

STATE OF MICHIGAN INVESTMENT BOARD MEETING

June 12, 2024

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 12, 2024

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- Approval of the 4/2/24 SMIB Meeting Minutes
- 9:35 a.m. Executive Summary & Performance for Periods Ending 3/31/24
- 9:45 a.m. Current Asset Allocation Review
- Markets Review and Outlook
- 10:00 a.m. Guest Speaker: Mohit Mittal, CIO of Core Strategies, PIMCO
- 10:50 a.m. Review of Investment Reports
- Private Equity Capital – Receive and File
 - Real Estate & Infrastructure – Receive and File
 - Real Return & Opportunistic – Receive and File
 - Absolute Return – Receive and File
 - Defined Contribution – Receive and File
 - Domestic Equity – Receive and File
 - International Equity – Receive and File
 - Fixed Income – Receive and File
- 10:55 a.m. Public Comment
- 11:00 a.m. Closing Remarks ~ Adjournment



2024 Meeting Schedule

Tuesday, October 1, 2024
Tuesday, December 17, 2024

All meetings start at 9:30 a.m.

State of Michigan Retirement System

MINUTES

State of Michigan Investment Board Meeting

June 12, 2024



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN INVESTMENT BOARD

April 2, 2024 Meeting Minutes

Board Members Present:

Chairman – Treasurer Rachael Eubanks – Present
Ms. Jennifer Flood – Absent
Ms. Dina Richard – Present
Mr. Reginald Sanders – Absent
Ms. Denise Ilitch – Present

Members of the Public and Bureau of Investments Staff in Attendance:

Robert Brackenbury	Leo Sanchez	Andrew Higginson
Greg Parker	John Richards	Richard Holcomb
Janet Sudac	Jack Behar	Ari Barkan
Allison Wardlaw	Mark Porrell	Henry McVey
Anthony Estell	Patrick Moraniec	Krasimir Yankov
Jon Braeutigam	Max Kotary	
Travis Haney	Aaron Haftl	

Many others attended via Microsoft Teams.

Opening Remarks:

Chairman, Treasurer Rachael Eubanks, called the meeting to order at 9:35 am.

Approval of Minutes:

Approval of September 28, 2023, SMIB Meeting Minutes – Motion to approve by Dina Richard.
Seconded: Denise Ilitch.

Approval of December 13, 2023, SMIB Meeting Minutes – Motion to approve by Denise Ilitch.
Seconded: Dina Richard.

Special Acknowledgement:

Mr. John Richards for achieving 50 years of service to the State of Michigan within the Domestic Equity Division of the BOI.

AGENDA

Executive Summary

Mr. Jon Braeutigam, Chief Investment Officer of the Bureau of Investments, explained the SMRS 10-year rate of return is 9%, which is higher than the peer median returns. This return rate gives approximately \$18.8 billion in excess value compared to median returns over the past ten years.

The higher rate of return also adds an estimated \$2.1 billion to the fiscal year 2025 budget and for every year sooner the Funds become fully funded, a projected \$3.8 billion is added to the budget annually.

The SMRS portfolio is comprised of \$100.9 billion in assets with \$17.3 billion in unfunded commitments. The Fund had \$460 million in new commitments during the December 2023 quarter and \$248 million net of contributions over the past year were paid out by the combined systems.

Mr. Braeutigam further discussed the Funds plan liquidity and ended by explaining the quarter's new commitments within Private Equity and Absolute Return.

Asset Allocation Review

Mr. Greg Parker, Director of Asset Allocation and Public Markets, presented a brief markets review, tying it to the capital markets assumption performed by AON. He discussed the U.S. interest rates. The yield to maturity on the U.S. Aggregate index today is 4.5%.

Mr. Parker discussed U.S. interest rates, stating the yield curve remains deeply inverted. The 3-month U.S. T-bill is yielding 5.3% and the yield to maturity on the U.S. Aggregate is 4.5%.

Mr. Parker stated the U.S. credit spreads as of December 31, 2023, widened slightly after the bankruptcy of Silicon Valley Bank. Investment grade credit spreads are roughly 20 bps below 20-year median rates and high yield credit spreads are approximately 110 bps below 20-year median rates.

Venture Capital Update, Erin Mock, Senior Investment Manager

Ms. Erin Mock, Senior Investment Manager, of the Venture Capital Division (VCD), presented an overview of the VCD. She explained manager relationships, stage focus and geography focus of funds and fund exposure.

Ms. Mock further explained the Division's returns and performance as well as the current venture capital market.

Guest Speaker: Mr. Henry H. McVey, Head of Global Macro, KKR

Mr. Henry McVey's presentation was titled Outlook for 2024: Glass Half Full. He explained the five key drivers of the glass half full thesis. 1) KKR still believes that the bear market in equities actually ended in October 2022. 2) They also think that earnings for the cycle already bottomed in 2023. 3) Outside of government bonds, new issuance supply remains near record lows. The technical bid for many parts of credit and equities remains compelling. 4) They also believe central banks are closer to the end of the tightening campaign at a time when central bank balance sheets are still near record level. 5) Perhaps most important in this theory is that the "glass half full" approach to investing this cycle also applies to the thematic tilts, which they believe will likely win in a disinflationary or a reflationary environment.

Mr. McVey further presented a compelling economic update. He concluded that 1) His team believes we are in a good environment for risk assets, including areas beyond large capitalization growth stocks. 2) Investors are likely too defensively positioned; at the same time, central bank balance sheets are quite accommodative, which is important for all valuations. 3) Lack of central

bank tightening should allow the cost of capital to become more definable in 2024, which should accelerate capital markets and M&A activity. 4) They see some disinflation in the near-term. 5) Asset Allocation: Overweight in opportunistic credit, collateral based cash flows, and control private equity positions.

Public Comment:

There was no public comment.

Adjournment:

The meeting concluded at 11:06 am. The next meeting is June 12, 2024.

Approved:

Chairman, Treasurer Rachael Eubanks

State of Michigan Retirement System

EXECUTIVE SUMMARY

State of Michigan Investment Board Meeting

June 12, 2024



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

EXECUTIVE SUMMARY

March 31, 2024

Performance

Great long-term returns.

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	11.9%	7.9%	9.9%	9.9%	9.1%
Policy Returns	15.0%	7.3%	10.1%	9.6%	8.9%
Peer Median Returns*	11.9%	6.1%	8.9%	8.5%	7.7%

*State Street Universe greater than \$10 billion.

- Over the past three, five, seven, and ten years, the returns are significantly higher than peer median returns. The peers are defined as the State Street Universe of public pension plans greater than \$10 billion. Notably, the standard deviation of the monthly returns is below average for the longer time horizons.
- Over a very long horizon, since 1979, the annualized rate of return on the plan assets has been approximately 9.4%.
- Compounding at higher than peer returns can add significant value. For example, based on the \$58.3 billion March 2014 market value, a ten-year annualized return of 9.1% compared to the 7.7% peer median return added approximately \$16.8 billion in excess value. This equates to roughly an additional \$2.0 billion to the FY2025 budget.

Asset Allocation

Market and liquidity risk.

- To earn the actuarial rates of return or higher, investment risks (primarily equity risk) must be assumed. The spread between the required rate of return and the risk-free rate is approximately 60 bps. This is the lowest spread in over 30 years. At the end of March 2024, the equity risk (beta) is approximately 0.36; lower than peer median of approximately 0.56.
- Liquidity is another fundamental risk assumed and it is managed through asset allocation. The plans have outstanding capital commitments to fund approximately \$17.4 billion in illiquid assets. In the March 2024 quarter, \$650 million of new commitments were made. To meet the strategic asset allocation targets, the pace of new commitments will have to remain subdued for the next several years.
- The combined systems paid out approximately \$601 million net of contributions over the past twelve months ending in March 2024. This compares to \$848 million a year ago and \$1.5 billion two years ago. Over the next several years, it is expected this figure will grow larger both in dollars and % AUM. A few reasons include approximately \$1.2 billion in additional one-time contributions will be made throughout FY-2023, MPSERS OPEB is now fully funded and will now require approximately \$700 million less in contributions, and as MPSERS and SERS pensions achieves fully funded status (estimated 50% probability to occur by 2031) an additional \$3.8 billion of contributions will no longer be required.

NEW COMMITMENTS

January 1, 2024 – March 31, 2024

(\$ Millions)

Asset class	Fund Name / (Managed By)	Commitment
Private Equity		
	Dover Street XI, LP (HarbourVest Partners, LLC)	\$100
Real Estate and Infrastructure		
	BentallGreenOak Asia (USD) IV, LP (BGO)	100
	Rialto Real Estate Fund V-Debt, LP (Rialto Capital Management, LLC)	100
Real Return & Opportunistic		
	Whitehorse Liquidity Partners GP Solutions Fund II, LP (Whitehorse Liquidity Partners)	150
	Origami Opportunities Fund V, LP (Origami Capital Partners)	100
	Origami Opportunities Overflow Fund V, LP (Origami Capital Partners)	100
TOTAL		\$650

State of Michigan Retirement System

PERFORMANCE

State of Michigan Investment Board Meeting

June 12, 2024



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.*

MPERS PENSION

Time-Weighted Rates of Return Periods Ending March 31, 2024

	% of Portfolio 3/31/24	Ten		Seven		Five		Three		One		Current	
		Years ¹		Years ¹		Years ¹		Years ¹		Year		Quarter	
		Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
TOTAL PLAN	100.0	9.1	12	9.9	11	9.9	12	7.9	11	11.9	49	4.7	34
Median - Greater than \$10 Billion ²		7.7		8.9		8.9		6.1		11.9		3.8	
MPERS Total Plan Policy		8.9		9.6		10.1		7.3		15.0		5.5	
PRIVATE EQUITY AND VENTURE CAPITAL	21.8	13.7	7	14.9	10	14.7	16	12.4	24	3.5	80	1.4	64
Median ²		9.6		10.6		11.0		11.6		6.4		1.8	
Private Equity and VC Benchmark ³		15.4		16.8		19.1		13.3		30.0		12.5	
DOMESTIC EQUITIES	21.4	12.4	13	13.8	10	14.0	6	10.2	6	35.6	4	14.2	4
Median ²		9.5		11.2		11.0		6.6		20.9		7.9	
S&P 1500 Index		12.7		13.7		14.7		11.0		29.2		10.3	
INTERNATIONAL EQUITIES	13.8	5.4	37	6.6	72	6.9	81	2.0	74	15.8	26	6.2	27
Median ²		5.2		6.9		7.3		3.6		15.1		5.7	
MSCI ACWI ex USA Net Index ⁴		4.3		5.9		6.0		1.9		13.3		4.7	
REAL RETURN AND OPPORTUNISTIC	10.4	11.0		12.2		11.6		9.4		8.9		4.2	
50% (CPI + 4%) + 50% (actuarial rate) ⁵		7.3		7.4		7.4		8.0		6.8		2.1	
ABSOLUTE RETURN	9.9	5.6		7.0		7.8		8.3		10.5		2.7	
1-Month T-Bill + 400 bps		5.3		5.9		6.0		6.7		9.4		5.4	
HFR Benchmark ⁶		3.4		4.2		4.9		3.9		5.5		2.8	
REAL ESTATE & INFRASTRUCTURE	9.3	9.4	19	8.2	21	7.6	28	12.4	15	-0.7	37	-0.5	52
Median ²		8.1		6.0		4.9		6.1		-5.5		-0.5	
NCREIF Property Index ⁷		5.1		3.3		2.4		2.3		-8.4		-1.3	
NCREIF Open Fund Index Net		5.8		3.8		2.6		2.5		-12.0		-2.6	
FIXED INCOME	8.7	3.0	11	2.6	9	1.9	21	-0.1	22	5.1	7	0.7	11
Median ²		1.9		1.6		1.1		-1.6		2.4		-0.6	
Bloomberg US Agg Index		1.5		1.1		0.4		-2.5		1.7		-0.8	
CASH EQUIVALENTS	4.7	1.7		2.2		2.2		2.8		5.5		1.4	
1 Month T-Bill		1.3		1.9		2.0		2.7		5.4		1.4	

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 History from 10/1/2010 to 6/30/14 reflects MSCI ACWI ex USA (gross).
⁵ Current actuarial rate is 6%. History prior to 12/1/18 reflects 50% (CPI +5%) + 50% (actuarial rate).
⁶ FOF Conservative 1 month lagged.
⁷ NCREIF Property Index is NPI minus 130 bps.
Source: State Street Analytics; the NCREIF - NPI (Property Index) source is NCREIF.

Cumulative and Consecutive Total Fund Returns

MPSERS										
Cumulative For Years Ending 3/31/24										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	11.9	4.8	7.9	12.5	9.9	9.3	9.9	10.1	9.1	9.1
Public Plan - Median (> \$10 billion)*	11.9	4.6	6.1	12.3	8.9	8.2	8.5	9.0	7.8	7.7
Rank	49	48	11	29	12	12	11	11	12	12
bp Difference - Median	1	21	177	22	106	112	144	109	131	140
Consecutive For Years Ending										
	03/24	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15
MPSERS	11.9	-1.8	14.3	27.5	0.2	6.1	13.8	11.2	1.4	9.3
Public Plan - Median (> \$10 billion)*	11.9	-3.6	10.4	29.1	-2.1	4.6	10.5	11.2	0.1	8.1
Rank	49	28	10	61	17	11	10	49	14	14
bp Difference - Median	1	177	396	-157	225	157	325	4	124	117

MSERS										
Cumulative For Years Ending 3/31/24										
	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	11.9	4.8	7.9	12.5	9.9	9.3	9.9	10.1	9.1	9.1
Public Plan - Median (> \$1 billion)*	12.3	4.2	5.9	12.3	8.9	8.1	8.4	8.9	7.8	7.7
Rank	54	44	12	28	9	8	9	9	9	9
bp Difference - Median	-37	64	196	22	104	118	152	117	131	138
Consecutive For Years Ending										
	03/24	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15
MSERS	11.9	-1.9	14.4	27.5	0.2	6.1	13.8	11.3	1.3	9.2
Public Plan - Median (> \$1 billion)*	12.3	-3.8	8.6	30.4	-3.0	4.3	10.5	11.8	0.0	8.0
Rank	54	25	7	68	14	8	11	59	12	12
bp Difference - Median	-37	188	576	-290	315	185	324	-51	131	127

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS

Cumulative For Years Ending 3/31/24

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	11.9	4.8	7.9	12.5	9.9	9.3	9.9	10.1	9.1	9.1
Public Plan - Median (> \$1 billion)*	12.3	4.2	5.9	12.3	8.9	8.1	8.4	8.9	7.8	7.7
Rank	55	44	13	31	10	9	10	10	10	10
bp Difference - Median	-38	64	195	20	102	116	151	116	130	137

Consecutive For Years Ending

	03/24	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15
MSPRS	11.9	-1.9	14.3	27.5	0.2	6.1	13.8	11.2	1.3	9.2
Public Plan - Median (> \$1 billion)*	12.3	-3.8	8.6	30.4	-3.0	4.3	10.5	11.8	0.0	8.0
Rank	55	25	8	70	14	8	11	59	12	12
bp Difference - Median	-38	189	572	-294	315	184	324	-55	131	126

MJRS

Cumulative For Years Ending 3/31/24

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	11.9	4.8	7.4	12.0	9.6	9.0	9.7	9.9	8.9	8.9
Public Plan - Median (> \$1 billion)*	12.3	4.2	5.9	12.3	8.9	8.1	8.4	8.9	7.8	7.7
Rank	58	44	25	54	18	13	13	14	11	11
bp Difference - Median	-41	60	143	-24	69	89	127	95	112	119

