

STATE OF MICHIGAN INVESTMENT BOARD MEETING

June 11, 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

JUNE 11, 2020

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:35 a.m. Approval of the 3/19/20 SMIB Meeting Minutes
- 9:40 a.m. Executive Summary & Performance for Periods Ending 3/31/20
- 9:50 a.m. Asset Liability Analysis/Asset Allocation Discussion and Recommendation
Guest Speakers: Steve Cummings, Max Kotary, Tim McEnergy – AON
- 10:20 a.m. Action Item:
- Resolution Authorizing Asset Allocation Strategy
- 10:45 a.m. 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, September 10, 2020

Thursday, December 10, 2020

All meetings start at 9:30 a.m.

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State of Michigan Retirement System

MINUTES

State of Michigan Investment Board Meeting

June 11, 2020



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN INVESTMENT BOARD

March 19, 2020 Meeting Minutes

Board Members Present:

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

Members of the Public and Bureau of Investments Staff Present:

Karl Borgquist	Robert Brackenbury	Jack Behar
Travis Haney	Greg Parker	Jim Elkins
Jennifer Yeung	Dan Quigley	Todd Warstler
Janet Sudac	Lori Barrett	

Via Conference Line:

Jon Braeutigam	Max Kotary
Peter Woodford	Tim McEnergy
Steve Cummings	

Opening Remarks:

Rachael Eubanks called the meeting to order at 9:30 am. She stated that it is hard to even find words for what is happening. These are certainly unprecedented times. The State of Michigan is working from home due to Covid-19 and people are practicing social distance measures from one another and working remotely. She is enormously grateful for staff's dedication to keep moving forward in this unique situation.

Approval of Minutes:

Approval of the December 19, 2019 SMIB Meeting Minutes – Motion to approve: James Nicholson. Seconded: Dina Richard. The vote was unanimous to approve.

AGENDA

Executive Summary and Performance

Robert Brackenbury, Deputy Chief Investment Officer for the Bureau of Investments, reviewed the executive summary performance section discussing returns and markets. He described the appearance of the room and how different it was from usual so that those on the phone could visualize it with social distancing requirements in effect.

Mr. Brackenbury explained that Monday, March 16th, was the largest single day drop in the S&P history since 1987. It was truly another black Monday. The Nasdaq presented an all-time record drop in a single day. Volatility like this has not been seen since the global financial crisis. Mr. Brackenbury stated that there was no way to see this coming, and it is clear that the 11-year bull run cycle is over. What is unclear is where the market is going to end up through this pandemic.

Performance for the quarter ending 12/31/2019 was discussed, reviewing the executive summary. Mr. Brackenbury explained that the 1-year return of 15.4% is well north of the

assumed rate of return of 6.8%. What's more important is that SMRS has always invested for the long-term, and the 3, 5, 7, and 10-year returns are well in excess of the assumed rate of return but also significantly in excess of peer returns. Jon Braeutigam led this team for a decade and set down these blueprints 10 years ago to give us this outperformance and now we are seeing the value of excess returns. It's helping not just the State of Michigan but the retirees of the State of Michigan.

Mr. Brackenbury explained that a few weeks ago during market peaks, \$1 billion in public equities was turned into cash, providing liquidity to the portfolio. SMRS also has far less public equity exposure than in the past decade, meaning we are less exposed to the volatility of the public equity markets. These two items, having more cash on hand and having a lower public equity allocation should help mitigate some of the near-term challenges we are going to see going forward.

Asset Allocation Review, Markets Review and Outlook

Gregory Parker, Director of Investments - Public Markets discussed this being unprecedented times and that although staff are being pulled in many different directions, staff members are on the same page. He pointed out the dedication to the support of the operation, the responsiveness, the foresight and the assistance that the team gives to think through these very difficult times. We are all getting through this together and couldn't imagine a better team managing the public pension money than the one we have with the State of Michigan. The entire team should be acknowledged.

Mr. Parker described many of the changes in 2019 that assisted with the current high liquidity amounts. The SMRS is defensively postured although it needs to take risks. He discussed liquidity and equity risks. The US stock market has entered what is termed a correction, which is falling in price by more than 20%. This correction has been the fastest in terms of time than any other 20% correction. The Dow and S&P declined more than 20% in about 10 days. Historically, it's taken years to months to fall at that level. As a reminder we are at the lowest public equity market exposure than we've been in 30 years.

Resolution 2020-1

Mr. Woodrow Tyler discussed the reasoning behind this resolution and roll was taken.

Action Item: Resolution 2020-1 – Resolution authorizing removal of Oakmark Equity and Income Fund from 401(k) 457 DC Plans Investment Manager Lineup

Ayes: 4 Nays: 0 Motion Passed.

Defined Contribution Plan

Mr. Woodrow Tyler, Senior Investment Manager offered to have his section reviewed and filed as such in the essence of time. He stated the book can be reviewed and discussed at a later date so that time and attention can be focused more on what is happening currently in the public markets.

Domestic Equity Review

Mr. Jack Behar, Senior Investment Manager briefly discussed the excellent fourth quarter 2019 performance then went into the current unprecedented volatility of the market. He explained that changes were made in many investments in order to become more liquid in early 2020, not because of the virus but to be proactive and reduce some risk as the market

had run up so much. Unfortunately, the way the market reacted could have never been foreseen and the results have been devastating. Those investments that would have usually fared well in a typical down market did not in this case. There are tremendous worries about credit. The good news is that the government and the feds are doing things to try to assist with this and seem to understand the gravity of the problem.

Mr. Behar read a very recent article that Janet Yellen and Ben Bernanke wrote that talked about what we can do as a country to make this a very sharp but quick recession. Part of what they talked about is if we can shore up the people who are losing their jobs and companies, that once we get through this we can get back up and running. If there are mass layoffs and bankruptcies it's very, very difficult to get the economy back up and running quickly. Mr. Behar stated that his hope is that it will play out this way. The Federal Reserve is also taking steps to provide liquidity to the financial market.

Fixed Income Review

Mr. Daniel Quigley, Senior Investment Manager discussed 2019 performance briefly then went into the current market conditions.

The market is responding differently from any downturn in history. The markets turned extremely quick and it is very surprising to see levered investors basically trying to sell anything they can to call liquidity. Mr. Quigley explained difficulty with executing trades never seen before. The normal market making activity seized up and he believes what occurred was a combination of normally levered investors that were trading things like cash and Treasuries versus the futures investors that were then faced with large margin calls and then had to quickly unwind positions.

When looking at the spreads last week in the futures market and the Treasuries market, they were at levels never seen before. This is a market where SMRS routinely internally prints \$100 to \$200 million trades without a problem. Friday afternoon of last week the market actually moved when \$8 million in Treasuries was sold. Trades this week are being executed easier. Other examples were given to show how different the market is at this point in time and situations were explained that Mr. Quigley has never seen before in volatile times.

The Division has been trimming high-yield and investment grade corporate debt for the last 18 months based on the teams view of valuation for corporate credit. There is a quality bias within the division's high-yield strategies and a definite underweight in some of the riskier sectors as well as the ratings classifications.

There was much discussion from Board Members regarding this topic and questions regarding the current market conditions.

Review of Investment Reports and Basket Clause – Received and Filed

Closing Remarks

Treasurer Eubanks reached out to the Board and to staff of the BOI wanting to make sure the BOI had what was needed during this time from the State in order to continue to act as quickly as we have.

Public Comment

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

Adjournment

Treasurer Eubanks adjourned the meeting at 11:07 am. Motion to adjourn by James Nicholson. Seconded: Reggie Sanders. The vote was unanimous to adjourn.

Approved:

Rachael Eubanks, Chairman

State of Michigan Retirement System

EXECUTIVE SUMMARY

State of Michigan Investment Board Meeting

June 11, 2020



Gregory J. Parker, CFA

Director of Investments – Public Markets

Director of Asset Allocation

Bureau of Investments

EXECUTIVE SUMMARY

March 31, 2020

Performance

Great peer comparison.

MPSERS Plan (03/31/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	0.2%	6.6%	6.4%	8.1%	8.6%
Policy Returns	3.4%	6.7%	6.7%	8.3%	8.8%
Peer Median Returns*	-1.2%	4.7%	4.7%	6.2%	7.1%

*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. Compared to the State Street Universe of public pension plans greater than \$10 billion, the returns are near the top decile of returns across these time periods. Also, the plans' returns were among the least risky, as measured by standard deviation.
- Over a very long horizon, since 1979, the annualized rate of return on the plan assets has been approximately 9.1%.
- Compounding at higher than peer returns can add significant value. For example, based on the \$47.9 billion March 2010 market value, a ten-year annualized return of 8.6% compared to the 7.1% peer median return would add about \$14.3 billion in excess value. Due to these gains, it is estimated that General Fund and School Aid Fund annual contributions into pension fund pools are nearly \$1 billion less than they would have been if SMRS had earned the peer average investment return.
- The returns were generally in-line with the policy benchmark.
- Many of the individual asset class returns were better than median, however the returns in Domestic Equity and Long-Term Fixed Income had returns slightly below peers. However, for those asset classes the longer-term track record compared to peers is better than average.

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 March 2020, the equity risk (beta) is approximately 0.4 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 \$13.5 billion in illiquid assets, primarily in private equity. In the March 2020 quarter, \$1.7 billion of new commitments were made.
- The combined systems paid out approximately \$2.1 billion net of contributions over the past twelve months ending in March 2020. Over the past year, private equity was a net purchaser of approximately \$933 million, real return & opportunistic \$761 million, and fixed income approximately \$35 million. Over the past year, the allocation to domestic equity was reduced by \$3.4 billion, international equity by \$748 million, real estate by \$689 million, and absolute return by \$24 million. The allocation to short-term cash increased by approximately \$1.1 billion.

Economy and Capital Markets

Forecasts of severe recessions in global economies.

- Economists are currently predicting that 2020 GDP growth for the U.S. will be -5.7%, and the G-20 country economies will shrink on average -3.6%. This would be the most severe economic contraction in the U.S. in over 70 years.
- The interest rate curve inversion that lasted through the summer of 2019 reverted to a positive slope by mid-October. By the end of February 2020, the curve had once again inverted, however, due to the Fed actions, the slope was back into positive territory at the end of March 2020. An inverted yield curve is often cited as a warning indicator of an impending economic recession; however, a reversion of rates normally does not invalidate the power of the signal and in some ways the re-inversion is even more worrisome now than it was last summer.
- The past decade, coming out from the Global Financial Crisis, has been characterized as a risk-on market; however, many traditional risk premia have not performed as expected. For example; U.S. small cap stocks have lagged large caps, value styles have lagged growth styles, foreign equities have lagged U.S. equities, and within foreign markets, emerging markets have lagged developed.
- Many domestic equity valuation metrics are above historical averages, consequently the returns over the next cycle may not be as strong as the historical average of 11 – 12% year-over-year total returns.

Defined Contribution

A summary.

- At the end of March 2020, the Defined Contribution assets were \$8.2 billion, down from \$8.6 billion the year prior. Index fund strategies represent 41.1% and actively managed funds represent 34.1% of the assets. The default Target Date Funds are 22.7% and the Self-Managed Account is 2.1% of the assets.
- In December 2019, the SECURE Act (Setting Every Community Up for Retirement Enhancement) was signed into law with broad bi-partisan support. 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. The three main provisions are; 1) extend retirement plan access, 2) increase savings contributions, and 3) expand savings distribution options.
- In March 2020, the U.S. Congress passed the Coronavirus Aid, Relief, and Economic Security Act (“CARES Act”). Because of it, several temporary changes were made. Specifically:
 - Distributions of up to \$100,000 through December 30, 2020 are subject to tax relief.
 - Loan limits against the balance of the accounts were increased from \$50,000 to \$100,000 (or 100% of the participant’s account balance, if less) for loans made from March 27, 2020 through September 22, 2020.
 - For existing loans, payments which were due between March 27, 2020 through December 31, 2020 were allowed to be suspended for up to one year.
 - Required minimum distributions were suspended for the remainder of 2020.

Investment Update

Highlighting the quarter.

(\$ Millions)

NEW COMMITMENTS

January 1, 2020 – March 31, 2020

<u>Asset class</u>	<u>Fund Name / (Managed By)</u>	<u>Commitment</u>
Private Equity		
	Acorn Bioventures, L.P. (Acorn Capital Advisors GP, LLC)	\$100.0
	Insight Partners XI, L.P. (Insight Venture Management, LLC)	100.0
	Odyssey Investment Partners Fund VI, LP (Odyssey Investment Partners, LLC)	100.0
	Clearlake Capital Partners VI, L.P. (Clearlake Capital Management VI, L.P.)	75.0
	Flagship Pioneering Origination Fund VII (Flagship Pioneering, Inc.)	75.0
	Vista Foundation Fund IV, L.P. (VFF Management, L.P.)	75.0
	Lightspeed Venture Partners Select IV, L.P. (Lightspeed Venture Partners Select IV L.P.)	25.0
	Lightspeed Venture Partners XIII, L.P. (Lightspeed Venture Partners XIII L.P.)	10.0
	Golden Bell Azalea, LLC (ICG Advisors, LLC)	9.5
Real Estate and Infrastructure Division		
	GreenOak Europe III, LP (Bentall Green Oak)	82.7
	ArcLight Energy Partners VII, LP (ArcLight Capital Partners, LLC)	50.0
Real & Opportunistic Division		
	SJC Onshore Direct Lending Fund IV – SMRS, L.P. (Czech Asset Management)	250.0
	Axton Holdings, LLC (Barings Alternative Investments)	210.0
	HarbourVest Direct Lending Fund (L) L.P. (HarbourVest Partners)	100.0
Absolute Return Division		
	Cerberus Manitou Residential Loan Fund, LP (Cerberus Capital Management, L.P.)	200.0
	Monument Park, LLC (Domain Capital Advisors)	200.0
TOTAL		\$1,662.2

State of Michigan Retirement System

PERFORMANCE

State of Michigan Investment Board Meeting

June 11, 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 March 31, 2020

	% of Portfolio 3/31/20	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	8.6	13	8.1	6	6.4	12	6.6	17	0.2	17	-8.6	23
Median - Greater than \$10 Billion ²		7.1		6.2		4.7		4.7		-1.2		-10.1	
MPSERS Total Plan Policy		8.8		8.3		6.7		6.7		3.4		-7.6	
DOMESTIC EQUITIES	18.4	9.9	48	9.0	26	5.5	28	4.1	34	-11.8	66	-23.2	77
Median ²		9.5		6.6		4.8		3.4		-10.6		-21.5	
S&P 1500 Index		10.3		9.2		6.2		4.2		-8.5		-20.6	
PRIVATE EQUITY AND VENTURE CAPITAL	21.2	14.4	9	14.1	8	12.9	7	14.9	10	13.7	7	3.0	6
Median ²		10.1		9.5		8.3		8.4		4.9		0.0	
Private Equity and VC Benchmark ³		16.9		18.1		15.0		18.7		35.3		9.9	
INTERNATIONAL EQUITIES	13.9	3.2	48	2.1	41	0.3	49	-1.2	42	-14.3	30	-23.2	25
Median ²		3.2		2.0		0.2		-1.5		-15.3		-23.9	
International Blended Benchmark ⁴		2.0		1.2		-0.6		-2.0		-15.6		-23.4	
FIXED INCOME	13.7	4.4	63	3.6	41	3.7	52	4.0	52	3.7	74	-2.2	84
Median ²		4.6		3.3		3.8		4.1		6.8		1.5	
Barclays Aggregate		3.9		3.2		3.4		4.8		8.9		3.2	
REAL RETURN AND OPPORTUNISTIC	13.2	10.3		11.7		10.2		12.0		8.3		0.1	
50% (CPI +500 bps) + 50% (6.8% actuarial rate)		7.3		7.1		7.1		7.0		6.3		1.6	
REAL ESTATE & INFRASTRUCTURE	9.6	11.0	47	10.8	48	9.2	28	8.6	32	6.3	48	0.0	60
Median ²		10.9		10.6		8.3		7.4		6.0		0.0	
NCREIF - Property Blended Index ⁵		8.8		7.5		6.3		5.1		3.9		0.4	
NCREIF Open Fund Index Net		10.4		8.9		7.5		5.9		3.9		0.8	
ABSOLUTE RETURN	6.1	4.8		4.8		3.7		5.0		5.0		1.1	
HFRI FOF Cons 1 month lagged		2.7		2.8		2.0		2.7		3.0		0.5	
CASH EQUIVALENTS	3.9	0.9		1.2		1.6		2.1		2.4		0.7	
1 Month T-Bill		0.6		0.8		1.1		1.7		2.0		0.4	

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 3/31/20

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	0.2	3.1	6.6	7.7	6.4	6.9	8.1	8.4	8.0	8.6
Public Plan - Median (> \$10 billion)*	-1.2	1.5	4.7	6.3	4.7	5.0	6.2	6.7	6.6	7.1
Rank	17	22	17	12	12	13	6	13	12	13
bp Difference - Median	138	157	185	143	168	185	192	164	144	151

Consecutive For Years Ending

	03/20	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11
MPSERS	0.2	6.1	13.8	11.2	1.4	9.3	15.7	10.4	5.0	14.2
Public Plan - Median (> \$10 billion)*	-1.2	4.3	11.0	11.3	0.1	7.2	13.1	10.5	4.6	13.2
Rank	17	6	8	52	12	11	7	51	39	33
bp Difference - Median	138	182	276	-4	124	203	260	-6	42	102

MSERS

Cumulative For Years Ending 3/31/2020

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	0.2	3.1	6.6	7.7	6.4	6.9	8.1	8.4	8.0	8.6
Public Plan - Median (> \$1 billion)*	-3.0	0.8	4.1	5.8	4.4	4.8	5.8	6.4	6.2	7.0
Rank	13	13	10	7	6	6	6	8	8	8
bp Difference - Median	319	235	244	187	203	206	228	196	175	154

Consecutive For Years Ending

	03/20	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11
MSERS	0.2	6.1	13.8	11.3	1.3	9.2	15.6	10.4	4.8	14.1
Public Plan - Median (> \$1 billion)*	-3.0	4.2	11.3	11.7	-0.2	6.5	13.0	10.6	4.4	13.9
Rank	13	4	16	58	9	8	15	54	39	42
bp Difference - Median	319	195	248	-41	156	269	258	-16	42	22

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS

Cumulative For Years Ending 3/31/20

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	0.2	3.1	6.6	7.7	6.4	6.9	8.1	8.3	8.0	8.6
Public Plan - Median (> \$1 billion)*	-3.0	0.8	4.1	5.8	4.4	4.8	5.8	6.4	6.2	7.0
Rank	13	13	10	7	6	7	8	8	8	8
bp Difference - Median	319	235	244	186	202	205	226	193	173	154

Consecutive For Years Ending

	03/20	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11
MSPRS	0.2	6.1	13.8	11.2	1.3	9.2	15.5	10.4	4.9	14.3
Public Plan - Median (> \$1 billion)*	-3.0	4.2	11.3	11.7	-0.2	6.5	13.0	10.6	4.4	13.9
Rank	13	4	16	58	9	8	19	56	38	41
bp Difference - Median	319	194	248	-45	156	268	248	-20	48	36

MJRS

Cumulative For Years Ending 3/31/20

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	0.2	3.1	6.6	7.7	6.4	6.9	8.0	8.2	7.9	8.5
Public Plan - Median (> \$1 billion)*	-3.0	0.8	4.1	5.8	4.4	4.8	5.8	6.4	6.2	7.0
Rank	13	12	9	7	6	7	8	8	8	9
bp Difference - Median	322	236	245	189	204	204	216	183	164	145

Consecutive For Years Ending

	03/20	03/19	03/18	03/17	03/16	03/15	03/14	03/13	03/12	03/11
MJRS	0.2	6.1	13.8	11.3	1.3	9.1	14.9	10.2	4.9	14.2
Public Plan - Median (> \$1 billion)*	-3.0	4.2	11.3	11.7	-0.2	6.5	13.0	10.6	4.4	13.9
Rank	13	4	17	57	9	8	29	60	39	42
bp Difference - Median	322	194	247	-38	155	254	185	-40	46	30

*State Street Public Funds Universe

State of Michigan Retirement System

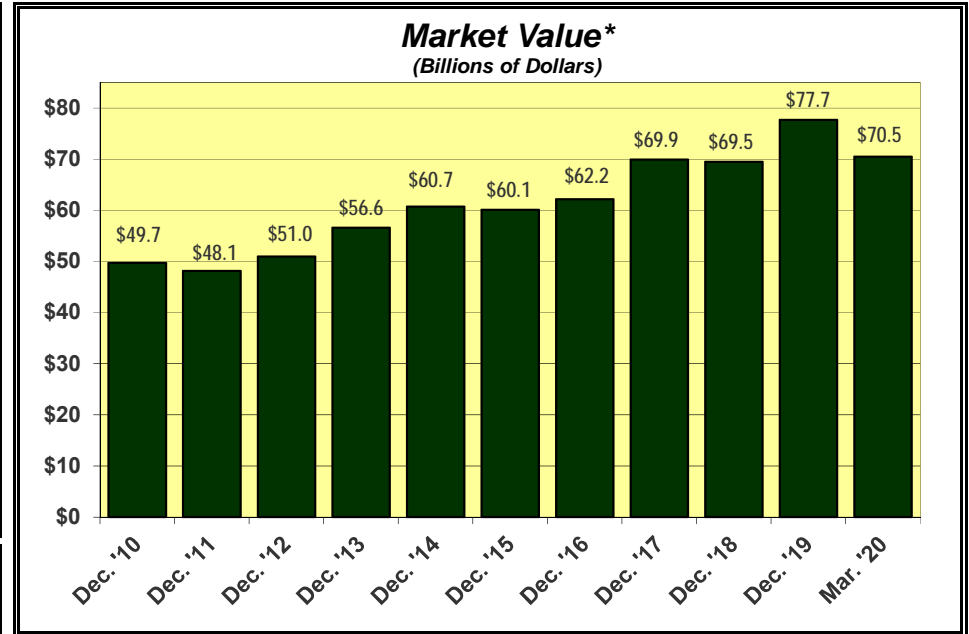
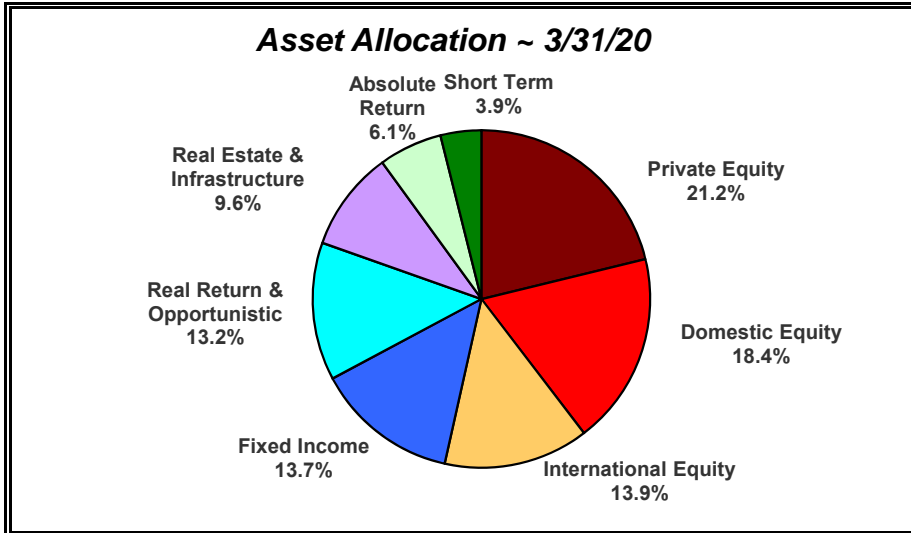
ASSET ALLOCATION REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEM PROFILE - MARCH 2020



Asset Allocation By Market Value (In Millions)

Investment Strategies	3/31/2020		3/31/2019	
Private Equity	\$14,973	21.2%	\$12,452	17.1%
Domestic Equity	12,954	18.4%	17,963	24.7%
International Equity	9,835	13.9%	12,264	16.9%
Fixed Income	9,630	13.7%	9,178	12.6%
Real Return & Opportunistic	9,330	13.2%	7,975	11.0%
Real Estate & Infrastructure	6,745	9.6%	7,044	9.7%
Absolute Return	4,269	6.1%	4,104	5.7%
Short Term***	2,768	3.9%	1,676	2.3%
TOTAL	\$70,504	100.0%	\$72,656	100.0%

Market Value By Plan ~ 3/31/20 (in Millions)

Pension Plan	OPEB**	Combined	
Mkt. Value	Mkt. Value	Mkt. Value	%
MPSERS	\$47,478	\$6,865	\$54,343 77.0%
MSERS - (closed)	11,321	2,961	14,282 20.3%
MSPRS	1,403	228	1,631 2.3%
MJRS - (closed)	240	8	248 0.4%
TOTAL	\$60,442	\$10,062	\$70,504 100.0%

MSERS includes the Military Pension Fund

Short Term Equivalents (in Billions)

Short Term Strategy***	\$2.8	
Short Term in Other Inv. Strategies	2.2	
TOTAL SHORT TERM	\$5.0	7.1% 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

