

STATE OF MICHIGAN INVESTMENT BOARD MEETING

September 10, 2020

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

SEPTEMBER 10, 2020

Agenda



- 9:30 a.m. **Call to Order and Opening Remarks**
- Approval of the 6/11/20 SMIB Meeting Minutes**
- 9:35 a.m. **Guest Speaker: Henry McVey – KKR**
- 10:00 a.m. **Executive Summary & Performance for Periods Ending 6/30/20**
- 10:10 a.m. **Current Asset Allocation Review**
- Markets Review and Outlook**
- 10:20 a.m. **BOI Investment Staff Focus: Henry James**
- Review of Investment Reports**
- **Domestic Equity – Receive and File**
 - **Private Equity – Receive and File**
 - **International Equity – Receive and File**
 - **Real & Opportunistic Return – Receive and File**
 - **Real Estate & Infrastructure – Receive and File**
 - **Fixed Income – Receive and File**
 - **Absolute Return – Receive and File**
 - **Defined Contribution – Receive and File**
- Basket Clause – Receive and File**
- 11:00 a.m. **Public Comment**
- Closing Remarks ~ Adjournment**



2020 Meeting Schedule

Thursday, December 10, 2020

All meetings start at 9:30 a.m.

www.michigan.gov/treasury

State of Michigan Retirement System

MINUTES

State of Michigan Investment Board Meeting

September 10, 2020



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN INVESTMENT BOARD

June 11, 2020 Meeting Minutes

Board Members Present:

Chairman – Treasurer Rachael Eubanks – via Microsoft Teams
Ms. Dina Richard – via Microsoft Teams
Mr. Reginald Sanders – via Microsoft Teams
Mr. James Nicholson – via conference line
Mr. Chris Kolb – via Microsoft Teams

Members of the Public and Bureau of Investments Staff Present – via Microsoft Teams

Jon Braeutigam	Robert Brackenbury	Karl Borgquist
Greg Parker	Jim Elkins	Phil Kovarkis
Steve Cummings	Tim McEnery	John Sullivan
Max Kotary	Annette Russell	Janet Sudac
Lori Barrett	Travis Haney	Peter Woodford
Daniel Quigley	Jennifer Yeung	Woodrow Tyler
Todd Warstler	Jack Behar	Lan Chen
Semone James	Patrick Moraniec	Ann Storberg

Many others were present by AT&T phone line.

Opening Remarks:

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

Approval of Minutes:

Approval of the March SMIB Meeting Minutes – Motion to approve by Chris Kolb. Seconded: Reggie Sanders. The vote was unanimous to approve.

AGENDA

Asset Liability Analysis/Asset Allocation Discussion and Recommendation

Guest Speakers from AON: Max Kotary, Tim McEnery, Steve Cummings, Phil Kovarkis, Head of Asset Liability Team and John Sullivan, Senior Member of Asset Liability Team.

Mr. Phil Kovarkis gave a high-level summary overview of the asset-liability study, as well as the executive summary, highlighting the conclusions of the study performed over the last few months, supporting the recommended asset allocation policy. All questions were answered by members of the AON team.

Action Item – Resolution Authorizing Asset Allocation Strategy

Mr. Gregory Parker, Director of Investments – Public Markets, discussed the resolution authorizing the asset allocation strategy. Mr. Parker believes the timing is right for this change and that staffing is appropriate for accomplishing this new strategy. He further explained how the strategy would be achieved.

Resolution 2020-2

Mr. Gregory Parker described the reasoning for the new targets and ranges within this new resolution. Motion to accept the resolution by Dina Richard. Second: Reggie Sanders. Roll call vote was taken.

Action Item: Resolution 2020-2 – Resolution authorizing new asset allocation strategy.

Ayes: 5 Nays: 0 Motion Passed.

Executive Summary and Performance

Jon Braeutigam, Chief Investment Officer for the Bureau of Investments, reviewed the executive summary performance section discussing performance returns and market conditions.

Asset Allocation Review, Markets Review and Outlook

Mr. Gregory Parker explained the definition of the policy return as noted in the performance section and pointed out that SMRS’s returns are driven by those policy weight decisions, meaning by its strategic allocation policy weight.

He described the current economic forecast for the U.S. and the world, including the economic recession that began at the end of February 2020 due to Covid-19. He explained that no one was able to forecast this pandemic, and there is so much unknown regarding the virus that it is difficult to determine the length and severity of the economic downturn.

Review of Investment Reports and Basket Clause – Received and Filed

Public Comment:

Treasurer Eubanks asked that any attendees wishing to address the Board speak out. Public comment was made by Eileen O’Grady with the Private Equity Stakeholder Project. She presented an update on the firm Leonard Green & Partners, which owns a hospital chain through its fund Green Equity Investors V, L.P., in which the SMRS is a limited partner investor. Ms. O’Grady addressed the board regarding her group’s concerns with this hospital chain.

Adjournment

Treasurer Eubanks acknowledged staff, noting their high-level passion for the job and adjourned the meeting at 10:55 am. Motion to adjourn by Chris Kolb. 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

September 10, 2020



Gregory J. Parker, CFA

Director of Investments – Public Markets

Director of Asset Allocation

Bureau of Investments

EXECUTIVE SUMMARY

June 30, 2020

Performance

Great peer comparison.

MPSERS Plan (06/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	0.1%	6.6%	6.8%	8.4%	9.4%
Policy Returns	3.1%	7.1%	7.6%	8.7%	10.1%
Peer Median Returns*	2.1%	5.9%	6.2%	7.5%	8.5%

*State Street Universe greater than \$10 billion.

- Over the past three, five, seven, and ten years, the returns are significantly higher than peer median returns. The peers are defined as the State Street Universe of public pension plans greater than \$10 billion. Notably, the standard deviation of the monthly returns was in the lowest quartile for the longer time horizons.
- Over a very long horizon, since 1979, the annualized rate of return on the plan assets has been approximately 9.2%.
- Compounding at higher than peer returns can add significant value. For example, based on the \$45.1 billion June 2010 market value, a ten-year annualized return of 9.4% compared to the 8.5% peer median return would add about \$8.8 billion in excess value.
- The returns lagged the policy benchmark over the past 1-year as the public markets returns rebounded sharply in the June 2020 quarter.

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 rate of return, additional risks (primarily equity risk) must be assumed. At the end of June 2020, the equity risk (beta) is approximately 0.37 which is one of the lowest measurements 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 June 2020 quarter, \$255 million of new commitments were made.
- The combined systems paid out approximately \$2.1 billion net of contributions over the past twelve months ending in June 2020. Over the past year, real return & opportunistic was a net purchaser of \$1.0 billion and private equity approximately \$606 million. Over the past year, the allocation to domestic equity was reduced by \$1.95 billion, long-term fixed income by \$700 million, real estate by \$520 million, international equity by \$250 million, and absolute return by \$50 million. The allocation to short-term cash decreased by approximately \$284 million.

Investment Update*Highlighting the quarter.*

(\$ Millions)

NEW COMMITMENTS**April 1, 2020 – June 30, 2020**

Asset class	Fund Name / (Managed By)	Commitment
Private Equity		
	CVC Capital Partners VIII, L.P. (CVC Capital Partners VIII Limited)	\$112.3
	Silver Lake Partners VI, L.P. (Silver Lake Management Company VI, LLC)	75.0
	Meritech Capital Partners VII, L.P. (Meritech Capital Associates VII, LLC)	42.5
	Renaissance Venture Capital Fund IV, L.P. (Renaissance Venture Capital Fund IV GP, LLC)	25.0
Real Estate and Infrastructure Division		
	No new commitments	0.0
Real & Opportunistic Division		
	No new commitments	0.0
Absolute Return Division		
	No new commitments	0.0
TOTAL		\$254.8

State of Michigan Retirement System

PERFORMANCE

State of Michigan Investment Board Meeting

September 10, 2020



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 June 30, 2020

	% of Portfolio 6/30/20	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	9.4	23	8.4	16	6.8	32	6.6	36	0.1	83	3.1	95
Median - Greater than \$10 Billion ²		8.5		7.5		6.2		5.9		2.1		7.2	
MPSERS Total Plan Policy		10.1		8.7		7.6		7.1		3.1		4.8	
DOMESTIC EQUITIES	21.0	13.3	32	11.4	25	9.5	27	9.7	31	2.0	65	20.5	39
Median ²		12.1		9.0		7.4		7.5		3.6		19.5	
S&P 1500 Index		13.8		11.7		10.2		9.9		6.1		20.8	
PRIVATE EQUITY AND VENTURE CAPITAL	19.1	13.0	9	12.2	7	10.1	7	10.7	10	-0.2	39	-8.1	92
Median ²		9.3		8.2		6.2		5.2		-2.2		-4.6	
Private Equity and VC Benchmark ³		13.8		12.9		9.9		8.3		-4.2		-19.0	
INTERNATIONAL EQUITIES	15.9	6.1	57	4.9	38	3.1	48	1.8	50	-3.4	46	16.1	74
Median ²		6.1		4.3		2.9		1.7		-3.5		17.3	
International Blended Benchmark ⁴		5.0		3.8		2.3		1.1		-4.8		16.1	
FIXED INCOME	12.7	4.4	63	4.4	46	4.6	52	4.5	62	3.7	86	3.2	76
Median ²		4.7		4.2		4.6		4.8		7.4		4.1	
Barclays Aggregate		3.8		4.0		4.3		5.3		8.7		2.9	
REAL RETURN AND OPPORTUNISTIC	12.3	9.6		10.7		8.5		8.8		-0.1		-5.2	
50% (CPI +500 bps) + 50% (6.8% actuarial rate)		7.2		7.0		7.0		6.8		5.9		1.3	
REAL ESTATE & INFRASTRUCTURE	8.7	10.1	65	9.4	48	7.3	54	5.5	71	-2.3	93	-6.0	97
Median ²		10.5		9.3		7.3		5.8		2.7		0.0	
NCREIF - Property Blended Index ⁵		8.3		6.9		5.4		4.1		1.4		-1.3	
NCREIF Open Fund Index Net		9.8		8.1		6.4		4.7		1.3		-1.8	
ABSOLUTE RETURN	5.8	4.3		3.7		2.4		3.1		0.0		-3.9	
HFRI FOF Cons 1 month lagged		2.3		2.0		1.0		1.3		-1.5		-3.3	
CASH EQUIVALENTS	4.7	1.0		1.2		1.6		2.1		1.9		0.2	
1 Month T-Bill		0.6		0.8		1.1		1.6		1.4		0.0	

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 SP500 + 300 bps with a 3 month lag.

⁴ 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.

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.

Cumulative and Consecutive Total Fund Returns

MPSERS

Cumulative For Years Ending 6/30/20

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	0.1	3.9	6.6	8.1	6.8	6.7	8.4	8.9	8.1	9.4
Public Plan - Median (> \$10 billion)*	2.1	4.2	5.9	7.4	6.2	6.0	7.5	7.8	7.4	8.5
Rank	83	53	36	27	32	16	16	22	23	23
bp Difference - Median	-207	-22	67	69	57	68	88	102	70	90

Consecutive For Years Ending

	06/20	06/19	06/18	06/17	06/16	06/15	06/14	06/13	06/12	06/11
MPSERS	0.1	8.0	12.0	12.9	1.5	6.2	19.1	12.2	2.6	21.7
Public Plan - Median (> \$10 billion)*	2.1	6.6	9.1	13.0	1.4	3.8	16.9	12.5	1.8	22.0
Rank	83	20	4	58	45	5	14	57	32	56
bp Difference - Median	-207	134	290	-12	12	240	222	-29	80	-21

MSERS

Cumulative For Years Ending 6/30/2020

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	0.1	3.9	6.6	8.1	6.8	6.7	8.4	8.8	8.1	9.4
Public Plan - Median (> \$1 billion)*	2.2	4.0	5.6	7.4	6.0	5.6	7.2	7.5	7.0	8.1
Rank	80	53	30	22	24	15	16	19	20	23
bp Difference - Median	-209	-4	96	75	73	110	122	130	107	133

Consecutive For Years Ending

	06/20	06/19	06/18	06/17	06/16	06/15	06/14	06/13	06/12	06/11
MSERS	0.1	7.9	12.0	13.0	1.5	6.2	19.1	12.2	2.4	21.7
Public Plan - Median (> \$1 billion)*	2.2	6.5	8.7	13.0	1.3	3.0	16.9	12.5	1.1	21.9
Rank	80	17	4	49	43	4	19	56	34	54
bp Difference - Median	-209	149	333	3	24	318	216	-30	134	-16

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS

Cumulative For Years Ending 6/30/20

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	0.1	3.9	6.6	8.1	6.8	6.7	8.4	8.8	8.1	9.4
Public Plan - Median (> \$1 billion)*	2.2	4.0	5.6	7.4	6.0	5.6	7.2	7.5	7.0	8.1
Rank	79	54	30	23	25	19	17	19	21	23
bp Difference - Median	-208	-5	96	75	73	109	120	127	105	132

Consecutive For Years Ending

	06/20	06/19	06/18	06/17	06/16	06/15	06/14	06/13	06/12	06/11
MSPRS	0.1	7.9	12.0	13.0	1.5	6.2	19.0	12.1	2.5	21.8
Public Plan - Median (> \$1 billion)*	2.2	6.5	8.7	13.0	1.3	3.0	16.9	12.5	1.1	21.9
Rank	79	17	4	49	43	4	19	58	33	52
bp Difference - Median	-208	147	334	2	23	316	208	-41	138	-9

MJRS

Cumulative For Years Ending 6/30/20

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	0.1	3.9	6.6	8.1	6.8	6.7	8.3	8.7	8.0	9.4
Public Plan - Median (> \$1 billion)*	2.2	4.0	5.6	7.4	6.0	5.6	7.2	7.5	7.0	8.1
Rank	79	52	29	21	24	15	19	20	23	24
bp Difference - Median	-207	-4	97	77	74	110	111	120	98	129

Consecutive For Years Ending

	06/20	06/19	06/18	06/17	06/16	06/15	06/14	06/13	06/12	06/11
MJRS	0.1	7.9	12.0	13.0	1.5	6.2	18.2	12.2	2.4	22.1
Public Plan - Median (> \$1 billion)*	2.2	6.5	8.7	13.0	1.3	3.0	16.9	12.5	1.1	21.9
Rank	79	17	4	47	43	4	29	54	34	48
bp Difference - Median	-207	148	334	9	21	315	128	-25	128	26

*State Street Public Funds Universe

State of Michigan Retirement System

ASSET ALLOCATION REVIEW

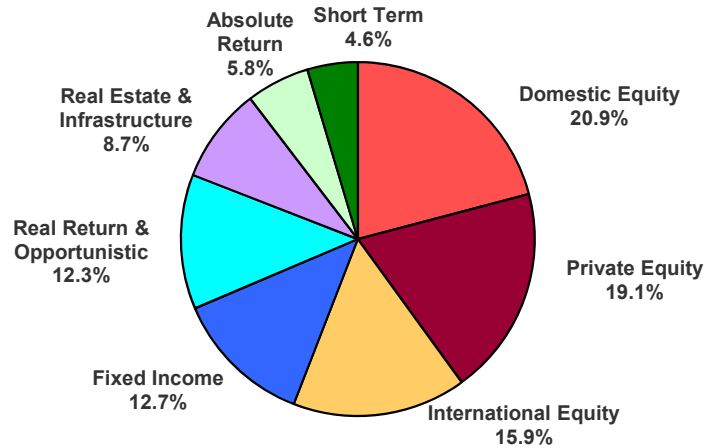
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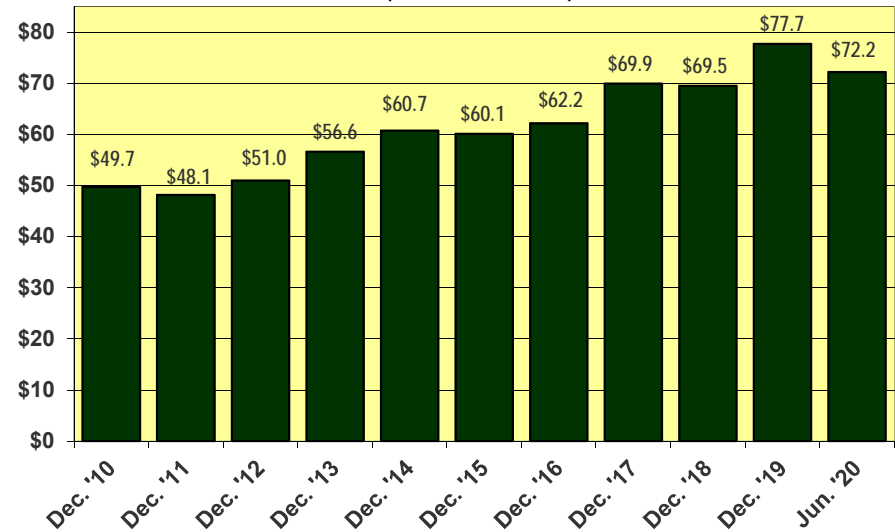
Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEM PROFILE - JUNE 2020

Asset Allocation ~ 6/30/20



**Market Value*
(Billions of Dollars)**



**Asset Allocation By Market Value
(In Millions)**

Investment Strategies	6/30/2020		6/30/2019	
Domestic Equity	\$15,080	20.9%	\$16,636	22.3%
Private Equity	13,779	19.1%	13,380	18.0%
International Equity	11,458	15.9%	12,131	16.3%
Fixed Income	9,163	12.7%	9,459	12.7%
Real Return & Opportunistic	8,884	12.3%	7,951	10.7%
Real Estate & Infrastructure	6,295	8.7%	6,994	9.4%
Absolute Return	4,179	5.8%	4,260	5.7%
Short Term***	3,363	4.6%	3,648	4.9%
TOTAL	\$72,201	100.0%	\$74,459	100.0%

**Market Value By Plan ~ 6/30/20
(in Millions)**

Pension Plan	OPEB**	Combined	
Mkt. Value	Mkt. Value	Mkt. Value	%
MPSERS	\$48,525	\$7,160	\$55,685 77.1%
MSERS - (closed)	11,484	3,106	14,590 20.2%
MSPRS	1,431	242	1,673 2.3%
MJRS - (closed)	244	9	253 0.4%
TOTAL	\$61,684	\$10,517	\$72,201 100.0%

MSERS includes the Military Pension Fund

Short Term Equivalents (in Billions)

Short Term Strategy***	\$3.4	
Short Term in Other Inv. Strategies	1.2	
TOTAL SHORT TERM	\$4.6	6.3% of Total Funds

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

Pensions & Investments survey - February 10, 2020 issue

*The combined net payout for the plans for FY 2018 was \$1.7 billion with \$22.0 billion paid out FY 2009 thru FY 2018 (Pension CAFRs). This represents the amount paid to beneficiaries in excess of employer and employee contributions.

**OPEB - Other Post Employment Benefits

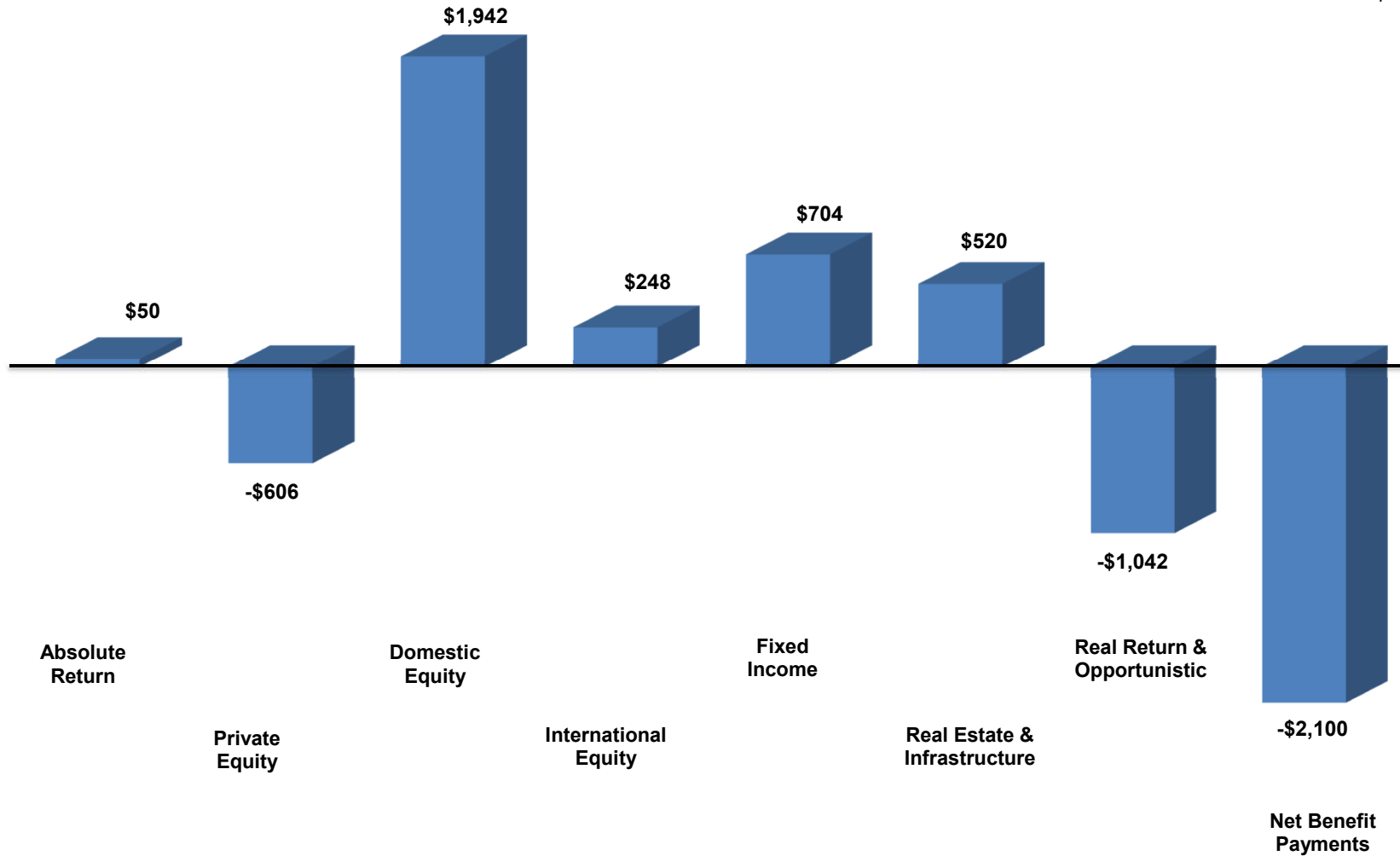
Sources and Uses of Cash

July 2019 ~ June 2020

7/01/19 Short-Term Cash Balance: \$ 3,649

6/30/20 Short-Term Cash Balance: 3,365

Net Short-Term Cash Decrease: \$ 284



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

Dollars in millions

Asset Allocation Targets As of 6/30/20

	MPSERS		MSERS		MSPRS		MJRS		SMRS
<i>Asset Class</i>	<i>6/30/20</i>	<i>Target*</i>	<i>6/30/20</i>	<i>Target*</i>	<i>6/30/20</i>	<i>Target*</i>	<i>6/30/20</i>	<i>Target*</i>	<i>Ranges</i>
Domestic Equity	21.0%	25.0%	21.0%	25.0%	21.0%	25.0%	21.0%	25.0%	17% - 32%
Private Equity	19.1%	16.0%	19.0%	16.0%	19.0%	16.0%	19.1%	16.0%	13% - 25%
International Equity	15.9%	15.0%	15.9%	15.0%	15.9%	15.0%	15.8%	15.0%	12% - 22%
Real Return & Opportunistic	12.3%	12.5%	12.3%	12.5%	12.3%	12.5%	12.3%	12.5%	8% - 18%
Long Term Fixed Income	12.7%	10.5%	12.7%	10.5%	12.7%	10.5%	12.7%	10.5%	8% - 18%
Real Estate & Infrastructure	8.7%	10.0%	8.7%	10.0%	8.7%	10.0%	8.7%	10.0%	8% - 18%
Absolute Return	5.8%	9.0%	5.8%	9.0%	5.8%	9.0%	5.8%	9.0%	5% - 11%
Short Term Fixed Income	4.7%	2.0%	4.7%	2.0%	4.7%	2.0%	4.7%	2.0%	1% - 8%
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

September 10, 2020



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	11.0%	30.0%	13.8%
International Equity	9.5%	21.4%	5.0%
Real Ret/Opportunistic	8.1%	9.5%	7.2%
Domestic Equity	7.4%	18.2%	13.8%
Real Estate (Core)	7.4%	15.0%	8.3%
Absolute Return	4.6%	9.0%	2.3%
Long-Term Fixed Income	1.3%	4.0%	3.8%
Short-Term	0.7%	1.5%	0.6%

* Aon Investment Consultants 2020 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.
- The June 2020 quarter was one that could be characterized as a healing for the economy and risk markets in general. This was on the back of one of the most severe market dislocations across asset classes as well as some of the most awe-inspiring actions taken by the U.S. Federal Reserve and U.S. Treasury.
- Corporations in the U.S. as well as globally have access to capital through the debt market. The June 2020 quarter saw record issuances globally as well as in the U.S., as both investment grade and high yield issuance was at a record high.
- In many ways, the Covid-19 pandemic accelerated business trends that were already in place headed into the year 2020. Many economically disruptive companies are included in the NASDAQ 100 Index and the contrast of this index return compared to the broader S&P 1500 Composite return exemplifies this point.
- Analyst EPS expectations for foreign companies are similar to their U.S. counterparts, if slightly less bearish. Analysts expect EPS to decline over the next twelve months in developed markets by -2.6% but expect slight growth in emerging markets of 0.75%.
- Safe haven commodity assets such as gold have performed well recently. At the end of June 2020, the dollar price for an ounce of gold was at \$1,800. This is 27% higher than the year prior.

U.S. Fixed Income

The debt markets are open.