Consecutive For Years Ending

	03/24	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15
MJRS	11.9	-1.9	12.8	27.3	0.2	6.1	13.8	11.3	1.3	9.1
Public Plan - Median (> \$1 billion)*	12.3	-3.8	8.6	30.4	-3.0	4.3	10.5	11.8	0.0	8.0
Rank	58	25	15	73	14	8	12	59	12	13
bp Difference - Median	-41	185	417	-310	318	184	323	-48	130	112

*State Street Public Funds Universe

State of Michigan Retirement System

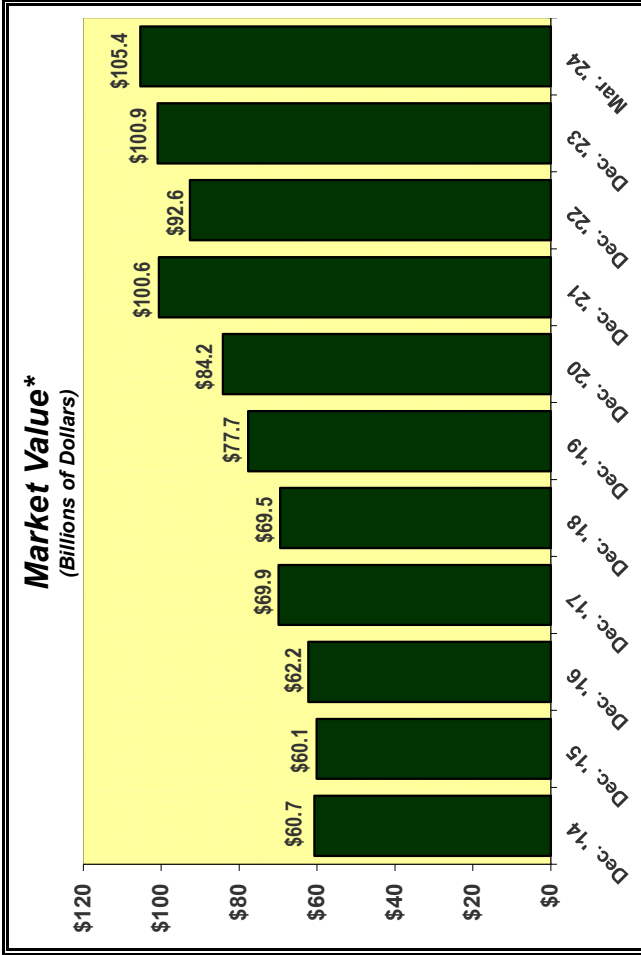
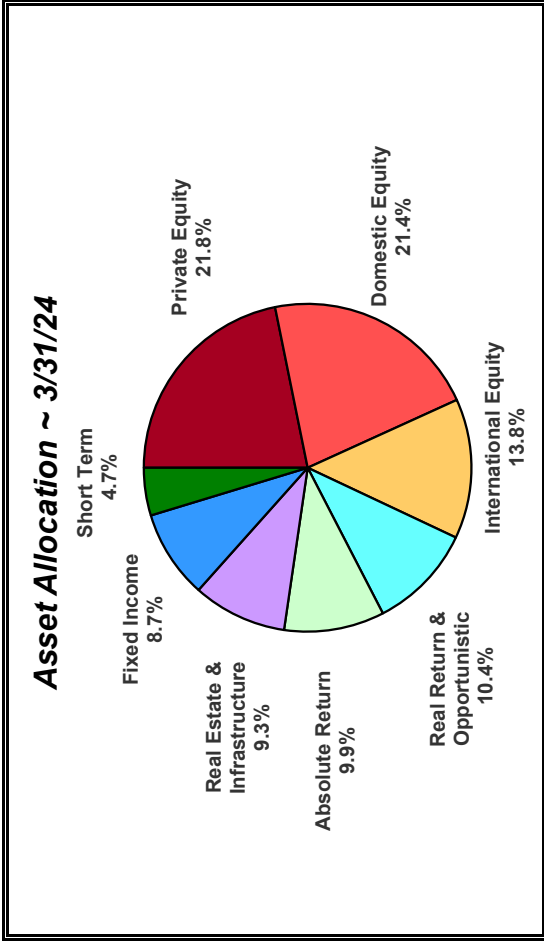
ASSET ALLOCATION REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



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

STATE OF MICHIGAN RETIREMENT SYSTEM PROFILE - MARCH 2024



Asset Allocation By Market Value (In Millions)

Investment Strategies	3/31/2024	3/31/2023
Private Equity	\$22,954	\$22,367
Domestic Equity	22,527	17,910
International Equity	14,555	12,992
Real Return & Opportunistic	10,922	10,340
Absolute Return	10,417	9,695
Real Estate & Infrastructure	9,857	10,137
Fixed Income	9,206	8,776
Short Term	4,997	3,123
TOTAL	\$105,435	\$95,340

Short Term Equivalents (in Billions)

Short Term Strategy	\$5.0
Short Term in Other Inv. Strategies	1.6
TOTAL SHORT TERM	\$6.6

6.2% of Total Funds

Market Value By Plan ~ 3/31/24 (in Millions)

	Pension Plan Mkt. Value	OPEB** Mkt. Value	Combined Mkt. Value	%
MPERS	\$69,102	\$13,228	\$82,330	78.1%
MSERS - (closed)	14,179	6,198	20,377	19.3%
MSPRS	1,993	448	2,441	2.3%
MJRS - (closed)	274	13	287	0.3%
TOTAL	\$85,548	\$19,887	\$105,435	100.0%

MSERS includes the Military Pension Fund

12th Largest State Public Retirement System in the U.S.

Pensions & Investments survey - February 12, 2024 issue

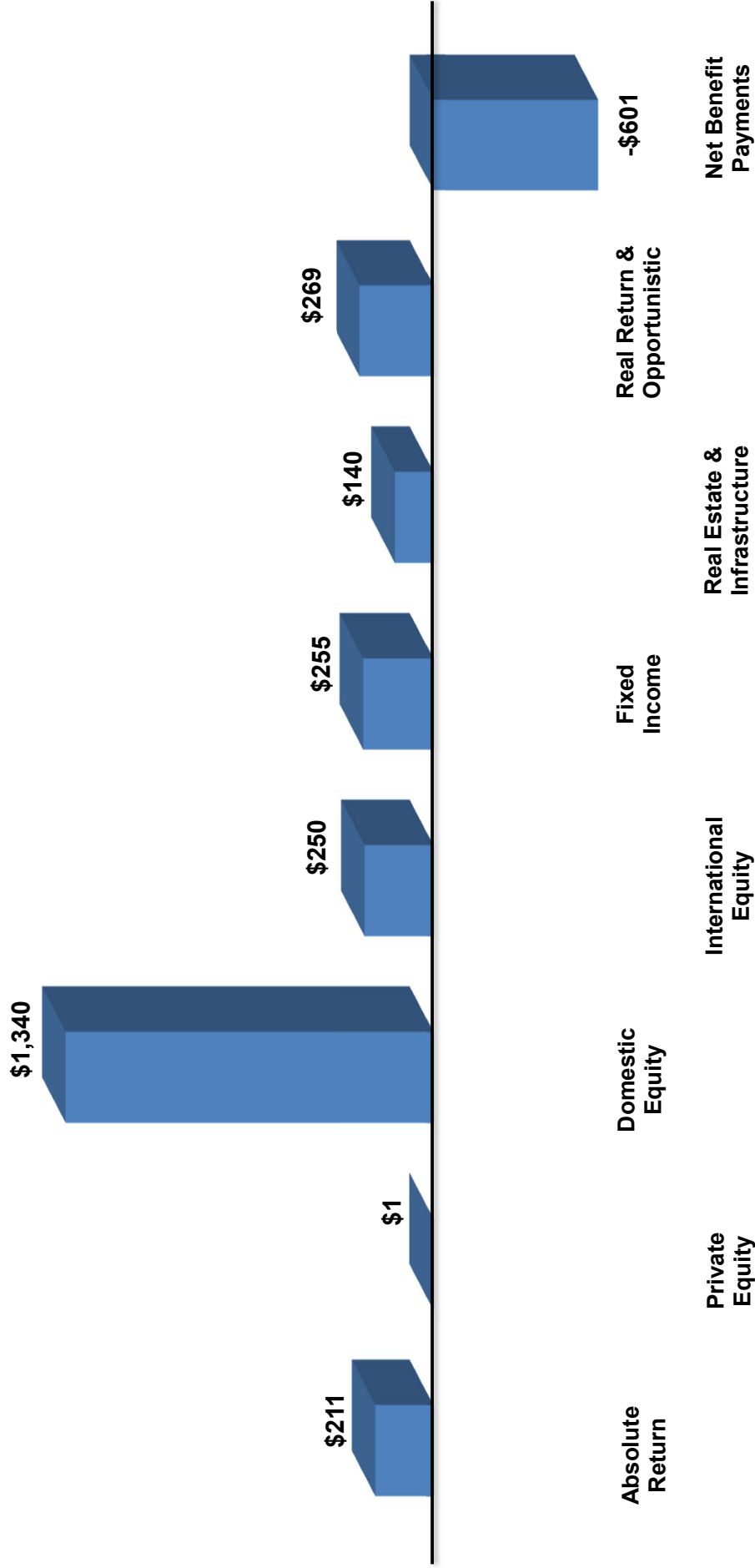
*The combined net payout for the plans for FY 2022 was \$1.2 billion with \$25.6 billion paid out FY 2010 thru FY 2022 (Pension ACFRs). This represents the amount paid to beneficiaries in excess of employer and employee contributions.

**OPEB - Other Post-Employment Benefits

Sources and Uses of Cash

April 2023 ~ March 2024

4/1/23 Short-Term Cash Balance: \$3,126
 3/31/24 Short-Term Cash Balance: \$4,997
 Net Short-Term Cash Increase: \$1,871



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 3/31/24

Asset Class	MPSERS		MSERS		MSPRS		MJRS		SMRS
	3/31/24	Target*	3/31/24	Target*	3/31/24	Target*	3/31/24	Target*	Ranges
Private Equity	21.8%	16.0%	21.9%	16.0%	21.8%	16.0%	16.7%	16.0%	13% - 27%
Domestic Equity	21.4%	25.0%	21.5%	25.0%	21.4%	25.0%	21.4%	25.0%	17% - 32%
International Equity	13.8%	15.0%	13.9%	15.0%	13.8%	15.0%	13.8%	15.0%	12% - 22%
Real Return & Opportunistic	10.4%	10.0%	10.4%	10.0%	10.4%	10.0%	9.4%	10.0%	8% - 18%
Absolute Return	9.9%	9.0%	9.9%	9.0%	9.9%	9.0%	9.9%	9.0%	5% - 11%
Real Estate & Infrastructure	9.3%	10.0%	9.4%	10.0%	9.4%	10.0%	8.4%	10.0%	8% - 18%
Long Term Fixed Income	8.7%	13.0%	8.8%	13.0%	8.8%	13.0%	15.9%	13.0%	8% - 18%
Short Term Fixed Income	4.7%	2.0%	4.2%	2.0%	4.5%	2.0%	4.5%	2.0%	1% - 8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

*Complies with basket clause and international restrictions.

State of Michigan Retirement System

MARKETS REVIEW AND OUTLOOK

State of Michigan Investment Board Meeting

June 12, 2024



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

CAPITAL MARKETS

Return and Risk Assumptions, Benchmark and Outlook

A starting point.

MPSERS Plan	Assumed Return* (Arithmetic)	Standard Deviation*	Trailing 10-Year (Benchmark**)
Private Equity	11.0%	20.0%	15.4%
Real Estate	9.6%	17.0%	5.1%
Real Ret / Opportunistic	9.1%	18.0%	7.3%
International Equity	8.5%	18.2%	4.3%
Domestic Equity	8.2%	18.0%	12.7%
Absolute Return	7.0%	11.6%	3.4%
Long-Term Fixed Income	4.8%	4.7%	1.5%
Short-Term	4.1%	1.4%	1.3%

* Aon Investment Consultants 2024 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.

- At the end of March 2024, the yield to maturity of the U.S. Aggregate index was 4.85%. These are some of the highest yields over the past ten years and rank in the second decile of yields over the past twenty.
- Interest rates at both the short and long end are now finally earning more than the year-over-year increase in CPI. The U.S. Fed Funds rate is around 180 basis points above the year-over-year increase in CPI. The last time real yields were this high during an inflationary environment was from September 2006 through September 2007.
- Valuation metrics for the U.S. market are higher relative to historical averages, suggesting the market is priced to deliver marginally lower rates of return. A concern is that the risk of a potential recession is not priced in, and many strategists believe that if a recession were to materialize, valuations will continue to cheapen. Relative to bond yields, the S&P 500 yields are at a two-decade low.
- Fundamentally, the market's returns on equity continue to be historically higher than average and some of the largest companies in the market today are less cyclical (economically sensitive) than past market leaders. These facts lend support to the argument that higher valuations are justified, and therefore the market could perhaps continue to deliver historical average rates of return in the future.
- Based on a price-to-earnings valuation multiple, non-U.S. equities are trading at valuations below average. Relative to the U.S., excluding non-earning companies, developed international markets trade at approximately a 39% discount to U.S. counterparts while emerging markets are at a 45% discount.

U.S. Fixed Income

Positive real yields

- At the end of March 2024, the yield to maturity of the U.S. Aggregate index was 4.85%. These are some of the highest yields over the past ten years and rank in the second decile of yields over the past twenty.
- The most recent change to the U.S. Federal Reserve Board policy interest rate was a 25 basis points hike in July 2023. By the end of the March 2024 quarter, the market was pricing in between 2 and 3 rate cuts through the remainder of the year.
- An inverted yield curve is often cited as having U.S. economic recession predictive power. However, at the end of March 2024, credit spreads were not pricing in economic worries. Both investment grade and high yield spreads were well below historical averages.
- Interest rates at both the short and long end are now finally earning more than the year-over-year increase in CPI. The U.S. Fed Funds rate is around 180 basis points above the year-over-year increase in CPI. The last time real yields were this high during an inflationary environment was from September 2006 through September 2007.

International Equity

Good relative valuations.

- The broad non-U.S. stock market return for the one year ending March 2024 was 13.3%, and 4.3% annualized over the past 10 years. There are two key variables that explain most of the under-performance of international vs. U.S. equities over the past decade the appreciating value of the U.S. dollar and the valuation multiple changes of the markets. Each is responsible for explaining approximately half of the relative returns.
- The DXY index is often referred to as a measure of U.S. dollar value relative to other developed nation currencies. At the end of September 2022, the index hit a value of 112, a twenty-year high, but has fallen over -7% since then.
- Based on a price-to-earnings valuation multiple, non-U.S. equities are trading at valuations below average. Relative to the U.S., excluding non-earning companies, developed international markets trade at approximately a 39% discount to U.S. counterparts while emerging markets are at a 45% discount.

Domestic Equity

Concentration in the domestic equity index.

- The broad U.S. stock market return for the one year ending March 2024 was 29.2%, and 12.7% annualized over the past 10 years. In contrast, U.S. small-cap stocks returned 19.7% for the year ending March 2024 and are priced 13% below their all-time highs.
- Valuation metrics for the U.S. market are higher relative to historical averages, suggesting the market is priced to deliver marginally lower rates of return. A concern is that the risk of a potential recession is not priced in, and many strategists believe that if a recession were to materialize, valuations will continue to cheapen. Relative to bond yields, the S&P 500 yields are at a two decade low.
- Fundamentally, the market's returns on equity continue to be historically higher than average and some of the largest companies in the market today are less cyclical (economically sensitive) than past market leaders. These facts lend support to the argument that higher valuations are justified, and therefore the market could perhaps continue to deliver historical average rates of return in the future.
- The S&P 500 has become very concentrated by weight, but also by returns, making it difficult for active managers to add value in this type of market. By weight, the largest seven companies make up more than 29.4% of the index weight.

