.
- Liquidity is another fundamental risk assumed and it is managed through asset allocation. The plans have outstanding capital commitments to fund approximately \$12.8 billion in illiquid assets, primarily in private equity. In the March 2019 quarter, over \$900 million of new commitments were made.
- The combined systems paid out approximately \$2.0 billion net of contributions over the past twelve months ending in March 2019. Over the past year, real return & opportunistic was a net purchaser of approximately \$1.1 billion, private equity of approximately \$330 million and fixed income of \$60 million. Over the past year in round numbers, the allocation to real estate decreased by \$1.5 billion, domestic equity was reduced by \$785 million and absolute return by \$70 million. The allocation to short-term cash decreased by approximately \$1.1 billion.

Investment Update

Highlighting the quarter.

(\$ Millions)

NEW COMMITMENTS

January 1 – March 31, 2019

<u>Asset class</u>	<u>Fund Name / (Managed By)</u>	<u>Commitment</u>
Private Equity		
	Blackstone Capital Partners VIII, L.P. (The Blackstone Group)	\$200
	Genstar Capital Partners IX, L.P. (Genstar Capital Partners LLC)	125
	American Industrial Partners Capital Fund VII, L.P. (American Industrial Partners)	100
	Summit Partners Growth Equity Fund X, L.P. (Summit Partners, L.P.)	100
	Arboretum Ventures V, L.P. (Arboretum Ventures, Inc.)	35
	Menlo Special Opportunities Fund II. L.P. (Menlo Ventures Management, L.P.)	30
	Accel Growth Fund V, L.P. (Accel Associates)	28
	CircleUp Credit Fund I, LP (CircleUp Network Inc.)	25
	Silver Lake SL SPV-2 (Sliver Lake Partners)	14
	Accel XIV, L.P. (Accel Associates)	10
	Accel Leaders Fund II, L.P. (Accel Associates)	9
Real Estate and Infrastructure Division		
	Asana Partners Fund II, LP (Asana Partners, LP)	50
	Core Property Index Fund, LLC (IDR Investment Management, LLC)	25
Real, Opportunistic, & Absolute Return Division		
	Carlyle International Energy Partners II S.C.Sp. (CIM Global, L.L.C.)	150
TOTAL		\$901

State of Michigan Retirement System

PERFORMANCE

State of Michigan Investment Board Meeting

June 6, 2019



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 of Michigan Investment Board as fiduciary of the State of Michigan Retirement System, and independent of the Board, to the State Treasurer for various Michigan trust funds and the State's common cash, for which the State Treasurer is the fiduciary.

SMRS Goals

Maintain sufficient liquidity to pay benefits.

Meet or exceed the actuarial assumption over the long term.

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

Diversify assets to reduce risk.

Exceed individual asset class benchmarks over the long term.

MPSERS PENSION

Time-Weighted Rates of Return Periods Ending March 31, 2019

	% of Portfolio 3/31/19	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	11.0	19	9.6	5	8.3	5	10.3	9	6.1	8	5.3	85
Median - Greater than \$10 Billion ²		10.0		8.0		6.7		8.9		4.3		6.8	
MPSERS Total Plan Policy		11.6		9.4		7.8		9.4		4.2		3.8	
DOMESTIC EQUITIES	24.8	16.1	28	13.1	12	10.8	19	14.3	10	9.7	16	14.8	15
Median ²		15.0		12.1		9.5		12.1		6.4		13.2	
S&P 1500 Index		16.0		12.7		10.6		13.3		8.8		13.6	
INTERNATIONAL EQUITIES	16.8	10.3	32	5.9	56	3.8	31	8.6	35	-5.0	71	10.4	80
Median ²		10.0		6.0		3.2		8.3		-4.1		11.0	
International Blended Benchmark ³		8.1		4.9		2.6		8.1		-4.2		10.3	
PRIVATE EQUITY AND VENTURE CAPITAL	17.2	13.9	14	14.2	9	12.7	13	13.7	12	11.9	14	-1.4	96
Median ²		9.8		9.8		8.7		9.7		6.3		0.9	
Private Equity and VC Benchmark ⁴		16.5		16.0		11.7		12.5		-1.5		-12.9	
FIXED INCOME	12.7	5.3	36	3.8	16	4.2	15	4.2	20	5.1	11	3.4	42
Median ²		4.9		3.0		3.1		2.8		4.1		3.3	
Barclays Aggregate		3.8		2.5		2.7		2.0		4.5		2.9	
REAL ESTATE & INFRASTRUCTURE	9.7	6.8	61	11.2	28	11.2	36	9.5	29	8.5	52	0.6	67
Median ²		7.1		10.2		10.3		8.2		8.5		1.6	
NCREIF - Property Blended Index ⁵		7.1		8.2		7.7		5.7		5.5		1.5	
NCREIF Open Fund Index Net		7.7		9.8		9.2		7.0		6.6		1.2	
REAL RETURN AND OPPORTUNISTIC	11.0			11.3		10.5		12.9		10.8		0.0	
50% (CPI +500 bps) + 50% (6.8% actuarial rate)				7.2		7.2		7.5		7.0		2.0	
ABSOLUTE RETURN	5.7	7.0		5.2		3.5		6.9		3.3		0.6	
HFRI FOF Cons 1 month lagged		3.3		3.0		1.9		3.4		1.3		1.8	
CASH EQUIVALENTS	2.3	1.0		0.9		1.1		1.6		2.5		0.8	
1 Month T-Bill		0.4		0.5		0.7		1.1		2.1		0.6	

¹ Annualized Returns and Percentile Rank.

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

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

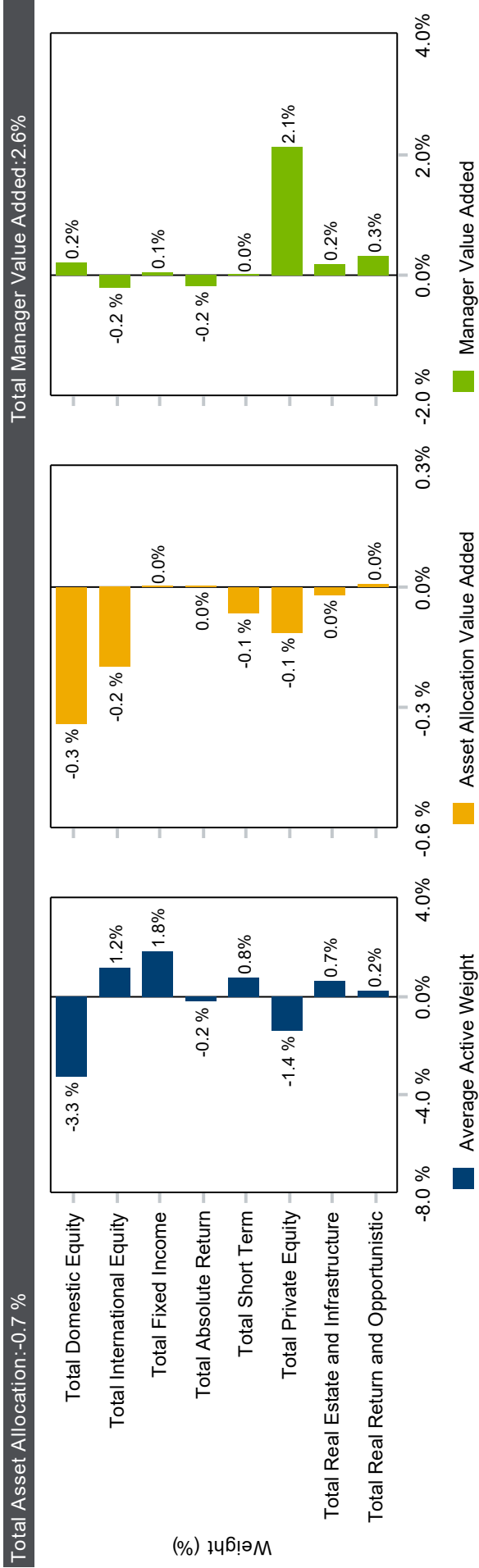
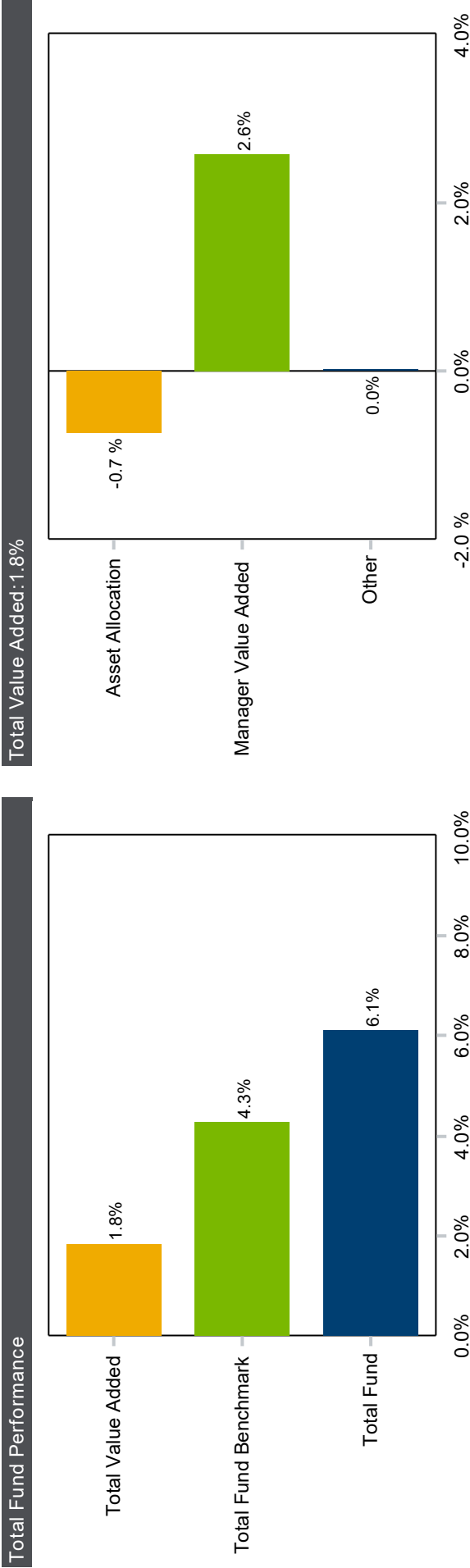
⁴ SP500 + 300 bps with a 3 month lag.

⁵ NCREIF - Property Blended Index, is NPI minus 130 bps.

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

Total Fund Attribution

Total Michigan vs. Total Fund Benchmark



Cumulative and Consecutive Total Fund Returns

MPSERS										
Cumulative For Years Ending 3/31/19										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	6.1	9.9	10.3	8.0	8.3	9.5	9.6	9.0	9.6	11.0
Public Plan - Median (> \$10 billion)*	4.3	7.5	8.9	6.4	6.7	7.5	8.0	7.5	8.2	10.0
Rank	8	5	9	5	5	4	5	5	4	19
bp Difference - Median	183	238	148	166	155	199	165	149	134	101
Consecutive For Years Ending										
	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10
MPSERS	6.1	13.8	11.2	1.4	9.3	15.7	10.4	5.0	14.2	24.3
Public Plan - Median (> \$10 billion)*	4.3	10.7	11.7	0.0	7.2	13.0	10.4	4.6	13.7	28.6
Rank	8	7	61	10	9	6	49	37	41	82
bp Difference - Median	183	308	-52	140	207	268	1	46	50	-425

MSERS										
Cumulative For Years Ending 3/31/2019										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	6.1	9.9	10.4	8.0	8.3	9.5	9.6	9.0	9.5	10.9
Public Plan - Median (> \$1 billion)*	4.4	7.4	8.9	6.4	6.6	7.5	7.9	7.5	8.3	10.1
Rank	6	6	7	3	3	4	4	4	6	27
bp Difference - Median	178	245	150	167	170	197	169	148	121	79
Consecutive For Years Ending										
	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10
MSERS	6.1	13.8	11.3	1.3	9.2	15.6	10.4	4.8	14.1	24.1
Public Plan - Median (> \$1 billion)*	4.4	10.6	11.8	-0.2	7.1	12.7	10.4	4.6	14.0	30.0
Rank	6	9	63	8	10	7	52	38	49	91
bp Difference - Median	178	318	-49	152	211	285	-3	27	13	-590

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS											
Cumulative For Years Ending 3/31/19											
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year	
MSPRS	6.1	9.9	10.3	8.0	8.3	9.4	9.6	9.0	9.5	10.9	
Public Plan - Median (> \$1 billion)*	4.4	7.4	8.9	6.4	6.6	7.5	7.9	7.5	8.3	10.1	
Rank	6	6	8	4	4	4	4	4	6	28	
bp Difference - Median	177	245	149	167	168	195	166	147	121	75	
Consecutive For Years Ending											
	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10	
MSPRS	6.1	13.8	11.2	1.3	9.2	15.5	10.4	4.9	14.3	23.6	
Public Plan - Median (> \$1 billion)*	4.4	10.6	11.8	-0.2	7.1	12.7	10.4	4.6	14.0	30.0	
Rank	6	9	63	8	10	10	56	38	48	91	
bp Difference - Median	177	318	-53	152	210	275	-7	33	27	-634	

MJRS											
Cumulative For Years Ending 3/31/19											
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year	
MJRS	6.1	9.9	10.4	8.0	8.2	9.3	9.4	8.9	9.4	10.6	
Public Plan - Median (> \$1 billion)*	4.4	7.4	8.9	6.4	6.6	7.5	7.9	7.5	8.3	10.1	
Rank	6	6	6	3	4	4	5	6	7	40	
bp Difference - Median	177	244	151	168	167	183	153	135	111	47	
Consecutive For Years Ending											
	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11	03/10	
MJRS	6.1	13.8	11.3	1.3	9.1	14.9	10.2	4.9	14.2	21.7	
Public Plan - Median (> \$1 billion)*	4.4	10.6	11.8	-0.2	7.1	12.7	10.4	4.6	14.0	30.0	
Rank	6	10	62	8	10	18	61	38	49	93	
bp Difference - Median	177	317	-46	151	196	212	-27	31	21	-831	

*State Street Public Funds Universe

State of Michigan Retirement System
ASSET ALLOCATION REVIEW

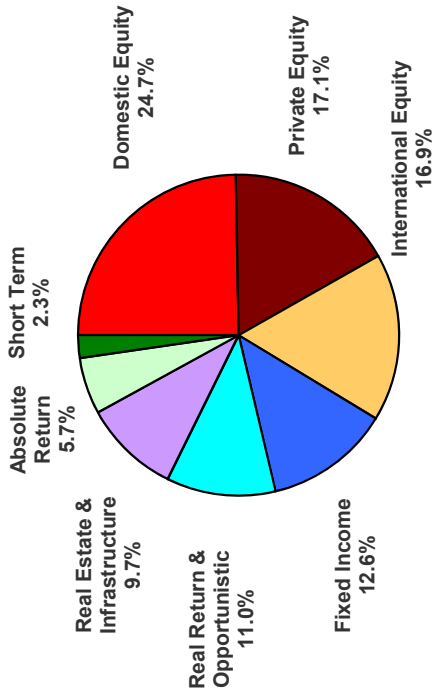
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Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEM PROFILE - MARCH 2019

Asset Allocation ~ 3/31/19



Asset Allocation By Market Value

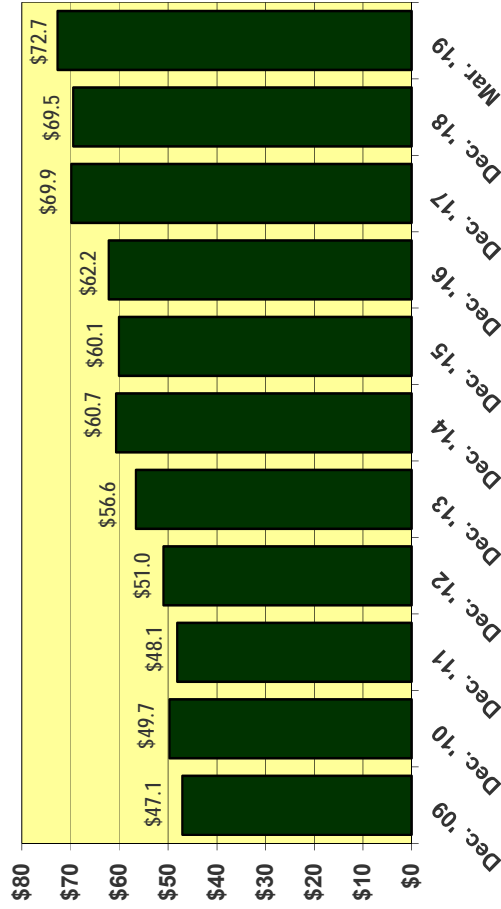
Investment Strategies	3/31/2019	3/31/2018
Domestic Equity	\$17,963	\$17,136
Private Equity	12,452	10,934
International Equity	12,264	12,901
Fixed Income	9,178	8,627
Real Return & Opport.	7,975	6,239
Real Estate & Infra.	7,044	7,987
Absolute Return	4,104	4,055
Short Term***	1,676	2,742
TOTAL	\$72,656	\$70,621

Short Term Equivalents (in Billions)

Short Term Strategy***	\$1.7
Short Term in Other Inv. Strategies	1.2
TOTAL SHORT TERM	\$2.9

4.0% of Total Funds

Market Value* (Billions of Dollars)



Market Value By Plan ~ 3/31/19

(in Millions)				
	Pension Plan	OPEB**	Combined	
	Mkt. Value	Mkt. Value	Mkt. Value	
			%	
MPSERS	\$49,511	\$6,421	\$55,932	77.0%
MSERS - (closed)	12,129	2,658	14,787	20.3%
MSPRS	1,469	199	1,668	2.3%
MJRS - (closed)	261	8	269	0.4%
TOTAL	\$63,370	\$9,286	\$72,656	100.0%

MSERS includes the Military Pension Fund

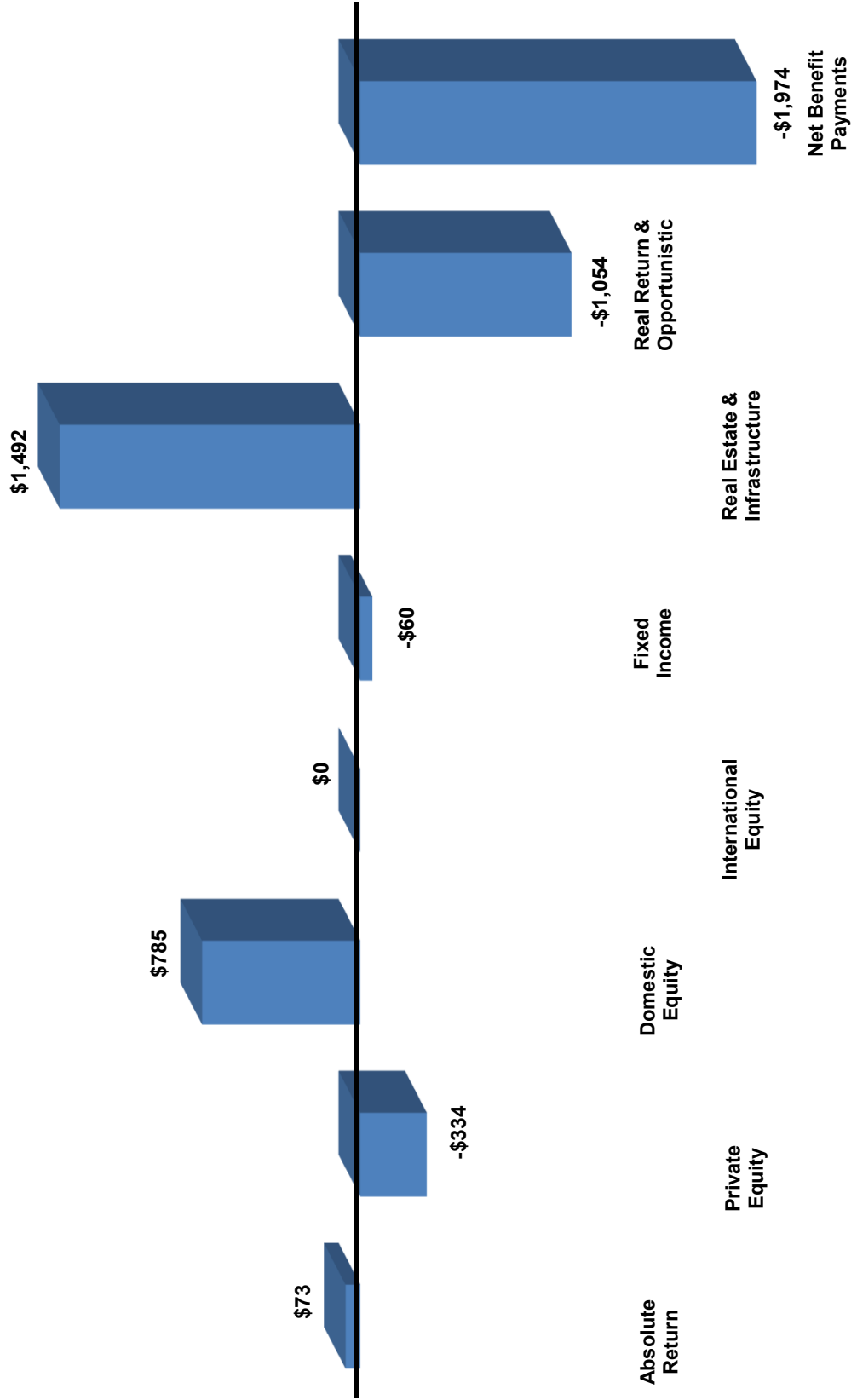
18th Largest DB Public Pension Fund in the U.S.

Pensions & Investments Survey - February 4, 2019 issue

Sources and Uses of Cash

April 2018 ~ March 2019

4/01/18 Balance of Short-Term Cash: \$ 2,747
 3/31/19 Balance of Short-Term Cash: 1,675
 Net Short-Term Cash Decrease: \$ 1,072



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 3/31/19

Asset Class	MPERS		MSERS		MSPRS		MJRS		SMRS
	3/31/19	Target*	3/31/19	Target*	3/31/19	Target*	3/31/19	Target*	Ranges
Domestic Equity	24.8%	28.0%	24.8%	28.0%	24.8%	28.0%	24.8%	28.0%	20% - 35%
Private Equity	17.2%	18.0%	17.2%	18.0%	17.2%	18.0%	17.2%	18.0%	10% - 20%
International Equity	16.8%	16.0%	16.8%	16.0%	16.8%	16.0%	16.8%	16.0%	15% - 25%
Long Term Fixed Income	12.7%	10.5%	12.7%	10.5%	12.7%	10.5%	12.6%	10.5%	10% - 20%
Real Estate & Infrastructure	9.7%	10.0%	9.7%	10.0%	9.7%	10.0%	9.7%	10.0%	5% - 15%
Real Return & Opportunistic	11.0%	9.5%	11.0%	9.5%	11.0%	9.5%	11.0%	9.5%	5% - 15%
Absolute Return	5.7%	6.0%	5.7%	6.0%	5.7%	6.0%	5.7%	6.0%	3% - 9%
Short Term Fixed Income	2.3%	2.0%	2.3%	2.0%	2.3%	2.0%	2.2%	2.0%	1% - 6%
TOTAL	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 System

MARKETS REVIEW AND OUTLOOK

State of Michigan Investment Board Meeting
June 6, 2019



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**)
Private Equity	11.1%	24.0%	16.5%
International Equity	9.6%	20.0%	8.1%
Domestic Equity	7.8%	17.0%	16.0%
Real Estate (Core)	6.4%	11.5%	7.1%
Absolute Return	5.7%	9.0%	3.3%
Real Ret/Opportunistic	8.9%	9.5%	6.4%
Long-Term Fixed Income	3.0%	4.0%	3.8%
Short-Term	2.8%	1.0%	0.4%

* Aon Investment Consultants 2019 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

A market update.

- 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 (Fed) and other central banks, as well as the run-up in prices for most risk assets over the past several years.
- Based on a forward estimated price-to-earnings valuation multiple, developed international markets trade at approximately a 20% discount to U.S. counterparts while emerging markets are at a 25% discount.
- Analysts are estimating year-over-year growth in U.S. equity earnings for the next year to be nearly 8.7%, which is about half the rate of the trailing twelve months, but about the same as the average growth rate of the past 40 years.
- At its December 2018 meeting, the Federal Reserve Board voted to raise its key interest rate by an additional 25 basis points, the ninth of this tightening cycle. At the beginning of 2019, the market has priced in very low odds of another Fed tightening, and in fact is now saying that there is a greater than 50% chance of a Fed cut in late 2019.
- Over the past ten, twenty, and thirty years, publicly traded REITs have out-returned private real estate by 10.4%, 3.4%, and 4.1% annualized, respectively, though they are three times more volatile.
- Since its inception, the absolute return portfolio's return has had a monthly beta of approximately 0.15 and annualized net alpha of 2.3%. The fund also has a low correlation to the Fixed Income benchmark; -0.1%, making it a good diversifier to equity and rates.

International Equity

A compelling case.

- International equities continue to underperform domestic equities. Over the year ending March 2019, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -13.0%. Over the past three, five, seven, and ten years, international underperformed domestic by -5.2%, -8.0%, -8.0%, and -7.2% annualized, respectively.
- Based on a forward estimated price-to-earnings valuation multiple, developed international markets trade at approximately a 20% discount to U.S. counterparts while emerging markets are at a 25% discount.
- Year-over-year earnings growth for international markets is estimated to be roughly 10.7% for the year. Earnings in international markets can grow around 25% just to get back to all-time highs, suggesting that there could be a runway for earnings to grow at a high rate for some time. Trading at a valuation multiple discount, international equity represents a leveraged play on continued global growth.
- Within international equities, emerging markets underperformed developed markets last year by -4.3%. Over the past three and five years, emerging beat developed by 3.4% and 1.5% annualized, respectively.
- The plan is underweight international equity against a global benchmark (approximately 41% versus 46% of total public equity) and at a slightly lower allocation than the peer median; 16.9% versus peer median of 17.7%.

Domestic Equity

Normal earnings growth.

- The broad U.S. stock market return for the one year ending March 2019 was 9.5%. Small caps continue to lag larger caps. Over the past one, three, five, seven, and ten years, small caps have underperformed large caps by -7.4%, -0.6%, -3.9%, -2.1% and -0.6% annualized, respectively.
- Meanwhile, growth extended its dominance over value stocks in the U.S., having outperformed by 6.8%, 5.9%, 5.5%, 3.1% and 2.9% annualized over the past one, three, five, seven and ten years, respectively. Since June 2007, the growth style has returned over 50% more than value style. Perhaps even more surprising, since March 1994 (the past 25-years) growth and value have earned nearly the same return.
- Analysts are estimating year-over-year growth in U.S. equity earnings for the next year to be nearly 8.7%, which is about half the rate of the trailing twelve months, but about the same as the average growth rate of the past 40 years.
- Many valuation metrics are near historical averages. However, the absolute returns over the next cycle may not be as strong as the historical average of 11 – 12% year-over-year total returns. One reason for this is the fact that market EPS is above-trend as is returns on equity. However, the largest securities in the market today are less cyclical (economically sensitive) as past market leaders.