- The March 2020 quarter witnessed one of the most severe market dislocations within the U.S. Fixed Income asset class as well as some of the most awe-inspiring actions taken by the U.S. Federal Reserve and U.S. Treasury.
- To highlight a few of the policy responses:
 - The Fed will be lending as much as \$5 Trillion, which is more than its entire balance sheet before the crisis, as it's part of the CARES act.
 - The Fed created new lending facilities targeting the corporate and municipal bond markets and is able to extend loans directly to large and small companies as well as buy bond ETFs.
 - The expanded policies also allow the Fed to buy corporate bonds from “fallen angels” that have been recently downgraded.
 - These programs are on top of the usual liquidity facilities of lowering rates and providing currency swap lines to foreign central banks.
- The responses to these policy actions had a calming effect on the markets. By the end of June 2020, the 10-year U.S. interest rate was 0.66% and the 2-year rate was at 0.15%. Spreads on investment-grade corporate debt were 1.4% which is 0.3% above average and high yield fixed income spreads were 6.3% which are 1.8% above long-term averages.
- Corporations in the U.S. as well as globally have access to capital through the debt market. The June 2020 quarter saw record issuances globally as well as in the U.S., as both the investment grade and high yield issuance was at a record high.

Domestic Equity

A bifurcated market.

- The broad U.S. stock market return for the one year ending June 2020 was 6.1%. Incredibly, this level is approximately only -9% from the all-time high which was hit in February 2020.
- Many domestic equity valuation metrics are above historical averages, and analysts expect that fundamentals will continue to deteriorate over the next twelve months. Consequently, the returns over the next cycle may not be as strong as the historical average of 11 – 12% year-over-year total returns. Fundamentally, however, the market's returns on equity continue to be historically higher than average and some of the largest companies in the market today are less cyclical (economically sensitive) than past market leaders. These facts lend support to the argument that higher valuations are justified, and therefore the market could perhaps continue to deliver historical average rates of return in the future.
- In many ways, the Covid-19 pandemic accelerated business trends that were already in place headed into the year 2020. Many economically disruptive companies are included in the NASDAQ 100 Index and the contrast of this index return compared to the broader S&P 1500 Composite return exemplifies this point. The one-year return for the NASDAQ 100 ending June 2020 was 33.8%, out-returning the S&P 1500 by 27.7%. Analysts expect the S&P 500 EPS to fall another 3% in the next twelve months, however, they estimate that the NASDAQ 100 EPS will grow 8% over the same time period.

International Equity

Are fundamentals priced in?

- International equities underperformed domestic equities over the year ending June 2020 by -10.5%. Over the past three, five, seven, and ten years, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -8.3%, -7.5%, -7.6%, and -8.3% annualized, respectively.
- Within international equities, emerging market returns exceeded developed markets over the past one, three and five years by 1.9%, 0.9% and 0.7% annualized, respectively. However, over the past seven and ten years, emerging markets returns were -0.7% and -2.3% annualized less than developed markets.
- From a factor perspective within international equity markets, both higher quality and momentum performed well over the past one and three years. International had a similar story as the U.S, where value as a factor lagged.
- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international markets trade at approximately a 17% discount to U.S. counterparts while emerging markets are at a 34% discount. Analyst EPS expectations for foreign companies are similar to their U.S. counterparts, if slightly less bearish. Analysts expect EPS to decline over the next twelve months in developed markets by -2.6% but expect slight growth in emerging markets of 0.75%.

Real Estate

Comparing Public vs. Private Real Estate

- Over the one year ending June 2020, the NAREIT index decreased by -6.5% including dividends, as the economic hit of the global pandemic began to take hold. Over the past ten years, publicly traded REITs have out-performed private real estate by 0.6%, annualized, but they are about three times more volatile.
- Dividend yields on REITs at the end of June 2020 were estimated to be around 4.0% which is nearly 3.5% higher than the yield of the ten-year U.S. Treasury. Historically, REIT dividend yields have averaged only 1.2% higher than the ten-year U.S. Treasury and at these levels may be seen as relatively attractive.

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 1%. 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 6.1%, should historical hedge fund betas and alphas continue, a 2.2% annualized net return seems like a reasonable assumed rate of return for hedge funds. This return is approximately 3-month U.S. Libor plus 150 basis points. However, it should also be noted that in the past after times of market dislocations, the realized alpha has been higher.

Commodities

Safe havens on a roll.

- Over the past ten years, commodities prices broadly have fallen, as measured by the Thomson Reuters CRB Commodity Index, down by roughly -14% from March 2010. Commodities broadly have strengthened in price since the April 2020 low.
- The U.S. dollar experienced a bout of volatility in the month of March 2020 and has fallen in value -5.9% from the end of March to the end of July. As measured by the DXY index it was virtually unchanged for year-over-year and is near the midpoint of the past 5 year trading range versus a basket of currencies.
- Safe haven commodity assets such as gold have performed well recently. At the end of June 2020, the dollar price for an ounce of gold was at \$1,800. This is 27% higher than the year prior. Over the past decade, the precious metal has appreciated by more than 44%, this is in sharp contrast to the broad commodity market in general. Investors in gold believe that the significant increase in debt by the U.S. as well as other large economies provides a tail-wind for the supply constraint metal.

Annual Total Returns of Key Asset Classes 2000 - 2019

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
Best	Gov't Bonds	Corp. Bonds	Gov't Bonds	Int'l Equity	Int'l Equity	Real Estate	Int'l Equity	Int'l Equity	Gov't Bonds	Int'l Equity	U.S. Equity	Real Estate	Int'l Equity	U.S. Equity	U.S. Equity	Real Estate	U.S. Equity	Int'l Equity	Real Estate	U.S. Equity	Best	
	13.23%	10.40%	11.50%	40.82%	20.90%	20.06%	26.65%	16.65%	12.38%	41.44%	16.38%	14.26%	16.83%	32.80%	13.08%	13.32%	11.93%	27.19%	6.71%	30.90%		
	Real Estate	Real Estate	Corp. Bonds	U.S. Equity	Real Estate	Int'l Equity	Real Estate	Real Estate	Cash	U.S. Equity	Real Estate	Gov't Bonds	U.S. Equity	Int'l Equity	Real Estate	U.S. Equity	Real Estate	U.S. Equity	Inflation	Int'l Equity		
	12.24%	7.28%	10.52%	29.58%	14.48%	16.62%	16.59%	15.84%	2.05%	27.24%	13.11%	9.02%	16.17%	15.29%	11.81%	1.01%	7.97%	21.13%	1.91%	22.13%		
	Corp. Bonds	Gov't Bonds	Real Estate	Hedge Funds	U.S. Equity	U.S. Equity	U.S. Equity	Gov't Bonds	Inflation	Corp. Bonds	Int'l Equity	Corp. Bonds	Real Estate	Real Estate	Corp. Bonds	Gov't Bonds	Corp. Bonds	Real Estate	Cash	Corp. Bonds		
	9.40%	7.24%	6.74%	9.01%	11.78%	5.65%	15.34%	8.67%	0.10%	16.05%	11.15%	8.35%	10.54%	10.99%	7.53%	0.86%	5.63%	6.96%	1.88%	14.54%		
	Cash	Cash	Hedge Funds	Real Estate	Hedge Funds	Hedge Funds	Hedge Funds	Hedge Funds	Corp. Bonds	Hedge Funds	Corp. Bonds	Inflation	Corp. Bonds	Hedge Funds	Gov't Bonds	Inflation	Int'l Equity	Corp. Bonds	Gov't Bonds	Gov't Bonds		
	6.16%	4.43%	3.57%	8.99%	5.83%	5.13%	9.21%	7.68%	-3.07%	9.65%	8.46%	2.96%	9.37%	7.70%	4.92%	0.66%	4.50%	6.42%	0.88%	6.83%		
	Hedge Funds	Hedge Funds	Inflation	Corp. Bonds	Corp. Bonds	Inflation	Cash	U.S. Equity	Real Estate	Inflation	Gov't Bonds	U.S. Equity	Hedge Funds	Inflation	Hedge Funds	Hedge Funds	Inflation	Hedge Funds	Hedge Funds	Hedge Funds		Real Estate
	5.77%	3.11%	2.39%	7.69%	5.25%	3.42%	4.81%	5.47%	-6.46%	2.72%	5.52%	1.75%	4.22%	1.49%	3.14%	0.37%	2.09%	3.88%	-1.05%	6.42%		
Inflation	Inflation	Cash	Gov't Bonds	Gov't Bonds	Cash	Corp. Bonds	Corp. Bonds	Hedge Funds	Cash	Hedge Funds	Cash	Gov't Bonds	Cash	Inflation	Cash	Hedge Funds	Gov't Bonds	Corp. Bonds	Hedge Funds			
3.39%	1.55%	1.79%	2.36%	3.48%	3.06%	4.27%	5.10%	-19.86%	0.19%	5.07%	0.10%	2.02%	0.07%	0.68%	0.01%	1.89%	2.30%	-2.51%	6.35%			
U.S. Equity	U.S. Equity	Int'l Equity	Inflation	Inflation	Gov't Bonds	Gov't Bonds	Cash	U.S. Equity	Gov't Bonds	Inflation	Hedge Funds	Inflation	Corp. Bonds	Cash	Corp. Bonds	Gov't Bonds	Inflation	U.S. Equity	Inflation			
-6.98%	-10.64%	-14.95%	1.88%	3.25%	2.65%	3.46%	5.03%	-36.72%	-2.19%	1.50%	-3.55%	1.70%	-2.01%	0.04%	-0.77%	1.05%	2.12%	-4.96%	2.29%			
Int'l Equity	Int'l Equity	U.S. Equity	Cash	Cash	Corp. Bonds	Inflation	Inflation	Int'l Equity	Real Estate	Cash	Int'l Equity	Cash	Gov't Bonds	Int'l Equity	Int'l Equity	Cash	Cash	Int'l Equity	Cash			
-15.31%	-19.74%	-21.30%	1.16%	1.33%	1.95%	2.55%	4.06%	-45.52%	-16.86%	0.13%	-13.71%	0.11%	-2.60%	-3.87%	-5.67%	0.27%	0.84%	-14.20%	2.28%			
Worst																				Worst		

		Annualized Returns 2000 - 2019																			
Return			Cash		Infl.		Hedge		Int'l.		Gov't.		Corp.		US Eq.		R.E.			Return	
Risk			1.77%		2.15%		3.16%		4.27%		4.59%		6.06%		6.44%		8.73%			Risk	
			0.96%		1.33%		4.79%		18.66%		4.44%		5.22%		15.93%		4.55%				

- Hedge Funds are represented by the HFRI FOF Conservative Index
- Inflation is represented by the U.S. Consumer Price Index (SA)
- International Equity is represented by the MSCI - AC World EX-USA Index
- Cash is represented by 30-day T-Bills
- U.S. Equity is represented by the S&P 1500 Index
- Real Estate is represented by the NCREIF National Property Index
- Corporate Bonds are represented by the BBG Barclays - U.S. Corp. Inv. Gd. Index
- Government Bonds are represented by the BBG Barclays - U.S. Government Index

State of Michigan Retirement System

DOMESTIC EQUITY REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	2.0%	9.7%	9.5%	11.4%	13.3%
S&P 1500	6.1%	9.9%	10.2%	11.7%	13.8%
Peer Median Return	3.6%	7.5%	7.4%	9.0%	12.1%
Percentile Rank vs. Peers *	65	31	27	25	32

*State Street Universe greater than \$1 billion

- In the quarter ended June 30, 2020, Total Domestic Equity outperformed its peer group over three, five, seven and ten years while underperforming the S&P 1500. During the past year, performance was 410 basis points (bps) behind the benchmark net of fees, with incurred tracking error of 3.4%.
- While the division outperformed the S&P 1500 in both January and February and has resumed its positive performance trajectory since markets were stabilized in April, both returns and risk metrics were impacted by the Black Swan impact of Covid-19 in March.
- The division's value orientation, investments in the financial sector and exposure to smaller companies have proved challenging in 2020, particularly during the heat of the crisis in the financial markets.
- Moreover, since the end of March, markets have become exceptionally bifurcated, with technology companies that are less sensitive to or even benefitting from the current "work from home" environment, skyrocketing in value to arguably inappropriate levels, while many other companies remain priced for a recessionary environment.
- This dynamic has led to one of the widest valuation dispersions in history, similar to the technology bubble of the late 1990's. While such dispersions can make it difficult for active managers to outperform, it can also lay the foundation for future excess returns if and when such relationships normalize.

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 division is in the process of implementing the Barra risk model, which will enable it to have an improved ability to measure its sensitivity to certain “buckets” of companies, such as those with price momentum (momentum stocks), discounted prices (value stocks) and high returns on invested capital (quality stocks).
- The goal is to have a balance of such companies in the portfolio, along with beta exposure when we believe markets are attractive, in order to drive consistent performance throughout the economic cycle.
- The division will be launching two new internal funds in September relating to this objective.
 - The first is a value, quality and momentum index fund, which will be comprised of equal exposure to each “factor bucket” and will be managed by Ted Kulinski, who heads our index fund strategies.
 - The second will be a momentum-based strategy, underpinned by deep analysis into companies that are engaged in disruptive innovation and address large underlying markets. This fund will be managed by Henry James, our internal technology specialist, who has decades of experience and an established track record of identifying such companies early in their lifespans.

Market Environment and Outlook

- At ~22x forward earnings, equity markets trade at a premium to both their historical average of 15.7x and their twenty-five-year historical average of 18x.
- Meanwhile treasury bonds trade at 150x earnings versus their historical average of 21x.
- Factoring this in, alongside near zero percent returns on cash, the enormous influx of money injected into the financial system from the Federal Reserve, and the continued availability of many attractively valued companies, stocks remain a reasonable alternative to bonds and bond-like asset classes.
- As of June 30, the market was paying out 1.8% of its earnings in dividends and reducing shares outstanding by 2.5% through share buybacks, for a 4.3% total shareholder yield. The market was also reinvesting back into growth at a rate of 1.8%, thus generating a roughly 6.1% investment return (shareholder yield of 4.3% + reinvestment rate of 1.8%).
- Given current recessionary conditions, growth, buybacks and dividends will all be negatively affected this year and possibly into next year, but the market should generate long-term investment returns in the 7-8% range looking ahead to 2021 and beyond as profitability improves and reinvestment picks up.
- Such returns compare favorably to the 30-year U.S. Treasury at 1.4%, and unfavorably to the historical compound annual return for the S&P 500 from 1928-2018 of 9.5%.

SMRS
Domestic Equity Strategies
6/30/20

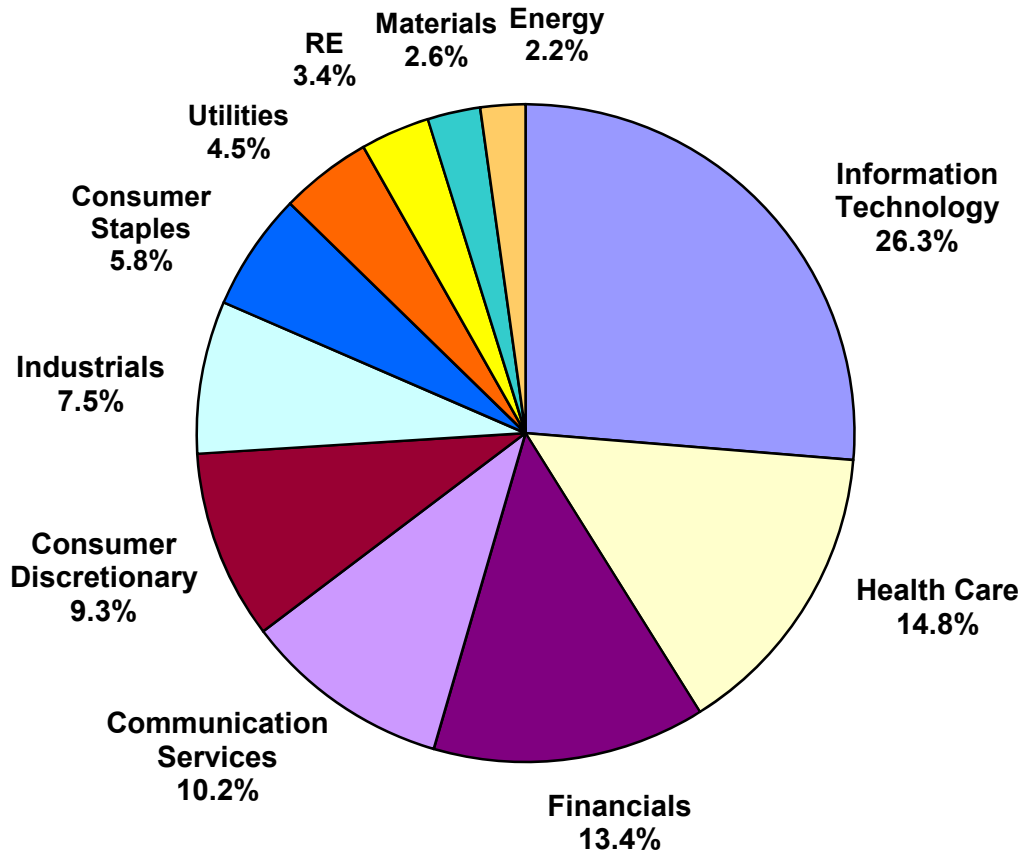
Markets	Amount	Total	% of Total
Internal Indexed (\$ in Millions)			
Indexed Portfolios	\$7,500		
Total Indexed		\$7,500	49.7%
Internal Active			
Active Portfolios	\$3,821		
Total Internal Active		\$3,821	25.4%
External Active			
Los Angeles Capital	\$1,188		
Mellon Capital	980		
ARK Investments	516		
Seizert Capital Partners	415		
Clarkston Capital Partners	384		
Attucks Asset Management	107		
Bivium Capital	101		
Ancora	<u>68</u>		
Total External Active		\$3,759	24.9%

Total Domestic Equity **\$15,080** **100.0%**

SMRS

Domestic Equity By Sector

6/30/20



Market Value in Millions				
6/30/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Information Technology	\$3,958	26.3%	26.5%	-0.2%
Health Care	2,236	14.8%	14.4%	0.4%
Financials	2,017	13.4%	10.5%	2.9%
Communication Services	1,541	10.2%	10.1%	0.1%
Consumer Discretionary	1,404	9.3%	11.1%	-1.8%
Industrials	1,137	7.5%	8.7%	-1.2%
Consumer Staples	879	5.8%	6.7%	-0.9%
Utilities	684	4.5%	3.1%	1.4%
Real Estate	512	3.4%	3.4%	0.0%
Materials	385	2.6%	2.8%	-0.2%
Energy	327	2.2%	2.7%	-0.5%
Total	<u>\$15,080</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Domestic Equities Composite

6/30/20

Date:	<u>6/30/20</u>	<u>3/31/20</u>	<u>12/31/19</u>	<u>9/30/19</u>
Assets (\$ in Millions):	\$15,080	\$12,954	\$17,645	\$16,789
Number of Securities:	1,304	1,316	1,354	1,316
Active Share:	31%	35%	41%	43%

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)	\$309.5	\$375.4	\$112.7
Normalized P/E	19.2	20.8	15.8
P/E Upside to S&P 1500	8.3%	0.0	31.7%
Price/Book	3.2	3.3	1.9
Return on Equity	15.6%	16.0%	12.0%
Risk Metrics			
Beta	1.04	1.00	0.99
Tracking Error	2.7%	0.0%	4.8%
Projected Returns			
Dividend Yield	2.0%	1.8%	2.8%
Buyback Yield	2.6%	2.5%	2.9%
Reinvestment Rate	<u>2.0%</u>	<u>1.8%</u>	<u>1.2%</u>
Projected Investment Return	<u>6.6%</u>	<u>6.1%</u>	<u>6.9%</u>

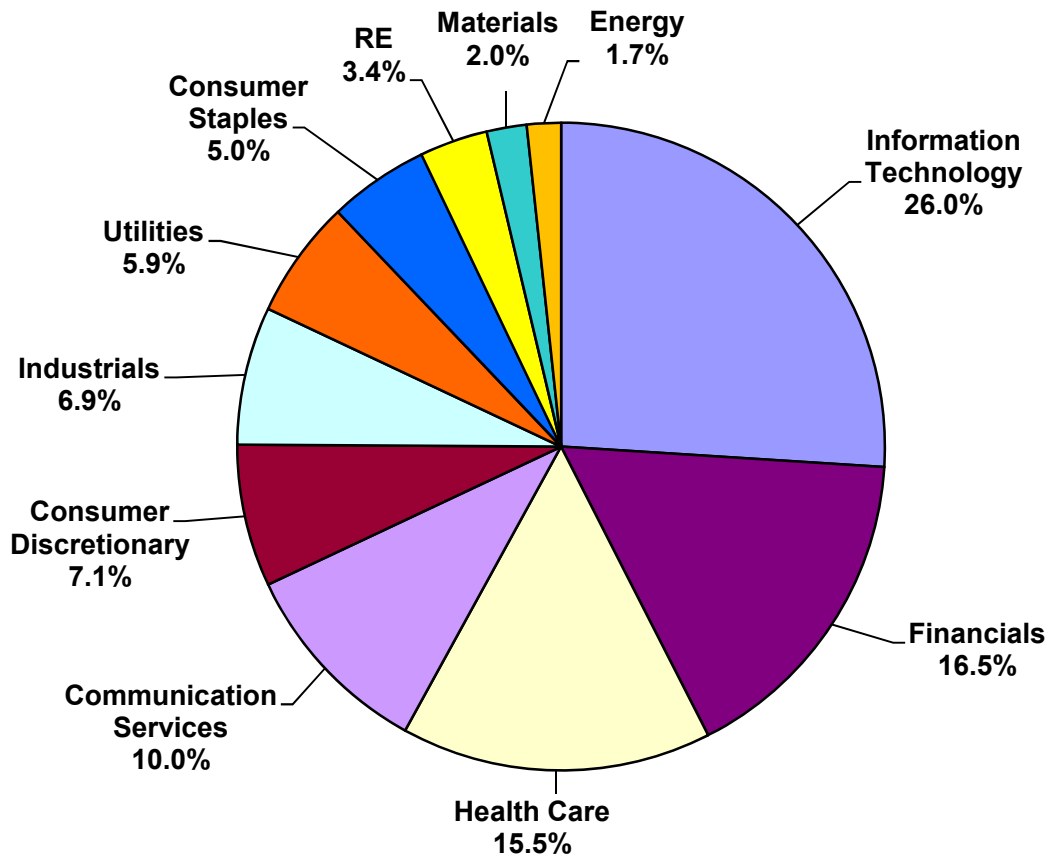
TOP TEN EXPOSURES – Domestic Equities vs S&P 1500 6/30/20

<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	7.1%	25.0	Microsoft Corp.	5.6%	37.7
Microsoft Corp.	4.4%	37.7	Apple, Inc.	5.3%	30.6
SPDR Port. LT Treasury ETF	4.3%	58.1	Amazon.com, Inc.	4.5%	162.6
Apple, Inc.	4.3%	30.6	Facebook, Inc. Class A	2.0%	33.6
Amazon.com, Inc.	3.1%	162.6	Alphabet, Inc., Class A	1.6%	36.4
Facebook, Inc. Class A	1.8%	33.6	Alphabet, Inc., Class C	1.5%	36.2
NextEra Energy, Inc.	1.5%	27.3	Johnson & Johnson	1.3%	18.6
Alphabet, Inc., Class A	1.3%	36.4	Berkshire Hathaway, Inc. B	1.3%	19.4
Visa, Inc.	1.2%	39.4	Visa, Inc.	1.2%	39.4
Berkshire Hathaway, Inc. B	1.0%	19.4	Procter and Gamble Co.	1.1%	24.5
TOTAL	<u>30.0%</u>	<u>34.8</u>	TOTAL	<u>25.4%</u>	<u>36.0</u>

SMRS

Active Equity By Sector

6/30/20



Market Value in Millions				
6/30/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Information Technology	\$1,971	26.0%	26.5%	-0.5%
Financials	\$1,252	16.5%	10.5%	6.0%
Health Care	\$1,173	15.5%	14.4%	1.1%
Communication Services	\$760	10.0%	10.1%	-0.1%
Consumer Discretionary	\$534	7.1%	11.1%	-4.0%
Industrials	\$527	6.9%	8.7%	-1.8%
Utilities	\$450	5.9%	3.1%	2.8%
Consumer Staples	\$380	5.0%	6.7%	-1.7%
Real Estate	\$256	3.4%	3.4%	0.0%
Materials	\$150	2.0%	2.8%	-0.8%
Energy	\$128	1.7%	2.7%	-1.0%
Total	<u>\$7,581</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

6/30/20

Date:	<u>6/30/20</u>	<u>3/31/20</u>	<u>12/31/19</u>	<u>9/30/19</u>
Assets (\$ in Millions):	\$7,581	\$7,367	\$10,232	\$9,969
Number of Securities:	873	957	1,069	1,052
Active Share:	61%	61%	70%	72%

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)	\$238.5	\$375.4	\$112.7
Normalized P/E	18.8	20.8	15.8
P/E upside to S&P 1500	10.6%	0.0	31.7%
Price/Book	2.0x	3.3x	1.9x
Return on Equity	17.5%	16.0%	12.0%
Risk Metrics			
Beta	1.01	1.00	0.99
Tracking Error	5.4%	0.0%	4.8%
Projected Returns			
Dividend Yield	2.2%	1.8%	2.8%
Buyback Yield	2.7%	2.5%	2.9%
Reinvestment Rate	<u>2.3%</u>	<u>1.8%</u>	<u>1.2%</u>
Projected Investment Return	<u>7.2%</u>	<u>6.1%</u>	<u>6.9%</u>