Real Estate

Comparing public vs. private real estate.

- Over the one year ending March 2024, the NAREIT index gained 8% including dividends, which was approximately 16.4% higher than their private market counterparts. Over the medium to longer-term, publicly traded REITs have earned 0.5% - 1.5% higher return than their private market counterparts but they are about three times more volatile.
- Dividend yields on REITs at the end of March were estimated to be around 4.0%, which is 20 bps lower than the yield of the 10-year U.S. Treasury. This metric is approximately 1.4% below the historical average.

Commodities

Inflation; supply and demand issues.

- Fed policy is restrictive and while the inflation is coming down, it is still high by historical standards. March 2024 reading for year-over-year CPI was 3.5% which was up from 3.2% the quarter prior. For comparison, the 20-year median CPI is 2.2%.
- The commodities prices broadly, as measured by the CRB index, are down -2.6% over the 12-month period ending March 2024. The price for crude oil was up 9.9% year-over-year and ended March 2024 at \$83.17 per barrel.
- An additional complication for assessing the inflation picture is the war between Russia and Ukraine which started on February 24, 2022.

Annual Total Returns of Key Asset Classes 2004 - 2023

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Best ↑	Int'l Equity 20.90%	Real Estate 20.06%	Int'l Equity 26.65%	Int'l Equity 16.65%	Gov't Bonds 12.38%	Int'l Equity 41.44%	U.S. Equity 16.38%	Real Estate 14.26%	Int'l Equity 16.83%	U.S. Equity 32.80%	U.S. Equity 13.08%	Real Estate 13.32%	U.S. Equity 11.93%	Int'l Equity 27.19%	Real Estate 6.71%	U.S. Equity 30.90%	U.S. Equity 17.92%	U.S. Equity 28.45%	Inflation 6.50%	U.S. Equity 25.47%
	Real Estate 14.48%	Int'l Equity 16.62%	Real Estate 15.84%	Real Estate 15.84%	Cash 2.05%	U.S. Equity 27.24%	Real Estate 13.11%	Gov't Bonds 9.02%	U.S. Equity 16.17%	Int'l Equity 15.29%	Real Estate 11.81%	U.S. Equity 1.01%	Real Estate 7.97%	U.S. Equity 21.13%	Inflation 1.91%	Int'l Equity 22.13%	Int'l Equity 10.65%	Real Estate 17.70%	Real Estate 5.50%	Int'l Equity 16.08%
	U.S. Equity 11.78%	U.S. Equity 5.65%	U.S. Equity 15.34%	U.S. Equity 8.67%	Inflation 0.10%	Corp. Bonds 16.05%	Corp. Bonds 11.15%	Corp. Bonds 8.35%	Corp. Bonds 10.54%	Corp. Bonds 10.99%	Gov't Bonds 7.53%	Inflation 0.86%	Corp. Bonds 5.63%	Corp. Bonds 6.96%	Cash 1.88%	Gov't Bonds 14.54%	Gov't Bonds 9.89%	Gov't Bonds 8.29%	Cash 1.46%	Corp. Bonds 8.52%
	Hedge Funds 5.83%	Hedge Funds 5.13%	Hedge Funds 9.21%	Hedge Funds 7.68%	Corp. Bonds -3.07%	Hedge Funds 9.65%	Corp. Bonds 8.46%	Inflation 2.96%	Hedge Funds 9.37%	Hedge Funds 7.70%	Gov't Bonds 4.92%	Hedge Funds 0.66%	Int'l Equity 4.50%	Corp. Bonds 6.42%	Gov't Bonds 0.88%	Real Estate 6.83%	Gov't Bonds 7.94%	Hedge Funds 7.56%	Hedge Funds 0.12%	Cash 5.13%
	Corp. Bonds 5.25%	Inflation 3.42%	Cash 4.81%	U.S. Equity 5.47%	Real Estate -6.46%	Inflation 2.72%	Gov't Bonds 5.52%	U.S. Equity 1.75%	Gov't Bonds 4.22%	Cash 1.49%	Hedge Funds 3.14%	Cash 0.37%	Hedge Funds 2.09%	Hedge Funds 3.88%	Hedge Funds -1.05%	Real Estate 6.42%	Real Estate 4.75%	Inflation 7.12%	Gov't Bonds -12.32%	Hedge Funds 4.50%
	Gov't Bonds 3.48%	Gov't Bonds 4.27%	Corp. Bonds 5.10%	Cash 5.03%	Hedge Funds -19.86%	Gov't Bonds 0.19%	Hedge Funds 5.07%	Hedge Funds 0.10%	Int'l Equity 2.02%	Corp. Bonds 0.07%	Cash 0.68%	Corp. Bonds 0.01%	Gov't Bonds 1.89%	Gov't Bonds 2.30%	Corp. Bonds -2.51%	Hedge Funds 4.40%	Real Estate 1.60%	Corp. Bonds 0.05%	Int'l Equity -15.57%	Gov't Bonds 4.09%
	Inflation 3.25%	Gov't Bonds 2.65%	Gov't Bonds 3.46%	Cash 5.03%	U.S. Equity -36.72%	Gov't Bonds -2.19%	Inflation 1.50%	Hedge Funds -3.55%	Inflation 1.70%	Corp. Bonds -2.01%	Cash 0.04%	Corp. Bonds -0.77%	Gov't Bonds 1.05%	Inflation 2.12%	U.S. Equity -4.96%	Inflation 2.29%	Inflation 1.40%	Corp. Bonds -1.04%	Corp. Bonds -15.78%	Inflation 3.40%
	Cash 1.33%	Corp. Bonds 1.95%	Int'l Equity 2.55%	Inflation 4.06%	Int'l Equity -45.52%	Real Estate -16.86%	Cash 0.13%	Int'l Equity -13.71%	Cash 0.11%	Gov't Bonds -2.60%	Int'l Equity -3.87%	Int'l Equity -5.67%	Cash 0.27%	Cash 0.84%	Int'l Equity -14.20%	Cash 2.28%	Cash 0.45%	Gov't Bonds -2.28%	U.S. Equity -17.78%	Real Estate -7.94%
Worst ↓																				

		Annualized Returns 2004 - 2023			
		Gov't.	Corp.	Int'l.	US Eq.
Return		2.70%	4.13%	5.92%	9.75%
Risk		5.04%	6.71%	18.85%	16.13%

- 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

PRIVATE EQUITY REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



Peter A. Woodford
Senior Investment Manager
Private Equity Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	3.5%	12.4%	14.7%	14.9%	13.7%
PE Benchmark Returns	30.0%	13.3%	19.1%	16.8%	15.4%
Peer Median Returns	6.4%	11.6%	11.0%	10.6%	9.6%

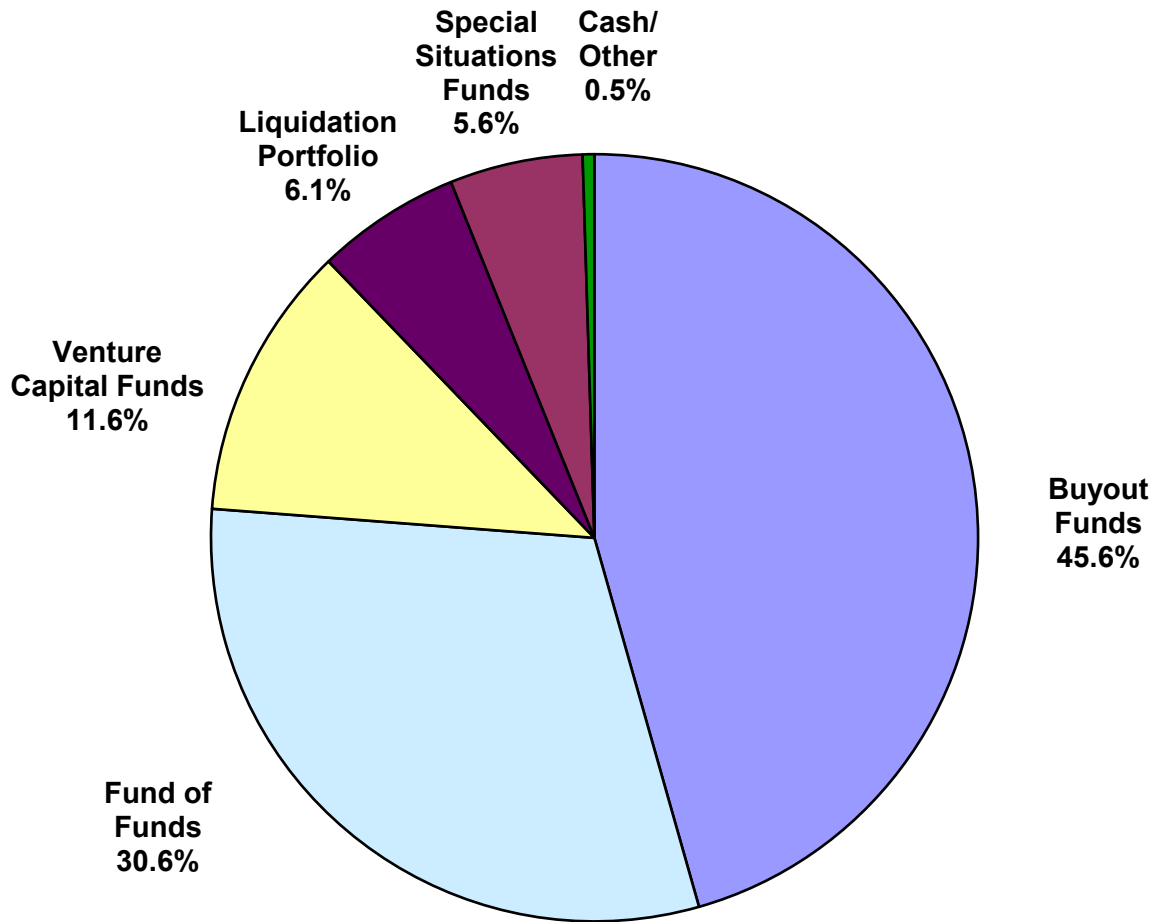
- It is not unusual for private equity returns to lag the public benchmark returns during periods of expansion and lead the public benchmark during periods of contraction. Over the last 10 years, the Private Equity Division outperformed the S&P 500 by 0.7% (ten-year S&P 500 return 13.0%) and underperformed the benchmark by 1.7%.
- Private equity returns have been strong relative to peer median returns, ranking in the top 7.0% of peers over the past ten years. Outperformance to peers is attributable to strategy as well as fund and co-investment selectivity.
- Commitments closed during the quarter:
 - \$100 million to Dover Street XI, LP, a commingled fund managed by HarbourVest Partners LLC focused on secondary fund investments in General Partner and Limited Partner interests globally.

Strategy Updates

The strategy for the next twelve months will focus on existing sponsors raising successor funds. This may be a combination of buyout, venture capital, secondary, and growth equity funds seeking new commitments. 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

3/31/24

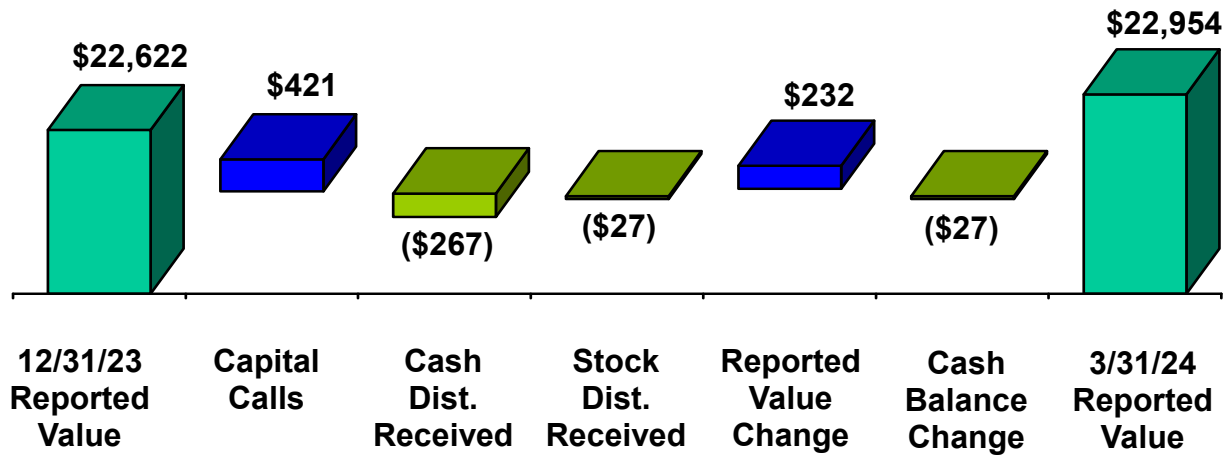


Market Value in Millions

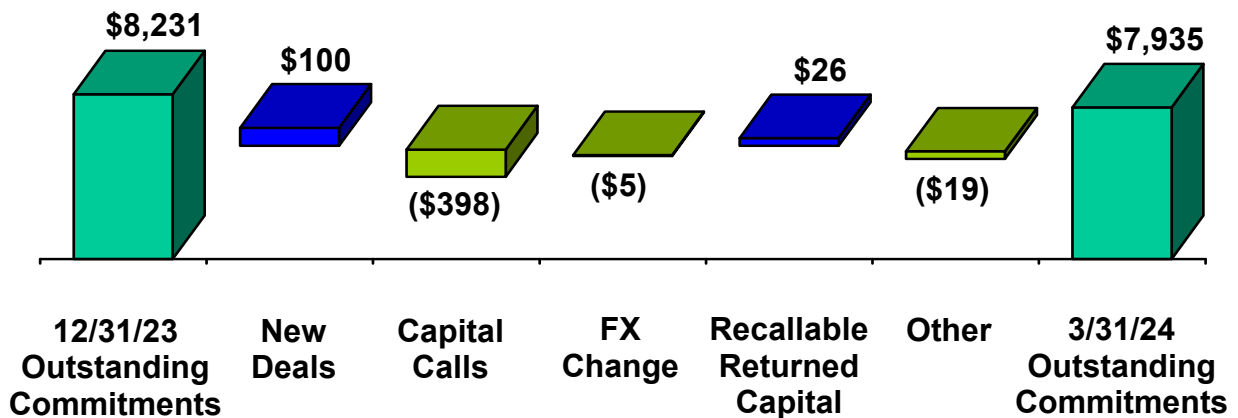
	<u>3/31/24</u>		<u>3/31/23</u>	
Buyout Funds	\$10,452	45.6%	\$9,718	43.4%
Fund of Funds	\$7,026	30.6%	6,538	29.2%
Venture Capital Funds	\$2,663	11.6%	2,804	12.5%
Liquidation Portfolio	\$1,410	6.1%	1,873	8.4%
Special Situations Funds	\$1,284	5.6%	1,333	6.0%
Cash/Other	\$119	0.5%	101	0.5%
Total	<u>\$22,954</u>	<u>100.0%</u>	<u>\$22,367</u>	<u>100.0%</u>