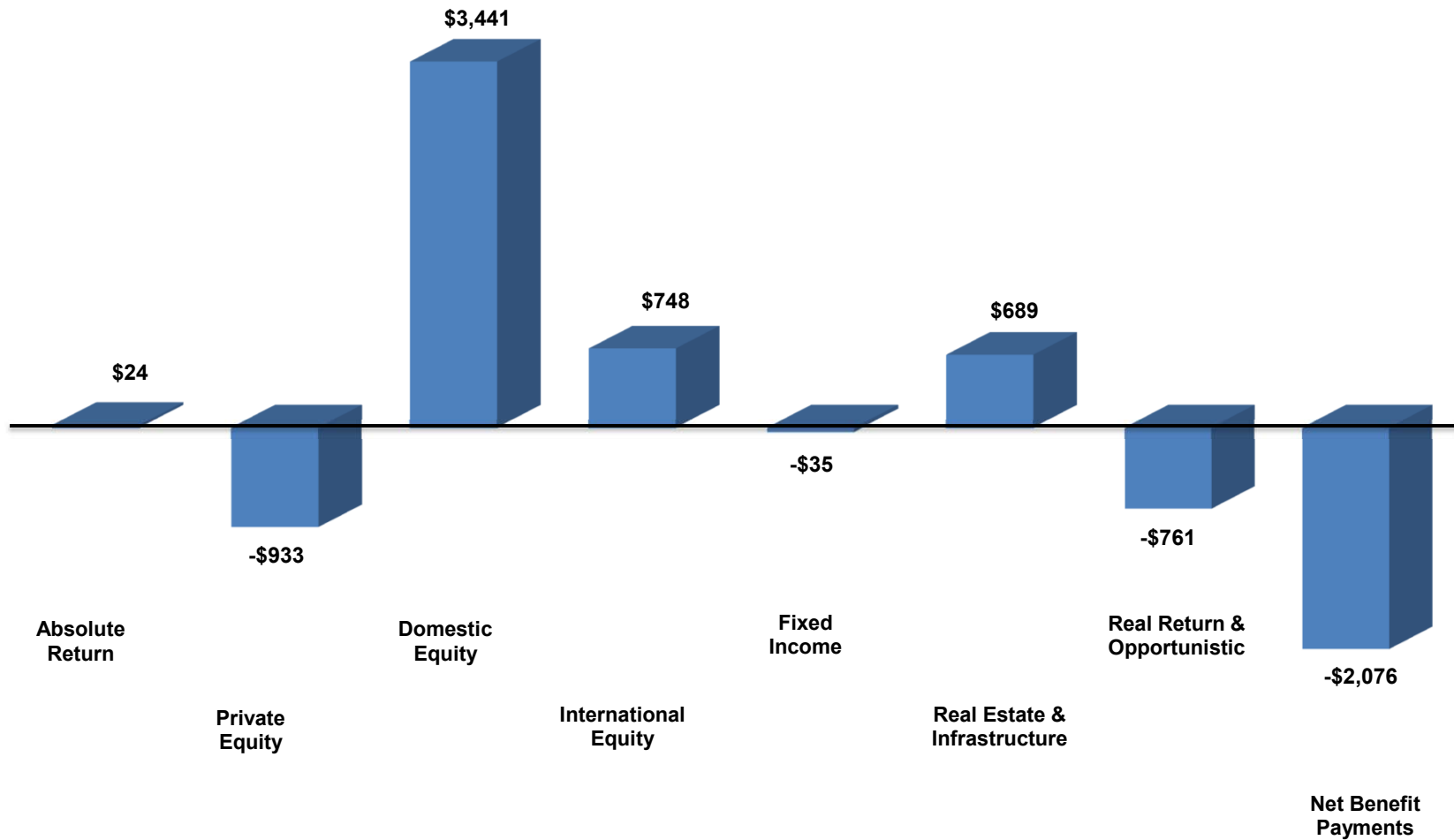
Sources and Uses of Cash

April 2019 ~ March 2020

4/01/19 Short-Term Cash Balance: \$ 1,675

3/31/20 Short-Term Cash Balance: 2,772

Net Short-Term Cash Increase: \$ 1,097



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

Dollars in millions

Asset Allocation Targets As of 3/31/20

	MPSERS		MSERS		MSPRS		MJRS		SMRS
<i>Asset Class</i>	<i>3/31/20</i>	<i>Target*</i>	<i>3/31/20</i>	<i>Target*</i>	<i>3/31/20</i>	<i>Target*</i>	<i>3/31/20</i>	<i>Target*</i>	<i>Ranges</i>
Domestic Equity	18.4%	28.0%	18.4%	28.0%	18.4%	28.0%	18.4%	28.0%	20% - 35%
Private Equity	21.2%	18.0%	21.2%	18.0%	21.2%	18.0%	21.2%	18.0%	10% - 20%
International Equity	13.9%	16.0%	14.0%	16.0%	14.0%	16.0%	13.9%	16.0%	15% - 25%
Long Term Fixed Income	13.7%	10.5%	13.7%	10.5%	13.7%	10.5%	13.7%	10.5%	10% - 20%
Real Return & Opportunistic	13.2%	9.5%	13.2%	9.5%	13.2%	9.5%	13.2%	9.5%	5% - 15%
Real Estate & Infrastructure	9.6%	10.0%	9.6%	10.0%	9.6%	10.0%	9.6%	10.0%	5% - 15%
Absolute Return	6.1%	6.0%	6.1%	6.0%	6.1%	6.0%	6.1%	6.0%	3% - 9%
Short Term Fixed Income	3.9%	2.0%	3.9%	2.0%	3.9%	2.0%	3.9%	2.0%	1% - 6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

*Complies with basket clause and international restrictions.

State of Michigan Retirement System

MARKETS REVIEW AND OUTLOOK

State of Michigan Investment Board Meeting

June 11, 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	11.9%	25.0%	16.1%
International Equity	9.9%	21.4%	2.0%
Domestic Equity	7.9%	18.2%	10.3%
Real Estate (Core)	7.7%	15.0%	10.4%
Absolute Return	4.9%	9.0%	2.7%
Real Ret/Opportunistic	9.1%	9.5%	7.3%
Long-Term Fixed Income	1.9%	4.0%	3.9%
Short-Term	1.0%	1.0%	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 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.
- The broad U.S. stock market return for the one year ending March 2020 was -8.5%. During March 2020, the S&P 500 index corrected by over -35% during a span of just over four weeks. However, by the end of April, the market had recouped approximately 20% of the loss and was down only -14% from the peak in February 2020.
- International equities underperformed domestic equities over the year ending March 2020 by -6.6%. Over the past three, five, seven, and ten years, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -5.7%, -6.3%, -7.7%, and -7.8% annualized, respectively.
- Safe haven commodity assets such as gold have performed well recently. At the end of March 2020, the dollar price for an ounce of gold was at \$1,583. This is 1.1% higher for the month and 22.5% higher than the year prior. Over the past decade, the precious metal has appreciated by more than 42%, 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 provide a tail-wind for the supply constrained metal

U.S. Fixed Income

Volatility and policy in focus.

- 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.
- Structured products underperformed significantly through the month of March 2020. One contributor to this was a severe liquidity crisis which caused even the highest quality, investment grade structured credit assets to trade at double-digit yields.
- This liquidity crisis was especially caused by a de-leveraging of both mortgage REITs and hedge funds and the forced selling of structured credit assets by daily liquid mutual funds meeting redemptions.
- Banks are well-capitalized, however, with the 08-09 Global Financial Crisis still fresh on their minds, they were reluctant to step up in the wake of the pandemic and an uncertain economic future. Severe price dislocations in the agency mortgage market ensued, which started the downward spiral of more selling from the REITs, which drove prices even lower, which led to more margin calls and so on.
- A return to normalcy in these usually efficient markets did not come until the Federal Reserve stepped in with their latest round of “Quantitative Easing”, which included aggressive purchasing of agency MBS on an accelerated schedule in an attempt to inject liquidity into the system. Spreads today are still very wide by historical standards.
- By the end of March 2020, the 10-year U.S. interest rate was 0.67% and the 2-year was at 0.25%. Spreads on investment-grade corporate debt were 2.6% which is 1.7% above average and high yield fixed income spreads were 8.8% which are 4.4% above long term averages.

Domestic Equity

Size and Style factors in focus.

- The broad U.S. stock market return for the one year ending March 2020 was -8.5%. During March 2020, the S&P 500 index corrected by over -35% during a span of just over four weeks. However, by the end of April, the market had recouped approximately 20% of the loss and was down only -14% from the peak in February 2020.
- Meanwhile, value style in the U.S. continues to perform very poorly relative to the growth style. Over the past year ending March 2020, growth stocks outperformed value stocks by 17.6% and over longer time periods, it has outperformed by 13.2%, 8.1%, 7.2%, and 5.2% annualized over the past three, five, seven and ten years, respectively. Since 1985, the Growth style has out returned the Value style by roughly 0.5% annualized.
- Another factor which is surprisingly showing poor returns is U.S. small cap stocks. Over the past year ending March 2020, large cap S&P 500 stocks outperformed Russell 2000 small cap stocks by 17.0% and over longer time periods, it has outperformed by 9.8%, 7.0%, 5.4%, and 3.6% annualized over the past three, five, seven and ten years respectively. Since 1978, the large cap stocks have out returned the small cap stocks by roughly 0.9% annualized.
- Many domestic equity valuation metrics are above historical averages, consequently the returns over the next cycle may not be as strong as the historical average of 11 – 12% year-over-year total returns. However, the market's returns on equity continues 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 returns in the future.

International Equity

Lagging U.S. counterparts

- International equities underperformed domestic equities over the year ending March 2020 by -6.6%. Over the past three, five, seven, and ten years, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -5.7%, -6.3%, -7.7%, and -7.8% annualized, respectively.
- A primary explanation for international equity's 10-year annualized underperformance of -7.8% is the annualized differences in change in the EPS (-7.3%) of the two indexes. The MSCI ACWI ex USA index EPS grew at a very low rate of 0.9% per year, while the EPS growth of the U.S. market was approximately 8.2%.
- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international markets trade at approximately a 15% discount to U.S. counterparts while emerging markets are at a 30% discount.
- Within international equities, emerging market returns trailed developed markets over the past one, seven and ten years by -2.9%, -2.0% and -1.9% annualized, respectively. However, over the past three years and five years, emerging markets returns were 0.3% and 0.3% annualized more than developed markets.

Real Estate

REITs get hit

- Over the one year ending March 2020, the NAREIT index decreased by -15.9% including dividends, as the economic hit of the global pandemic began to take hold. Over the past ten years, publicly traded REITs have lagged private real estate by -1.9%, annualized, but they are about three times more volatile.
- Dividend yields on REITs at the end of March 2020 were estimated to be around 4.7% which is nearly 4.1% 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 2.5%. 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 8.1%, should historical hedge fund betas and alphas continue, a 5.0% annualized net return seems like a reasonable assumed rate of return for hedge funds. This return is approximately 3-month U.S. Libor plus 350 basis points.

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 -52% from March 2010.
- In an extremely unusual event, on April 20, 2020 the contract for May West Texas Intermediate crude oil expired at -\$37.63 per barrel. This was due in part to the massive demand shock created by the policy responses for restricting travel. In addition, global suppliers continued their production at a more normal economic rate. Because of this, storage for crude within the U.S. was in very short supply and the negative price reflected this high cost for taking delivery.
- The U.S. dollar also experienced a bout of volatility in the month of March 2020, falling 3.3% before rallying 8.3%. As measured by the DXY index, it was virtually unchanged for the month and year-over-year versus a basket of currencies.
- Safe haven commodity assets such as gold have performed well recently. At the end of March 2020, the dollar price for an ounce of gold was at \$1,583. This is 1.1% higher for the month and 22.5% higher than the year prior. Over the past decade, the precious metal has appreciated by more than 42%, 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 provide a tail-wind for the supply constrained 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			0.96%		1.33%		4.79%		18.66%		4.44%		5.22%		15.93%		4.55%				Risk

- 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

ACTION ITEM

State of Michigan Investment Board Meeting

June 11, 2020



Gregory J. Parker, CFA

Director of Investments – Public Markets

Director of Asset Allocation

Bureau of Investments

STATE OF MICHIGAN INVESTMENT BOARD
RESOLUTION AUTHORIZING ASSET ALLOCATION STRATEGY

Resolution 2020-2

WHEREAS, the State of Michigan Investment Board (the “Board”) pursuant to Executive Order 2018-10 (the “Order”) and the Investment Policy Statement approved by the Board, is required to approve asset allocation targets and ranges with respect to the investment of the assets of the State of Michigan’s defined benefit retirement systems (the “DB Plans”);

WHEREAS, the Board previously approved an asset allocation at its meeting on November 27, 2018 in Resolution 2018-3 (the “Existing Allocation”);

WHEREAS, the Board has reviewed an adjusted asset allocation submitted to it by the Department of Treasury’s Bureau of Investments (the “BOI”) and attached hereto as Exhibit A (the “Asset Allocation Strategy”); and

WHEREAS, the Asset Allocation Strategy is intended to supersede and replace, in all respects, the Existing Allocation.

NOW, THEREFORE, BE IT RESOLVED, the Board adopts the Asset Allocation Strategy and the Proposed Asset Allocation Ranges described therein, which fully replaces and supersedes the Existing Allocation.

Ayes:

Nays:

Recused:

East Lansing, Michigan

June 11, 2020

State of Michigan Investment Board

Asset Allocation Targets with Ranges^{1, 2}

As of 03/31/2020

Asset Class	Weights			Current Asset Allocation Ranges	Proposed Asset Allocation Ranges
	Actual	Current Target	New Target		
Domestic Equity <i>S&P 1500 Broad Market Index</i>	18.4%	28.0%	25.0%	20% - 35%	17% - 32%
Private Equity <i>S&P 500 + 300 bps</i>	21.2%	18.0%	16.0%	10% - 20%	13% - 25%
International Equity <i>MSCI ACWI ex USA Index</i>	13.9%	16.0%	15.0%	15% - 25%	12% - 22%
Real Return & Opportunistic <i>Custom</i>	13.2%	9.5%	12.5%	5% - 15%	8% - 18%
Long Term Fixed Income <i>Bloomberg Barclays U.S. Aggregate Index</i>	13.7%	10.5%	10.5%	10% - 20%	8% - 18%
Real Estate & Infrastructure <i>Custom</i>	9.6%	10.0%	10.0%	5% - 15%	8% - 18%
Absolute Return <i>HFRI FoF Conservative Index</i>	6.1%	6.0%	9.0%	3% - 9%	5% - 11%
Short Term Fixed Income <i>30-Day U.S. T-Bill</i>	3.9%	2.0%	2.0%	1% - 6%	1% - 8%
TOTAL	100.0%	100.0%	100.0%		

¹ Information in this table is based upon an asset liability study performed by Aon and presented at the State of Michigan Investment Board's June 11, 2020 quarterly meeting.

² Allocation and ranges are applicable to all component units of the State of Michigan Retirement System.

State of Michigan Retirement System

DOMESTIC EQUITY REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-11.8%	4.1%	5.5%	9.0%	9.9%
S&P 1500	-8.5%	4.2%	6.2%	9.2%	10.3%
Peer Median Return	-10.6%	3.4%	4.8%	6.6%	9.5%
Percentile Rank vs. Peers *	66	34	28	26	48

*State Street Universe greater than \$1 billion

- Total Domestic Equity outperformed its peer group over three, five, seven and ten year time periods while modestly underperforming the S&P 1500 over the longer-term.
- During the past year, performance was 340 basis points (bps) behind the benchmark net of fees, with incurred tracking error of 3.5%.
- While the division outperformed the S&P 1500 in both January and February, both returns and risk metrics were dramatically affected by the Black Swan impact of Covid-19 on the financial markets in March.
- March was an exceptionally difficult month for DED's numerous investments in the financial sector, many of which were tied to real estate, as the sector suffered from illiquid markets, significant bond price volatility and a lack of credit visibility into mortgage, rental and interest rate payments as the global economy shut down.
- Similarly, the division's investments in small and mid-cap companies also underperformed their larger cap counterparts in March.
- As the economy slowly regains its footing and as the world better learns to cope with the Covid-19 pandemic, we expect many of these companies' share prices to recover significantly, although this will likely take time and improved visibility.

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 reexamining its risk process based on March results, as performance was not within desired risk tolerance.
 - In addition to more thoughtful diversification and tactical use of cash as a potential risk mitigant, the division is also looking at emphasizing style factor research to better understand and predict its sources of tracking error.
- The Domestic Equity Portfolio has reduced its exposure to the financial sector, while nonetheless remaining overweight. The division is also now overweight in small-mid cap companies for the first time in many years.
 - As the economy slowly recovers and uncertainty lessens, such companies are likely to see a significant benefit. The division is also overweight the utility sector, which continues to be a good value in an uncertain but record low interest rate environment.
- Total Domestic Equity's portfolio trades at 13.7x earnings versus the S&P 1500 at 15x, with a significantly higher dividend yield of 3.3% versus 2.4%.

Market Environment and Outlook

- At ~15x forward earnings, equity markets trade at a discount to both their historical average of 15.7x and their twenty-five-year historical average of 18x.
- Factoring in the existing level of low interest rates, stocks are priced at an exceptionally wide return spread to long term bonds.
- While this spread is attractive, particularly over the longer-term, it is also reflective of the significant uncertainty posed by the Covid-19 pandemic and its resulting impact on the global economy.
- As of March 31, the market was paying out 2.4% of its earnings in dividends and reducing shares outstanding by 3.1% through share buybacks, for a 5.5% total shareholder yield. The market was also growing shareholders' equity at a rate of 2.6%, thus generating roughly 8.1% (shareholder yield of 5.5% + reinvestment rate of 2.6%) in an environment where stock multiples, growth and returns on equity are stable.
- Given current recessionary conditions, growth, buybacks and dividends will all be negatively affected in 2020, but the market should generate long-term investment returns in the 8% range looking ahead to 2021 and beyond.
- Such returns compare favorably to the 30-year U.S. Treasury at 1.3%, and unfavorably to the historical compound annual return for the S&P 500 from 1928-2018 of 9.5%.

SMRS

Domestic Equity Strategies

3/31/20

Markets	Amount	Total	% of Total
Internal Indexed (\$ in Millions)			
Indexed Portfolios	\$5,587		
Total Indexed		\$5,587	43.1%
Internal Active			
Active Portfolios	\$3,935		
Total Internal Active		\$3,935	30.4%
External Active			
Los Angeles Capital	\$1,006		
Mellon Capital	919		
Seizert Capital Partners	419		
ARK Investments	401		
Clarkston Capital Partners	396		
Attucks Asset Management	110		
Bivium Capital	109		
Ancora	<u>72</u>		
Total External Active		\$3,432	26.5%

Total Domestic Equity

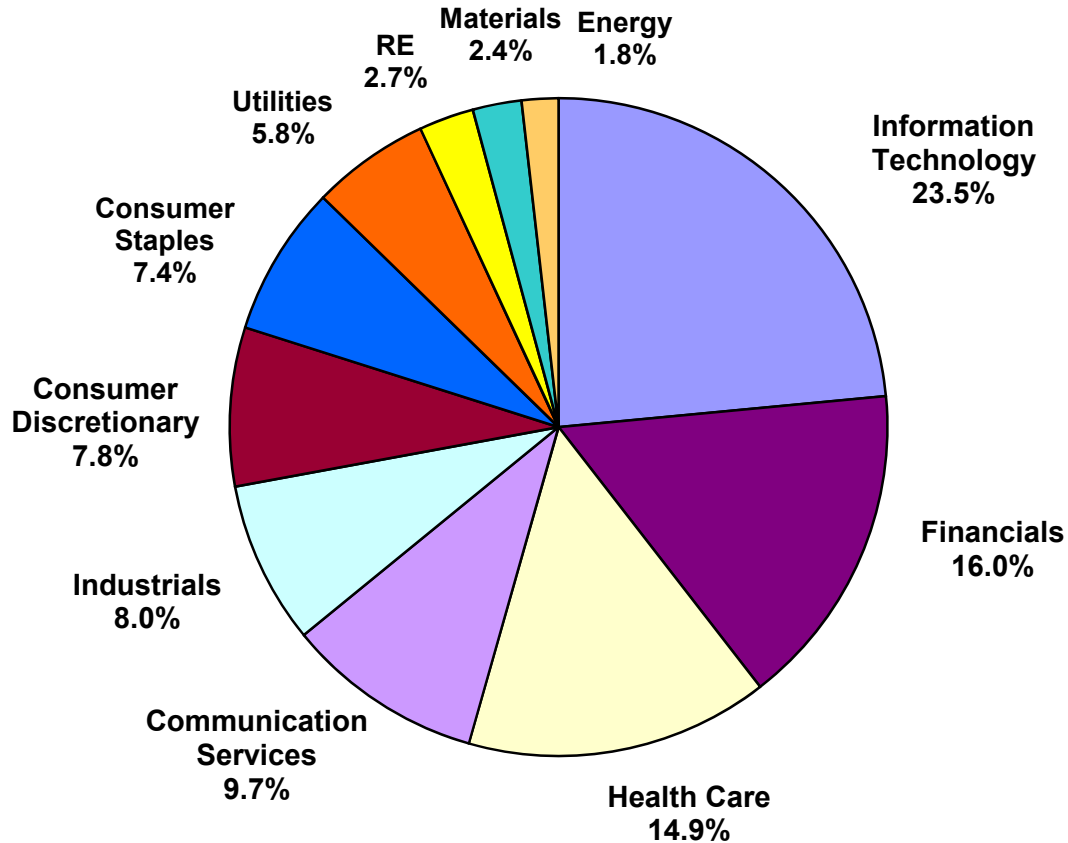
\$12,954

100.0%

SMRS

Domestic Equity By Sector

3/31/20



Market Value in Millions				
3/31/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Information Technology	\$3,037	23.5%	24.7%	-1.2%
Financials	2,075	16.0%	11.3%	4.7%
Health Care	1,934	14.9%	15.2%	-0.3%
Communication Services	1,260	9.7%	10.1%	-0.4%
Industrials	1,036	8.0%	8.9%	-0.9%
Consumer Discretionary	1,011	7.8%	10.0%	-2.2%
Consumer Staples	951	7.4%	7.5%	-0.1%
Utilities	752	5.8%	3.6%	2.2%
Real Estate	349	2.7%	3.5%	-0.8%
Materials	312	2.4%	2.7%	-0.3%
Energy	237	1.8%	2.5%	-0.7%
Total	<u>\$12,954</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Domestic Equities Composite

3/31/20

Date:	<u>3/31/20</u>	<u>12/31/19</u>	<u>9/30/19</u>	<u>6/30/19</u>
Assets (\$ in Millions):	\$12,954	\$17,645	\$16,789	\$16,636
Number of Securities:	1,316	1,354	1,316	1,296
Active Share:	35%	41%	43%	49%

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)	\$205.6	\$249.8	\$103.3
P/E FY1	13.7x	15.1x	11.9x
P/E upside to S&P 1500	10.5%	0.0	27.1%
Price/Book	2.4x	2.5x	1.5x
Return on Equity	16.8%	16.2%	12.6%
Risk Metrics			
Beta	1.00	1.00	0.97
Tracking Error	2.2%	0.0%	3.6%
Projected Returns			
Dividend Yield	3.3%	2.4%	3.6%
Buyback Yield	3.1%	3.1%	3.5%
Reinvestment Rate	<u>2.1%</u>	<u>2.6%</u>	<u>1.9%</u>
Projected Investment Return	<u>8.5%</u>	<u>8.1%</u>	<u>9.0%</u>

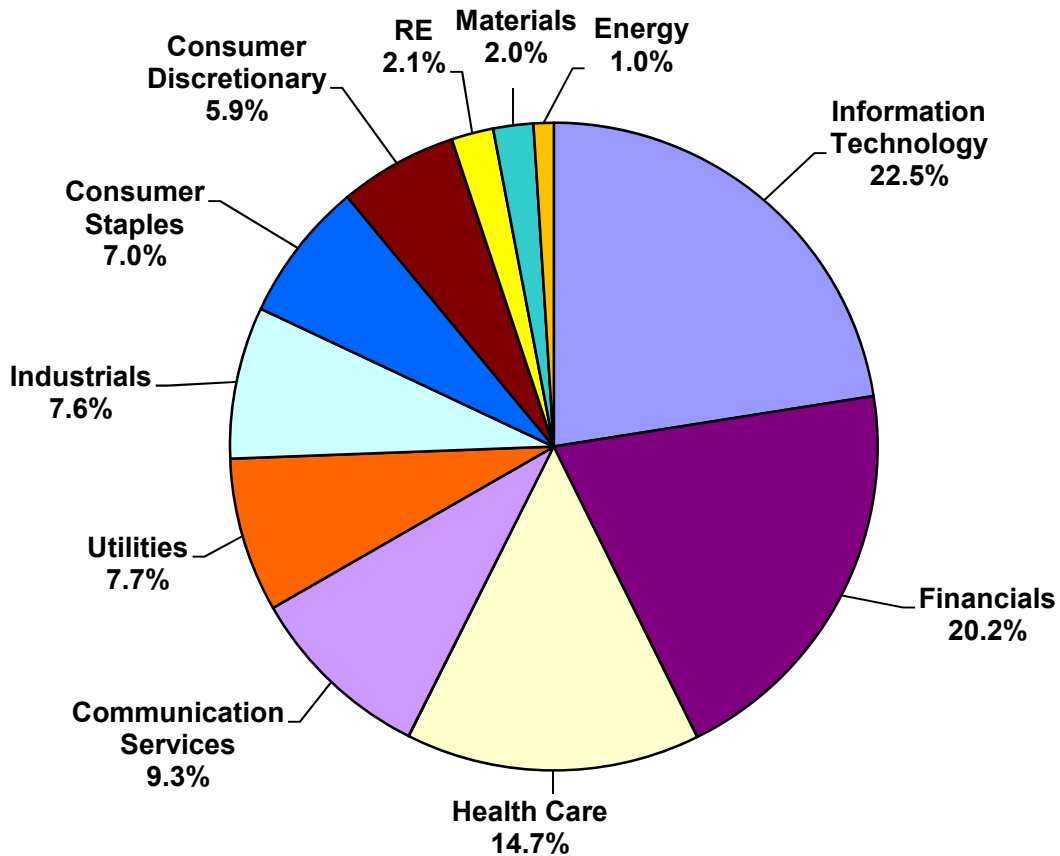
TOP TEN EXPOSURES – Domestic Equities vs S&P 1500 3/31/20

<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	9.5%	15.7	Microsoft Corp.	5.2%	27.6
SPDR Port. LT Treasury ETF	4.8%	56.1	Apple, Inc.	4.5%	19.1
Microsoft Corp.	3.6%	27.6	Amazon.com, Inc.	3.6%	68.0
Apple, Inc.	3.2%	19.1	Facebook, Inc. Class A	1.7%	18.9
Amazon.com, Inc.	2.1%	68.0	Berkshire Hathaway, Inc. B	1.6%	12.2
Facebook, Inc. Class A	1.6%	18.9	Johnson & Johnson	1.5%	15.2
AGNC Investment Corp.	1.5%	4.4	Alphabet, Inc., Class C	1.5%	22.7
NextEra Energy, Inc.	1.4%	24.9	Alphabet, Inc., Class A	1.5%	22.7
Berkshire Hathaway, Inc. B	1.2%	12.2	Procter and Gamble Co.	1.2%	23.1
JPMorgan Chase & Co.	1.1%	9.3	JPMorgan Chase & Co.	1.2%	9.3
TOTAL	<u>30.1%</u>	<u>17.5</u>	TOTAL	<u>23.6%</u>	<u>21.2</u>