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

6/30/20

<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	9.5%	25.0	Microsoft Corp.	5.6%	37.7
SPDR Port. LT Treasury ETF	8.6%	58.1	Apple, Inc.	5.3%	30.6
Apple, Inc.	3.3%	30.6	Amazon.com, Inc.	4.5%	162.8
Microsoft Corp.	3.3%	37.7	Facebook, Inc. Class A	2.0%	33.6
NextEra Energy, Inc.	2.6%	27.3	Alphabet, Inc., Class A	1.6%	36.4
Amazon.com, Inc.	1.8%	162.6	Alphabet, Inc., Class C	1.5%	36.2
Athene Holding Ltd. Class A	1.6%	7.4	Johnson & Johnson	1.3%	18.6
CVS	1.6%	9.0	Berkshire Hathaway, Inc. B	1.3%	19.4
Facebook, Inc. Class A	1.5%	33.6	Visa, Inc.	1.2%	39.4
Square	1.5%	485.3	Procter and Gamble Co.	1.1%	24.5
TOTAL	<u>37.2%</u>	<u>14.3</u>	TOTAL	<u>25.4%</u>	<u>36.0</u>

Manager Performance - Net of Fees

6/30/20

<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	\$6,901,099,287	7.3%	10.6%	10.8%	12.2%	--	N/A
S&P 500		7.5%	10.7%	10.7%	12.1%	--	
Style & Risk Adjusted Benchmark		7.5%	10.7%	10.7%	12.1%	--	
Lipper Large-Cap Core		5.8%	9.4%	9.2%	10.8%	--	
<i>Excess Return</i>		-0.2%	-0.1%	0.0%	0.1%	--	
<i>Alpha</i>		-0.2%	-0.1%	0.1%	0.1%	--	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		42	34	21	15	--	
SMRS All-Cap Garp	1,455,415,290	-0.9%	5.7%	6.6%	9.7%	11.2%	4/30/11
S&P 1500 Super Composite		6.1%	9.9%	10.2%	11.7%	11.6%	
Style & Risk Adjusted Benchmark		-4.5%	10.6%	9.9%	12.0%	11.7%	
Lipper Multi-Cap Core		2.1%	6.8%	7.2%	9.4%	9.3%	
<i>Excess Return</i>		-6.9%	-4.2%	-3.6%	-2.1%	-0.4%	
<i>Alpha</i>		3.6%	-4.9%	-3.3%	-2.3%	-0.6%	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		70	68	68	51	22	
SMRS Large-Cap Core	1,038,989,214	-23.3%	0.9%	2.6%	6.8%	5.8%	8/31/07
S&P 500		7.5%	10.7%	10.7%	12.1%	8.3%	
Style & Risk Adjusted Benchmark		-16.3%	-2.0%	2.9%	6.2%	5.8%	
Lipper Large-Cap Core		5.8%	9.4%	9.2%	10.8%	7.5%	
<i>Excess Return</i>		-30.8%	-9.8%	-8.1%	-5.3%	-2.5%	
<i>Alpha</i>		-7.0%	2.9%	-0.3%	0.6%	0.0%	
<i>Pct Rank vs Lipper Large-Cap Core</i>		100	100	99	97	94	
Mellon US Equity Enhanced	979,654,809	26.6%	26.9%	--	--	27.5%	3/1/17
S&P 500		7.5%	10.7%	--	--	10.7%	
Style & Risk Adjusted Benchmark		14.4%	18.4%	--	--	18.7%	
Lipper Large-Cap Core		5.8%	9.4%	--	--	9.4%	
<i>Excess Return</i>		19.1%	16.1%	--	--	16.9%	
<i>Alpha</i>		12.2%	8.4%	--	--	8.9%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		1	1	--	--	1	
SMRS Large-Cap Growth	706,679,784	19.8%	19.1%	13.7%	15.8%	10.8%	5/31/05
S&P 500 Growth		17.8%	16.7%	14.6%	15.7%	10.9%	
Style & Risk Adjusted Benchmark		15.7%	16.6%	14.7%	15.9%	10.9%	
Lipper Large-Cap Growth		20.8%	18.1%	14.4%	15.6%	10.8%	
<i>Excess Return</i>		2.1%	2.3%	-0.9%	0.2%	0.0%	
<i>Alpha</i>		4.1%	2.5%	-1.0%	-0.1%	-0.1%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		59	37	67	48	43	
LA Capital All-Cap Growth	662,698,074	6.2%	12.1%	12.2%	14.3%	11.8%	5/31/05
S&P 1500 Growth		16.1%	15.7%	13.9%	15.1%	10.8%	
Style & Risk Adjusted Benchmark		15.4%	14.6%	12.5%	13.7%	8.8%	
Lipper Multi-Cap Growth		17.6%	16.1%	12.3%	13.8%	10.2%	
<i>Excess Return</i>		-9.8%	-3.6%	-1.7%	-0.8%	1.0%	
<i>Alpha</i>		-9.1%	-2.5%	-0.2%	0.6%	2.9%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		86	78	49	43	21	
SMRS Mid-Cap Index	598,661,035	-4.9%	3.2%	6.1%	8.8%	--	N/A
S&P 400		-6.7%	2.4%	5.2%	8.0%	--	
Style & Risk Adjusted Benchmark		-8.0%	2.4%	5.2%	8.0%	--	
Lipper Mid-Cap Core		-7.3%	2.0%	3.8%	6.7%	--	
<i>Excess Return</i>		1.8%	0.8%	0.9%	0.8%	--	
<i>Alpha</i>		3.1%	0.8%	0.9%	0.8%	--	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		37	40	22	22	--	
Large-Cap Consistent Growth	544,223,331	7.1%	18.7%	13.8%	--	13.2%	3/1/15
S&P 500		7.5%	10.7%	10.7%	--	9.8%	
Style & Risk Adjusted Benchmark		18.1%	16.0%	13.9%	--	12.7%	
Lipper Large-Cap Core		5.8%	9.4%	9.2%	--	8.4%	
<i>Excess Return</i>		-0.4%	8.0%	3.0%	--	3.4%	
<i>Alpha</i>		-11.0%	2.7%	-0.1%	--	0.4%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		45	1	1	--	1	

Fund Name	Market Value	1-Year	3-Years	5-Years	7-Years	Inception	Inception Date
LA Capital Deep Value	525,308,101	-12.6%	-0.1%	2.9%	--	2.7%	4/1/15
S&P 1500 Value		-5.5%	3.2%	5.7%	--	5.4%	
Style & Risk Adjusted Benchmark		-12.6%	-1.2%	6.2%	--	5.9%	
Lipper Multi-Cap Value		-10.3%	0.4%	3.1%	--	2.9%	
<i>Excess Return</i>		-7.0%	-3.3%	-2.7%	--	-2.7%	
<i>Alpha</i>		0.0%	1.0%	-3.3%	--	-3.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		72	61	56	--	56	
Ark Investments	516,282,559	27.4%	29.0%	--	--	32.0%	3/1/16
S&P 1500 Growth		16.1%	15.7%	--	--	17.3%	
Style & Risk Adjusted Benchmark		0.5%	24.4%	--	--	27.2%	
Lipper Multi-Cap Growth		17.6%	16.1%	--	--	17.5%	
<i>Excess Return</i>		11.4%	13.3%	--	--	14.7%	
<i>Alpha</i>		27.0%	4.7%	--	--	4.9%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		16	7	--	--	3	
Seizert Capital Partners	414,549,568	-2.4%	3.8%	6.1%	7.7%	11.4%	11/30/09
S&P 1500 Value		-5.5%	3.2%	5.7%	7.7%	10.4%	
Style & Risk Adjusted Benchmark		-5.3%	3.1%	5.6%	7.6%	10.4%	
Lipper Multi-Cap Value		-10.3%	0.4%	3.1%	5.8%	8.5%	
<i>Excess Return</i>		3.1%	0.6%	0.4%	-0.1%	1.0%	
<i>Alpha</i>		2.9%	0.7%	0.5%	0.1%	1.0%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		6	10	8	13	2	
Clarkston Capital Small/Mid-Cap	202,705,282	1.2%	5.6%	7.5%	--	9.2%	1/1/14
S&P 400		-8.0%	1.9%	5.0%	--	5.8%	
Style & Risk Adjusted Benchmark		-7.8%	-0.4%	4.1%	--	4.7%	
Lipper Mid-Cap Core		-7.3%	2.0%	3.8%	--	4.5%	
<i>Excess Return</i>		9.3%	3.8%	2.5%	--	3.4%	
<i>Alpha</i>		9.0%	6.0%	3.4%	--	4.5%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		3	14	8	--	1	
Clarkston Capital Large-Cap	181,503,636	-8.1%	3.6%	6.2%	--	6.1%	4/1/15
S&P 500 Value		-4.5%	3.7%	6.0%	--	5.7%	
Style & Risk Adjusted Benchmark		-7.5%	2.9%	4.8%	--	4.5%	
Lipper Large-Cap Value		-6.1%	3.3%	5.4%	--	5.2%	
<i>Excess Return</i>		-3.6%	-0.1%	0.2%	--	0.4%	
<i>Alpha</i>		-0.6%	0.7%	1.5%	--	1.6%	
<i>Pct. Rank vs. Lipper Large-Cap Value</i>		71	44	29	--	30	
Attucks Asset Management	106,769,724	-5.6%	3.9%	5.2%	7.6%	5.6%	11/30/07
S&P 1500		6.1%	9.9%	10.2%	11.7%	7.9%	
Style & Risk Adjusted Benchmark		-5.4%	3.1%	5.5%	12.0%	7.9%	
Lipper Multi-Cap Core		2.1%	6.8%	7.2%	9.4%	6.2%	
<i>Excess Return</i>		-11.7%	-6.0%	-5.0%	-4.2%	-2.2%	
<i>Alpha</i>		-0.2%	0.8%	-0.3%	-4.4%	-2.3%	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		91	81	80	83	69	
Bivium Capital Partners	101,331,146	-8.2%	2.0%	3.3%	6.7%	5.0%	11/30/07
S&P 1500 Value		-5.5%	3.2%	5.7%	7.7%	5.0%	
Style & Risk Adjusted Benchmark		-4.1%	3.7%	5.6%	7.7%	8.0%	
Lipper Multi-Cap Value		-10.3%	0.4%	3.1%	5.8%	4.1%	
<i>Excess Return</i>		-2.6%	-1.1%	-2.4%	-1.0%	0.0%	
<i>Alpha</i>		-4.1%	-1.7%	-2.3%	-1.0%	-3.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		28	27	48	31	26	
Ancora	67,604,519	-10.4%	--	--	--	-1.8%	10/1/17
S&P 1000		-8.0%	--	--	--	0.6%	
Style & Risk Adjusted Benchmark		-7.9%	--	--	--	0.6%	
Lipper Mid-Cap Core		-7.3%	--	--	--	0.9%	
<i>Excess Return</i>		-2.4%	--	--	--	-2.4%	
<i>Alpha</i>		-2.5%	--	--	--	-2.4%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		72	--	--	--	75	

State of Michigan Retirement System

PRIVATE EQUITY REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



Peter A. Woodford
Senior Investment Manager
Private Equity Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-0.2%	10.7%	10.1%	12.2%	13.0%
PE Benchmark Returns	-4.2%	8.3%	9.9%	12.9%	13.8%
Peer Median Returns	-2.2%	5.2%	6.2%	8.2%	9.3%
Percentile Rank vs. Peers*	39	10	7	7	9

*State Street Universe greater than \$1 billion

- Private Equity returns have been strong relative to peer median returns, ranking in the top 9% 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 public benchmarks during periods of expansion and lead public benchmarks during periods of contraction. The past ten years, largely an expansionary period, has been no exception; however, that spread has compressed following the COVID-19 driven downturn. Over this period, the Private Equity Division outperformed the S&P (ten-year S&P 500 return 10.5%; lagged one quarter to align with benchmark and valuations) by 2.5% but underperformed the PE benchmark by 80 bps.
- For the twelve months ending June 30, 2020, the Private Equity Division made contributions of approximately \$606 million, net of distributions. Although the pace of distributions continues to slow, stock distributions, predominantly from VC managers, have provided a notable lift year-to-date. After an active Q1 from a capital call perspective, contributions have significantly slowed as GPs have remained disciplined, conservatively deploying capital in an uncertain environment.
- Commitments closed during the quarter include:
 - \$25 million to Renaissance Venture Capital Fund IV, a venture capital fund-of-funds.
 - \$42.5 million to Meritech Capital Partners VII, a late-stage, technology-focused venture capital fund.
 - \$75 million to Silver Lake Partners VI, a large-cap buyout fund with a technology emphasis.
 - €100 million (\$112 million) to CVC Capital Partners Fund VIII, a large-cap buyout fund with a European focus.

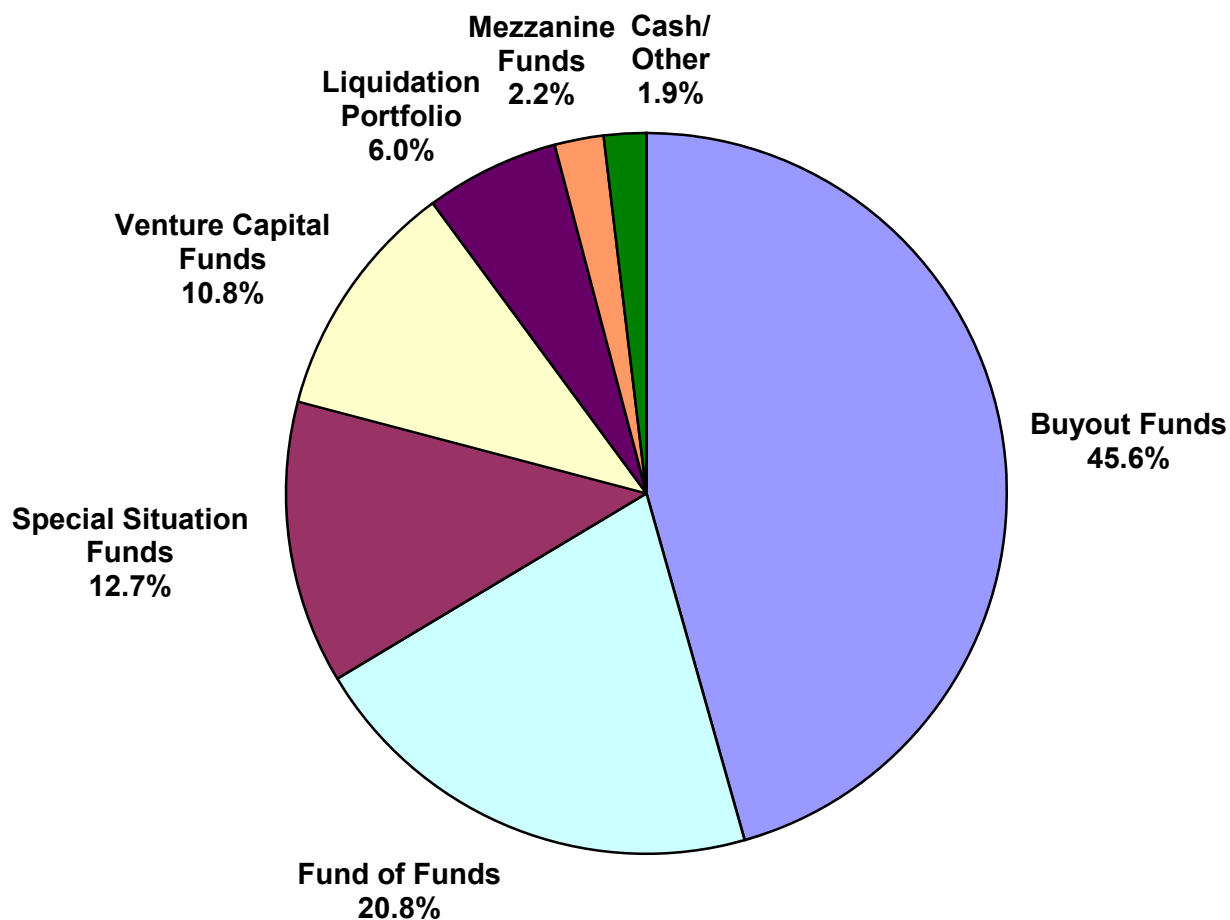
Strategy Update

The strategy for the next twelve months will focus primarily on existing sponsors raising successor funds. This may be a combination of buyout, venture capital, secondary, and growth equity funds returning to market. The Private Equity Division continues to tilt slightly toward the middle- and lower-middle market to diversify its exposure to large funds. The Venture Capital Division will continue to pursue attractive opportunities across all strategies with a focus on early stage and a bias towards healthcare versus the broader market. Co-investments will continue to play an important role in both averaging down costs and targeting specific investments with attractive risk/return characteristics.

SMRS

Private Equity

6/30/20



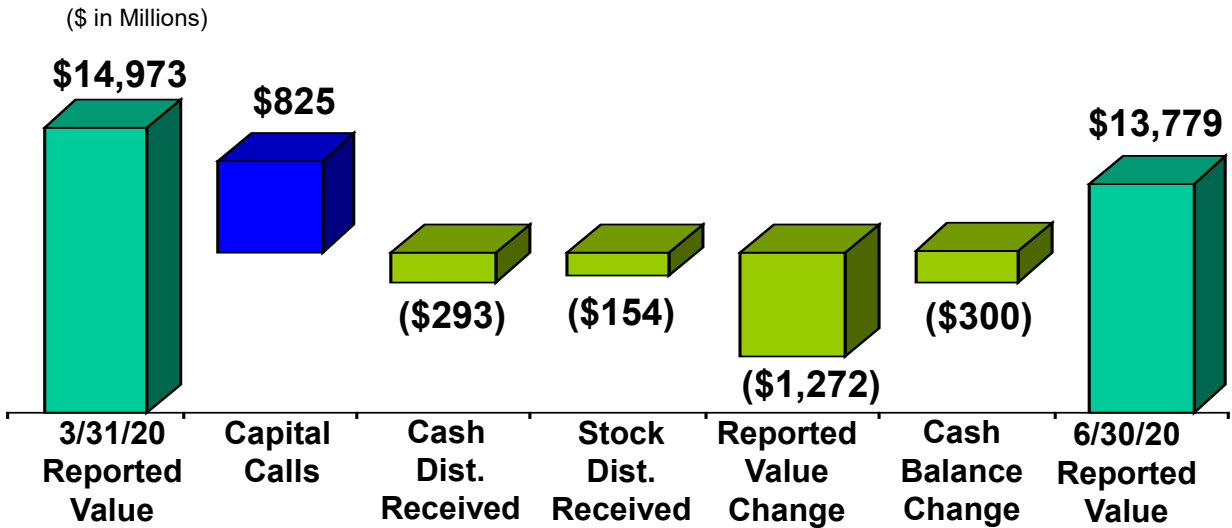
Market Value in Millions				
	<u>6/30/20</u>		<u>6/30/19</u>	
Buyout Funds	\$6,283	45.6%	\$5,947	44.5%
Fund of Funds	2,870	20.8%	2,368	17.7%
Special Situation Funds	1,752	12.7%	1,810	13.5%
Venture Capital Funds	1,480	10.8%	1,518	11.4%
Liquidation Portfolio	828	6.0%	1,022	7.6%
Mezzanine Funds	300	2.2%	295	2.2%
Cash/Other	266	1.9%	420	3.1%
Total	<u>\$13,779</u>	<u>100.0%</u>	<u>\$13,380</u>	<u>100.0%</u>

SMRS

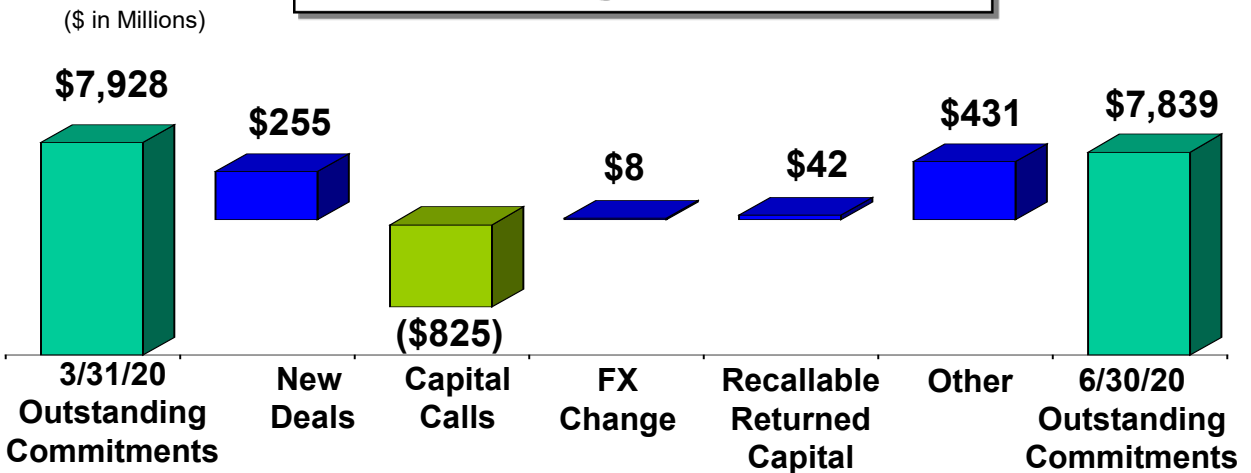
Private Equity

6/30/20

Invested Commitments



Outstanding Commitments

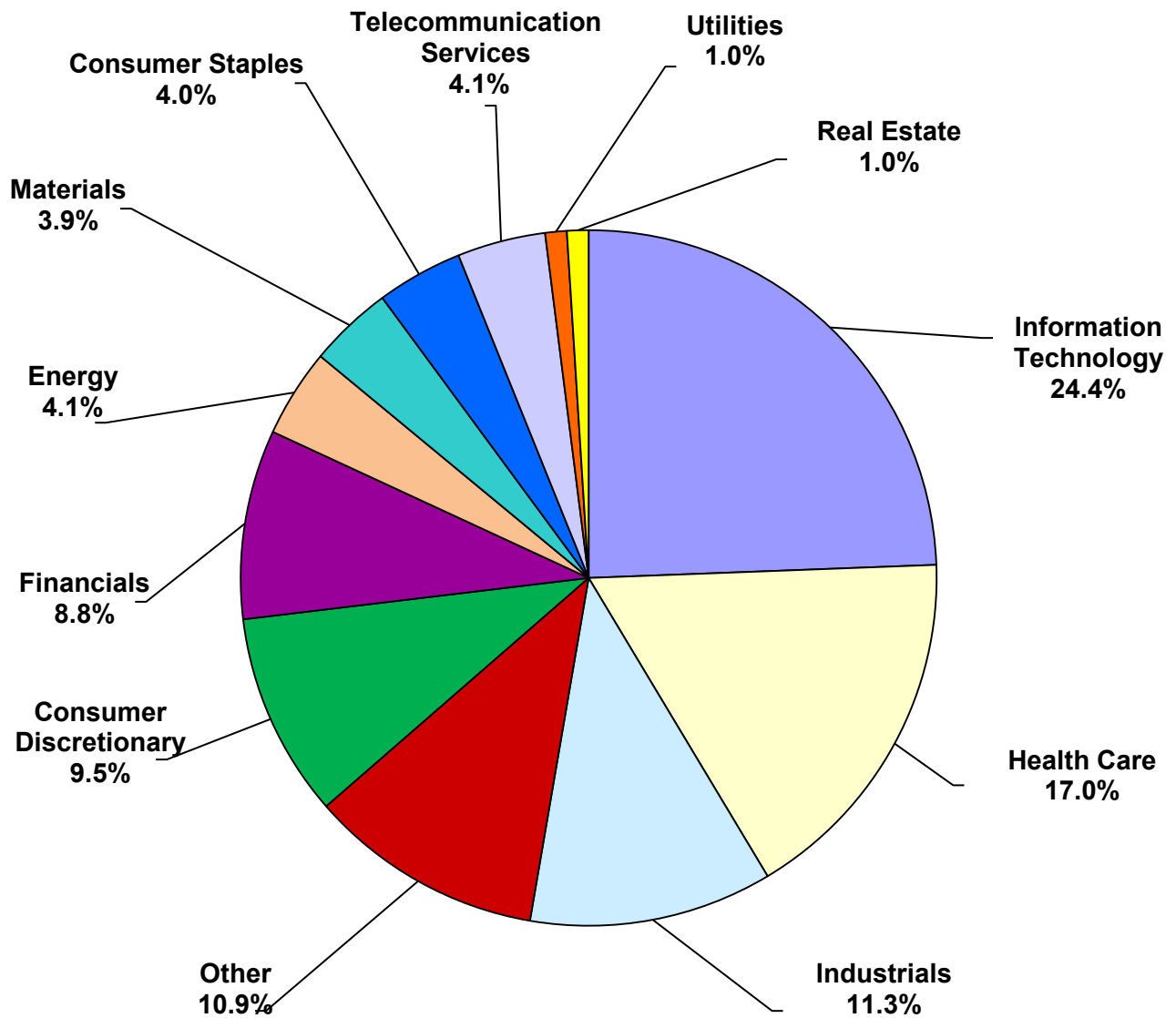


SMRS

Private Equity

6/30/20

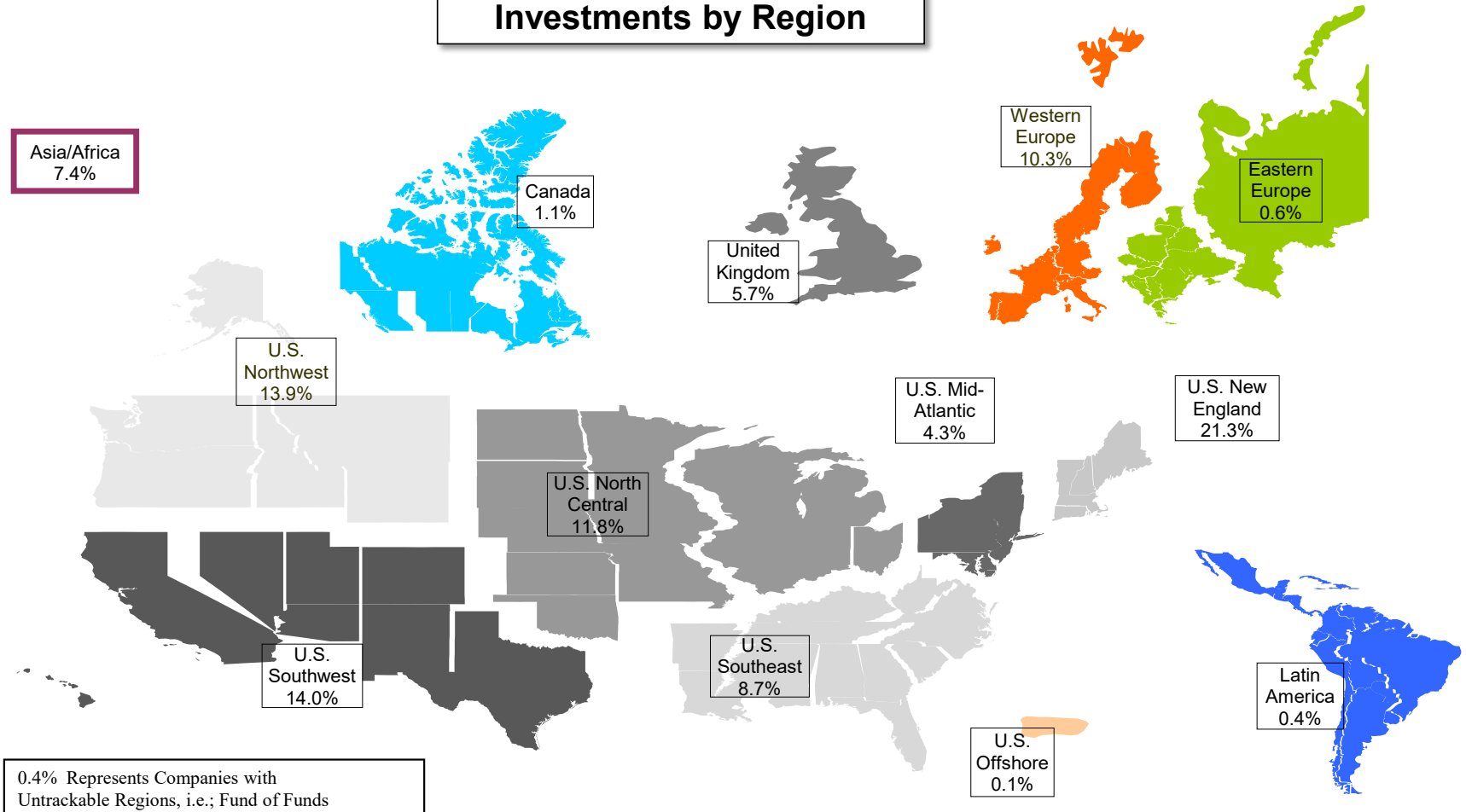
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 3/31/20 and are subject to change.