SMRS Private Equity 3/31/24

Invested Commitments



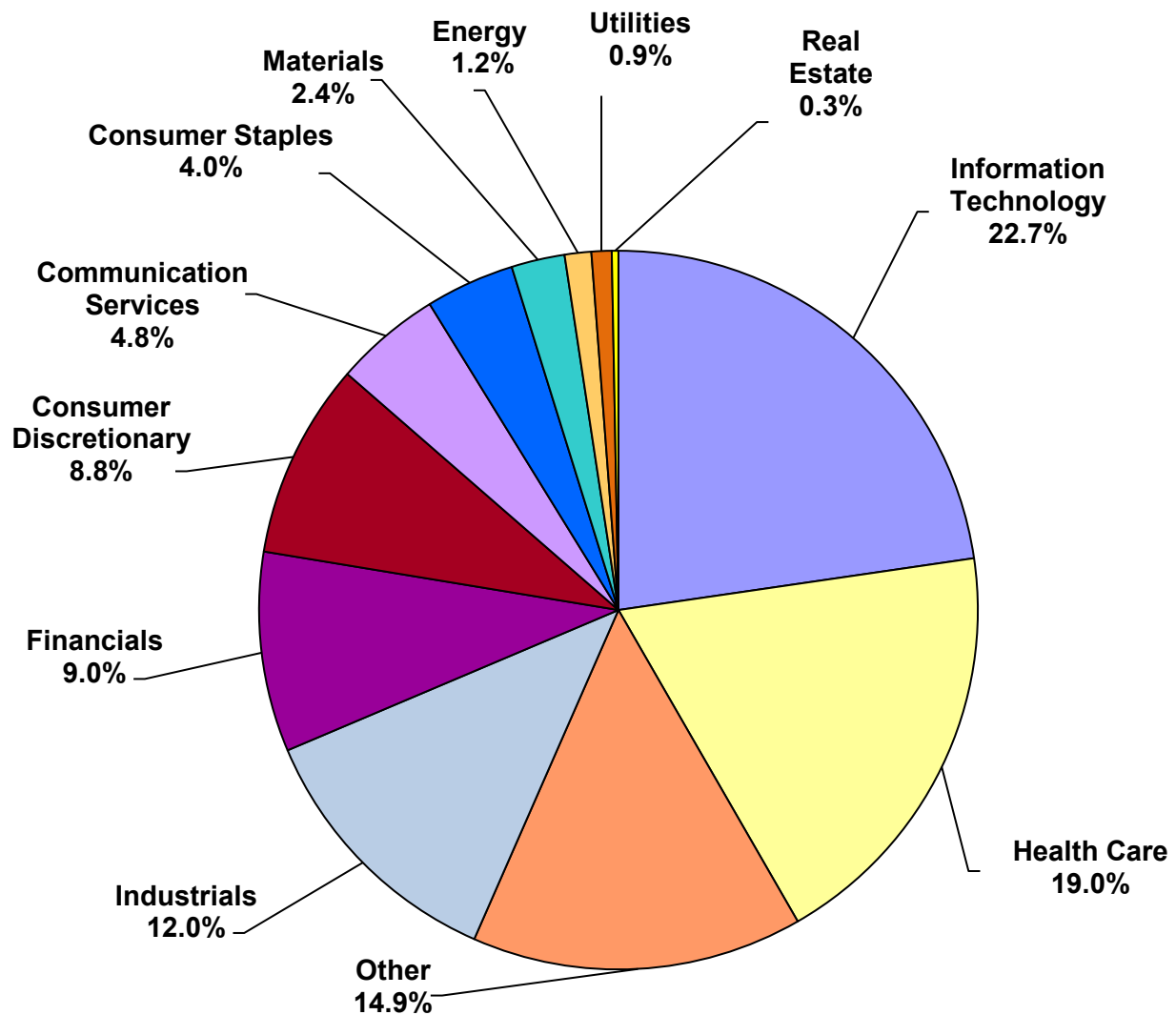
Outstanding Commitments



SMRS Private Equity

3/31/24

Investments by Industry

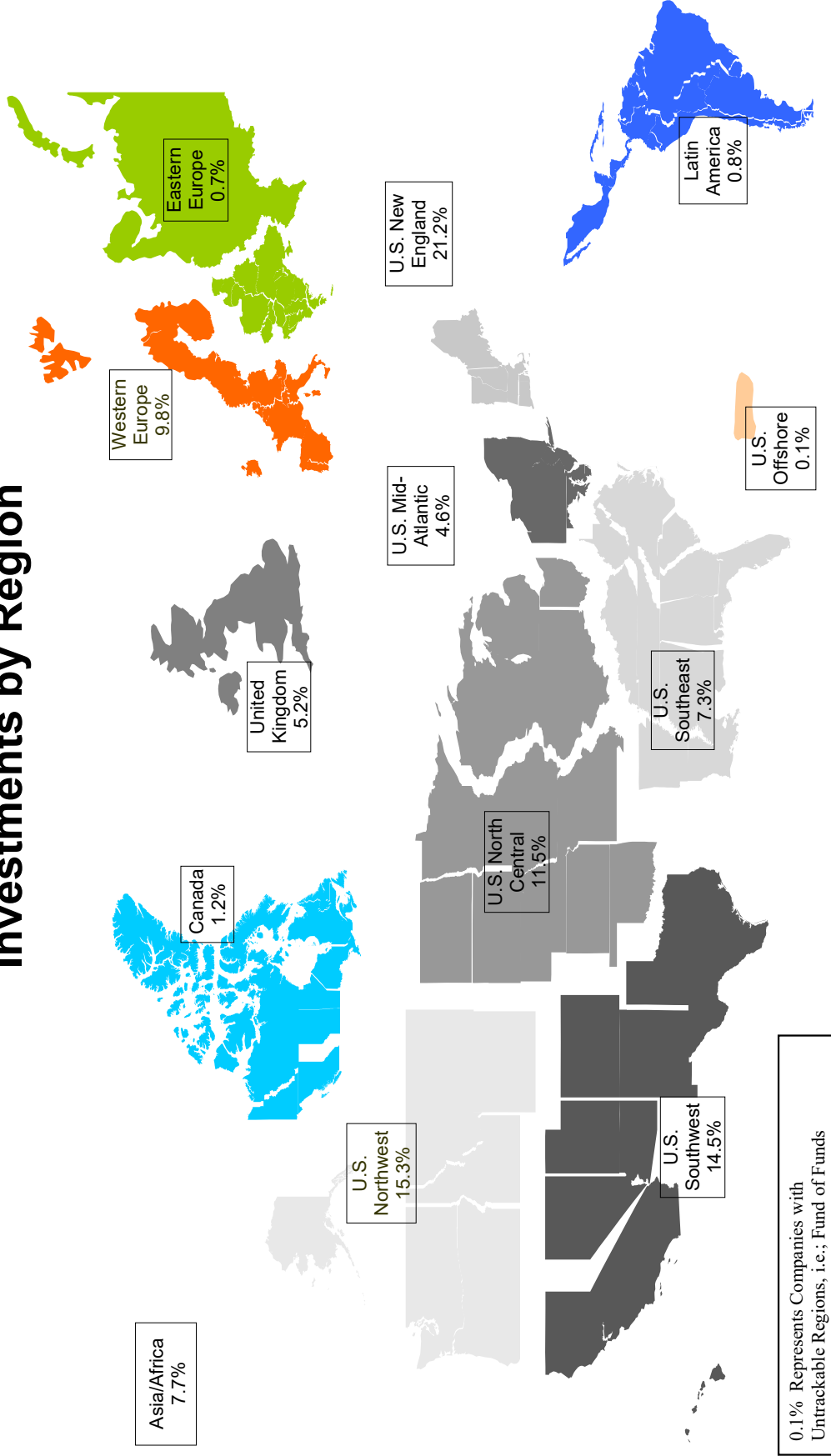


These numbers are based on the most recent available General Partner Data; primarily 12/31/23 and are subject to change.

SMRS Private Equity

3/31/24

Investments by Region



0.1% Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 75.7%, Europe 15.7%, Asia 7.7%, Other 0.1%, Latin America 0.8%

SMRS

Private Equity

3/31/24

Portfolio by Vintage Year

(\$ in Millions)

<u>Asset Vintage</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>
1986-2005	\$ 138	\$ 57	\$ 195
2006*	62	90	152
2007	46	41	87
2008	144	63	207
2009	4	0	4
2010	60	3	63
2011	336	38	374
2012	455	28	483
2013	136	36	172
2014	888	107	995
2015	7,665	1,432	9,097
2016	1,877	169	2,046
2017	1,903	208	2,111
2018	3,649	869	4,518
2019	2,170	333	2,503
2020	952	312	1,264
2021	1,653	1,233	2,886
2022	672	1,960	2,632
2023	25	756	781
2024	0	200	200
Income Accruals	0	0	0
Cash	94	0	94
Act. Small Cap - Stock Dist	25	0	25
Total	\$ 22,954	\$ 7,935	\$ 30,889

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total Exposure</u>	<u>Total (USD)</u>
Euro (\$1.08/ €)	€ 505	€ 273	€ 778	\$840

SMRS

Private Equity

3/31/24

Net Market Value by Entity

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
5AM Opportunities I, LP	\$ 13,849,905	\$ 0
5AM Opportunities II, LP	19,613,523	2,500,000
5AM Ventures VI, LP	19,807,455	750,000
5AM Ventures VII, LP	7,420,505	15,500,000
Accel Europe I, LP	1,091,957	1
Accel Europe II, LP	25,417,948	3,300,000
Accel Growth Fund II, LP	12,037,692	0
Accel Growth Fund III, LP	10,627,184	280,000
Accel Growth Fund IV, LP	24,382,243	0
Accel Growth Fund V, LP	38,351,524	0
Accel Growth Fund VI, LP	13,050,234	10,312,500
Accel India VII, LP	3,313,128	6,050,000
Accel IX, LP	627,455	3,000,000
Accel Leaders 4, LP	10,417,632	39,500,000
Accel Leaders Fund 3, LP	29,432,046	6,600,000
Accel Leaders Fund II, LP	11,080,696	0
Accel Leaders Fund, LP	15,372,234	0
Accel London V, LP	31,430,721	840,000
Accel London VI, LP	14,529,529	1,875,000
Accel London VII, LP	6,444,335	4,875,000
Accel VI, LP	461,906	0
Accel VI-S	316,687	652,611
Accel X, LP	2,869,552	0
Accel XI, LP	6,569,022	1,440,000
Accel XII, LP	19,906,231	980,000
Accel XIII, LP	17,979,787	1,250,000
Accel XIV, LP	11,642,651	1,150,000
Accel XV, LP	4,884,372	4,550,000
Accel XVI, LP	0	10,000,000
Accel-KKR Growth Capital Fund IV, LP	14,763,510	24,567,096
Acorn Bioventures 2, LP	36,672,770	60,000,000
Acorn Bioventures, LP	71,556,869	10,000,000
Advent Global Private Equity V, LP	3,365,589	8,700,000
Advent International GPE IX, LP	326,528,903	16,234,015
Advent International GPE VI-A, LP	16,046,033	0

	Adjusted Reported Value	Unfunded Commitment
Advent International GPE VII-B, LP	23,417,529	8,000,000
Advent International GPE VIII-B, LP	217,690,922	0
Advent International GPE X, LP	145,498,253	204,707,652
Advent International LAPEF VII	39,133,126	27,150,000
Advent Latin American Private Equity Fund VI, LP	28,525,170	2,450,000
Affinity Asia Pacific Fund III, LP	11,284,206	8,520,204
Affinity Asia Pacific Fund IV, LP	75,381,709	13,949,187
Affinity Asia Pacific Fund V, LP	99,648,784	80,289,312
Apax Digital II, LP	21,146,887	74,816,986
Apax Digital, LP	60,527,446	6,929,878
Apax Europe Fund VI, LP	7,330,649	2,283,982
Apax Europe VII, LP	2,047,815	1,608,531
Apax IX, LP	127,137,208	14,436,164
Apax US VII, LP	2,964,301	417,509
Apax VIII - B, LP	16,249,407	3,983,093
Apax X USD L.P.	164,934,261	23,522,916
Apax XI USD, LP	3,069,167	147,624,555
Apollo Investment Fund IX, LP	98,212,212	27,192,980
Apollo Investment Fund VIII, LP	29,680,281	10,209,667
Arboretum Ventures II, LP	414,159	0
Arboretum Ventures III, LP	2,828,608	0
Arboretum Ventures IV, LP	9,288,066	4,860,001
Arboretum Ventures V, LP	22,586,270	9,065,000
Arboretum Ventures VI, LP	4,540,963	29,435,000
Ares Corporate Opportunities Fund II, LP	0	11,423,773
Ares Corporate Opportunities Fund III, LP	164,782	1,424,582
Ares Corporate Opportunities Fund IV, LP	18,688,716	1,688,819
ASF VIII B	108,879,546	56,579,267
AXA ASF Miller Co-Investment	129,705	0
Axiom Asia 6, LP	30,012,724	22,000,000
Axiom Asia Co-Investment Fund I, LP	46,571,706	5,196,015
Axiom Asia Co-Investment Fund II, LP	26,814,084	26,434,673
Axiom Asia IV, LP	54,558,672	6,747,811
Axiom Asia Private Capital Fund III, LP	50,028,920	5,250,002
Axiom Asia V, LP	51,335,867	10,500,000
BC European Capital VII, LP	595,761	0
Berkshire Fund IX Coinvestment Fund, LP	49,882,613	8,838,223
Berkshire Fund IX, LP	201,787,750	11,428,634
Berkshire Fund VI, LP	23,006,266	6,902,067
Berkshire Fund VII, LP	6,482,452	2,441,522
Berkshire Fund VIII, LP	78,206,034	11,237,309
Berkshire Fund X, LP	81,287,626	74,828,738
Blackstone Capital Partners IV, LP	146,658	4,413,477

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Blackstone Capital Partners V, LP	968,674	13,069,138
Blackstone Capital Partners VI, LP	79,600,706	32,926,549
Blackstone Capital Partners VII, LP	240,092,011	19,328,680
Blackstone Capital Partners VIII, LP	157,784,484	77,636,798
Blackstone Capital Partners V-S	153	712,476
Blackstone Growth II, LP	0	100,000,000
Carlyle Europe Partners V, SCSp	109,081,048	31,824,416
Carlyle Partners Growth, LP	13,963,121	34,208,880
Carlyle Partners V, LP	14,082,052	10,645,569
Carlyle Partners VI, LP	60,759,415	9,288,430
Carlyle Partners VII, LP	296,488,300	13,435,711
Carlyle Partners VIII, LP	101,116,028	93,158,607
Charlesbank Equity Fund IX, LP	113,165,397	14,150,771
Charlesbank Equity Fund X, LP	67,037,537	39,903,977
Charlesbank Equity Overage Fund X, L.P.	55,696,054	4,490,468
Charlesbank Fund IX Overage Allocation Program	44,042,181	11,393,817
Clearlake Capital Partners VII, LP	120,607,397	84,616,922
Clearlake Capital Partners VIII, LP	0	100,000,000
Coller International Partners V, LP	68,977	2,000,000
Coller International Partners VI, LP	10,111,778	5,000,000
Coller International Partners VII, LP	68,629,886	45,871,272
CVC Capital Partners Fund IX (A), LP	0	162,000,006
CVC Capital Partners VII, LP	225,649,254	8,404,307
CVC Capital Partners VIII, LP	84,811,692	28,921,336
Dover Street IX, LP	60,462,929	12,000,000
Dover Street X, LP	128,378,848	38,250,000
** Dover Street XI, LP	0	100,000,000
FirstMark Capital I, LP	25,095,792	196,596
FirstMark Capital IV, LP	61,214,172	0
FirstMark Capital OF I, LP	8,850,296	0
FirstMark Capital OF II, LP	57,441,012	0
FirstMark Capital OF III, LP	32,698,225	0
FirstMark Capital OF IV, LP	3,114,684	31,500,000
FirstMark Capital V, LP	38,477,950	3,850,000
FirstMark Capital VI, LP	1,750,000	33,250,000
Flagship Pioneering Fund VII, LP	88,932,052	120,000,000
Flagship Pioneering Fund VIII, LP	4,000,000	196,000,000
Flagship Pioneering Special Opportunities Fund II, LP	94,452,154	8,500,000
Flagship Pioneering VI, LP	317,761,510	0
Flagship Ventures Fund 2004	17,386	0
Flagship Ventures Fund 2007, LP	2,365,967	0
Flagship Ventures Fund IV, LP	43,389,385	0
Flagship Ventures Fund V, LP	53,872,405	0