Interest Rates

A future rate cut?

- At the end of December 2018, the U.S. 10-year Treasury was yielding only 17 basis points more than the 2-year Treasury. That is the narrowest spread between the two rates since June 2007 and the dawning of the global financial crisis. By March 2019, the spread had narrowed further to 14 basis points, widening only slightly by April.
- Flat yield curves are often viewed as worrisome. One material difference between the environment of today's flat yield curve and the one in 2007 is the fact that the current Fed Fund's rate is accommodative by historical standards, yielding a real yield of close to 0.5% while in the summer of 2007 the real yield was close to 2.5%.
- At its December 2018 meeting, the Federal Reserve Board voted to raise its key interest rate by an additional 25 basis points, the ninth of this tightening cycle. At the beginning of 2019, the market has priced in very low odds of another Fed tightening, and in fact is now saying that there is a greater than 50% chance of a Fed cut in late 2019.
- Spreads on investment-grade and high-yield fixed income are just slightly tighter than their average levels. The plan has reduced its credit exposure and has instead allocated towards securitized assets which now represent 38.3% of the fixed income portfolio.

Real Estate

The benefit adding REITs.

- Over the one year ending March 2019, the REIT market, as measured by the NAREIT index, increased by 20% including its dividends, significantly outpacing private real estate returns (measured by the NCREIF-ODCE Index) by 14.3%. Over the past ten, twenty, and thirty years, publicly traded REITs have out-returned private real estate by 10.4%, 3.4%, and 4.1% annualized, respectively, though they are three times more volatile.
- Although investing in similar assets, the returns of publicly traded REITs and private real estate have historically been lowly (and at times are anti) correlated to one another, meaning much of the REIT volatility is diversifiable.
- In fact, had the REID allocated up to 15% of its portfolio to REITs over this horizon, it could have earned approximately 80 basis points higher returns annualized without meaningfully changing the average annual volatility of returns.
- Dividend yields on REITs are around 3.8%, which is 1.25% higher than the yield of the ten-year U.S. Treasury and at its historical average spread.

Hedge Funds

Estimating the asset class return.

- Since its inception, the absolute return portfolio's return has had a monthly beta of approximately 0.15 and annualized net alpha of 2.3%. The fund also has a low correlation to the Fixed Income benchmark; -0.1%, making it a good diversifier to equity and rates.
- Based on an expected annualized equity market return of approximately 7.4%, should historical hedge fund betas and alphas continue, a 5.5% annualized net return seems like a reasonable assumed rate of return for hedge funds. This return is approximately 3-month U.S. Libor plus 300 basis points.

State of Michigan Retirement System

REAL ESTATE AND INFRASTRUCTURE REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



Todd A. Warstler
Senior Investment Manager
Real Estate and Infrastructure Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3-31-19)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	8.5%	9.5%	11.2%	11.2%	6.8%
NCREIF NPI	5.5%	5.7%	7.7%	8.2%	7.1%
Peer Median Returns	8.5%	8.2%	10.3%	10.2%	7.1%
Percentile Rank vs. Peers*	52	29	36	28	61

*State Street Universe greater than \$1 billion

- Outperformance relative to the one-year benchmark resulted from the Real Estate and Infrastructure Division's (REID) strategy of being underweight in retail, overweight in hotels, team selectivity within the apartment sector, several favorable sale executions in the real estate portfolio, and appreciation and gains in the infrastructure portfolio.

Strategy Update

- The REID is focusing on sourcing off-market opportunities through its extensive network and reducing risk in the portfolio through early income-generating investments including credit strategies that are higher in the capital stack with a shorter projected hold period. The REID has selectively acquired properties where it can add value through management and leasing and has continued to develop properties at attractive risk-adjusted returns. The REID will continue its strategy of assembling portfolios in both traditional and non-traditional real estate sectors that REID believes will become institutional property types, providing above market appreciation and total returns.
- The REID has been actively managing the portfolio with dispositions resulting in capital returned in excess of \$1.8 billion, and funding new investments of nearly \$662 million over the past 12 months. The REID is purposely a biased seller and is working with its advisors in executing the disposition of properties and realizing gains from the sale of assets at historically low capitalization rates where these opportunities exist.
- The REID has approximately \$1.3 billion in unfunded commitments. New commitments during the quarter include:
 - \$50 million in Asana Partners Fund II, LP, a commingled fund specializing in value-add urban retail real estate opportunities in select markets in the United States, managed by Asana Partners, LP.
 - \$25 million in Core Property Index Fund, LLC, an open-end commingled fund which seeks to track the NCREIF NFI-ODCE Index with a tracking error of 12 basis points or less, managed by IDR Investment Management, LLC.

Market Environment

- Fund flows to the real estate sector remain strong and there is significant dry powder in the system which should continue to act as a support for pricing. Retail properties continue to be less attractive to investors as e-commerce sales continue to grow with

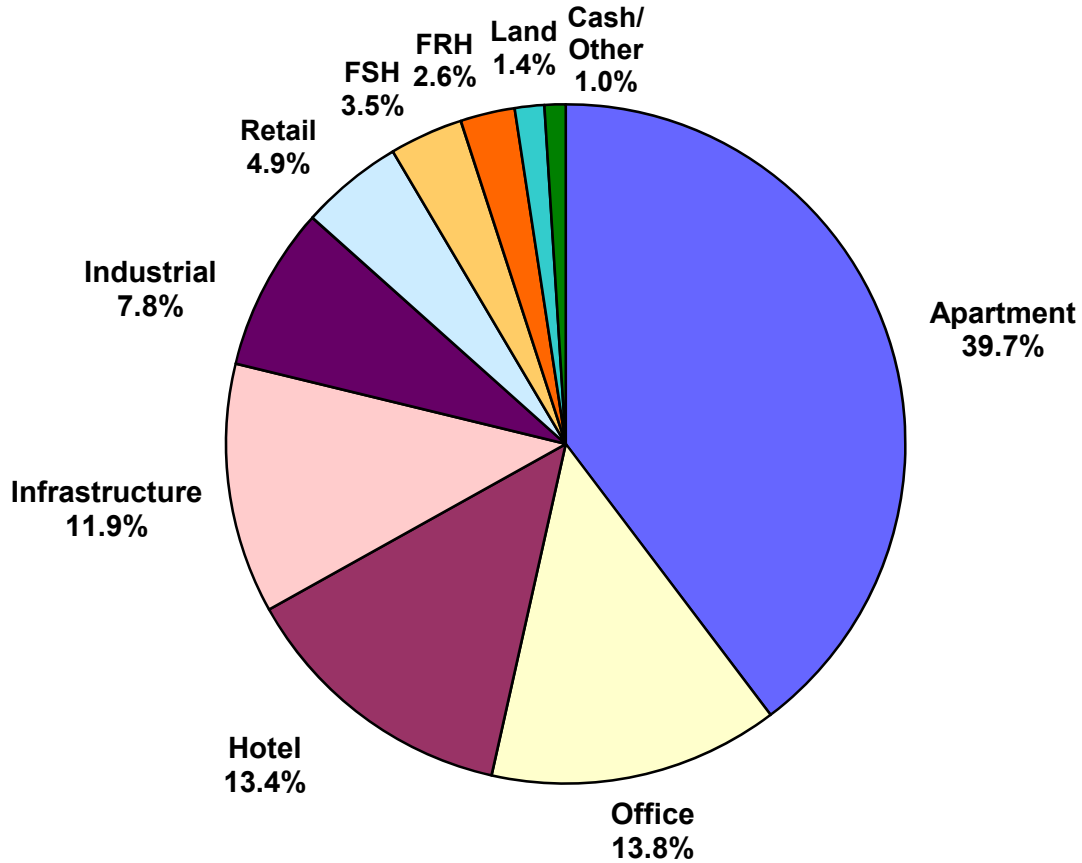
investors instead favoring warehouse (as a retail substitute in some cases) and segments of the apartment sector. Senior housing, student housing, data centers and medical office once considered niche are attracting more investor attention. Supply of new buildings in all property types, except retail, has increased in many markets and is beginning to raise concern from investors. However, a strong economy has so far kept demand for space high enough to absorb new supply. Additionally, lenders have become more selective in quality and location of the collateral and have been disciplined in their underwriting standards for construction lending. The cost of new construction in land, labor and materials has steadily increased, making it more difficult for developers to meet return thresholds.

- The passage of the U.S. tax reform bill is generally viewed as favorable to the real estate industry. Economic growth from companies increasing investment in their U.S. business operations would increase demand for office labor and industrial space. Real estate developers will benefit from a lower pass-through tax rate. The increase in the standard deduction could further delay apartment renters from purchasing a home. Some areas of the country (high cost, high tax regions) are feeling a negative impact from this tax bill. The limits on mortgage interest deductions and the loss of the state and local tax deduction (SALT) are exacerbating affordability in these areas. Many of these regions are seeing population declines as business and residents move to lower tax/cost states. Manhattan, Chicago and L.A. are notable examples and this can have negative impacts on all property types.
- Capital flows to the infrastructure sector also remain strong, as investor interest in the asset class continues to grow. Opportunities include North American energy, power generation, European transportation, and emerging market fundamental infrastructure projects. The industry has gained attention from the Federal Administration's intent on rebuilding U.S. infrastructure; however, details on legal and financial framework of Public Private Partnerships (P3) are limited and will take time to develop. A tight labor market for construction workers, rising wage and materials cost and political gridlock in Washington could inhibit timing of funding and completions.
- Tightening lending standards combined with heightened bank regulations after the global financial crisis have worked to constrain lending activity in many instances. Demand for private credit from non-traditional capital providers, particularly when a financial sponsor requires speed and certainty of execution is expected to continue to grow. Real estate credit in the U.S., Europe and Asia in various forms should continue to present opportunities.

SMRS

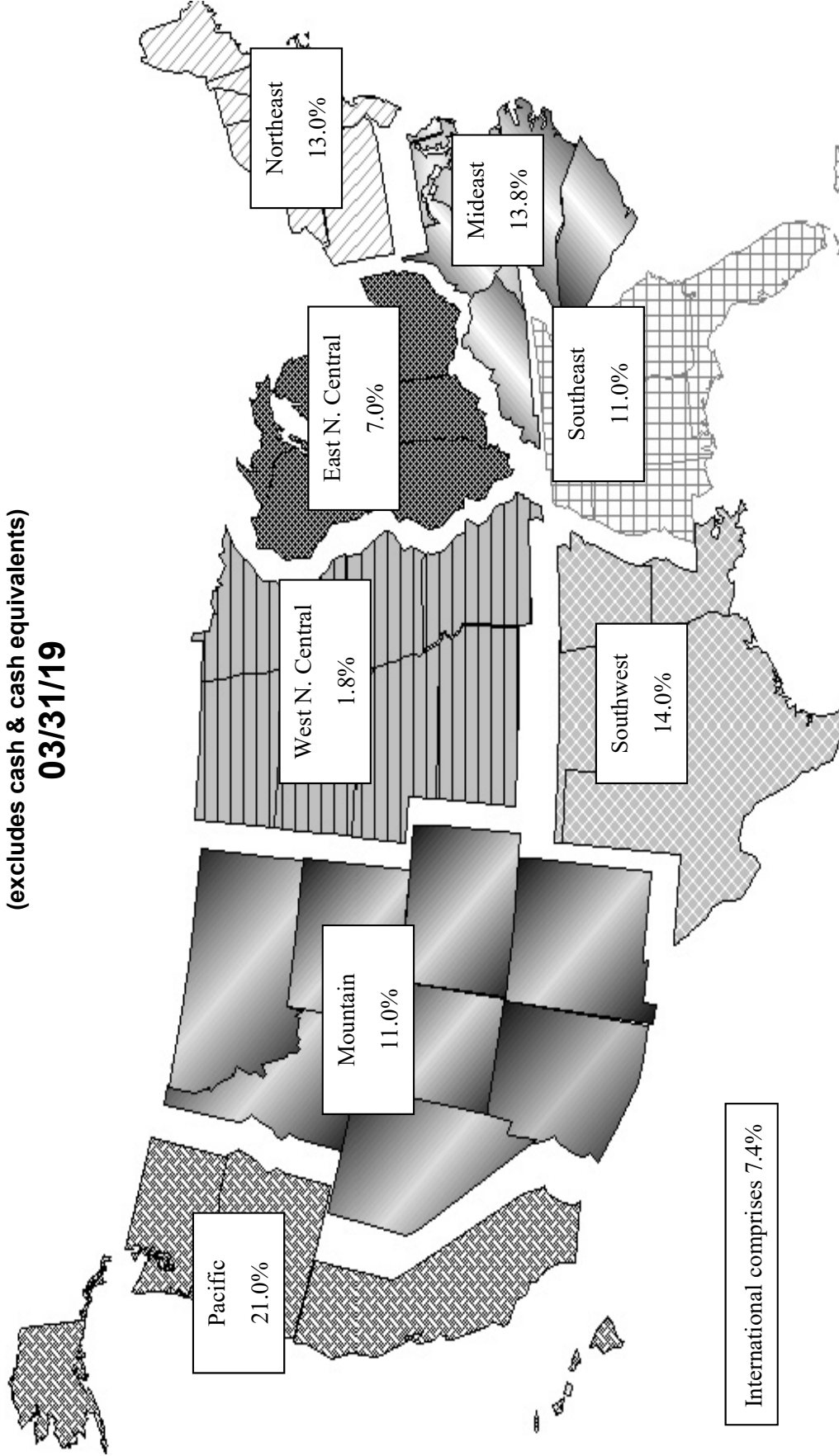
Real Estate and Infrastructure

3/31/19



Market Value in Millions				
	<u>3/31/19</u>		<u>3/31/18</u>	
Apartment	\$2,794	39.7%	\$3,576	44.8%
Office	975	13.8%	875	10.9%
Hotel	940	13.4%	953	11.9%
Infrastructure	840	11.9%	831	10.4%
Industrial	549	7.8%	612	7.7%
Retail	343	4.9%	329	4.1%
For Sale Homes (FSH)	247	3.5%	291	3.6%
For Rent Homes (FRH)	185	2.6%	309	3.9%
Land	99	1.4%	109	1.4%
	<u>\$6,972</u>	<u>99.0%</u>	<u>\$7,885</u>	<u>98.7%</u>
Cash/Other	<u>72</u>	<u>1.0%</u>	<u>102</u>	<u>1.3%</u>
Total Investments	<u>\$7,044</u>	<u>100.0%</u>	<u>\$7,987</u>	<u>100.0%</u>

SMRS
Real Estate by Region
Based on Market Value
(excludes cash & cash equivalents)
03/31/19



Geographic regions defined by NCREIF, whose property index composition is: Pacific 33.0%, Mountain 6.5%, West N. Central 1.2%, Southwest 10.4%, East N. Central 7.1%, Southeast 9.6%, Northeast 20.6%, Midwest 11.6%

SMRS
Real Estate and Infrastructure
3/31/19

**Top Ten
Advisors or Entity**

<u>Advisor or Entity</u>	<u>Market Value</u>
MWT Holdings LLC	\$ 2,125,983,103
Clarion Partners	670,637,153
Blackstone Group	407,132,628
Five Star Realty Partners LLC	360,033,820
Principal Real Estate Investors	404,639,585
Domain Capital Advisors Inc	314,343,659
Rialto Capital Management LLC	301,209,305
CIM Investment Advisors LLC	257,602,204
L&B Realty Advisors	166,608,725
Transwestern Investment Management	156,847,933
	<u>\$ 5,165,038,115</u>

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	94.4%	86.7%	97.2%	92.0%	73.4%
National Average	93.0%	87.5%	93.0%	95.6%	61.8%

SMRS
Market Values by Ownership Entity
3/31/19

REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 71,112,994	\$ 0
AEW Senior Housing III	3,760,775	994,625
Apollo Asia Real Estate Fund	23,498,263	51,116,044
Asana Partners Fund I, LP	23,224,522	5,416,828
* Asana Partners Fund II, LP	0	50,000,000
Avanath Affordable Housing I, LLC	2,309,945	0
Avanath Affordable Housing II, LLC	33,491,618	0
Avanath II SMRS Co-Investment Fund LLC	15,076,524	0
Avanath Affordable Housing III	43,954,716	4,701,794
Blackstone R/E IH3 Co-Inv Partners	185,469,484	0
Blackstone R/E Partners V, LP	4,343,683	0
Blackstone R/E Partners VI, LP	6,970,799	3,680,930
Blackstone R/E Partners VIII, LP	60,873,880	27,387,000
Blackstone R/E Partners IX, LP	0	200,000,000
Capri Select Income II	59,479	0
Capri Urban Investors, LLC	8,514,703	0
CIM Fund III, LP	40,226,016	0
CIM Fund VIII, L.P.	102,852,678	13,580,511
CIM Urban REIT, LLC	40,784,623	0
CIM VI (Urban REIT), LLC	31,869,218	0
Clarion Gables Multifamily Trust, LP	31,439,983	0
Columbus Circle Holdings, LLC	207,887,458	37,060,586
* Core Property Index Fund LLC	0	25,000,000
Crown Small Cap Real Estate	17,117,670	8,375,000
Domain GVA-1, LLC	38,497,773	2,487,251
Domain Hotel Properties, LLC	415,742,465	0
Gateway Capital Real Estate Fund II, LP	15,558,942	0
Great Lakes Property Group Trust	42,583,404	9,565,475
Heitman Credit	50,806,904	0
IMRF II ColInvest Spiga LP	13,474,402	4,014,958
Invesco Mortgage Recovery Feeder Fund	3,457,417	0
Invesco Mortgage Recovery Fund II, L.P.	42,809,180	14,107,874
IPF II Co-Invest Cayman LP	27,756,009	2,220,897
JBC Funds North LaSalle LLC	16,926,181	0
JBC Opportunity Fund III, LP	495,673	0
JP Morgan India Property Fund II, LLC	31,638,138	2,784,470
KBS/SM Fund III, LP	47,675,182	0
KBS/SM Fund IV	296,136	0
L-A Saturn Acquisition	31,144,777	0
Landmark Real Estate Partners V, LP	8,697,969	0
LaSalle Asia Opportunity Fund II, LP	279,741	0
LaSalle Asia Opportunity Fund III, LP	1,216,463	0

	Market Value	Unfunded Commitment
Lion Industrial Trust	218,015,406	0
Lion Mexico Fund, LP	5,439,302	0
Lombard GVA0016 (former AGL Annuity)	360,460,100	0
Lone Star Fund X LP	142,801,445	59,743,657
Lone Star Fund XI LP	0	200,000,000
Lubert-Adler Real Estate Fund VII, LP	61,250,006	6,222,826
M1 Westgate ColInvest LLC	18,006,964	0
M301W ColInvest LLC	23,862,703	0
MERS Acquisitions Ltd.	166,608,725	27,400,000
MG Alliance, LLC	153,861	0
MIP Holdco LLC	123,907,601	29,053,441
MSREF V - International	2,373,332	0
MSREF VI - International	4,548,738	0
MSRESS Fund III Institutional LP	19,131,691	0
MWT Holdings, LLC	2,125,983,103	0
Northpark Land Associates	33,813,001	11,460,600
Paladin Realty Brazil Investors III (USA), LP	17,630,011	0
Paladin Realty Latin America Investors IV-CI, LP	45,121,674	0
Paladin Realty TB COINV V LP	9,981,102	0
Penmain Office LLC	34,145,417	0
Principal Separate Account	333,526,592	108,421,310
Proprium RE Spec. Situations Fund, LP	56,841,243	25,500,550
Rialto Absolute Partnership I	75,244,827	0
Rialto Credit Partshp LP	88,128,792	1,374,858
Rialto Real Estate Fund, LP	19,802,587	0
Rialto Real Estate Fund II, LP	36,845,831	0
Rialto Real Estate Fund III-Debt, LP	34,288,478	12,101,378
Rialto Real Estate Fund III-Property, LP	20,518,199	25,205,480
Rialto Mezzanine Partners Fund	26,380,591	0
SM Brell II LP	26,719,441	0
Stockbridge RE Fund II-C, LP	25,980,653	0
Strategic LP	19,812,631	0
Strategic II LLC	1,450,231	48,341,000
TPG RE Finance Trust Inc. (TRTX)	94,217,446	0
TPG Real Estate Partners II	28,739,680	15,678,032
TPG Real Estate Partners III, LP	0	50,000,000
TSP Spartan C-I LLC	29,455	0
TSP Spartan C-II LLC	19,493,035	0
TSP Value and Income Fund II, LP	13,417,842	35,435,200
True North High Yield Invest. Fund II, LLC	4,197,007	0
True North Real Estate Fund III, LLC	45,413,851	9,348,297
Venture Center, LLC	287,140	0
Western National Realty Fund II, LP	4,123,101	0
	\$ 6,132,588,624	\$ 1,127,780,872
Short-Term Investments and Other	59,415,099	0
Total Real Estate Investments	\$ 6,192,003,723	\$ 1,127,780,872

* New or additional commitment made during the quarter reported

SMRS
Market Values by Ownership Entity
3/31/19

INFRASTRUCTURE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
Arclight Energy Partners VI, LP	\$ 48,046,516	\$ 7,836,260
ASF VI Infrastructure B LP	20,333,608	13,016,123
ASF VII Infrastructure Fund B L.P.	11,516,223	19,091,258
ASF Como Co-Investment LP	7,432,562	3,004,353
Basalt Infrastructure Partners, LP (Balfour Beatty)	49,084,397	2,219,047
Blackstone Energy Partners, LP	44,074,250	4,728,291
Blackstone Energy Partners II, LP	75,785,068	23,702,753
Brookfield Infrastructure Fund II-B, L.P.	53,597,931	5,004,228
Customized Infrastructure Strategies, LP	40,801,196	5,661,912
Dalmore Capital Fund	63,447,783	0
GCM Grosvenor Infrastructure Investment Program, L.P. (CSG)	74,086,974	0
GCM Grosvenor Customized Infrastructure Strategies II, L.P.	46,016,724	11,374,186
Global E&P Infrastructure Fund II L.P. (formerly First Reserve)	50,180,808	17,858,400
GSO Energy Select Opportunities Fund LP	29,615,461	25,684,982
JPMorgan AIRRO India SideCar Fund US, LLC	83,348,677	3,187,421
JPMorgan AIRRO Fund II	11,305,821	7,440,094
KKR Eagle CoInvest L.P.	33,888,357	1,853,268
KKR Global Infrastructure Investors, LP	38,294,825	4,182,224
Ridgewood Water & Strategic Infrastructure Fund LP	2,681,524	45,137,013
RPEP SMRS Infra II, LLC	5,500,390	500,000
StonePeak Infrastructure Fund LP	50,804,176	10,696,894
	<u>\$ 839,843,268</u>	<u>\$ 212,178,707</u>
Short-Term Investments and Other	12,427,334	0
Total Infrastructure Investments	<u>\$ 852,270,602</u>	<u>\$ 212,178,707</u>
TOTAL INVESTMENTS	<u>\$ 7,044,274,325</u>	<u>\$ 1,339,959,579</u>

State of Michigan Retirement System
PRIVATE EQUITY REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



Peter A. Woodford
Senior Investment Manager
Private Equity Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	11.9%	13.7%	12.7%	14.2%	13.9%
PE Benchmark Returns	-1.5%	12.5%	11.7%	16.0%	16.5%
Peer Median Returns	6.3%	9.7%	8.7%	9.8%	9.8%
Percentile Rank vs. Peers*	14	12	13	9	14

*State Street Universe greater than \$1 billion

- Private Equity returns have been strong relative to peer median returns, ranking in the top 14% of peers over the past ten years. Outperformance to peers is attributable to fund selectivity and strategy. It is not unusual for private equity returns to lag the public benchmark during periods of economic expansion and lead the public benchmark during periods of economic contraction. The nearly 10-year expansion since the second half of 2009 is no exception. General Partners are slow to increase portfolio company valuations and even then, do so conservatively.
- For the twelve months ending March 31, 2019, the Private Equity Division made contributions of approximately \$334 million, net of distributions. Although the pace of distributions continues to slow, distribution activity should remain healthy for as long as the economic expansion continues. General Partners are incentivized to exit investments at current valuations.
- Commitments closed during the quarter include:
 - \$200 million to Blackstone Capital Partners VIII, a large diversified buyout fund.
 - \$125 million to Genstar Capital Partners IX, a middle-market diversified buyout fund.
 - \$100 million to American Industrial Partners VII, a middle-market buyout fund, focused on the industrial space.
 - \$100 million to Summit Partners Growth Equity Fund X, a growth equity fund.
 - \$35 million to Arboretum Ventures V, a multi-stage healthcare venture capital fund, focused on life sciences.
 - \$30 million to Menlo Special Opportunities Fund II, a late stage venture capital fund.
 - \$28 million to Accel Growth Fund V, a late stage venture/growth fund.
 - \$25 million to CircleUp Credit Fund, focused on short term credit/receivables.
 - \$14 million to Silver Lake SL SPV-2, a special purpose vehicle to hold residual interests in SLP III.
 - \$10 million to Accel XIV, an early stage technology venture capital fund.
 - \$9 million Accel Leaders Fund II, a late stage venture/growth fund.