SMRS Private Equity 6/30/20

Investments by Region



Geographic Report: North America 74%, Europe 16%, Asia 7%, Other 3%

SMRS

Private Equity

6/30/20

Portfolio by Vintage Year

(\$ in Millions)

<u>Asset Vintage</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>
1986-2005	\$ 269	\$ 104	\$ 373
2006*	317	116	433
2007	159	121	280
2008	355	79	434
2009	13	1	14
2010	159	4	163
2011	586	99	685
2012	982	75	1,057
2013	273	108	381
2014	1,347	279	1,626
2015	4,933	807	5,740
2016	1,918	505	2,423
2017	858	841	1,699
2018	963	1,888	2,851
2019	307	2,061	2,368
2020	73	751	824
Income Accruals	1	0	1
Cash	256	0	256
Act. Small Cap - Stock Dist	10	0	10
Total	<u>\$ 13,779</u>	<u>\$ 7,839</u>	<u>\$ 21,618</u>

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

<u></u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>	<u>Total (USD)</u>
Euro (\$1.12/ €)	€ 382	€ 423	€ 805	\$904

SMRS

Private Equity

6/30/20

Top 10 Sponsors

(\$ in Millions)

Asset Type	Reported Value	Outstanding Commitment	Total
HarbourVest Partners, LLC	\$ 3,276	\$ 892	\$ 4,168
Blackstone Group, The	489	371	860
Leonard Green & Partners, L.P.	424	410	834
Kohlberg, Kravis, Roberts & Co.	530	271	801
Warburg, Pincus LLC	530	240	770
Carlyle Group, L.P.	391	355	746
Advent International Corp.	440	292	732
Grosvenor Capital Management, L.P.	537	116	653
Flagship Ventures	372	183	555
InSight Venture Partners	399	97	496
Top 10 Total Value	\$ 7,388	\$ 3,227	\$ 10,615

Cash Weighted Rates of Return*

(Net IRR)	Current Qtr.	1-Year	3-Year	5-Year	10-Year
Buyout	0.1%	-5.2%	9.2%	10.3%	14.4%
Fund of Funds	0.0%	-8.3%	5.5%	6.7%	9.3%
Mezzanine	-0.1%	-1.6%	7.2%	7.6%	10.0%
Special Situations	0.0%	-4.9%	5.6%	6.8%	11.1%
Venture Capital	-0.1%	-1.6%	13.2%	9.4%	17.2%

*These numbers are based on most recent available General Partner reported data; primarily 3/31/2020 and are subject to change.

SMRS

Private Equity

6/30/20

Net Market Values by Ownership Entity

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
5AM Opportunities I, L.P.	\$ 11,157,302	\$ 19,050,000
5AM Ventures VI, L.P.	5,113,701	14,300,000
Accel Europe I, L.P.	2,812,617	1
Accel Europe II	26,297,346	3,300,000
Accel Growth Fund II, L.P.	9,901,695	0
Accel Growth Fund III, L.P.	8,294,222	840,000
Accel Growth Fund IV L.P.	24,562,655	990,000
Accel Growth Fund V L.P.	10,636,245	16,919,178
Accel IX, L.P.	3,195,038	3,000,000
Accel Leaders Fund II L.P.	4,887,117	4,312,500
Accel Leaders Fund L.P.	10,669,565	0
Accel London V L.P.	19,186,756	1,560,000
Accel London VI, L.P.	2,616,362	9,625,000
Accel VI-S	1,977,149	652,611
Accel VI, L.P.	779,851	0
Accel X, L.P.	10,229,243	0
Accel XI, L.P.	3,248,040	1,440,000
Accel XII, L.P.	10,332,403	1,190,000
Accel XIII, L.P.	7,231,258	3,300,000
Accel XIV L.P.	2,894,749	6,850,000
Acorn Bioventures, L.P.	30,000,000	70,000,000
Advent Global Private Equity V	5,324,522	8,700,000
Advent International GPE IX, L.P.	55,485,428	188,750,000
Advent International GPE VI-A LP	23,702,001	0
Advent International GPE VII-B, L.P.	113,688,012	12,000,000
Advent International GPE VIII-B, L.P.	221,592,528	14,174,998
Advent International LAPEF VII	0	60,000,000
Advent Latin American Private Equity Fund VI, L.P.	20,270,221	7,980,000
Affinity Asia Pacific Fund III, L.P.	4,024,699	8,913,061
Affinity Asia Pacific Fund IV, L.P.	55,889,525	19,555,459
Affinity Asia Pacific Fund V L.P.	28,099,309	140,396,722
AIP VII, L.P.	2,649,332	71,026,423
Apax Digital, L.P.	20,925,064	28,318,858
Apax Europe Fund VI	14,259,762	2,375,236
Apax Europe VII, L.P.	509,986	1,672,798
Apax IX, L.P.	167,287,226	15,247,386
Apax US VII	2,036,067	417,509
Apax VIII - B, L.P.	58,041,896	7,832,881

	Adjusted Reported Value	Unfunded Commitment
Apax X USD L.P.	0	150,000,000
Apollo Investment Fund IX, L.P.	22,106,832	75,028,110
Apollo Investment Fund VIII L.P.	67,391,629	13,727,389
Arboretum Ventures II	958,755	0
Arboretum Ventures III, L.P.	14,909,866	0
Arboretum Ventures IV, L.P.	20,646,056	9,720,000
Arboretum Ventures V, L.P.	2,262,596	31,955,000
Ares Corporate Opportunities Fund II	172,835	11,423,773
Ares Corporate Opportunities Fund III, LP	6,986,944	7,048,927
Ares Corporate Opportunities Fund IV, L.P.	62,459,824	14,586,157
ASF VIII B	29,825,448	122,894,781
AXA ASF Miller Co-Investment	380,977	6,656,684
Axiom Asia Co-Investment Fund I, L.P.	20,374,143	28,943,451
Axiom Asia IV, L.P.	52,990,251	9,950,886
Axiom Asia Private Capital Fund III, L.P.	51,639,392	5,729,639
Axiom Asia V, L.P.	16,283,381	33,750,000
BC European Capital IX	56,624,587	7,838,688
BC European Capital VII, L.P.	633,681	0
BC European Capital VIII, L.P.	3,288,578	8,756,578
Berkshire Fund IX Coinvestment Fund, L.P.	15,443,103	27,421,161
Berkshire Fund IX, L.P.	95,388,651	75,459,166
Berkshire Fund VI, L.P.	16,677,112	7,600,677
Berkshire Fund VII, L.P.	6,928,483	2,444,220
Berkshire Fund VIII, L.P.	80,965,730	7,115,318
Blackstone Capital Partners IV	4,303,246	4,580,765
Blackstone Capital Partners V	6,956,497	13,069,148
Blackstone Capital Partners V-S	729,511	712,476
Blackstone Capital Partners VI, LP	147,229,353	32,907,897
Blackstone Capital Partners VII, L.P.	252,755,675	46,603,501
Blackstone Capital Partners VIII L.P.	0	200,000,000
Bridgepoint Europe IV	11,309,140	4,828,750
Carlyle Europe Partners II	569,310	4,153,347
Carlyle Europe Partners III	7,740,911	5,136,766
Carlyle Europe Partners IV, L.P.	101,110,009	12,096,183
Carlyle Europe Partners V, S.C.SP.	17,654,125	117,774,061
Carlyle Partners V L.P.	31,067,395	52,623,545
Carlyle Partners VI, L.P.	148,504,000	11,497,087
Carlyle Partners VII, L.P.	84,499,191	152,011,959
Centerbridge Capital Partners III, LP	60,025,808	30,757,036
Cerberus SMRS Partners, L.P.	31,538,027	23,304,657
Charlesbank Equity Fund IX, L.P.	31,862,100	57,302,735
Charlesbank Fund IX Overage Allocation Program	28,021,587	22,458,489
CircleUp Credit Fund I, LP	23,298,109	2,242,795
CLEARLAKE CAPITAL PARTNERS VI, L.P.	7,313,167	67,684,186
Clearlake Opportunities Partners II, LP	17,932,536	55,939,901
CM Liquidity Fund, L.P.	0	25,000,000

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Coller International Partners V, L.P.	12,013,219	2,000,000
Coller International Partners VI, L.P.	31,485,564	29,723,267
Coller International Partners VII, L.P.	132,844,994	34,955,215
Crescent Mezzanine Partners VI, L.P.	21,635,815	5,681,254
Crescent Mezzanine Partners VII	74,877,666	64,987,141
CVC Capital Partners VII, L.P.	83,151,234	84,520,588
** CVC Capital Partners VIII, L.P.	0	112,314,999
Dover Street IX, L.P.	70,560,945	23,000,000
Dover Street X, L.P.	14,731,389	135,000,000
EnCap Energy Capital Fund X, L.P.	26,067,252	6,681,669
FIMI Opportunity 6, L.P.	29,659,636	25,000,003
FirstMark Capital I, L.P.	36,787,918	196,596
FirstMark Capital IV, L.P.	26,242,728	11,200,000
FirstMark Capital OF I, L.P.	24,446,318	0
FirstMark Capital OF II, L.P.	40,395,963	0
FirstMark Capital OF III	2,100,000	32,900,000
FirstMark Capital P2, L.P.	116,363,391	0
FirstMark Capital V, L.P.	0	35,000,000
Flagship Pioneering Origination Fund VII	3,750,000	71,250,000
Flagship Pioneering SOF II, L.P.	23,550,177	75,500,000
Flagship Pioneering VI	85,900,279	30,750,000
Flagship Ventures Fund 2004	27,008	0
Flagship Ventures Fund 2007, L.P.	7,054,908	0
Flagship Ventures Fund IV, L.P.	103,306,257	0
Flagship Ventures Fund V	106,696,578	0
Flagship Ventures Opportunities Fund I, L.P.	41,478,525	5,750,000
Fox Paine Capital Fund II, LP	21,877,141	15,382,699
FS Equity Partners VII, L.P.	91,158,872	13,216,106
FS Equity Partners VIII, L.P.	19,054,667	53,296,480
G-IV Acquisition Holdings, LLC	9,121,776	0
GCM Grosvenor Fund Investment Program I, L.P.	7,071,010	1,256,800
GCM Grosvenor Fund Investment Program II, L.P.	22,453,773	13,267,284
GCM Grosvenor Fund Investment Program III - 2004	27,081,629	4,419,938
GCM Grosvenor Fund Investment Program III - 2006	35,232,362	6,750,459
GCM Grosvenor Fund Investment Program V, L.P.	52,445,738	9,245,914
GCM Grosvenor Fund Investment Program VI, L.P.	26,063,694	3,566,639
GCM Grosvenor Fund Investment Program VIII, L.P.	74,947,669	22,400,297
GCM Grosvenor SeasPriFIP LP (PIS06-10)	39,178,713	16,704,440
GCM Grosvenor SeasPriFIP LP (PIS14)	229,221,841	21,744,279
GCM Grosvenor SeasPriFIP LP (Seed)	23,058,055	16,556,088
Genstar Capital Partners IX, L.P.	16,556,216	58,033,374
Genstar Capital Partners VIII, L.P.	62,053,609	5,464,572
Genstar IX Opportunities Fund I, LP	14,941,212	34,969,695
Genstar VIII Opportunities Fund I, L.P.	57,999,405	2,750,030
Golden Bell Azalea, LLC	9,500,000	0
Green Equity Investors V	100,226,555	25,966,435

	Adjusted Reported Value	Unfunded Commitment
Green Equity Investors VI, L.P.	125,554,466	10,666,423
Green Equity Investors VII, L.P.	190,298,644	31,594,971
Green Equity Investors VIII, L.P.	0	250,000,000
Greenspring Master G, L.P.	69,869,016	80,000,000
Greenspring Micro II, L.P.	10,371,448	14,716,263
GSO Capital Opportunities Fund II, L.P.	8,152,157	8,095,124
GSO Capital Opportunities Fund III, L.P.	47,601,643	37,245,690
GSO COF III Co-Investment Fund, L.P.	21,055,507	27,703,099
HarbourVest Credit Opportunities Fund II, LP	0	75,000,000
HarbourVest Dover Street VIII, L.P.	21,542,272	6,075,000
HarbourVest Int'l III Partnership	151,264	1,200,000
Harbourvest Partners Co-Investment Fund IV L.P.	80,985,437	19,107,835
HarbourVest Partners Co-Investment Fund V L.P.	63,700,162	130,000,000
HarbourVest Partners Mezzanine Income Fund	73,892,153	16,310,000
HarbourVest V Partnership	128,442	300,000
HarbourVest VI - Direct Fund LP	2,097,695	750,000
HarbourVest VI Partnership	453,128	2,000,000
Harvest Partners VII, L.P.	67,760,658	3,986,834
Harvest Partners VIII	39,340,004	60,159,228
HPS Mezzanine Partners III, L.P.	45,052,502	7,732,633
Insight Partners XI, L.P.	15,000,000	85,000,000
Insight Venture Partners Growth-Buyout Coinvestment	87,404,571	5,378,020
Insight Venture Partners IX, L.P.	187,856,858	492,418
Insight Venture Partners X, L.P.	109,105,472	6,200,000
Jade Equity Investors, L.P.	7,997,734	92,002,266
Kelso Investment Associates IX, L.P.	66,880,345	12,172,444
Kelso Investment Associates VII	160,467	0
Kelso Investment Associates VIII	22,694,885	22,036,170
Kelso Investment Associates X, L.P.	16,491,310	81,084,345
Khosla Ventures III, L.P.	12,386,865	750,000
Khosla Ventures IV, L.P.	68,547,465	950,000
Khosla Ventures Seed D, L.P.	5,343,555	4,550,000
Khosla Ventures V, L.P.	65,123,803	1,750,000
Khosla Ventures VI, L.P.	35,823,483	38,400,000
KKR 2006 Fund, L.P.	77,115,023	4,728,614
KKR Americas Fund XII, L.P.	107,392,514	97,689,860
KKR Asian	1,924,673	0
KKR Asian Fund II, L.P.	43,159,428	262,660
KKR Asian Fund III	59,749,408	46,453,873
KKR China Growth Fund	22,563,577	3,383,656
KKR European Fund II	1,073,023	0
KKR European Fund III	5,969,770	6,430,608
KKR European Fund IV L.P.	92,482,429	7,590,357
KKR European Fund V (USD) SCSp	22,826,374	96,677,082
KKR Millennium Fund	232,956	0
KKR North America Fund XI, L.P.	95,771,245	7,568,977

	Adjusted Reported Value	Unfunded Commitment
Lead Edge Capital IV, L.P.	21,952,774	6,608,536
Lightspeed Opportunity Fund, L.P.	8,209,918	16,750,000
Lightspeed Venture Partners Select IV, L.P.	2,500,000	22,500,000
Lightspeed Venture Partners VII, L.P.	10,826,021	0
Lightspeed Venture Partners XIII, L.P.	600,000	9,400,000
Menlo Special Opportunities Fund II, L.P.	8,025,848	22,205,284
Menlo Ventures IX, L.P.	935,026	0
Menlo Ventures X, L.P.	1,980,641	0
Menlo Ventures XI, L.P.	15,242,207	0
Menlo Ventures XIV, L.P.	5,902,392	1,400,000
Meritech Capital Partners IV, L.P.	9,183,480	600,000
Meritech Capital Partners V, L.P.	28,624,352	1,450,000
Meritech Capital Partners VI, L.P.	29,010,205	12,375,000
** Meritech Capital Partners VII, L.P.	0	42,500,000
Michigan Growth Capital Partners II, L.P.	137,432,513	3,524,497
Michigan Growth Capital Partners III, L.P.	84,619,074	28,328,763
Michigan Growth Capital Partners, LP	58,816,032	9,072,836
New Leaf Biopharma Opportunities II, L.P.	102,922,215	12,000,000
New Leaf Growth Fund I, L.P.	49,558,882	0
New Leaf Ventures II, L.P.	6,746,150	0
New Leaf Ventures III, L.P.	43,635,738	0
New Leaf Ventures IV, L.P.	24,000,635	23,562,500
Nordic Capital VI, L.P.	154,671	1
Nordic Capital VII	406,601	3,141,057
Nordic Capital VIII, L.P. (Alpha)	33,606,825	5,393,553
Oak Investment Partners X, L.P.	410,012	0
Oak Investments Partners IX, L.P.	140,192	0
Oaktree Opportunities Fund X, L.P.	25,914,283	5,100,000
Oaktree Opportunities Fund Xb, L.P.	22,632,977	42,000,000
OCM Opportunities Fund IX, L.P.	43,041,199	0
OCM Opportunities Fund VII (B), L.P.	111,030	2,500,000
OCM Opportunities Fund VII, L.P.	358,836	0
OCM Opportunities Fund VIII B, L.P.	9,352,207	0
OCM Opportunities Fund VIII, L.P.	823,395	0
OCM Principal Opportunities Fund IV	534,713	4,998,467
Ocqueoc Holdings, LLC	9,219,380	48,741,756
Odyssey Investment Partners Fund VI, LP	4,021,446	95,978,554
Parthenon Investors II	432,796	3,186,779
Parthenon Investors III	27,734,234	2,682,182
Parthenon Investors IV, L.P.	43,500,535	2,757,740
Peninsula Capital Fund IV	14,051	2,201,026
Peninsula Fund VI, L.P.	33,691,254	6,124,373
Permira Growth Opportunities I, L.P.1	14,213,288	33,750,000
Permira VII L.P. 1	14,071,333	69,073,724
PPC Fund II	40,112,647	38,290,758
Public Pension Capital, LLC	63,811,625	50,890,818

	Adjusted Reported Value	Unfunded Commitment
** Renaissance Venture Capital Fund IV, L.P.	0	25,000,000
Rhone Partners V, L.P.	83,777,476	35,699,978
Riverside Capital Appreciation Fund VI, LP	37,634,761	7,189,562
Riverside Capital Appreciation Fund VII, L.P.	32,577,164	58,655,964
Riverside Micro Cap Fund I, LP	14,951,494	5,632,976
Riverside Micro-Cap Fund II, L.P.	48,403,039	2,735,834
Riverside Micro-Cap Fund III, L.P.	75,221,538	4,823,424
Riverside Micro-Cap Fund IV	54,348,291	3,890,438
Riverside Micro-Cap Fund IV B, L.P.	4,625,351	9,317,702
Riverside Micro-Cap Fund V, L.P.	21,404,903	75,023,352
Science Ventures Fund II, L.P.	22,073,090	3,800,000
Science Ventures Fund III, LP	4,955,357	20,000,000
Shamrock Capital Content Fund I, L.P	33,907,998	16,468,263
Shamrock Growth Capital Fund IV, L.P.	26,834,205	20,493,113
Silver Lake Partners II	22,797	3,531,586
Silver Lake Partners III	15,749,514	11,092,521
Silver Lake Partners IV, L.P.	59,491,258	2,084,020
Silver Lake Partners V, L.P.	48,069,913	22,382,511
** Silver Lake Partners VI, L.P.	0	75,000,000
Silver Lake SL SPV-2	27,990,166	0
SK Capital Partners V, L.P.	12,639,604	35,897,698
SKCP Catalyst Fund I-A, L.P.	4,471,494	30,066,366
SM/TCP L.P.	14,905,375	1,615,217
SMRS - TOPE LLC	2,368,778,589	240,808,071
SMRS-CAPP LLC	42,740,436	61,300,000
SMRS-NCRP LLC	536,092,630	180,958,521
Summit Partners Growth Equity Fund X, L.P.	8,826,315	92,220,000
Sycamore Partners III, L.P.	7,032,702	85,363,601
TCW/Crescent Mezzanine Partners V, LLC	6,251,041	12,395,466
TCW/Crescent Mezzanine Partners VC Secondary	1,960,765	0
The Huron Fund III, L.P.	7,972,101	2,072,756
The Huron Fund IV, L.P.	31,648,050	2,502,309
The Huron Fund V, L.P.	12,832,352	22,083,436
The Shansby Group 5 (TSG5)	467,996	4,261,291
Thoma Bravo Discover Fund II, L.P.	45,291,824	29,338,156
Thoma Bravo Fund XII, L.P.	194,469,949	2,633,922
Thoma Bravo Fund XIII, L.P.	95,131,350	34,640,223
TI Platform BOV, L.P.	5,199,725	9,824,395
TI Platform Fund II, L.P.	3,768,545	11,120,048
TI Platform SMRS SMA, L.P.	19,342,596	41,818,556
TPG Healthcare Partners, L.P.	2,287,447	22,148,159
TPG IV (Texas Pacific Group IV)	616,377	211,725
TPG Partners III, LP	461,539	2,087,002
TPG Partners VI, L.P.	50,319,605	9,990,887
TPG Partners VIII, L.P.	8,472,771	113,787,668
TPG Partners, VII, L.P.	138,648,311	16,017,346

	Adjusted Reported Value	Unfunded Commitment
TPG V (Texas Pacific Group V)	5,609,531	5,841,509
Trilantic Capital Partners V (North America) Fund A, L.L.	27,121,986	3,594,193
Trilantic Capital Partners VI (North America) L.P.	13,385,992	57,276,813
TSG6, L.P.	80,080,933	22,431,360
TSG7 A L.P.	112,001,382	30,502,901
TSG8, L.P.	11,781,662	127,893,954
Turnbridge Capital Partners I , LP	49,208,978	37,927,757
Veritas Capital Fund V, L.P.	141,082,385	11,358,273
Veritas Capital Fund VI, L.P.	145,820,465	13,494,710
Veritas Capital Fund VII, LP	781,283	99,218,717
Veritas V Co-Investors, L.P.	81,049,386	0
Vista Equity Endeavor Fund I, L.P.	44,407,151	8,198,027
Vista Equity Endeavor Fund II, LP	4,909,328	59,153,945
Vista Equity Partners Fund V, L.P.	49,517,036	11,649,766
Vista Equity Partners Fund VI, L.P.	90,762,509	11,101,567
Vista Equity Partners VII, L.P.	17,495,877	56,183,207
Vista Foundation Fund III, L.P.	23,310,923	8,108,187
Vista Foundation Fund IV, L.P.	0	75,000,000
Warburg Pincus China-Southeast Asia II, L.P.	2,300,412	72,375,000
Warburg Pincus China, L.P.	48,026,113	4,477,500
Warburg Pincus Energy MCIP, L.P.	0	10,396,887
Warburg Pincus Energy, L.P.	58,616,303	10,300,000
Warburg Pincus Equity Partners, L.P.	1,181,942	0
Warburg Pincus Financial Sector, L.P.	26,761,744	19,215,000
Warburg Pincus Global Growth, L.P.	32,037,040	115,650,000
Warburg Pincus International Partners	593,643	0
Warburg Pincus Private Equity IX	7,671,634	0
Warburg Pincus Private Equity VIII, L.P.	277,879	0
Warburg Pincus Private Equity X, L.P.	40,200,679	0
Warburg Pincus Private Equity XI, L.P.	101,858,157	0
Warburg Pincus Private Equity XII Secondary, L.P.	26,244,298	987,500
Warburg Pincus Private Equity XII, L.P.	183,916,631	6,912,500
WestAm COREplus Private Equity QP	392,608	2,086,719
Total Private Equity	\$ 13,513,130,302	\$ 7,839,431,480
Cash	219,870,956	0
Active Small Cap Cash	35,979,009	0
Active Small Cap	9,658,083	0
Income Accruals	378,976	0
Grand Total	\$ 13,779,017,326	\$ 7,839,431,480

Total Private Equity amounts do not include Cash and Active Small Cap
New Commitments made during quarter reported

State of Michigan Retirement System

INTERNATIONAL EQUITY REVIEW

State of Michigan Investment Board Meeting

September 10, 2020



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-3.4%	1.8%	3.1%	4.9%	6.1%
MSCI ACWI ex USA Returns	-4.8%	1.1%	2.3%	3.8%	5.0%
Peer Median Returns	-3.5%	1.7%	2.9%	4.3%	6.1%
Percentile Rank vs. Peers*	46	50	48	38	57

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

- The International Equity Division (IED) outperformed both peers and the division's benchmark over all listed periods.
- The portfolio outperformed the benchmark by 1.4% over the last twelve months.
- Outperformance was driven by the quality factor, momentum factor, energy sector, health care sector, and financials sector.