	Adjusted Reported Value	Unfunded Commitment
Flagship Ventures Opportunities Fund I, LP	29,461,640	0
GCM Grosvenor Fund Investment Program I, LP	3,679,141	1,070,800
GCM Grosvenor Fund Investment Program II, LP	12,593,628	12,898,225
GCM Grosvenor Fund Investment Program III - 2004	22,041,086	3,958,803
GCM Grosvenor Fund Investment Program III - 2006	25,360,106	6,468,850
GCM Grosvenor Fund Investment Program V, LP	24,581,567	9,276,702
GCM Grosvenor Fund Investment Program VI, LP	17,546,662	1,155,603
GCM Grosvenor Fund Investment Program VIII, LP	101,998,940	8,558,358
GCM Grosvenor SeasPriFIP, LP (PIS06-10)	16,724,371	10,707,927
GCM Grosvenor SeasPriFIP, LP (PIS14)	221,785,676	20,925,242
GCM Grosvenor SeasPriFIP, LP (Seed)	5,614,326	17,132,163
Genstar Capital Partners IX, LP	105,960,467	10,416,631
Genstar Capital Partners VIII, LP	85,230,543	4,121,413
Genstar Capital Partners X, LP	96,000,788	6,022,803
Genstar Capital Partners XI, LP	257,299	124,518,933
Genstar IX Opportunities Fund I, LP	62,801,079	7,434,374
Genstar VIII Opportunities Fund I, LP	58,706,047	3,224,383
Genstar X Opportunities Fund I, LP	22,785,139	2,955,240
Genstar XI Opps Fund I, LP (Priority Co-Invest Vehicle)	5,725,551	19,265,523
Golden Bell Azalea, LLC	123,698	0
Green Equity Investors IX, LP	57,851,660	224,815,480
Green Equity Investors V	3,559,879	14,745,120
Green Equity Investors VI, LP	142,544,625	946,569
Green Equity Investors VII, LP	224,809,716	27,280,806
Green Equity Investors VIII, LP	290,548,951	16,189,022
Greenspring Master G, LP	613,030,506	350,905,809
Greenspring Micro II, LP	38,855,808	2,250,000
GTCR Fund XIII, LP	27,588,005	23,422,247
GTCR Fund XIV, LP	0	150,000,000
GTCR Strategic Growth Fund, LP	12,639,327	29,189,000
HarbourVest Dover Street VIII, LP	4,487,213	5,400,000
HarbourVest Int'l III Partnership, LP	139,661	1,200,000
Harbourvest Partners Co-Investment Fund IV, LP	73,611,852	19,107,835
HarbourVest Partners Co-Investment Fund V, LP	235,581,477	45,000,000
Harbourvest Partners Co-Investment Fund VI, LP	165,273,467	40,000,000
HarbourVest V Partnership, LP	109,305	300,000
HarbourVest VI - Direct Fund, LP	1,026,268	750,000
HarbourVest VI Partnership, LP	184,840	2,000,000
Harvest Partners IX, LP	30,433,654	67,076,541
Harvest Partners VII, LP	100,803,427	7,734,486
Harvest Partners VIII, LP	113,348,993	11,549,533
Hellman & Friedman Capital Partners X, LP	76,734,569	32,931,302
Hg Saturn 3 A, LP	33,989,967	67,370,263

	Adjusted Reported Value	Unfunded Commitment
Insight Partners Fund X Follow-On Fund, LP	38,760,165	6,350,000
Insight Partners XI, LP	144,867,634	2,992,458
Insight Partners XII, LP	113,354,506	27,750,000
Insight Partners XIII, LP	0	150,000,000
Insight Venture Partners GB Coinvestment Fund, LP	109,484,991	2,958,070
Insight Venture Partners IX, LP	238,624,134	1,301,991
Insight Venture Partners X, LP	208,725,753	5,714,746
Jade Equity Investors, LP	106,396,966	26,831,994
Jade Equity Investors II, LP	0	150,000,000
Kelso Investment Associates IX, LP	55,878,877	10,290,072
Kelso Investment Associates VII, LP	140,598	0
Kelso Investment Associates VIII, LP	588,433	7,693,622
Kelso Investment Associates X, LP	152,597,338	15,804,673
Khosla Ventures III, LP	4,055,724	0
Khosla Ventures IV, LP	59,195,066	950,000
Khosla Ventures Opportunity I, LP	24,410,661	2,500,000
Khosla Ventures Opportunity II, LP	596,605	11,812,500
Khosla Ventures Seed D, LP	22,541,737	940,000
Khosla Ventures Seed E, LP	5,732,222	650,000
Khosla Ventures Seed F, LP	3,554,540	8,812,500
Khosla Ventures V, LP	91,503,352	1,750,000
Khosla Ventures VI, LP	126,896,795	3,750,000
Khosla Ventures VII, LP	43,257,984	13,600,000
Khosla Ventures VIII, LP	7,500,000	42,500,000
KKR 2006 Fund, LP	20,725	6,102,869
KKR Americas Fund XII, LP	237,749,535	23,111,563
KKR Asian, LP	0	395,007
KKR Asian Fund II, LP	20,793,448	0
KKR Asian Fund III, LP	111,597,896	14,730,983
KKR China Growth Fund, LP	2,591,560	3,306,040
KKR European Fund II, LP	556,548	0
KKR European Fund III, LP	1,823,749	6,410,112
KKR European Fund IV, LP	84,444,131	405,873
KKR European Fund V (USD), SCSp	128,778,169	13,312,778
KKR Millennium Fund, LP	174,192	0
KKR North America Fund XI, LP	46,710,245	1,388,428
KKR North America Fund XIII, SCSp	76,640,248	55,138,333
Lead Edge Capital IV, LP	29,199,976	9,521,879
Lead Edge Capital V, LP	32,074,251	2,798,171
Lead Edge Capital VI, LP	17,547,621	46,923,376
Lightspeed India Fund IV, LLC	1,569,501	5,745,000
Lightspeed Opportunity Fund II, LP	14,699,430	10,000,000
Lightspeed Opportunity Fund, LP	24,018,461	250,000

	Adjusted Reported Value	Unfunded Commitment
Lightspeed Venture Partners Select IV, LP	29,701,220	1,250,000
Lightspeed Venture Partners Select V, LP	14,071,847	10,000,000
Lightspeed Venture Partners VII, LP	4,444,276	0
Lightspeed Venture Partners XIII, LP	11,971,743	800,000
Lightspeed Venture Partners XIV-A, LP	6,479,114	4,387,500
Lightspeed Venture Partners XIV-B, LP	7,963,260	7,287,500
Menlo Special Opportunities Fund II, LP	41,070,626	2,100,000
Menlo Special Opportunities Fund III, LP	7,473,126	16,750,000
Menlo Ventures IX, LP	0	0
Menlo Ventures X, LP	1,215,887	0
Menlo Ventures XI, LP	12,210,540	0
Menlo Ventures XIV, LP	15,142,396	0
Menlo Ventures XV, LP	24,814,681	2,000,000
Menlo Ventures XVI, LP	3,129,990	11,700,000
Meritech Capital Partners Franchise Fund, LP	5,071,814	10,050,000
Meritech Capital Partners IV, LP	1,756,635	0
Meritech Capital Partners V, LP	14,120,321	400,000
Meritech Capital Partners VI, LP	42,160,409	1,700,000
Meritech Capital Partners VII, LP	32,212,736	12,112,500
Meritech Capital Partners VIII, LP	0	48,000,000
Meritech Capital Sidecar III, LP	0	12,000,000
Michigan Growth Capital Partners II, LP	79,785,179	0
Michigan Growth Capital Partners III, LP	124,948,522	11,557,515
Michigan Growth Capital Partners IV, LP	41,580,280	51,446,015
Michigan Growth Capital Partners, LP	17,742,593	5,282,862
Michigan SEMF Barings	81,418,835	77,040,337
Michigan SEMF Grosvenor	87,741,605	77,029,864
New Leaf Biopharma Opportunities II, LP	99,226,894	0
New Leaf Growth Fund I, LP	2,417,691	0
New Leaf Ventures II, LP	1,633,631	0
New Leaf Ventures III, LP	26,999,203	0
New Leaf Ventures IV, LP	65,136,969	14,750,000
Oak Investments Partners IX, LP	9,890	0
Ocqueoc Holdings, LLC	1,340,215	47,129,107
Odyssey Investment Partners Fund VI, LP	94,687,619	18,738,980
Permira Growth Opportunities I, LP 1	44,639,114	7,944,666
Permira Growth Opportunities II, SCSp	10,662,080	34,456,595
Permira VII, LP 1	83,682,323	9,441,534
Permira VIII, LP 2	31,911,794	50,149,152
Public Pension Capital, LLC	118,209,432	16,017,819
Renaissance Venture Capital Fund IV, LP	9,820,370	14,500,000
Renaissance Venture Capital Fund V, LP	400,000	19,600,000
Riverside Capital Appreciation Fund VI, LP	26,599,811	6,262,007

	Adjusted Reported Value	Unfunded Commitment
Riverside Capital Appreciation Fund VII, LP	86,378,669	18,213,255
Riverside Micro Cap Fund I, LP	3,855,450	4,096,758
Riverside Micro-Cap Fund II, LP	315,750	2,735,834
Riverside Micro-Cap Fund III, LP	46,460,658	4,823,424
Riverside Micro-Cap Fund IV, LP	68,074,569	6,709,650
Riverside Micro-Cap Fund IV B, LP	28,182,948	576,806
Riverside Micro-Cap Fund V, LP	131,000,360	8,151,007
Riverside Micro-Cap Fund VI, LP	38,796,056	87,149,234
Science Ventures Fund II, LP	49,597,117	1,000,000
Science Ventures Fund III, LP	11,068,056	8,750,000
Silver Lake Partners III, LP	6,047,508	11,910,583
Silver Lake Partners IV, LP	73,326,618	1,440,657
Silver Lake Partners V, LP	68,543,012	8,705,374
Silver Lake Partners VI, LP	83,732,060	5,113,763
Silver Lake SL SPV-2	34,374,756	0
SK Capital Partners V, LP	57,691,697	4,194,936
SKCP Catalyst Fund I-A, LP	36,501,815	8,742,129
SMRS - TOPE, LLC	5,154,078,720	411,551,571
SMRS-CAPP, LLC	414,705,901	158,831,651
SMRS-NCRP, LLC	1,166,455,577	888,658,994
Summit Partners Growth Equity Fund X, LP	113,502,295	27,239,778
Summit Partners Growth Equity Fund XI-A, LP	29,022,067	74,202,880
The Veritas Capital Fund VIII, LP	133,804,861	110,065,325
The Veritas Capital Vantage Fund, LP	30,240,697	32,426,480
Thoma Bravo Discover Fund II, LP	106,473,122	20,853,678
Thoma Bravo Discover Fund IV, LP	62,278,165	42,819,839
Thoma Bravo Explore II, LP	0	100,000,000
Thoma Bravo Fund XII, LP	183,243,129	36,904,285
Thoma Bravo Fund XIII, LP	184,637,292	10,504,042
Thoma Bravo Fund XV, LP	79,457,558	28,696,927
Thoma Bravo XIV, LP	128,327,261	14,760,303
TI Platform BOV, LP	16,370,799	3,660,903
TI Platform Fund II, LP	17,324,262	1,586,228
TI Platform Fund III, LP	9,759,004	15,106,789
TI Platform SMRS SMA, LP	113,660,861	22,502,690
TPG Healthcare Partners II, LP	9,211,547	29,153,188
TPG Healthcare Partners, LP	26,127,276	1,153,074
TPG IV, LP	77,182	211,725
TPG Partners IX, LP	30,719,697	83,419,441
TPG Partners VI, LP	3,341,448	7,467,821
TPG Partners VIII, LP	147,843,999	17,500,202
TPG Partners, VII, LP	60,192,531	2,589,333
TPG V, LP	305,614	5,841,509

	Adjusted Reported Value	Unfunded Commitment
TSG6, LP	7,881,135	11,913,637
TSG7 A, LP	115,318,956	20,863,038
TSG8, LP	124,746,449	14,154,656
TSG9, LP	39,903,173	131,667,783
Veritas Capital Fund V, LP	120,647,609	1,508,273
Veritas Capital Fund VI, LP	127,875,354	14,826,993
Veritas Capital Fund VII, LP	132,245,432	4,717,193
Veritas V Co-Investors, LP	66,862,907	0
Warburg Pincus Global Growth, LP	179,466,413	8,700,000
Warburg Pincus Private Equity IX, LP	236,619	0
Warburg Pincus Private Equity X, LP	5,499,560	0
Warburg Pincus Private Equity XI, LP	63,982,131	0
Warburg Pincus Private Equity XII Secondary, LP	19,223,754	0
Warburg Pincus Private Equity XII, LP	134,576,755	0
Total	\$ 22,834,973,594	\$ 7,935,255,094
Cash	93,802,130	0
Active Small Cap Cash	22,315,118	0
Active Small Cap	2,966,357	0
Income Accruals	0	0
Grand Total	\$ 22,954,057,199	\$ 7,935,255,094

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

** New Commitments made during quarter reported

State of Michigan Retirement System

REAL ESTATE AND INFRASTRUCTURE REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-0.7%	12.4%	7.6%	8.2%	9.4%
NCREIF NPI	-8.4%	2.3%	2.4%	3.3%	5.1%
Peer Median Returns	-5.5%	6.1%	4.9%	6.0%	8.1%

*State Street Universe greater than \$1 billion

- Outperformance relative to the one-year benchmark resulted primarily from the Real Estate and Infrastructure Division's (REID) strategy of being overweight in hospitality, underweight to office, and exposure to infrastructure and REIT sectors. Over the ten-year timeframe the REID is outperforming the benchmark by 430 basis points.