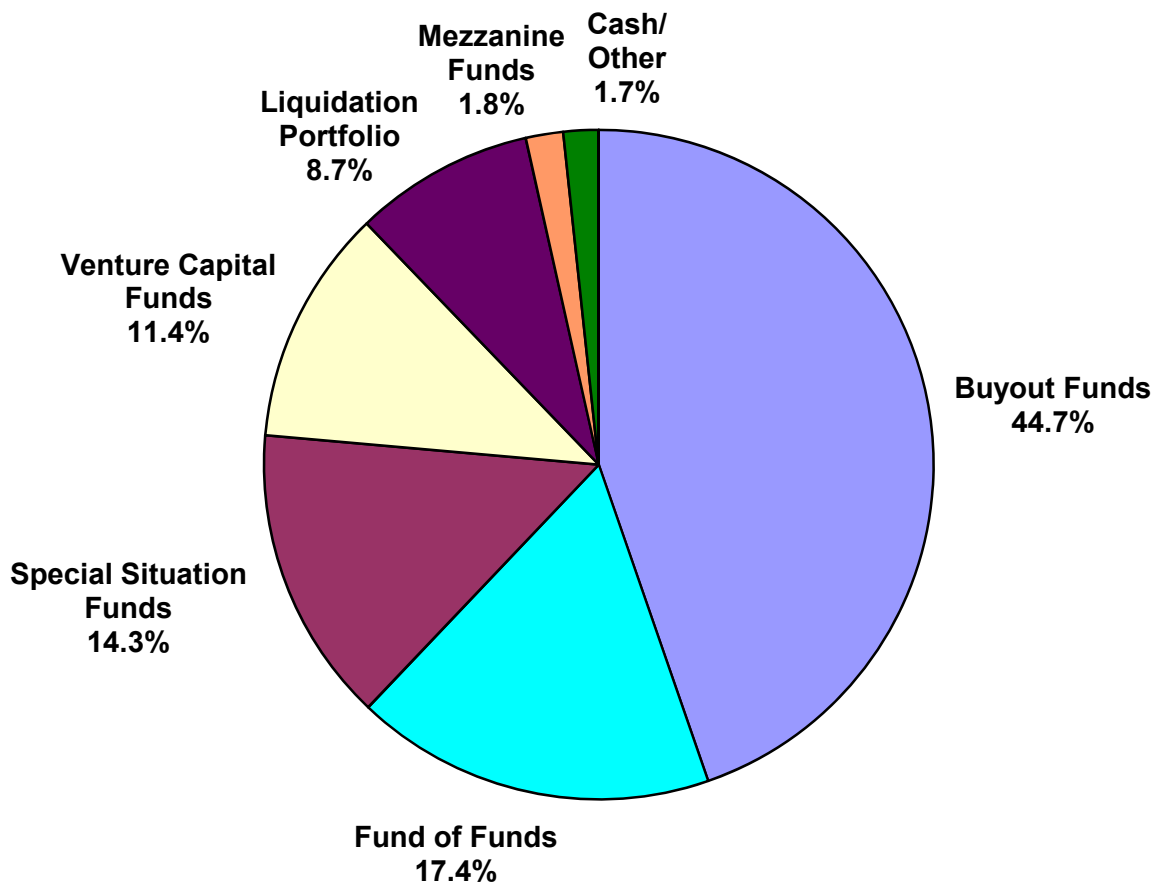
Strategy Update

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

SMRS

Private Equity

3/31/19



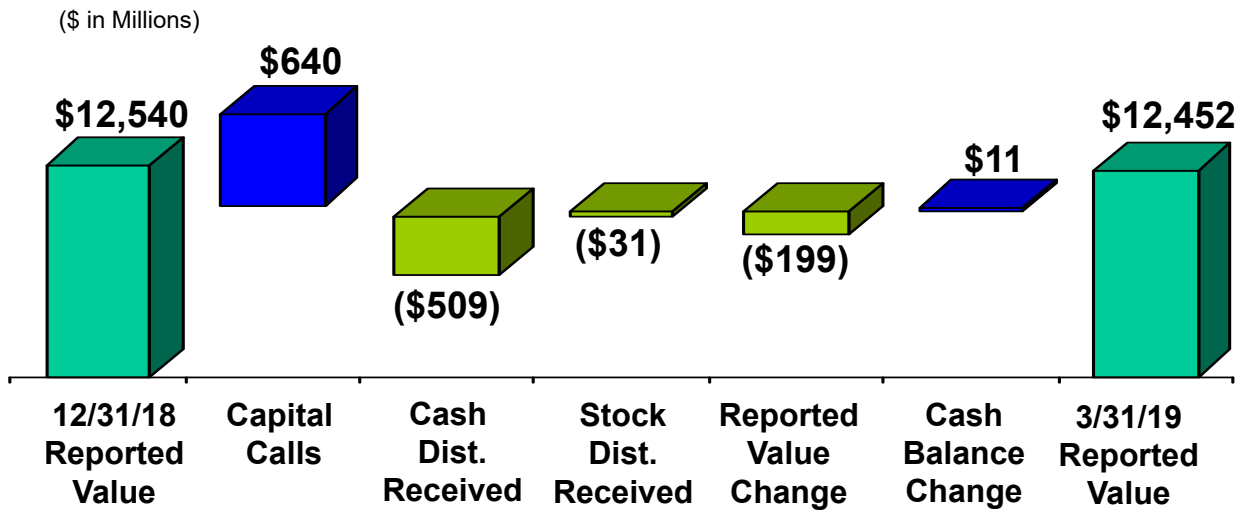
Market Value in Millions					
	<u>3/31/19</u>		<u>3/31/18</u>		
Buyout Funds	\$5,570	44.7%	\$5,129	46.9%	
Fund of Funds	2,166	17.4%	1,207	11.0%	
Special Situation Funds	1,779	14.3%	1,753	16.0%	
Venture Capital Funds	1,416	11.4%	1,178	10.8%	
Liquidation Portfolio	1,086	8.7%	1,222	11.2%	
Mezzanine Funds	222	1.8%	205	1.9%	
Cash/Other	213	1.7%	240	2.2%	
Total	<u>\$12,452</u>	<u>100.0%</u>	<u>\$10,934</u>	<u>100.0%</u>	

SMRS

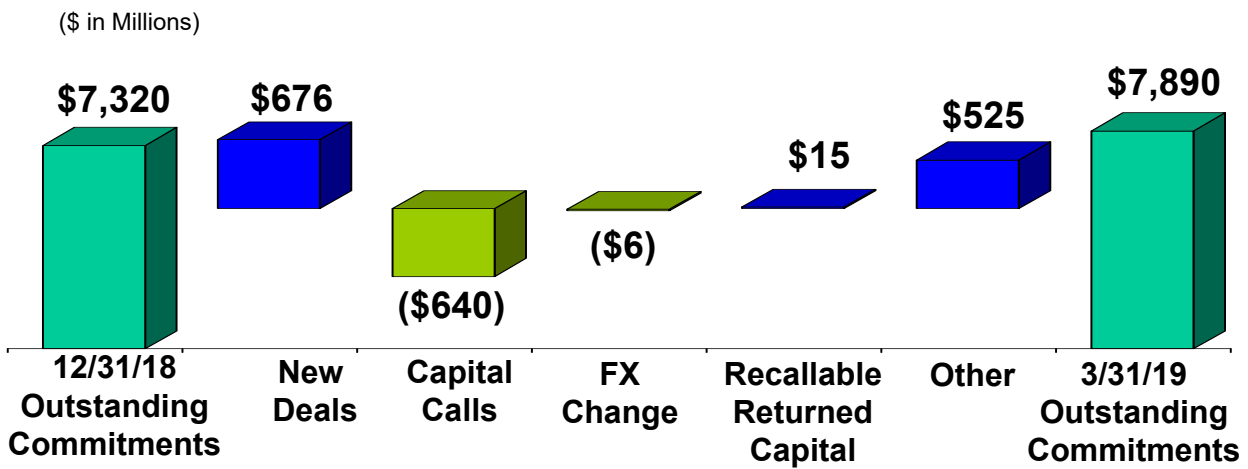
Private Equity

3/31/19

Invested Commitments



Outstanding Commitments

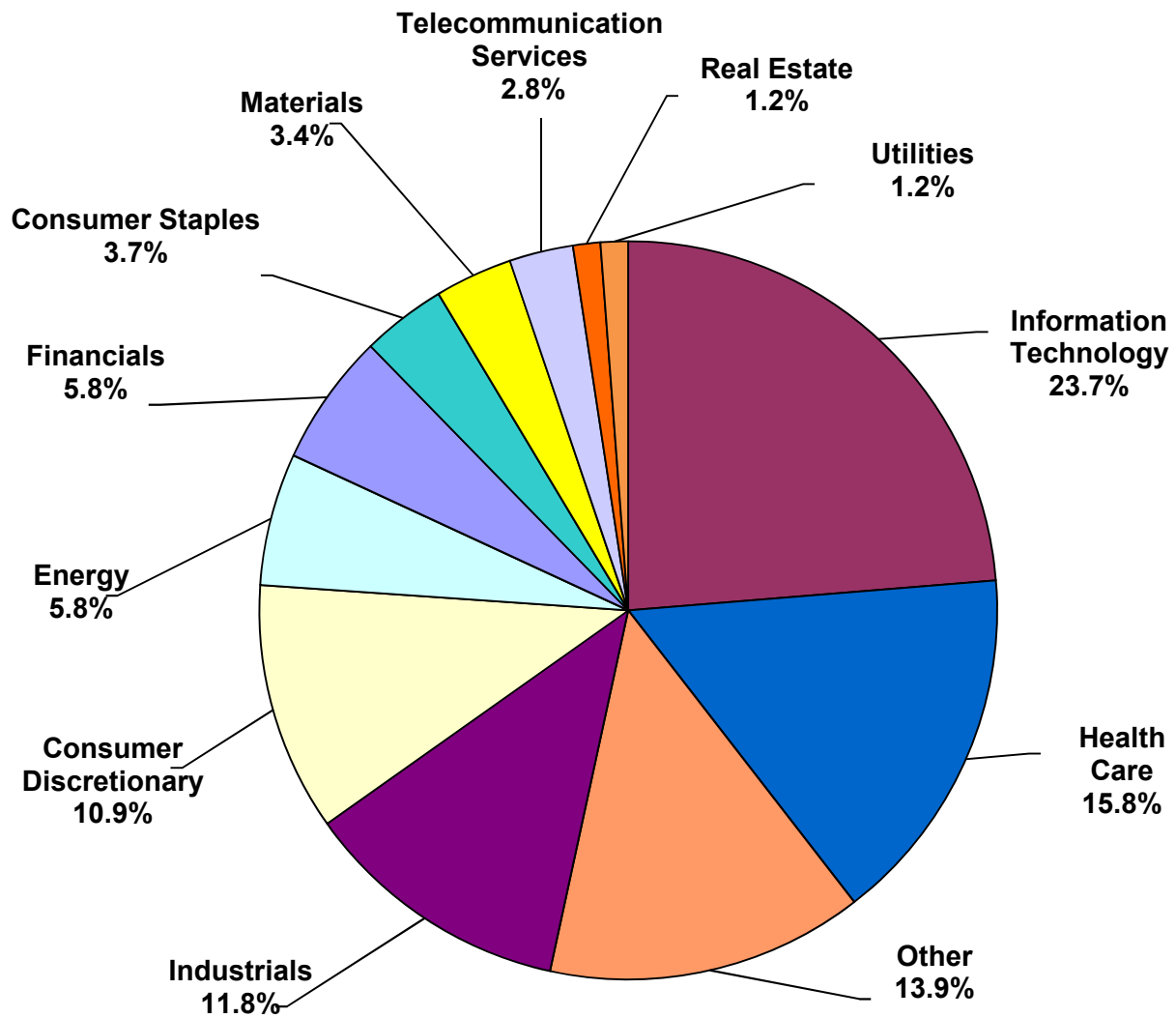


SMRS

Private Equity

3/31/19

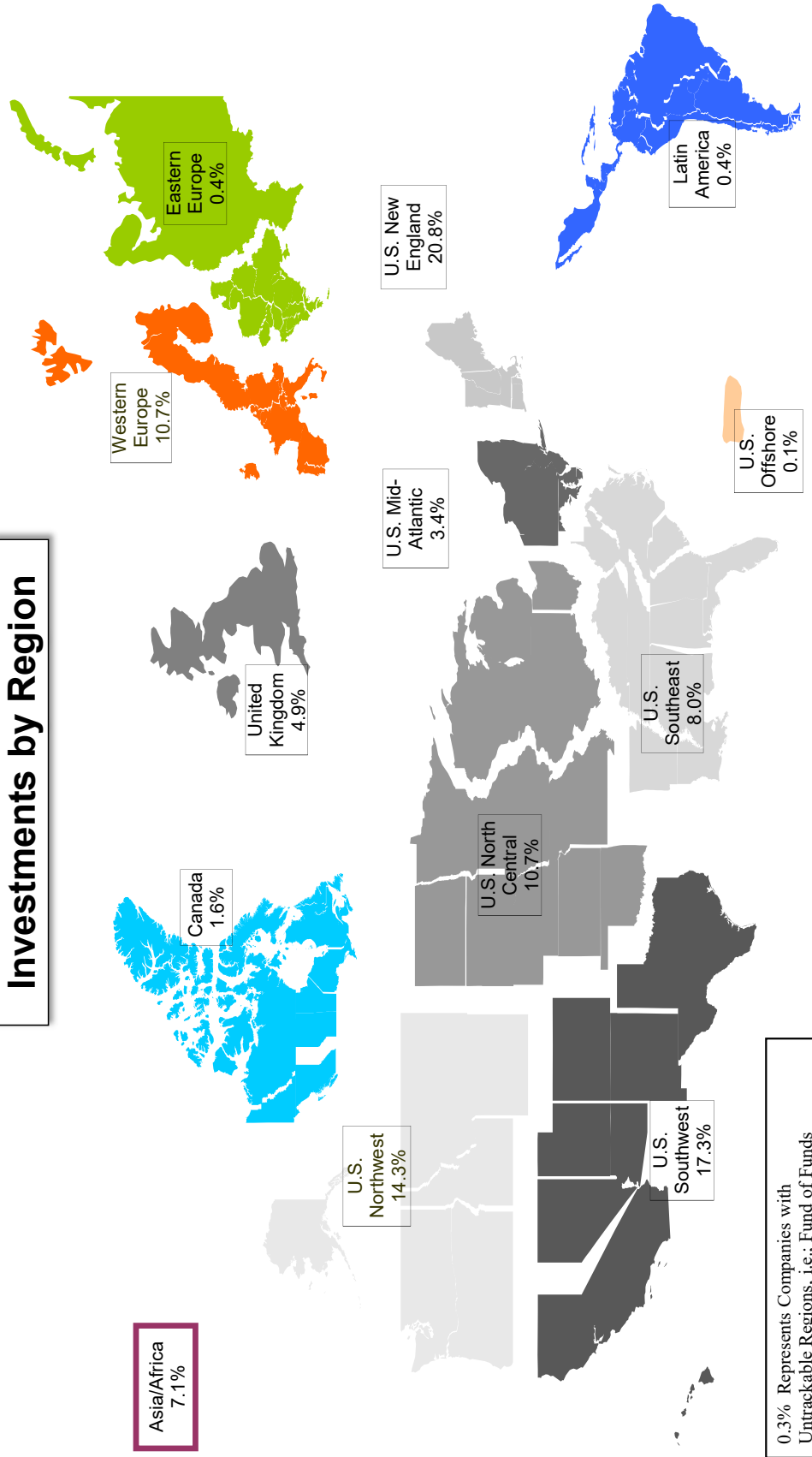
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 12/31/18 and are subject to change.

SMRS Private Equity 3/31/19

Investments by Region



0.3% Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 75%, Europe 16%, Asia 7%, Other 2%

SMRS

Private Equity

3/31/19

Portfolio by Vintage Year

(\$ in Millions)

<u>Asset Vintage</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>
1986-98	\$ 2	\$ 2	\$ 4
1999	5	5	10
2000	40	23	63
2001	65	60	125
2002	1	3	4
2003	5	8	13
2004	81	35	116
2005	213	24	237
2006*	481	169	650
2007	411	130	541
2008	544	99	643
2009	30	1	31
2010	231	4	235
2011	673	104	777
2012	1,278	106	1,384
2013	393	117	510
2014	1,418	327	1,745
2015	4,288	1,494	5,782
2016	1,349	963	2,312
2017	424	1,225	1,649
2018	302	2,321	2,623
2019	6	670	676
Income Accruals	1	0	1
Cash	205	0	205
Act. Small Cap - Stock Dist	6	0	6
Total	\$ 12,452	\$ 7,890	\$ 20,342

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>	<u>Total (USD)</u>
Euro (\$1.23/ €)	€ 388	€ 331	€ 719	\$883

SMRS

Private Equity

3/31/2019

Top 10 Sponsors

(\$ in Millions)

Asset Type	Reported Value	Outstanding Commitment	Total
HarbourVest Partners, LLC	\$ 2,790	\$ 912	\$ 3,702
Blackstone Group, The	513	493	1,006
Kohlberg, Kravis, Roberts & Co.	505	383	888
Warburg, Pincus LLC	590	293	883
Carlyle Group, L.P.	381	452	833
Grosvenor Capital Management, L.P	573	123	696
Leonard Green & Partners, L.P.	404	139	543
Advent International Corp.	440	77	517
Riverside Company	220	238	458
TPG, Inc.	232	201	433
Top 10 Total Value	\$ 6,648	\$ 3,311	\$ 9,959

Cash Weighted Rates of Return*

(Net IRR)	Current Qtr.	1-Year	3-Year	5-Year	10-Year
Buyout	1.6%	10.4%	15.6%	13.3%	18.0%
Fund of Funds	0.0%	14.7%	15.0%	14.3%	11.9%
Mezzanine	0.1%	7.1%	10.6%	6.5%	10.6%
Special Situations	0.7%	4.2%	10.1%	8.3%	13.7%
Venture Capital	0.1%	10.7%	13.3%	13.3%	20.3%

*These numbers are based on most recent available General Partner reported data; primarily 12/31/18 and are subject to change.

SMRS

Private Equity

3/31/19

Net Market Values by Ownership Entity

	Adjusted Reported Value	Unfunded Commitment
5AM Opportunities I, L.P.	\$ 2,141,262	\$ 27,825,000
5AM Ventures VI, L.P.	861,119	19,000,000
Accel Europe I, L.P.	3,220,718	1
Accel Europe II	20,804,300	3,300,000
Accel Growth Fund II, L.P.	12,464,602	240,000
Accel Growth Fund III, L.P.	14,561,967	1,120,000
Accel Growth Fund IV L.P.	19,908,054	2,640,000
** Accel Growth Fund V L.P.	4,218,750	23,906,250
Accel IX, L.P.	5,131,039	3,000,000
** Accel Leaders Fund II L.P.	0	9,375,000
Accel Leaders Fund L.P.	5,259,038	330,000
Accel London V L.P.	12,113,223	3,480,000
Accel VI-S	2,123,641	652,611
Accel VI, L.P.	871,955	0
Accel VIII, L.P.	247,001	4,782,499
Accel X, L.P.	15,508,025	0
Accel XI, L.P.	7,897,677	1,680,000
Accel XII, L.P.	8,370,606	1,190,000
Accel XIII, L.P.	5,393,071	4,800,000
** Accel XIV L.P.	750,000	9,250,000
Advent Global Private Equity V	6,887,299	8,700,000
Advent International GPE VI-A LP	38,817,614	0
Advent International GPE VII-B, L.P.	176,449,050	12,000,000
Advent International GPE VIII-B, L.P.	196,358,133	45,000,001
Advent Latin American Private Equity Fund VI, L.P.	21,908,767	11,602,500
Affinity Asia Pacific Fund III, L.P.	34,813,195	10,550,074
Affinity Asia Pacific Fund IV, L.P.	114,633,663	19,149,634
Affinity Asia Pacific Fund V L.P.	25,642,118	149,357,882
** AIP VII, L.P.	0	100,000,000
Apax Digital, L.P.	6,335,545	42,940,524
Apax Europe Fund VI	16,922,694	2,374,601
Apax Europe VII, L.P.	24,677,441	1,672,351
Apax IX, L.P.	79,623,503	83,505,421
Apax US VII	10,373,079	417,509
Apax VIII - B, L.P.	98,147,225	7,322,257
Apollo Investment Fund IX, L.P.	9,571,322	90,427,643
Apollo Investment Fund VIII L.P.	82,363,311	18,149,892
Arboretum Ventures II	2,170,281	0

	Adjusted Reported Value	Unfunded Commitment
Arboretum Ventures III, L.P.	16,436,732	0
Arboretum Ventures IV, L.P.	23,220,517	12,690,000
** Arboretum Ventures V, L.P.	0	35,000,000
Ares Corporate Opportunities Fund II	6,928,483	11,423,773
Ares Corporate Opportunities Fund III, LP	61,484,335	8,485,652
Ares Corporate Opportunities Fund IV, L.P.	91,122,003	17,167,792
ASF VIII B	15,000	149,985,000
AXA ASF Miller Co-Investment	451,246	6,656,684
Axiom Asia Co-Investment Fund I, L.P.	3,629,020	46,248,591
Axiom Asia IV, L.P.	35,657,614	19,447,811
Axiom Asia Private Capital Fund III, L.P.	47,440,689	6,649,264
Axiom Asia V, L.P.	1,531,727	48,500,000
BC European Capital IX	66,210,220	1,593,681
BC European Capital VII, L.P.	598,389	0
BC European Capital VIII, L.P.	12,860,348	8,754,240
Berkshire Fund IX Coinvestment Fund, L.P.	5,136,183	42,932,166
Berkshire Fund IX, L.P.	69,324,188	98,786,259
Berkshire Fund VI, L.P.	13,082,075	7,600,677
Berkshire Fund VII, L.P.	29,130,718	2,449,845
Berkshire Fund VIII, L.P.	70,241,717	9,463,285
Blackstone Capital Partners IV	5,516,705	4,655,896
Blackstone Capital Partners V	11,241,970	13,069,148
Blackstone Capital Partners V-S	1,515,928	712,476
Blackstone Capital Partners VI, LP	249,340,594	43,877,598
Blackstone Capital Partners VII, L.P.	173,331,722	130,063,920
** Blackstone Capital Partners VIII L.P.	0	200,000,000
Bridgepoint Europe IV	30,086,144	5,995,225
Carlyle Europe Partners II	793,518	4,152,238
Carlyle Europe Partners III	12,162,819	5,505,659
Carlyle Europe Partners IV, L.P.	116,446,063	13,031,359
Carlyle Europe Partners V, S.C.SP.	11,381,931	128,974,326
Carlyle Partners IV, L.P.	3,717,772	16,009,296
Carlyle Partners V L.P.	50,358,501	54,261,025
Carlyle Partners VI, L.P.	158,397,109	14,084,598
Carlyle Partners VII, L.P.	27,906,459	216,093,354
Centerbridge Capital Partners III, LP	38,041,215	46,875,089
Cerberus SMRS Partners, L.P.	46,079,761	23,304,657
Charlesbank Equity Fund IX, L.P.	13,282,273	85,515,021
Charlesbank Fund IX Overage Allocation Program	13,872,037	35,696,334
** CircleUp Credit Fund I, LP	0	25,000,000
CM Liquidity Fund, L.P.	0	25,000,000
Coller International Partners V, L.P.	14,813,799	43,600,000
Coller International Partners VI, L.P.	35,147,555	29,723,267
Coller International Partners VII, L.P.	105,479,651	63,040,960
Crescent Mezzanine Partners VI, L.P.	30,166,877	8,439,769
Crescent Mezzanine Partners VII	19,184,811	128,982,360
CVC Capital Partners VII, L.P.	28,497,884	141,811,044

	Adjusted Reported Value	Unfunded Commitment
Dover Street IX, L.P.	54,376,297	42,000,000
EnCap Energy Capital Fund X, L.P.	35,512,425	10,279,331
Entertainment IP Fund, L.P.	16,809,108	32,227,624
FIMI Opportunity 6, L.P.	16,476,545	33,227,275
FirstMark Capital I, L.P.	79,390,642	196,596
FirstMark Capital IV, L.P.	12,605,791	22,750,000
FirstMark Capital OF I, L.P.	26,417,035	0
FirstMark Capital OF II, L.P.	20,539,766	14,350,000
FirstMark Capital P2, L.P.	168,082,451	0
Flagship Pioneering Special Opportunities Fund II, L.P.	0	100,000,000
Flagship Pioneering VI	22,711,850	54,750,000
Flagship Ventures Fund 2004	6,480,571	0
Flagship Ventures Fund 2007, L.P.	14,252,554	0
Flagship Ventures Fund IV, L.P.	120,343,781	0
Flagship Ventures Fund V	88,420,559	525,000
Flagship Ventures Opportunities Fund I, L.P.	41,296,589	15,750,000
Fox Paine Capital Fund II, LP	29,904,001	15,382,699
FS Equity Partners VII, L.P.	107,467,374	8,966,475
FS Equity Partners VIII, L.P.	0	75,000,000
G-IV Acquisition Holdings, LLC	13,521,776	0
GCM Grosvenor Fund Investment Program I, L.P.	8,819,813	1,330,800
GCM Grosvenor Fund Investment Program II, L.P.	32,001,702	13,924,851
GCM Grosvenor Fund Investment Program III - 2004	42,141,175	4,506,596
GCM Grosvenor Fund Investment Program III - 2006	49,999,420	6,909,576
GCM Grosvenor Fund Investment Program V, L.P.	55,432,255	9,856,595
GCM Grosvenor Fund Investment Program VI, L.P.	23,383,557	7,424,585
GCM Grosvenor Fund Investment Program VIII, L.P.	70,475,945	31,456,440
GCM Grosvenor SeasPriFIP LP (PIS06-10)	55,961,992	16,949,077
GCM Grosvenor SeasPriFIP LP (PIS14)	199,281,397	17,031,169
GCM Grosvenor SeasPriFIP LP (Seed)	35,963,896	13,080,208
** Genstar Capital Partners IX, L.P.	0	125,000,000
Genstar Capital Partners VIII, L.P.	31,382,537	20,231,101
Genstar VIII Opportunities Fund I, L.P.	48,143,753	6,951,947
Green Equity Investors IV	249,885	1,136,036
Green Equity Investors V	162,640,830	25,966,435
Green Equity Investors VI, L.P.	132,033,279	13,031,501
Green Equity Investors VII, L.P.	108,541,037	99,024,660
Greenspring Master G, L.P.	10,000,000	90,000,000
Greenspring Micro II, L.P.	2,783,737	22,216,263
GSO Capital Opportunities Fund II, L.P.	13,288,843	10,744,359
GSO Capital Opportunities Fund III, L.P.	45,452,060	54,024,609
GSO COF III Co-Investment Fund, L.P.	13,422,074	36,110,684
HarbourVest Dover Street VIII, L.P.	25,650,582	6,750,000
HarbourVest Int'l III Partnership	165,353	1,200,000
Harbourvest Partners Co-Investment Fund IV L.P.	83,187,591	25,893,830
HarbourVest Partners Mezzanine Income Fund	49,123,774	39,810,000
HarbourVest V Partnership	167,309	300,000

	Adjusted Reported Value	Unfunded Commitment
HarbourVest VI - Direct Fund LP	2,916,478	750,000
HarbourVest VI Partnership	987,588	2,000,000
Harvest Partners VII, L.P.	44,013,879	33,809,979
HPS Mezzanine Partners III, L.P.	37,568,502	14,276,255
Insight Venture Partners Growth-Buyout Coinvestment Fund, L.P.	75,934,193	9,343,979
Insight Venture Partners IX, L.P.	148,774,994	5,578,363
Insight Venture Partners X, L.P.	51,099,585	50,000,000
Kelso Investment Associates IX, L.P.	94,643,907	24,250,276
Kelso Investment Associates VII	2,065,599	0
Kelso Investment Associates VIII	34,737,748	22,074,943
Kelso Investment Associates X, L.P.	9,830,055	89,879,560
Khosla Ventures III, L.P.	26,985,854	750,000
Khosla Ventures IV, L.P.	85,541,161	950,000
Khosla Ventures Seed D, L.P.	1,281,290	8,600,000
Khosla Ventures V, L.P.	54,577,022	6,600,000
Khosla Ventures VI, L.P.	16,424,294	57,900,000
KKR 2006 Fund, L.P.	69,154,402	4,955,653
KKR Americas Fund XII, L.P.	77,555,550	121,557,416
KKR Asian	5,910,406	0
KKR Asian Fund II, L.P.	51,658,274	4,985,801
KKR Asian Fund III	27,830,745	73,837,803
KKR China Growth Fund	27,324,744	3,383,656
KKR E2 Investors (Annex) Fund	0	0
KKR European Fund II	1,562,730	0
KKR European Fund III	13,029,285	6,272,565
KKR European Fund IV L.P.	118,422,491	31,367,379
KKR European Fund V (USD) SCSp	0	125,000,000
KKR Millennium Fund	252,911	0
KKR North America Fund XI, L.P.	111,659,649	11,219,634
Lead Edge Capital IV, L.P.	12,391,817	10,162,287
Lightspeed Venture Partners VI	323,398	0
Lightspeed Venture Partners VII, L.P.	12,362,874	0
** Menlo Special Opportunities Fund II, L.P.	1,500,000	28,500,000
Menlo Ventures IX, L.P.	2,120,317	0
Menlo Ventures X, L.P.	22,997,016	0
Menlo Ventures XI, L.P.	50,306,379	0
Menlo Ventures XIV, L.P.	3,473,942	3,850,000
MeriTech Capital Partners II, L.P.	157,099	1,850,000
Meritech Capital Partners III, L.P.	242,149	0
Meritech Capital Partners IV, L.P.	15,703,636	900,000
Meritech Capital Partners V, L.P.	23,262,365	1,450,000
Meritech Capital Partners VI, L.P.	12,175,957	27,250,000
Michigan Growth Capital Partners II, L.P.	197,360,507	9,898,849
Michigan Growth Capital Partners III, L.P.	33,290,675	79,438,047
Michigan Growth Capital Partners, LP	44,418,289	11,516,926
Midtown Fund III, L.P.	0	0
Midtown II Liquidating Trust	0	0