SMRS

Active Equity By Sector

3/31/20



Market Value in Millions				
3/31/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Information Technology	\$1,658	22.5%	24.7%	-2.2%
Financials	1,491	20.2%	11.3%	8.9%
Health Care	1,080	14.7%	15.2%	-0.5%
Communication Services	687	9.3%	10.1%	-0.8%
Utilities	564	7.7%	3.6%	4.1%
Industrials	562	7.6%	8.9%	-1.3%
Consumer Staples	514	7.0%	7.5%	-0.5%
Consumer Discretionary	438	5.9%	10.0%	-4.1%
Real Estate	151	2.1%	3.5%	-1.4%
Materials	145	2.0%	2.7%	-0.7%
Energy	77	1.0%	2.5%	-1.5%
Total	<u>\$7,367</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Actively Managed Composite

3/31/20

Date:	<u>3/31/20</u>	<u>12/31/19</u>	<u>9/30/19</u>	<u>6/30/19</u>
Assets (\$ in Millions):	\$7,367	\$10,232	\$9,969	\$9,911
Number of Securities:	957	1,069	1,052	1,036
Active Share:	61%	70%	72%	82%

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	SMRS	S&P 1500	S&P 1500 Value
Market Capitalization (\$ in Billions)	\$163.2	\$249.8	\$103.3
P/E FY1	12.1x	15.1x	11.9x
P/E upside to S&P 1500	25.0%	0.0	27.1%
Price/Book	2.2x	2.5x	1.5x
Return on Equity	17.5%	16.2%	12.6%
Risk Metrics			
Beta	1.01	1.00	0.97
Tracking Error	3.7%	0.0%	3.6%
Projected Returns			
Dividend Yield	4.0%	2.4%	3.6%
Buyback Yield	3.1%	3.1%	3.5%
Reinvestment Rate	<u>2.4%</u>	<u>2.6%</u>	<u>1.9%</u>
Projected Investment Return	<u>9.5%</u>	<u>8.1%</u>	<u>9.0%</u>

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

3/31/20

<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	13.0%	15.7	Microsoft Corp.	5.2%	27.6
SPDR Port. LT Treasury ETF	8.5%	56.1	Apple, Inc.	4.5%	19.1
AGNC Investment Corp.	2.6%	4.4	Amazon.com, Inc.	3.6%	68.0
Microsoft Corp.	2.6%	27.6	Facebook, Inc. Class A	1.7%	18.9
Apple, Inc.	2.5%	19.1	Berkshire Hathaway, Inc. B	1.6%	12.2
NextEra Energy, Inc.	2.2%	24.9	Johnson & Johnson	1.5%	15.2
Exelon Corp.	1.7%	11.2	Alphabet, Inc., Class C	1.5%	22.7
Facebook, Inc. Class A	1.6%	18.9	Alphabet, Inc., Class A	1.5%	22.7
Berkshire Hathaway, Inc. B	1.4%	12.2	Procter and Gamble Co.	1.2%	23.1
Athene Holding Ltd. Class A	1.2%	3.3	JPMorgan Chase & Co.	1.2%	9.3
TOTAL	<u>37.2%</u>	<u>14.3</u>	TOTAL	<u>23.6%</u>	<u>21.2</u>

Manager Performance - Net of Fees

3/31/20

<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	\$5,208,541,846	-7.1%	5.1%	6.8%	9.7%	--	N/A
S&P 500		-7.0%	5.1%	6.7%	9.6%	--	
Style & Risk Adjusted Benchmark		-6.9%	5.1%	6.7%	9.6%	--	
Lipper Large-Cap Core		-7.7%	4.1%	5.4%	8.4%	--	
<i>Excess Return</i>		-0.1%	0.0%	0.1%	0.1%	--	
<i>Alpha</i>		-0.1%	0.0%	0.1%	0.1%	--	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		43	36	19	15	--	
SMRS Large-Cap Core	1,369,353,216	-37.8%	-5.3%	-1.7%	4.5%	4.1%	8/31/07
S&P 500		-7.0%	5.1%	6.7%	9.6%	6.9%	
Style & Risk Adjusted Benchmark		-38.0%	-9.6%	0.4%	8.0%	4.8%	
Lipper Large-Cap Core		-7.7%	4.1%	5.4%	8.4%	6.1%	
<i>Excess Return</i>		-30.9%	-10.4%	-8.5%	-5.1%	-2.8%	
<i>Alpha</i>		0.1%	4.4%	-2.2%	-3.5%	-0.6%	
<i>Pct Rank vs Lipper Large-Cap Core</i>		100	100	100	97	96	
SMRS All-Cap Garp	1,384,804,547	-10.2%	1.9%	3.9%	8.0%	9.9%	4/30/11
S&P 1500 Super Composite		-8.5%	4.2%	6.2%	9.2%	9.6%	
Style & Risk Adjusted Benchmark		-10.4%	5.2%	6.1%	9.8%	10.0%	
Lipper Multi-Cap Core		-12.3%	1.3%	3.1%	6.8%	7.2%	
<i>Excess Return</i>		-1.7%	-2.3%	-2.2%	-1.2%	0.3%	
<i>Alpha</i>		0.2%	-3.3%	-2.2%	-1.8%	-0.2%	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		38	50	42	30	2	
Mellon US Equity Enhanced	919,305,807	21.5%	25.1%	--	--	23.8%	3/1/17
S&P 500		-7.0%	5.1%	--	--	5.0%	
Style & Risk Adjusted Benchmark		-2.6%	11.7%	--	--	12.0%	
Lipper Large-Cap Core		-7.7%	4.1%	--	--	4.0%	
<i>Excess Return</i>		28.4%	20.0%	--	--	18.8%	
<i>Alpha</i>		24.0%	13.3%	--	--	11.8%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		1	1	--	--	1	
SMRS Large-Cap Growth	671,544,153	0.5%	12.6%	9.2%	12.8%	9.4%	5/31/05
S&P 500 Growth		-2.5%	9.6%	9.5%	12.3%	9.4%	
Style & Risk Adjusted Benchmark		-2.1%	9.6%	9.6%	12.6%	9.4%	
Lipper Large-Cap Growth		-1.1%	10.5%	9.0%	11.9%	9.1%	
<i>Excess Return</i>		3.0%	3.0%	-0.2%	0.6%	0.1%	
<i>Alpha</i>		2.7%	3.0%	-0.4%	0.3%	0.0%	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		34	27	52	28	37	
LA Capital All-Cap Growth	544,612,294	-7.5%	6.3%	7.9%	11.7%	10.5%	5/31/05
S&P 1500 Growth		-3.9%	8.6%	8.8%	11.7%	9.2%	
Style & Risk Adjusted Benchmark		-3.8%	8.2%	8.0%	10.8%	7.5%	
Lipper Multi-Cap Growth		-5.2%	8.1%	6.6%	9.9%	8.5%	
<i>Excess Return</i>		-3.6%	-2.3%	-0.9%	-0.1%	1.3%	
<i>Alpha</i>		-3.6%	-1.9%	-0.1%	0.9%	3.0%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		71	66	34	24	13	
LA Capital Deep Value	461,338,675	-21.5%	-4.2%	0.2%	--	0.2%	4/1/15
S&P 1500 Value		-13.8%	-0.7%	3.0%	--	3.0%	
Style & Risk Adjusted Benchmark		-26.3%	-6.8%	3.2%	--	3.2%	
Lipper Multi-Cap Value		-20.7%	-4.3%	-0.1%	--	-0.1%	
<i>Excess Return</i>		-7.7%	-3.5%	-2.7%	--	-2.7%	
<i>Alpha</i>		4.8%	2.6%	-3.0%	--	-3.0%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		63	55	49	--	49	
Large-Cap Consistent Growth	444,028,867	-4.8%	11.6%	8.9%	--	9.2%	3/1/15
S&P 500		-7.0%	5.1%	6.7%	--	6.3%	
Style & Risk Adjusted Benchmark		-4.5%	8.8%	8.8%	--	8.4%	
Lipper Large-Cap Core		-7.7%	4.1%	5.4%	--	5.0%	
<i>Excess Return</i>		2.2%	6.5%	2.2%	--	3.0%	
<i>Alpha</i>		-0.3%	2.8%	0.1%	--	0.9%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		17	1	2.0%	--	1	

Fund Name	Market Value	1-Year	3-Years	5-Years	7-Years	Inception	Inception Date
Seizert Capital Partners	419,274,101	-11.8%	-0.5%	3.1%	6.4%	10.2%	11/30/09
S&P 1500 Value		-13.8%	-0.7%	3.0%	6.2%	9.3%	
Style & Risk Adjusted Benchmark		-13.1%	-0.6%	2.9%	6.1%	9.3%	
Lipper Multi-Cap Value		-20.7%	-4.3%	-0.1%	3.9%	7.1%	
<i>Excess Return</i>		2.0%	0.2%	0.1%	0.2%	0.9%	
<i>Alpha</i>		1.3%	0.1%	0.2%	0.3%	0.9%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		6	13	6	4	2	
Ark Investments	401,018,698	-13.5%	17.2%	--	--	20.5%	3/1/16
S&P 1500 Growth		-3.9%	8.6%	--	--	11.9%	
Style & Risk Adjusted Benchmark		-19.8%	12.9%	--	--	18.4%	
Lipper Multi-Cap Growth		-5.2%	8.1%	--	--	11.3%	
<i>Excess Return</i>		-9.6%	8.6%	--	--	8.6%	
<i>Alpha</i>		6.3%	4.3%	--	--	2.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		93	5	--	--	3	
SMRS Mid-Cap Index	378,531,698	-22.4%	-3.8%	1.1%	5.4%	--	N/A
S&P 400		-22.5%	-4.1%	0.6%	4.9%	--	
Style & Risk Adjusted Benchmark		-22.3%	-4.1%	0.6%	4.9%	--	
Lipper Mid-Cap Core		-20.9%	-3.8%	-0.5%	4.1%	--	
<i>Excess Return</i>		0.1%	0.3%	0.5%	0.5%	--	
<i>Alpha</i>		-0.1%	0.3%	0.5%	0.5%	--	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		62	53	25	28	--	
Clarkston Capital Large-Cap	223,700,081	-13.9%	0.0%	4.0%	--	4.0%	4/1/15
S&P 500 Value		-12.2%	0.1%	3.4%	--	3.4%	
Style & Risk Adjusted Benchmark		-16.4%	-0.4%	3.1%	--	3.1%	
Lipper Large-Cap Value		-16.3%	-1.2%	2.2%	--	2.2%	
<i>Excess Return</i>		-1.7%	-0.1%	0.6%	--	0.6%	
<i>Alpha</i>		2.5%	0.4%	0.9%	--	0.9%	
<i>Pct. Rank vs. Lipper Large-Cap Value</i>		29	30	12.0%	--	12	
Clarkston Capital Small/Mid-Cap	172,613,597	-11.1%	0.5%	4.1%	--	6.8%	1/1/14
S&P 400		-23.5%	-4.5%	0.5%	--	2.5%	
Style & Risk Adjusted Benchmark		-16.7%	-2.3%	0.7%	--	2.3%	
Lipper Mid-Cap Core		-20.9%	-3.8%	-0.5%	--	1.5%	
<i>Excess Return</i>		12.4%	4.9%	3.6%	--	4.3%	
<i>Alpha</i>		5.6%	2.8%	3.4%	--	4.5%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		5	7	4	--	1	
Attucks Asset Management	109,657,590	-14.9%	-0.2%	2.3%	5.8%	4.6%	11/30/07
S&P 1500		-8.5%	4.2%	6.2%	9.2%	6.4%	
Style & Risk Adjusted Benchmark		-13.0%	-0.6%	2.9%	9.6%	6.5%	
Lipper Multi-Cap Core		-12.3%	1.3%	3.1%	6.8%	4.6%	
<i>Excess Return</i>		-6.3%	-4.5%	-3.9%	-3.4%	-1.8%	
<i>Alpha</i>		-1.8%	0.3%	-0.6%	-3.8%	-1.9%	
<i>Pct. Rank vs. Lipper Multi-Cap Core</i>		70	70	70	75	59	
Bivium Capital Partners	108,771,171	-13.0%	-0.4%	1.8%	5.6%	4.3%	11/30/07
S&P 1500 Value		-13.8%	-0.7%	3.0%	6.2%	4.0%	
Style & Risk Adjusted Benchmark		-13.0%	-0.7%	3.0%	6.3%	6.7%	
Lipper Multi-Cap Value		-20.7%	-4.3%	-0.1%	3.9%	2.8%	
<i>Excess Return</i>		0.8%	0.3%	-1.1%	-0.7%	0.2%	
<i>Alpha</i>		0.0%	0.2%	-1.2%	-0.7%	-2.4%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		7	13	18	17	15	
Ancora	72,014,861	-24.7%	--	--	--	-8.8%	10/1/17
S&P 1000		-23.5%	--	--	--	-7.5%	
Style & Risk Adjusted Benchmark		-24.9%	--	--	--	-7.3%	
Lipper Mid-Cap Core		-20.9%	--	--	--	-6.6%	
<i>Excess Return</i>		-1.1%	--	--	--	-1.2%	
<i>Alpha</i>		0.2%	--	--	--	-1.4%	
<i>Pct. Rank vs. Lipper Mid-Cap Core</i>		76	--	--	--	73	

State of Michigan Retirement System

PRIVATE EQUITY REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



Peter A. Woodford
Senior Investment Manager
Private Equity Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	13.7%	14.9%	12.9%	14.1%	14.4%
PE Benchmark Returns	35.3%	18.7%	15.0%	18.1%	16.9%
Peer Median Returns	4.9%	8.4%	8.3%	9.5%	10.1%
Percentile Rank vs. Peers*	7	10	7	8	9

*State Street Universe greater than \$1 billion

- COVID 19 will have a significant impact on private equity performance, but the 1-year return does not reflect this because of the lag effect. Preliminary data suggests valuations will be particularly impacted by exposure to energy, consumer facing businesses (hotels, restaurants, retail, transportation and construction) and publicly held companies.
- Despite the downturn, 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 the public benchmark returns during periods of expansion and lead the public benchmark during periods of contraction. Over this period, the Private Equity Division has outperformed the S&P by 390 basis points (ten-year S&P 500 return 10.5%) but underperformed the benchmark by 2.5%.
- For the twelve months ending March 31, 2020, the Private Equity Division made contributions of approximately \$933 million, net of distributions. The pace of distributions has slowed significantly due to the coronavirus and lower transactional activity. General Partners are not incentivized to exit investments at current valuations.
- Commitments closed during the quarter include:
 - \$100 million to Acorn Bioventures, L.P., a late stage life sciences/healthcare venture fund.
 - \$100 million to Insight Partners XI, L.P., a growth equity software fund.
 - \$100 million to Odyssey Investment Partners VI, LP, a diversified mid-market buyout fund.
 - \$75 million to Clearlake Capital Partners VI, L.P., a special situation industrial and software fund.
 - \$75 million to Flagship Pioneering Origination Fund VII, a life sciences venture fund.
 - \$75 million to Vista Foundation Fund IV, L.P., a middle market tech buyout fund.
 - \$25 million to Lightspeed Venture Partners Select IV, L.P., a late stage venture fund.
 - \$10 million to Lightspeed Venture Partners XIII, L.P. an early stage venture fund.
 - \$9.5 million to Golden Bell Azalea, LCC, an SMA focused on opportunistic deal flow.

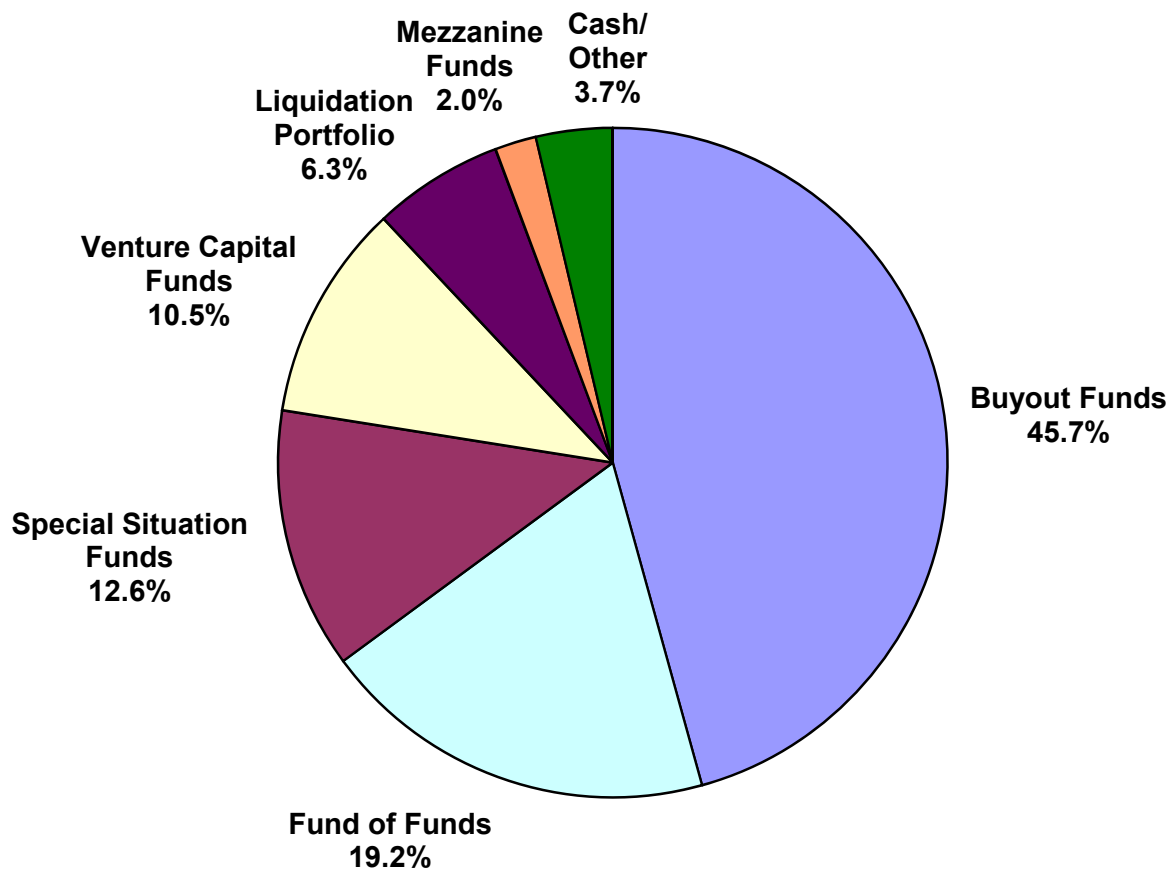
Strategy Update

The strategy for the next twelve months will focus on liquidity while making fewer commitments. The private equity division has a significant amount of unfunded commitments that can be invested during the current cycle. Although several sponsors are raising capital to take advantage of the dislocation, transaction activity has been relatively muted. The Private Equity Division continues to tilt slightly toward growth equity and the lower-middle market to diversify its exposure to large funds. Co-investments continue to play an important role in both averaging down costs and targeting specific investments with attractive risk/return characteristics.

SMRS

Private Equity

3/31/20



Market Value in Millions				
	<u>3/31/20</u>		<u>3/31/19</u>	
Buyout Funds	\$6,844	45.7%	\$5,570	44.7%
Fund of Funds	2,882	19.2%	2,166	17.4%
Special Situation Funds	1,882	12.6%	1,779	14.3%
Venture Capital Funds	1,565	10.5%	1,416	11.4%
Liquidation Portfolio	938	6.3%	1,086	8.7%
Mezzanine Funds	304	2.0%	222	1.8%
Cash/Other	558	3.7%	213	1.7%
Total	<u>\$14,973</u>	<u>100.0%</u>	<u>\$12,452</u>	<u>100.0%</u>

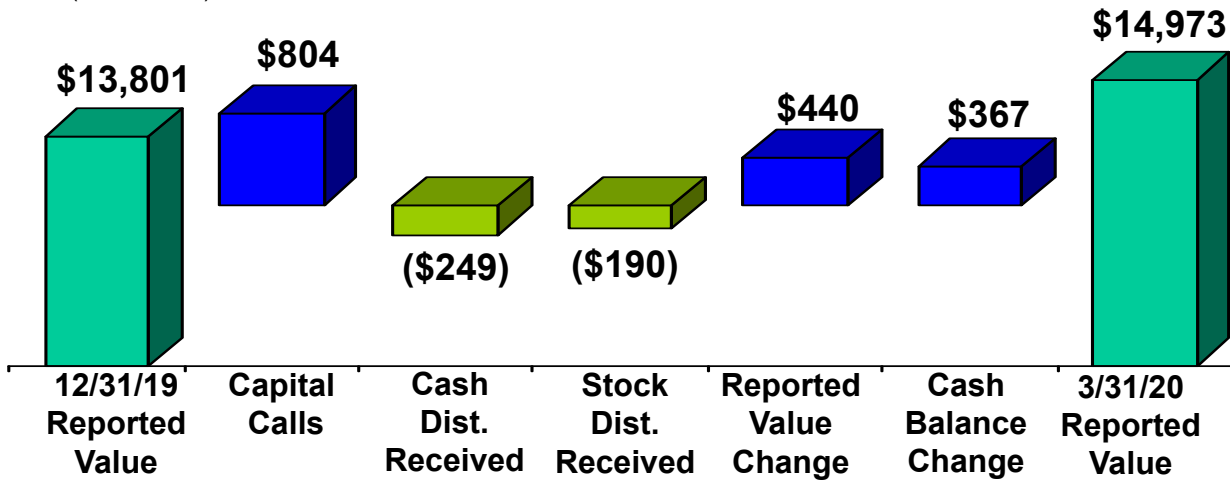
SMRS

Private Equity

3/31/20

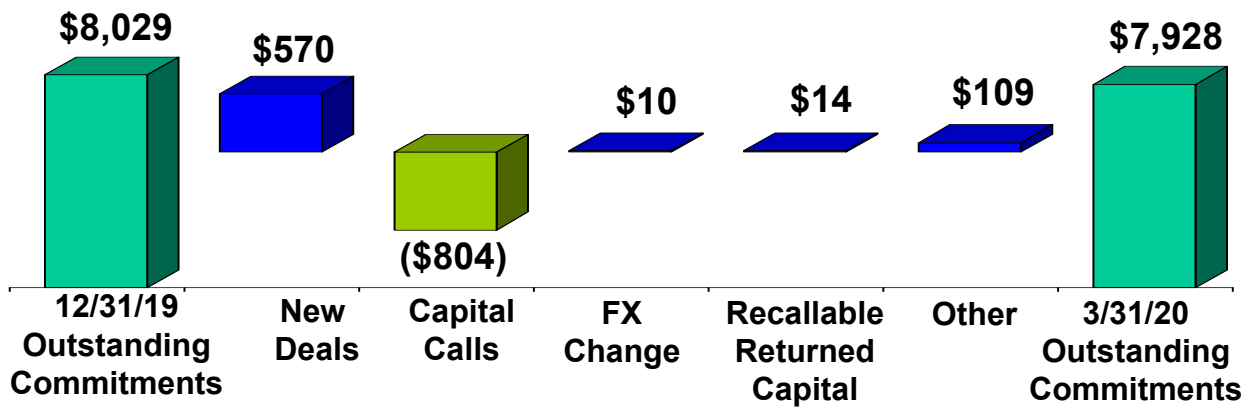
Invested Commitments

(\$ in Millions)



Outstanding Commitments

(\$ in Millions)