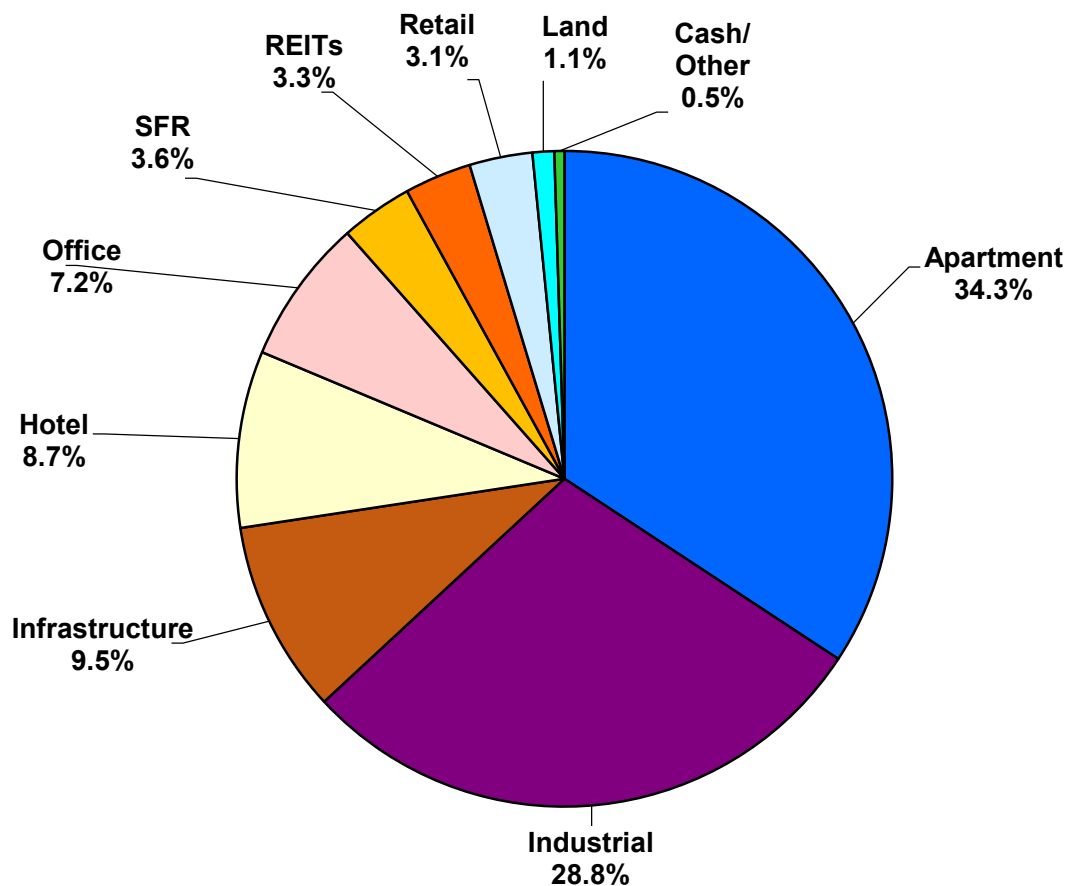
Strategy Update

- Impacts to commercial markets from the global pandemic have been uneven across the real estate and infrastructure sectors with some impacts transitory and others of a more lasting nature. New threats to markets have emerged and continued into the first quarter of 2024 including escalating geopolitical tensions, elevated levels of inflation and sharply higher interest rates. We continue to monitor, assess, and shift strategies, as necessary.
- In the real estate space, we are focused on sourcing off-market opportunities through our extensive network and where available reducing risk in the portfolio through early income-generating investments. 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 the potential for above market appreciation and total returns. In the infrastructure space, we continue to focus on diversified strategies and to identify those managers with top performing track records and best in class investment teams, who are pursuing opportunities in those sectors we have identified for allocation.
- We have been actively managing the portfolio with capital returned of approximately \$1.2 billion, and funding for new or existing investments of approximately \$1.4 billion the past 12 months.
- The REID has approximately \$2.9 billion in unfunded commitments. Two new commitments were made during the quarter.
 - \$100 million in BentallGreenOak Asia (USD) IV, LP, a closed-end Asia (x mainland China & India) multi-strategy real estate fund concentrating in the Japan office, logistics residential and hospitality sectors, managed by BGO.
 - \$100 million in Rialto Real Estate Fund V-Debt, LP, a closed-end commingled fund specializing in credit strategies including distressed debt, non-performing loans, subordinated debt, mezzanine, and commercial mortgage-backed securities, managed by Rialto Capital Management, LLC.

SMRS

Real Estate and Infrastructure

3/31/24

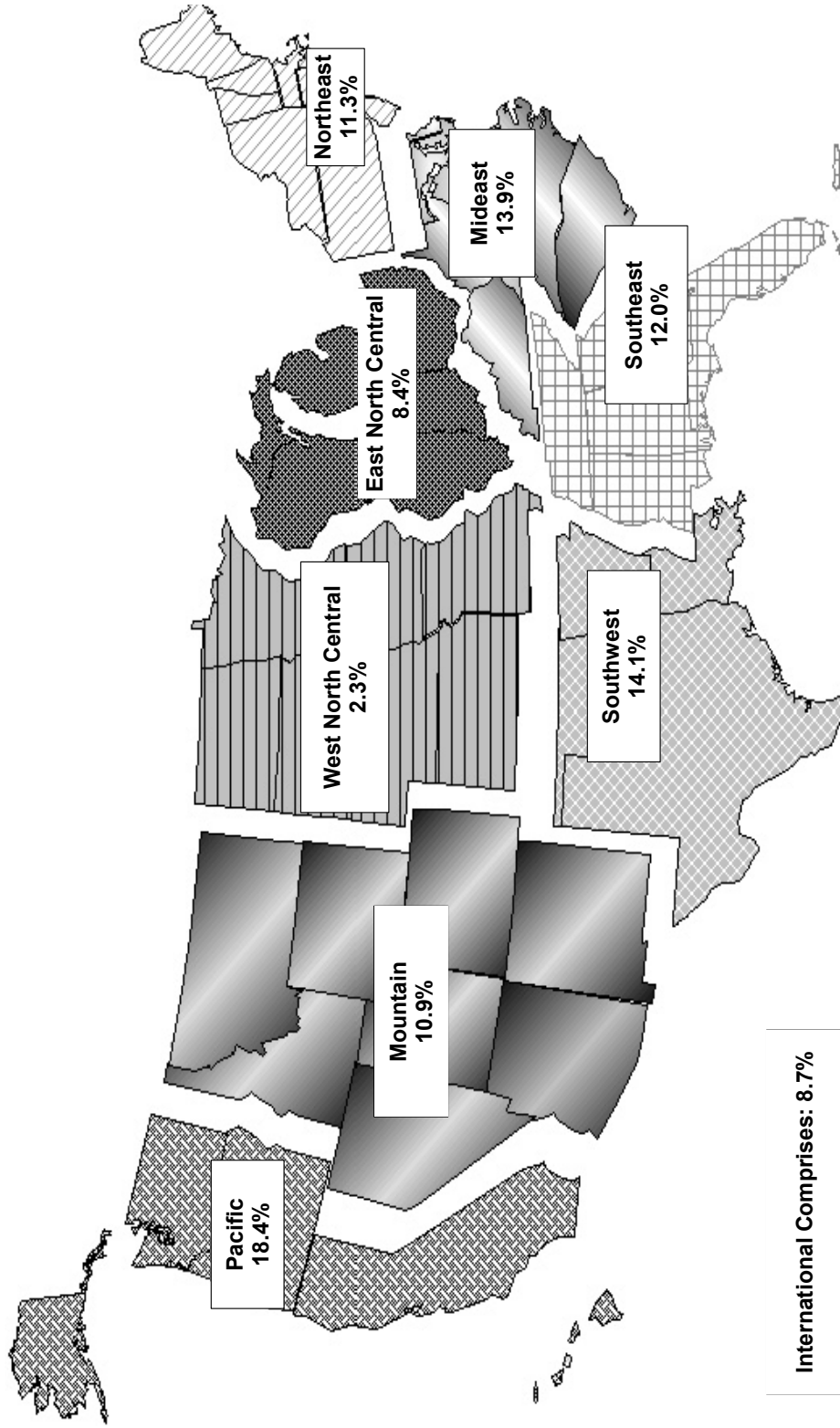


Market Value in Millions				
	<u>3/31/24</u>		<u>3/31/23</u>	
Apartment	\$3,377	34.3%	\$3,895	38.4%
Industrial	2,842	28.8%	2,817	27.8%
Infrastructure	937	9.5%	860	8.5%
Hotel	859	8.7%	808	8.0%
Office	706	7.2%	696	6.9%
SFR	350	3.6%	388	3.8%
REITs	325	3.3%	302	3.0%
Retail	306	3.1%	294	2.9%
Land	105	1.1%	51	0.5%
	<u>\$9,808</u>	<u>99.5%</u>	<u>\$10,111</u>	<u>99.7%</u>
Cash/Other	49	0.5%	26	0.3%
Total Investments	<u>\$9,857</u>	<u>100.0%</u>	<u>\$10,137</u>	<u>100.0%</u>

SMRS Real Estate 3/31/24

Investments by Region

(excludes public REITs & cash equivalents)



Geographic regions defined by NCREIF, whose property index composition is:

Pacific	Northeast	Southwest	Midwest	Mountain	East North Central	West North Central
32.5%	18.8%	10.9%	10.7%	7.3%	6.1%	1.1%

SMRS Real Estate

3/31/24

Market Value by Ownership Entity

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 20,877,955	\$ 0
AEW Senior Housing Investors IV, LP	33,340,522	8,318,844
AEW Senior Housing Investors III, LP	3,415,833	258,896
Albertsons Companies, Inc.	50,606,097	0
Apollo Asia Real Estate Fund, LP	47,096,814	11,673,757
Asana Partners Fund I, LP	32,453,394	2,449,559
Asana Partners Fund II, LP	48,987,821	8,092,905
Asana Partners Fund III, LP	39,207,174	56,666,667
Avanath Affordable Housing III, LLC	59,909,141	990,001
Avanath Affordable Housing IV, LLC	32,371,857	52,292
Avanath Affordable Housing Renaissance Fund, LP	44,949,162	0
* BentallGreenOak Asia (USD) IV, LP	0	100,000,000
BentallGreenOak Europe IV, LP	26,533,855	82,499,893
BentallGreenOak US Cold Storage, LP	19,479,734	54,643,205
BGO Europe III Co-Investment, LP	21,664,844	8,677,687
BlackRock MiREIT Fund	110,000,666	0
Blackstone Real Estate Partners IX, LP	223,673,162	31,744,637
Blackstone Real Estate Partners V.TE.2, LP	61,370	2,087,026
Blackstone Real Estate Partners VI, LP	166,409	3,680,930
Blackstone Real Estate Partners VIII, LP	52,700,514	9,864,920
Blackstone Real Estate Partners X LP	11,070,132	190,452,985
Carlyle Realty Partners IX, LP	21,575,393	74,719,308
CIM Fund III, LP	22,447,205	0
CIM Fund VIII, LP	60,825,475	0
CIM VI (Urban REIT), LLC	14,027,269	0
Clarion Gables Multifamily Trust, LP	35,653,775	0
Columbus Circle Holdings, LLC	267,067,465	177,987,473
Crown Small Cap Real Estate Fund II-T, LP	7,311,768	3,280,000
DM2501, LLC	8,861,691	28,941,409
Domain GVA-1, LLC	8,130,130	0
Domain Hotel Properties, LLC	398,567,785	0
Eastport Properties, LLC	83,060,319	1,239,010
GreenOak Europe III, LP	57,738,213	21,490,459
Heitman Core Real Estate Debt Income Trust, LP	43,988,016	0
Heitman Global Real Estate Fund II, LP	56,804,741	40,774,049
Heitman MiREIT Fund	108,698,839	0
IDR Core Property Index Fund, LLC	109,617,546	0
India Property Fund II, LLC	6,127,289	5,897,418
Invesco Mortgage Recovery Feeder Fund, LP	144,634	2,152,585
Invesco Mortgage Recovery Fund II, LP	14,991,434	18,116,596
Invesco Strategic Opportunities III, LP	21,375,487	82,461,385
IPF II Co-Invest, LP	6,453,184	2,168,655
ISO III SMRS Sidecar, LP	14,713,050	51,086,951
JBC Funds North LaSalle, LLC	24,000	0
KBS/SM Fund III, LP	173,685	0
KBS/SM Fund IV, LP	96,710,784	0
L&B Spartan Holdings LP	184,075,016	81,779,547
Landmark Real Estate Partners V, LP	107,797	0

	<u>Market Value</u>	<u>Unfunded Commitment</u>
LaSalle Asia Opportunity Fund III, LP	498,632	1,732,325
Lion Industrial Trust	461,738,342	0
Lion Mexico Fund, LP	2,379,961	0
Lombard International Life Assurance Company GVA0016	346,098,839	1,907,506
Lone Star Fund X (U.S), LP	96,838,891	21,734,113
Lone Star Fund XI, LP	142,744,685	30,218,979
Lone Star Fund XII, LP	0	300,000,000
Lubert-Adler Real Estate Fund VII, LP	27,013,960	1,875,000
M1-Westgate Co-Investor, LLC	65,689	0
M-301W Co-Investor, LLC	357,033	0
MERS Acquisitions Ltd	1,484,781	0
MIP Holdco, LLC	218,265,105	7,969,559
Morgan Stanley Real Estate Special Situations Fund III Institutional, LP	790,166	0
MWT Holdings, LLC	2,501,270,198	0
Northpark Land Associates, LLLP	40,567,899	4,719,836
Paladin Realty Brazil Investors III (US-A), LP	920,885	0
Paladin Realty Latin America Investors IV-CI, LP	28,395,764	0
Paladin Realty TB Co-Investment, LP	13,074,479	0
Penmain Office, LLC	104,257	0
Principal Data Center Growth & Income Fund, LP	580,402,297	400,000,000
Principal Separate Account	215,958,486	25,500,995
Principal MiREIT	106,402,467	0
Proprium Real Estate Special Situations Fund Institutional, LP	131,769,577	0
Rialto Credit Partnership, LP	7,683,120	0
Rialto Real Estate Fund III-Debt, LP	37,685,531	0
Rialto Real Estate Fund III-Property, LP	18,488,901	0
Rialto Real Estate Fund IV - Debt, LP	76,317,912	9,531,172
* Rialto Real Estate Fund V-Debt, LP	3,800,000	96,200,000
SFR CM, LP	103,852,583	4,950,495
SM Brell II, LP	134,704	0
SMP Data Center LLC	548,884,760	0
Stockbridge Real Estate Fund II-C, LP	876,377	0
Strategic II, LLC	407,252,904	45,879,616
TPG RE Finance Trust Inc.	37,243,148	0
TPG Real Estate Partners II, LP	794,192	6,591,117
TPG Real Estate Partners III, LP	30,180,386	15,673,382
TPG Real Estate Partners IV, LP	19,032,467	124,496,784
Transwestern Strategic Partners Fund III, LP	47,329,233	25,345,640
True North Real Estate Fund III, LLC	18,122,887	5,000,000
TSP Value and Income Fund II, LP	12,523,760	6,790,952
Warwick UK Real Estate Fund I	55,975,981	0
	\$ 8,871,159,687	\$ 2,300,617,320
Short Term Investments and Other	32,917,317	0
Total Real Estate Investments	\$ 8,904,077,004	\$ 2,300,617,320

* New or additional commitment made during the quarter

SMRS

Infrastructure

3/31/24

Market Value by Ownership Entity

	<u>Market Value</u>	<u>Unfunded Commitment</u>
ArcLight Energy Partners Fund VI, LP	\$ 15,639,094	\$ 7,004,763
ArcLight Energy Partners VII	42,670,881	13,599,256
ASF Como Co-Investment, LP	1,046,267	1,503,410
ASF VI Infrastructure B, LP	9,188,462	4,919,972
ASF VII Infrastructure Fund B, LP	25,279,024	6,616,006
ASF VIII Infrastructure B, LP	27,705,756	74,432,213
Basalt Infrastructure Partners, LP	8,660,038	2,219,045
Blackstone Energy Partners II, LP	62,183,854	12,752,989
Blackstone Energy Partners, LP	8,918,746	4,728,291
Blackstone Energy Transition Partners IV, LP	0	100,000,000
Blackstone Green Private Credit Fund III, LP	7,000,000	93,000,000
Brookfield Infrastructure Fund II-B, LP	44,302,026	2,825,603
Customized Infrastructure Strategies, LP	9,636,465	4,394,416
Dalmore Capital Fund	57,531,160	0
GCM Grosvenor Customized Infrastructure Strategies II, LP	30,188,497	6,240,942
GCM Grosvenor Customized Infrastructure Strategies III, LP	55,904,507	45,944,550
GCM Grosvenor Infrastructure Investment Program, LP	129,044,682	12,004,811
Global Energy & Power Infrastructure Fund II, LP	18,961,010	2,237,661
GSO Energy Select Opportunities Fund II, LP	10,285,582	34,754,176
GSO Energy Select Opportunities Fund, LP	2,939,298	22,498,007
Irradiant Renewable Opportunities Partners (TE), LP	33,568,307	68,473,232
KKR Eagle Co-Invest, LP	44,488,670	1,853,268
KKR Global Infrastructure Investors IV LP	66,220,972	40,920,901
KKR Global Infrastructure Investors, LP	18,514	2,943,773
Ridgewood Water & Infrastructure Fund, LP	45,147,049	8,706,747
Ridgewood Water & Strategic Infrastructure Fund II, LP	30,836,752	42,644,140
RPEP SMRS Holdings, LLC	14,129,922	0
StonePeak Infrastructure Fund, LP	30,674,277	7,806,336
TRG AIRRO Fund II	15,792,088	6,480,150
TRG AIRRO India SideCar Fund US, LLC	88,792,723	0
	\$ 936,754,623	\$ 631,504,657
Short Term Investments and Other	15,758,298	0
Total Infrastructure Investments	\$ 952,512,921	\$ 631,504,657
TOTAL INVESTMENTS	\$ 9,856,589,925	\$ 2,932,121,977

* New or additional commitment made during the quarter

State of Michigan Retirement System

REAL RETURN & OPPORTUNISTIC REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



Daniel J. Quigley
Senior Investment Manager
Real, Opportunistic, and Absolute Return Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Real & Opportunistic	8.9%	9.4%	11.6%	12.2%	11.0%
Custom Benchmark	6.8%	8.0%	7.4%	7.4%	7.3%

- The portfolio value is \$10.9 billion with a return of 8.9% for the past twelve-month period.
- Performance for the year has been driven by both income distributions and asset appreciation within the entertainment royalties and real assets portfolios.