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, 38.8% of assets, to gain specific international stock market exposures.
 - Stock plus investments, 37.9% of assets, to implement a portable alpha strategy onto high-level strategic tilts.
 - Index investments, 23.3% 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 2.1% which is below the division's risk budget of 3.0%.
 - The momentum factor, the largest strategic contributor to tracking error, accounts for only 11.0% of the total tracking error indicating that long-term the portfolio is not materially exposed to any one single risk.
 - Future portfolio returns will be driven by the long-term strategic positions of the quality factor, value factor and momentum factor.

- Quarterly changes to International Equity Division allocation.
 - Rebalanced \$1.4 billion of equity swaps to match the division's long-term equity factor strategy.
 - Allocated \$189 million to collateral investments within the Internal Stock Plus strategy. Total included \$186 million to Blackstone Strategic Opportunity Fund (BSOF) and \$2.5 million to Blackstone Strategic Capital Holdings II (BSCH II). Over the full investment horizon, both investments should have returns greater than equity swap financing costs while exhibiting low sensitivity to publicly traded equities.

Market Environment and Outlook

Market Performance

- International stock markets declined nearly -33.0% in 2020. Since late March, markets have dramatically rebounded down -7.0% year-to-date. Earnings per share growth year-over-year further declined to -20.0% versus a February reading of -7.0%. Multiples have expanded approximately 23.0% year-over-year.
- Quality factor and momentum factor outperformed the MSCI ACWI ex USA on a relative basis, up year-to-date 4.7% and 9.9% respectively. The value factor continued to underperform, down -18.6%. Quality, value, and momentum remain strategically important to the IED.
- Emerging markets have outperformed the MSCI ACWI ex USA down only -1.7% year-to-date. Developed markets trail the broader index down -9.1%.
- The U.S. dollar is down year-to-date -3.2% and has fallen nearly -9.0% since its March high. Part of the outperformance in the emerging markets can be attributed to the weakening U.S. dollar.
- Commodities remain depressed, down -15.2% for the year. Oil is down -34.0% in 2020, copper is up 2.5%, and gold is up 30.4%.
- Global government interest rates (index weighted) remain subdued at approximately 0.9%, down from 1.3% in early 2020.

Outlook

- IED's assessment of the global economy indicates a higher probability that the world remains in a protracted recession. COVID-19 was the catalyst, however, many signs of stress were present in late 2019 and will linger beyond the reopening of the global economy.
- World trade volumes, a proxy for economic growth, were already contracting year-over-year at -1.0% in November 2019. For context, the historical average is 3.2% over the last twenty years. Through May of 2020, the latest data point, volumes collapsed down -17.7% a level not seen since 2009 in the depths of the Great Financial Crisis (GFC).

- In less than six weeks, the U.S. Federal Reserve moved rates to the zero bound and unconventionally expanded their balance sheet by a larger dollar amount than all of the GFC. In April, IED believed this would clear the way for President Trump to resume pressure on China even if the Federal Reserve would prefer otherwise. Through July 2020, U.S. China relations have further deteriorated economically and politically and will act as a headwind to the global recovery.
- Global PMIs were barely above expansionary territory in December 2019 at 50.1. By April 2020, global PMIs collapsed to 39.8. As of July 2020, the PMIs have fully recovered to 50.3 signaling small expansion in the global economy.
- Europe top line sales and earnings contracted year-over-year at -6.1% and -21.1%, a level not seen since the periphery debt crisis. This marks a downward acceleration in fundamentals for Europe. Forward looking sales and earnings per share are expected to be slightly up over the next 12 months, 0.5% and 1.5% respectively. Europe manufacturing PMIs indicate the economic contraction was worse in Europe relative to global PMIs with a reading of 33.4 in April.
- Japan manufacturing PMIs contracted for the seventeenth consecutive month with a reading below 50.0. Sales growth year-over-year declined -2.7% and earnings per share growth further accelerated to the downside at -24.0%, indicating sluggish economic activity. Forward looking sales growth is expected to slow -1.6% in the next year and earnings to expand slightly at 1.0%.
- Central banks are fully committed to an “anything it takes” policy similar to what Mario Draghi adopted near the end of his ECB term. The question will be if the vast amounts of liquidity can offset a major solvency crisis in the next two years.
- Analysts’ forward-looking earnings per share growth is estimated at 4.2% for the MSCI ACWI ex USA index through July 2021. The sentiment has rapidly changed. As of May 2020, analysts were projecting negative -4.6% year-over-year earnings per share growth which was the first negative forward-looking estimate since the GFC. The current health and economic crisis make it difficult to accurately project earnings over the next two years.
- Questions remain whether the late March 2020 low in stock prices was at the bottom of the market. As noted earlier, IED believes there is a higher probability we are in the early stages of a protracted recession. This belief is based on historical leading economic metrics and market fundamentals.
- In difficult forecasting times, IED prefers price to peak earnings to address the challenges analysts have in projecting forward earnings per share. Both peak earnings per share and price are known at any given moment. Although trailing earnings per share could be used, trailing earnings are usually falling during the end of a business cycle.
- IED examined international stock market bottoms back to 2000 (two recessions) and for the U.S. stock market back to 1960 (seven recessions). Limited international earnings per share data was why U.S. markets were included in the analysis.

- The late March 2020 price low for international stocks was 9.6x price to peak earnings, slightly higher than the 9.0x average. For U.S. markets, the March low was 14.7x which was the highest multiple ever paid for peak earnings. The average for U.S. markets is approximately 9.9x. International stock markets in March may have reached a reasonable price level considering the impact to future earnings.
- Go-forward returns for the MSCI ACWI ex USA index on an annualized basis are estimated at 8.3%. 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 0.9% implies an international equity risk premium of 7.4%. The equity risk premium decreased due to an increase in stock prices and no change to the long-term government bond interest rates.

Conclusion

International stock market fundamentals further declined in the second quarter of 2020, however, global government bond yields remained near all-time lows as central banks stayed committed to ultra-accommodative monetary policies not seen since the GFC. The policies in Japan, Europe, and now the U.S. are open-ended inflation targeting processes. Central banks' policies will remain low indefinitely as the global recession lasts longer than the COVID-19 pandemic. The liquidity crisis caused by COVID-19, will slowly turn into a solvency crisis forcing monetary policy to remain accommodative if not requiring additional large non-standard policies.

Questions remain how long can markets delay examining the fundamentals. Currently some market participants have chosen to focus on 2023 earnings to justify market multiples. IED believes that places unsustainable pressure on central banks to maintain confidence through 2023. As such, markets will more likely return to fundamentals prior to 2023. In the second quarter, the forward-looking estimates for both sales and earnings stabilized, however, growth remained subdued. Stock prices continued to rise, widening the gap between market prices and fundamentals. For this reason, IED believes in the next twelve months, major central banks will be forced to significantly increase their accommodation to maintain confidence. As of July 2020, multiples have expanded for the second year in a row more than 20.0%.

International stock markets trade at approximately their twenty-three-year average of 17.0x price to earnings history and a wide spread relative to global risk-free rates. To capture the spread to bonds, international stock investors will need a long investment horizon as the short-term environment will experience increased volatility and a higher probability of a significant drawdown in equity markets.

SMRS
International Equity Strategies
6/30/20

Markets	Amount	Total	% of Total
Active (\$ in Millions)			
BlackRock MSCI	\$1,949		
Wellington	828		
IED Quality Equity	516		
Martin Currie	400		
Marathon-London	283		
Lazard	233		
UBS	175		
Effissimo	65		
Total Active		\$4,449	38.8%
Stock Plus			
Internal	\$2,573		
PIMCO	1,765		
Total Stock Plus		\$4,338	37.9%
Indexed			
SSGA	\$1,390		
BlackRock	1,281		
Total Indexed		\$2,671	23.3%

TOTAL

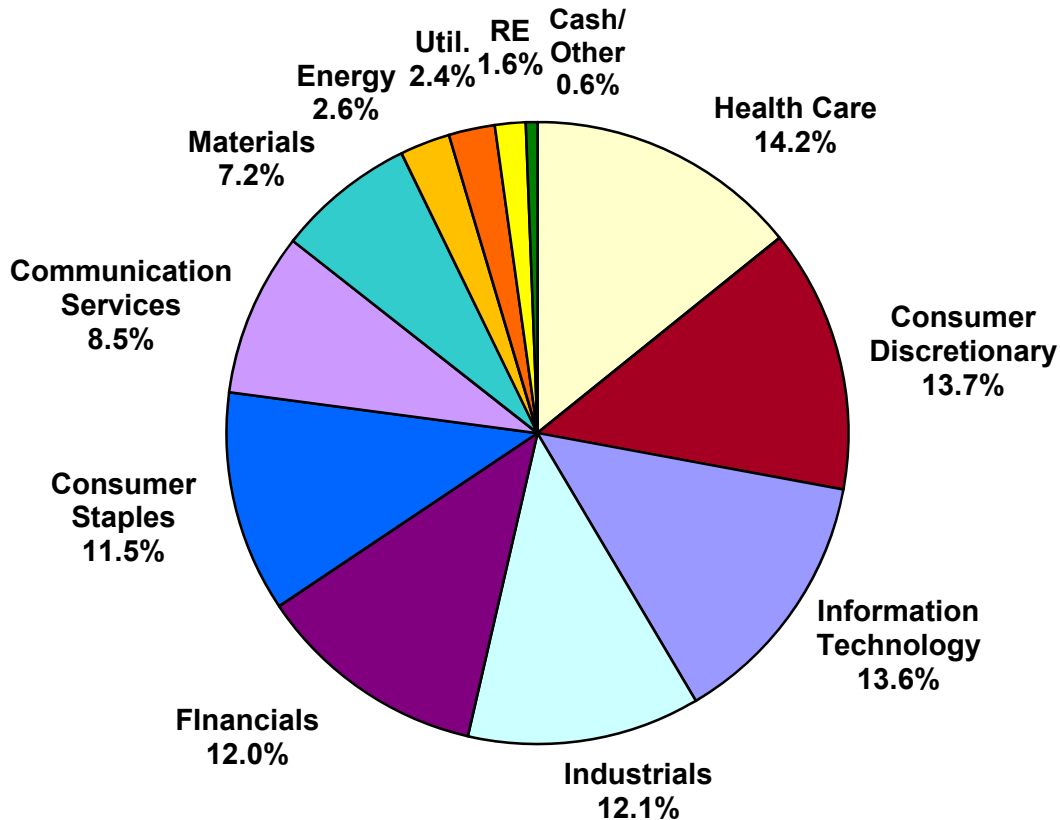
\$11,458

100.0%

SMRS

International Equity By Sector

6/30/20



Market Value in Millions				
6/30/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Health Care	\$1,625	14.2%	8.6%	5.6%
Consumer Discretionary	1,575	13.7%	6.4%	7.3%
Information Technology	1,561	13.6%	2.9%	10.7%
Industrials	1,391	12.1%	7.5%	4.6%
Financials	1,373	12.0%	27.4%	-15.4%
Consumer Staples	1,321	11.5%	4.9%	6.6%
Communication Services	971	8.5%	8.1%	0.4%
Materials	821	7.2%	11.3%	-4.1%
Energy	298	2.6%	10.5%	-7.9%
Utilities	277	2.4%	7.8%	-5.4%
Real Estate	178	1.6%	4.6%	-3.0%
Total Investments	\$11,391	99.4%	100.0%	
Cash/Other	67	0.6%	0.0%	0.6%
Total	\$11,458	100.0%	100.0%	

Benchmark: MSCI ACWI ex USA

SMRS

International Equities

6/30/20

Date:	<u>6/30/20</u>	<u>3/31/20</u>	<u>12/31/19</u>	<u>9/30/19</u>
Assets (\$ in Millions):	\$11,458	\$9,835	\$13,129	\$11,929
Number of Securities:	2,677	2,715	2,982	2,711
Active Share:	33%	32%	33%	32%

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 Total Return	7.6%	9.3%	6.3%	8.3%
Sustainable Growth Rate	4.6%	6.4%	3.7%	5.8%
Dividend Yield	2.1%	2.2%	2.4%	2.5%
Buyback Yield	0.2%	0.1%	0.2%	0.1%
Collateral Yield	0.7%	0.7%	--	--
Risk:				
Beta	0.99	--	1.00	--
Volatility	22.3%	--	22.9%	--
Tracking Error	2.1%	--	0.0%	--
Information Ratio	0.6	0.5	--	--
Fundamental:				
Average Capitalization (\$ in Billions)	100.1	--	91.9	--
Price/Earnings	19.9	18.2	20.8	18.3
Price/Book	1.7	1.9	1.7	1.9
ROE	8.6%	10.7%	8.2%	10.6%

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.	3.2%	\$614.6	38.3	\$361.5
Taiwan Semiconductor Manufacturing Co., Ltd.	2.4%	275.1	19.1	277.4
Roche Holding	1.8%	298.3	16.2	201.6
Alibaba Group Holding, Ltd.	1.7%	580.4	24.7	192.3
Nestle S.A.	1.6%	329.0	24.3	180.5
Samsung Electronics Co., Ltd.	1.5%	293.9	14.4	166.7
ASML Holding	1.3%	156.3	45.9	151.2
Sanofi	1.1%	127.9	14.9	125.2
CSL Limited	1.0%	89.7	42.6	116.4
Novo Nordisk	<u>1.0%</u>	<u>117.3</u>	24.0	<u>115.2</u>
TOTAL	<u>16.5%</u>	<u>\$2,882.4</u>		<u>\$1,888.0</u>

International Equity Performance - Net of Fees
6/30/20

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception</u>	<u>Inception Date</u>
Total International Equity	\$11,458,333,596	-3.6%	1.6%	2.9%	4.7%	5.1%	1/1/04
MSCI ACWI ex USA		-4.8%	1.1%	2.3%	3.8%	5.2%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	4.6%	
<i>Excess Return</i>		1.2%	0.5%	0.6%	1.0%	-0.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		25	11	14	7	23	
Total International Active Strategy	\$4,449,651,610	-0.1%	2.0%	3.0%	4.7%	4.5%	5/1/05
MSCI ACWI ex USA		-4.8%	1.1%	2.3%	3.7%	4.6%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	3.9%	
<i>Excess Return</i>		4.7%	0.9%	0.7%	1.0%	-0.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		5	7	12	10	21	
BlackRock MSCI Systematic Return	1,948,107,364	0.6%	--	--	--	6.3%	12/1/18
MSCI ACWI ex USA		-4.8%	--	--	--	2.0%	
Lipper International Multi-Cap Core		-5.5%	--	--	--	1.0%	
<i>Excess Return</i>		5.4%	--	--	--	4.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		3	--	--	--	1	
IED Quality Equity	515,588,067	--	--	--	--	1.3%	2/1/20
MSCI ACWI ex USA		--	--	--	--	-8.5%	
Lipper International Multi-Cap Core		--	--	--	--	-9.2%	
<i>Excess Return</i>		--	--	--	--	9.8%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		--	--	--	--	1	
Wellington IRE	403,833,805	-4.3%	2.3%	2.7%	5.0%	4.0%	12/1/05
MSCI World ex USA		-5.4%	0.8%	2.0%	3.8%	3.5%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	3.2%	
<i>Excess Return</i>		1.2%	1.5%	0.7%	1.2%	0.4%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		33	5	17	6	13	
Martin Currie International Long-Term	400,128,980	8.0%	7.9%	--	--	11.3%	2/1/17
MSCI ACWI ex USA		-4.8%	1.1%	--	--	3.9%	
Lipper International Multi-Cap Core		-5.5%	-5.5%	--	--	3.0%	
<i>Excess Return</i>		12.8%	6.8%	--	--	7.4%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		1	1	--	--	1	
Marathon-London International Fund	283,237,699	-6.3%	-0.5%	2.1%	4.6%	6.2%	2/1/12
MSCI World ex USA		-5.4%	0.8%	2.0%	3.8%	4.7%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	4.6%	
<i>Excess Return</i>		-0.9%	-1.3%	0.1%	0.8%	1.5%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		66	65	40	10	7	
Wellington Emerging Markets Local Equity	278,396,608	-5.0%	1.4%	3.8%	4.0%	5.4%	12/1/11
MSCI Emerging Market Index		-3.4%	1.9%	2.9%	3.2%	3.3%	
Lipper Emerging Markets		-4.1%	1.2%	2.3%	2.4%	2.9%	
<i>Excess Return</i>		-1.6%	-0.5%	0.9%	0.8%	2.1%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		56	47	31	29	16	
Lazard/Wilmington International Equity	232,875,000	-7.4%	0.6%	0.7%	--	0.6%	6/1/14
MSCI World ex USA		-5.4%	0.8%	2.0%	--	1.0%	
Lipper International Large-Cap Core		-5.5%	0.0%	1.7%	--	1.0%	
<i>Excess Return</i>		-2.0%	-0.3%	-1.3%	--	-0.4%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		75	51	81	--	72	
UBS China A Opportunity Fund	\$175,093,800	--	--	--	--	11.1%	5/1/20
MSCI China On shore		--	--	--	--	8.2%	
Lipper Emerging Markets		--	--	--	--	10.0%	
<i>Excess Return</i>		--	--	--	--	2.9%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		--	--	--	--	31	
Wellington Select China Equity	145,720,673	--	--	--	--	21.4%	9/1/19
MSCI All China Index		--	--	--	--	1.9%	
Lipper Emerging Markets		--	--	--	--	0.9%	
<i>Excess Return</i>		--	--	--	--	19.5%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		--	--	--	--	2	
Effissimo Capital Management Japan	64,555,904	-17.4%	-9.2%	--	--	-2.5%	12/1/15
MSCI Japan		3.1%	3.0%	--	--	4.7%	
Lipper International Small/Mid-Cap value		-9.9%	-3.4%	--	--	2.2%	
<i>Excess Return</i>		-20.5%	-12.2%	--	--	-7.2%	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Value</i>		91	89	--	--	89	

Fund Name	Market Value	1-Year	3-Years	5-Years	7-Years	Inception	Inception Date
Total International Stock Plus Strategy	\$4,338,403,535	-6.6%	0.9%	2.7%	4.8%	6.1%	11/1/09
MSCI ACWI ex USA		-4.8%	1.1%	2.3%	3.7%	6.4%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	6.0%	
<i>Excess Return</i>		-1.8%	-0.2%	0.4%	1.1%	-0.4%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		68	27	18	7	47	
Internal Stock Plus	2,573,340,918	-10.1%	-0.1%	1.2%	4.0%	3.8%	9/1/11
MSCI ACWI ex USA		-4.8%	1.1%	2.3%	3.7%	3.8%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	4.2%	
<i>Excess Return</i>		-5.3%	-1.3%	-1.1%	0.3%	0.0%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		89	59	71	32	69	
PIMCO StocksPLUS	1,765,062,617	-1.2%	--	--	--	1.1%	4/1/19
MSCI ACWI ex USA		-4.8%	--	--	--	-1.6%	
Lipper International Multi-Cap Core		-5.5%	--	--	--	-2.3%	
<i>Excess Return</i>		3.6%	--	--	--	2.7%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		6	--	--	--	11	

Total International Index Strategy	\$2,670,278,451	-4.3%	2.2%	3.4%	4.8%	6.6%	7/1/09
MSCI ACWI ex USA		-4.8%	1.1%	2.3%	3.7%	5.5%	
Lipper International Multi-Cap Core		-5.5%	0.0%	1.7%	3.6%	5.5%	
<i>Excess Return</i>		0.5%	1.1%	1.1%	1.1%	1.2%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		33	5	10	6	5	
SSGA MSCI ACWI ex USA Index	1,389,839,385	-4.0%	--	--	--	-1.3%	11/1/17
MSCI ACWI ex USA		-4.8%	--	--	--	-1.7%	
Lipper International Multi-Cap Core		-5.5%	--	--	--	-2.5%	
<i>Excess Return</i>		0.8%	--	--	--	0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		31	--	--	--	23	
Blackrock ACWI ex USA Index	1,280,439,067	-4.6%	--	--	--	-3.1%	3/1/18
MSCI ACWI ex USA		-4.8%	--	--	--	-3.4%	
Lipper International Multi-Cap Core		-5.5%	--	--	--	-3.7%	
<i>Excess Return</i>		0.2%	--	--	--	0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		40	--	--	--	42	

State of Michigan Retirement System

REAL & OPPORTUNISTIC RETURN REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



Jennifer Yeung
Senior Investment Manager
Real & Opportunistic Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Real & Opportunistic	-0.1%	8.8%	8.5%	10.7%	9.6%
Custom Benchmark	5.9%	6.8%	7.0%	7.0%	7.2%

- The portfolio value is \$8.9 billion with a one-year return of -0.1%. Performance was impacted by the global deterioration in asset values across all facets of the economy. Current asset values are reflective of the issues faced in the first half of 2020 and the uncertainty of economic activity through the remainder of the year and into 2021. Given diversification across numerous strategies and a keen focus on manager selection, our portfolio has generally been resilient and our outlook for long-term valuations remains positive.
- Portfolio return was positively impacted by income earned from entertainment royalties, investments in asset managers, credit investments and natural resource strategies.

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.
- During the quarter, the Real Return & Opportunistic portfolio continued to benefit from exposure to assets with low equity beta and diversity of strategy, industry and geography. Several of our private credit managers called capital to exploit investment opportunities created by extreme market volatility.
- The Real Return & Opportunistic portfolio has approximately \$3.6 billion of unfunded commitments.
- No new commitments closed during the quarter.
- In addition to monitoring the impact of COVID-19, we remain focused on finding differentiated strategies that are additive to the current portfolio mix and continue to like private credit opportunities, niche strategies with some scalability, and contractual cash flow. Specifically, we like opportunities that have defensible cash flows and offer structural downside protection. We continue to be selective and favor experienced investment teams with a proven track record.