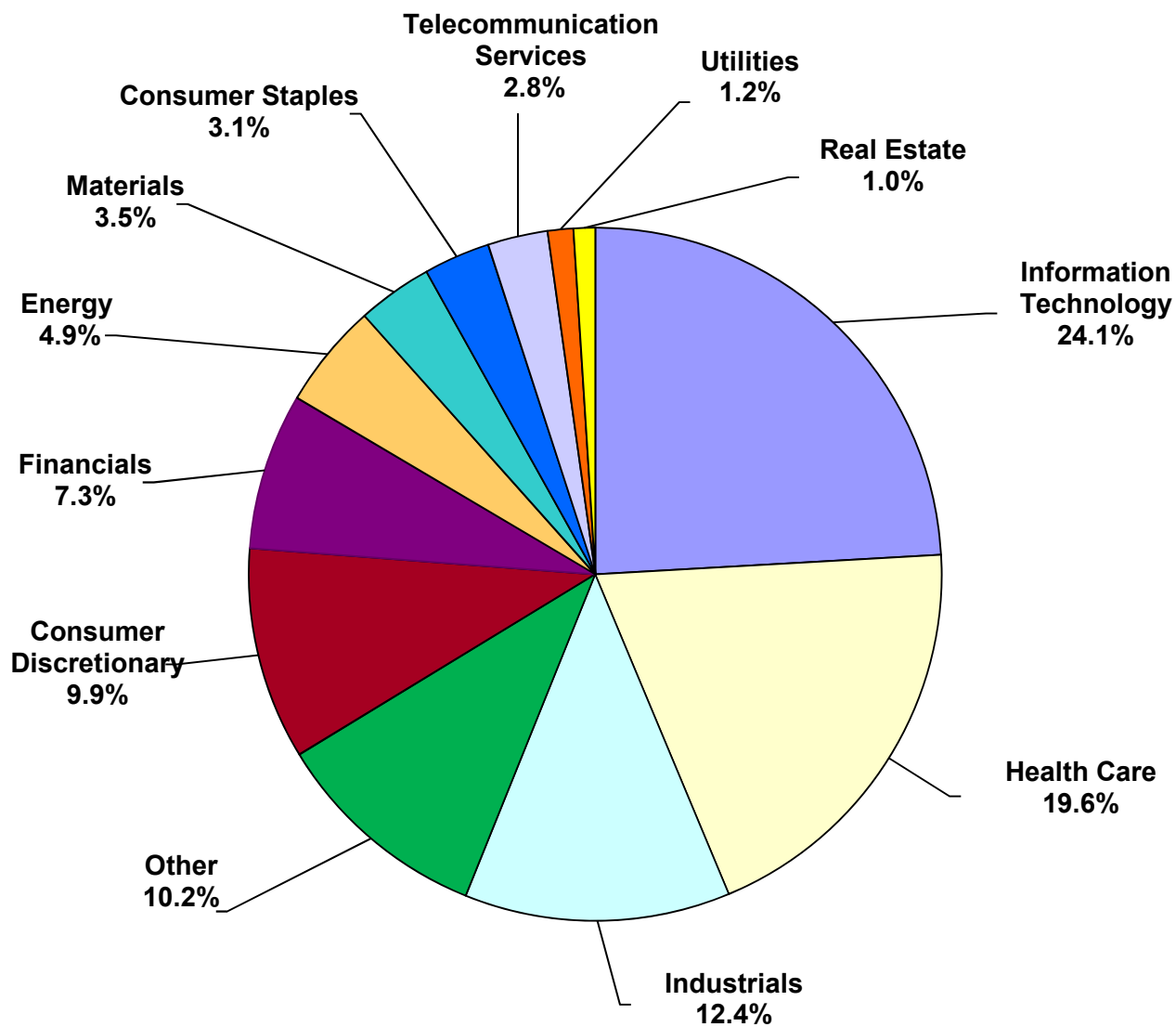


SMRS

Private Equity

3/31/20

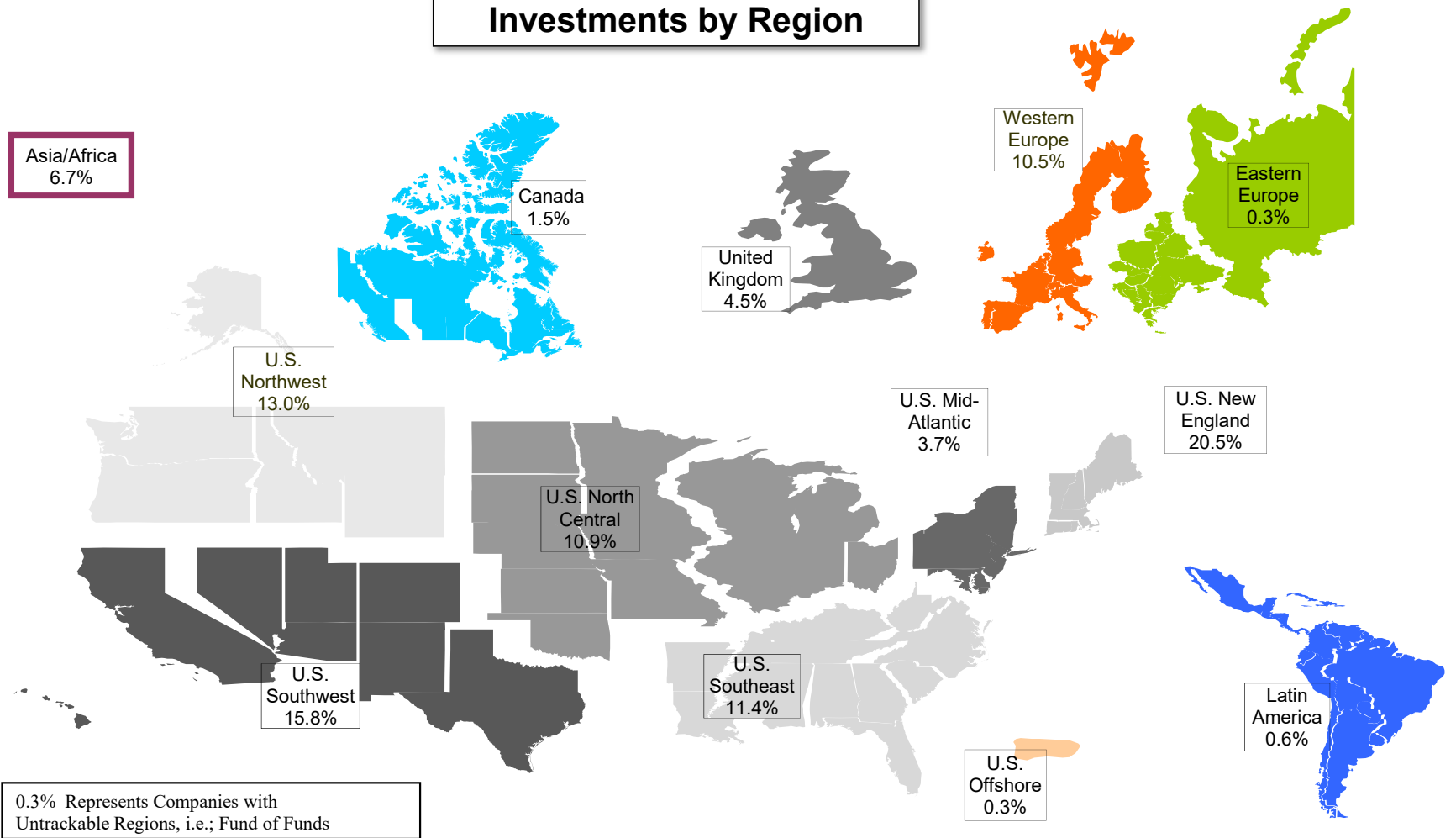
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 12/31/2019 and are subject to change.

Private Equity 3/31/20

Investments by Region



Geographic Report: North America 75%, Europe 15%, Asia 7%, Other 3%

SMRS

Private Equity

3/31/20

Portfolio by Vintage Year

(\$ in Millions)

Asset Vintage	Reported Value	Outstanding Commitment	Total Exposure
1986-2005	\$ 311	\$ 108	\$ 419
2006*	370	157	527
2007	246	126	372
2008	454	79	533
2009	14	1	15
2010	183	4	187
2011	665	93	758
2012	1,113	78	1,191
2013	321	109	430
2014	1,534	295	1,829
2015	5,177	705	5,882
2016	2,026	570	2,596
2017	809	927	1,736
2018	913	1,999	2,912
2019	252	2,134	2,386
2020	26	543	569
Income Accruals	2	0	2
Cash	555	0	555
Act. Small Cap - Stock Dist	2	0	2
Total	\$ 14,973	\$ 7,928	\$ 22,901

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

	Reported Value	Outstanding Commitment	Total Exposure	Total (USD)
Euro (\$1.10/ €)	€ 416	€ 343	€ 759	\$833

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Private Equity

3/31/20

Top 10 Sponsors

(\$ in Millions)

<u>Asset Type</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total</u>
HarbourVest Partners, LLC	\$ 3,388	\$ 765	\$ 4,153
Blackstone Group, The	587	387	974
Kohlberg, Kravis, Roberts & Co.	608	302	910
Leonard Green & Partners, L.P.	441	435	876
Advent International Corp.	536	301	837
Carlyle Group, L.P.	404	390	794
Grosvenor Capital Management, L.F	561	121	682
Flagship Ventures	375	192	567
Apax Partners Worldwide LLP	308	212	520
Veritas Capital Fund, L.P.	393	125	518
Top 10 Total Value	<u>\$ 7,601</u>	<u>\$ 3,230</u>	<u>\$ 10,831</u>

Cash Weighted Rates of Return*

<u>(Net IRR)</u>	<u>Current Qtr.</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>
Buyout	-1.4%	9.1%	15.3%	13.9%	15.1%
Fund of Funds	0.0%	4.0%	11.1%	11.4%	11.8%
Mezzanine	-0.1%	7.9%	11.6%	9.2%	10.3%
Special Situations	0.0%	8.4%	9.8%	9.1%	11.7%
Venture Capital	0.0%	11.5%	16.2%	11.4%	21.0%

*These numbers are based on most recent available General Partner reported data; primarily 12/31/2019 and are subject to change.

SMRS

Private Equity

3/31/20

Net Market Values by Ownership Entity

	Adjusted Reported Value	Unfunded Commitment
5AM Opportunities I, L.P.	\$ 9,559,938	\$ 22,050,000
5AM Ventures VI, L.P.	3,457,381	15,900,000
Accel Europe I, L.P.	3,072,095	1
Accel Europe II	28,647,183	3,300,000
Accel Growth Fund II, L.P.	14,936,782	-
Accel Growth Fund III, L.P.	15,528,180	1,120,000
Accel Growth Fund IV L.P.	25,550,427	990,000
Accel Growth Fund V L.P.	10,019,736	17,718,750
Accel IX, L.P.	3,275,951	3,000,000
Accel Leaders Fund II L.P.	4,592,978	4,781,250
Accel Leaders Fund L.P.	9,887,478	-
Accel London V L.P.	19,125,934	1,920,000
Accel London VI, L.P.	1,951,356	10,375,000
Accel VI-S	2,035,381	652,611
Accel VI, L.P.	836,370	-
Accel VIII, L.P.	45,058	4,782,499
Accel X, L.P.	11,709,665	-
Accel XI, L.P.	9,694,322	1,440,000
Accel XII, L.P.	10,896,653	1,190,000
Accel XIII, L.P.	7,402,647	3,300,000
Accel XIV L.P.	2,456,740	7,350,000
** Acorn Bioventures, L.P.	-	100,000,000
Advent Global Private Equity V	5,318,977	8,700,000
Advent International GPE IX, L.P.	52,289,143	195,000,000
Advent International GPE VI-A LP	30,829,059	-
Advent International GPE VII-B, L.P.	151,881,513	12,000,000
Advent International GPE VIII-B, L.P.	267,107,821	16,424,998
Advent International LAPEF VII	-	60,000,000
Advent Latin American Private Equity Fund VI, L.P.	28,641,796	8,505,000
Affinity Asia Pacific Fund III, L.P.	21,844,845	9,592,941
Affinity Asia Pacific Fund IV, L.P.	63,512,562	19,555,459
Affinity Asia Pacific Fund V L.P.	31,813,733	140,396,722
AIP VII, L.P.	1,057,921	73,501,784
Apax Digital, L.P.	14,789,117	36,869,684
Apax Europe Fund VI	21,547,568	2,320,462
Apax Europe VII, L.P.	5,031,644	1,634,223
Apax IX, L.P.	190,545,961	15,247,386
Apax US VII	5,398,145	417,509
Apax VIII - B, L.P.	71,135,018	6,035,127

	Adjusted Reported Value	Unfunded Commitment
Apax X USD L.P.	-	150,000,000
Apollo Investment Fund IX, L.P.	16,180,862	81,297,627
Apollo Investment Fund VIII L.P.	83,835,969	15,616,378
Arboretum Ventures II	1,100,831	-
Arboretum Ventures III, L.P.	15,303,562	-
Arboretum Ventures IV, L.P.	24,323,118	10,200,000
Arboretum Ventures V, L.P.	2,248,008	32,305,000
Ares Corporate Opportunities Fund II	172,835	11,423,773
Ares Corporate Opportunities Fund III, LP	20,050,820	7,048,927
Ares Corporate Opportunities Fund IV, L.P.	65,128,794	14,667,178
ASF VIII B	40,675,281	114,402,097
AXA ASF Miller Co-Investment	400,043	6,656,684
Axiom Asia Co-Investment Fund I, L.P.	21,200,639	28,943,451
Axiom Asia IV, L.P.	54,262,608	9,950,886
Axiom Asia Private Capital Fund III, L.P.	51,416,228	5,729,639
Axiom Asia V, L.P.	11,354,140	38,750,000
BC European Capital IX	62,811,566	8,455,627
BC European Capital VII, L.P.	619,068	-
BC European Capital VIII, L.P.	5,449,547	8,554,650
Berkshire Fund IX Coinvestment Fund, L.P.	16,929,985	27,421,161
Berkshire Fund IX, L.P.	95,201,560	75,459,166
Berkshire Fund VI, L.P.	13,716,928	7,600,677
Berkshire Fund VII, L.P.	4,899,395	2,444,220
Berkshire Fund VIII, L.P.	89,216,066	414,246
Blackstone Capital Partners IV	4,336,862	4,580,765
Blackstone Capital Partners V	8,784,906	13,069,148
Blackstone Capital Partners V-S	1,042,641	712,476
Blackstone Capital Partners VI, LP	217,405,200	32,907,897
Blackstone Capital Partners VII, L.P.	264,096,981	62,072,761
Blackstone Capital Partners VIII L.P.	-	200,000,000
Bridgepoint Europe IV	11,324,380	5,858,539
Carlyle Europe Partners II	562,400	4,057,570
Carlyle Europe Partners III	9,450,949	5,018,311
Carlyle Europe Partners IV, L.P.	108,817,267	11,817,243
Carlyle Europe Partners V, S.C.SP.	19,948,619	115,058,173
Carlyle Partners V L.P.	41,819,825	54,261,025
Carlyle Partners VI, L.P.	165,617,079	11,787,259
Carlyle Partners VII, L.P.	57,755,829	188,119,563
Centerbridge Capital Partners III, LP	57,926,846	34,837,324
Cerberus SMRS Partners, L.P.	34,375,255	23,304,657
Charlesbank Equity Fund IX, L.P.	29,347,475	66,664,986
Charlesbank Fund IX Overage Allocation Program	21,044,388	29,915,639
CircleUp Credit Fund I, LP	20,114,438	5,677,135
** CLEARLAKE CAPITAL PARTNERS VI, L.P.	-	75,000,000
Clearlake Opportunities Partners II, LP	9,153,926	66,003,731
CM Liquidity Fund, L.P.	-	25,000,000
Coller International Partners V, L.P.	15,211,479	43,600,000
Coller International Partners VI, L.P.	32,925,352	29,723,267

	Adjusted Reported Value	Unfunded Commitment
Coller International Partners VII, L.P.	124,972,882	38,264,915
Crescent Mezzanine Partners VI, L.P.	21,598,878	5,681,254
Crescent Mezzanine Partners VII	59,386,709	88,491,564
CVC Capital Partners VII, L.P.	88,444,814	82,270,164
Dover Street IX, L.P.	72,223,601	28,000,000
Dover Street X, L.P.	9,046,286	142,500,000
EnCap Energy Capital Fund X, L.P.	39,720,635	7,185,994
FIMI Opportunity 6, L.P.	27,830,636	26,363,639
FirstMark Capital I, L.P.	60,261,968	196,596
FirstMark Capital IV, L.P.	22,423,867	13,650,000
FirstMark Capital OF I, L.P.	25,218,837	-
FirstMark Capital OF II, L.P.	40,228,794	1,400,000
FirstMark Capital OF III	-	35,000,000
FirstMark Capital P2, L.P.	116,363,391	-
FirstMark Capital V, L.P.	-	35,000,000
** Flagship Pioneering Origination Fund VII	-	75,000,000
Flagship Pioneering Special Opportunities Fund II, L.P.	21,170,668	78,000,000
Flagship Pioneering VI	78,800,825	31,500,000
Flagship Ventures Fund 2004	27,694	-
Flagship Ventures Fund 2007, L.P.	7,107,175	-
Flagship Ventures Fund IV, L.P.	114,335,027	-
Flagship Ventures Fund V	109,886,368	-
Flagship Ventures Opportunities Fund I, L.P.	43,524,990	7,750,000
Fox Paine Capital Fund II, LP	21,112,198	15,382,699
FS Equity Partners VII, L.P.	96,948,452	14,387,164
FS Equity Partners VIII, L.P.	16,309,646	57,644,453
G-IV Acquisition Holdings, LLC	9,121,776	-
GCM Grosvenor Fund Investment Program I, L.P.	7,127,114	1,276,800
GCM Grosvenor Fund Investment Program II, L.P.	20,795,018	13,267,284
GCM Grosvenor Fund Investment Program III - 2004	34,571,753	4,448,301
GCM Grosvenor Fund Investment Program III - 2006	35,437,938	6,870,459
GCM Grosvenor Fund Investment Program V, L.P.	51,449,323	9,498,842
GCM Grosvenor Fund Investment Program VI, L.P.	25,773,427	3,981,610
GCM Grosvenor Fund Investment Program VIII, L.P.	80,428,214	23,890,553
GCM Grosvenor SeasPriFIP LP (PIS06-10)	43,780,334	16,698,651
GCM Grosvenor SeasPriFIP LP (PIS14)	238,096,412	24,344,279
GCM Grosvenor SeasPriFIP LP (Seed)	23,058,055	16,556,088
Genstar Capital Partners IX, L.P.	17,986,355	57,589,503
Genstar Capital Partners VIII, L.P.	65,554,824	962,049
Genstar IX Opportunities Fund I, LP	15,478,817	35,006,553
Genstar VIII Opportunities Fund I, L.P.	61,597,446	3,815,593
** Golden Bell Azalea, LLC	9,500,000	-
Green Equity Investors V	116,638,617	25,966,435
Green Equity Investors VI, L.P.	140,823,419	12,676,442
Green Equity Investors VII, L.P.	183,850,375	46,580,576
Green Equity Investors VIII, L.P.	-	250,000,000
Greenspring Master G, L.P.	59,478,382	90,500,000
Greenspring Micro II, L.P.	7,795,208	17,216,263

	Adjusted Reported Value	Unfunded Commitment
GSO Capital Opportunities Fund II, L.P.	12,420,004	8,095,124
GSO Capital Opportunities Fund III, L.P.	54,909,893	38,200,460
GSO COF III Co-Investment Fund, L.P.	23,827,986	27,801,380
HarbourVest Credit Opportunities Fund II, LP	-	75,000,000
HarbourVest Dover Street VIII, L.P.	24,746,644	6,075,000
HarbourVest Int'l III Partnership	158,655	1,200,000
Harbourvest Partners Co-Investment Fund IV L.P	91,758,054	19,107,835
HarbourVest Partners Co-Investment Fund V L.P	47,372,677	150,000,000
HarbourVest Partners Mezzanine Income Fund	76,556,431	16,310,000
HarbourVest V Partnership	153,787	300,000
HarbourVest VI - Direct Fund LP	2,207,283	750,000
HarbourVest VI Partnership	563,004	2,000,000
Harvest Partners VII, L.P.	81,160,786	1,418,182
Harvest Partners VIII	15,541,775	84,166,894
HPS Mezzanine Partners III, L.P.	46,000,337	8,372,976
** Insight Partners XI, L.P.	15,000,000	85,000,000
Insight Venture Partners Growth-Buyout Coinvestment Fu	93,802,106	4,328,566
Insight Venture Partners IX, L.P.	190,322,343	2,828,363
Insight Venture Partners X, L.P.	102,418,068	10,200,000
Jade Equity Investors, L.P.	-	100,000,000
Kelso Investment Associates IX, L.P.	74,387,123	12,304,435
Kelso Investment Associates VII	878,793	-
Kelso Investment Associates VIII	28,364,059	22,037,251
Kelso Investment Associates X, L.P.	18,568,713	81,730,452
Khosla Ventures III, L.P.	11,813,752	750,000
Khosla Ventures IV, L.P.	72,360,839	950,000
Khosla Ventures Seed D, L.P.	4,529,699	5,400,000
Khosla Ventures V, L.P.	64,813,470	1,750,000
Khosla Ventures VI, L.P.	28,000,188	46,650,000
KKR 2006 Fund, L.P.	95,638,015	4,817,383
KKR Americas Fund XII, L.P.	105,291,352	104,334,027
KKR Asian	2,295,231	-
KKR Asian Fund II, L.P.	51,398,929	2,112,843
KKR Asian Fund III	55,107,385	54,357,440
KKR China Growth Fund	23,434,606	3,383,656
KKR European Fund II	1,073,435	-
KKR European Fund III	8,922,106	6,430,608
KKR European Fund IV L.P.	135,423,793	7,839,437
KKR European Fund V (USD) SCSp	14,230,151	110,818,391
KKR Millennium Fund	232,956	-
KKR North America Fund XI, L.P.	114,881,716	7,568,977
Lead Edge Capital IV, L.P.	23,096,888	6,608,536
Lightspeed Opportunity Fund, L.P.	7,601,107	17,375,000
** Lightspeed Venture Partners Select IV, L.P.	1,250,000	23,750,000
Lightspeed Venture Partners VII, L.P.	11,843,465	-
** Lightspeed Venture Partners XIII, L.P.	300,000	9,700,000
Menlo Special Opportunities Fund II, L.P.	7,913,254	22,205,284
Menlo Ventures IX, L.P.	1,184,797	-

	Adjusted Reported Value	Unfunded Commitment
Menlo Ventures X, L.P.	393,884	-
Menlo Ventures XI, L.P.	16,770,023	-
Menlo Ventures XIV, L.P.	6,136,933	1,750,000
Meritech Capital Partners IV, L.P.	15,939,426	600,000
Meritech Capital Partners V, L.P.	34,269,703	1,450,000
Meritech Capital Partners VI, L.P.	29,316,720	13,012,500
Michigan Growth Capital Partners II, L.P.	136,673,271	3,922,224
Michigan Growth Capital Partners III, L.P.	83,497,189	35,511,086
Michigan Growth Capital Partners, LP	53,071,950	9,641,262
New Leaf Biopharma Opportunities II, L.P.	111,107,993	12,000,000
New Leaf Growth Fund I, L.P.	106,935,878	-
New Leaf Ventures II, L.P.	7,958,567	-
New Leaf Ventures III, L.P.	48,343,577	-
New Leaf Ventures IV, L.P.	25,462,059	23,562,500
Nordic Capital VI, L.P.	209,326	1
Nordic Capital VII	485,827	3,068,624
Nordic Capital VIII, L.P. (Alpha)	38,667,465	5,269,177
Oak Investment Partners X, L.P.	456,404	-
Oak Investments Partners IX, L.P.	141,200	-
Oaktree Opportunities Fund X, L.P.	28,117,434	5,100,000
Oaktree Opportunities Fund Xb, L.P.	16,889,017	52,500,000
OCM Opportunities Fund IX, L.P.	55,256,745	-
OCM Opportunities Fund VII (B), L.P.	907,139	2,500,000
OCM Opportunities Fund VII, L.P.	1,865,023	-
OCM Opportunities Fund VIII B, L.P.	12,972,574	-
OCM Opportunities Fund VIII, L.P.	1,721,273	-
OCM Principal Opportunities Fund IV	1,028,299	4,998,467
Ocqueoc Holdings, LLC	10,267,492	48,878,796
** Odyssey Investment Partners Fund VI, LP	-	100,000,000
Parthenon Investors II	491,887	3,186,779
Parthenon Investors III	26,403,206	2,682,182
Parthenon Investors IV, L.P.	45,803,432	3,592,740
Peninsula Capital Fund IV	132,460	2,201,026
Peninsula Fund VI, L.P.	36,268,813	6,124,373
Permira Growth Opportunities I, L.P.1	11,092,527	39,500,000
Permira VII L.P. 1	8,846,578	73,447,171
PPC Fund II	41,046,203	38,537,819
Public Pension Capital, LLC	62,431,749	51,204,309
Rhone Partners V, L.P.	74,567,443	49,556,524
Riverside Capital Appreciation Fund VI, LP	46,893,931	7,189,562
Riverside Capital Appreciation Fund VII, L.P.	42,502,845	58,655,964
Riverside Micro Cap Fund I, LP	17,202,638	5,782,975
Riverside Micro-Cap Fund II, L.P.	39,571,510	2,735,834
Riverside Micro-Cap Fund III, L.P.	82,081,356	4,823,424
Riverside Micro-Cap Fund IV	60,349,814	3,890,438
Riverside Micro-Cap Fund IV B, L.P.	9,730,421	5,330,444
Riverside Micro-Cap Fund V, L.P.	19,322,794	79,793,444
Science Ventures Fund II, L.P.	21,194,249	5,400,000

	Adjusted Reported Value	Unfunded Commitment
Science Ventures Fund III, LP	5,000,000	20,000,000
Shamrock Capital Content Fund I, L.P.	31,448,567	18,147,041
Shamrock Growth Capital Fund IV, L.P.	27,123,631	24,386,137
Silver Lake Partners II	58,735	3,531,586
Silver Lake Partners III	25,348,772	13,199,137
Silver Lake Partners IV, L.P.	63,616,898	1,701,717
Silver Lake Partners V, L.P.	44,692,128	27,989,086
Silver Lake SL SPV-2	35,456,860	-
SK Capital Partners V, L.P.	14,020,968	35,951,944
SKCP Catalyst Fund I-A, L.P.	4,780,357	30,219,643
SM/TCP L.P.	23,581,823	1,615,217
SMRS - TOPE LLC	2,391,118,931	81,048,071
SMRS-CAPP LLC	39,242,229	61,300,000
SMRS-NCRP LLC	632,524,919	180,958,521
Summit Partners Growth Equity Fund X, L.P.	3,250,000	96,750,000
Sycamore Partners III, L.P.	9,601,684	85,363,601
TCW/Crescent Mezzanine Partners V, LLC	7,260,970	12,395,466
TCW/Crescent Mezzanine Partners VC Secondary	2,251,016	-
The Huron Fund III, L.P.	9,063,364	2,072,756
The Huron Fund IV, L.P.	36,307,087	2,502,309
The Huron Fund V, L.P.	14,028,518	22,083,436
The Shansby Group 5 (TSG5)	491,172	4,261,291
Thoma Bravo Discover Fund II, L.P.	38,442,927	36,946,928
Thoma Bravo Fund XII, L.P.	212,615,869	2,633,922
Thoma Bravo Fund XIII, L.P.	79,853,852	48,612,890
TI Platform BOV, L.P.	4,595,008	10,236,559
TI Platform Fund II, L.P.	3,765,087	11,120,048
TI Platform SMRS SMA, L.P.	16,355,121	43,720,928
TPG Healthcare Partners, L.P.	230,179	24,360,713
TPG IV (Texas Pacific Group IV)	1,319,535	211,725
TPG Partners III, LP	467,481	2,087,002
TPG Partners VI, L.P.	60,887,485	8,554,388
TPG Partners VIII, L.P.	6,670,205	118,329,795
TPG Partners, VII, L.P.	156,513,291	17,862,040
TPG V (Texas Pacific Group V)	10,719,506	5,841,509
Trilantic Capital Partners V (North America) Fund A, L.P.	31,125,405	3,594,193
Trilantic Capital Partners VI (North America) L.P.	16,717,845	57,276,813
TSG6, L.P.	104,121,107	22,431,360
TSG7 A L.P.	115,811,184	31,254,486
TSG8, L.P.	21,379,065	128,620,935
Turnbridge Capital Partners I , LP	79,076,249	37,927,757
Veritas Capital Fund V, L.P.	155,483,651	11,358,273
Veritas Capital Fund VI, L.P.	156,542,358	13,494,710
Veritas Capital Fund VII, LP	-	100,000,000
Veritas V Co-Investors, L.P.	81,049,386	-
Vista Equity Endeavor Fund I, L.P.	47,039,299	8,198,027
Vista Equity Endeavor Fund II, LP	4,882,800	59,153,945
Vista Equity Partners Fund V, L.P.	52,548,798	11,649,766

	Adjusted Reported Value	Unfunded Commitment
Vista Equity Partners Fund VI, L.P.	97,626,554	11,023,143
Vista Equity Partners VII, L.P.	18,262,002	56,075,703
Vista Foundation Fund III, L.P.	23,372,458	8,070,863
** Vista Foundation Fund IV, L.P.	-	75,000,000
Warburg Pincus China-Southeast Asia II, L.P.	2,227,690	72,375,000
Warburg Pincus China, L.P.	49,082,272	4,477,500
Warburg Pincus Energy MCIP, L.P.	-	10,396,887
Warburg Pincus Energy, L.P.	75,193,891	16,900,000
Warburg Pincus Equity Partners, L.P.	1,182,192	-
Warburg Pincus Financial Sector, L.P.	24,432,926	22,365,000
Warburg Pincus Global Growth, L.P.	26,218,261	121,650,000
Warburg Pincus International Partners	584,797	-
Warburg Pincus Private Equity IX	9,227,930	-
Warburg Pincus Private Equity VIII, L.P.	271,231	-
Warburg Pincus Private Equity X, L.P.	72,850,803	-
Warburg Pincus Private Equity XI, L.P.	125,338,931	-
Warburg Pincus Private Equity XII Secondary, L.P.	28,058,068	987,500
Warburg Pincus Private Equity XII, L.P.	196,655,671	6,912,500
WestAm COREplus Private Equity QP	393,130	2,086,719
Total Private Equity	\$ 14,414,286,207	\$ 7,927,979,616
Cash	528,942,200	-
Active Small Cap Cash	25,881,736	-
Active Small Cap	1,822,272	-
Income Accruals	1,702,173	-
Grand Total	\$ 14,972,634,588	\$ 7,927,979,616

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

June 11, 2020



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/2020)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-14.3%	-1.2%	0.3%	2.1%	3.2%
MSCI ACWI ex USA Returns	-15.6%	-2.0%	-0.6%	1.2%	2.0%
Peer Median Returns	-15.3%	-1.5%	0.2%	2.0%	3.2%
Percentile Rank vs. Peers*	30	42	49	41	48

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

- The International Equity Division (IED) outperformed both peers and the division's benchmark over the one, three, five, seven, and ten-year periods.
- The portfolio outperformed the benchmark by 1.3% over the last twelve months.
- Outperformance in the quality factor, momentum factor, financials sector and energy sector were offset by underperformance in the value factor.