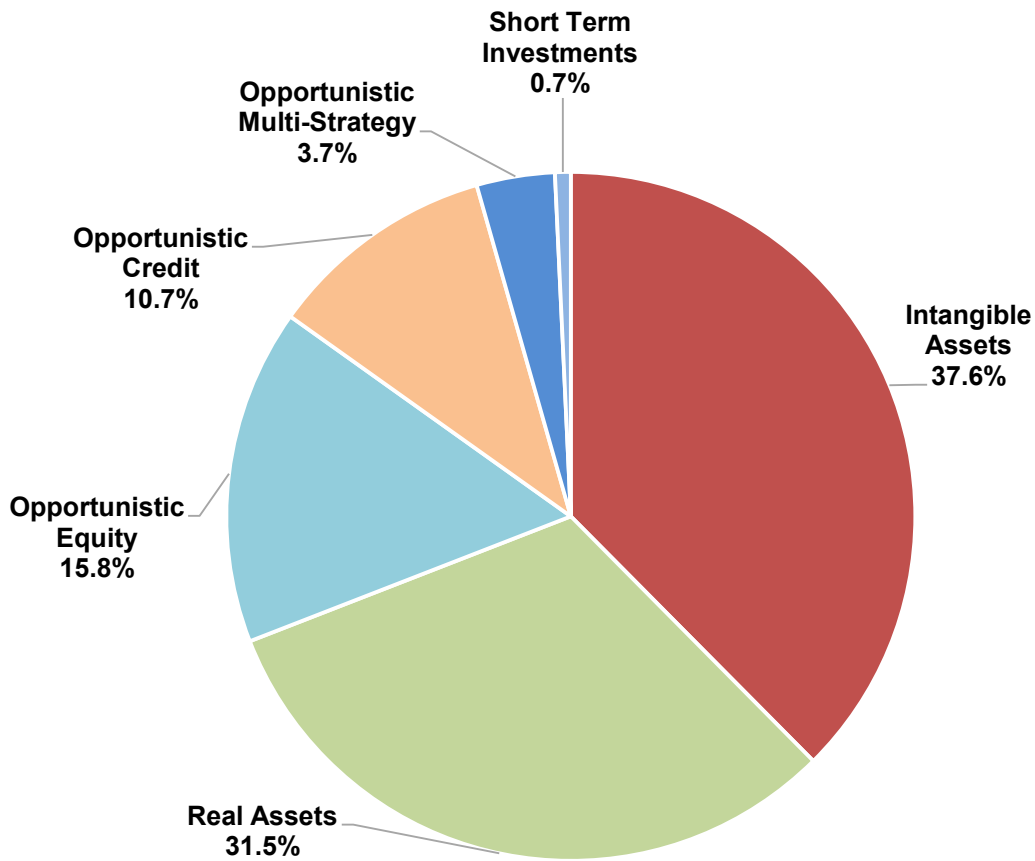
Strategy Update

- The objective of the Real Return & Opportunistic portfolio is to provide an inflation hedge and/or to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- During the quarter, the Real Return & Opportunistic portfolio continued to benefit from exposure to assets with low equity beta and diversity of strategy, industry, and geography.
- The Real Return & Opportunistic portfolio has approximately \$3.4 billion of unfunded commitments. The following are new commitments closed during the quarter.
 - \$150 million to Whitehorse Liquidity Partners GP Solutions Fund II, LP, a commingled fund managed by Whitehorse Liquidity Partners focused on non-control opportunities globally.
 - \$100 million to Origami Opportunities Fund V, LP, a commingled fund managed by Origami Capital Partners focused on non-control opportunities in North America and Europe.
 - \$100 million to Origami Opportunities Overflow Fund V, LP, a co-investment fund managed by Origami Capital Partners focused on non-control opportunities in North America and Europe.
- In addition to monitoring opportunities in the private capital markets along with macroeconomic developments, staff remains focused on finding differentiated strategies that are additive to the current portfolio mix and continues to favor niche private markets strategies with some scalability. Opportunities that have defensible, contractual cash flows and offer structural downside protection, specifically those with experienced investment teams and proven track records, are preferred.

SMRS

Real Return and Opportunistic 3/31/24

Investments By Strategy



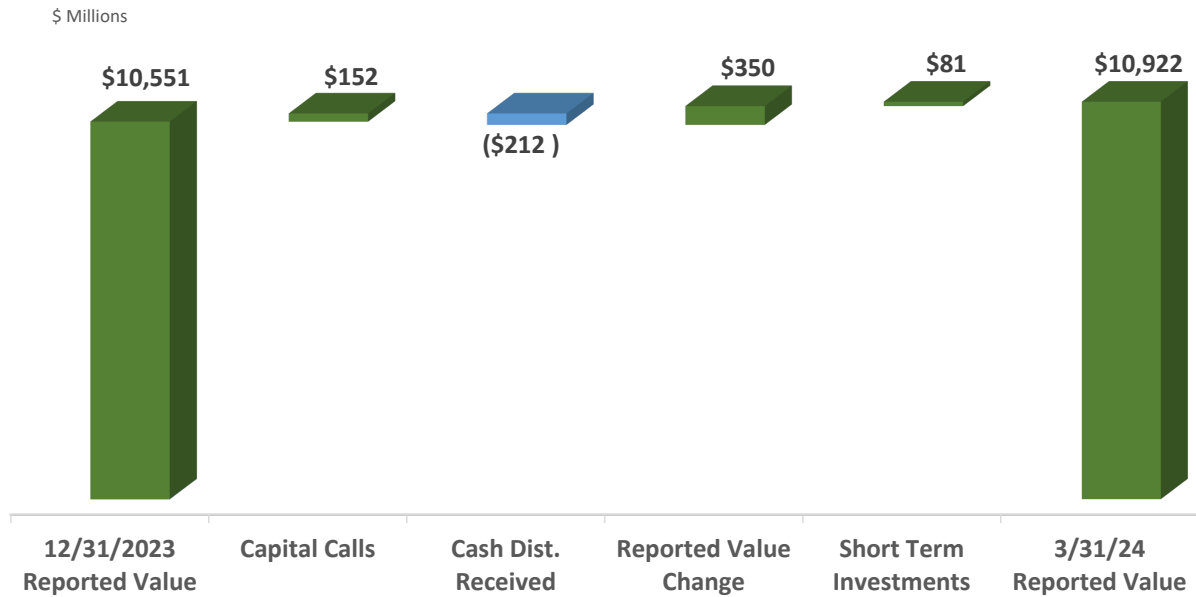
Market Value in Millions	
	<u>3/31/24</u>
Intangible Assets	\$4,103
Real Assets	3,443
Opportunistic Equity	1,722
Opportunistic Credit	1,172
Opportunistic Multi-Strategy	401
Short Term Investments	<u>81</u>
Total Investments	<u><u>\$10,922</u></u>

SMRS

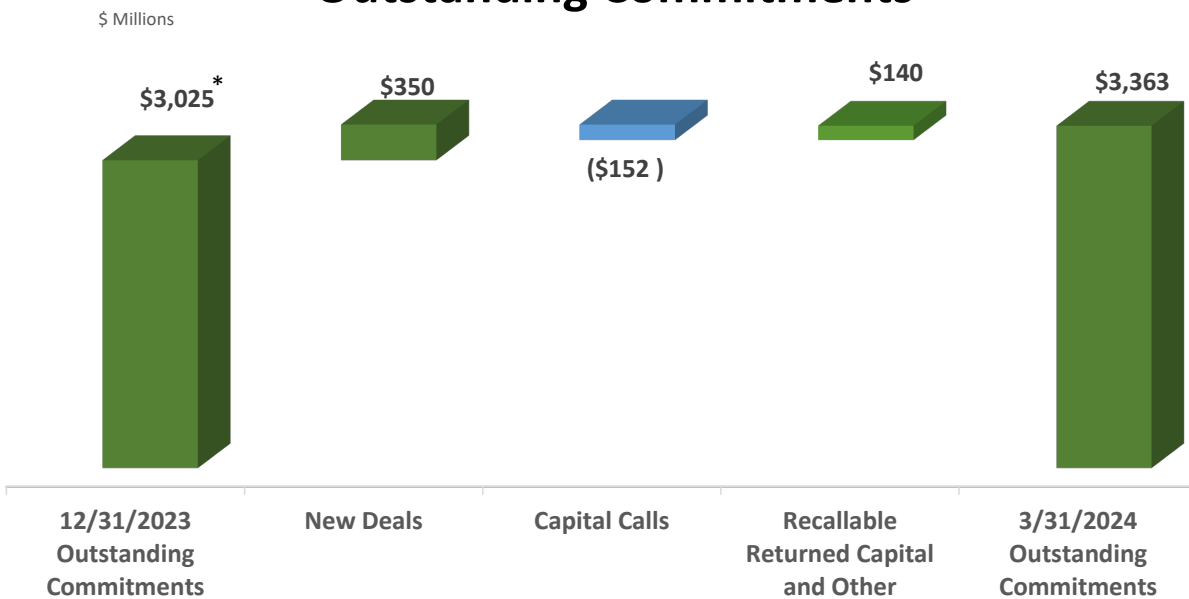
Real Return and Opportunistic

3/31/24

Invested Commitments



Outstanding Commitments



*Adjusted for transfers from RRO to PED

SMRS

Real Return and Opportunistic

3/31/24

Net Market Value by Entity

	Market Value	Unfunded Commitment
* Abernathy Fund I, LLC	\$ 231,708,573	\$ 4,948,241
* Abernathy Fund II	17,968,199	27,836,452
American Industrial Partners Capital Fund VIII, LP	0	100,000,000
American Industrial Partners VII, LP	92,962,866	18,237,768
Apollo Financial Credit Investments Fund II, LP	238,425,902	283,948,495
Apollo Financial Credit Investments Fund III, LP	185,839,525	240,597,919
Apollo HK TMS Investments Holdings, LP	0	0
Axton Holdings, LLC	3,594,765,027	0
Blackstone Strategic Capital Holdings (Side Car), LP	106,146,111	0
Blackstone Strategic Capital Holdings II, LP	157,227,569	93,740,417
Blackstone Strategic Capital Holdings, LP	114,720,085	15,174,695
Blue Peninsula Fund, LP	125,620,524	10,858,813
BroadRiver III, LP	147,160,706	59,487,103
BSCH Parallel (MLG) I, LP	315,375,821	0
Centerbridge Capital Partners III, LP	67,872,480	5,730,781
CircleUp Credit Fund I, LP	6,458,707	900,364
Clearlake Capital Partners VI, LP	112,539,950	3,718,307
Clearlake Opportunities Partners II, LP	44,120,052	28,259,580
Clearlake Opportunities Partners III, LP	22,116,756	77,006,311
Content Holdings, LLC	270,308,586	0
Energy Transition Holdings LLC	980,361,808	0
Green Range Holdings LLC	2,373,678,831	1,379,609,653
Hopen Life Sciences Fund II, LP	2,003,733	135,000
Nyanza I, LLC	0	2,222
Nyanza II, LLC	206,143,344	85,447,867
** Origami Opportunities Fund V, LP	25,657,902	74,342,098
** Origami Opportunities Overflow Fund V LP	0	100,000,000
* Renaissance Venture Cap Fund II, LP	22,477,711	0
* Renaissance Venture Cap Fund III, LP	29,533,881	2,250,000
Shamrock Capital Content Fund I, LP	32,018,819	35,427,069
Sixth Street Agriculture Partners I, LP	89,073,004	19,961,144
Sixth Street Growth Partners (A), LP	216,457,570	61,883,524
Sixth Street Growth Partners II (A), LP	62,976,316	138,683,542
Sixth Street TAO Partners (B), LP	235,219,042	124,067,523
* Social Network Holdings, LLC	411,908,670	0
Sycamore Partners III, LP	101,211,487	44,624,093
TPG Rise Climate, LP	121,247,230	138,661,188
Vida Insurance Credit Opportunity Fund II, LP	79,882,851	37,944,695
** Whitehorse Liquidity Partners GP Solutions Fund II, LP	0	150,000,000
Total Real Return and Opportunistic	\$ 10,841,189,638	\$ 3,363,484,863
Short Term Investments & Other	80,548,934	0
Grand Total	\$ 10,921,738,572	\$ 3,363,484,864

* Fund of Funds

** New Commitment

State of Michigan Retirement System

ABSOLUTE RETURN REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



Daniel J. Quigley
Senior Investment Manager
Real, Opportunistic, and Absolute Return Division

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Absolute Return	10.5%	8.3%	7.8%	7.0%	5.6%
HFRI FOF Conservative	5.4%	3.9%	4.9%	4.2%	3.4%

- The value of the Absolute Return portfolio is \$10.4 billion with a one-year return of 10.5%. The portfolio's performance was positive for both Private Credit and Hedge Funds.
- A contributor to Private Credit's positive performance this year has been the floating rate nature of the underlying investments, which allowed them to avoid price declines that were driven by rising interest rates during the Federal Reserve tightening cycle. Senior corporate credit, mortgage credit, and housing related exposures were all positive drivers of performance.
- In the Hedge Fund portfolio, core managers in the Credit and Multi-Strategy sleeves of the portfolio were the primary drivers of returns. Macro and Quant strategies also exhibited outperformance.
- Hedge Fund Credit strategies focused on Special Situations and Mortgage Credit investments outperformed as managers were able to take advantage of market dislocations. This credit outperformance was primarily driven by mortgage servicing and specialty finance strategies.
- In total, Hedge Fund and Private Credit strategies have taken advantage of higher market volatility and higher interest rates to generate strong risk adjusted returns.