SMRS

Real Return and Opportunistic

6/30/20

Top Ten Advisors or Entities

(\$ in Millions)

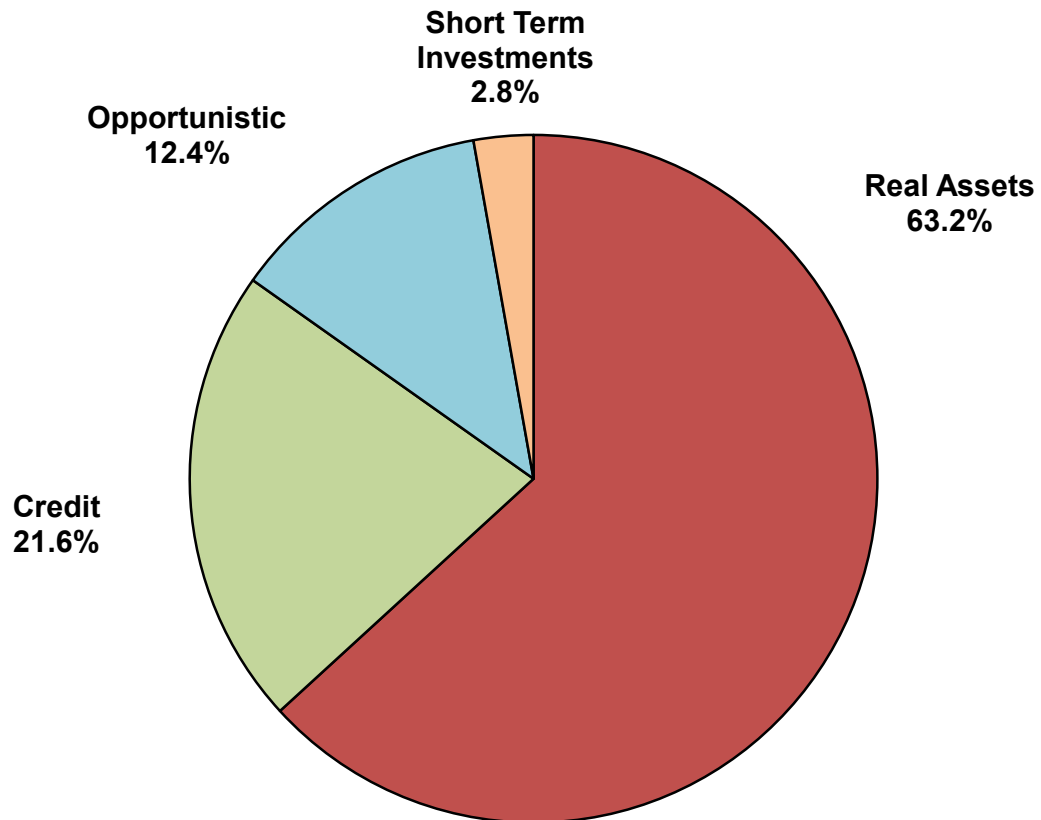
<u>Advisor or Entity</u>	<u>Market Value</u>
Great Mountain Partners LLC	\$ 2,588
Apollo Global Management	1,025
Barings Alternative Investments	797
Domain Capital Advisors	571
Sixth Street Partners	409
Czech Asset Management	405
Kayne Anderson Capital Partners	302
Fortress Investment Group	221
Ridgewood Energy	208
HPS Investment Partners	207
Total Market Value	\$ <u>6,733</u>

SMRS

Real Return and Opportunistic

6/30/20

Investments By Strategy

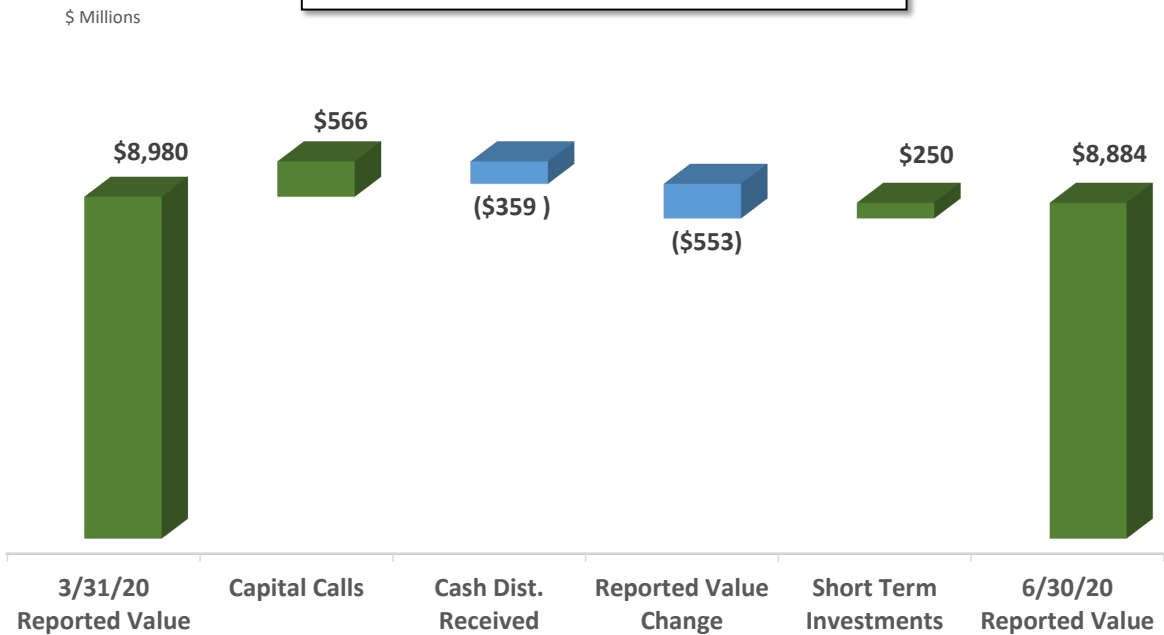


Market Value in Millions	
	<u>6/30/20</u>
Real Assets	\$5,616
Credit	1,919
Opportunistic	1,099
Short Term Investments	<u>250</u>
Total Investments	<u><u>\$8,884</u></u>

SMRS

Real Return and Opportunistic 6/30/20

Invested Commitments



Outstanding Commitments



SMRS

Real Return and Opportunistic

6/30/20

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy	\$ 265,780,511	\$ 17,170,707
* Abernathy II	4,388,437	131,068,376
Altus Midstream	2,217,950	0
Angelo Gordon Credit Solutions Fund	73,690,257	24,711,423
Apollo European Principal Finance Fund II	11,573,014	8,106,174
Apollo HK TMS Investments Holdings LP	1	0
Axton Holdings	2,235,744,595	0
Barings Asset Based Income Fund I	157,270,129	126,378,012
Barings Global Real Asset Fund I	61,161,643	42,646,984
Blackstone Strategic Capital Holdings, LP	55,590,547	53,909,388
Blue Peninsula Fund LP	136,576,911	54,608,949
Broadriver III	55,449,341	143,127,419
BSCH Parallel (MLG) I LP	137,031,580	0
BSCH II	1	237,500,000
BSCH II Co-Invest	0	100,000,000
Carlyle Energy Mezzanine Opportunity Fund II	16,231,263	18,075,502
Carlyle IEP Co-Invest (Varo)	12,771,749	837,818
Carlyle International Energy Partners	35,669,213	24,008,247
Carlyle International Energy Partners II	8,997,093	135,000,000
Castle Credit SMRS Holdings LLC	135,303,764	48,203,298
Centerbridge SCP III	28,194,876	3,025,715
Centerbridge SCP III, LP – Flex, L.P.	20,868,837	49,000,000
Content Holdings, LLC	453,928,320	39,034,618
Credit Opportunity Fund III	19,614,439	19,972,427
Energy Recap and Restructuring	11,542,907	7,085,025
ERR MI Holdings LP	1,752,450	2,269,933
FCO MA MI LP	152,667,176	39,860,296
Financial Credit Investment II	244,177,896	183,297,353
Financial Credit Investment III	224,302,941	144,720,362
Flywheel Energy Co-Invest	43,060,611	7,000,000
Fortress Transportation & Infrastructure	49,062,230	0
Greatrock LLC	58,685,941	0
Global Maritime	66,632,650	3,414,854
GSO Credit Alpha Fund	31,800,613	37,910,063
HarbourVest Direct Lending Fund (L) L.P.	0	100,000,000
Hopen Life Science Fund II	3,721,948	640,000
HPS Red Cedar Fund	198,395,631	106,600,000
Kayne Anderson Energy Fund VII, LP	20,383,599	15,469,791
Kayne Anderson Private Energy Income Fund	98,857,262	26,294,961
Kayne Anderson Private Energy Income Fund II	35,444,330	124,373,958
Kayne Solutions Fund	77,342,325	171,986,652
KKR Energy Income & Growth Fund	23,165,779	1,953,202
KKR Lending Partners	5,223,837	11,930,723
KKR Lending Partners II	19,318,427	11,737,239
Lakewater	93,311,958	1,900,000

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Lakewater II	68,043,742	1,800,000
Lakewater III	241,346,727	2,900,000
Lakewater IV	31,252,113	832,177
Lakewater V	85,992,756	3,001,598
Marathon CLO Equity Fund	10,222,652	4,951,579
Merit Energy Partners I LP	34,392,069	0
MidCap Finco Holdings LTD	284,994,840	0
Mortgage Servicing Rights	68,762,206	0
Napier Park Aircraft Leasing Vehicle I, LLC	39,403,046	17,944,862
Napier Park AL Rollover Fund I	13,629,885	60,067,481
Nash Co-Investment	11,923,923	94,259
New Fortress Energy HLDGS	352,687,375	0
New Fortress Energy LLC	8,010,654	0
NGP Natural Resources XII	61,251,974	72,260,015
Orion Co-Investments III, LP	3,346,162	0
Orion Mine Finance	46,086,116	1,057,949
Orion Mine Finance 1A	34,332,810	827,618
Orion Mine Finance Co-Fund II LP	13,591,024	35,000,000
Orion Mine Finance II	80,125,424	27,646,392
Orion Mine Finance III LP	10,289,548	53,174,426
Redding Ridge Holdings, LP	72,884,775	10,842,105
* Ren Venture Fund II	28,753,742	1,500,000
* Ren Venture Fund III	9,832,511	16,000,000
Ridgewood Energy Oil & Gas II	68,118,172	17,104,339
Ridgewood Energy Oil & Gas III	92,959,432	134,363,529
Ridgewood Fund II Co-Invest (REOG)	18,060,415	4,516,974
Riverside Credit Solutions FD I LP	40,301,612	7,556,985
RPEP Energy Opportunistic Institutional Partners	28,455,907	10,144,235
SJC Direct Lending Fund II	227,172	38,261,315
SJC Direct Lending Fund III	199,728,111	25,279,108
SJC Direct Lending Fund III Co-Invest G-III	20,000,000	0
SJC Onshore Direct Lending Fund IV – SMRS, L.P.	185,000,000	65,000,000
* Social Network Holdings	112,984,464	5,590,289
Specialty Loan Fund III	8,657,730	5,931,772
Sprott Private Resource Lending (US), LP	20,450,668	78,961,168
Sprott PRL(M) LP	1,469,468	22,295,779
Sprott PRL(M-Co-Invest) LP	7,636,755	17,687,500
Structured Credit Recovery Fund IV	167,407,575	0
Terra Co-Investment	27,229,965	14,000,000
TICP CLO Partners II	26,788,097	1,724,474
TICP CLO Partners III	13,162,230	86,448,017
TSSP Agriculture Partners	4,887,630	94,657,148
TSSP Adjacent Opportunities Partners	212,238,694	102,560,804
TSSP Capital Solutions	117,607,600	183,949,525
TSSP Opportunities Partners IV	33,952,538	65,372,463
Turning Rock Fund I, LP	48,256,968	30,034,706
Vida Insurance Credit Opportunity Fund II	98,086,545	9,433,075
Warwick (SMRS) Co-Invest, L.P.	30,090,325	2,089,081
Warwick Partners III	51,750,259	4,511,027
Total Real Return and Opportunistic	\$ 8,633,569,385	\$ 3,612,203,242
Short-Term Investments & Other	250,047,437	0
Grand Total	\$ 8,883,616,823	\$ 3,612,203,242

* Fund of Funds

** New Commitment

State of Michigan Retirement System

REAL ESTATE AND INFRASTRUCTURE REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-2.3%	5.5%	7.3%	9.4%	10.1%
NCREIF NPI	1.4%	4.1%	5.4%	6.9%	8.3%
Peer Median Returns	2.7%	5.8%	7.3%	9.3%	10.5%
Percentile Rank vs. Peers*	93	71	54	48	65

*State Street Universe greater than \$1 billion

- Underperformance relative to the one-year benchmark resulted from the Real Estate and Infrastructure Division's (REID) strategy of being overweight in hospitality and performance in the infrastructure portfolio particularly in the energy sector.

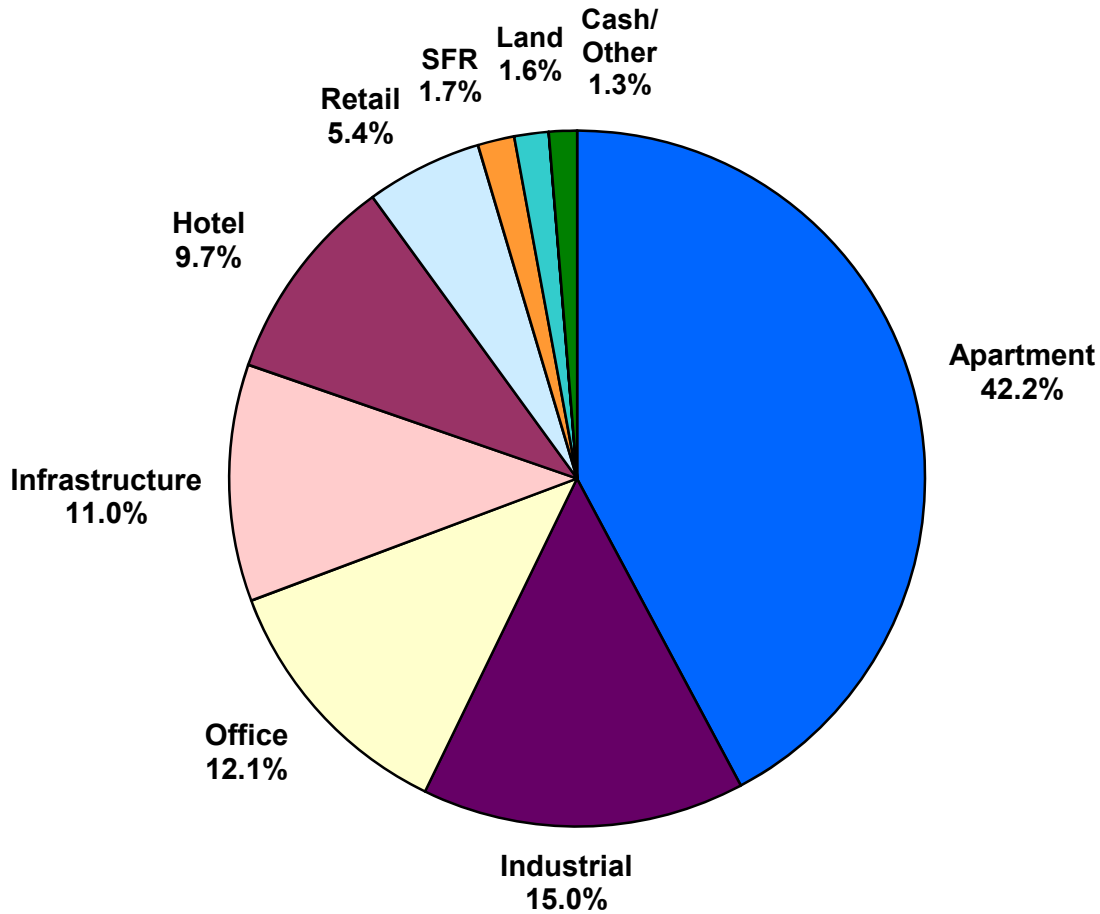
Strategy Update

- The Covid 19 global pandemic and Shelter-in-Place orders implemented to slow the spread of the virus resulted in major negative impacts to the US economy and commercial real estate and infrastructure markets. Large segments of the US economy remain shuttered to various degrees with economic reopening at various stages across the country. The impacts are only beginning to be felt in the commercial markets with uneven impacts across the real estate and infrastructure sectors. We will monitor, assess, and shift strategies as necessary. US and foreign investors remain cautious and transaction volumes have dropped to very low levels.
- We are focused on sourcing off-market opportunities through our 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. We have selectively acquired properties where we can add value through management and leasing and have continued to develop properties at attractive risk-adjusted returns. The team continues to assemble portfolios in both traditional and non-traditional real estate sectors that we believe will become institutional property types, providing above market appreciation and total returns.
- We have been actively managing the portfolio, with capital returned of more than \$1 billion, and funding for new or existing investments of just under \$700 million over the past 12 months. We will continue to work with our advisors in executing the disposition of properties and realizing gains at low capitalization rates where these opportunities still exist.
- The REID has approximately \$1.4 billion in unfunded commitments. No new commitments were made during the quarter.

SMRS

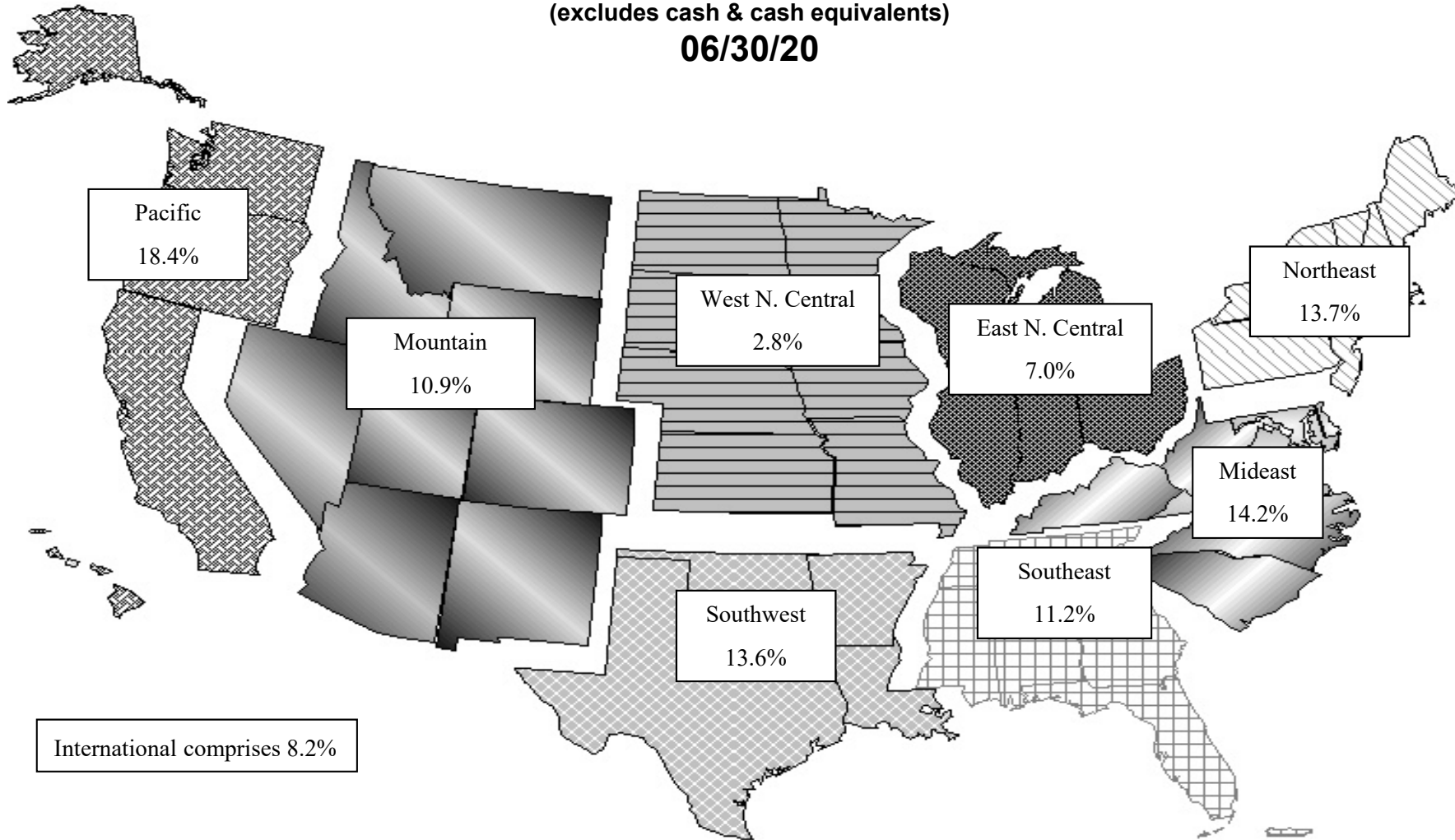
Real Estate and Infrastructure

6/30/20



Market Value in Millions				
	<u>6/30/20</u>		<u>6/30/19</u>	
Apartment	\$2,659	42.2%	\$2,813	40.2%
Industrial	942	15.0%	588	8.4%
Office	764	12.1%	970	13.9%
Infrastructure	691	11.0%	861	12.3%
Hotel	613	9.7%	919	13.1%
Retail	338	5.4%	325	4.6%
Single Family Residential (SFR)	108	1.7%	331	4.8%
Land	100	1.6%	102	1.5%
	<u>\$6,215</u>	<u>98.7%</u>	<u>\$6,909</u>	<u>98.8%</u>
Cash/Other	80	1.3%	85	1.2%
Total Investments	<u>\$6,295</u>	<u>100.0%</u>	<u>\$6,994</u>	<u>100.0%</u>

SMRS
Real Estate by Region
Based on Market Value
(excludes cash & cash equivalents)
06/30/20



3

Geographic regions defined by NCREIF, whose property index composition is: Pacific 34.0%, Mountain 6.5%, West N. Central 1.2%, Southwest 10.7%, East N. Central 6.7%, Southeast 9.8%, Northeast 19.5%, Midwest 11.6%

SMRS
Real Estate and Infrastructure
6/30/20

**Top Ten
Advisors or Entity**

<u>Advisor or Entity</u>	(\$ in millions)
	<u>Market Value</u>
MWT Holdings LLC	\$ 2,014
Principal Real Estate Investors	547
Clarion Partners	424
Five Star Realty Partners LLC	345
Domain Capital Advisors Inc	281
Blackstone Group	219
Rialto Capital Management LLC	214
CIM Investment Advisors LLC	186
Transwestern Investment Management	182
L&B Realty Advisors	179
	<u>\$ 4,591</u>

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	94.3%	86.9%	96.2%	89.8%	51.6%
National Average	93.4%	87.7%	92.7%	95.3%	51.8%

SMRS
Market Values by Ownership Entity
6/30/20
REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 60,960,379	\$ 0
AEW Senior Housing III	4,072,870	715,013
AEW Senior Housing Investors IV	6,779,379	41,371,546
Apollo Asia Real Estate Fund	45,659,115	30,234,574
Asana Partners Fund I	26,189,872	4,245,809
Asana Partners Fund II	6,309,974	38,280,405
Avanath Affordable Housing II, LLC	32,925,322	0
Avanath II SMRS Co-Investment Fund LLC	13,940,793	0
Avanath Affordable Housing III	42,762,791	5,311,980
Avanath Affordable Housing IV	6,576,896	29,261,396
Blackstone R/E Partners V, LP	1,376,385	0
Blackstone R/E Partners VI, LP	3,808,470	3,680,930
Blackstone R/E Partners VIII, LP	72,032,072	12,753,548
Blackstone R/E Partners IX, LP	53,894,920	144,685,022
Capri Urban Investors, LLC	7,043,390	0
CIM Commercial Trust Corp	6,335,557	0
CIM Fund III, LP	36,000,388	0
CIM Fund VIII, L.P.	104,296,649	1,487,563
CIM VI (Urban REIT), LLC	32,295,439	0
Clarion Gables Multifamily Trust, LP	32,986,191	0
Columbus Circle Holdings, LLC	164,966,517	163,665,768
Crown Small Cap Real Estate	16,283,757	4,402,500
DM2501, LLC	0	0
Domain GVA-1, LLC	36,208,550	1,940,056
Domain Hotel Properties, LLC	136,266,152	0
Eastport Properties, LLC	0	0
Gateway Capital Real Estate Fund II, LP	2,860,085	0
Great Lakes Property Group Trust	8,059,014	9,565,475
GreenOak Europe III, LP	11,610,372	70,378,890
Heitman Credit	49,759,451	0
IDR Core Property Index Fund LLC	25,984,033	0
India Property Fund II, LLC	14,764,954	1,552,610
Invesco Mortgage Recovery Feeder Fund	3,642,648	0
Invesco Mortgage Recovery Fund II, L.P.	22,786,301	34,249,727
Invesco Strategic Opportunities III, L.P.	22,921,479	82,461,385
IPF II Co-Invest LP	16,020,181	1,270,897
JBC Funds North LaSalle LLC	20,023,403	0
JBC Opportunity Fund III, LP	495,673	0
KBS/SM Fund III, LP	50,091,744	0
KBS/SM Fund IV	155,660	0
L-A Saturn Acquisition	28,499,782	0
Landmark Real Estate Partners V, LP	6,138,471	0
LaSalle Asia Opportunity Fund II, LP	119	0
LaSalle Asia Opportunity Fund III, LP	1,201,534	0

	Market Value	Unfunded Commitment
Lion Industrial Trust	250,459,787	0
Lion Mexico Fund, LP	4,960,254	0
Lombard GVA0016 (former AGL Annuity)	345,658,513	0
Lone Star Fund X LP	127,897,892	29,311,293
Lone Star Fund XI LP	5,395,129	184,384,432
Lubert-Adler Real Estate Fund VII, LP	58,158,863	6,538,662
M1 Westgate ColInvest LLC	6,313,704	0
M301W ColInvest LLC	1,652,939	0
MERS Acquisitions Ltd.	179,225,843	7,130,012
MIP Holdco LLC	147,124,171	13,859,458
MSREF V - International	2,339,339	0
MSRESS Fund III Institutional LP	6,273,893	0
MWT Holdings, LLC	2,014,670,558	0
Northpark Land Associates	37,886,410	7,659,661
Orange Investors LLC	453,068	0
Paladin Realty Brazil Investors III (USA), LP	7,744,434	0
Paladin Realty Latin America Investors IV-CI, LP	27,294,831	0
Paladin Realty TB COINV V LP	10,842,711	0
Penmain Office LLC	42,398,985	0
Principal Separate Account	486,649,674	65,884,391
Proprium RE Spec. Situations Fund, LP	85,806,203	16,143,656
Rialto Absolute Partnership I	68,962,122	0
Rialto Credit Partshp LP	20,659,266	0
Rialto Real Estate Fund, LP	20,406,397	0
Rialto Real Estate Fund II, LP	28,448,717	0
Rialto Real Estate Fund III-Debt, LP	39,973,188	0
Rialto Real Estate Fund III-Property, LP	35,532,347	5,342,466
Rialto Mezzanine Partners Fund	307,268	0
SM Brell II LP	20,661,797	0
Stockbridge RE Fund II-C, LP	6,731,671	0
Strategic II LLC	54,614,450	30,946,825
TPG RE Finance Trust Inc. (TRTX)	41,488,481	0
TPG Real Estate Partners II	27,760,414	9,531,098
TPG Real Estate Partners III	6,663,263	41,814,220
TSP Spartan C-I LLC	7,154	0
TSP Spartan C-II LLC	15,735,038	0
TSP Value & Income Fund II, LP	19,639,852	30,197,274
True North High Yield Invest. Fund II, LLC	1,877,412	0
True North Real Estate Fund III, LLC	29,676,186	5,000,000
	\$ 5,523,338,960	\$ 1,135,258,541
Short-Term Investments and Other	63,190,547	0
Total Real Estate Investments	\$ 5,586,529,507	\$ 1,135,258,541

* New or additional commitment made during the quarter reported

SMRS
Market Values by Ownership Entity
6/30/20

INFRASTRUCTURE

	Market Value	Unfunded Commitment
Arclight Energy Partners VI, LP	\$ 31,442,118	\$ 7,004,763
Arclight Energy Partners VII, LP	2,079,091	46,778,097
ASF VI Infrastructure B LP	22,479,015	9,156,177
ASF VII Infrastructure Fund B L.P.	13,663,173	17,789,037
ASF Como Co-Investment LP	6,132,596	2,405,051
Basalt Infrastructure Partners, LP	39,643,726	2,219,045
Blackstone Energy Partners, LP	16,848,754	4,728,291
Blackstone Energy Partners II, LP	52,736,421	4,332,432
Brookfield Infrastructure Fund II-B, L.P.	52,339,949	4,614,993
Customized Infrastructure Strategies, LP	31,046,569	4,608,964
Dalmore Capital Fund	63,728,219	0
GCM Grosvenor Infrastructure Investment Program, L.P.	74,511,637	0
GCM Grosvenor Customized Infrastructure Strategies II, L.P.	43,874,098	14,728,938
Global E&P Infrastructure Fund II L.P.	47,416,091	5,666,611
GSO Energy Select Opportunities Fund LP	16,869,013	23,237,456
GSO Energy Select Opportunities Fund II, LP	2,227,433	46,638,959
JPMorgan AIRRO India SideCar Fund US, LLC	68,222,675	1,419,301
JPMorgan AIRRO Fund II	7,995,740	7,013,452
KKR Eagle CoInvest L.P.	27,532,470	1,853,268
KKR Global Infrastructure Investors, LP	8,519,089	4,182,224
Ridgewood Water & Strategic Infrastructure Fund LP	7,035,022	42,612,201
RPEP SMRS Infra II, LLC	4,951,154	500,000
StonePeak Infrastructure Fund LP	49,774,426	10,031,198
	<hr/>	<hr/>
Short-Term Investments and Other	\$ 691,068,479	\$ 261,520,458
	17,015,675	0
	<hr/>	<hr/>
Total Infrastructure Investments	\$ 708,084,154	\$ 261,520,458
	<hr/>	<hr/>
TOTAL INVESTMENTS	\$ 6,294,613,661	\$ 1,396,778,999
	<hr/>	<hr/>

* New or additional commitment made during the quarter reported

State of Michigan Retirement System
FIXED INCOME REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



Daniel J. Quigley
Senior Investment Manager
Fixed Income Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	3.7%	4.5%	4.6%	4.4%	4.4%
Bloomberg Barclays US Agg	8.7%	5.3%	4.3%	4.0%	3.8%
Peer Median Returns	7.4%	4.8%	4.6%	4.2%	4.7%
Percentile Rank vs. Peers*	86	62	52	46	63

*State Street Universe greater than \$1 billion

- The fixed income portfolio underperformed its benchmark and peer group on a one-year and three-year basis. This underperformance was driven by an overweight to corporate credit and structured credit securities and an underweight to U.S. Treasury securities and Agency Residential Mortgage Backed Securities (RMBS).
- The performance of risk assets was strong during the quarter as markets started to recover from the first quarter selloff. This recovery was supported by record amounts of Monetary and Fiscal Policy support as the Federal Reserve and U.S. Treasury sought to support the economy and stabilize financial markets during the COVID-19 economic shutdown. Investment Grade corporates, high yield, and emerging market debt all experienced quarterly returns above 9%. The performance of the U.S. Aggregate Index was driven by this credit spread tightening in corporate bonds and returned 2.9% for the quarter.
- The year-over-year (YOY) widening of spreads for high yield credit and structured credit securities was the main driver of performance on a one-year basis. In addition to this, the portfolio had a shorter duration than the U.S. Aggregate benchmark. This hurt relative performance as interest rates declined substantially on a YOY basis.