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, 35.3% of assets, to implement a portable alpha strategy onto high-level strategic tilts.
 - Index investments, 25.9% 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 2.3% which is below the division's risk budget of 3.0%.
 - The portfolio remains tactically under exposed to the market factor (beta) accounting for approximately 30% of the division's tracking error.
 - The momentum factor, the largest strategic contributor to tracking error, accounts for only 8.0% of the total tracking error indicating long-term the portfolio is not materially exposed to any one single risk.

- Future portfolio returns will be driven by the tactical low beta and the long-term strategic positions of the quality factor, value factor and momentum factor.
- Quarterly changes to International Equity Division allocation.
 - Reduced \$788.0 million of equity swaps to lower the division's total market exposure (beta) and to ensure sufficient liquidity within the Stock Plus strategy.
 - Raised \$250.0 from SSGA Small-Cap International portfolio to meet the SMRS asset allocation decision.

Market Environment and Outlook

Market Performance

- International stock markets declined nearly -33.0% in 2020. Since late March markets have rebounded down -18.2% year-to-date. Earnings per share growth year-over-year decelerated to -14.0% versus a March reading of -7.0%. Multiples have expanded approximately 2.0%.
- Quality and momentum outperformed the MSCI ACWI ex USA on a relative basis, down year-to-date -9.5% and -8.4% respectively. Value continued to underperform, down -23.0%. Quality, value, and momentum remain strategically important to the IED.
- Developed and emerging markets performed in line with the MSCI ACWI ex USA both down -18.0% respectively.
- The U.S. dollar appreciated 6.7% by late March as markets declined. Since then, the U.S. dollar has weakened to 3.7% year-to-date.
- Commodities remain depressed, down -37.0% for the year. Commodities remain depressed -55.0% from their interim cycle highs back in early 2011. Oil is down -57.0% in 2020, copper -15.7%, and gold up 12.1%.
- Global risk-free 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 is in a recession. COVID-19 was the catalyst but 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 was 3.4% over the last twenty years. Through February 2020, the latest data point, volumes further decelerated slowing to -2.6%. As the March through June data is released, expectations will be for further declines which are consistent with global recessions. The resurgence of trade disputes between U.S., Europe and China will explain the persistence of negative trade volume growth.

- 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 Great Financial Crisis (GFC). The IED believes this clears the way for President Donald Trump to resume pressure on China with respect to the trade negotiations even if the Federal Reserve would prefer otherwise. The ultra-accommodative policy has signaled the Fed is fully committed to offsetting any deep declines in U.S. economic activity.
- Global PMIs were barely above expansionary territory in December 2019 at 50.1. By April 2020, global PMIs collapsed to 39.8. Historically, a decline of this magnitude indicates a recession rather than a mid-cycle adjustment and a return to peak earnings is at least several quarters if not years away.
- Europe top line sales and earnings contracted year-over-year at -5.6% and -14.2%, a level not seen since the periphery debt crisis. Europe manufacturing PMIs indicate the economic contraction was worse in Europe with a PMI reading of 33.4 in April.
- The German Constitutional Court recently ruled parts of the European Central Bank (ECB) recent policy actions were illegal. This legal debate underscores the complexity of implementing monetary decisions in the region. The ECB may be prevented from delivering the monetary support that Europe needs thus lengthening the severity and duration of the recession.
- Japan manufacturing PMIs contracted for the fifteenth consecutive month with a reading below 50.0. Sales growth year-over-year was slightly positive at 1.2% but earnings per share growth is accelerating to the downside at -13.7% indicating sluggish economic activity.
- On a positive note, major central banks appear to be fully committed to an “anything it takes” policy similarly to what Mario Draghi adopted for the ECB. The question will be if the vast amounts of liquidity can offset a major solvency crisis in the next two years. IED has positioned the division’s beta accordingly.
- Analysts, for the first time since the GFC, are projecting negative year-over-year earnings per share growth at -5.3% for the MSCI ACWI ex USA index as of May 2020. The sentiment has rapidly changed. In late February of 2020, analysts were projecting positive 8.9% year-over-year earnings per share growth. 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 the bottom of the market. As noted early, 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 these difficult 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 in free fall during the end of a business cycle.
- The 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 the genesis of 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 8.9%. This rate is based on the current price and actual fundamentals over multiple periods to remove fundamental variability, better estimating the earnings power of the index.
- A ten-year blended international government yield of 0.9% implies an international equity risk premium of 8.0%. The equity risk premium increased due to an increase in forward looking stock returns and a decrease in long-term government bond interest rates.

Conclusion

International economic fundamentals continued to decline in 2020, however, global government bond yields fell as major central banks' monetary policies moved to full accommodation policies not seen since the GFC. The policies in Japan, Europe, and now the U.S. are open-ended inflation targeting processes. The central bank policy will remain low indefinitely as the global recession will last 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 non-standard policies.

International stock markets trade at approximately a 30.0% discount relative to their twenty-three-year history and a wide spread relative to global risk-free rates. To capture this upside, 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
3/31/20

Markets	Amount	Total	% of Total
Active (\$ in Millions)			
BlackRock MSCI	\$1,681		
Wellington	852		
IED Quality Equity	429		
Martin Currie	346		
Marathon-London	249		
Lazard	204		
Effissimo Capital Management	55		
Total Active		\$3,816	38.8%
Stock Plus			
Internal	\$2,036		
PIMCO	1,436		
Total Stock Plus		\$3,472	35.3%
Indexed			
SSGA	\$1,445		
BlackRock	1,101		
Total Indexed		\$2,547	25.9%

TOTAL

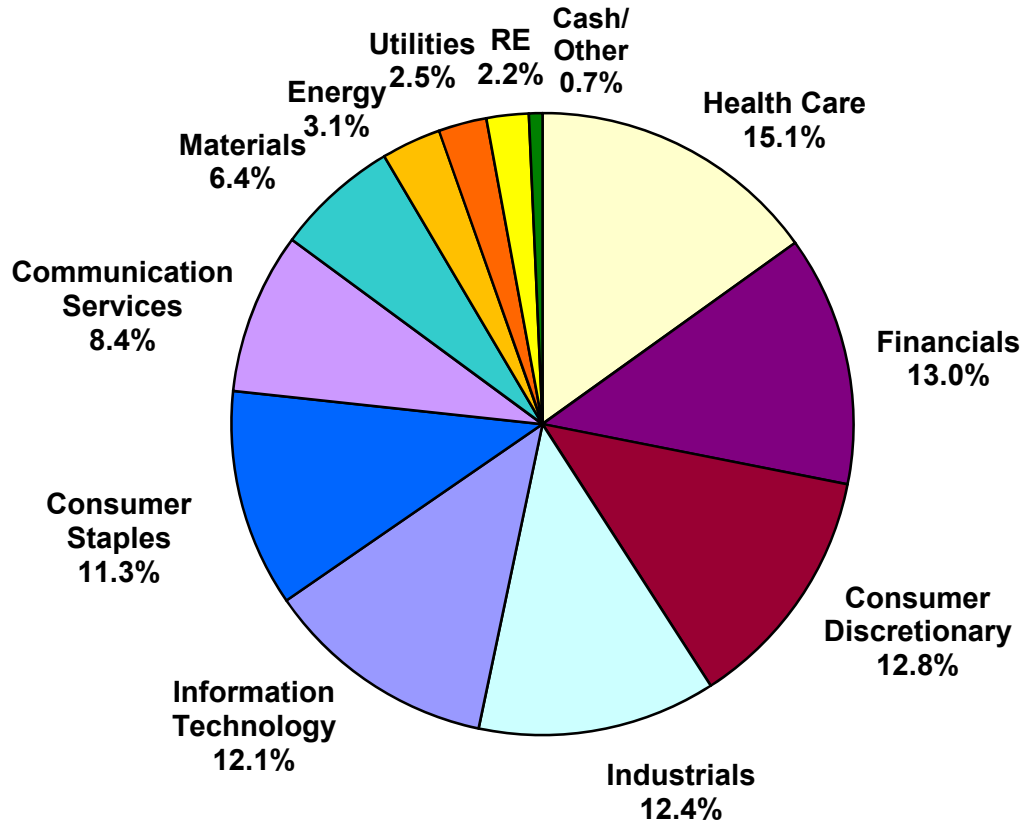
\$9,835

100.0%

SMRS

International Equity By Sector

3/31/20



Market Value in Millions				
3/31/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Health Care	\$1,486	15.1%	10.7%	4.4%
Financials	1,277	13.0%	18.3%	-5.3%
Consumer Discretionary	1,258	12.8%	12.0%	0.8%
Industrials	1,222	12.4%	11.4%	1.0%
Information Technology	1,193	12.1%	10.6%	1.5%
Consumer Staples	1,107	11.3%	10.3%	1.0%
Communication Services	830	8.4%	7.5%	0.9%
Materials	628	6.4%	7.4%	-1.0%
Energy	300	3.1%	5.2%	-2.1%
Utilities	245	2.5%	3.6%	-1.1%
Real Estate	216	2.2%	3.0%	-0.8%
Total Investments	\$9,762	99.3%	100.0%	
Cash/Other	73	0.7%	0.0%	0.7%
Total	\$9,835	100.0%	100.0%	

Benchmark: MSCI ACWI ex USA

SMRS

International Equities

3/31/20

Date:	<u>3/31/20</u>	<u>12/31/19</u>	<u>9/30/19</u>	<u>6/30/19</u>
Assets (\$ in Millions):	\$9,835	\$13,129	\$11,929	\$12,131
Number of Securities:	2,715	2,982	2,711	2,705
Active Share:	32%	33%	32%	31%

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	8.8%	9.7%	7.9%	8.9%
Sustainable Growth Rate	5.0%	6.5%	4.2%	5.9%
Dividend Yield	2.8%	2.5%	3.2%	3.0%
Buyback Yield	0.4%	0.1%	0.5%	0.1%
Collateral Yield	0.5%	0.5%	--	--
Risk:				
Beta	0.91	--	1.00	--
Volatility	19.9%	--	21.8%	--
Tracking Error	2.3%	--	0.0%	--
Information Ratio	0.4	0.3	--	--
Fundamental:				
Average Capitalization (\$ in Billions)	80.0	--	72.9	--
Price/Earnings	15.4	15.6	15.2	15.1
Price/Book	1.5	1.7	1.5	1.6
ROE	9.9%	11.0%	9.6%	10.9%

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%	\$468.6	31.2	\$310.5
Roche Holding AG	2.2%	279.3	15.4	212.4
Taiwan Semiconductor Manufacturing Co., Ltd.	1.9%	234.9	17.0	184.5
Alibaba Group Holding, Ltd.	1.6%	507.8	27.4	159.4
Samsung Electronics Co., Ltd.	1.4%	261.3	11.4	134.7
ASML Holding NV	1.2%	113.2	31.9	114.1
CSL Limited	1.2%	82.4	38.8	113.7
Novo Nordisk	1.1%	112.1	22.4	108.6
Sanofi	1.0%	110.3	12.6	101.3
AstraZeneca PLC	<u>0.9%</u>	<u>117.4</u>	22.3	<u>92.1</u>
TOTAL	<u>15.6%</u>	<u>\$2,287.4</u>		<u>\$1,531.4</u>

International Equity Performance - Net of Fees
3/31/20

<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	\$9,835,238,576	-14.5%	-1.5%	0.1%	1.9%	4.2%	1/1/04
MSCI ACWI ex USA		-15.6%	-2.0%	-0.6%	1.2%	4.3%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	3.5%	
<i>Excess Return</i>		1.0%	0.5%	0.7%	0.8%	-0.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		26	19	15	17	19	
Total International Active Strategy	\$3,816,136,216	-11.8%	-1.0%	0.3%	2.1%	3.4%	5/1/05
MSCI ACWI ex USA		-15.6%	-2.0%	-0.6%	1.2%	3.6%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	2.8%	
<i>Excess Return</i>		3.8%	1.0%	1.0%	1.0%	-0.2%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		15	15	15	17	18	
BlackRock MSCI Systematic Return	1,681,298,646	-11.0%	--	--	--	-3.8%	12/1/18
MSCI ACWI ex USA		-15.6%	--	--	--	-8.4%	
Lipper International Multi-Cap Core		-15.9%	--	--	--	-9.3%	
<i>Excess Return</i>		4.6%	--	--	--	4.7%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		10	--	--	--	2	
Wellington IRE	495,884,541	-14.0%	-0.9%	-0.1%	2.5%	2.9%	12/1/05
MSCI World ex USA		-14.9%	-2.1%	-0.8%	1.4%	2.6%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	2.0%	
<i>Excess Return</i>		0.9%	1.2%	0.7%	1.1%	0.4%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		23	13	18	8	9	
IED Quality Equity	429,487,624	--	--	--	--	-16.2%	2/1/20
MSCI ACWI ex USA		--	--	--	--	-21.2%	
Lipper International Multi-Cap Core		--	--	--	--	-21.4%	
<i>Excess Return</i>		--	--	--	--	5.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		--	--	--	--	3	
Martin Currie International Long-Term	345,578,214	0.4%	5.5%	--	--	7.2%	2/1/17
MSCI ACWI ex USA		-15.6%	-2.0%	--	--	-0.6%	
Lipper International Multi-Cap Core		-15.9%	-15.9%	--	--	-1.5%	
<i>Excess Return</i>		16.0%	7.5%	--	--	7.8%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		1	1	--	--	1	
Marathon-London International Fund	249,168,807	-15.1%	-2.4%	0.1%	2.8%	4.7%	2/1/12
MSCI World ex USA		-14.9%	-2.1%	-0.8%	1.4%	3.0%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	2.8%	
<i>Excess Return</i>		-0.2%	-0.3%	0.9%	1.4%	1.7%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		43	49	15	6	5	
Wellington Emerging Markets Local Equity	224,536,095	-21.9%	-2.7%	-0.5%	-0.2%	2.9%	12/1/11
MSCI Emerging Market Index		-17.7%	-1.6%	-0.4%	-0.4%	1.3%	
Lipper Emerging Markets		-19.6%	-3.5%	-1.6%	-1.4%	0.6%	
<i>Excess Return</i>		-4.2%	-1.1%	-0.1%	0.2%	1.5%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		69	43	37	33	17	
SSGA International Alpha Small Cap	204,075,000	-14.8%	-1.8%	-1.5%	--	-1.7%	5/1/07
MSCI World ex USA Small Cap		-14.9%	-2.1%	-0.8%	--	-1.4%	
Lipper International Small/Mid-Cap Core		-15.9%	-2.9%	-1.2%	--	-1.5%	
<i>Excess Return</i>		0.1%	0.3%	-0.7%	--	-0.2%	
<i>Pct Rank vs. Lipper International Small/Mid-Cap Core</i>		32	23	62	--	60	
Lazard/Wilmington International Equity	204,075,000	-14.8%	-1.8%	-1.5%	--	-1.7%	6/1/14
MSCI World ex USA		-14.9%	-2.1%	-0.8%	--	-1.4%	
Lipper International Large-Cap Core		-15.9%	-2.9%	-1.2%	--	-1.5%	
<i>Excess Return</i>		0.1%	0.3%	-0.7%	--	-0.2%	
<i>Pct Rank vs. Lipper International Large-Cap Core</i>		32	23	62	--	60	
Wellington Select China Equity	131,230,011	--	--	--	--	9.4%	9/1/19
MSCI All China Index		--	--	--	--	1.9%	
Lipper Emerging Markets		--	--	--	--	-16.8%	
<i>Excess Return</i>		--	--	--	--	7.5%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		--	--	--	--	1	
Effissimo Capital Management Japan	54,877,279	-28.6%	-12.7%	--	--	-6.2%	12/1/15
MSCI Japan		-6.7%	1.0%	--	--	2.3%	
Lipper International Small/Mid-Cap value		-24.8%	-7.4%	--	--	-1.6%	
<i>Excess Return</i>		-21.9%	-13.6%	--	--	-8.6%	
<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	\$3,472,226,220	-16.6%	-2.0%	-0.3%	2.1%	4.9%	1/1/09
MSCI ACWI ex USA		-15.6%	-2.0%	-0.6%	1.2%	5.2%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	4.7%	
<i>Excess Return</i>		-1.0%	0.0%	0.4%	0.9%	-0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		59	28	19	15	36	
Internal Stock Plus	2,036,247,931	-17.6%	-2.5%	-1.3%	2.1%	2.5%	9/1/11
MSCI ACWI ex USA		-15.6%	-2.0%	-0.6%	1.2%	2.1%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	2.4%	
<i>Excess Return</i>		-2.0%	-0.6%	-0.7%	1.0%	0.4%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		70	50	56	12	52	
PIMCO StocksPLUS	1,435,978,292	-15.3%	--	--	--	-15.3%	4/1/19
MSCI ACWI ex USA		-15.6%	--	--	--	-15.6%	
Lipper International Multi-Cap Core		-15.9%	--	--	--	-15.9%	
<i>Excess Return</i>		0.3%	--	--	--	0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		43	--	--	--	43	

Total International Index Strategy	\$2,546,876,142	-15.6%	-0.9%	0.7%	1.9%	5.3%	7/1/09
MSCI ACWI ex USA		-15.6%	-2.0%	-0.6%	1.2%	4.1%	
Lipper International Multi-Cap Core		-15.9%	-2.9%	-1.2%	1.2%	4.0%	
<i>Excess Return</i>		0.0%	1.1%	1.3%	0.7%	1.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		44	13	8	17	8	
SSGA MSCI ACWI ex USA Index	1,445,448,875	-15.7%	--	--	--	-7.6%	11/1/17
MSCI ACWI ex USA		-15.6%	--	--	--	-7.7%	
Lipper International Multi-Cap Core		-15.9%	--	--	--	-8.4%	
<i>Excess Return</i>		-0.1%	--	--	--	0.1%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		45	--	--	--	34	
Blackrock ACWI ex USA Index	1,101,427,266	-15.4%	--	--	--	-10.2%	3/1/18
MSCI ACWI ex USA		-15.6%	--	--	--	-10.5%	
Lipper International Multi-Cap Core		-15.9%	--	--	--	-10.6%	
<i>Excess Return</i>		0.2%	--	--	--	0.3%	
<i>Pct Rank vs. Lipper International Multi-Cap Core</i>		43	--	--	--	40	

State of Michigan Retirement System

REAL & OPPORTUNISTIC RETURN REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



Jennifer Yeung
Senior Investment Manager
Real & Opportunistic Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Real & Opportunistic	8.3%	12.0%	10.2%	11.7%	10.3%
Custom Benchmark	6.3%	7.0%	7.1%	7.1%	7.3%

- The portfolio value is \$9.0 billion with a one-year return of 8.3%. Performance for the year was driven by a combination of current income and capital appreciation. Income was earned from entertainment royalties, investments in asset managers, credit investments and natural resource strategies. Appreciation in value was driven by media and entertainment, transportation and natural resource assets.

Strategy Update

- The objective of the Real Return & Opportunistic portfolio is to provide an inflation hedge and/or to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- It is too early to assess the long-term impact of COVID-19 on our portfolio as the duration of stay-at-home measures and severity of economic impact is still unknown. In this environment, the Real Return & Opportunistic portfolio should benefit from exposure to assets with low equity beta and diversification across numerous strategies and managers.
- The Real Return & Opportunistic portfolio has approximately \$4.0 billion of unfunded commitments. The following are new commitments closed during the quarter.
 - \$250 million to SJC Onshore Direct Lending Fund IV – SMRS, L.P. (Czech Asset Management), a separately managed account that will invest alongside SJC Fund IV. The Fund will provide senior secured loans to middle market companies in the United States.
 - \$210 million to Axton Holdings, LLC (Barings Alternative Investments), follow-on equity contribution to acquire publishing and copyrights.
 - \$100 million to HarbourVest Direct Lending Fund (L) L.P. (HarbourVest Partners), a commingled fund that provides senior secured loans to lower-middle and middle market companies, primarily in the United States.
- 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 investment teams that are disciplined and have experience investing over multiple cycles.