	Adjusted Reported Value	Unfunded Commitment
New Leaf Biopharma Opportunities II, L.P.	79,376,809	20,000,000
New Leaf Growth Fund I, L.P.	135,215,370	0
New Leaf Ventures II, L.P.	14,554,776	0
New Leaf Ventures III, L.P.	33,097,149	6,187,500
New Leaf Ventures IV, L.P.	8,469,878	40,812,500
Nordic Capital VI, L.P.	819,858	1
Nordic Capital VII	4,843,753	3,091,364
Nordic Capital VIII, L.P. (Alpha)	38,656,501	7,102,224
Oak Investment Partners X, L.P.	3,254,942	0
Oak Investments Partners IX, L.P.	264,139	0
Oaktree Opportunities Fund X, L.P.	29,498,655	5,100,000
Oaktree Opportunities Fund Xb, L.P.	8,230,396	61,250,000
OCM Opportunities Fund IX, L.P.	51,983,684	0
OCM Opportunities Fund VII (B), L.P.	1,221,296	5,000,000
OCM Opportunities Fund VII, L.P.	2,427,839	0
OCM Opportunities Fund VIII B, L.P.	17,217,255	0
OCM Opportunities Fund VIII, L.P.	2,255,915	0
OCM Principal Opportunities Fund IV	1,001,317	5,002,377
Ocqueoc Holdings, LLC	13,774,589	49,478,782
Parthenon Investors II	1,090,968	3,186,779
Parthenon Investors III	30,060,306	2,732,182
Parthenon Investors IV, L.P.	57,250,180	3,901,540
Peninsula Capital Fund IV	1,062,529	2,201,026
Peninsula Fund VI, L.P.	28,297,710	12,637,805
Permira Growth Opportunities I, L.P.1	0	50,000,000
PPC Fund II	26,451,983	49,088,870
Public Pension Capital, LLC	51,879,923	64,901,099
Rhone Partners V, L.P.	70,244,572	47,889,889
Riverside Capital Appreciation Fund VI, LP	61,751,954	10,787,971
Riverside Capital Appreciation Fund VII, L.P.	0	100,000,000
Riverside Micro Cap Fund I, LP	17,542,648	5,782,975
Riverside Micro-Cap Fund II, L.P.	32,186,244	2,735,834
Riverside Micro-Cap Fund III, L.P.	65,412,604	8,539,304
Riverside Micro-Cap Fund IV	43,492,704	10,639,880
Riverside Micro-Cap Fund V, L.P.	0	100,000,000
Science Ventures Fund II, L.P.	15,382,991	6,600,000
Shamrock Growth Capital Fund IV, L.P.	14,860,735	32,333,432
Silver Lake Partners II	260,475	3,531,586
Silver Lake Partners III	57,936,882	13,199,137
Silver Lake Partners IV, L.P.	59,772,539	3,982,198
Silver Lake Partners V, L.P.	26,232,587	40,406,601
** Silver Lake SL SPV-2	0	13,892,735
SK Capital Partners V, L.P.	5,437,434	44,367,771
SM/TCP L.P.	34,200,888	1,615,217
SMRS - TOPE LLC	1,745,423,151	535,041,815
SMRS-CAPP LLC	33,149,794	67,300,000
SMRS-NCRP LLC	795,179,899	190,958,521

	Adjusted Reported Value	Unfunded Commitment
** Summit Partners Growth Equity Fund X, L.P.	0	100,000,000
Sycamore Partners III, L.P.	10,507,967	87,157,654
TCW/Crescent Mezzanine Partners III Secondary	5,782	0
TCW/Crescent Mezzanine Partners III, L.P.	5,036	29,733,856
TCW/Crescent Mezzanine Partners IV, L.P.	250,434	13,660,773
TCW/Crescent Mezzanine Partners IVB Secondary	221,824	0
TCW/Crescent Mezzanine Partners V, LLC	9,404,834	15,382,013
TCW/Crescent Mezzanine Partners VC Secondary	2,867,278	0
The Huron Fund III, L.P.	7,076,204	4,207,756
The Huron Fund IV, L.P.	28,624,700	1,774,460
The Huron Fund V, L.P.	8,593,236	25,952,500
The Shansby Group 5 (TSG5)	1,664,398	4,261,291
Thoma Bravo Discover Fund II, L.P.	11,166,493	62,648,719
Thoma Bravo Fund XII, L.P.	153,473,859	10,415,876
Thoma Bravo Fund XIII, L.P.	17,990,883	107,009,117
TI Platform BOV, L.P.	1,830,209	13,199,140
TI Platform Fund II, L.P.	1,711,228	13,232,454
TI Platform SMRS SMA, L.P.	9,991,290	50,008,710
TPG Healthcare Partners, L.P.	0	25,000,000
TPG IV (Texas Pacific Group IV)	1,536,410	211,725
TPG Partners III, LP	643,975	2,087,002
TPG Partners VI, L.P.	70,294,752	10,258,102
TPG Partners VIII, L.P.	0	125,000,000
TPG Partners, VII, L.P.	139,031,042	32,249,575
TPG V (Texas Pacific Group V)	20,680,136	5,841,509
Trilantic Capital Partners V (North America) Fund A, L.P.	33,609,257	5,088,443
Trilantic Capital Partners VI (North America) L.P.	13,164,903	60,544,169
TSG6, L.P.	103,284,128	27,075,084
TSG7 A L.P.	92,361,902	42,638,126
TSG8, L.P.	1,225,600	148,774,400
Turnbridge Capital Partners I , LP	92,952,165	18,632,872
Veritas Capital Fund V, L.P.	131,363,255	1,708,273
Veritas Capital Fund VI, L.P.	79,217,821	28,251,198
Veritas V Co-Investors, L.P.	52,748,189	0
Vista Equity Endeavor Fund I, L.P.	37,110,977	14,677,288
Vista Equity Partners Fund V, L.P.	55,569,695	14,933,326
Vista Equity Partners Fund VI, L.P.	78,678,153	13,337,950
Vista Equity Partners VII, L.P.	6,171,077	68,828,654
Vista Foundation Fund III, L.P.	16,889,085	8,666,855
Warburg Pincus China, L.P.	36,371,994	13,477,500
Warburg Pincus Energy MCIP, L.P.	0	10,396,887
Warburg Pincus Energy, L.P.	75,235,985	30,600,000
Warburg Pincus Equity Partners, L.P.	1,159,872	0
Warburg Pincus Financial Sector, L.P.	8,025,296	35,460,000
Warburg Pincus Global Growth, L.P.	1,800,000	148,200,000
Warburg Pincus International Partners	0	0
Warburg Pincus Private Equity IX	11,827,874	0

	Adjusted Reported Value	Unfunded Commitment
Warburg Pincus Private Equity VIII, L.P	2,475,211	0
Warburg Pincus Private Equity X, L.P.	110,019,258	0
Warburg Pincus Private Equity XI, L.P.	182,533,616	0
Warburg Pincus Private Equity XII Secondary, L.P.	19,962,540	6,812,500
Warburg Pincus Private Equity XII, L.P.	139,936,332	47,687,500
WestAm COREplus Private Equity QP	368,709	2,086,719
Total Private Equity	\$ 12,239,297,942	\$ 7,889,925,573
Cash	190,110,188	-
Active Small Cap Cash	15,296,310	-
Active Small Cap	6,164,937	-
Income Accruals	1,590,575	-
Grand Total	\$ 12,452,459,952	\$ 7,889,925,573

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

** New Commitments made during quarter reported

State of Michigan Retirement System
DOMESTIC EQUITY REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	9.7%	14.3%	10.8%	13.1%	16.1%
S&P 1500	8.8%	13.3%	10.6%	12.7%	16.0%
Peer Median Return	6.4%	12.1%	9.5%	12.1%	15.0%
Percentile Rank vs. Peers *	16	10	19	12	28

*State Street Universe greater than \$1 billion

- Total Domestic Equity outperformed its peer group and the S&P 1500 over all time periods. Over the past year performance was 80 basis points (bps) in excess of the benchmark on a net of fees basis, with incurred tracking error of 1.7%.
- SMRS pays roughly 8 bps per year in domestic equity fees versus its peer group at an estimated 20-25 bps (per the research of Aon/Hewitt in 2017), making net of fee peer group comparisons more favorable than what the table above indicates.
- Combined internally managed active portfolios returned 11.1% over the past year, outperforming the S&P 1500 by 160 bps. Combined internal growth funds returned 15.8% during this same time, ranking in the top decile of active growth managers and outpacing the S&P 500 by 700 bps.
- Division performance driven by investments in Square, General Electric, Exelon, Conagra and Twitter among others.
- Mellon Capital returned 18.6%, outperforming the S&P 1500 by a little over 900 bps, contributing ~35 bps to the division's overall return. This high beta portfolio is designed to help the division outperform in a rising market.
- LA Capital All-Cap Growth returned 13.4%, beating the S&P 1500 by 460 bps while outpacing its benchmark S&P 1500 Growth Index over nearly all time periods. This is particularly notable because such outperformance was achieved with a lower risk profile than most indices and managers.
- Fisher Investments returned 11.9%, outperforming the S&P 1500 by 300 basis points and ranking near the top 5% of its peer group. Fisher has outperformed the S&P 1500 by 200 bps annualized since its inception date in 2004, ranking in the top 1% of its peer group.

Asset Class Goal

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

Strategy Update

- The Domestic Equity Portfolio remains overweight the financial sector and defensive stocks while remaining underweight consumer discretionary and commodity related sectors. The estimated portfolio beta is 1.1, so a significant market correction would present a modest headwind to performance. The division is also overweight volatility via the options market. This will have the effect of partly offsetting losses in sharp down markets and amplifying gains in sharp up markets.
 - Total Domestic Equity's portfolio would outperform the S&P 1500 by ~20% were it to appreciate to the market multiple of 17.2x from where it stands now at 14.1x, or if multiples between it and the benchmark were otherwise to converge.
 - The potential for multiple convergence is driven by active exposures in Berkshire Hathaway, Apple, AGNC, Facebook, Gilead Sciences and Ally Financial among others.
 - In the event that multiples do not converge, the division remains in a position to outperform based on its higher level of dividend yield, coupled with faster earnings per share growth than the S&P 1500.
 - At the broader portfolio level, allocations to attractively valued financial and defensive stocks offset each other from an interest rate risk standpoint, paving the way for potential outperformance in most rate environments.

Market Environment and Outlook

- At ~17.2x forward earnings, equity markets trade at a premium to their historical average of 15.7x and nearly 5% below their twenty-five-year historical average of 18x, albeit with higher levels of profitability, which may prove to be cyclical.
- Factoring in the existing low level of interest rates, stocks are attractively priced for an environment where long-term bond yields are 4% or lower.
- The market is currently paying out 1.9% of its earnings in dividends and reducing shares outstanding by 3.1% by way of share buybacks, for a 5.0% total shareholder yield.
- It is also growing shareholders' equity at a rate of 2.4% by reinvesting roughly 15% of its earnings back into its underlying businesses.
- The market is thus poised to earn roughly 7.4% (shareholder yield of 5.0% + reinvestment rate of 2.4%) in an environment where stock multiples and returns on equity are stable.
- This compares favorably to the 30-year U.S. Treasury at 2.8%, and unfavorably to the historical compound annual return for the S&P 500 from 1928 – 2017 of 9.5%.

SMRS

Domestic Equity Strategies

3/31/19

Markets	Amount	Total	% of Total
Internal Indexed (\$ in Millions)			
Indexed Portfolios	\$7,958		
Total Indexed		\$7,958	44.3%
Internal Active			
Active Portfolios	\$5,273		
Total Internal Active		\$5,273	29.4%
External Active			
Los Angeles Capital	\$1,218		
Mellon Capital	846		
Fisher Investments	687		
Seizert Capital Partners	562		
Clarkston Capital Partners	498		
ARK Investments	483		
Attucks Asset Management	148		
Bivium Capital	144		
Ancora	100		
Munder Capital Management	22		
Northpointe Capital	21		
Total External Active		\$4,732	26.3%

Total Domestic Equity

\$17,963

100.0%

SMRS

Domestic Equities Composite

3/31/19

Date:	<u>3/31/19</u>	<u>12/31/18</u>	<u>9/30/18</u>	<u>6/30/18</u>
Assets (\$ in Millions):	\$17,963	\$15,693	\$19,214	\$17,831
Number of Securities:	1,314	1,295	1,370	1,334
Active Share:	47%	49%	44%	39%

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

Characteristics	<u>SMRS</u>	<u>S&P 1500</u>	<u>S&P 1500 Value</u>
Market Capitalization (\$ in Billions)	\$227.0	\$213.8	\$165.0
P/E FY1	14.1x	17.2x	14.1x
P/E upside to S&P 1500	21.6%	0.0	22.2%
Price/Book	3.7x	3.2x	2.2x
Return on Equity	25.2%	17.9%	15.3%
Risk Metrics			
Beta	1.14	1.00	0.89
Tracking Error	2.6%	0.0%	3.8%
Projected Returns			
Dividend Yield	3.0%	1.9%	2.4%
Buyback Yield	3.3%	3.1%	3.7%
Reinvestment Rate	<u>2.8%</u>	<u>2.4%</u>	<u>2.1%</u>
Projected Investment Return	<u>9.1%</u>	<u>7.4%</u>	<u>8.2%</u>

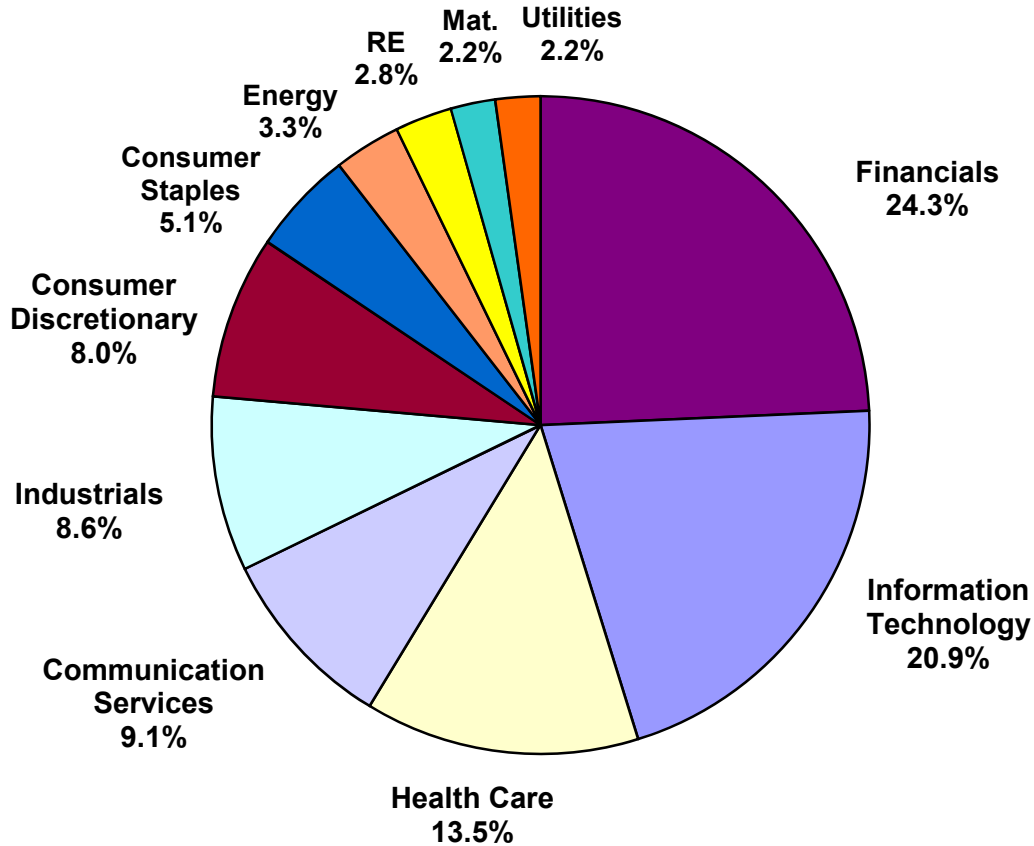
TOP TEN EXPOSURES – Domestic Equities vs S&P 1500 3/31/19

<u>Domestic Equity Portfolio</u>			<u>S&P 1500</u>		
<u>Company Name</u>	<u>Portfolio Weight</u>	<u>FY1 P/E</u>	<u>Company Name</u>	<u>Market Weight</u>	<u>FY1 P/E</u>
SPDR S&P 500 ETF Trust	20.0%	17.2	Microsoft Corp.	3.5%	27.0
SPDR Port. LT Treasury ETF	7.1%	36.8	Apple, Inc.	3.4%	17.7
Apple, Inc.	3.4%	17.7	Amazon.com, Inc.	2.9%	67.2
AGNC Investment Corp.	2.5%	8.0	Facebook, Inc. Class A	1.6%	23.7
Berkshire Hathaway, Inc. B	2.4%	13.6	Berkshire Hathaway, Inc. B	1.5%	13.6
Microsoft Corp.	2.3%	27.0	Alphabet, Inc., Class C	1.4%	25.5
Facebook, Inc. Class A	2.1%	23.7	Johnson & Johnson	1.4%	15.7
Amazon.com, Inc.	1.8%	67.2	Alphabet, Inc., Class A	1.4%	25.6
Annaly Capital Mgmt., Inc.	1.6%	8.5	Exxon Mobil Corp.	1.3%	19.1
Gilead Sciences, Inc.	1.5%	10.2	JPMorgan Chase & Co.	1.3%	10.8
TOTAL	<u>44.7%</u>	<u>17.4</u>	TOTAL	<u>19.7%</u>	<u>19.6</u>

SMRS

Domestic Equity By Sector

3/31/19



Market Value in Millions				
3/31/19				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$4,366	24.3%	13.0%	11.3%
Information Technology	3,750	20.9%	20.7%	0.2%
Health Care	2,425	13.5%	14.2%	-0.7%
Communication Services	1,642	9.1%	9.4%	-0.3%
Industrials	1,546	8.6%	10.1%	-1.5%
Consumer Discretionary	1,445	8.0%	10.4%	-2.4%
Consumer Staples	908	5.1%	6.9%	-1.8%
Energy	598	3.3%	5.3%	-2.0%
Real Estate	499	2.8%	3.7%	-0.9%
Materials	396	2.2%	2.9%	-0.7%
Utilities	388	2.2%	3.4%	-1.2%
Total	<u>\$17,963</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

3/31/19

Date:	<u>3/31/19</u>	<u>12/31/18</u>	<u>9/30/18</u>	<u>6/30/18</u>
Assets (\$ in Millions):	\$10,005	\$8,655	\$10,696	\$9,879
Number of Securities:	1,086	1,021	1,073	1,053
Active Share:	83%	85%	77%	68%

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

Characteristics	<u>SMRS</u>	<u>S&P 1500</u>	<u>S&P 1500 Value</u>
Market Capitalization (\$ in Billions)	\$183.1	\$213.8	\$165.0
P/E FY1	12.3x	17.2x	14.1x
P/E upside to S&P 1500	40.3%	0.0	22.2%
Price/Book	4.2x	3.2x	2.2x
Return on Equity	31.9%	17.9%	15.3%
Risk Metrics			
Beta	1.25	1.00	0.89
Tracking Error	4.5%	0.0%	3.8%
Projected Returns			
Dividend Yield	3.8%	1.9%	2.4%
Buyback Yield	3.6%	3.1%	3.7%
Reinvestment Rate	<u>3.0%</u>	<u>2.4%</u>	<u>2.1%</u>
Projected Investment Return	<u>10.4%</u>	<u>7.4%</u>	<u>8.2%</u>

TOP TEN EXPOSURES – Actively Managed Equities vs S&P 1500

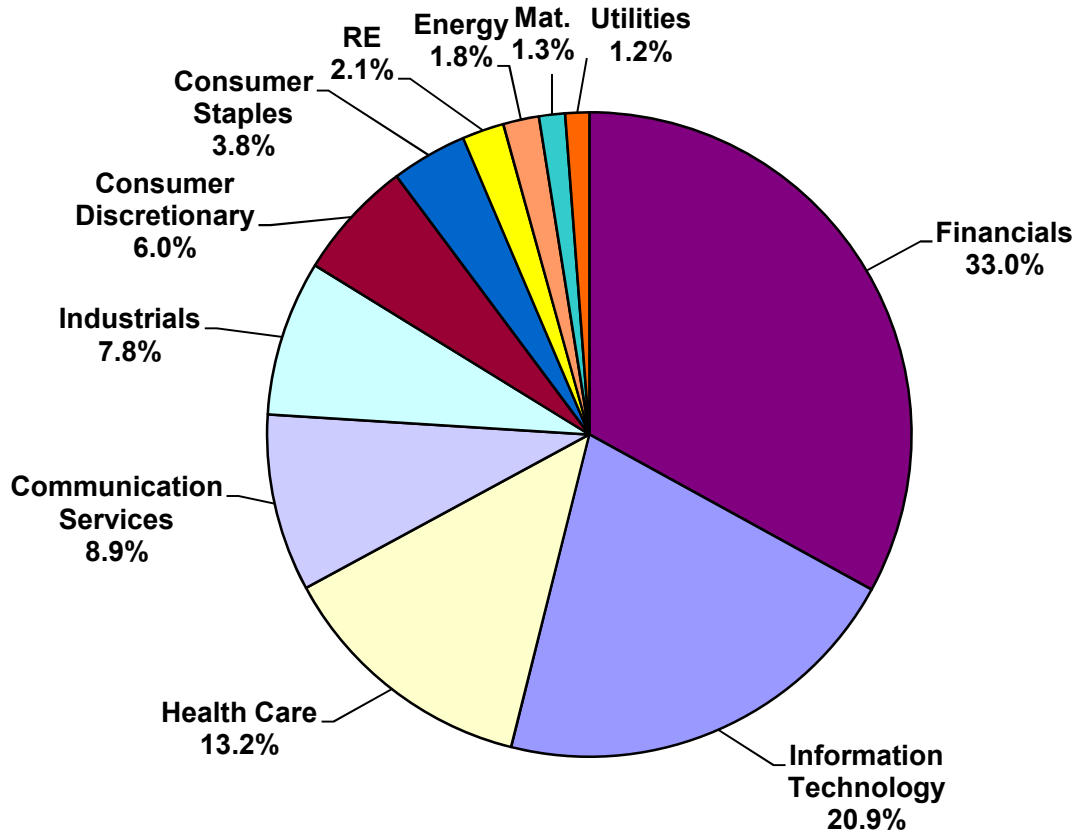
3/31/19

<u>Actively Managed Equity Portfolio</u>			<u>S&P 1500</u>		
<u>Company Name</u>	<u>Portfolio Weight</u>	<u>FY1 P/E</u>	<u>Company Name</u>	<u>Market Weight</u>	<u>FY1 P/E</u>
SPDR S&P 500 ETF Trust	31.3%	17.2	Microsoft Corp.	3.5%	27.0
SPDR Port. LT Treasury ETF	12.7%	36.8	Apple, Inc.	3.4%	17.7
AGNC Investment Corp.	4.4%	8.0	Amazon.com, Inc.	2.9%	67.2
Berkshire Hathaway, Inc. B	3.6%	13.6	Facebook, Inc. Class A	1.6%	23.7
Apple, Inc.	3.5%	17.7	Berkshire Hathaway, Inc. B	1.5%	13.6
Annaly Capital Mgmt., Inc.	2.8%	8.5	Alphabet, Inc., Class C	1.4%	25.5
Facebook, Inc. Class A	2.6%	23.7	Johnson & Johnson	1.4%	15.7
Ally Financial, Inc.	2.4%	8.0	Alphabet, Inc., Class A	1.4%	25.6
Gilead Sciences, Inc.	2.4%	10.2	Exxon Mobil Corp.	1.3%	19.1
U.S. Bancorp	<u>2.0%</u>	<u>11.5</u>	JPMorgan Chase & Co.	<u>1.3%</u>	<u>10.8</u>
TOTAL	<u>67.7%</u>	<u>15.6</u>	TOTAL	<u>19.7%</u>	<u>19.6</u>

SMRS

Active Equity By Sector

3/31/19



Market Value in Millions				
3/31/19				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$3,302	33.0%	13.0%	20.0%
Information Technology	2,093	20.9%	20.7%	0.2%
Health Care	1,320	13.2%	14.2%	-1.0%
Communication Services	887	8.9%	9.4%	-0.5%
Industrials	783	7.8%	10.1%	-2.3%
Consumer Discretionary	595	6.0%	10.4%	-4.4%
Consumer Staples	378	3.8%	6.9%	-3.1%
Real Estate	208	2.1%	3.7%	-1.6%
Energy	184	1.8%	5.3%	-3.5%
Materials	132	1.3%	2.9%	-1.6%
Utilities	123	1.2%	3.4%	-2.2%
Total	<u>\$10,005</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