Strategy Update

- The objective 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 while having a risk profile that is similar to the long-term volatility experienced in traditional core fixed income. The yield-to-maturity of the portfolio is currently 3.3% versus a benchmark yield of 1.3%. In addition to this, the portfolio exhibits risk characteristics that are in line with the historical volatility of traditional fixed income benchmarks and has equity beta of 0.2.
- The Core-plus strategy implemented to achieve this goal includes:
 - Core: As of June 30, 2020, the portfolio's allocation to U.S. Treasuries, Investment Grade corporate bonds, government-guaranteed U.S. Agency Debentures, RMBS, and Commercial Mortgage Backed Securities (CMBS) was 58.3%. This includes a 20.7% 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 results in lower liquidity and higher volatility. The allocation to the Plus portfolio was 41.7% as of June 30, 2020.

Tactical Update

- The allocation to securitized credit, primarily in CMBS, ABS, non-agency RMBS, and CLO securities, was 30.0% of the portfolio at the end of the quarter. The combination of low interest rate duration and high coupon income (often floating rate) offers attractive characteristics for the overall fixed income portfolio in this low interest rate environment. This portion of the portfolio underperformed significantly as securitized markets experienced a dramatic selloff and freeze in market liquidity during the quarter. The one-year return on this portfolio was -5.2%.
- The allocation to high-yield strategies was 5.1% at the end of the quarter. This out-of-benchmark position underperformed during the first quarter but recovered strongly last quarter. The one-year performance of this allocation was 1.6% on a one-year basis, underperforming the core index by over 600 basis points (bp).
- 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. This allocation will underperform during risk-off markets when interest rates decline, however should exhibit strong risk-adjusted return characteristics on a go forward basis in this low interest rate environment.
- The allocation to U.S. TIPS was reduced during the quarter and ended the period at 3.2% of the fixed income portfolio. The TIPS allocation has underperformed nominal U.S. Treasuries on a one-year basis as inflation expectations have declined, however has experienced strong absolute returns that exceed 8% on a one-year basis. 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 steepened on a YTD basis for the quarter as short-term interest rates fell by a larger amount than long-term interest rates. Three-month U.S. Treasury Bills declined by 141 bp to 0.14% at the end of the quarter while ten-year U.S. Treasuries decreased by 125 bp to 0.66%.
- Inflation expectations increased during the quarter with ten-year breakeven inflation expectations ending June at 1.34%, an increase of 40 bp for the quarter.
- Credit markets recovered during the quarter with HY corporate bond spreads tightening by 254 bp to 626 bp at the end of the quarter. These HY spreads were still 290 bp higher on a YTD basis after the selloff in February and March. Investment grade corporate bond spreads also tightened during the quarter, decreasing by 122 bp to 150 bp.
- Emerging Markets debt also strengthened during the quarter with spreads decreasing by 249 bp to 408bp. EM spreads are 107 bp wider on a YTD basis.
- Commercial Mortgage Backed Securities (CMBS) were one of the few credit markets that did not experience a reduction in credit spreads during the quarter as markets priced in an increased likelihood of delinquencies and defaults for commercial real estate loans in the current economic environment. BBB CMBS spreads widened by 53 bp during the quarter to 740 bp. These spreads are 483 bp higher on a YTD basis

Conclusion

- The portfolio currently has a neutral interest rate duration to the benchmark but remains overweight to corporate and structured debt securities. This positioning increases the income of the portfolio while also increasing the potential for price volatility. The portfolio will continue to look for attractive risk-adjusted opportunities within the fixed income opportunity set.

SMRS

Fixed Income by Strategy

6/30/20

	Amount	Total	% of Total
Core (\$ in Millions)			
FID Internal	\$4,386		
PIMCO Mortgage Fund	490		
PGIM Investment Grade Credit	221		
Total Core		\$5,097	55.6%
Tactical			
Fidelity Tactical	\$491		
Total Tactical		\$491	5.4%
Securitized Debt			
Met West Securitized Ops	\$488		
Napier Park CLO Debt	462		
Napier Park ABS Income	473		
Principal CMBS	381		
TICP CLO Debt	380		
Fortress Credit ABI	306		
Putnam DMS	143		
Napier Park Strategic Loan	112		
Total Securitized Debt		\$2,745	30.0%
High Yield			
PGIM High Yield	\$212		
Columbia Management	196		
Crescent Direct Lending	60		
Total High Yield		\$468	5.1%
Global			
T. Rowe Global Multi-Sector	\$252		
PGIM Global Liquid Relative Value	110		
Total Global		\$361	3.9%

TOTAL

\$9,163

100.0%

NOTE: Totals may not be exact due to rounding.

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

6/30/20

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Maturity (Yrs)	9.3	8.0
Duration (Yrs)	5.9	6.0
Spread Duration (Yrs)	6.9	6.3
Coupon (%)	3.4	3.0
Yield to Maturity (%)	3.3	1.3
Credit Rating	A	AA
VaR (%)	11.1	7.7
Tracking Error	4.47	NA
Beta (vs S&P 500)	0.17	-0.01

Commentary

Objectives

Income:

The coupon of the portfolio is approximately 40 bps higher than the benchmark. Price movement has been the main driver of U.S. bond market returns YTD, but Income is the primary driver of long-term performance.

Liquidity:

20.3% of the portfolio is invested in cash, U.S. Treasuries, and TIPS. These investments can be liquidated via same-day trading.

Principal Preservation:

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

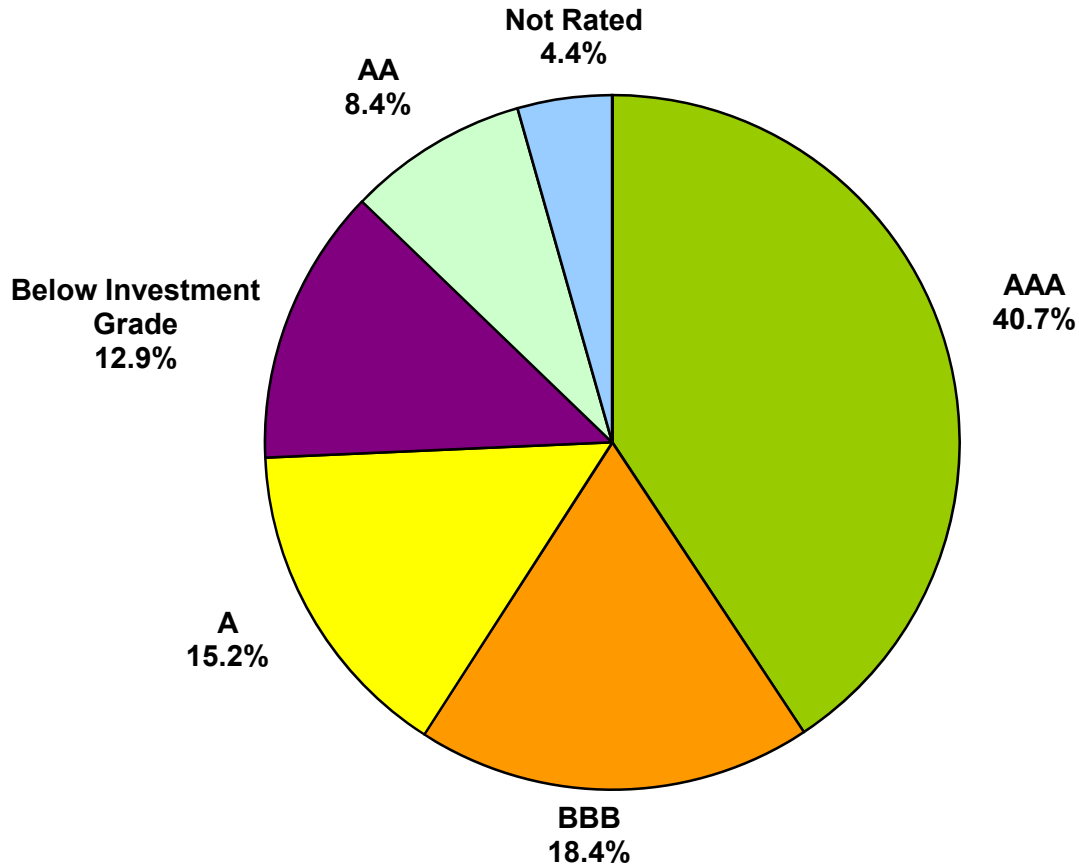
Diversification:

The equity beta of the portfolio is roughly 0.2 meaning that the portfolio returns have a low correlation with equity market movements.

SMRS

Fixed Income By Rating

6/30/20



Market Value in Millions				
6/30/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$3,732	40.7%	68.5%	-27.8%
AA	769	8.4%	3.4%	5.0%
A	1,388	15.2%	11.9%	3.3%
BBB	1,685	18.4%	13.5%	4.9%
* Below Investment Grade	1,185	12.9%	0.5%	12.4%
Not Rated	404	4.4%	2.2%	2.2%
Total Investments	<u>\$9,163</u>	<u>100.0%</u>	<u>100.0%</u>	

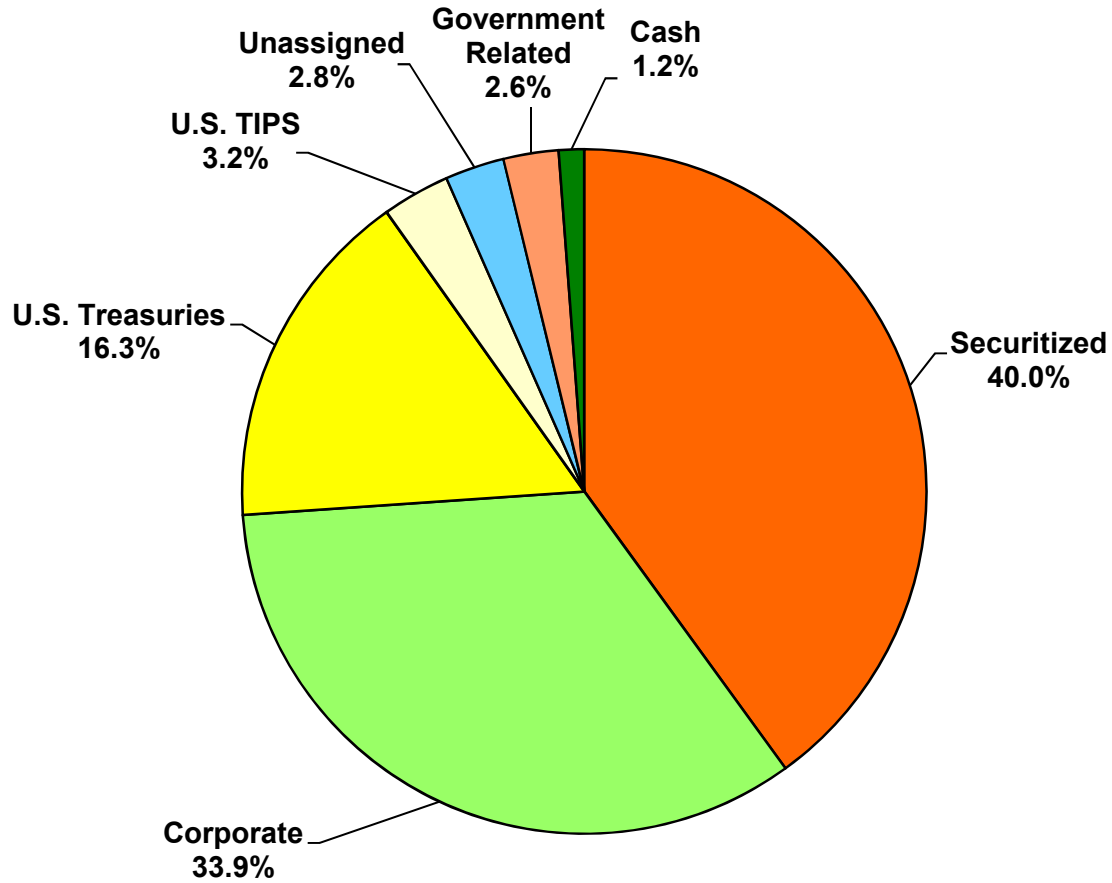
* Comprised of approximately 8.4% High Yield Credit and 4.5% High Yield RMBS/ABS

Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

6/30/20



Market Value in Millions				
6/30/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Securitized	\$3,661	40.0%	29.5%	10.5%
Corporate	3,107	33.9%	27.3%	6.6%
U.S. Treasuries	1,493	16.3%	37.2%	-20.9%
U.S. TIPS	297	3.2%	0.0%	3.2%
Unassigned	260	2.8%	0.0%	2.8%
Government Related	237	2.6%	6.0%	-3.4%
Cash	108	1.2%	0.0%	1.2%
Total Investments	<u>\$9,163</u>	<u>100.0%</u>	<u>100.0%</u>	

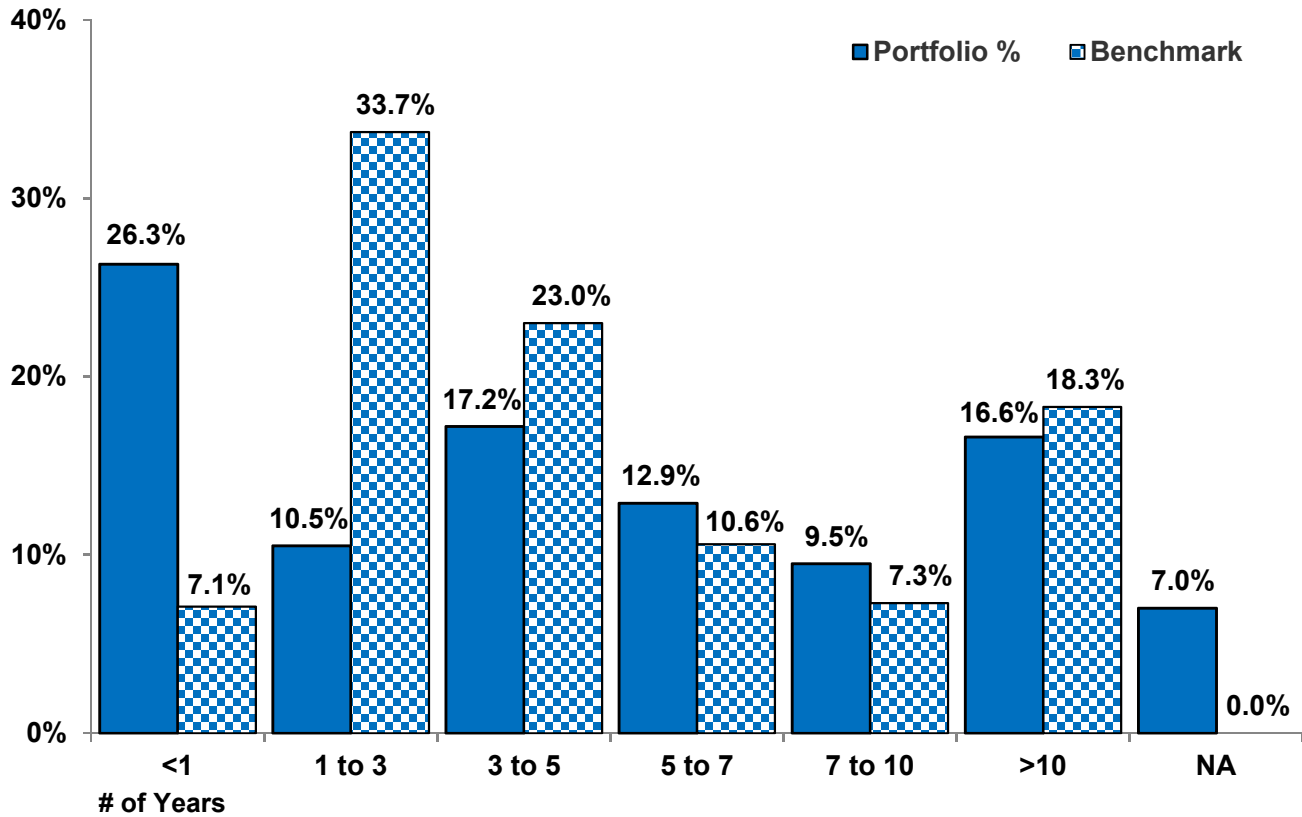
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

6/30/20



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$2,407	26.3%	7.1%	0.2	0.6
1 to 3	962	10.5%	33.7%	2.1	2.1
3 to 5	1,576	17.2%	23.0%	4.0	3.9
5 to 7	1,179	12.9%	10.6%	5.9	6.0
7 to 10	872	9.5%	7.3%	8.0	8.1
>10	1,521	16.6%	18.3%	18.2	17.2
NA	646	7.0%	0.0%	0.0	0.0
Total	\$9,163	100.0%	100.0%	5.9	6.0

* Effective Duration

Benchmark: Barclays US Aggregate

Total Fixed Income Performance - Net of Fees (MPSERS)

6/30/20

	<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	\$9,163,146,101	3.51%	4.30%	4.38%	4.19%	4.23%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.74%</i>	<i>5.32%</i>	<i>4.30%</i>	<i>3.96%</i>	<i>3.82%</i>
Internal Core Fixed Income	4,386,234,270.00	8.02%	5.82%	5.12%	4.62%	4.37%
Externally Managed Fixed Income	\$4,776,911,830.74	-0.78%	2.84%	3.73%	3.94%	4.32%
PIMCO Mortgage Fund	489,781,623	6.65%				
<i>Bloomberg/Barclays US MBS Agy Fixed Indx</i>	<i>N/A</i>	<i>5.67%</i>				
Investment Grade Credit	\$220,880,452	9.46%	6.30%	5.93%	5.53%	5.69%
PGIM Investment Grade	220,880,452	9.46%	6.30%	5.93%	5.58%	5.79%
<i>Bloomberg/Barclays Credit Index</i>	<i>N/A</i>	<i>9.07%</i>	<i>6.14%</i>	<i>5.54%</i>	<i>5.14%</i>	<i>5.24%</i>
Tactical Fixed Income	\$491,392,519	5.76%	5.05%	4.64%	5.11%	9.19%
Fidelity Tactical Bond Fund	491,392,519	6.02%	5.49%	5.26%		
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.74%</i>	<i>5.32%</i>	<i>4.30%</i>	<i>3.96%</i>	<i>3.82%</i>
High Yield Fixed Income	\$468,161,940	1.63%	4.00%	5.13%		
Columbia Management High Yield	196,266,323	1.50%	3.70%	4.90%		
PGIM High Yield	211,847,577	2.12%	4.47%	5.46%		
Crescent Direct Lending	60,048,040	3.35%				
<i>Bloomberg/Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>2.06%</i>	<i>4.16%</i>	<i>5.01%</i>		
Structured Fixed Income	\$2,745,220,259	-5.19%	1.53%			
Principal CMBS	381,275,317	-9.17%	0.89%	2.06%	3.73%	8.18%
MetWest Securitized Opportunities	488,389,125	1.82%	3.82%	3.92%		
Napier Park ABS Income	472,558,392	11.58%	1.52%	4.82%		
Napier Park Strategic Loan LP	111,533,387	2.39%	5.05%			
Napier Park CLO Debt	462,020,250	0.16%	2.39%			
TICP CLO Debt	380,233,111	3.43%	3.16%			
Fortress ABI	305,964,006					
Putnam DMS	143,246,672					
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.74%</i>	<i>5.32%</i>	<i>4.30%</i>	<i>3.96%</i>	<i>3.82%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>5.94%</i>	<i>4.90%</i>	<i>4.58%</i>	<i>5.16%</i>	<i>5.48%</i>
Global Fixed Income	\$361,475,038	4.06%	4.00%			
T. Rowe Global Multi-Sector	251,505,528	3.42%	4.08%			
PGIM GLRV	109,969,510	5.55%				
<i>Custom GMS Benchmark</i>	<i>N/A</i>	<i>4.18%</i>	<i>4.78%</i>			

State of Michigan Retirement System

ABSOLUTE RETURN REVIEW

State of Michigan Investment Board Meeting

September 10, 2020



Daniel J. Quigley
Senior Investment Manager
Absolute Return Strategy

EXECUTIVE SUMMARY

Performance

MPSERS Plan (6/30/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Absolute Return	0.0%	3.1%	2.4%	3.7%	4.3%
HFRI FOF Conservative	-1.5%	1.3%	1.0%	2.0%	2.3%

- The value of the Absolute Return portfolio is \$4.2 billion with a one-year return of 0.0%. The performance of the portfolio was positive for the second quarter with several strategies bouncing back from the market selloff in the first quarter.
- Credit strategies drove strong performance in the quarter across corporate credit, residential mortgages and distressed credit sub-strategies. Corporate credit performance was positive as the high yield and leveraged loan markets rebounded following the March dislocation, bolstered by central bank support and the gradual restart of economic activity across the US. The residential mortgage markets rallied from their March lows as technical selling pressure subsided and borrower delinquencies outperformed market expectations. Distressed credit strategies were also positive as post-reorg equities and distressed credits recovered modestly.
- Multi-Strategy and Event strategies were the second largest contributors to performance for the quarter. Event managers generated alpha due to their exposure to sectors most impacted by COVID-19 related lockdowns, which rebounded strongly in the quarter on the prospect of economies reopening. Within Multi-Strategy, the Special Situations sub-strategy performed well with key contributors including a portfolio of mortgage servicing rights, a capital markets strategy and a second lien in a software company.

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, we are focused on continuing to recover losses from the first quarter market selloff and protecting capital going forward. We have slightly increased our exposure to multi-strategy managers.