SMRS

Real Return and Opportunistic

3/31/20

Top Ten Advisors or Entities

(\$ in Millions)

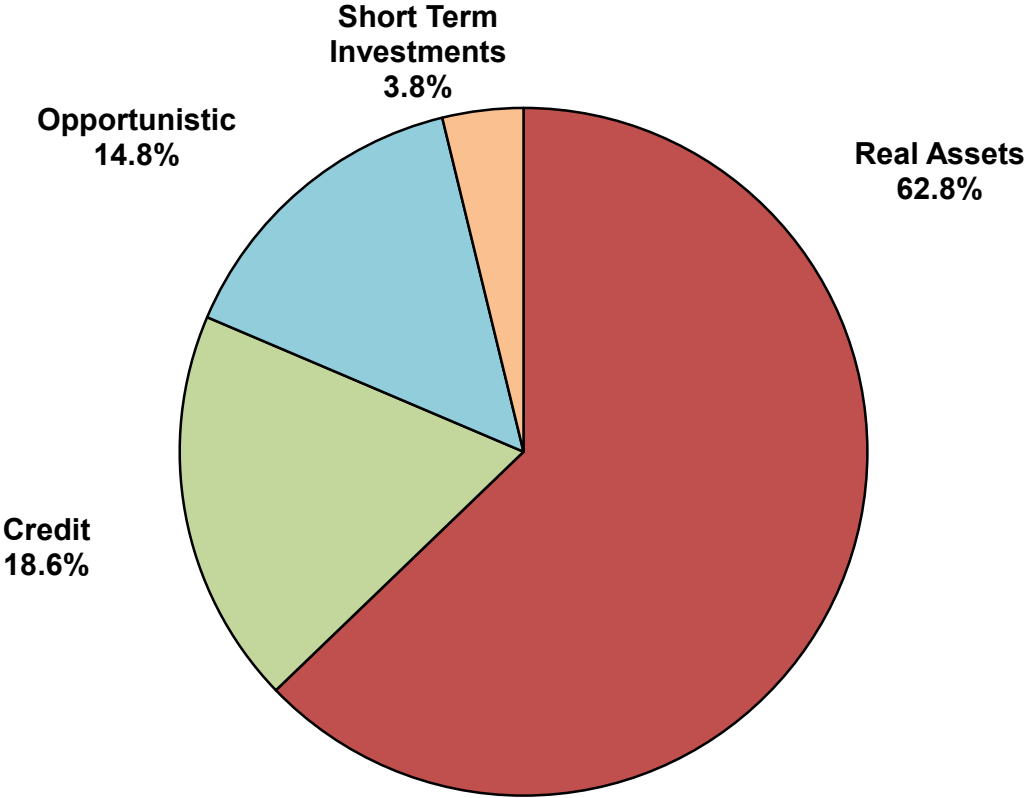
<u>Advisor or Entity</u>	<u>Market Value</u>
Barings Alternative Investments	\$ 2,878
Apollo Global Management	1,165
Domain Capital Advisors	1,058
ICG Advisors	634
Sixth Street Partners	360
Kayne Anderson Capital Partners	344
Ridgewood Energy	246
Fortress Investment Group	240
Blackstone Alternative Asset Management	229
Orion Resource Partners	228
Total Market Value	\$ 7,382

SMRS

Real Return and Opportunistic

3/31/20

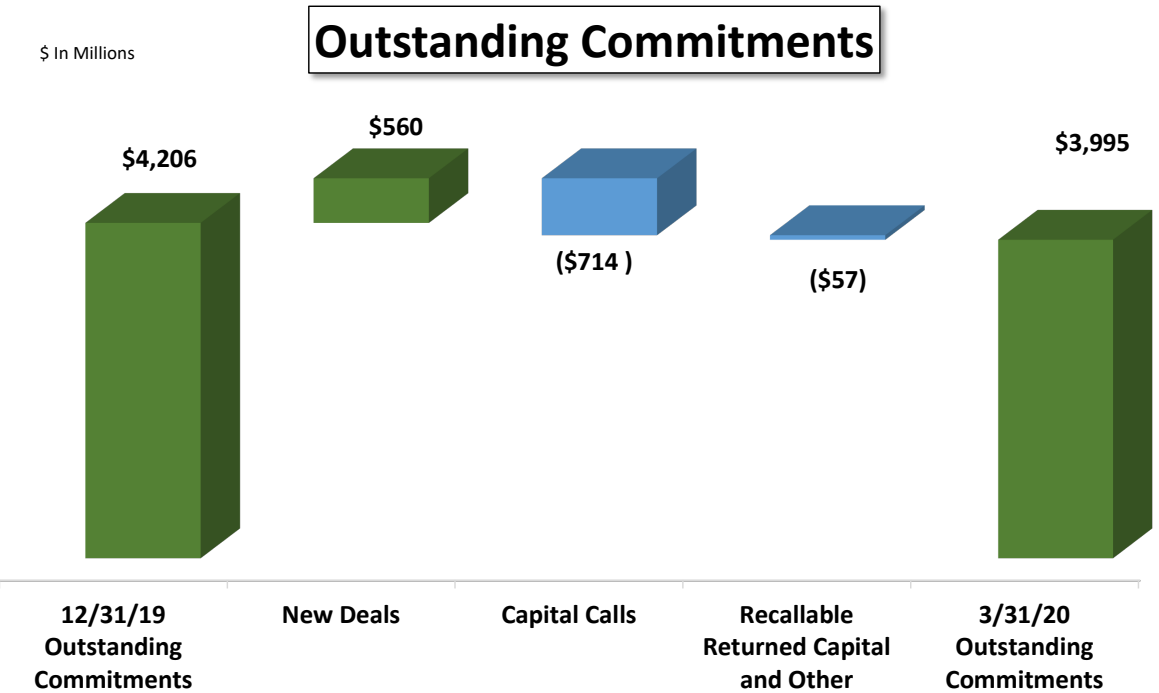
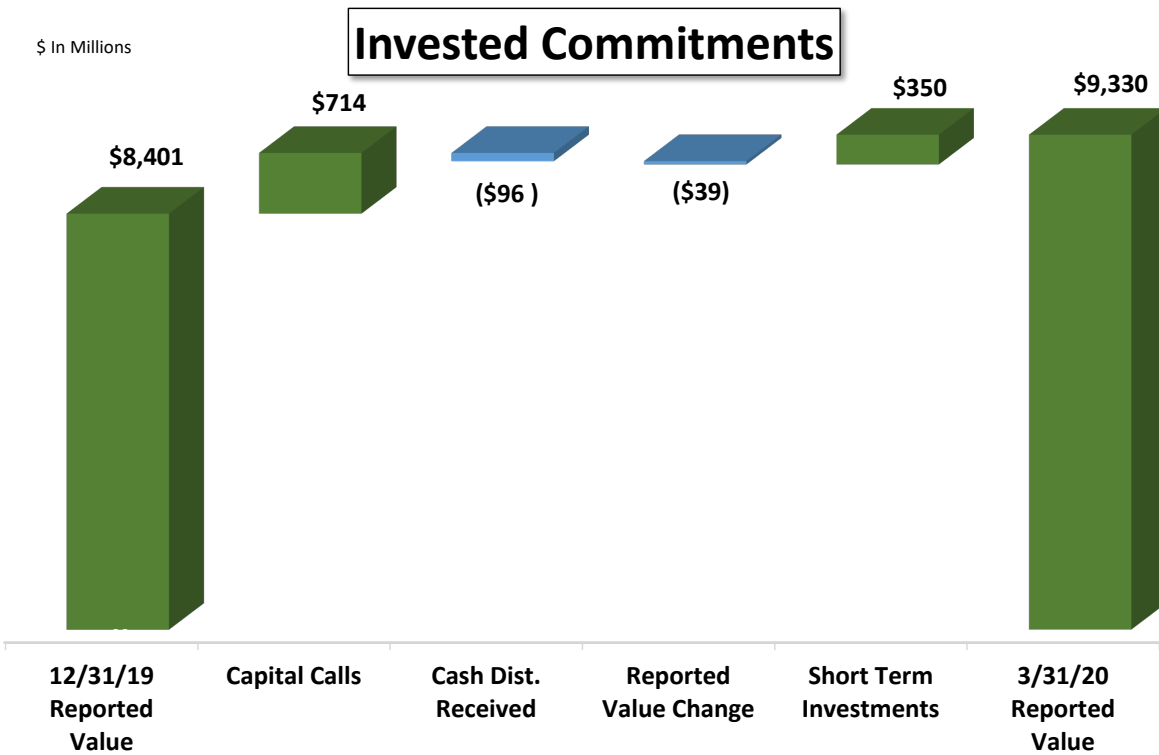
Investments By Strategy



Market Value in Millions	
	<u>3/31/20</u>
Real Assets	\$5,860
Credit	1,737
Opportunistic	1,383
Short Term Investments	<u>350</u>
Total Investments	<u>\$9,330</u>

SMRS

Real Return and Opportunistic 3/31/20



SMRS

Real Return and Opportunistic

3/31/20

Net Market Value by Entity

	Net Market Value	Unfunded Commitment
* Abernathy	\$ 300,046,688	\$ 13,187,958
* Abernathy II	188,639,579	6,076,308
Altus Midstream	2,625,000	0
Angelo Gordon Credit Solutions Fund	61,174,277	44,711,423
Apollo European Principal Finance Fund II	12,599,470	8,183,322
Apollo HK TMS Investments Holdings LP	1	0
Apollo Offshore Credit Fund	14,127,338	0
** Axton Holdings	1,968,907,521	73,675,174
Barings Asset Based Income Fund I	167,300,339	135,675,627
Barings Global Real Asset Fund I	61,440,414	42,646,984
Blackstone Strategic Capital Holdings, LP	70,437,216	53,132,700
Blue Peninsula Fund LP	139,802,104	53,411,323
Broadriver III	34,787,960	158,032,157
BSCH Parallel (MLG) I LP	158,866,370	0
BSCH II	1	250,000,000
BSCH II Co-Invest	0	100,000,000
Carlyle Energy Mezzanine Opportunity Fund II	21,717,907	23,885,775
Carlyle IEP Co-Invest (Varo)	15,840,293	861,225
Carlyle International Energy Partners	45,787,752	24,008,247
Carlyle International Energy Partners II	12,698,444	135,000,000
Castle Credit SMRS Holdings LLC	69,346,558	110,275,798
Centerbridge SCP III	32,192,956	1,432,213
Centerbridge SCP III, LP – Flex, L.P.	10,500,000	59,500,000
Content Holdings, LLC	449,889,839	39,071,627
Credit Opportunity Fund III	23,437,058	19,972,427
Energy Recap and Restructuring	23,895,453	7,085,025
ERR MI Holdings LP	2,913,530	2,269,933
FCO MA MI LP	167,597,216	41,050,536
Financial Credit Investment II	243,783,313	183,797,353
Financial Credit Investment III	225,539,075	139,999,050
Flywheel Energy Co-Invest	43,922,569	7,000,000
Fortress Transportation & Infrastructure	30,970,769	0
Greatrock LLC	58,411,324	0
Global Maritime	76,235,555	3,414,854
GSO Credit Alpha Fund	39,079,427	37,910,063
** HarbourVest Direct Lending Fund (L) L.P.	0	100,000,000
Hopen Life Science Fund II	4,035,499	640,000
HPS Red Cedar Fund	201,260,907	106,262,984
Kayne Anderson Energy Fund VII, LP	45,366,649	19,714,558
Kayne Anderson Private Energy Income Fund	121,394,865	26,294,961
Kayne Anderson Private Energy Income Fund II	36,392,777	124,373,958
Kayne Solutions Fund	63,815,549	185,410,605
KKR Energy Income & Growth Fund	38,657,303	1,953,202
KKR Lending Partners	8,932,668	11,930,723
KKR Lending Partners II	28,974,389	11,737,239
Lakewater	106,835,817	1,900,000

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
Lakewater II	76,795,145	1,800,000
Lakewater III	289,662,881	2,900,000
Lakewater IV	31,954,373	1,600,000
Lakewater V	116,686,297	5,900,000
Marathon CLO Equity Fund	16,393,030	4,529,470
Merit Energy Partners I LP	32,742,308	0
MidCap Finco Holdings LTD	298,321,770	0
Mortgage Servicing Rights	72,272,742	0
Napier Park Aircraft Leasing Vehicle I, LLC	46,190,502	18,394,243
Napier Park AL Rollover Fund I	16,175,086	60,232,914
Nash Co-Investment	16,996,578	94,259
New Fortress Energy HLDGS	564,428,609	0
New Fortress Energy LLC	6,051,258	0
NGP Natural Resources XII	72,014,010	75,623,942
Orion Co-Investments III, LP	4,953,791	0
Orion Mine Finance	59,904,087	1,604,819
Orion Mine Finance 1A	39,166,537	1,087,148
Orion Mine Finance Co-Fund II LP	20,294,929	35,000,000
Orion Mine Finance II	93,730,794	24,369,990
Orion Mine Finance III LP	10,342,718	63,815,181
Redding Ridge Holdings, LP	88,815,003	10,842,105
* Ren Venture Fund II	28,097,026	1,500,000
* Ren Venture Fund III	7,450,703	17,250,000
Ridgewood Energy Oil & Gas II	86,881,323	12,640,906
Ridgewood Energy Oil & Gas III	110,185,571	136,474,687
Ridgewood Fund II Co-Invest (REOG)	24,420,712	5,097,494
Riverside Credit Solutions FD I LP	32,153,589	16,771,187
RPEP Energy Opportunistic Institutional Partners	24,501,807	12,975,646
SJC Direct Lending Fund II	1	38,261,315
SJC Direct Lending Fund III	206,004,144	24,296,971
SJC Direct Lending Fund III Co-Invest G-III	20,000,000	0
** SJC Onshore Direct Lending Fund IV – SMRS, L.P.	0	250,000,000
* Social Network Holdings	119,560,773	5,590,848
Specialty Loan Fund III	8,943,565	5,982,929
Sprott Private Resource Lending (US), LP	31,345,558	73,578,036
Sprott PRL(M) LP	1,460,660	22,295,779
Sprott PRL(M-Co-Invest) LP	7,446,943	17,687,500
Structured Credit Recovery Fund IV	258,011,711	0
Terra Co-Investment	32,564,482	14,000,000
TICP CLO Partners II	44,073,080	1,724,474
TICP CLO Partners III	14,687,139	84,930,086
TSSP Agriculture Partners	4,657,138	94,657,148
TSSP Adjacent Opportunities Partners	193,853,558	122,724,240
TSSP Capital Solutions	82,089,788	216,063,734
TSSP Opportunities Partners IV	21,034,834	79,335,787
Turning Rock Fund I, LP	30,310,101	47,571,869
Vida Insurance Credit Opportunity Fund II	92,139,828	13,664,523
Warwick (SMRS) Co-Invest, L.P.	35,378,815	2,089,081
Warwick Partners III	58,908,170	4,511,027
Total Real Return and Opportunistic	\$ 8,980,233,204	\$ 3,994,954,667
Short-Term Investments & Other	350,096,593	0
Grand Total	\$ 9,330,329,797	\$ 3,994,954,667

* Fund of Funds

** **New Commitment**

State of Michigan Retirement System

REAL ESTATE AND INFRASTRUCTURE REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3-31-20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	6.3%	8.6%	9.2%	10.8%	11.0%
NCREIF NPI	3.9%	5.1%	6.3%	7.5%	8.8%
Peer Median Returns	6.0%	7.4%	8.3%	10.6%	10.9%
Percentile Rank vs. Peers*	48	32	28	48	47

*State Street Universe greater than \$1 billion

- Outperformance relative to the one-year benchmark resulted from the Real Estate and Infrastructure Division's (REID) strategy of being underweight in retail, performance of credit strategies, and appreciation and gains across the entire portfolio.

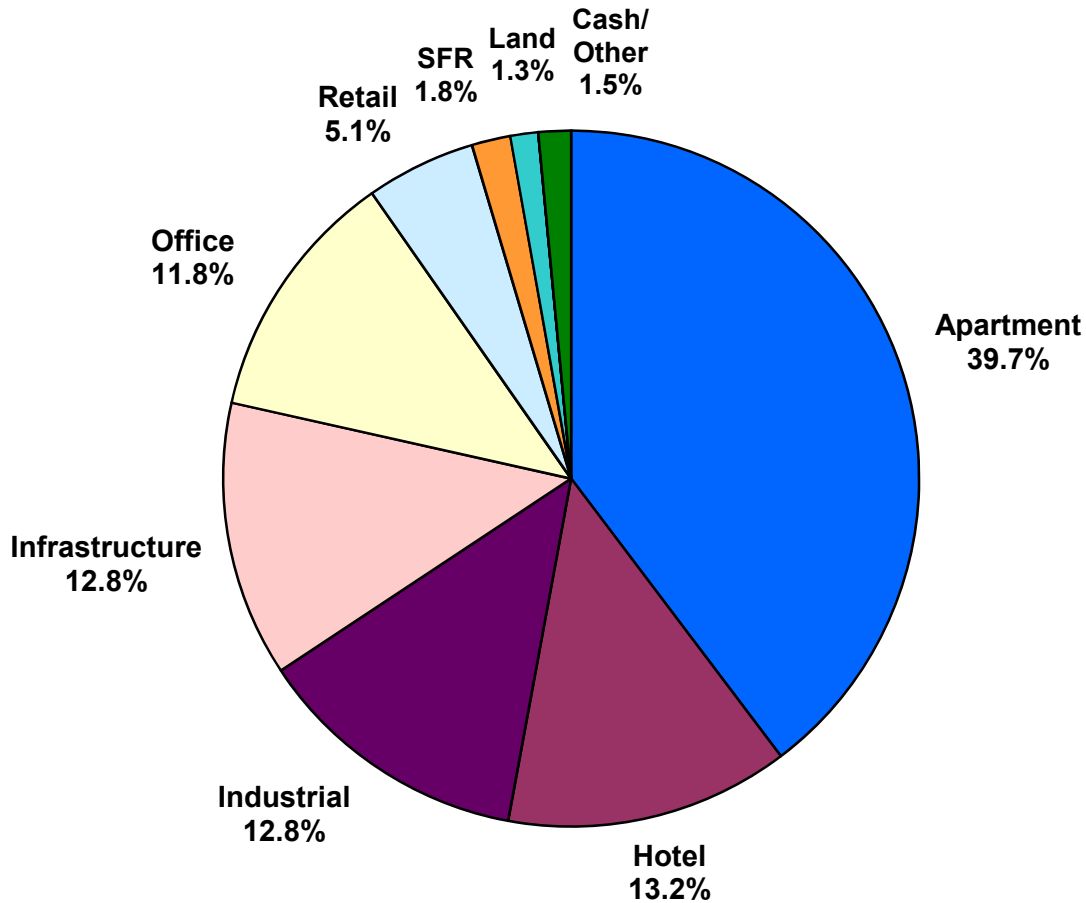
Strategy Update

- The Covid 19 global pandemic and Shelter-in-Place orders implemented to slow the spread of the virus have resulted in major negative impacts to the US economy and commercial real estate markets. Large segments of the US economy remain shuttered and the impacts are only beginning to be felt in the commercial real estate and infrastructure markets. 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 also underwrite best in class commingled funds that fit into the REID portfolio strategy with regard to sector and returns.
- We have been actively managing the portfolio with capital returned of more than \$1.1 billion, and funding for new or existing investments of nearly \$720 million over the past 12 months. We continue to work with our advisors in executing the disposition of properties and realizing gains at historically low capitalization rates where these opportunities exist.
- The REID has approximately \$1.6 billion in unfunded commitments. New commitments during the quarter include:
 - €75 million (\$82.7 million) in GreenOak Europe III, LP, a closed-end commingled fund that will target opportunities in Western Europe of quality institutional real estate focusing on logistics assets, managed by Bentall Green Oak.
 - \$50 million in ArcLight Energy Partners VII, LP, a closed-end commingled fund specializing in investments in North American energy/power infrastructure, managed by ArcLight Capital Partners, LLC.

SMRS

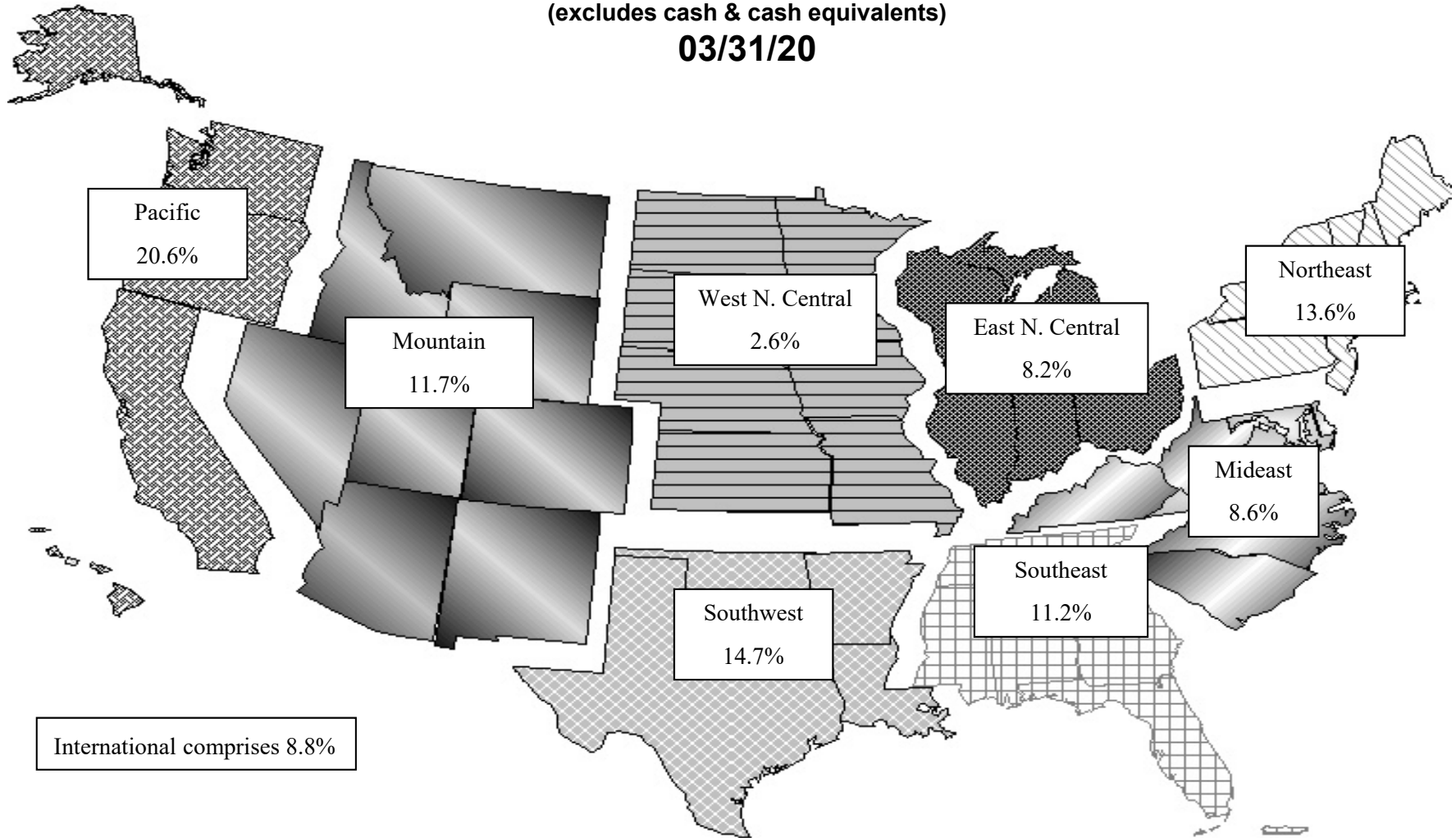
Real Estate and Infrastructure

3/31/20



Market Value in Millions				
	<u>3/31/20</u>		<u>3/31/19</u>	
Apartment	\$2,676	39.7%	\$2,794	39.7%
Hotel	893	13.2%	940	13.4%
Industrial	866	12.8%	549	7.8%
Infrastructure	862	12.8%	840	11.9%
Office	797	11.8%	975	13.8%
Retail	342	5.1%	343	4.9%
Single Family Residential (SFR)	121	1.8%	432	6.1%
Land	85	1.3%	99	1.4%
	<u>\$6,642</u>	<u>98.5%</u>	<u>\$6,972</u>	<u>99.0%</u>
Cash/Other	103	1.5%	72	1.0%
Total Investments	<u>\$6,745</u>	<u>100.0%</u>	<u>\$7,044</u>	<u>100.0%</u>

SMRS
Real Estate by Region
Based on Market Value
(excludes cash & cash equivalents)
03/31/20



3

Geographic regions defined by NCREIF, whose property index composition is: Pacific 34.1%, Mountain 6.3%, West N. Central 1.1%, Southwest 10.8%, East N. Central 6.9%, Southeast 9.5%, Northeast 19.8%, Midwest 11.5%

SMRS
Real Estate and Infrastructure
3/31/20

**Top Ten
Advisors or Entity**

Advisor or Entity	(\$ in millions)
	Market Value
MWT Holdings LLC	\$ 1,981
Clarion Partners	676
Principal Real Estate Investors	515
Five Star Realty Partners LLC	345
Domain Capital Advisors Inc	285
Blackstone Group	268
Rialto Capital Management LLC	227
CIM Investment Advisors LLC	195
Transwestern Investment Management	182
Lone Star Global	168
	\$ 4,842

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	93.9%	87.5%	95.8%	91.1%	65.8%
National Average	93.4%	87.7%	92.7%	95.3%	51.8%

SMRS
Market Values by Ownership Entity
3/31/20
REAL ESTATE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 70,731,210	\$ 0
AEW Senior Housing III	4,031,890	715,013
AEW Senior Housing Investors IV	8,206,453	41,371,546
Apollo Asia Real Estate Fund	46,934,571	30,234,574
Asana Partners Fund I	28,141,958	4,960,809
Asana Partners Fund II	3,634,549	45,530,405
Avanath Affordable Housing II, LLC	32,742,789	0
Avanath II SMRS Co-Investment Fund LLC	13,929,288	0
Avanath Affordable Housing III	42,752,372	5,311,980
Avanath Affordable Housing IV	4,888,194	29,261,396
Blackstone R/E Partners V, LP	2,233,892	0
Blackstone R/E Partners VI, LP	5,261,201	3,680,930
Blackstone R/E Partners VIII, LP	75,513,611	14,776,598
Blackstone R/E Partners IX, LP	35,028,078	165,040,051
Capri Urban Investors, LLC	8,302,930	0
CIM Commercial Trust Corp	6,517,748	0
CIM Fund III, LP	38,497,068	0
CIM Fund VIII, L.P.	109,728,891	1,487,563
CIM VI (Urban REIT), LLC	32,280,661	0
Clarion Gables Multifamily Trust, LP	32,986,407	0
Columbus Circle Holdings, LLC	170,371,567	164,807,201
Crown Small Cap Real Estate	16,763,710	5,980,000
DM2501, LLC	0	0
Domain GVA-1, LLC	39,981,464	1,940,056
Domain Hotel Properties, LLC	395,211,060	0
Eastport Properties, LLC	0	100,000,000
Gateway Capital Real Estate Fund II, LP	2,865,119	0
Great Lakes Property Group Trust	8,204,739	9,565,475
* GreenOak Europe III, LP **	13,305,795	69,391,249
Heitman Credit	50,831,173	0
IDR Core Property Index Fund LLC	25,764,029	0
India Property Fund II, LLC	22,387,689	2,212,118
Invesco Mortgage Recovery Feeder Fund	3,809,037	0
Invesco Mortgage Recovery Fund II, L.P.	23,215,805	34,249,727
Invesco Strategic Opportunities III, L.P.	18,789,323	82,461,385
IPF II Co-Invest LP	22,779,651	1,720,897
JBC Funds North LaSalle LLC	22,618,445	0
JBC Opportunity Fund III, LP	495,673	0
KBS/SM Fund III, LP	48,150,835	0
KBS/SM Fund IV	160,277	0
L-A Saturn Acquisition	38,095,542	0
Landmark Real Estate Partners V, LP	6,721,477	0
LaSalle Asia Opportunity Fund II, LP	283,754	0
LaSalle Asia Opportunity Fund III, LP	1,228,563	0

	<u>Market Value</u>	<u>Unfunded Commitment</u>
Lion Industrial Trust	243,802,042	0
Lion Mexico Fund, LP	4,960,254	0
Lombard GVA0016 (former AGL Annuity)	345,658,513	0
Lone Star Fund X LP	160,046,285	30,483,414
Lone Star Fund XI LP	8,119,547	187,254,621
Lubert-Adler Real Estate Fund VII, LP	61,854,016	6,538,662
M1 Westgate CoInvest LLC	6,339,958	0
M301W CoInvest LLC	1,825,260	0
MERS Acquisitions Ltd.	167,647,203	17,144,500
MG Alliance, LLC	50,994	0
MIP Holdco LLC	147,119,403	14,446,169
MSREF V - International	2,340,028	0
MSRESS Fund III Institutional LP	6,708,382	0
MWT Holdings, LLC	1,981,684,000	0
Northpark Land Associates	37,393,055	7,605,609
Orange Investors LLC	475,450	0
Paladin Realty Brazil Investors III (USA), LP	10,595,207	0
Paladin Realty Latin America Investors IV-CI, LP	39,235,134	0
Paladin Realty TB COINV V LP	11,693,291	0
Penmain Office LLC	37,738,103	0
Principal Separate Account	445,144,300	115,401,998
Proprium RE Spec. Situations Fund, LP	87,914,391	16,143,656
Rialto Absolute Partnership I	68,706,557	0
Rialto Credit Partshp LP	21,567,379	1,374,858
Rialto Real Estate Fund, LP	21,373,588	0
Rialto Real Estate Fund II, LP	31,618,774	0
Rialto Real Estate Fund III-Debt, LP	45,888,617	0
Rialto Real Estate Fund III-Property, LP	36,253,330	8,082,192
Rialto Mezzanine Partners Fund	1,781,481	0
SM Brell II LP	20,254,628	0
Stockbridge RE Fund II-C, LP	6,833,467	0
Strategic II LLC	45,750,647	37,417,721
TPG RE Finance Trust Inc. (TRTX)	26,485,089	0
TPG Real Estate Partners II	31,475,553	9,784,519
TPG Real Estate Partners III	5,038,483	43,631,538
TSP Spartan C-I LLC	7,154	0
TSP Spartan C-II LLC	15,491,569	0
TSP Value & Income Fund II, LP	19,856,842	30,197,274
True North High Yield Invest. Fund II, LLC	2,081,059	0
True North Real Estate Fund III, LLC	36,878,160	5,000,000
Venture Center, LLC	16,140	0
	<u>\$ 5,780,081,820</u>	<u>\$ 1,345,205,704</u>
Short-Term Investments and Other	84,560,401	0
Total Real Estate Investments	<u>\$ 5,864,642,222</u>	<u>\$ 1,345,205,704</u>