Manager Performance - Net of Fees

3/31/19

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception</u>	<u>Inception Date</u>
SMRS S&P 500 Index	\$7,281,289,236	9.5%	13.7%	11.0%	13.1%	--	N/A
S&P 500		9.5%	13.5%	10.9%	12.8%	--	
Style & Risk Adjusted Benchmark		9.5%	13.5%	10.9%	12.8%	--	
Lipper Large-Cap Core		7.9%	12.3%	9.4%	11.6%	--	
<i>Excess Return</i>		<i>0.0%</i>	<i>0.1%</i>	<i>0.1%</i>	<i>0.2%</i>	<i>--</i>	
<i>Alpha</i>		<i>0.0%</i>	<i>0.2%</i>	<i>0.2%</i>	<i>0.3%</i>	<i>--</i>	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		<i>29</i>	<i>22</i>	<i>14</i>	<i>10</i>	<i>--</i>	
SMRS Large-Cap Core	2,473,603,669	12.6%	16.2%	10.6%	14.3%	8.8%	8/31/07
S&P 500		9.5%	13.5%	10.9%	12.8%	8.2%	
Style & Risk Adjusted Benchmark		6.8%	17.7%	11.6%	13.7%	8.7%	
Lipper Large-Cap Core		7.9%	12.3%	9.4%	11.6%	7.4%	
<i>Excess Return</i>		<i>3.1%</i>	<i>2.7%</i>	<i>-0.3%</i>	<i>1.5%</i>	<i>0.7%</i>	
<i>Alpha</i>		<i>5.8%</i>	<i>-1.6%</i>	<i>-1.0%</i>	<i>0.6%</i>	<i>0.1%</i>	
<i>Pct Rank vs Lipper Large-Cap Core</i>		<i>8</i>	<i>3</i>	<i>26</i>	<i>2</i>	<i>9</i>	
SMRS All-Cap Garp	1,615,149,566	4.0%	11.4%	8.9%	11.9%	12.7%	4/30/11
S&P 1500 Super Composite		8.8%	13.3%	10.6%	12.7%	12.1%	
Style & Risk Adjusted Benchmark		9.6%	14.0%	10.8%	12.8%	12.2%	
Lipper Multi-Cap Core		4.9%	11.1%	7.9%	10.8%	9.9%	
<i>Excess Return</i>		<i>-4.8%</i>	<i>-1.9%</i>	<i>-1.8%</i>	<i>-0.8%</i>	<i>0.6%</i>	
<i>Alpha</i>		<i>-5.6%</i>	<i>-2.6%</i>	<i>-1.9%</i>	<i>-0.9%</i>	<i>0.5%</i>	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		<i>64</i>	<i>52</i>	<i>38</i>	<i>31</i>	<i>2</i>	
Mellon US Equity Enhanced	846,413,272	18.6%	--	--	--	24.9%	3/1/17
S&P 500		9.5%	--	--	--	11.3%	
Style & Risk Adjusted Benchmark		18.1%	--	--	--	22.4%	
<i>Lipper Large-Cap Core</i>		<i>7.9%</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>10.2%</i>	
<i>Excess Return</i>		<i>9.1%</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>13.7%</i>	
<i>Alpha</i>		<i>0.5%</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>2.5%</i>	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		<i>1</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>1</i>	
LA Capital Deep Value	727,516,332	2.0%	9.2%	--	--	6.6%	4/1/15
S&P 1500 Value		5.5%	10.6%	--	--	7.7%	
Style & Risk Adjusted Benchmark		3.4%	11.1%	--	--	7.9%	
Lipper Multi-Cap Value		1.8%	9.3%	--	--	5.8%	
<i>Excess Return</i>		<i>-3.5%</i>	<i>-1.4%</i>	<i>--</i>	<i>--</i>	<i>-1.1%</i>	
<i>Alpha</i>		<i>-1.4%</i>	<i>-1.9%</i>	<i>--</i>	<i>--</i>	<i>-1.4%</i>	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		<i>47</i>	<i>58</i>	<i>--</i>	<i>--</i>	<i>33</i>	
Fisher All-Cap	686,835,544	11.9%	16.8%	12.9%	12.6%	11.0%	10/31/04
S&P 1500		8.8%	13.3%	10.6%	12.7%	9.0%	
Style & Risk Adjusted Benchmark		11.7%	13.7%	11.6%	13.6%	10.8%	
Lipper Multi-Cap Core		4.9%	11.1%	7.9%	10.8%	7.8%	
<i>Excess Return</i>		<i>3.1%</i>	<i>3.5%</i>	<i>2.2%</i>	<i>-0.1%</i>	<i>2.0%</i>	
<i>Alpha</i>		<i>0.2%</i>	<i>3.1%</i>	<i>1.3%</i>	<i>-0.9%</i>	<i>0.2%</i>	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		<i>6</i>	<i>1</i>	<i>1</i>	<i>12</i>	<i>1</i>	
SMRS Mid-Cap Index	676,626,268	2.9%	11.9%	8.9%	12.1%	--	N/A
S&P 400		2.6%	11.2%	8.3%	11.4%	--	
Style & Risk Adjusted Benchmark		2.6%	11.2%	8.2%	11.3%	--	
Lipper Mid-Cap Core		2.8%	10.2%	6.8%	10.2%	--	
<i>Excess Return</i>		<i>0.3%</i>	<i>0.6%</i>	<i>0.6%</i>	<i>0.7%</i>	<i>--</i>	
<i>Alpha</i>		<i>0.3%</i>	<i>0.7%</i>	<i>0.7%</i>	<i>0.7%</i>	<i>--</i>	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		<i>46</i>	<i>24</i>	<i>16</i>	<i>8</i>	<i>--</i>	

Fund Name	Market Value	1-Year	3-Years	5-Years	7-Years	Inception	Inception Date
SMRS Large-Cap Growth	675,763,362	15.7%	15.5%	13.0%	13.9%	10.1%	5/31/05
S&P 500 Growth		12.8%	15.9%	13.4%	14.5%	10.3%	
Style & Risk Adjusted Benchmark		12.4%	16.8%	14.2%	15.1%	10.4%	
Lipper Large-Cap Growth		11.8%	16.2%	12.5%	13.4%	9.9%	
<i>Excess Return</i>		3.0%	-0.4%	-0.4%	-0.5%	-0.2%	
<i>Alpha</i>		3.3%	-1.4%	-1.2%	-1.2%	-0.3%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		11	66	41	37	37	
Seizert Capital Partners	562,035,721	0.9%	11.8%	6.8%	11.0%	12.8%	11/30/09
S&P 1500 Value		5.5%	10.6%	8.0%	11.0%	12.1%	
Style & Risk Adjusted Benchmark		5.4%	10.2%	8.0%	11.3%	12.2%	
Lipper Multi-Cap Value		1.8%	9.3%	6.2%	9.7%	10.6%	
<i>Excess Return</i>		-4.6%	1.2%	-1.1%	0.1%	0.7%	
<i>Alpha</i>		-4.5%	1.5%	-1.2%	-0.3%	0.6%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		61	5	35	17	6	
LA Capital All-Cap Growth	490,968,699	13.4%	13.7%	13.2%	15.0%	11.9%	5/31/05
S&P 1500 Growth		11.8%	15.6%	12.9%	14.2%	10.3%	
Style & Risk Adjusted Benchmark		10.9%	14.0%	11.1%	12.8%	9.6%	
Lipper Multi-Cap Growth		10.4%	15.3%	10.5%	12.3%	9.6%	
<i>Excess Return</i>		1.6%	-1.9%	0.3%	0.8%	1.7%	
<i>Alpha</i>		2.5%	-0.2%	2.1%	2.2%	2.3%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		24	68	14	11	8	
Ark Investments	483,153,860	12.3%	32.0%	--	--	34.2%	3/1/16
S&P 1500 Growth		11.8%	15.6%	--	--	17.6%	
Style & Risk Adjusted Benchmark		2.3%	26.4%	--	--	29.1%	
Lipper Multi-Cap Growth		10.4%	15.3%	--	--	17.2%	
<i>Excess Return</i>		0.5%	16.4%	--	--	16.6%	
<i>Alpha</i>		10.0%	5.6%	--	--	5.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		31	1	--	--	1	
Large-Cap Consistent Growth	480,105,590	9.0%	13.4%	--	--	11.3%	3/1/15
S&P 500		9.5%	13.5%	--	--	9.8%	
Style & Risk Adjusted Benchmark		12.1%	14.4%	--	--	10.8%	
Lipper Large-Cap Core		7.9%	12.3%	--	--	8.4%	
<i>Excess Return</i>		-0.5%	-0.1%	--	--	1.5%	
<i>Alpha</i>		-3.1%	-1.0%	--	--	0.5%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		40	30	--	--	3	
Clarkston Capital Large-Cap	281,898,712	8.8%	10.0%	--	--	9.1%	4/1/15
S&P 500 Value		5.9%	10.6%	--	--	7.8%	
Style & Risk Adjusted Benchmark		5.2%	8.9%	--	--	6.3%	
Lipper Large-Cap Value		5.0%	10.6%	--	--	7.3%	
<i>Excess Return</i>		2.8%	-0.6%	--	--	1.3%	
<i>Alpha</i>		3.6%	1.2%	--	--	2.7%	
<i>Pct. Rank vs. Lipper Large-Cap Value</i>		12	70	--	--	12	
Clarkston Capital Small/Mid-Cap	216,303,490	3.4%	9.8%	10.6%	--	10.6%	1/1/14
S&P 400		2.3%	11.6%	8.3%	--	8.4%	
Style & Risk Adjusted Benchmark		4.9%	7.9%	6.2%	--	6.3%	
Lipper Mid-Cap Core		2.8%	10.2%	6.8%	--	6.9%	
<i>Excess Return</i>		1.1%	-1.8%	2.2%	--	2.2%	
<i>Alpha</i>		-1.5%	1.9%	4.4%	--	4.3%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		43	62	2	--	3	
Attucks Asset Management	148,425,780	5.2%	10.7%	7.1%	9.9%	6.5%	11/30/07
S&P 1500		8.8%	13.3%	10.6%	12.7%	7.8%	
Style & Risk Adjusted Benchmark		8.4%	9.8%	10.6%	12.9%	7.8%	
Lipper Multi-Cap Core		4.9%	11.1%	7.9%	10.8%	6.3%	
<i>Excess Return</i>		-3.5%	-2.7%	-3.6%	-2.8%	-1.4%	
<i>Alpha</i>		-3.1%	0.9%	-3.5%	-3.0%	-1.4%	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		53	65	71	74	51	

<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>
Bivium Capital Partners	144,483,651	3.2%	10.7%	6.9%	9.4%	6.0%	11/30/07
S&P 1500 Value		5.5%	10.6%	8.0%	11.0%	5.8%	
Style & Risk Adjusted Benchmark		5.9%	11.2%	8.4%	11.4%	8.1%	
Lipper Multi-Cap Value		1.8%	9.3%	6.2%	9.7%	5.2%	
<i>Excess Return</i>		-2.3%	0.1%	-1.0%	-1.6%	0.2%	
<i>Alpha</i>		-2.6%	-0.6%	-1.5%	-2.1%	-2.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		35	19	32	66	27	
Ancora	100,478,735	0.7%	--	--	--	3.7%	10/1/17
S&P 1000		2.3%	--	--	--	5.0%	
Style & Risk Adjusted Benchmark		3.5%	--	--	--	4.7%	
Lipper Mid-Cap Core		2.8%	--	--	--	4.9%	
<i>Excess Return</i>		-1.6%	--	--	--	-1.3%	
<i>Alpha</i>		-2.8%	--	--	--	-1.0%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		74	--	--	--	68	
Munder Concentrated SMID Cap	22,129,986	-11.1%	6.1%	2.8%	7.0%	12.4%	4/30/09
S&P 1000		2.3%	11.6%	8.3%	11.6%	16.5%	
Style & Risk Adjusted Benchmark		-0.5%	10.0%	9.1%	12.4%	15.7%	
Lipper Mid-Cap Core		2.8%	10.2%	6.8%	10.2%	14.6%	
<i>Excess Return</i>		-13.4%	-5.6%	-5.5%	-4.6%	-4.1%	
<i>Alpha</i>		-10.6%	-3.9%	-6.3%	-5.4%	-3.3%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		100	92	94	95	87	
NorthPointe All-Cap Core	21,475,519	3.0%	8.8%	5.4%	9.3%	7.0%	10/31/04
S&P 1500 Value		5.5%	10.6%	8.0%	11.0%	7.8%	
Style & Risk Adjusted Benchmark		5.1%	9.4%	7.4%	10.8%	9.8%	
Lipper Multi-Cap Value		1.8%	9.3%	6.2%	9.7%	6.9%	
<i>Excess Return</i>		-2.6%	-1.8%	-2.6%	-1.7%	-0.9%	
<i>Alpha</i>		-2.1%	-0.6%	-2.0%	-1.5%	-2.8%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		38	70	72	68	45	

State of Michigan Retirement System
FIXED INCOME REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



Daniel J. Quigley
Senior Investment Manager
Fixed Income Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	5.1%	4.2%	4.2%	3.8%	5.3%
Bloomberg Barclays US Agg	4.5%	2.0%	2.7%	2.5%	3.8%
Peer Median Returns	4.1%	2.8%	3.1%	3.0%	4.9%
Percentile Rank vs. Peers*	11	20	15	16	36

*State Street Universe greater than \$1 billion

- The fixed income portfolio outperformed its benchmark and peer group across all time periods. This year-over-year (YOY) outperformance was driven by strong performance in the internal core bond portfolio as well as an overweight to investment grade and high yield corporate credit.
- The duration positioning of the portfolio helped drive outperformance due to an overweight to floating-rate securities in a rising short-term interest rate environment. This was paired with an underweight to the 1 to 5-year portion of the yield curve, which underperformed as the yield curve flattened. An underweight to long duration securities hindered performance slightly on a YOY basis.
- Investment Grade and High Yield Credit experienced a strong recovery in the first quarter after underperforming in the 4th quarter of 2018. HY spreads have recovered over half of their losses from the recent selloff. The Structured Fixed Income portion of the portfolio has slightly underperformed the benchmark on a one-year basis but has outperformed over longer time horizons.

Strategy Update

- The goal of the Fixed Income Division portfolio is to meet or exceed the returns of the Bloomberg U.S. Aggregate Bond Index while satisfying the overall characteristics of a core fixed income portfolio. These characteristics are: income, liquidity, principal preservation, and diversification from equity market risk. The portfolio has a higher yield than the benchmark without having meaningfully more risk than the U.S. Aggregate Index. The yield-to-maturity of the portfolio is currently 4.0% versus a benchmark yield of 3.3%. In addition to this, the portfolio has an equity beta of 0.0, in line with the U.S. Aggregate Index.
- The Core-plus strategy implemented to achieve this goal includes:
 - Core: As of March 31, 2019, the allocation to U.S. Treasuries, investment-grade corporate bonds, government-guaranteed U.S. Agency Debentures, RMBS, and Commercial Mortgage Backed Securities (CMBS) was 67.9%. This includes a 20.5% allocation to U.S. Treasuries, TIPS, and cash.
 - Plus: The portfolio maintains a strategic out-of-benchmark allocation to high-yield corporate debt, securitized credit, and global fixed income strategies as market opportunities allow. This allocation increases the portfolio yield and total return potential, but will result in lower liquidity and higher volatility. The allocation to the Plus portfolio was 32.1% as of March 31, 2019.

Tactical Update

- The allocation to securitized credit, primarily in CMBS, ABS, non-agency RMBS, and CLO securities, was 22.9% of the portfolio at the end of the quarter. The combination of low interest rate duration and high coupon income (often floating rate) is attractive at this point in the interest rate cycle.
- The allocation to high-yield strategies was 5.6% at the end of the quarter. This out-of-benchmark position has benefitted portfolio performance.
- The portfolio has a meaningful allocation to floating rate securities, including AAA CLO investments and investment-grade floating rate corporate bonds. This allocation accounts for approximately 20% of portfolio assets and should position the portfolio to outperform in a rising interest rate environment.
- The allocation to U.S. TIPS decreased during the quarter to 3.6% of the fixed income portfolio. The TIPS allocation has outperformed nominal U.S. Treasuries on a YTD basis, but has underperformed over the past year. We believe that this allocation offers an attractive hedge to the portfolio should inflation expectations increase in the future.

Market Environment and Outlook

- The yield curve for U.S. Treasury securities flattened for the year with short-term interest rates increasing and long-term rates declining. The yield on the ten-year Treasury decreased by 32 bps on a YOY basis to 2.41% while three-month T-Bill yield increased by 70 bps to 2.40%. The yield curve is inverted for short and intermediate maturities with the three-year Treasury having a yield of 2.21%, roughly 20 bp below the three-month T-Bill.
- Inflation expectations increased during the quarter with ten-year breakeven inflation expectations ending March at 1.87%. This was a 16 bp increase for the quarter.
- Credit markets recovered with high-yield spreads ending March at 391 bps. This represented a 135 bp decrease in spreads for the quarter. These spread levels are roughly 50 bp tighter than their five-year average. Investment grade credit spreads tightened by 34 bp for the quarter to 119 bp, 7 bp tighter than the five-year average.
- Emerging Markets Debt also recovered during the quarter with the EMD Index returning 5.4% YTD. EMD spreads ended March at 268 bp, 30 bp below the five-year average for the index.
- Developed market interest rates declined across most major markets during the quarter as investors priced in lower global growth expectations. The yield on the ten-year German Bund ended the quarter at -0.07%, down 57 bp on a YOY basis. The Japanese JGB ended the quarter with a ten-year yield of -0.09%.

Conclusion

- The portfolio maintains a defensive position for rising interest rates. The duration remains short of the benchmark and the portfolio maintains an underweight to long-term debt. This position is offset through a larger allocation to structured and corporate debt securities which increase the income of the portfolio. The portfolio has also reduced corporate credit exposure due to poor valuations in various credit markets. The portfolio will continue to look for attractive risk-adjusted opportunities within the fixed income opportunity set.

SMRS

Long-Term Fixed Income by Strategy

3/31/19

	Amount	Total	% of Total
Core (\$ in Millions)			
LTFID Internal	\$4,934		
PIMCO Mortgage Fund	258		
Dodge & Cox	251		
PGIM Investment Grade Credit	239		
Total Core		\$5,683	61.9%
Tactical			
Pyramis	\$313		
Loomis Core Plus	233		
Total Tactical		\$546	5.9%
Securitized Debt			
Met West Securitized Ops	\$474		
Principal CMBS	405		
Napier Park CLO Debt	369		
TICP CLO Debt	362		
Napier Park ABS Income	406		
Napier Park Strategic Loan	85		
Total Securitized Debt		\$2,101	22.9%
High Yield			
Columbia Management	\$238		
PGIM High Yield	251		
Crescent Direct Lending	22		
Total High Yield		\$510	5.6%
Global			
T. Rowe Global Multi-Sector	\$236		
PGIM Global Liquid Relative Value	102		
Total Global		\$338	3.7%

TOTAL

\$9,178

100.0%

NOTE: Totals may not be exact due to rounding.

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

3/31/19

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Maturity (Yrs)	7.8	8.1
Duration (Yrs)	4.8	5.9
Spread Duration (Yrs)	5.7	6.0
Coupon (%)	3.7	3.2
Yield to Maturity (%)	4.0	3.0
Credit Rating	A-	AA
VaR (%)	3.8	4.3
Tracking Error	1.51	NA
Beta (vs S&P 500)	0.02	-0.03

Commentary

Objectives

Income:

Liquidity:

Principal Preservation:

Diversification:

Highlights

The coupon of the portfolio is approximately 50 bps higher than the benchmark. Roughly 20% of the portfolio is invested in floating-rate securities, allowing coupon income to increase relative to the benchmark if the yield curve continues to flatten.

20.5% of the portfolio is invested in cash, U.S. Treasuries, and TIPS. These investments can be liquidated via same-day trading.

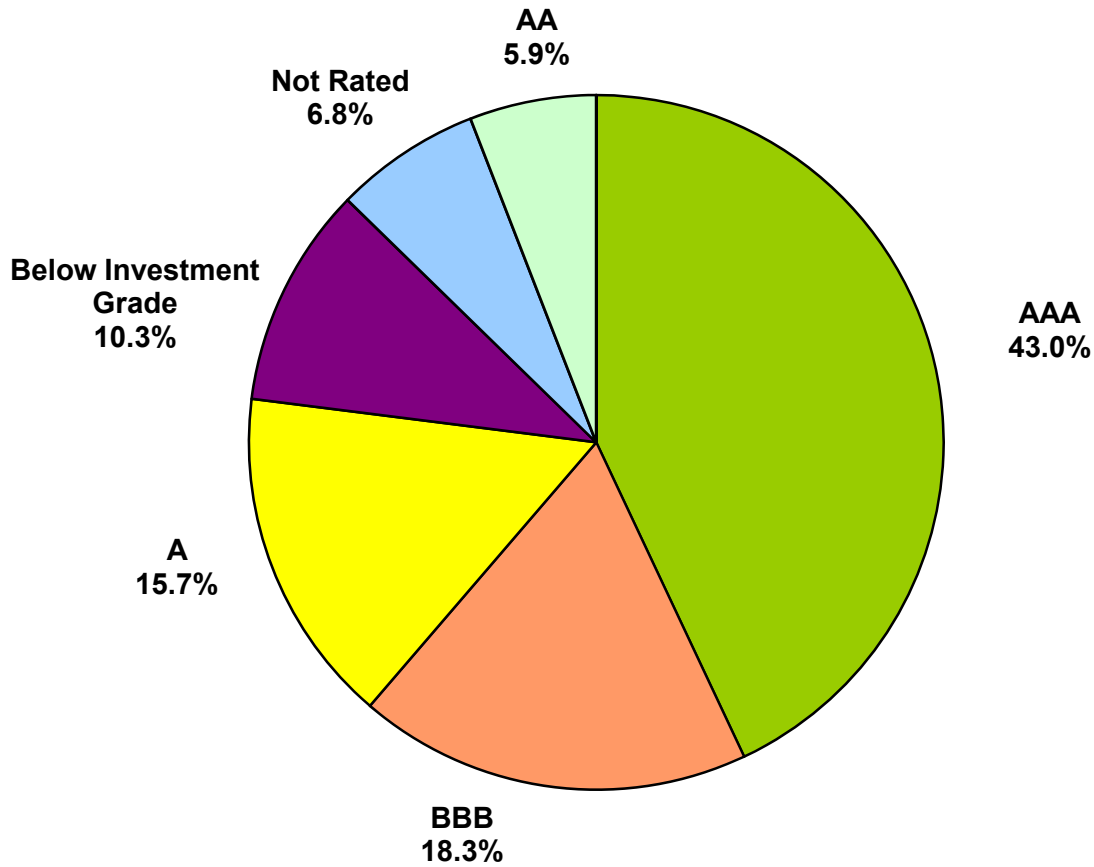
The portfolio has a large allocation to U.S. Treasuries and carries an investment-grade credit rating.

The equity beta of the portfolio is roughly 0.0 meaning that the portfolio returns are uncorrelated with equity market movements, and in line with the benchmark bond index.

SMRS

Fixed Income By Rating

3/31/19



Market Value in Millions				
3/31/19				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$3,950	43.0%	71.5%	-28.5%
AA	539	5.9%	3.3%	2.6%
A	1,443	15.7%	10.4%	5.3%
BBB	1,680	18.3%	12.3%	6.0%
Not Rated	626	6.8%	1.9%	4.9%
* Below Investment Grade	940	10.3%	0.6%	9.7%
Total Investments	<u>\$9,178</u>	<u>100.0%</u>	<u>100.0%</u>	

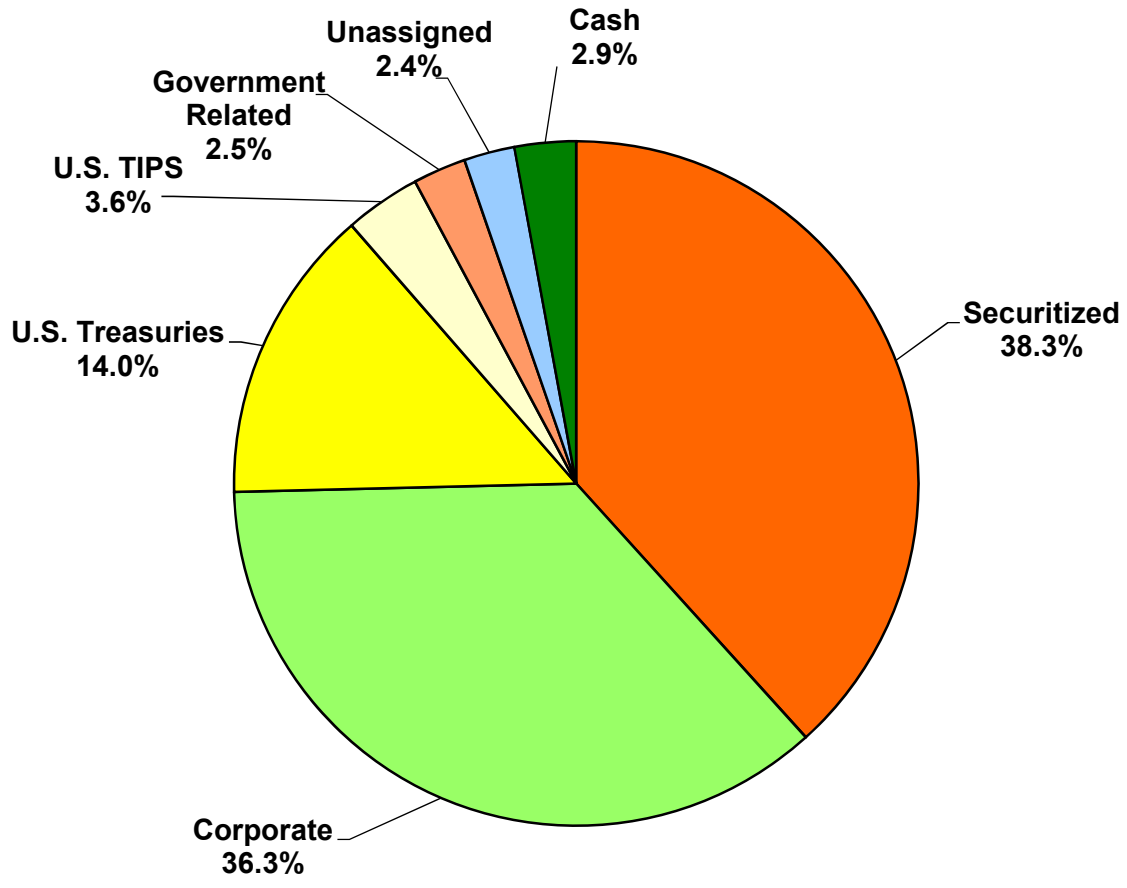
* Comprised of approximately 7.7% High Yield Credit and 2.6% High Yield RMBS/ABS

Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

3/31/19



Market Value in Millions				
3/31/19				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Securitized	\$3,512	38.3%	30.3%	8.0%
Corporate	3,331	36.3%	24.7%	11.6%
U.S. Treasuries	1,289	14.0%	39.1%	-25.1%
U.S. TIPS	330	3.6%	0.0%	3.6%
Government Related	229	2.5%	5.9%	-3.4%
Unassigned	224	2.4%	0.0%	2.4%
Cash	263	2.9%	0.0%	2.9%
Total Investments	<u>\$9,178</u>	<u>100.0%</u>	<u>100.0%</u>	