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

SMRS

Absolute Return

6/30/20

Net Market Values by Entity

		<u>Net Market Value</u>
* Tahquamenon Fund, LP	\$	3,528,142,022
Cerberus Manitou Residential Loan Fund, LP		130,758,013
JM IV, LP		70,482,775
SJC Direct Lending Revolver Fund III, LP		86,092,690
MP Securitized Credit Master Fund, LP		46,998,302
* EnTrust White Pine Partners, LP		11,774,670
Visium Balanced Fund, LP		299,801
Monument Park, LLC		254,194,257
Total Absolute Return	\$	4,128,742,530
Short-Term Investments & Other		50,073,672
Grand Total	\$	4,178,816,202

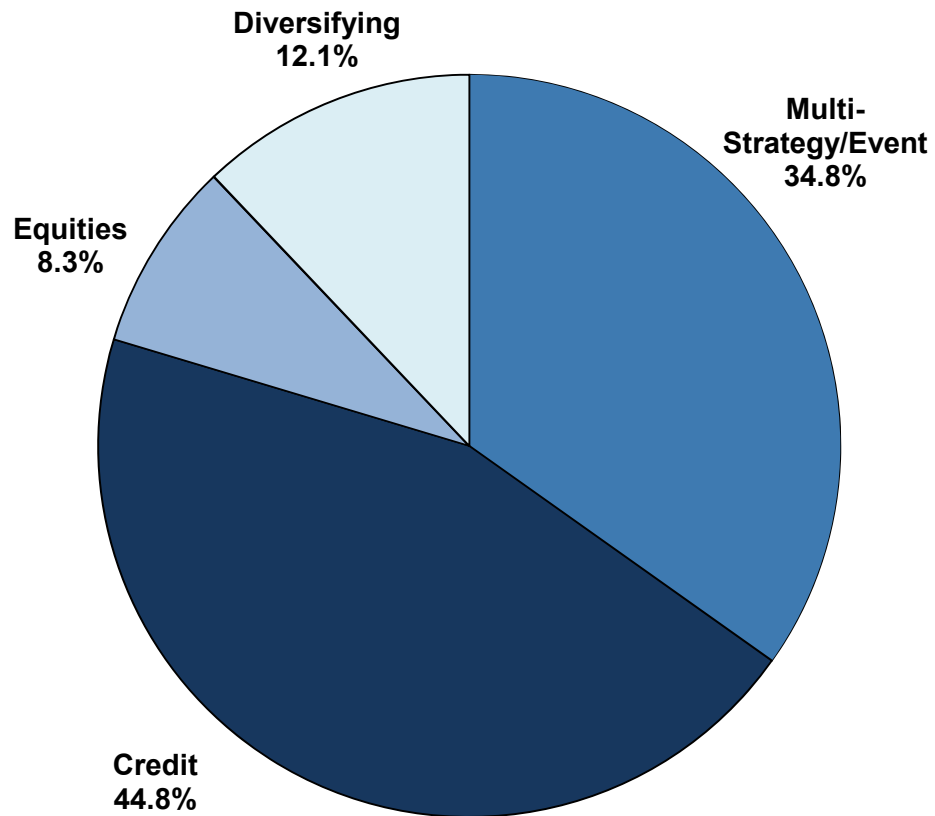
* Fund of Funds

SMRS

Absolute Return

6/30/20

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	74	Median Position Size:	0.5%
Strategies:	4	Average Position Size:	1.3%
Relationships:	8	Largest Position Size:	7.3%

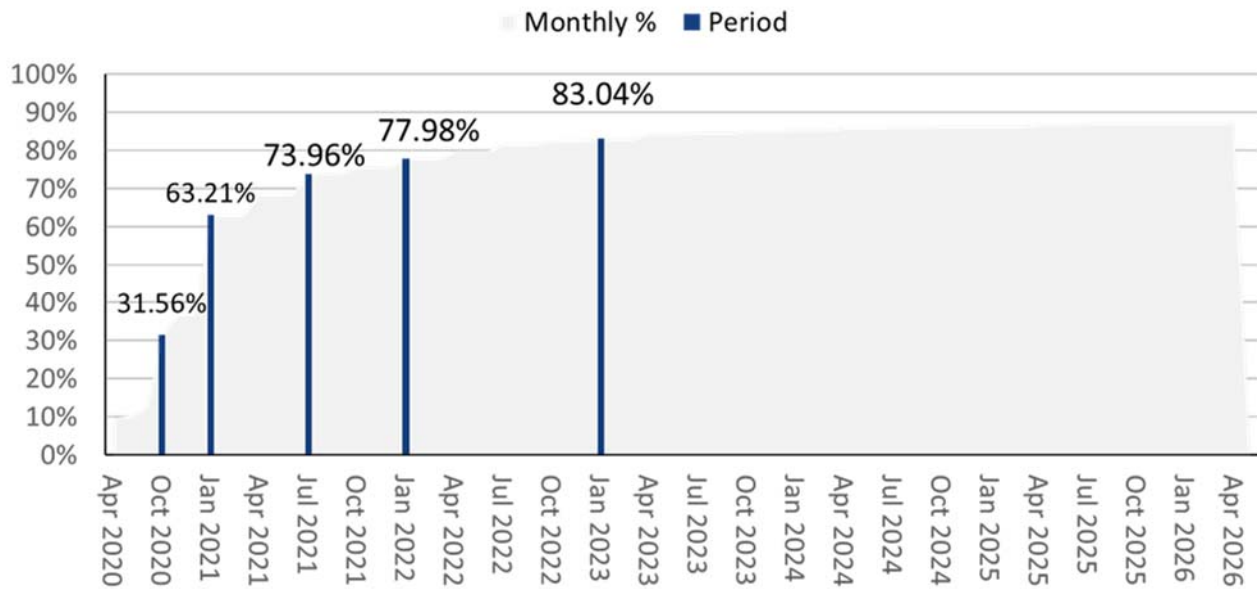
SMRS

Absolute Return

6/30/20

Liquidity Analysis

Redeemable	Marginal Allocation (% each period)	Aggregate Allocation (% since Analysis Date)
By 10/1/20	31.56%	31.56%
By 1/1/21	31.85%	63.21%
By 7/1/21	10.75%	73.96%
By 1/1/22	4.02%	77.98%
By 1/1/23	5.06%	83.04%
After 1/1/23	4.45%	87.49%
Illiquid	12.51%	100.00%
Total	100.00%	N/A



State of Michigan Retirement System

DEFINED CONTRIBUTION REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



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

EXECUTIVE SUMMARY

Overview

Defined Contribution (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 which 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.

SOM Plans	6/30/19	6/30/20
State of Michigan 401(k)	\$6,295	\$6,644
State of Michigan 457	1,804	1,775
Pension Plus 401(k) & 457	794	1,082
EAA	11	11
Total	\$8,904	\$9,512

(\$ in millions)

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.

Market Environment and Outlook

The Federal Reserve announced on March 23 that “they would do whatever it takes for as long as it takes” to get the economy turned around immediately. This stopped the decline in financial markets and led to their subsequent recovery in April which has continued into July with equity markets recovering much of their first quarter losses. Much of Washington’s fiscal stimulus is set to end in August, but Washington is likely to extend additional support for households and firms in the second half with an estimated \$1.0-\$1.5 trillion in added benefits likely.

The COVID19 crises led to one of the deepest recessions in the last 90 years, but the quick action by both the Federal Reserve and Washington appear to have made it one of the shortest recessions on record. Data suggests the U.S. recession ended in March, but markets are likely to trade nervously over the coming weeks in response to the second wave of pandemic and its uncertain impact on the economy.

Significant uncertainty remains about the shape of the economic recovery and this will remain as an overhang for financial markets. Nearly all economists agree that the shape of the recovery will be a function of the outlook for the virus and most believe the benefits of improved social practices, better therapeutics and the potential for one or more vaccines will begin to improve the outlook starting in early 2021 with improvement throughout the year.

DC Plan Evolution

The SECURE Act (Setting Every Community Up for Retirement Enhancement) was signed into law with broad bi-partisan support at the end of 2019. While there are 29 provisions in the law, they can be categorized into three main provisions which will allow more Americans to participate in workplace plans and empower greater retirement readiness:

1. Extend Retirement Plan Access
 - a. Authorize open Multiple Employer Plans (MEPs) and repeal of the “one bad apple” rule (effective January 1, 2021)
 - b. Encourage small employers to adopt plans and auto enroll by providing tax credits (effective January 1, 2020)
 - c. Establish long-term part-time worker status (effective January 1, 2021)
2. Increase Savings Contributions
 - a. Increase the limit on automatic escalation from 10% to 15% (effective January 1, 2020)
 - b. Allow contributions to a traditional IRA after age 70½ (effective January 1, 2020)
 - c. Change required minimum distributions age from 70½ to 72 (effective January 1, 2020)
3. Expand Savings Distribution Options
 - a. Modified the fiduciary Safe Harbor for selecting an annuity provider (effective January 1, 2021)
 - b. Enable portability of lifetime income products (effective January 1, 2021)
 - c. Offer penalty-free distributions upon birth or adoption of a child (effective January 1, 2021)
 - d. Amend wealth transfer strategies by limiting the window of post-death payments (effective January 1, 2021)
 - e. Feature lifetime income disclosure- (DOL will establish standards by end of 2020).

SMRS
Defined Contribution Strategies
6/30/20

Markets	Amount		% of Total	Fee per \$1,000
QDIA (\$ in Millions)				
	<u>6/30/20</u>	<u>6/30/19</u>		
Total Target Date Fund	\$2,274	\$1,837	23.9%	\$0.70
Tier I Index Funds				
State Street S&P 500 Index Fund	\$1,334	\$1,212		\$0.13
State Street Bond Market Index Fund	\$950	804		0.20
State Street Global All Cap Equity ex-U.S. Index Fund	\$655	609		0.45
State Street S&P Mid Cap Index Fund	\$553	577		0.20
BlackRock Government Short-Term Investment CL F	\$245	232		0.56
BlackRock S&P Small Cap 600 Equity Index CL F	\$118	134		0.25
BlackRock Emerging Markets Index CL F	\$114	123		0.69
Total Tier I Index	\$3,969	\$3,691	41.7%	\$0.26
Tier II Active Funds				
Stable Value Fund	\$1,210	\$1,161		\$2.23
Dodge & Cox Stock Fund	\$483	571		4.13
Jennison Large Cap Growth Fund	\$486	403		2.92
American Funds EuroPacific Growth R6	\$293	319		4.90
Artisan Mid Cap Fund	\$148	124		7.05
Voya Small Cap Growth Equity Fund	\$135	152		4.33
PIMCO Total Return I Fund	\$126	118		4.60
T. Rowe Price Mid-Cap Value Fund	\$99	118		6.30
Virtus Ceredex Small-Cap Value Eq I	\$52	73		6.80
Prudential High Yield Fund	\$31	32		3.76
Oakmark Equity & Income I	\$0	116		4.30
Total Tier II Active	\$3,062	\$3,187	32.2%	\$3.54
Tier III				
Total Self Directed Brokerage Account	\$208	\$189	2.2%	NA

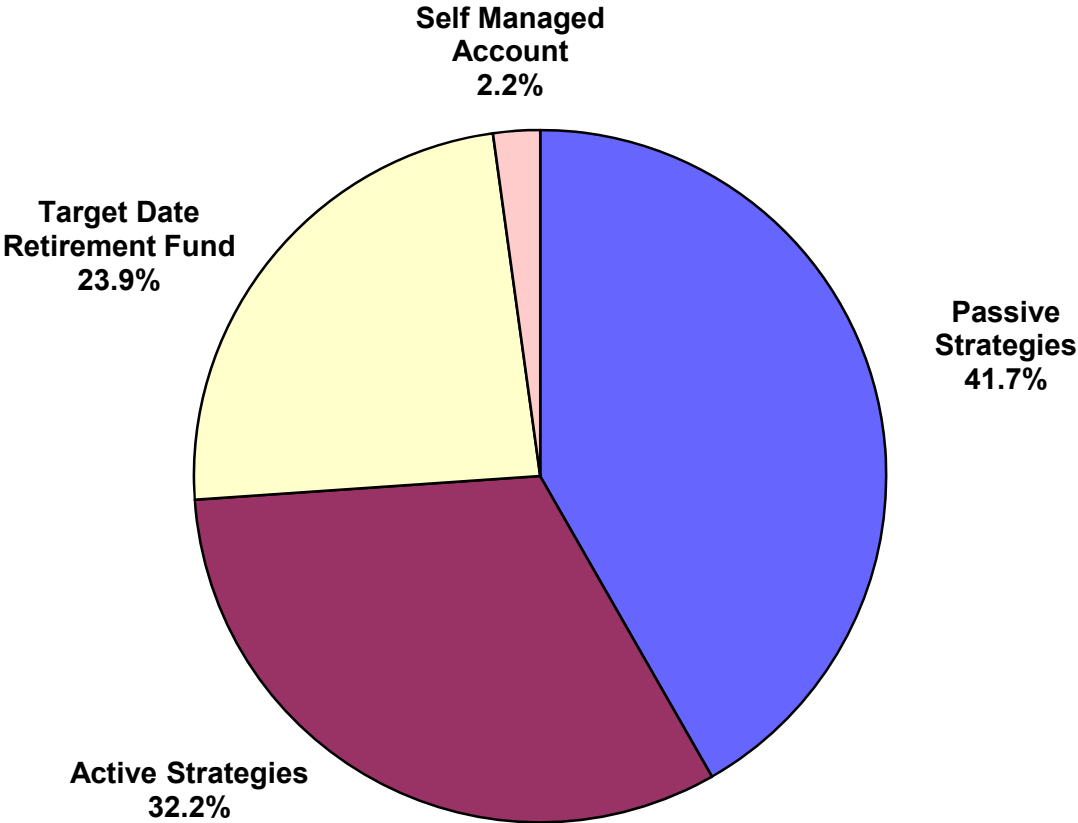
Total Defined Contribution Assets \$9,512 \$8,904 **100.0%** \$1.41

NOTE: Totals may not be exact due to rounding.

SMRS

Defined Contribution by Investment Strategy

6/30/20



Market Value in Millions				
	<u>6/30/20</u>		<u>6/30/19</u>	
Passive Strategies	\$3,969	41.7%	\$3,691	41.5%
Active Strategies	3,062	32.2%	3,187	35.8%
Target Date Retirement Fund	2,274	23.9%	1,837	20.6%
Self Managed Account	208	2.2%	189	2.1%
Total Investments	<u><u>\$9,512</u></u>	<u><u>100.0%</u></u>	<u><u>\$8,904</u></u>	<u><u>100.0%</u></u>

*Loan Fund \$209M as of 6/30/20
 Note: Totals may not be exact due to rounding.

Defined Contribution Performance by Fund 6/30/20

<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	\$103,578,041	4.2%	4.7%	4.3%	5.4%
State Street Income Custom Index		4.0%	4.6%	4.2%	5.5%
Morningstar Target-Date Retirement		4.0%	4.4%	4.1%	5.1%
Variance State Street Income Custom Index		0.2%	0.1%	0.1%	-0.1%
Variance Morningstar Target-Date Retirement		0.2%	0.3%	0.2%	0.3%
State Street Target Retirement 2020 Fund	132,259,673	4.1%	5.5%	5.4%	8.3%
State Street 2020 Custom Index		3.9%	5.4%	5.3%	8.3%
Morningstar Target-Date 2020		4.1%	5.2%	4.9%	6.8%
Variance State Street 2020 Custom Index		0.2%	0.1%	0.1%	0.0%
Variance Morningstar Target-Date 2020		0.0%	0.3%	0.5%	1.5%
State Street Target Retirement 2025 Fund	208,442,758	6.0%	6.7%	6.4%	9.2%
State Street 2025 Custom Index		5.7%	6.6%	6.4%	9.3%
Morningstar Target-Date 2025		3.9%	5.5%	5.4%	7.8%
Variance State Street 2025 Custom Index		0.3%	0.1%	0.0%	-0.1%
Variance Morningstar Target-Date 2025		2.1%	1.2%	1.0%	1.4%
State Street Target Retirement 2030 Fund	241,387,181	6.9%	7.2%	6.9%	9.8%
State Street 2030 Custom Index		6.7%	7.2%	6.8%	9.8%
Morningstar Target-Date 2030		3.6%	5.7%	5.7%	8.1%
Variance State Street 2030 Custom Index		0.2%	0.0%	0.1%	0.0%
Variance Morningstar Target-Date 2030		3.3%	1.5%	1.2%	1.7%
State Street Target Retirement 2035 Fund	265,464,801	6.6%	7.3%	7.0%	10.0%
State Street 2035 Custom Index		6.3%	7.2%	7.0%	10.0%
Morningstar Target-Date 2035		3.1%	5.9%	6.0%	8.8%
Variance State Street 2035 Custom Index		0.3%	0.1%	0.0%	0.0%
Variance Morningstar Target-Date 2035		3.5%	1.4%	1.0%	1.2%
State Street Target Retirement 2040 Fund	263,483,153	5.9%	7.2%	7.1%	10.1%
State Street 2040 Custom Index		5.7%	7.1%	7.0%	10.1%
Morningstar Target-Date 2040		2.4%	5.8%	5.9%	8.8%
Variance State Street 2040 Custom Index		0.2%	0.1%	0.1%	0.0%
Variance Morningstar Target-Date 2040		3.5%	1.4%	1.2%	1.3%
State Street Target Retirement 2045 Fund	271,207,482	5.3%	7.1%	7.1%	10.1%
State Street 2045 Custom Index		5.1%	7.0%	7.0%	10.2%
Morningstar Target-Date 2045		2.1%	5.8%	6.1%	9.2%
Variance State Street 2045 Custom Index		0.2%	0.1%	0.1%	-0.1%
Variance Morningstar Target-Date 2045		3.2%	1.3%	1.0%	0.9%
State Street Target Retirement 2050 Fund	339,866,730	5.0%	7.0%	7.0%	10.1%
State Street 2050 Custom Index		4.9%	6.9%	7.0%	10.1%
Morningstar Target-Date 2050		1.8%	5.7%	6.0%	9.0%
Variance State Street 2050 Custom Index		0.1%	0.1%	0.0%	0.0%
Variance Morningstar Target-Date 2050		3.2%	1.3%	1.0%	1.1%
State Street Target Retirement 2055 Fund	339,593,326	5.0%	7.0%	7.0%	N/A
State Street 2055 Custom Index		4.9%	6.9%	7.0%	N/A
Morningstar Target-Date 2055		1.8%	5.8%	6.2%	N/A
Variance State Street 2055 Custom Index		0.1%	0.1%	0.0%	N/A
Variance Morningstar Target-Date 2055		3.2%	1.2%	0.8%	N/A
State Street Target Retirement 2060 Fund	108,323,939	5.0%	7.0%	7.0%	N/A
State Street 2060 Custom Index		4.9%	6.9%	7.0%	N/A
Morningstar Target-Date 2060+		1.4%	5.7%	6.2%	N/A
Variance State Street 2060 Custom Index		0.1%	0.1%	0.0%	N/A
Variance Morningstar Target-Date 2060+		3.6%	1.3%	0.8%	N/A

<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 2065 Fund	\$240,378	N/A	N/A	N/A	N/A
<i>State Street 2065 Custom Index</i>		N/A	N/A	N/A	N/A
<i>Morningstar Target-Date 2060+</i>		N/A	N/A	N/A	N/A
<i>Variance State Street 2065 Custom Index</i>		N/A	N/A	N/A	N/A
<i>Variance Morningstar Target-Date 2060+</i>		N/A	N/A	N/A	N/A
TIER 1					
State Street S&P 500 Index Fund	1,334,078,155	7.5%	10.7%	10.7%	13.9%
S&P 500 Index		7.5%	10.7%	10.7%	14.0%
Morningstar Large Blend		3.6%	8.1%	8.1%	11.7%
Variance S&P 500 Index		0.0%	0.0%	0.0%	-0.1%
Variance Morningstar Large Blend		3.9%	2.6%	2.6%	2.2%
State Street Bond Market Index Fund	950,352,676	8.9%	5.4%	4.3%	3.8%
Bloomberg Barclays U.S. Aggregate Index		8.7%	5.3%	4.3%	3.8%
Morningstar Intermediate-Term Bond		7.8%	4.8%	4.0%	3.8%
Variance Bloomberg Barclays U.S. Aggregate Index		0.2%	0.1%	0.0%	0.0%
Variance Morningstar Intermediate-Term Bond		1.1%	0.6%	0.3%	0.0%
State Street S&P Mid Cap Index Fund	552,809,672	-6.8%	2.4%	5.2%	11.3%
S&P 400 Index		-6.7%	2.4%	5.2%	11.3%
Morningstar Mid-Cap Blend		-6.3%	2.1%	3.7%	9.6%
Variance S&P 400 Index		-0.1%	0.0%	0.0%	0.0%
Variance Morningstar Mid-Cap Blend		-0.5%	0.3%	1.5%	1.7%
State Street Global All Cap Equity ex-U.S. Index Fund	654,680,386	-4.2%	1.3%	2.6%	N/A
MSCI ACWI ex USA IMI (Net)		-4.7%	1.0%	2.3%	N/A
Morningstar Foreign Large Blend		-4.8%	0.4%	1.6%	N/A
Variance MSCI ACWI ex USA IMI (Net)		0.5%	0.3%	0.3%	N/A
<i>Variance Morningstar Foreign Large Blend</i>		0.6%	0.9%	1.0%	N/A
BlackRock Government Short-Term Investment CL F	245,391,293	1.4%	1.7%	1.1%	N/A
BofA Merrill Lynch US 3-Month Treasury Bill Index		1.6%	1.8%	1.2%	N/A
Variance BofA Merrill Lynch US 3-Month Treasury Bill Index		-0.2%	-0.1%	-0.1%	N/A
BlackRock S&P Small Cap 600 Equity Index CL F	117,515,143	-11.4%	N/A	N/A	N/A
S&P SmallCap 600 Index		-11.3%	N/A	N/A	N/A
Morningstar Small Blend		-11.5%	N/A	N/A	N/A
Variance S&P SmallCap 600 Index		-0.1%	N/A	N/A	N/A
Variance Morningstar Small Blend		0.1%	N/A	N/A	N/A
BlackRock Emerging Markets Index CL F	114,312,137	-3.5%	1.9%	2.8%	N/A
MSCI Emerging Market (Net)		-3.4%	1.9%	2.9%	N/A
Morningstar Diversified Emerging Mkts		-4.2%	0.8%	2.1%	N/A
Variance MSCI Emerging Market (Net)		-0.1%	0.0%	-0.1%	N/A
<i>Variance Morningstar Diversified Emerging Mkts</i>		0.7%	1.1%	0.7%	N/A
TIER 2					
Stable Value Fund	1,209,512,867	2.7%	2.5%	2.4%	2.3%
Barclays Int Gov/Credit A or Higher Index		7.2%	4.3%	3.2%	2.9%
Hueler Universe		2.4%	2.3%	2.1%	2.1%
Variance Barclays Int Gov/Credit A or Higher Index		-4.5%	-1.8%	-0.8%	-0.6%
Variance Hueler Universe		0.3%	0.2%	0.3%	0.2%
Dodge & Cox Stock Fund	482,860,539	-6.9%	2.8%	5.8%	11.6%
<i>Russell 1000 Value Index</i>		-8.8%	1.8%	4.6%	10.4%
<i>Morningstar Large Value</i>		-7.7%	2.1%	4.3%	9.5%
<i>Variance Russell 1000 Value Index</i>		1.9%	1.0%	1.2%	1.2%
<i>Variance Morningstar Large Value</i>		0.8%	0.7%	1.5%	2.1%

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
Jennison Large Cap Growth Fund	\$485,774,996	29.5%	22.3%	17.3%	N/A
<i>Russell 1000 Growth Index</i>		23.3%	19.0%	15.9%	N/A
<i>Morningstar Large Growth</i>		16.9%	15.8%	12.7%	N/A
<i>Variance Russell 1000 Growth Index</i>		6.2%	3.3%	1.4%	N/A
<i>Variance Morningstar Large Growth</i>		12.6%	6.5%	4.6%	N/A
American Funds EuroPacific Growth R6	293,297,656	3.2%	4.8%	4.9%	7.5%
<i>MSCI EAFE Index - Net Div</i>		-5.1%	0.8%	2.1%	5.7%
<i>Morningstar Foreign Large Blend</i>		-4.8%	0.4%	1.6%	5.2%
<i>Variance MSCI EAFE Index - Net Div</i>		8.3%	4.0%	2.8%	1.8%
<i>Variance Morningstar Foreign Large Blend</i>		8.0%	4.4%	3.3%	2.3%
Voya Small Cap Growth Equity Fund	134,542,652	-0.5%	3.1%	4.8%	12.0%
<i>Russell 2000 Growth Index</i>		3.5%	7.9%	6.9%	12.9%
<i>Morningstar Small Growth</i>		4.3%	9.7%	7.9%	12.4%
<i>Variance Russell 2000 Growth Index</i>		-4.0%	-4.8%	-2.1%	-0.9%
<i>Variance Morningstar Small Growth</i>		-4.8%	-6.6%	-3.1%	-0.4%
T. Rowe Price Mid-Cap Value Fund	99,161,083	-6.9%	0.5%	4.1%	9.8%
<i>Russell Midcap Value Index</i>		-11.8%	-0.5%	3.3%	10.3%
<i>Morningstar Mid-Cap Value</i>		-13.4%	-1.7%	1.7%	8.7%
<i>Variance Russell Midcap Value Index</i>		4.9%	1.0%	0.8%	-0.5%
<i>Variance Morningstar Mid-Cap Value</i>		6.5%	2.2%	2.4%	1.1%
PIMCO Total Return I Fund	126,406,204	8.3%	5.2%	4.4%	4.2%
<i>Bloomberg Barclays U.S. Aggregate Index</i>		8.7%	5.3%	4.3%	3.8%
<i>Morningstar Intermediate Core-Plus Bond</i>		6.8%	4.6%	4.0%	4.1%
<i>Variance Bloomberg Barclays U.S. Aggregate Index</i>		-0.4%	-0.1%	0.1%	0.4%
<i>Variance Morningstar Intermediate Core-Plus Bond</i>		1.5%	0.6%	0.4%	0.1%
Artisan Mid Cap Fund	148,143,004	24.1%	19.2%	13.5%	16.5%
<i>Russell Midcap Growth Index</i>		11.9%	14.8%	11.6%	15.1%
<i>Morningstar Mid-Cap Growth</i>		9.3%	12.2%	9.4%	12.9%
<i>Variance Russell Midcap Growth Index</i>		12.2%	4.4%	1.9%	1.4%
<i>Variance Morningstar Mid-Cap Growth</i>		14.8%	7.0%	4.1%	3.6%
Virtus Ceredex Small-Cap Value Eq I	51,554,396	-19.2%	-3.3%	1.2%	8.1%
<i>Russell 2000 Value Index</i>		-17.5%	-4.3%	1.3%	7.8%
<i>Morningstar Small Value</i>		-17.2%	-5.0%	-0.1%	7.2%
<i>Variance Russell 2000 Value Index</i>		-1.7%	1.0%	-0.1%	0.3%
<i>Variance Morningstar Small Value</i>		-2.0%	1.7%	1.3%	0.9%
Prudential High Yield Fund	30,520,194	1.3%	4.3%	5.3%	N/A
<i>Bloomberg Barclays U.S. Corp. HY 1% Issuer Cap Index</i>		-0.5%	3.1%	4.6%	N/A
<i>Morningstar High Yield Bond</i>		-2.0%	1.9%	3.2%	N/A
<i>Variance Bloomberg Barclays U.S. Corp. HY 1% Issuer Cap Index</i>		1.8%	1.2%	0.7%	N/A
<i>Variance Morningstar High Yield Bond</i>		3.3%	2.4%	2.1%	N/A
Self Directed	207,709,112				
TOTAL	\$9,512,469,625				

Loan Fund: \$209,441,324

State of Michigan Retirement System

BASKET CLAUSE REVIEW

State of Michigan Investment Board Meeting
September 10, 2020



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

SMRS

Basket Clause Investments

6/30/20

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$ 4,128,742,532
Total Real Return and Opportunistic	690,778,929
Total International Equity	64,569,928
Total Fixed Income	<u>70,622,366</u>
Total Basket Clause Investments	<u><u>\$ 4,954,713,755</u></u>

The basket clause investments on June 30, 2020, were \$5.0 billion or 6.9% of the total portfolio value of \$72.2 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, 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.