* New or additional commitment made during the quarter reported

** Euro denominated account converted to U.S. dollars at March 31, 2020 rate

SMRS
Market Values by Ownership Entity
3/31/20

INFRASTRUCTURE

	<u>Market Value</u>	<u>Unfunded Commitment</u>
ArcLight Energy Partners VI, LP	\$ 43,101,443	\$ 7,004,763
* ArcLight Energy Partners VII, LP	1,929,292	47,008,097
ASF VI Infrastructure B LP	22,811,559	9,156,177
ASF VII Infrastructure Fund B L.P.	13,819,175	17,789,037
ASF Como Co-Investment LP	5,778,412	2,405,051
Basalt Infrastructure Partners, LP	41,869,787	2,219,045
Blackstone Energy Partners, LP	28,758,545	4,728,291
Blackstone Energy Partners II, LP	92,322,038	18,212,191
Brookfield Infrastructure Fund II-B, L.P.	53,909,510	4,778,569
Customized Infrastructure Strategies, LP	34,915,039	4,635,332
Dalmore Capital Fund	67,727,423	0
GCM Grosvenor Infrastructure Investment Program, L.P.	77,960,129	0
GCM Grosvenor Customized Infrastructure Strategies II, L.P.	46,590,736	14,678,151
Global E&P Infrastructure Fund II L.P.	49,753,902	5,907,539
GSO Energy Select Opportunities Fund LP	26,214,703	23,237,456
GSO Energy Select Opportunities Fund II, LP	3,625,373	46,638,959
JPMorgan AIRRO India SideCar Fund US, LLC	80,052,853	3,187,421
JPMorgan AIRRO Fund II	9,483,003	7,013,452
KKR Eagle CoInvest L.P.	34,398,588	1,853,268
KKR Global Infrastructure Investors, LP	62,474,374	4,182,224
Ridgewood Water & Strategic Infrastructure Fund LP	7,584,665	42,612,201
RPEP SMRS Infra II, LLC	6,360,154	500,000
StonePeak Infrastructure Fund LP	50,560,693	10,232,593
	<u>\$ 862,001,396</u>	<u>\$ 277,979,817</u>
Short-Term Investments and Other	18,403,396	0
Total Infrastructure Investments	<u>\$ 880,404,792</u>	<u>\$ 277,979,817</u>
TOTAL INVESTMENTS	<u>\$ 6,745,047,014</u>	<u>\$ 1,623,185,521</u>

* New or additional commitment made during the quarter reported

State of Michigan Retirement System
FIXED INCOME REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



Daniel J. Quigley
Senior Investment Manager
Fixed Income Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	3.7%	4.0%	3.7%	3.6%	4.4%
Bloomberg Barclays US Agg	8.9%	4.8%	3.4%	3.2%	3.9%
Peer Median Returns	6.8%	4.1%	3.8%	3.3%	4.6%
Percentile Rank vs. Peers*	74	52	52	41	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).
- All risk sectors of the fixed income markets underperformed U.S. Treasury securities during the quarter as investors fled to safe-haven assets like cash and government bonds. Corporate bonds experienced a dramatic selloff. March performance was the second worst performing month in the 35-year plus history of both the Bloomberg High Yield (HY) and Bloomberg Investment Grade (IG) Indices. The selloff was only eclipsed by the worst performing month of the 2008 Global Financial Crisis. In addition to the selloff of corporate bonds, all sectors of the fixed income markets experienced exponentially higher volatility and lower liquidity as market making activity froze. This was driven by the large economic uncertainty created by the global spread of the coronavirus pandemic. Market making was restored due to unprecedented injections of liquidity from the Federal Reserve and U.S. Treasury.
- The widening of spreads for corporate and structured credit securities was the main driver of performance as increasing credit spreads outstripped interest rate declines during the quarter. Performance was hindered by maintaining a shorter duration in the portfolio when compared to the U.S. Aggregate Index.
- Investment Grade, High Yield (HY), Emerging Market Debt (EMD), and CMBS securities all experienced large negative returns during the quarter. Investment Grade corporate bonds experienced a -7% return during the month of March while HY and EMD experienced monthly losses greater than 10%.

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 4.5% versus a benchmark yield of 1.6%. In addition to this, the portfolio has an equity beta of 0.1, roughly in line with the U.S. Aggregate Index.
- The Core-plus strategy implemented to achieve this goal includes:
 - Core: As of March 31, 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 62.4%. This includes a 30.6% 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 37.6% as of March 31, 2020.

Tactical Update

- The allocation to securitized credit, primarily in CMBS, ABS, non-agency RMBS, and CLO securities, was 28.6% 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 negative 2.9%.
- The allocation to high-yield strategies was 5.4% at the end of the quarter. This out-of-benchmark position also underperformed after experiencing a loss of over 10% for the quarter. The high yield portion of the portfolio had a return of -3.9% on a one-year basis, underperforming the core index by over 1,000 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 2.4% of the fixed income portfolio. The TIPS allocation has underperformed nominal U.S. Treasuries on a one-year basis as inflation expectations have declined but have experienced strong absolute returns that exceed 7% on a one-year basis. We believe that this allocation offers an attractive hedge to the portfolio should inflation expectations increase in the future.
- The allocation to cash increased dramatically during the quarter, ending the quarter at \$1.1 billion, an increase of over \$900 million for the quarter. This was due to the increased need for liquidity in the broad SMRS portfolio coupled with the dramatic decrease in bond market liquidity during the quarter. Secondary market liquidity of corporate bonds, commercial paper, MBS, and ABS declined substantially during the month of March as banks receded from taking on market-making risk in volatile cash bond markets. Because of this decrease in liquidity, the portfolio allowed the cash balance to build in order to ensure tactical flexibility.

Market Environment and Outlook

- The yield curve for U.S. Treasury securities steepened 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 146 bp to 0.09% during the quarter while ten-year U.S. Treasuries decreased by 118 bp to 0.72%.
- Inflation expectations decreased during the quarter with ten-year breakeven inflation expectations ending March at 0.93%. This was an 85 bp decrease for the quarter.
- Credit markets experienced a dramatic sell-off during the quarter with HY corporate bonds experiencing a return of -12.8% and IG credit having a -3.4% return. IG spread levels widened by 179 bp to 272 bp at the end of the quarter. HY spreads ended March at 880 bp, 544 bp

higher on a calendar YTD basis. Both levels were the highest spread levels that the corporate bond markets have experienced since the Global Financial Crisis.

- Emerging Markets debt also lost value during the quarter with first quarter returns of -9.5%. The option-adjusted spread for the EMD index ended the month at 657 bp, 356 bp higher for the quarter.

Conclusion

- The portfolio maintains a defensive position for rising interest rates. The duration remains short of the benchmark and the portfolio maintains an underweight to long-term debt. This position is offset through a larger allocation to structured and corporate debt securities which 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

3/31/20

	Amount	Total	% of Total
Core (\$ in Millions)			
FID Internal	\$4,729		
PIMCO Mortgage Fund	481		
PGIM Investment Grade Credit	248		
Total Core		\$5,458	56.7%
Tactical			
Fidelity/Pyramis	\$552		
Total Tactical		\$552	5.7%
Securitized Debt			
Met West Securitized Ops	\$461		
Napier Park CLO Debt	389		
Napier Park ABS Income	595		
Principal CMBS	370		
TICP CLO Debt	333		
Fortress Credit ABI	358		
Putnam DMS	140		
Napier Park Strategic Loan	113		
Total Securitized Debt		\$2,759	28.6%
High Yield			
PGIM High Yield	\$237		
Columbia Management	228		
Crescent Direct Lending	55		
Total High Yield		\$520	5.4%
Global			
T. Rowe Global Multi-Sector	\$232		
PGIM Global Liquid Relative Value	109		
Total Global		\$341	3.5%

TOTAL

\$9,630

100.0%

NOTE: Totals may not be exact due to rounding.

SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

3/31/20

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Maturity (Yrs)	8.5	7.8
Duration (Yrs)	5.1	5.8
Spread Duration (Yrs)	5.1	6.1
Coupon (%)	3.5	3.1
Yield to Maturity (%)	4.5	1.6
Credit Rating	A	AA
VaR (%)	9.8	7.5
Tracking Error	3.1	NA
Beta (vs S&P 500)	0.09	-0.02

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:

30.6% 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.

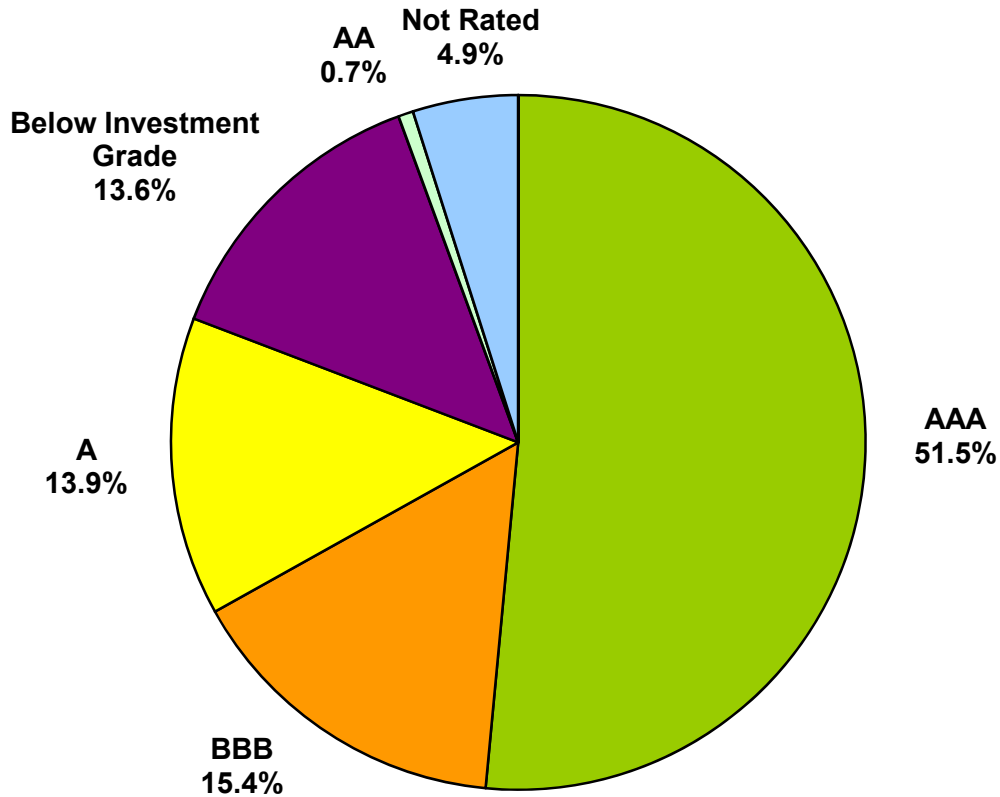
Diversification:

The equity beta of the portfolio is roughly 0.1 meaning that the portfolio returns have a low correlation with equity market movements.

SMRS

Fixed Income By Rating

3/31/20



Market Value in Millions				
3/31/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$4,962	51.5%	72.8%	-21.3%
AA	65	0.7%	3.0%	-2.3%
A	1,333	13.9%	10.4%	3.5%
BBB	1,486	15.4%	11.1%	4.3%
* Below Investment Grade	1,313	13.6%	0.6%	13.0%
Not Rated	471	4.9%	2.1%	2.8%
Total Investments	<u>\$9,630</u>	<u>100.0%</u>	<u>100.0%</u>	

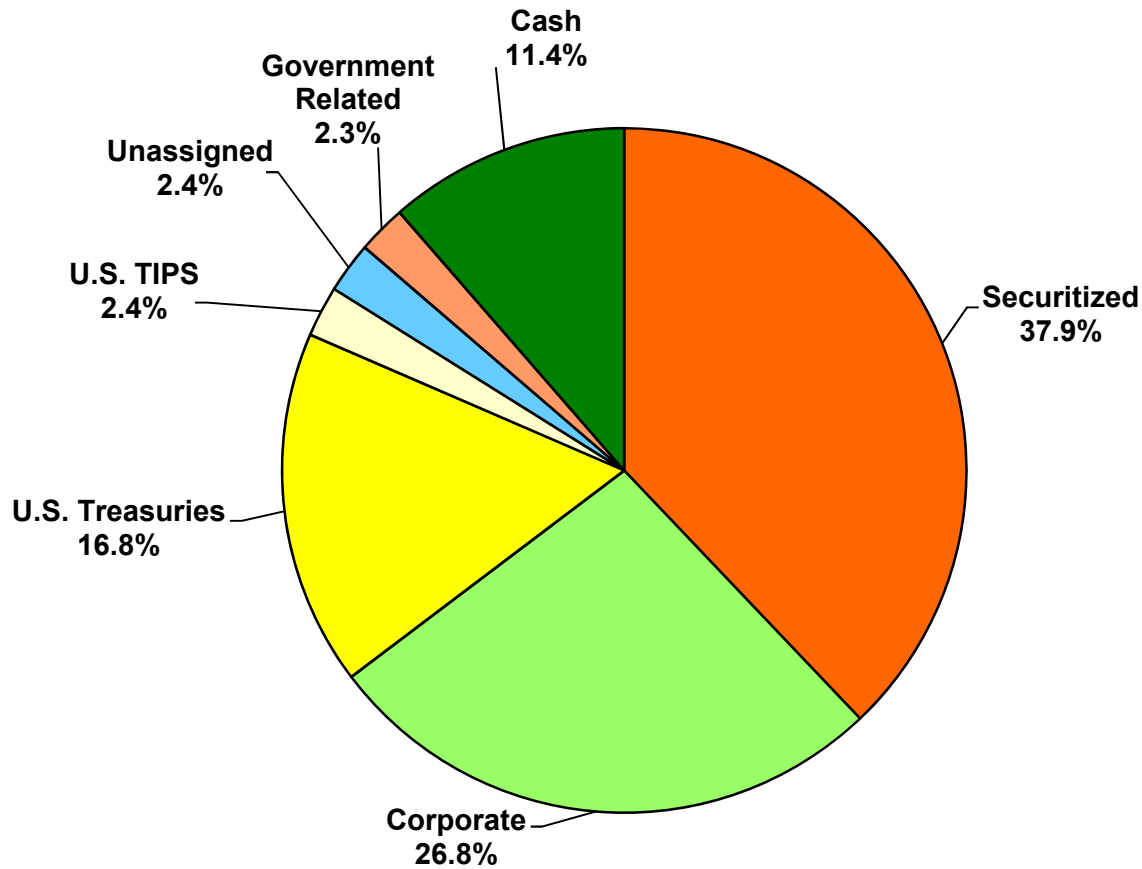
* Comprised of approximately 9.5% High Yield Credit and 4.2% High Yield RMBS/ABS

Benchmark: Barclays US Aggregate

SMRS

Fixed Income By Asset Type

3/31/20



Market Value in Millions				
3/31/20				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Securitized	\$3,651	37.9%	29.1%	8.8%
Corporate	2,578	26.8%	23.3%	3.5%
U.S. Treasuries	1,619	16.8%	41.8%	-25.0%
U.S. TIPS	233	2.4%	0.0%	2.4%
Unassigned	229	2.4%	0.0%	2.4%
Government Related	226	2.3%	5.8%	-3.5%
Cash	1,094	11.4%	0.0%	11.4%
Total Investments	<u>\$9,630</u>	<u>100.0%</u>	<u>100.0%</u>	

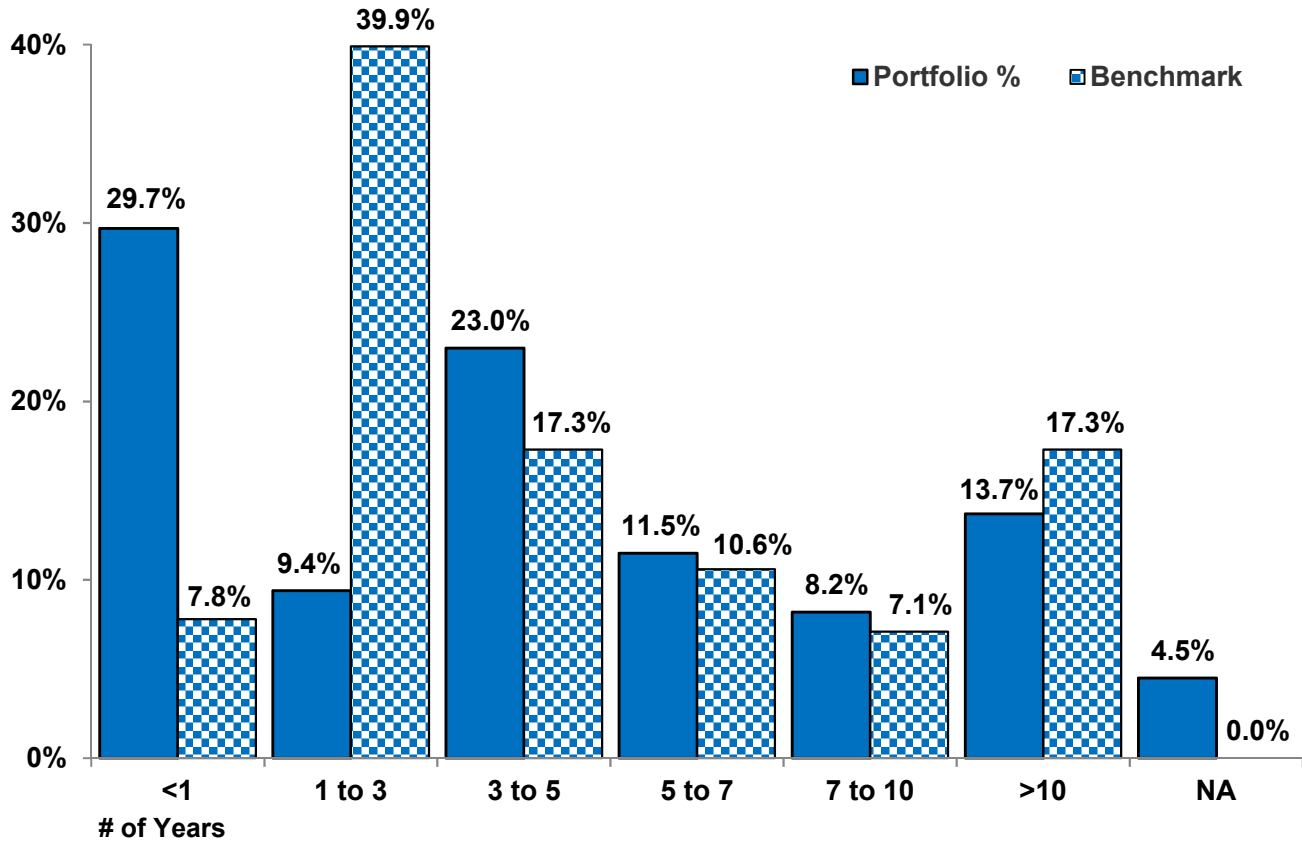
Benchmark: Barclays US Aggregate

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

3/31/20



Source: Factset

Market Value in Millions					
<u>Duration</u>	<u>Assets</u>	<u>Portfolio Weight</u>	<u>Benchmark Weight</u>	<u>Portfolio Duration*</u>	<u>Benchmark Duration*</u>
<1	\$2,855	29.7%	7.8%	-0.1	0.3
1 to 3	903	9.4%	39.9%	2.0	1.9
3 to 5	2,219	23.0%	17.3%	4.1	4.0
5 to 7	1,107	11.5%	10.6%	5.9	6.0
7 to 10	788	8.2%	7.1%	8.1	8.0
>10	1,321	13.7%	17.3%	19.7	17.0
NA	437	4.5%	0.0%	0.0	0.0
Total	\$9,630	100.0%	100.0%	5.4	5.6

* Effective Duration

Benchmark: Barclays US Aggregate

Total Fixed Income Performance - Net of Fees (MPSERS)

3/31/20

	<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	\$9,629,821,885	3.35%	3.79%	3.53%	3.43%	4.29%
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.93%</i>	<i>4.82%</i>	<i>3.36%</i>	<i>3.19%</i>	<i>3.88%</i>
Internal Core Fixed Income	4,728,701,378.50	7.67%	5.02%	4.09%	3.79%	4.36%
Externally Managed Fixed Income	\$4,901,120,506.74	-0.97%	2.59%	3.07%	3.13%	4.33%
PIMCO Mortgage Fund	481,362,487	6.69%				
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.93%</i>	<i>4.82%</i>	<i>3.36%</i>	<i>3.19%</i>	<i>3.88%</i>
Investment Grade Credit	\$248,215,221	3.71%	3.77%	3.34%	3.55%	4.98%
PGIM Investment Grade	248,215,221	3.71%	3.77%	3.34%	3.61%	5.08%
<i>Bloomberg/Barclays Credit Index</i>	<i>N/A</i>	<i>5.10%</i>	<i>4.19%</i>	<i>3.28%</i>	<i>3.44%</i>	<i>4.75%</i>
Tactical Fixed Income	\$552,139,020	1.31%	2.89%	3.05%	3.72%	9.62%
Fidelity Tactical Bond Fund	552,139,020	1.62%	3.31%	3.52%		
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.93%</i>	<i>4.82%</i>	<i>3.36%</i>	<i>3.19%</i>	<i>3.88%</i>
High Yield Fixed Income	\$519,569,635	-3.89%	1.82%	3.27%		
Columbia Management High Yield	228,023,053	-3.99%	1.56%	3.04%		
PGIM High Yield	236,543,910	-5.76%	1.40%	3.11%		
Crescent Direct Lending	55,002,672	6.90%				
<i>Bloomberg/Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>-4.85%</i>	<i>1.53%</i>	<i>2.96%</i>		
Structured Fixed Income	\$2,758,878,828	-2.86%	2.34%			
Principal CMBS	369,812,263	-8.65%	0.57%	1.26%	3.01%	9.09%
MetWest Securitized Opportunities	461,286,048	-2.62%	2.63%	2.86%		
Napier Park ABS Income	594,531,879	14.07%	11.00%			
Napier Park Strategic Loan LP	113,388,610	5.28%	6.23%			
Napier Park CLO Debt	389,356,864	-14.30%	-3.03%			
TICP CLO Debt	332,599,189	-8.23%	-1.18%			
Fortress ABI	357,999,245					
Putnam DMS	139,904,730					
<i>Bloomberg/Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>8.93%</i>	<i>4.82%</i>	<i>3.36%</i>	<i>3.19%</i>	<i>3.88%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>5.37%</i>	<i>4.06%</i>	<i>3.15%</i>	<i>3.47%</i>	<i>5.70%</i>
Global Fixed Income	\$340,955,316	0.86%	2.51%			
T. Rowe Global Multi-Sector	232,219,003	-1.45%	1.86%			
PGIM GLRV	108,736,313	6.21%				
<i>Custom GMS Benchmark</i>	<i>N/A</i>	<i>1.14%</i>	<i>3.14%</i>			

State of Michigan Retirement System

ABSOLUTE RETURN REVIEW

State of Michigan Investment Board Meeting

June 11, 2020



Daniel J. Quigley
Senior Investment Manager
Absolute Return Strategy

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/20)	1-Year	3-Years	5-Years	7-Years	10-Years
Absolute Return	5.0%	5.0%	3.7%	4.8%	4.8%
HFRI FOF Conservative	3.0%	2.7%	2.0%	2.8%	2.7%

- The value of the Absolute Return portfolio is \$4.3 billion with a one-year return of 5.0%. The performance of the portfolio was relatively flat for the quarter as positive returns early in the quarter were offset by broad market losses during the last half of the quarter.
- Mortgage strategies drove performance in a positive direction early in January but traded off substantially during the last few weeks of the quarter. Diversifying strategies were strong performers on a relative basis. The macro-rates sub-strategy provided positive returns and diversification for the overall portfolio. Within macro-rates, large positive contributors were long fixed income positions in swaps and Eurodollars. The returns from macro-rates managers were offset by negative performance in emerging market credit. Emerging market assets performed poorly due to risk-off sentiment created by the uncertainty of COVID-19 and oil prices.
- Equity managers were also a relative bright spot for the first quarter. Quantitative equity performance was bifurcated, as shorter-term liquidity provision strategies performed well while Commodity Trading Advisor (CTA) and quant-macro strategies were negative. Fundamental equity managers also produced varied performance, although mostly negative. Healthcare funds focused on the biopharmaceutical sector and technology, media, and telecom (TMT) funds generated alpha for the quarter, while energy, industrials and financial sectors detracted from performance.

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.
- The AR portfolio made a \$200 million commitment to the Cerberus Manitou Residential Loan Fund LP., managed by Cerberus, a large private equity/private credit firm.
- The AR portfolio also made a \$200 million commitment to the Monument Park, LLC., a credit and rescue financing investment vehicle managed by Domain Capital Advisors.
- In terms of allocation priorities, we are focused on recovering losses from the first quarter and protecting capital going forward. We have slightly increased our exposure to multi-strategy, macro and emerging markets managers.