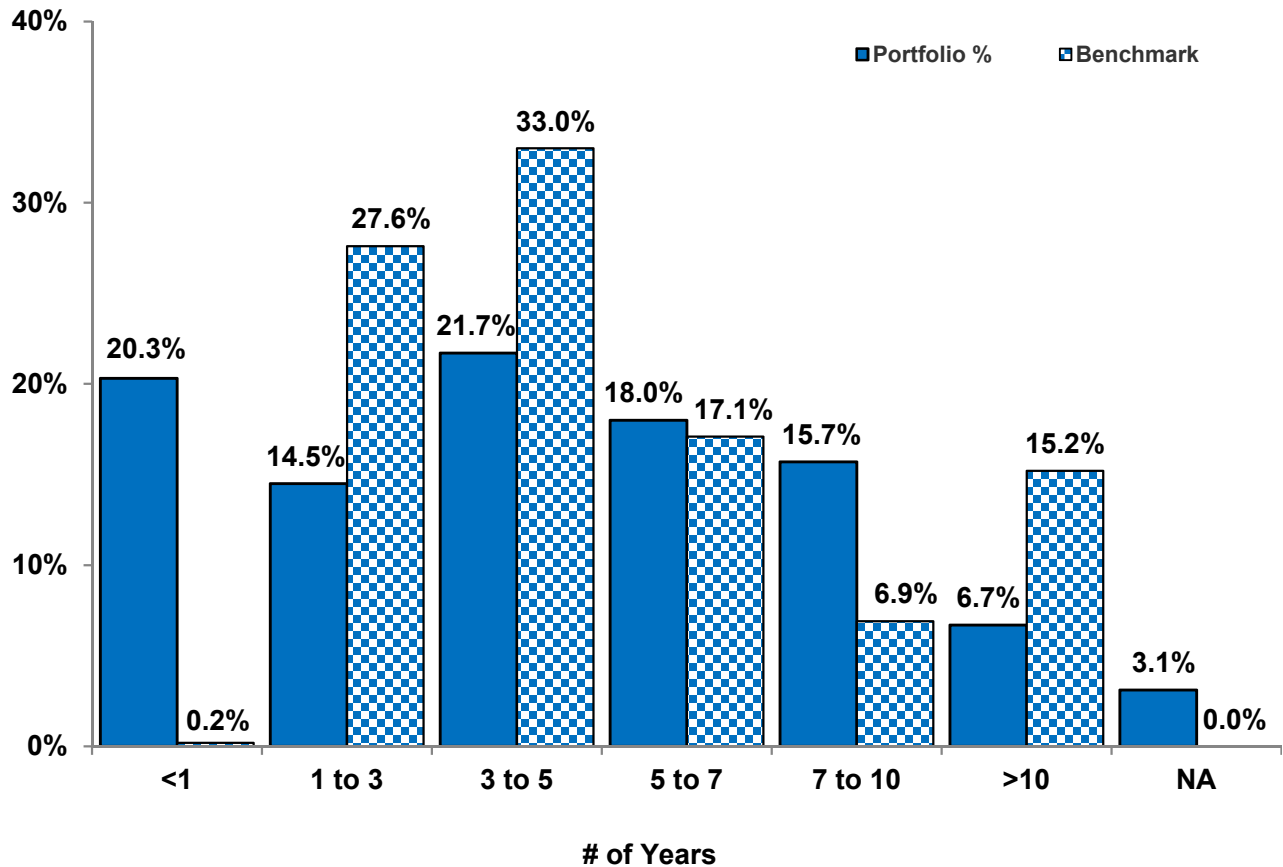
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

3/31/19



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,866	20.3%	0.2%	0.2	0.8
1 to 3	1,328	14.5%	27.6%	2.1	2.1
3 to 5	1,992	21.7%	33.0%	4.2	4.0
5 to 7	1,650	18.0%	17.1%	5.7	5.7
7 to 10	1,444	15.7%	6.9%	7.9	7.9
>10	616	6.7%	15.2%	17.5	15.9
NA	282	3.1%	0.0%	0.0	0.0
Total	\$9,178	100.0%	100.0%	5.0	5.8

* Effective Duration

Benchmark: Barclays US Aggregate

Total Fixed Income Performance - Net of Fees (MPSERS)

3/31/19

	<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	\$9,178,364,909	4.89%	4.05%	3.97%	3.65%	5.21%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>4.48%</i>	<i>2.03%</i>	<i>2.74%</i>	<i>2.48%</i>	<i>3.77%</i>
Internal Core Fixed Income	4,934,383,041.85	5.17%	3.14%	3.75%	3.26%	4.69%
Externally Managed Core Fixed Income	\$509,185,157	4.62%	3.47%	3.17%	3.16%	4.97%
Dodge & Cox Core	250,764,683	4.58%	3.61%	3.33%	3.51%	5.29%
PIMCO Mortgage Fund	258,420,474	4.66%				
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>4.48%</i>	<i>2.03%</i>	<i>2.74%</i>	<i>2.48%</i>	<i>3.77%</i>
Investment Grade Credit	\$239,366,869	4.66%	3.91%	3.93%	4.18%	6.92%
PGIM Investment Grade	239,366,869	4.66%	3.91%	3.93%	4.25%	6.97%
<i>Bloomberg/Barclays Credit Index</i>	<i>N/A</i>	<i>4.89%</i>	<i>3.48%</i>	<i>3.61%</i>	<i>3.71%</i>	<i>6.22%</i>
Tactical Fixed Income	\$545,964,967	4.36%	4.74%	3.85%		
Loomis Sayles CorePlus	233,215,522	3.64%	3.85%	3.00%	N/A	N/A
Fidelity Tactical Bond Fund	312,749,445	5.12%	5.67%	N/A	N/A	N/A
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>4.48%</i>	<i>2.03%</i>	<i>2.74%</i>	<i>2.48%</i>	<i>3.77%</i>
High Yield Fixed Income	\$510,270,612	6.50%	6.95%	4.93%	N/A	N/A
Columbia Management High Yield	237,536,708	6.32%	6.50%	4.81%	N/A	N/A
PGIM High Yield	251,164,169	6.68%	7.52%	5.08%	N/A	N/A
Crescent Direct Lending	21,569,735	N/A	N/A	N/A	N/A	N/A
<i>Bloomberg/Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>6.37%</i>	<i>7.53%</i>	<i>4.64%</i>		
Structured Fixed Income	\$2,100,962,984	4.45%	N/A	N/A	N/A	N/A
Principal CMBS	404,834,945	6.52%	5.33%	4.77%	7.37%	18.71%
MetWest Securitized Opportunities	473,730,856	3.90%	5.89%	4.10%	N/A	N/A
Napier Park ABS Income	406,014,816	7.31%	10.47%	N/A	N/A	N/A
Napier Park Strategic Loan LP	84,515,058	6.63%	N/A	N/A	N/A	N/A
Napier Park CLO Debt	369,427,646	2.52%	N/A	N/A	N/A	N/A
TICP CLO Debt	362,439,663	2.42%	N/A	N/A	N/A	N/A
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>4.48%</i>	<i>2.03%</i>	<i>2.74%</i>	<i>2.48%</i>	<i>3.77%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>5.54%</i>	<i>2.49%</i>	<i>4.22%</i>	<i>4.20%</i>	<i>10.61%</i>
Global Fixed Income	\$338,231,278	2.64%	4.18%	N/A	N/A	N/A
T. Rowe Global Multi-Sector	235,851,153	2.73%	4.32%	N/A	N/A	N/A
PGIM GLRV	102,380,125	2.45%	N/A	N/A	N/A	N/A
<i>Custom GMS Benchmark</i>	<i>N/A</i>		<i>4.65%</i>	<i>4.44%</i>	<i>N/A</i>	<i>N/A</i>

State of Michigan Retirement System

INTERNATIONAL EQUITY REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-5.0%	8.6%	3.8%	5.9%	10.3%
MSCI ACWI ex USA Returns	-4.2%	8.1%	2.6%	4.9%	8.1%
Peer Median Returns	-4.1%	8.3%	3.2%	6.0%	10.0%
Percentile Rank vs. Peers*	71	35	31	56	32

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

- The International Equity Division (IED) portfolio underperformed the benchmark by 0.7% over the last twelve months primarily due to the underperformance of emerging markets and a developed markets manager.

Asset Class Goals

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

Strategy

- The International Equity Division has three distinct portfolio strategies.
 - Active investments, 36.2% of assets, to gain specific international stock market exposures.
 - Stock plus investments, 35.2% of assets, to implement a portable alpha strategy onto high-level strategic tilts.
 - Index investments, 28.6% of assets, to gain broad international stock market exposure with minimal tracking risk.
- Current portfolio drivers of risk and return.
 - Tracking error of the portfolio is approximately 0.6% which is below the division's risk budget of 3.0%.
 - Emerging markets and financials, the largest contributors to tracking error, account for only 25.0% of the total tracking error indicating the portfolio is not materially exposed to any one single risk.
 - Future portfolio returns will be driven by the performance of the quality factor, value factor, momentum factor, and emerging markets overweight.

- Quarterly changes to International Equity Division allocation.
 - Rebalanced \$240.0 million of maturing equity swaps to MSCI factor indexes increasing the portfolio's exposure to the quality, value and momentum factors. The internal stock plus strategy has an estimated information ratio of 0.9.
 - Allocated \$840.0 million to the BlackRock MSCI Systematic Return strategy. IED designed this multi-factor custom index strategy to improve the consistency of the division's excess returns at a low cost of 6 bps. Over long investment horizons, IED estimates the strategy should produce excess returns of approximately 120 to 180 bps with an information ratio of around 1.0.
 - Invested \$300.0 million in LGT Capital Partners for a multi-alternatives strategy within internal stock plus. The return on capital should exceed the LIBOR based cost structure without significantly increasing the portfolio's exposure to equity markets.
 - Added \$100.0 million to Martin Currie. The portfolio has an estimated go-forward return of 11.6% that will be driven by exposure to the quality factor.

Market Environment and Outlook

- International equity markets rebounded in the first quarter of 2019, up 10.3% through the end of March. The performance stands juxtaposed to the 2018 fourth quarter where international markets were down -11.5%. Markets were down -14.2% in 2018 marking the single worst annual performance since the Great Financial Crisis of 2008-09.
- Many feared a slowing Chinese economy would tip the world into a recession. Those fears to a certain extent have abated in 2019 as the world's second largest economy has seen manufacturing PMIs increase steadily from the January lows back to an expansionary level for two consecutive months.
- Last July Chinese leadership shifted from a policy of debt reduction to growth as the economy began slowing across many fronts. Between fiscal and monetary spending, the economy received an estimated \$1.2 trillion injection equating to about 8.0% of the total Chinese economy. In 2019 there is potential for additional stimulus which would target the consumer and private businesses. The stock market responded to the deluge of stimulus, up nearly 21.0% through the end of April, nearly 7.7% better than the MSCI ACWI ex USA index.
- Based on the 2016 reflating of the Chinese economy there should be a knock-on impact in Europe around late summer by early fall 2019. Europe, especially Germany, has remained in a prolonged contraction that began in January 2018. The April readings on German manufacturing showed a fourth consecutive month of contraction and a 16th straight month-over-month declining value.
- Europe remains mired in slow economic growth and interest rates have further contracted. Eleven of the 14 western European economies in the MSCI ACWI ex USA index have negative interest rates on their two-year government bond yields. Even if the global economy picks up due to China, the European Central Bank is boxed in and will have a limited basis for raising rates in 2019 and potentially all of 2020.

- In 2018, analysts continuously revised downward their forward-looking estimates for earnings-per-share. The IED highlighted last quarter these low expectations potentially represented a catalyst for positive international stock returns in 2019. Despite international stocks now up 13.4% through April and signs of economic expansion returning, analysts have remained pessimistic about growth. Over the next twelve months, analysts expect earnings-per-share to grow approximately 9.4%. Expectations for growth remain near the 2015 lows.
- World trade volumes, a proxy for economic growth, declined -1.0% on average during the last quarter. Trade volumes over the last twelve months averaged 2.7% which is below the historical average of 3.6% over the last 20 years. On-going trade disputes between US, Europe and China may explain the subdued growth.
- The US Dollar has strengthened since January 2018, now up approximately 7.0% year-to-date. It is important to note though, the dollar remains range bound since December of 2014. Should the US Federal Reserve resume tightening and the other three major central banks remain accommodative, the dollar should rise creating further headwinds for international stocks specifically the emerging markets.
- Stock prices already reflect much of this slower economic reality and recently stronger US dollar. The MSCI ACWI ex USA trailing twelve-month normalized price-to-earnings ratio is 17.3 which is below the twenty-year average of 22.3, implying return upside should earnings growth pick-up.
- International stock markets trade at approximately a 20.0% discount relative to US markets on a last twelve-month basis. IED expects growth in China to eventually impact global growth rates which should quickly close the observed discount.
- Go-forward annualized returns for the MSCI ACWI ex USA index are estimated at 8.9%. This rate is based on the current price and actual fundamentals over multiple periods to remove fundamental variability, better estimating the earnings power of the index.
- A ten-year blended international government yield of 1.7% implies an international equity risk premium of 7.2%. The premium decreased primarily due to a rise in global stock prices since the late 2018.

Conclusion

International stock markets trade at a 20.0% discount to US markets largely due to concerns about ex-US growth. Excessive amounts of stimulus in China have created a temporary uptick in economic activity which may spill over to Europe later this year. Continued accommodation from central banks will backstop any further slowdown in the global economy. Any signs of global growth resuming would cause international stock market multiples to expand and close the discount to US markets. With no expansion, the analysts are indicating 2019 international stock market returns of about 9.4%.

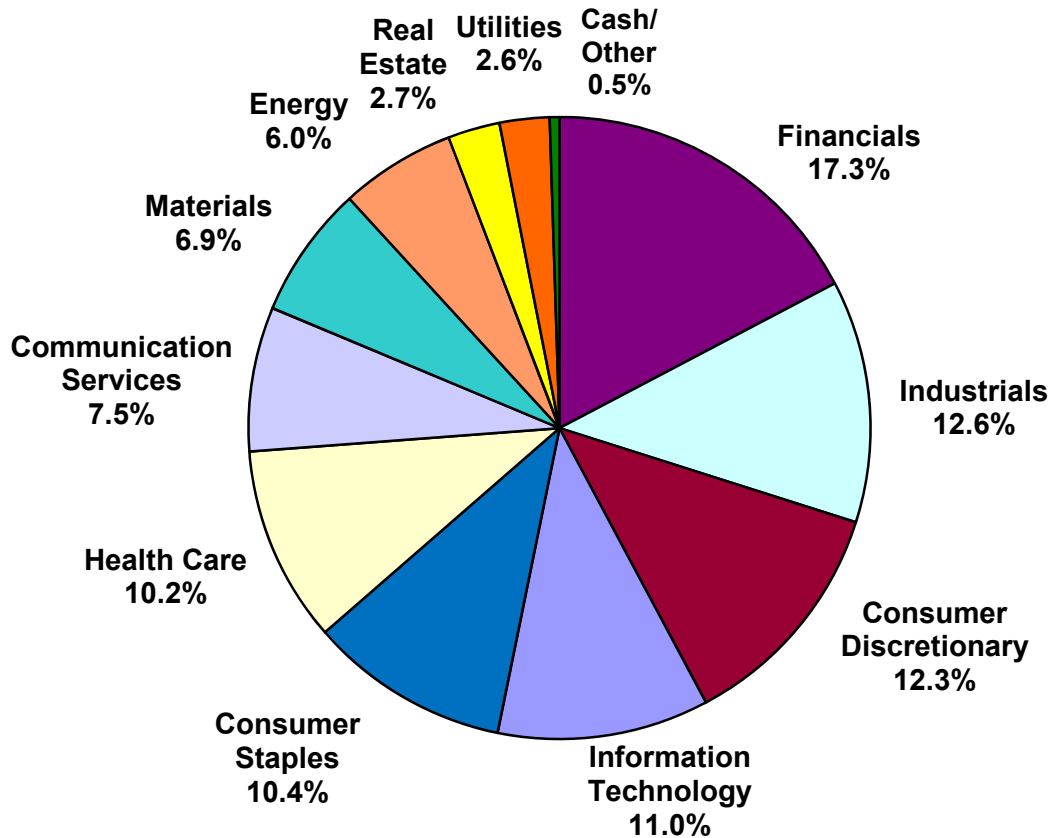
SMRS
International Equity Strategies
3/31/19

Markets	Amount	Total	% of Total
Active (\$ in Millions)			
Los Angeles Capital Management	\$1,213		
BlackRock	1,053		
Wellington	983		
Martin Currie	344		
Marathon-London	294		
Lazard	239		
SSGA	239		
Effissimo Capital Management	77		
Total Active		\$4,442	36.2%
Stock Plus			
Internal Swaps	\$2,582		
PIMCO	1,737		
Total Stock Plus		\$4,319	35.2%
Indexed			
SSGA	\$2,202		
BlackRock	1,301		
Total Indexed		\$3,503	28.6%
TOTAL		<u>\$12,264</u>	<u>100.0%</u>

SMRS

International Equity By Sector

3/31/19



Market Value in Millions				
3/31/19				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$2,129	17.3%	21.9%	-4.6%
Industrials	1,542	12.6%	11.9%	0.7%
Consumer Discretionary	1,510	12.3%	11.4%	0.9%
Information Technology	1,345	11.0%	8.7%	2.3%
Consumer Staples	1,273	10.4%	9.7%	0.7%
Health Care	1,255	10.2%	7.9%	2.3%
Communication Services	922	7.5%	7.1%	0.4%
Materials	843	6.9%	7.5%	-0.6%
Energy	734	6.0%	7.4%	-1.4%
Real Estate	331	2.7%	3.3%	-0.6%
Utilities	318	2.6%	3.2%	-0.6%
Total Investments	\$12,202	99.5%	100.0%	
Cash/Other	62	0.5%	0.0%	0.5%
Total	\$12,264	100.0%	100.0%	

Benchmark: MSCI ACWI ex USA

SMRS

International Equities

3/31/19

Date:	<u>3/31/19</u>	<u>12/31/18</u>	<u>9/30/18</u>	<u>6/30/18</u>
Assets (\$ in Millions):	\$12,264	\$11,084	\$12,558	\$12,491
Number of Securities:	2,636	2,646	2,669	2,644
Active Share:	26%	22%	22%	24%

Benchmark: MSCI ACWI ex USA

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

Portfolio Characteristics:	SMRS		MSCI ACWI ex USA	
	<u>LTM</u>	<u>Normalized</u>	<u>LTM</u>	<u>Normalized</u>
Return:				
Annualized Compound Rate	10.5%	10.1%	9.1%	8.9%
Sustainable Growth Rate	6.8%	7.1%	5.9%	6.4%
Dividend Yield	2.6%	2.3%	2.8%	2.5%
Buyback Yield	0.5%	0.1%	0.4%	0.0%
Overlay Yield	0.6%	0.6%	--	--
Risk:				
Beta	1.0	--	1.0	--
Volatility	12.8%	--	12.3%	--
Tracking Error	0.6%	--	0.0%	--
Information Ratio	2.2	1.8	--	--
Fundamental:				
Average Capitalization (\$ in Billions)	68.7	--	66.7	--
Price/Earnings	14.1	16.6	15.1	17.3
Price/Book	1.7	1.9	1.7	1.9
ROE	12.1%	11.7%	11.3%	11.2%

TOP TEN HOLDINGS

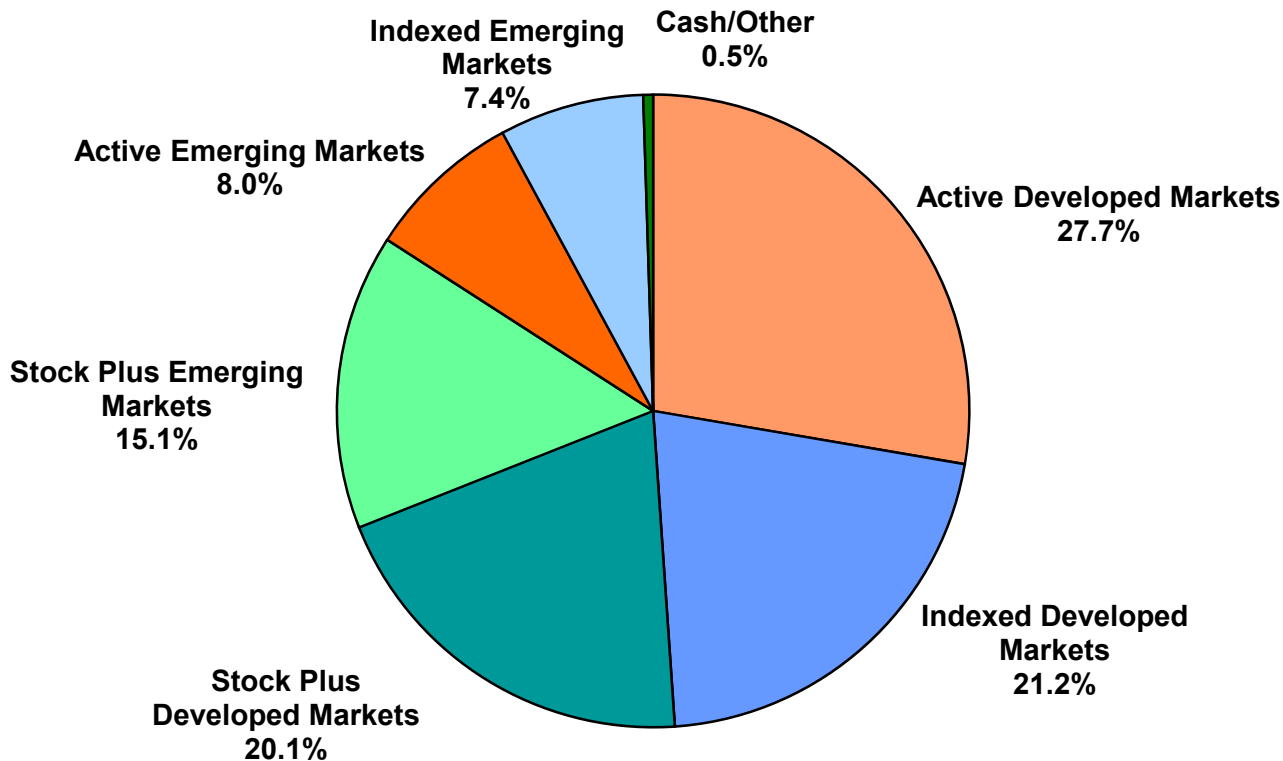
(\$ in Billions* - \$ in Millions**)

	<u>Portfolio Weight</u>	<u>Market Capitalization*</u>	<u>FY1 P/E</u>	<u>Market Value**</u>
Tencent Holdings Ltd.	2.1%	\$437.8	33.0	\$256.0
Samsung Electronics Co., Ltd.	1.8%	261.1	11.4	217.5
Taiwan Semiconductor Manufacturing Co., Ltd.	1.6%	206.6	19.0	192.0
Roche Holding Ltd. Genusssch	1.3%	237.1	14.8	162.2
Novartis AG	1.1%	245.3	18.3	139.5
Nestle S.A.	1.1%	291.9	21.8	135.5
Alibaba Group Holding Ltd. Sponsored ADR	0.8%	472.9	33.9	96.7
GlaxoSmithKline PLC	0.8%	103.3	14.5	96.3
Diageo PLC	0.7%	98.0	24.3	89.2
AstraZeneca PLC	<u>0.7%</u>	<u>101.3</u>	22.8	<u>85.7</u>
TOTAL	<u>12.0%</u>	<u>\$2,455.3</u>		<u>\$1,470.6</u>

SMRS

International Equity Exposure By Category

3/31/19



Market Value in Millions				
	<u>3/31/19</u>		<u>3/31/18</u>	
<u>Active</u>				
Developed Markets	\$3,398	27.7%	\$3,659	28.4%
Emerging Markets	982	8.0%	996	7.7%
Cash/Other	62	0.5%	86	0.7%
Total Active	<u>\$4,442</u>	<u>36.2%</u>	<u>\$4,741</u>	<u>36.8%</u>
<u>Stock Plus</u>				
Developed Markets	\$2,466	20.1%	\$2,343	18.2%
Emerging Markets	1,853	15.1%	2,172	16.8%
Total Stock Plus	<u>\$4,319</u>	<u>35.2%</u>	<u>\$4,515</u>	<u>35.0%</u>
<u>Indexed</u>				
Developed Markets	\$2,596	21.2%	\$2,716	21.0%
Emerging Markets	907	7.4%	929	7.2%
Total Indexed	<u>\$3,503</u>	<u>28.6%</u>	<u>\$3,645</u>	<u>28.2%</u>
Total International Equity	<u><u>\$12,264</u></u>	<u><u>100.0%</u></u>	<u><u>\$12,901</u></u>	<u><u>100.0%</u></u>

International Equity Performance - Net of Fees
3/31/19

Fund Name	Market Value	1-Year	3-Years	5-Years	7-Years	Inception Date
Total International Equity	\$12,264,090,550	-5.1%	8.4%	3.7%	5.7%	1/1/04
MSCI ACWI ex USA		-4.2%	8.1%	2.6%	4.7%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		-0.9%	0.3%	1.1%	1.0%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		58	9	14	31	

Total International Active Strategy	\$4,442,090,423	-6.2%	6.8%	2.9%	5.4%	5/1/05
MSCI ACWI ex USA		-4.2%	8.1%	2.6%	4.7%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		-2.0%	-1.3%	0.3%	0.7%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		69	60	25	53	

BlackRock MSCI Systematic Return	1,053,104,850	--	--	--	--	12/1/18
MSCI ACWI ex USA		--	--	--	--	
Lipper International Multi-cap Core		--	--	--	--	
<i>Excess Return</i>		--	--	--	--	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		--	--	--	--	

LACM World ex USA	842,191,384	-6.9%	4.4%	--	--	12/1/15
MSCI World ex USA		-3.1%	7.3%	--	--	
Lipper International Multi-Cap Core		-4.6%	-4.6%	--	--	
<i>Excess Return</i>		-3.8%	-2.9%	--	--	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		75	91	--	--	

Wellington IRE	694,985,372	-5.1%	7.9%	3.0%	6.0%	12/1/05
MSCI World ex USA		-3.1%	7.3%	2.2%	5.3%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		-2.0%	0.6%	0.8%	0.7%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		58	23	23	20	

LACM Emerging Markets	371,256,633	-9.1%	9.1%	3.4%	2.4%	12/1/09
MSCI Emerging Markets		-7.4%	10.7%	3.7%	2.7%	
Lipper Emerging Markets		-9.2%	9.0%	2.4%	2.4%	
<i>Excess Return</i>		-1.7%	-1.6%	-0.3%	-0.3%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		51	55	46	50	

Martin Currie International Long-term Uncons	344,227,432	3.5%	--	--	--	2/1/17
MSCI ACWI ex USA		-3.1%	--	--	--	
Lipper International Multi-Cap Core		-4.6%	--	--	--	
<i>Excess Return</i>		6.6%	--	--	--	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		5	--	--	--	

Marathon-London International	293,534,394	-4.6%	5.9%	3.5%	7.1%	2/1/12
MSCI World ex USA		-3.1%	7.3%	2.2%	5.3%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		-1.4%	-1.4%	1.3%	1.9%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		49	77	14	5	

Wellington Emerging Markets Local Equity	287,622,261	-9.8%	11.5%	5.0%	5.7%	12/1/11
MSCI Emerging Markets		-7.4%	10.7%	3.7%	2.7%	
Lipper Emerging Markets		-9.2%	9.0%	2.4%	2.4%	
<i>Excess Return</i>		-2.4%	0.8%	1.4%	3.0%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		56	24	13	6	

Lazard/Wilmington International Equity	239,400,000	-4.3%	4.3%	--	--	6/1/14
MSCI World ex USA		-3.1%	7.3%	--	--	
Lipper International Large-Cap Core		-4.6%	6.9%	--	--	
<i>Excess Return</i>		-1.2%	-3.0%	--	--	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		43	92	--	--	

Fund Name	Market Value	1-Year	3-Years	5-Years	7-Years	Inception Date
SSGA International Alpha Small Cap	238,923,680	-9.0%	5.7%	2.8%	7.8%	5/1/07
MSCI World ex USA Small Cap		-8.7%	7.3%	3.7%	7.0%	
Lipper International Small/Mid-Cap Core		-9.7%	5.8%	2.1%	5.2%	
<i>Excess Return</i>		-0.3%	-1.6%	-0.9%	0.8%	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Core</i>		31	71	56	8	
Effissimo Capital Management Japan	76,841,293	-17.9%	6.0%	--	--	12/1/15
MSCI Japan		-7.8%	8.1%	--	--	
Lipper International Small/Mid-Cap Value		-9.9%	6.1%	--	--	
<i>Excess Return</i>		-10.1%	-2.1%	--	--	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Value</i>		100	63	--	--	
Total International Stock Plus Strategy	\$4,319,253,036	-5.0%	9.8%	4.4%	6.8%	1/1/09
MSCI ACWI ex USA		-4.2%	8.1%	2.6%	4.7%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		-0.8%	1.7%	1.8%	2.0%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		48	3	5	9	
Internal Stock Plus	2,581,789,774	-3.9%	6.9%	4.4%	5.4%	9/1/11
MSCI ACWI ex USA		-4.2%	8.1%	2.6%	4.7%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		0.3%	-1.1%	1.8%	0.7%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		33	54	4	50	
PIMCO Stock Plus	1,736,260,339	--	--	--	--	2/1/19
MSCI ACWI ex USA		--	--	--	--	
Lipper International Multi-Cap Core		--	--	--	--	
<i>Excess Return</i>		--	--	--	--	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		--	--	--	--	

Total International Index Strategy	\$3,502,749,356	-3.9%	9.3%	4.1%	5.4%	7/1/09
MSCI ACWI ex USA		-4.2%	8.1%	2.6%	4.7%	
Lipper International Multi-Cap Core		-4.6%	6.9%	2.3%	5.1%	
<i>Excess Return</i>		0.3%	1.2%	1.5%	0.6%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		31	7	8	41	
SSGA MSCI ACWI ex USA Index	2,201,587,959	-3.9%	--	--	--	11/1/17
MSCI ACWI ex USA		-4.2%	--	--	--	
Lipper International Large-Cap Core		-4.6%	--	--	--	
<i>Excess Return</i>		0.3%	--	--	--	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		33	--	--	--	
BlackRock MSCI ACWI ex USA Index	1,301,161,397	-3.8%	--	--	--	3/1/18
MSCI ACWI ex USA		-4.2%	--	--	--	
Lipper International Large-Cap Core		-4.6%	--	--	--	
<i>Excess Return</i>		0.4%	--	--	--	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		29	--	--	--	

State of Michigan Retirement System
**REAL, OPPORTUNISTIC, &
ABSOLUTE RETURN REVIEW**

State of Michigan Investment Board Meeting
June 6, 2019



Jennifer Yeung
Senior Investment Manager
Real, Opportunistic, & Absolute Return Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Absolute Return	3.3%	6.9%	3.5%	5.2%	7.0%
HFRI FOF Conservative	1.4%	3.4%	2.0%	3.0%	3.3%

- The value of the Absolute Return portfolio is \$4.1 billion with a one-year return of 3.3%. Manager selection and exposure to multi-strategy, event-driven and diversifying strategies contributed to positive first quarter performance.
- Multi-strategy and event-driven strategies drove first quarter performance as all underlying managers delivered positive returns. Positive macroeconomic developments and the market recovery helped drive performance. Managers that trade credit securities particularly performed well as spreads tightened during the quarter.
- Diversifying strategies were the second largest contributor to performance for the quarter, with performance mostly driven by thematic macro managers with a long bias. Relative value traders also benefited from the pickup in interest rate volatility globally.

Strategy Update

- The objective of the Absolute Return portfolio is to diversify the total plans' holdings, targeting returns above investment-grade fixed income with lower volatility than the equity portfolio. The portfolio utilizes a diverse mix of managers that invest both long and short to target specific exposures and seek to hedge out unwanted risk.
- No new commitments for the quarter.
- In terms of allocation priorities, the focus is on adding to diversifying strategies. Examples of these include strategies that utilize quantitative models that trade equity securities. Due to lower alpha expectations, we are continuing to reduce our exposure to fundamental equity strategies.

Overall, we will continue to focus on opportunities that seek to provide diversification, protect the downside and deliver absolute return.

Performance

MPSERS Plan (3/31/19)	1-Year	3-Years	5-Years	7-Years	10-Years
Real Return and Opport.	10.8%	12.9%	10.5%	11.3%	N/A
Custom Benchmark	7.0%	7.5%	7.2%	7.2%	N/A

- Total Real Return and Opportunistic portfolio value is \$8.0 billion with a total one-year return of 10.8%. Performance for the year was driven by strong income from private credit, natural resource strategies, and media and entertainment holdings, as well as capital appreciation of transportation and media and entertainment assets.

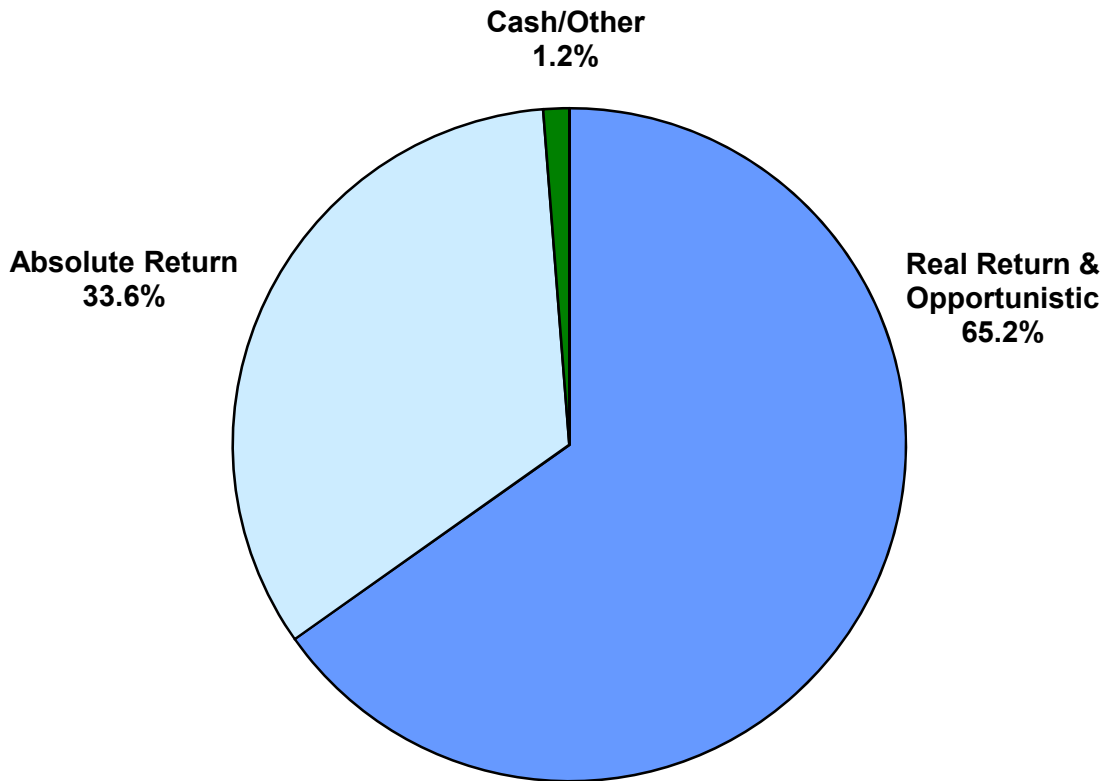
Strategy Update

- The objective of the Real Return & Opportunistic portfolio is to provide an inflation hedge and/or to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- The Real Return & Opportunistic portfolio has approximately \$3.5 billion of unfunded commitments. One new commitment was closed during the quarter:
 - \$150 million to Carlyle International Energy Partners II, a commingled fund that will invest in international energy opportunities across the value chain.
- We remain focused on finding differentiated strategies that are additive to the current portfolio mix.
 - We continue to like private energy opportunities, niche strategies with some scalability, and contractual cash flow.
 - Also, we like opportunities in the opportunistic credit space. These strategies have defensible cash flows, are backed by high quality collateral and offer structural downside protection. We continue to be selective and favor investment teams that are disciplined and have experience investing over multiple cycles.

SMRS

Real, Opportunistic, & Absolute Return

3/31/19



Market Value in Millions				
	<u>3/31/19</u>		<u>3/31/18</u>	
Real Return & Opportunistic	\$7,875	65.2%	\$6,164	59.9%
Absolute Return	4,054	33.6%	4,030	39.1%
Cash/Other	150	1.2%	100	1.0%
Total Investments	<u>\$12,079</u>	<u>100.0%</u>	<u>\$10,294</u>	<u>100.0%</u>

SMRS

Absolute Return

3/31/19

Net Market Values by Entity

		Net Market Value
Drawbridge Opportunities Fund	\$	245,800,737
* EnTrust White Pine Partners, LP		23,808,445
JM IV, LP		69,335,939
MP Securitized Credit Master Fund, LP		74,756,047
Riverside Credit Solutions Fund I, LP		3,372,391
SJC Direct Lending Revolver Fund III, LP		27,453,014
* Tahquamenon Fund, LP		3,609,309,664
Visium Balanced Fund, LP		299,801
Total Absolute Return	\$	4,054,136,038
Short-Term Investments & Other		50,047,700
Grand Total	\$	4,104,183,738

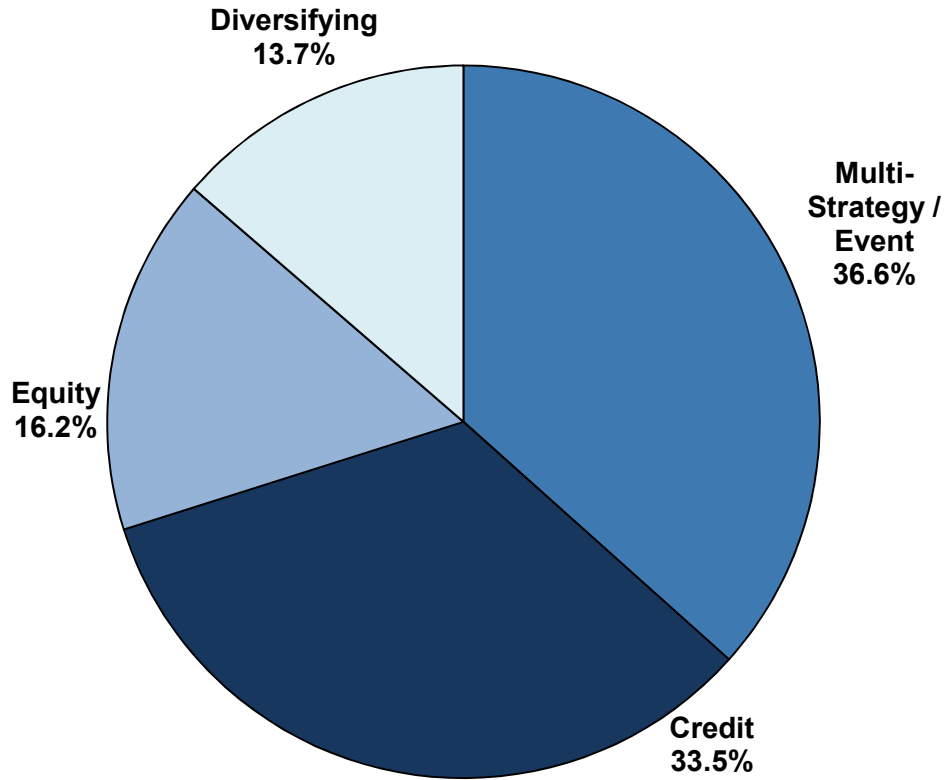
* Fund of Funds

SMRS

Absolute Return

3/31/19

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	73	Median Position Size:	0.6%
Strategies:	4	Average Position Size:	1.3%
Relationships:	8	Largest Position Size:	7.4%

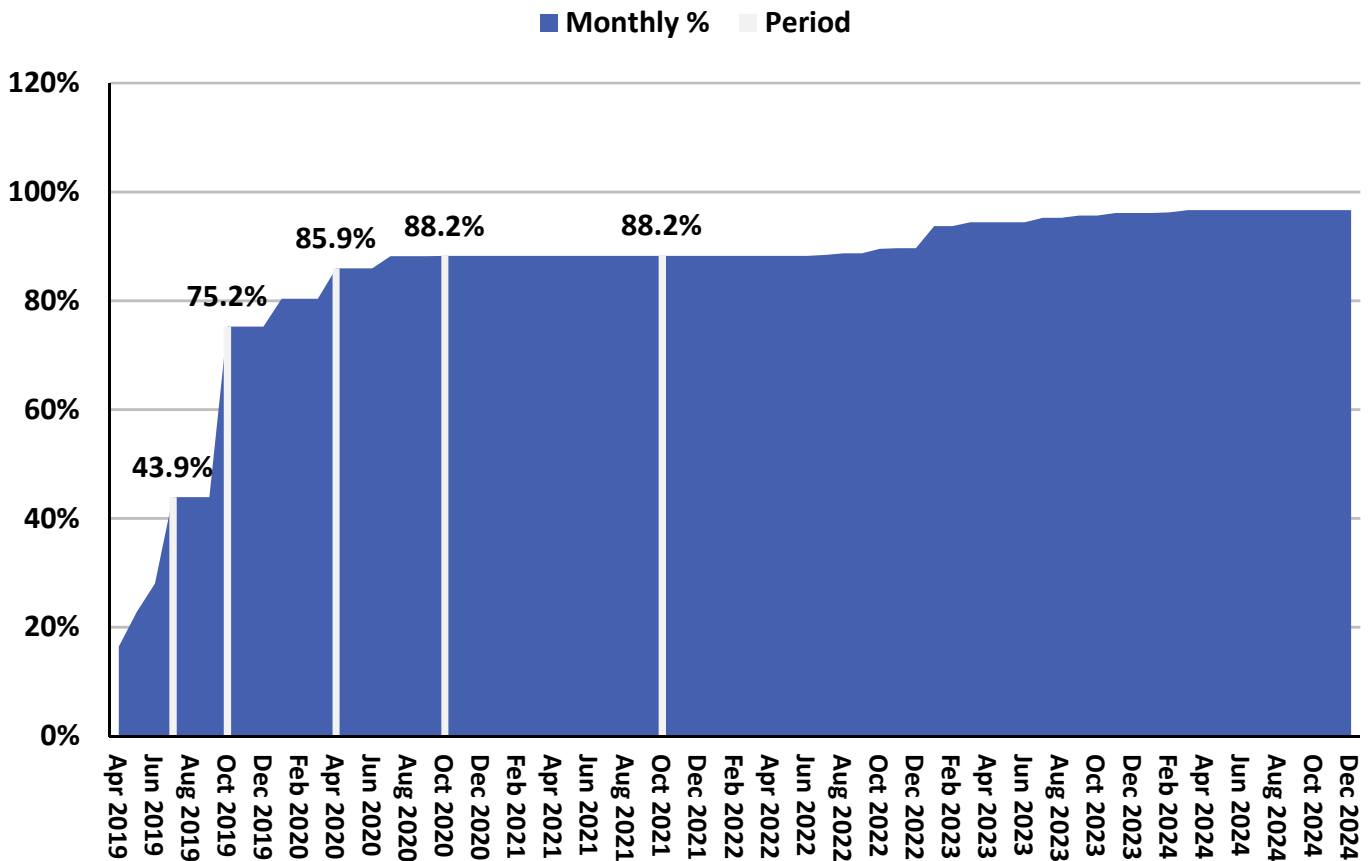
SMRS

Absolute Return

3/31/19

Liquidity Analysis

Redeemable	Marginal Allocation (% each period)	Aggregate Allocation (% since Analysis Date)
By 7/1/19	43.9%	43.9%
By 10/1/19	31.3%	75.2%
By 4/1/20	10.7%	85.9%
By 10/1/20	2.3%	88.2%
By 10/1/21	0.0%	88.2%
After 10/1/21	7.9%	96.1%
Illiquid	3.9%	100.0%
Total	100.0%	N/A



SMRS

Real Return and Opportunistic

3/31/19

Top Ten Advisors or Entities

(\$ in Millions)

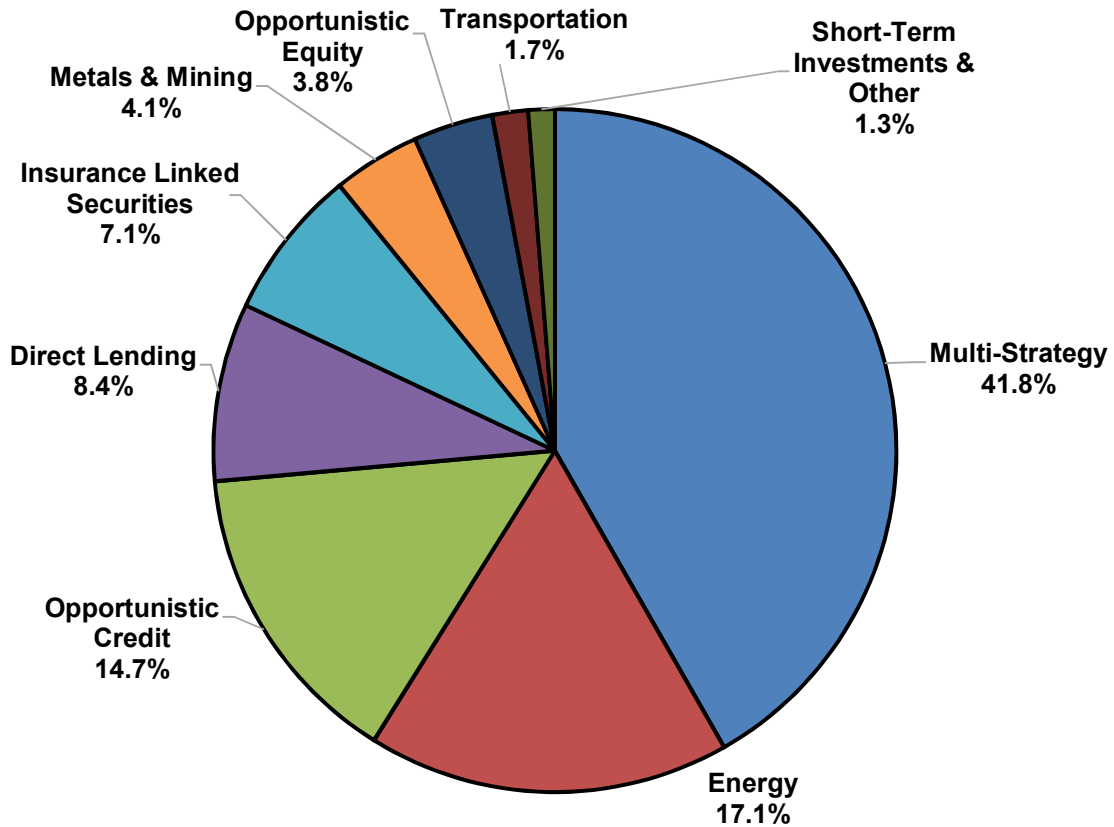
<u>Advisor or Entity</u>	<u>Market Value</u>
Barings Alternative Investments	\$ 2,474
Apollo Global Management	1,266
Domain Capital Advisors	813
ICG Advisors	504
Kayne Anderson Capital Partners	344
Orion Resource Partners	249
Fortress Investment Group	246
Ridgewood Energy	215
TPG Sixth Street Partners	204
Czech Asset Management	164
Total Market Value	\$ 6,479

SMRS

Real Return and Opportunistic

3/31/19

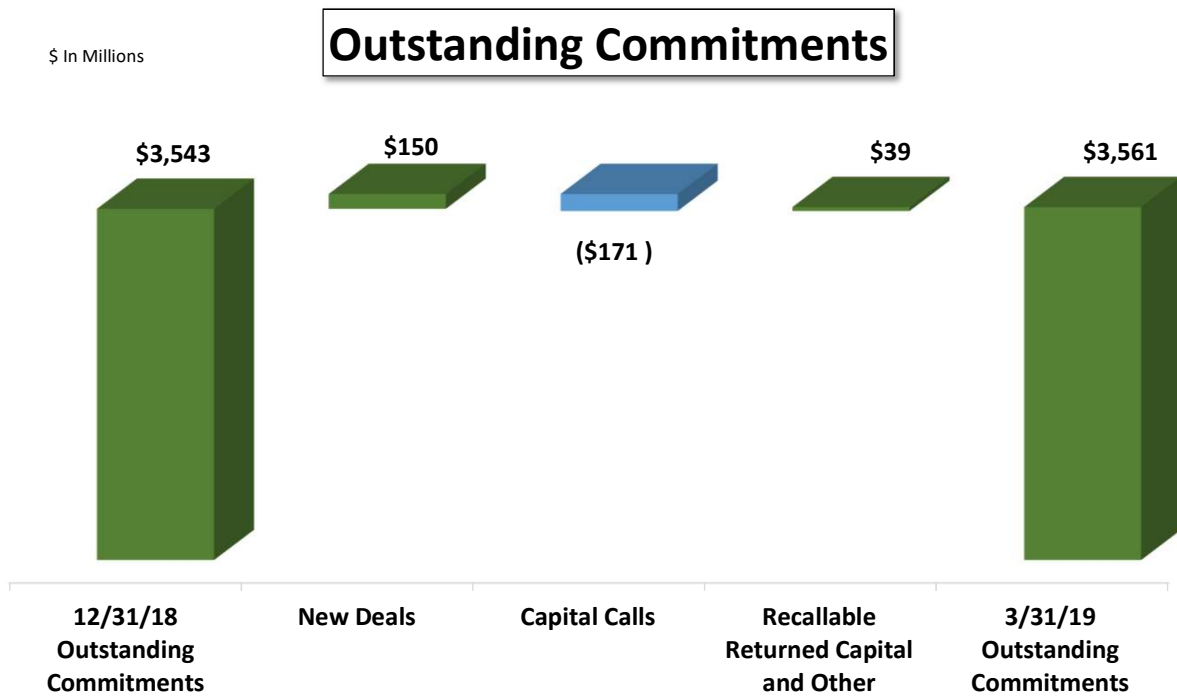
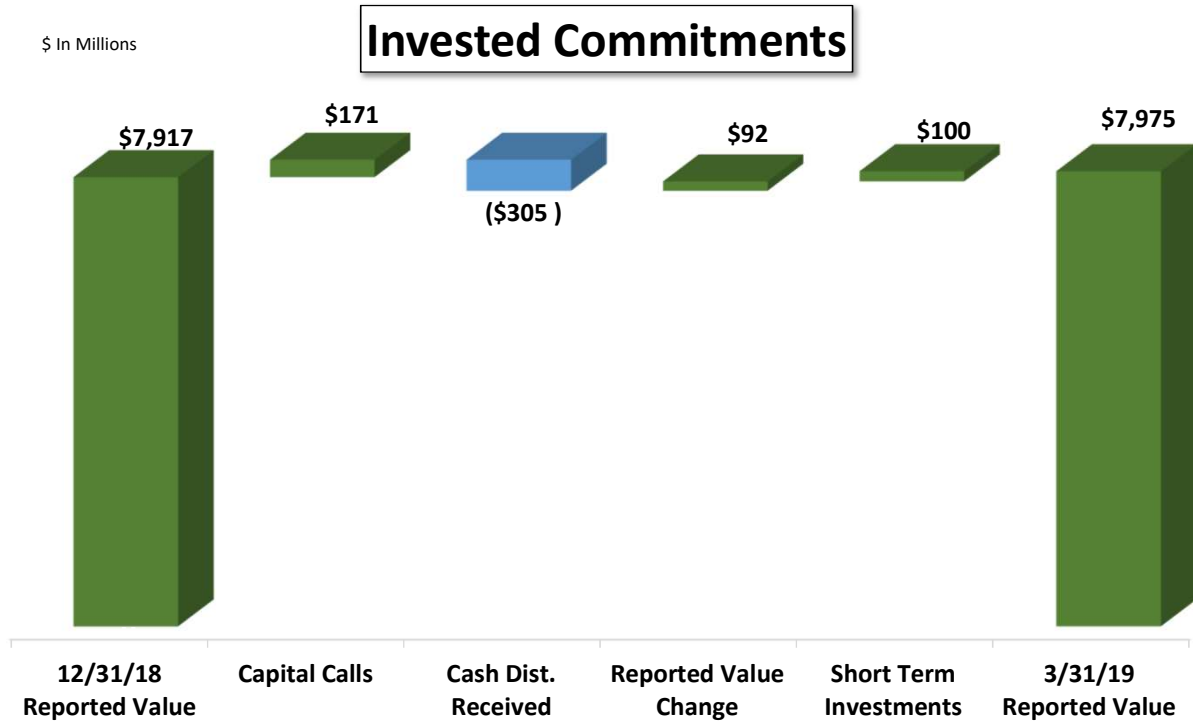
Investments By Strategy



Investment Strategy	
Multi-Strategy	\$ 3,329,219,269
Energy	1,366,865,278
Opportunistic Credit	1,170,791,999
Direct Lending	672,401,454
Insurance Linked Securities	569,982,333
Metals & Mining	329,273,068
Opportunistic Equity	301,418,009
Transportation	134,867,530
Short Term Investment & Other	100,056,951
Total Market Value	\$ 7,974,875,891

SMRS

Real Return and Opportunistic 3/31/19



SMRS

Real Return and Opportunistic

3/31/19

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy	\$ 254,202,115	\$ 50,679,666
Altus Midstream	20,650,000	0
Apollo European Principal Finance Fund II	20,732,367	8,255,324
Apollo HK TMS Investments Holdings LP	9,154,790	0
Apollo Offshore Credit Fund	282,191,544	0
Axton Holdings	1,709,729,751	0
Barings Asset Based Income Fund I	120,355,984	176,984,278
Barings Global Real Asset Fund I	59,549,993	43,992,231
Blackstone Strategic Capital Holdings, LP	56,578,996	69,901,159
Blue Peninsula Fund LP	138,946,984	62,752,611
Broadriver III	21,663,720	172,533,837
BSCH Parallel (MLG) I LP	101,176,670	38,874,114
Carlyle Energy Mezzanine Opportunity Fund II	19,757,192	30,870,900
Carlyle IEP Co-Invest (Varo)	16,764,947	887,052
Carlyle International Energy Partners	43,016,809	29,999,347
** Carlyle International Energy Partners II	0	150,000,000
Centerbridge SCP III	24,648,288	6,931,128
Content Holdings, LLC	396,931,101	49,461,995
Credit Opportunity Fund III	28,576,631	21,538,930
* EleganTree Fund SPC	9,723,964	4,738,072
Energy Recap and Restructuring	31,740,966	7,085,025
ERR MI Holdings LP	4,946,227	2,269,933
Fairfield	51,788,388	81,078,084
* FCO MA MI LP	165,363,061	50,300,000
Financial Credit Investment II	246,799,942	185,797,353
Financial Credit Investment III	156,765,019	191,856,791
Flywheel Energy Co-Invest	27,992,472	7,000,000
Fortress Transportation & Infrastructure	64,623,153	0
Global Maritime	83,934,404	2,914,854
GSO Credit Alpha Fund	52,198,245	37,910,064
Hopen Life Science Fund II	4,553,020	1,090,000
HPS Red Cedar Fund	131,932,035	154,665,229
KANG Fund LP	0	0
Kayne Anderson Energy Fund VII, LP	62,116,264	20,341,974
Kayne Anderson Private Energy Income Fund	119,383,111	30,101,281
Kayne Anderson Private Energy Income Fund II	29,988,158	119,250,000
Kayne Solutions Fund	73,757,446	176,382,521
KKR Energy Income & Growth Fund	50,305,912	4,162,083
KKR Lending Partners	15,243,785	11,930,723
KKR Lending Partners II	35,873,028	11,737,239
Lakewater	109,494,928	1,012,965
Lakewater II	32,805,796	11,041,654