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

SMRS

Absolute Return

3/31/20

Net Market Values by Entity

	Net Market Value
* Tahquamenon Fund, LP	\$ 3,865,104,510
Cerberus Manitou Residential Loan Fund, LP	178,044,657
JM IV, LP	73,009,234
SJC Direct Lending Revolver Fund III, LP	66,706,925
MP Securitized Credit Master Fund, LP	48,593,187
* EnTrust White Pine Partners, LP	12,270,700
Visium Balanced Fund, LP	299,801
Monument Park, LLC	0
Total Absolute Return	\$ 4,244,029,013
Short-Term Investments & Other	25,029,739
Grand Total	\$ 4,269,058,752

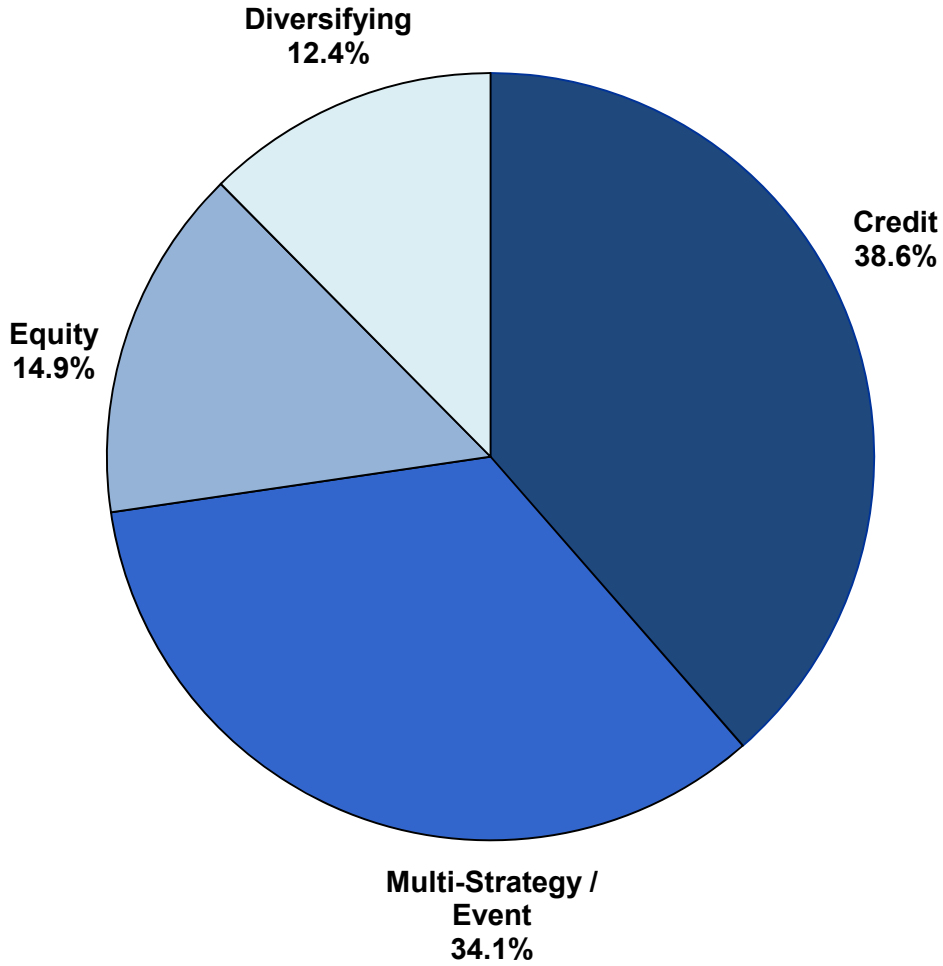
* Fund of Funds

SMRS

Absolute Return

3/31/20

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	72	Median Position Size:	0.6%
Strategies:	4	Average Position Size:	1.4%
Relationships:	7	Largest Position Size:	7.2%

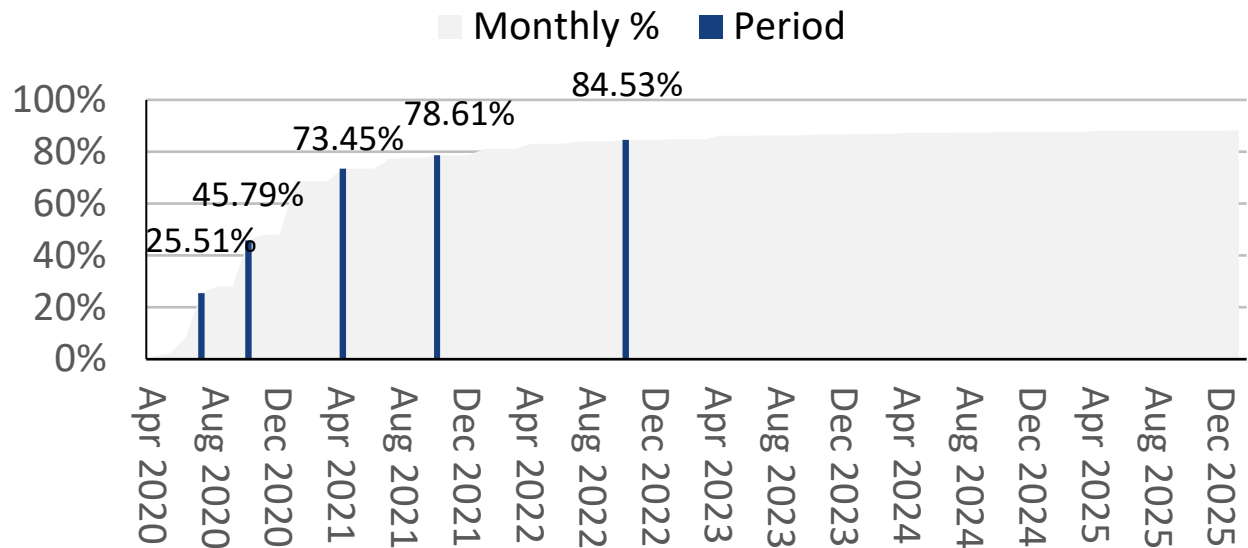
SMRS

Absolute Return

3/31/20

Liquidity Analysis

Redeemable	Marginal Allocation (% each period)	Aggregate Allocation (% since Analysis Date)
By 7/1/20	25.51%	25.51%
By 10/1/20	20.28%	45.79%
By 4/1/21	27.66%	73.45%
By 10/1/21	5.16%	78.61%
By 10/1/22	5.92%	84.53%
After 10/1/22	3.70%	88.23%
Illiquid	11.77%	100.00%
Total	100.00%	N/A



State of Michigan Retirement System

DEFINED CONTRIBUTION REVIEW

State of Michigan Investment Board Meeting
June 11, 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 in an attempt to outperform various cash, bond and stock indices over long periods of time.

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

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

SOM Plans	3/31/2019	3/31/2020
State of Michigan 401(k)	\$6,090	\$5,711
State of Michigan 457	1,788	1,603
Pension Plus 401(k) & 457	714	863
EAA	10	9
Total	\$8,602	\$8,186

(\$ 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 velocity of the stock market decline in March, and subsequent recovery in April have been unparalleled, with day-to-day price swings looking more like returns investors should expect for a full year. First quarter earnings reports are starting to shed some light on just how severe the impact will be, but the full impact is not likely to be seen until the second quarter. In this environment, there have been winners and losers, with technology and communications sectors resilient, while other, more cyclical sectors have been hard hit, especially energy and industrials.

Global central bankers have unleashed policies to help offset contracting growth and ease widespread liquidity strains. In the US, the Federal Reserve has launched several lending and asset purchase programs in order to provide stability in the commercial paper, Treasury debt, corporate and municipal bond and mortgage backed markets.

Despite the alarming economic growth, unemployment and weak manufacturing data, global stock markets have advanced in anticipation that a recovery will not be too far off once economies reopen. While the second quarter GDP could contract by more than 30%, it will be interesting to see if financial markets continue to look through the negative data.

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

3/31/20

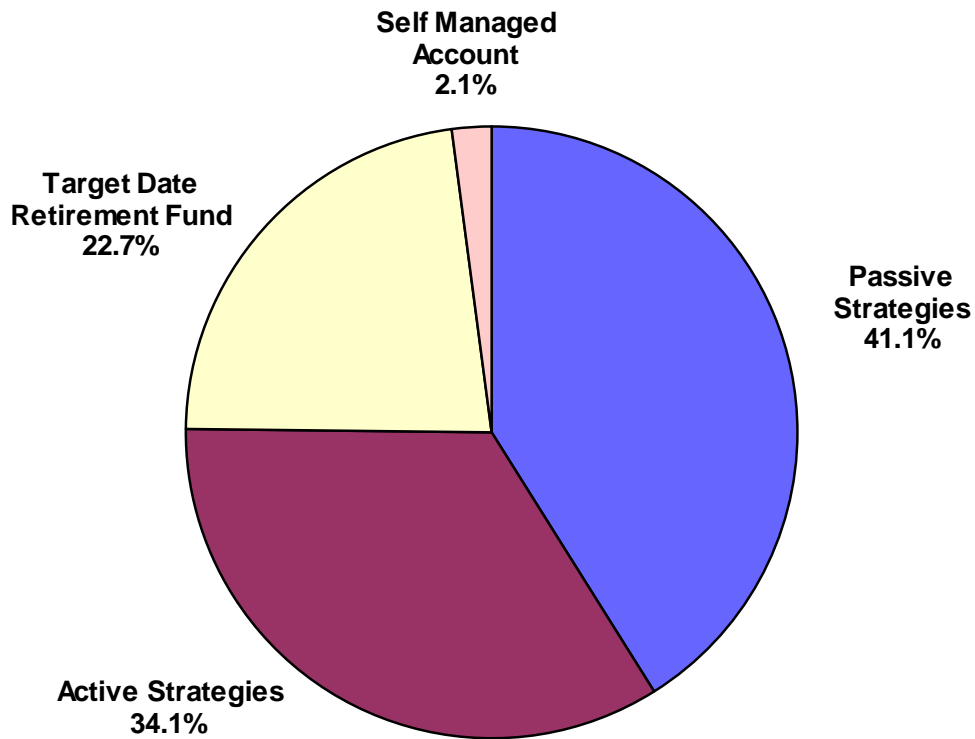
Markets	Amount		% of Total	Fee per \$1,000
QDIA (\$ in Millions)				
	<u>3/31/2020</u>	<u>3/31/2019</u>		
Total Target Date Fund	\$1,861	\$1,697	22.7%	\$0.70
Tier I Index Funds				
State Street S&P 500 Index Fund	\$1,061	\$1,171		\$0.13
State Street Bond Market Index Fund	882	762		0.20
State Street Global All Cap Equity ex-US Index Fund	540	581		0.45
State Street S&P Mid Cap Index Fund	441	565		0.20
BlackRock Government Short-Term Investment CL F	248	229		0.56
BlackRock Emerging Markets Index CL F	97	123		0.69
BlackRock S&P Small Cap 600 Equity Index CL F	95	137		0.25
Total Tier I Index	\$3,363	\$3,567	41.1%	\$0.26
Tier II Active Funds				
Stable Value Fund	\$1,205	\$1,161		\$2.23
Dodge & Cox Stock Fund	410	569		4.13
Jennison Large Cap Growth Fund	359	399		2.92
American Funds EuroPacific Growth R6	244	315		4.90
PIMCO Total Return I Fund	121	113		4.60
Voya Small Cap Growth Equity Fund	106	151		4.33
Artisan Mid Cap Fund	104	108		7.05
Oakmark Equity & Income I Fund	88	115		4.30
T. Rowe Price Mid-Cap Value Fund	81	119		6.30
Virtus Ceredex Small-Cap Value Eq I	44	73		6.80
Prudential High Yield Fund	29	28		3.76
Total Tier II Active	\$2,791	\$3,152	34.1%	\$3.46
Tier III				
Total Self Directed Brokerage Account	\$171	\$186	2.1%	NA
Total Defined Contribution Assets	\$8,186	\$8,602	100.0%	\$1.45

NOTE: Totals may not be exact due to rounding.

SMRS

Defined Contribution by Investment Strategy

3/31/20



Market Value in Millions				
	<u>3/31/20</u>		<u>3/31/19</u>	
Passive Strategies	\$3,363	41.1%	\$3,567	41.5%
Active Strategies	2,791	34.1%	3,152	36.6%
Target Date Retirement Fund	1,861	22.7%	1,697	19.7%
Self Managed Account	171	2.1%	186	2.2%
Total Investments	<u>\$8,186</u>	<u>100.0%</u>	<u>\$8,602</u>	<u>100.0%</u>

*Loan Fund \$208M as of 3/31/20

Defined Contribution Performance by Fund 3/31/20

<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	\$94,300,345	-1.5%	2.4%	2.5%	4.4%
State Street Income Custom Index		-1.5%	2.4%	2.5%	4.5%
Morningstar Target-Date Retirement		-1.1%	2.4%	2.3%	4.1%
Variance State Street Income Custom Index		0.0%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date Retirement		-0.4%	0.0%	0.2%	0.3%
State Street Target Retirement 2020 Fund	121,587,882	-3.3%	2.8%	3.1%	6.6%
State Street 2020 Custom Index		-3.3%	2.8%	3.1%	6.6%
Morningstar Target-Date 2020		-2.7%	2.6%	2.8%	5.2%
Variance State Street 2020 Custom Index		0.0%	0.0%	0.0%	0.0%
Variance Morningstar Target-Date 2020		-0.6%	0.2%	0.3%	1.4%
State Street Target Retirement 2025 Fund	179,748,156	-3.7%	3.3%	3.6%	7.1%
State Street 2025 Custom Index		-3.6%	3.3%	3.6%	7.2%
Morningstar Target-Date 2025		-4.2%	2.6%	3.0%	5.7%
Variance State Street 2025 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2025		0.5%	0.7%	0.6%	1.4%
State Street Target Retirement 2030 Fund	202,091,854	-4.1%	3.4%	3.8%	7.4%
State Street 2030 Custom Index		-4.0%	3.4%	3.8%	7.4%
Morningstar Target-Date 2030		-5.9%	2.3%	2.9%	5.8%
Variance State Street 2030 Custom Index		-0.1%	0.0%	0.0%	0.0%
Variance Morningstar Target-Date 2030		1.8%	1.1%	0.9%	1.6%
State Street Target Retirement 2035 Fund	216,959,135	-5.4%	3.2%	3.7%	7.3%
State Street 2035 Custom Index		-5.3%	3.2%	3.7%	7.4%
Morningstar Target-Date 2035		-7.8%	2.1%	2.9%	6.2%
Variance State Street 2035 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2035		2.4%	1.1%	0.8%	1.1%
State Street Target Retirement 2040 Fund	214,028,608	-6.8%	2.8%	3.5%	7.3%
State Street 2040 Custom Index		-6.7%	2.9%	3.6%	7.4%
Morningstar Target-Date 2040		-9.3%	1.6%	2.7%	6.0%
Variance State Street 2040 Custom Index		-0.1%	-0.1%	-0.1%	-0.1%
Variance Morningstar Target-Date 2040		2.5%	1.2%	0.8%	1.3%
State Street Target Retirement 2045 Fund	217,518,839	-8.2%	2.5%	3.4%	7.2%
State Street 2045 Custom Index		-8.1%	2.5%	3.4%	7.3%
Morningstar Target-Date 2045		-10.4%	1.5%	2.7%	6.3%
Variance State Street 2045 Custom Index		-0.1%	0.0%	0.0%	-0.1%
Variance Morningstar Target-Date 2045		2.2%	1.0%	0.7%	0.9%
State Street Target Retirement 2050 Fund	270,105,464	-8.8%	2.2%	3.2%	7.1%
State Street 2050 Custom Index		-8.6%	2.3%	3.3%	7.2%
Morningstar Target-Date 2050		-10.9%	1.2%	2.5%	6.1%
Variance State Street 2050 Custom Index		-0.2%	-0.1%	-0.1%	-0.1%
Variance Morningstar Target-Date 2050		2.1%	1.0%	0.7%	1.0%
State Street Target Retirement 2055 Fund	265,844,195	-8.8%	2.2%	3.2%	N/A
State Street 2055 Custom Index		-8.6%	2.3%	3.3%	N/A
Morningstar Target-Date 2055		-11.1%	1.3%	2.6%	N/A
Variance State Street 2055 Custom Index		-0.2%	-0.1%	-0.1%	N/A
Variance Morningstar Target-Date 2055		2.3%	0.9%	0.6%	N/A
State Street Target Retirement 2060 Fund	78,814,767	-8.8%	2.2%	N/A	N/A
State Street 2060 Custom Index		-8.6%	2.3%	N/A	N/A
Morningstar Target-Date 2060+		-11.4%	1.2%	N/A	N/A
Variance State Street 2060 Custom Index		-0.2%	-0.1%	N/A	N/A
Variance Morningstar Target-Date 2060+		2.6%	1.0%	N/A	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	\$22,692	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 I					
State Street S&P 500 Index Fund	\$1,060,730,302	-7.0%	5.1%	6.7%	10.5%
S&P 500 Index		-7.0%	5.1%	6.7%	10.5%
Morningstar Large Blend		-9.9%	2.9%	4.3%	8.4%
Variance S&P 500 Index		0.0%	0.0%	0.0%	0.0%
Variance Morningstar Large Blend		2.9%	2.2%	2.4%	2.1%
State Street Bond Market Index Fund	882,274,948	9.0%	4.8%	3.3%	3.8%
Bloomberg Barclays U.S. Aggregate Index		8.9%	4.8%	3.4%	3.9%
Morningstar Intermediate-Term Bond		6.6%	4.0%	2.9%	3.7%
Variance Bloomberg Barclays U.S. Aggregate Index		0.1%	0.0%	-0.1%	-0.1%
Variance Morningstar Intermediate-Term Bond		2.4%	0.8%	0.4%	0.1%
State Street Global All Cap Equity ex-U.S. Index Fund	539,947,634	-16.7%	-2.4%	-0.6%	N/A
MSCI ACWI ex USA IMI (Net)		-16.3%	-2.3%	-0.7%	N/A
Morningstar Foreign Large Blend		-15.6%	-2.6%	-1.2%	N/A
Variance MSCI ACWI ex USA IMI (Net)		-0.4%	-0.1%	0.1%	N/A
Variance Morningstar Foreign Large Blend		-1.1%	0.2%	0.6%	N/A
State Street S&P Mid Cap Index Fund	440,982,548	-22.5%	-4.1%	0.5%	7.8%
S&P 400 Index		-22.5%	-4.1%	0.6%	7.9%
Morningstar Mid-Cap Blend		-20.9%	-3.8%	-0.5%	6.3%
Variance S&P 400 Index		0.0%	0.0%	-0.1%	-0.1%
Variance Morningstar Mid-Cap Blend		-1.6%	-0.3%	1.0%	1.5%
BlackRock Government Short-Term Investment CL F	247,564,357	2.0%	1.7%	1.1%	N/A
BofA Merrill Lynch US 3-Month Treasury Bill Index		2.3%	1.8%	1.2%	N/A
Variance BofA Merrill Lynch US 3-Month Treasury Bill Index		-0.3%	-0.1%	-0.1%	N/A
BlackRock Emerging Markets Index CL F	96,942,840	-17.7%	-1.7%	-0.4%	N/A
MSCI Emerging Market (Net)		-17.7%	-1.6%	-0.4%	N/A
Morningstar Diversified Emerging Mkts		-19.3%	-3.4%	-1.5%	N/A
Variance MSCI Emerging Market (Net)		0.0%	-0.1%	0.0%	N/A
Variance Morningstar Diversified Emerging Mkts		1.6%	1.7%	1.1%	N/A
BlackRock S&P Small Cap 600 Equity Index CL F	94,505,789	-25.9%	N/A	N/A	N/A
S&P SmallCap 600 Index		-25.9%	N/A	N/A	N/A
Morningstar Small Blend		-26.3%	N/A	N/A	N/A
Variance S&P SmallCap 600 Index		0.0%	N/A	N/A	N/A
Variance Morningstar Small Blend		0.4%	N/A	N/A	N/A
TIER II					
Stable Value Fund	\$1,205,239,171	2.7%	2.5%	2.4%	2.3%
Barclays Int Gov/Credit A or Higher Index		8.1%	4.0%	2.8%	3.0%
Hueler Universe		2.5%	2.3%	2.1%	2.2%
Variance Barclays Int Gov/Credit A or Higher Index		-5.4%	-1.5%	-0.4%	-0.7%
Variance Hueler Universe		0.2%	0.2%	0.3%	0.1%
Dodge & Cox Stock Fund	409,811,675	-19.4%	-2.4%	2.8%	8.1%
<i>Russell 1000 Value Index</i>		-17.2%	-2.2%	1.9%	7.7%
<i>Morningstar Large Value</i>		-17.8%	-2.2%	1.3%	6.5%
<i>Variance Russell 1000 Value Index</i>		-2.2%	-0.2%	0.9%	0.4%
<i>Variance Morningstar Large Value</i>		-1.6%	-0.2%	1.5%	1.6%

<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	358,829,545	0.0%	13.2%	11.3%	N/A
<i>Russell 1000 Growth Index</i>		0.9%	11.3%	10.4%	N/A
<i>Morningstar Large Growth</i>		-3.8%	8.6%	7.5%	N/A
<i>Variance Russell 1000 Growth Index</i>		-0.9%	1.9%	0.9%	N/A
<i>Variance Morningstar Large Growth</i>		3.8%	4.6%	3.8%	N/A
American Funds EuroPacific Growth R6	244,375,257	-12.7%	0.3%	0.9%	4.0%
<i>MSCI EAFE Index - Net Div</i>		-14.4%	-1.8%	-0.6%	2.7%
<i>Morningstar Foreign Large Blend</i>		-15.6%	-2.6%	-1.2%	2.2%
<i>Variance MSCI EAFE Index - Net Div</i>		1.7%	2.1%	1.5%	1.3%
<i>Variance Morningstar Foreign Large Blend</i>		2.9%	2.9%	2.1%	1.8%
PIMCO Total Return I Fund	120,621,535	7.6%	4.5%	3.2%	4.1%
<i>Bloomberg Barclays U.S. Aggregate Index</i>		8.9%	4.8%	3.4%	3.9%
<i>Morningstar Intermediate Core-Plus Bond</i>		4.1%	3.3%	2.6%	3.9%
<i>Variance Bloomberg Barclays U.S. Aggregate Index</i>		-1.3%	-0.3%	-0.2%	0.2%
<i>Variance Morningstar Intermediate Core-Plus Bond</i>		3.5%	1.2%	0.6%	0.2%
Voya Small Cap Growth Equity Fund	105,614,307	-20.6%	-4.1%	0.2%	8.3%
<i>Russell 2000 Growth Index</i>		-18.6%	0.1%	1.7%	8.9%
<i>Morningstar Small Growth</i>		-17.8%	1.4%	2.4%	8.3%
<i>Variance Russell 2000 Growth Index</i>		-2.0%	-4.2%	-1.5%	-0.6%
<i>Variance Morningstar Small Growth</i>		-2.8%	-5.5%	-2.2%	0.0%
Artisan Mid Cap Fund	103,455,271	0.0%	9.8%	7.0%	11.9%
<i>Russell Midcap Growth Index</i>		-9.4%	6.5%	5.6%	10.9%
<i>Morningstar Mid-Cap Growth</i>		-11.2%	4.3%	3.9%	8.9%
<i>Variance Russell Midcap Growth Index</i>		9.4%	3.3%	1.4%	1.0%
<i>Variance Morningstar Mid-Cap Growth</i>		11.2%	5.5%	3.1%	3.0%
Oakmark Equity & Income I Fund	87,852,218	-14.2%	-1.8%	0.8%	4.9%
<i>60% S&P 500/40% Barclays U.S. Gov/Credit Index</i>		-0.1%	5.5%	5.7%	8.2%
<i>Morningstar Allocation--50% to 70% Equity</i>		-6.9%	1.3%	2.2%	5.3%
<i>Variance 60% S&P 500/40% Barclays U.S. Gov/Credit Index</i>		-14.1%	-7.3%	-4.9%	-3.3%
<i>Variance Morningstar Allocation--50% to 70% Equity</i>		-7.3%	-3.1%	-1.4%	-0.4%
T. Rowe Price Mid-Cap Value Fund	81,405,455	-22.9%	-6.1%	0.1%	6.5%
<i>Russell Midcap Value Index</i>		-24.1%	-6.0%	-0.8%	7.2%
<i>Morningstar Mid-Cap Value</i>		-25.5%	-7.0%	-2.0%	5.6%
<i>Variance Russell Midcap Value Index</i>		1.2%	-0.1%	0.9%	-0.7%
<i>Variance Morningstar Mid-Cap Value</i>		2.6%	0.9%	2.1%	0.9%
Virtus Ceredex Small-Cap Value Eq I	44,440,376	-29.8%	-9.0%	-1.8%	5.5%
<i>Russell 2000 Value Index</i>		-29.6%	-9.5%	-2.4%	4.8%
<i>Morningstar Small Value</i>		-31.8%	-11.1%	-4.2%	4.0%
<i>Variance Russell 2000 Value Index</i>		-0.2%	0.5%	0.6%	0.7%
<i>Variance Morningstar Small Value</i>		2.0%	2.1%	2.4%	1.5%
Prudential High Yield Fund	28,811,295	-5.5%	1.6%	3.2%	N/A
<i>Bloomberg Barclays U.S. Corp. HY 1% Issuer Cap Index</i>		-7.5%	0.5%	2.6%	N/A
<i>Morningstar High Yield Bond</i>		-7.7%	-0.2%	1.5%	N/A
<i>Variance Bloomberg Barclays U.S. Corp. HY 1% Issuer Cap Index</i>		2.0%	1.1%	0.6%	N/A
<i>Variance Morningstar High Yield Bond</i>		2.2%	1.8%	1.7%	N/A
TIER III					
Self Directed	171,211,692				
TOTAL	\$8,185,638,153				

Loan Fund: \$207,694,782

State of Michigan Retirement System

BASKET CLAUSE REVIEW

State of Michigan Investment Board Meeting
June 11, 2020



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

SMRS

Basket Clause Investments

3/31/20

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$ 4,244,029,013
Total Real Return and Opportunistic	682,650,256
Total International Equity	54,877,282
Total Fixed Income	<u>70,622,366</u>
Total Basket Clause Investments	<u><u>\$ 5,052,178,917</u></u>

The basket clause investments on March 31, 2020, were \$5.1 billion or 7.2% of the total portfolio value of \$70.5 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.