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Lakewater IV	32,661,706	2,196,174
Lakewater V	114,803,590	4,453,900
Marathon CLO Equity Fund	13,800,573	8,795,000
Merit Energy Partners I LP	31,852,399	0
MidCap Finco Holdings LTD	306,718,217	1,453,424
Mortgage Servicing Rights	80,354,121	0
Napier Park Aircraft Leasing Vehicle I, LLC	37,360,060	16,463,675
Napier Park AL Rollover Fund I	13,573,066	66,250,877
Nash Co-Investment	19,555,152	94,259
New Fortress Energy HLDGS	503,936,000	0
NGP Natural Resources XII	44,391,457	104,937,644
Orion Co-Investments III, LP	7,102,613	2,236,552
Orion Mine Finance	100,019,182	5,035,818
Orion Mine Finance 1A	52,208,104	4,324,712
Orion Mine Finance Co-Fund II LP	15,506,455	34,927,191
Orion Mine Finance II	73,983,626	25,062,608
Redding Ridge Holdings, LP	62,975,457	37,443,359
* Ren Venture Fund II	24,882,196	4,000,000
* Ren Venture Fund III	3,716,776	21,000,000
Ridgewood Energy Oil & Gas II	105,630,525	23,376,507
Ridgewood Energy Oil & Gas III	65,379,446	173,668,653
Ridgewood Fund II Co-Invest (REOG)	23,689,170	7,541,413
RPEP Energy Opportunistic Institutional Partners	19,861,432	16,436,235
SJC Direct Lending Fund	730,240	15,088,120
SJC Direct Lending Fund IA	238,444	3,764,486
SJC Direct Lending Fund II	31,994,902	38,261,315
SJC Direct Lending Fund III	111,334,018	118,345,127
SJC Direct Lending Fund III Co-Invest G-III	20,000,000	0
* Social Network Holdings	110,510,351	19,540,969
Specialty Equity Strategy LP	267,077	19,647,000
Specialty Loan Fund III	18,336,785	6,267,089
Sprott Private Resource Lending (US), LP	66,664,538	57,568,553
Sprott PRL(M) LP	6,030,974	19,057,857
Sprott PRL(M-Co-Invest) LP	7,757,576	17,137,500
Structured Credit Recovery Fund IV	152,036,895	71,219,864
Terra Co-Investment	30,909,255	14,000,000
TICP CLO Partners II	36,825,110	10,365,754
TSSP Adjacent Opportunities Partners	123,001,433	188,969,400
TSSP Capital Solutions	39,935,079	259,880,560
TSSP Opportunities Partners IV	4,671,785	94,861,457
Vida Insurance Credit Opportunity Fund II	92,965,265	6,988,814
Warwick (SMRS) Co-Invest, L.P.	31,255,040	2,732,720
Warwick Partners III	54,588,554	7,454,932
Total Real Return and Opportunistic	\$ 7,874,818,941	\$ 3,560,945,996
Short-Term Investments & Other	100,056,951	-
Grand Total	\$ 7,974,875,892	\$ 3,560,945,996

* Fund of Funds

** New Commitment

State of Michigan Retirement System
DEFINED CONTRIBUTION
REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



Woodrow S. Tyler
Senior Investment Manager
Defined Contribution, Trusts & Agencies Division

EXECUTIVE SUMMARY

Overview

The State of Michigan's Defined Contribution (DC) plan has over 177,590 participants across four constituent bases. The State's DC program initially started as a supplemental retirement plan, but for many of the plans it is now participants' primary retirement vehicle.

DC plans are participant led investments. The role of the Bureau of Investments is to offer a sufficient range of investment options to allow the participants to diversify their individual retirement accounts and construct portfolios that reasonably span the risk/return spectrum. To this end, the Plans may be comprised of at least one investment option from the categories below.

Investments Options

Tier I: Target Date Funds and Passively Managed Index Funds

- Target Date Funds (TDFs) are the default option for plan participants. Each TDF seeks to achieve its objective by investing in a set of underlying index funds representing various asset classes. Over time, the allocation to asset classes and funds change according to a predetermined "glide path" and will become more conservative as it approaches the target retirement date.
- Passively Managed Index Funds are comprised of low-cost index funds which seek to replicate the performance of a variety of cash, bond and stock indices with very little tracking error and at a low fee.

Tier II: Actively Managed Funds

- These are funds actively managed by investment managers in an attempt to outperform various cash, bond and stock indices over long periods of time.

Tier III: Self Directed Brokerage Account – Non-Core Options

- TD Ameritrade provides access to a broad range of investment choices including individual stocks, bonds, CDs, over 100 commission-free ETFs, and more than 13,000 mutual funds—including more than 2,100 no-load, no-transaction-fee (NTF) mutual funds.

Investment Selection

- The selection of each investment option for the Plans is based on the prudence standards set by the Governing Documents and applicable law, with flexibility built-in to allow a search to take full advantage of strategic opportunities. The search will focus on finding opportunities which are tailored to the Plans' specific needs. The BOI, in consultation with the Office of Retirement Services (ORS), will establish search criteria that aligns with the purpose and objective an investment option is seeking to attain. Due diligence will be completed with the goal of selecting a plan that, in the totality of circumstances, offers fair and reasonable investment options for the Plan participants.
- With respect to Tier III investments, the universe of available options is extensive. Since the selection of investments is directed solely by the participants which elect the Tier III option, the State does not provide any criteria for selecting or monitoring these non-core investment options.

Investment Monitoring

- The ORS and the BOI may examine each investment option as circumstances require, to ensure that a particular investment option's investment style and other relevant investment criteria, such as performance, fee and expense levels or the occurrence of a significant change are acceptable, given the purpose of each investment option.

Market Environment and Outlook

- Structural changes in the U.S. retirement system are supporting growth in the DC industry:
 - Rapid decline of employer funded pensions
 - Potential erosion of Social Security benefits
 - Workforce aging
 - New regulations, specifically, the Pension Protection Act of 2006;
 - Automatically enroll employees into the DC plan
 - Establish safe harbor investments known as QDIA
- In an effort to simplify the investment process for participants, industry trend has been to reduce the number of investment options offered in a DC plan. Based on the recent CEM benchmark report, the average number of investments offered by similarly sized plans is 13 options. The State of Michigan currently offers 20 investment options. The desired outcome of streamlining would be to benefit from economies of scale and ease the burden of asset allocation at the participant level.
- Another trend in the industry is the focus on retirement income. As fewer individuals have access to pension plans and DC plans have become the primary retirement vehicle for many Americans, more plan sponsors are exploring the ability to generate sustainable income in retirement.

SMRS

Defined Contribution Strategies

3/31/19

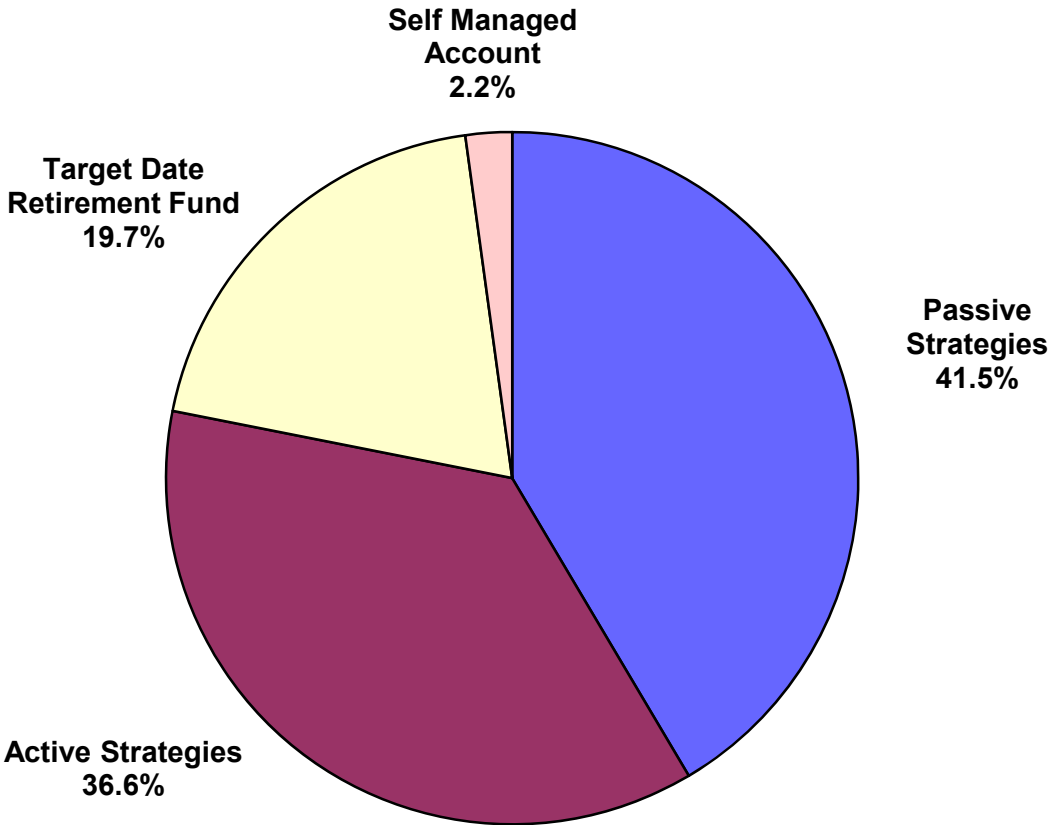
Markets	Amount		% of Total	Fee per \$1,000
QDIA (\$ in Millions)				
	<u>3/31/2019</u>	<u>3/31/2018</u>		
Total Target Date Fund	\$1,697	\$1,424	19.7%	\$0.70
Tier I Index Funds				
State Street S&P 500 Index Fund	\$1,171	\$1,090		\$0.23
State Street Bond Market Index Fund	762	678		0.52
State Street Global All Cap Equity ex-US Index Fund	581	546		1.21
State Street S&P Mid Cap Index Fund	565	566		0.52
BlackRock S&P Small Cap 600 Equity Index CL F	137	131		0.30
BlackRock Government Short-Term Investment CL F	229	227		0.60
BlackRock Emerging Markets Index CL F	123	154		0.70
Total Tier I Index	\$3,567	\$3,391	41.5%	\$0.54
Tier II Active Funds				
Stable Value Fund	\$1,161	\$1,145		\$2.20
Dodge & Cox Stock Fund	569	607		4.10
Jennison Large Cap Growth Fund	399	363		2.90
American Funds EuroPacific Growth R6	315	385		4.90
Voya Small Cap Growth Equity Fund	151	166		4.30
T. Rowe Price Mid-Cap Value Fund	119	129		6.40
PIMCO Total Return I Fund	113	119		5.50
Oakmark Equity & Income I Fund	115	124		4.30
Artisan Mid Cap Fund	108	88		7.20
Virtus Ceredex Small-Cap Value Eq I	73	76		6.80
Prudential High Yield Fund	28	27		3.80
Total Tier II Active	\$3,152	\$3,227	36.6%	\$3.65
Tier III				
Total Self Directed Brokerage Account	\$186	\$182	2.2%	NA
Total Defined Contribution Assets	\$8,603	\$8,224	100.0%	\$1.70

NOTE: Totals may not be exact due to rounding.

SMRS

Defined Contribution by Investment Strategy

3/31/19



Market Value in Millions				
	<u>3/31/19</u>		<u>3/31/18</u>	
Passive Strategies	\$3,568	41.5%	\$3,391	41.2%
Active Strategies	3,152	36.6%	3,226	39.2%
Target Date Retirement Fund	1,697	19.7%	1,424	17.3%
Self Managed Account	186	2.2%	182	2.2%
Total Investments	<u><u>\$8,603</u></u>	<u><u>100.0%</u></u>	<u><u>\$8,224</u></u>	<u><u>100.0%</u></u>

*Loan Fund \$194M as of 3/31/19

Defined Contribution Performance by Fund 3/31/19

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
State Street Target Retirement Income Fund	\$38,951,054	4.1%	5.0%	3.5%	6.5%
State Street Income Custom Index		4.1%	5.0%	3.5%	6.7%
Morningstar Target-Date Retirement		3.4%	4.8%	3.4%	6.7%
Variance State Street Income Custom Index		0.0%	0.0%	0.0%	-0.2%
Variance Morningstar Target-Date Retirement		0.7%	0.2%	0.1%	-0.2%
State Street Target Retirement 2015 Fund	54,027,992	4.1%	5.7%	4.1%	9.1%
State Street 2015 Custom Index		4.1%	5.7%	4.1%	9.1%
Morningstar Target-Date 2015		3.4%	6.1%	4.2%	8.3%
Variance State Street 2015 Custom Index		0.0%	0.0%	0.0%	0.0%
Variance Morningstar Target-Date 2015		0.7%	-0.4%	-0.1%	0.8%
State Street Target Retirement 2020 Fund	129,055,235	4.1%	7.1%	4.9%	10.3%
State Street 2020 Custom Index		4.2%	7.1%	4.9%	10.4%
Morningstar Target-Date 2020		3.3%	6.4%	4.4%	8.8%
Variance State Street 2020 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2020		0.8%	0.7%	0.5%	1.5%
State Street Target Retirement 2025 Fund	169,501,509	3.9%	8.3%	5.7%	11.2%
State Street 2025 Custom Index		3.9%	8.3%	5.7%	11.3%
Morningstar Target-Date 2025		3.4%	7.4%	5.0%	10.1%
Variance State Street 2025 Custom Index		0.0%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2025		0.5%	0.9%	0.7%	1.1%
State Street Target Retirement 2030 Fund	185,564,584	3.6%	8.8%	6.0%	11.8%
State Street 2030 Custom Index		3.7%	8.8%	6.0%	11.9%
Morningstar Target-Date 2030		3.3%	8.3%	5.4%	10.5%
Variance State Street 2030 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2030		0.3%	0.5%	0.6%	1.3%
State Street Target Retirement 2035 Fund	203,462,096	3.4%	9.4%	6.2%	12.2%
State Street 2035 Custom Index		3.5%	9.4%	6.2%	12.3%
Morningstar Target-Date 2035		3.2%	9.1%	5.9%	11.4%
Variance State Street 2035 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2035		0.2%	0.3%	0.3%	0.8%
State Street Target Retirement 2040 Fund	196,579,642	3.2%	9.8%	6.4%	12.4%
State Street 2040 Custom Index		3.3%	9.8%	6.4%	12.5%
Morningstar Target-Date 2040		3.1%	9.5%	6.1%	11.5%
Variance State Street 2040 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2040		0.1%	0.3%	0.3%	0.9%
State Street Target Retirement 2045 Fund	198,193,757	3.0%	10.2%	6.6%	12.5%
State Street 2045 Custom Index		3.1%	10.2%	6.6%	12.6%
Morningstar Target-Date 2045		3.0%	9.9%	6.3%	12.0%
Variance State Street 2045 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2045		0.0%	0.3%	0.3%	0.5%
State Street Target Retirement 2050 Fund	245,404,578	3.0%	10.2%	6.6%	12.5%
State Street 2050 Custom Index		3.1%	10.2%	6.5%	12.6%
Morningstar Target-Date 2050		2.9%	9.9%	6.3%	11.9%
Variance State Street 2050 Custom Index		-0.1%	0.0%	0.1%	-0.1%
Variance Morningstar Target-Date 2050		0.1%	0.3%	0.3%	0.6%
State Street Target Retirement 2055 Fund	227,561,593	3.0%	10.2%	6.6%	N/A
State Street 2055 Custom Index		3.1%	10.2%	6.5%	N/A
Morningstar Target-Date 2055		2.9%	10.1%	6.5%	N/A
Variance State Street 2055 Custom Index		-0.1%	0.0%	0.1%	N/A
Variance Morningstar Target-Date 2055		0.1%	0.1%	0.1%	N/A

Fund Name	Market Value	1-Year	3-Years	5-Years	10-Years
State Street Target Retirement 2060 Fund	\$48,451,240	3.0%	10.2%	N/A	N/A
<i>State Street 2060 Custom Index</i>		3.1%	10.2%	N/A	N/A
<i>Morningstar Target-Date 2060+</i>		3.0%	10.2%	N/A	N/A
<i>Variance State Street 2060 Custom Index</i>		-0.1%	0.0%	N/A	N/A
<i>Variance Morningstar Target-Date 2060+</i>		0.0%	0.0%	N/A	N/A
TIER I					
State Street S&P 500 Index Fund	1,170,848,935	9.5%	13.5%	10.9%	15.8%
S&P 500 Index		9.5%	13.5%	10.9%	15.9%
Morningstar Large Blend		6.9%	11.8%	8.5%	14.0%
Variance S&P 500 Index		0.0%	0.0%	0.0%	-0.1%
Variance Morningstar Large Blend		2.6%	1.7%	2.4%	1.8%
State Street Bond Market Index Fund	761,607,580	4.5%	2.0%	2.7%	3.7%
Bloomberg Barclays U.S. Aggregate Index		4.5%	2.0%	2.7%	3.8%
Morningstar Intermediate-Term Bond		4.0%	2.4%	2.5%	4.6%
Variance Bloomberg Barclays U.S. Aggregate Index		0.0%	0.0%	0.0%	-0.1%
Variance Morningstar Intermediate-Term Bond		0.5%	-0.4%	0.2%	-0.9%
State Street Global All Cap Equity ex-U.S. Index Fund	580,946,652	-5.1%	8.2%	2.9%	N/A
MSCI ACWI ex USA IMI (Net)		-5.0%	7.9%	2.7%	N/A
Morningstar Foreign Large Blend		-5.0%	6.6%	2.1%	N/A
Variance MSCI ACWI ex USA IMI (Net)		-0.1%	0.3%	0.2%	N/A
Variance Morningstar Foreign Large Blend		-0.1%	1.6%	0.8%	N/A
State Street S&P Mid Cap Index Fund	565,104,542	2.5%	11.2%	8.2%	16.2%
S&P 400 Index		2.6%	11.2%	8.3%	16.3%
Morningstar Mid-Cap Blend		2.1%	9.5%	6.0%	14.2%
Variance S&P 400 Index		-0.1%	0.0%	-0.1%	-0.1%
Variance Morningstar Mid-Cap Blend		0.4%	1.7%	2.2%	2.0%
BlackRock Government Short-Term Investment CL F	229,393,937	2.1%	1.2%	0.7%	N/A
BofA Merrill Lynch US 3-Month Treasury Bill Index		2.1%	1.2%	0.7%	N/A
Variance BofA Merrill Lynch US 3-Month Treasury Bill Index		0.0%	0.0%	0.0%	N/A
BlackRock S&P Small Cap 600 Equity Index CL F	136,849,747	1.7%	N/A	N/A	N/A
Russell 2000 Index		1.6%	N/A	N/A	N/A
Morningstar Small Blend		-0.2%	N/A	N/A	N/A
Variance Russell 2000 Index		0.1%	N/A	N/A	N/A
Variance Morningstar Small Blend		1.9%	N/A	N/A	N/A
BlackRock Emerging Markets Index CL F	122,751,422	-8.0%	10.7%	3.7%	N/A
MSCI Emerging Market (Net)		-7.4%	10.7%	3.7%	N/A
Morningstar Diversified Emerging Mkts		-9.4%	9.0%	2.6%	N/A
Variance MSCI Emerging Market (Net)		-0.6%	0.0%	0.0%	N/A
Variance Morningstar Diversified Emerging Mkts		1.4%	1.7%	1.1%	N/A
TIER II					
Stable Value Fund	1,161,490,192	2.2%	2.1%	2.2%	2.2%
Barclays Int Gov/Credit A or Higher Index		4.0%	1.3%	1.9%	2.7%
Hueler Universe		2.3%	2.0%	1.9%	2.2%
Variance Barclays Int. Gov Credit A or Better Index		-1.8%	0.8%	0.3%	-0.5%
Variance Hueler Universe		-0.1%	0.1%	0.3%	0.0%
Dodge & Cox Stock Fund	568,936,955	4.1%	14.0%	8.7%	16.1%
<i>Russell 1000 Value Index</i>		5.7%	10.5%	7.7%	14.5%
<i>Morningstar Large Value</i>		4.4%	10.1%	6.9%	13.2%
<i>Variance Russell 1000 Value Index</i>		-1.6%	3.5%	1.0%	1.6%
<i>Variance Morningstar Large Value</i>		-0.3%	3.9%	1.8%	2.9%

Fund Name	Market Value	1-Year	3-Years	5-Years	10-Years
Jennison Large Cap Growth Fund	\$398,715,561	12.1%	20.3%	14.9%	N/A
<i>Russell 1000 Growth Index</i>		12.7%	16.5%	13.5%	N/A
<i>Morningstar Large Growth</i>		10.6%	15.2%	11.1%	N/A
<i>Variance Russell 1000 Growth Index</i>		-0.6%	3.8%	1.4%	N/A
<i>Variance Morningstar Large Growth</i>		1.5%	5.1%	3.8%	N/A
American Funds EuroPacific Growth R6	315,342,644	-4.7%	9.3%	4.3%	7.7%
<i>MSCI EAFE Index - Net Div</i>		-3.7%	7.3%	2.3%	6.3%
<i>Morningstar Foreign Large Blend</i>		-5.0%	6.6%	2.1%	5.8%
<i>Variance MSCI EAFE Index - Net Div</i>		-1.0%	2.0%	2.0%	1.4%
<i>Variance Morningstar Foreign Large Blend</i>		0.3%	2.7%	2.2%	1.8%
Voya Small Cap Growth Equity Fund	151,324,982	-0.3%	11.4%	7.1%	N/A
<i>Russell 2000 Growth Index</i>		3.9%	14.9%	8.4%	N/A
<i>Morningstar Small Growth</i>		7.6%	15.8%	8.2%	N/A
<i>Variance Russell 2000 Growth Index</i>		-4.2%	-3.5%	-1.3%	N/A
<i>Variance Morningstar Small Growth</i>		-7.9%	-4.4%	-1.1%	N/A
T. Rowe Price Mid-Cap Value Fund	118,973,776	-0.1%	9.1%	7.4%	15.2%
<i>Russell Midcap Value Index</i>		2.9%	9.5%	7.2%	16.4%
<i>Morningstar Mid-Cap Value</i>		0.6%	8.7%	5.7%	14.3%
<i>Variance Russell Midcap Value Index</i>		-3.0%	-0.4%	0.2%	-1.2%
<i>Variance Morningstar Mid-Cap Value</i>		-0.7%	0.4%	1.7%	0.9%
Oakmark Equity & Income I Fund	114,949,938	1.7%	8.3%	5.2%	9.6%
<i>60% S&P 500/40% Barclays U.S. Gov/Credit Index</i>		7.8%	9.0%	7.8%	11.2%
<i>Morningstar Allocation--50% to 70% Equity</i>		3.8%	7.3%	4.9%	9.4%
<i>Variance 60% S&P 500/40% Barclays U.S. Gov/Credit Index</i>		-6.1%	-0.7%	-2.6%	-1.6%
<i>Variance Morningstar Allocation--50% to 70% Equity</i>		-2.1%	1.0%	0.3%	0.2%
PIMCO Total Return I Fund	113,349,602	3.8%	2.8%	2.9%	4.8%
<i>Bloomberg Barclays U.S. Aggregate Index</i>		4.5%	2.0%	2.7%	3.8%
<i>Morningstar Intermediate-Term Bond</i>		4.0%	2.4%	2.5%	4.6%
<i>Variance Bloomberg Barclays U.S. Aggregate Index</i>		-0.7%	0.8%	0.2%	1.0%
<i>Variance Morningstar Intermediate-Term Bond</i>		-0.2%	0.4%	0.4%	0.2%
Artisan Mid Cap Fund	108,492,950	13.9%	14.6%	8.6%	17.1%
<i>Russell Midcap Growth Index</i>		11.5%	15.1%	10.9%	17.6%
<i>Morningstar Mid-Cap Growth</i>		8.0%	13.9%	8.7%	15.1%
<i>Variance Russell Midcap Growth Index</i>		2.4%	-0.5%	-2.3%	-0.5%
<i>Variance Morningstar Mid-Cap Growth</i>		5.9%	0.7%	-0.1%	2.0%
Virtus Ceredex Small-Cap Value Eq I	73,170,961	2.0%	9.3%	6.4%	14.4%
<i>Russell 2000 Value Index</i>		0.2%	10.9%	5.6%	14.1%
<i>Morningstar Small Value</i>		-2.4%	8.4%	4.2%	13.8%
<i>Variance Russell 2000 Value Index</i>		1.8%	-1.6%	0.8%	0.3%
<i>Variance Morningstar Small Value</i>		4.4%	0.9%	2.2%	0.6%
Prudential High Yield Fund	27,862,890	6.8%	7.5%	N/A	N/A
<i>Bloomberg Barclays U.S. Corp. HY 1% Issuer Cap Index</i>		5.8%	8.5%	N/A	N/A
<i>Morningstar High Yield Bond</i>		4.4%	6.8%	N/A	N/A
<i>Variance Bloomberg Barclays U.S. Corp. HY 1% Issuer Cap Index</i>		1.0%	-1.0%	N/A	N/A
<i>Variance Morningstar High Yield Bond</i>		2.4%	0.7%	N/A	N/A
TIER III					
Self Directed	186,035,863				
TOTAL	\$8,602,902,411				

Loan Fund: \$193,735,403

State of Michigan Retirement System
BASKET CLAUSE REVIEW

State of Michigan Investment Board Meeting
June 6, 2019



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

SMRS

Basket Clause Investments

3/31/19

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$ 4,023,310,633
Total Real Return and Opportunistic	932,527,998
Total International Equity	76,841,291
Total Fixed Income	<u>60,179,575</u>
Total Basket Clause Investments	<u><u>\$ 5,092,859,497</u></u>

The basket clause investments at March 31, 2019, were \$5.1 billion or 7.0% of the total portfolio value of \$72.7 billion.

The Public Employees 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 System. It should not be interpreted in any way as financial advice.