Strategy Update

- The objective of the Absolute Return portfolio is to diversify the total plans' holdings, targeting returns above investment-grade fixed income with lower volatility than the equity portfolio. The portfolio utilizes a diverse mix of managers that invest both long and short to target specific exposures and seek to hedge out unwanted risk.
- No new commitments were closed during the quarter.
- In terms of allocation priorities, we expect to maintain the current allocation to hedge funds and will review investments on a relative value basis. We will also review credit strategies on an opportunistic basis.

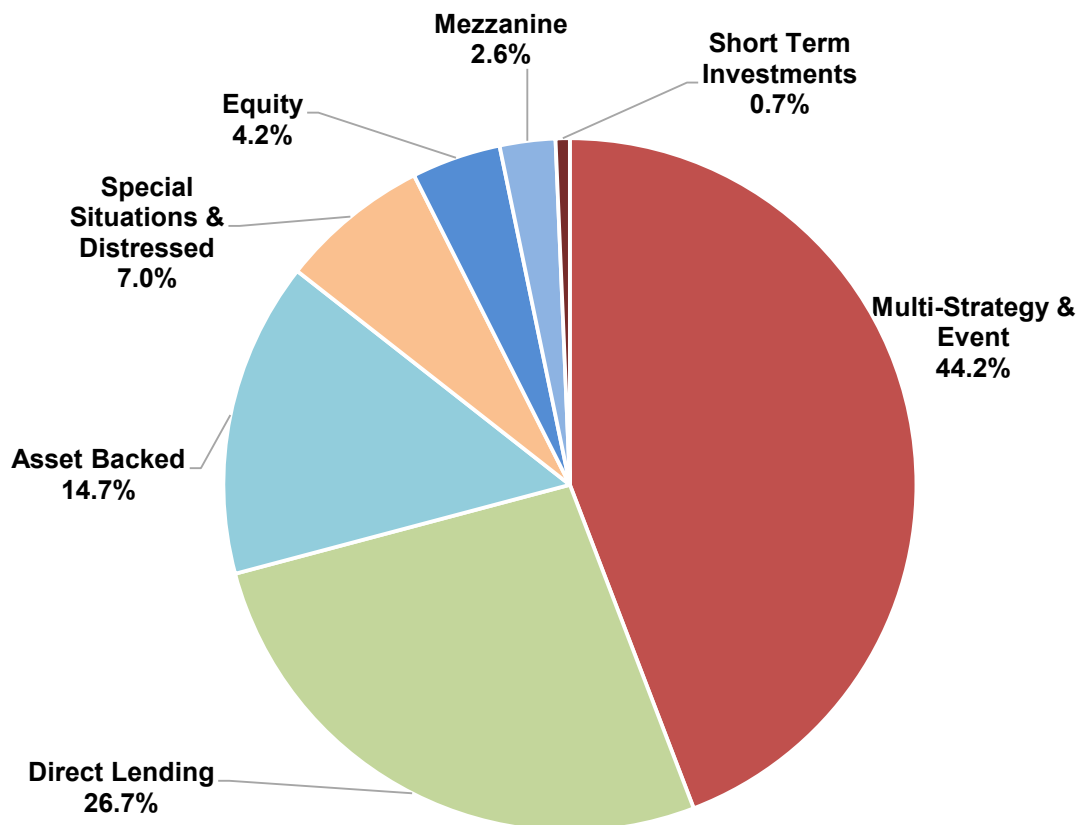
Overall, we will continue to focus on opportunities that seek to provide diversification, protect the downside, and deliver absolute return.

SMRS

Absolute Return

3/31/24

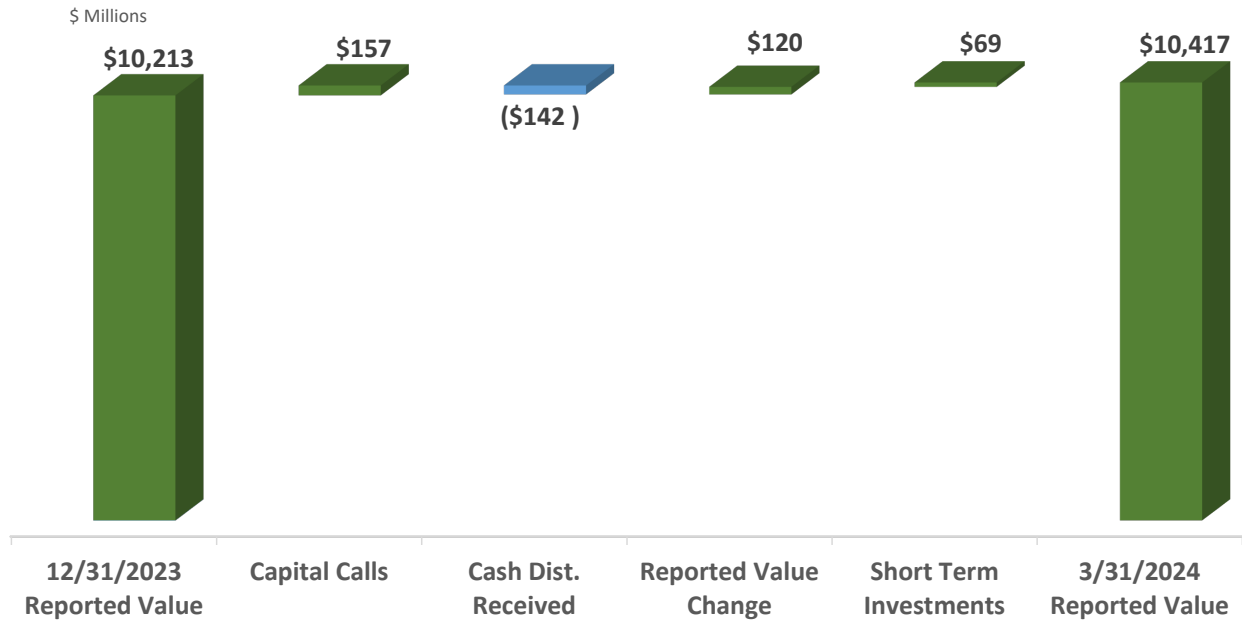
Investments By Strategy



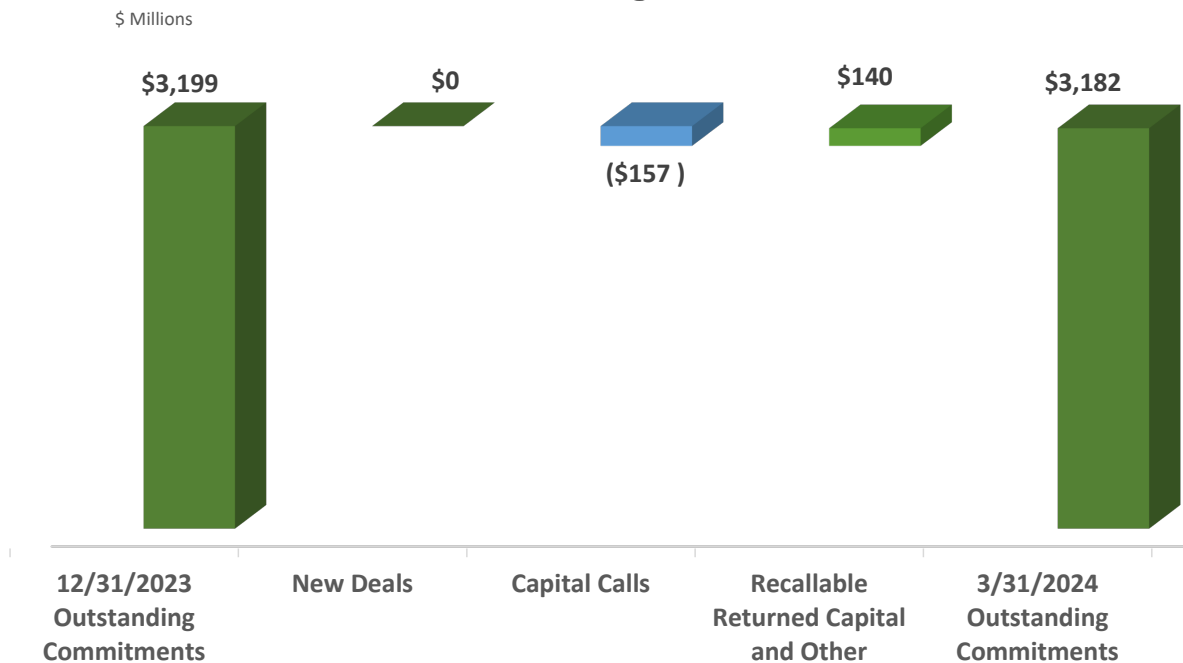
Market Value in Millions	
	3/31/24
Multi-Strategy & Event	\$ 4,603
Direct Lending	2,779
Asset Backed	1,532
Special Situations & Distressed	728
Equity	435
Mezzanine	270
Short Term Investments	69
Total Investments	\$ 10,417

SMRS Absolute Return 3/31/24

Invested Commitments



Outstanding Commitments



SMRS

Absolute Return

3/31/24

Net Market Value by Entity

	Net Market Value	Unfunded Commitment
Acacia Co-Invest, LP	\$ 339,427,883	\$ 0
AG Essential Housing, LP	14,137,907	58,000,000
Angelo Gordon Credit Solutions Fund II, LP	81,975,325	17,500,000
Angelo Gordon Credit Solutions Fund, LP	53,750,907	4,325,340
Apollo Accord+	226,606,349	97,359,608
Apollo MidCap FinCo Holdings, LTD	344,843,841	0
Apollo SCRF IV, LP	12,211,369	147,742,521
Blackstone Capital Opportunities Fund IV	78,850,247	74,082,556
Blackstone Capital Opportunities Fund IV Co-Invest	23,481,260	8,346,817
Blue Range Holdings, LLC	655,507,121	576,165,464
Castle Credit SMRS Holdings, LLC	151,517,976	71,382,271
Castle Credit SMRS Holdings, LLC Series C	100,458,260	6,127,256
Cerberus Manitou Residential Loan Fund, LP	285,014,928	21,214,615
Cerberus SMRS Partners, LP	10,228,219	23,304,657
EnTrust White Pine Partners, LP	4,022,068	0
Farallon Special Situations Fund II, LP	64,878,759	40,553,863
Fortress FCO MA MI, LP	110,578,074	25,408,921
Fortress MSR Opportunities Fund I A, LP	32,537,339	15,662,214
GSO Capital Opportunities Fund III, LP	20,070,834	26,504,994
GSO COF III Co-Investment Fund, LP	4,576,249	13,491,407
HarbourVest Credit Opportunities Fund II, LP	72,221,772	2,250,000
HarbourVest Credit Opportunities Fund III	0	75,000,000
Harbourvest Direct Lending Fund	97,329,647	12,500,000
HarbourVest Direct Lending II	0	60,000,000
HarbourVest Partners Mezzanine Income Fund	26,156,334	16,310,000
HPS Mezzanine Partners 2019, LP	44,329,749	10,985,845
HPS Red Cedar Fund, LP	307,350,114	125,048,311
Irradiant CLO Partners Fund II, LP (fka Kayne CLO Partners FD II)	53,985,528	21,183,140
Irradiant CLO Partners III	42,163,254	69,586,956
Irradiant Solutions Fund II, LP	202,152,524	197,110,282
Irradiant Solutions Fund, LP (fka Kayne)	110,690,972	128,900,703
Jana Strategic Investment Fund IV, LP	95,576,585	0
Kayne Anderson BDC, LLC (KABDC)	90,073,925	23,689,230
Lone Star Residential Mortgage Fund III	11,598,188	90,219,512
Marathon CLO Equity Fund, LP	9,573,467	0
Monument Park, LLC	93,278,804	0
MP Securitized Credit Fund, LP	466,767	0
Oaktree Opportunities Fund VIII, LP	119,475	0
OCM Opportunities Fund VIIb, LP	0	2,500,000
Owl Rock Technology Finance Corp II (ORTF II)	74,634,612	126,543,274
Owl Rock Technology Holdings II (ORTH II)	1,268,161	23,414,228
PIMCO Aviation Co-Invest Vehicle Onshore Feeder, LP	14,956,021	37,440,206
PIMCO Private Income Fund Onshore Feeder, LLC	94,496,859	0
Redding Ridge Holdings, LP	117,956,835	17,163,814

	Net Market Value	Unfunded Commitment
Sixth Street CLO Equity Fund IV	\$ 17,617,039	\$ 82,018,480
Sixth Street Lending Partners	185,342,745	343,903,710
Sixth Street Opportunities Partners IV (A), LP	75,135,221	13,874,861
Sixth Street Opportunities Partners V (A), LP	71,643,520	53,563,952
Sixth Street Specialty Lending Europe II (USD Feeder), LP	73,683,458	65,792,458
SJC DLF IV 10 Year-J, LLC	13,074,198	5,000,000
SJC Onshore Direct Lending Fund IV-SMRS, LP	290,568,604	135,728,363
SMRS-HVDL, LLC	106,065,042	11,210,800
Suttons Bay Fund LP	515,999,812	88,892,707
* Tahquamenon Fund, LP	4,598,881,095	0
TCW/Crescent Mezzanine Partners V, LP	0	12,395,466
TCW/Crescent Mezzanine Partners VC Secondary	397,336	0
TICP CLO Partners II, LP	26,305,864	1,480,904
TICP CLO Partners III, LP	79,365,288	4,411,277
Turning Rock Fund I, LP	31,943,131	16,319,293
Turning Rock Fund II, LP	68,310,821	8,513,715
Turning Rock Fund III, LP	18,447,827	71,552,173
* Visium Balanced Fund, LP	2	0
Total Absolute Return Strategies	\$ 10,347,835,512	\$ 3,181,676,164
Short-Term Investments & Other	69,063,621	0
Grand Total	\$ 10,416,899,133	\$ 3,181,676,164

* Fund of Funds

State of Michigan Retirement System

DEFINED CONTRIBUTION REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



Lan Hue Chen, CFA, CAIA
Senior Investment Manager
Defined Contribution, Trusts & Agencies Division

EXECUTIVE SUMMARY

Market Environment and Outlook

U.S. stocks enjoyed a strong first quarter as inflation's downward trend continued and U.S. economic growth beat expectations. The S&P 500 Index reached a new high and advanced by 10.56%. The communication services, energy, and information technology sectors led, while real estate and utilities lagged. Large-cap stocks outperformed small-caps and growth beat value. The Federal Open Market Committee voted to hold interest rates steady for the fifth consecutive time at its March meeting.

U.S. bonds slipped during the quarter amid persistently tight credit spreads and a rising U.S. Treasury yield curve. The Bloomberg U.S. Aggregate Bond Index fell -0.78%. The 10-year U.S. Treasury yield rose from 3.95% in January to 4.20% by quarter end on early concerns that lingering high inflation could change the Fed's rate cut plans; however, it remained essentially flat in March following favorable comments from Federal Reserve Chair Powell.

The U.S. economy remains strong, with positive gains in payrolls and productivity. Consumer spending momentum appears soft but stable. Household net worth has increased significantly since the pandemic, but consumer confidence remains below long-term averages due to the lasting negative impact of higher prices on consumers' psyches. The U.S. labor market remains robust but shows signs of softening. While inflation has fallen to more manageable levels, concerns about overheating persist.

Industry Update

Target date funds experienced record inflows in 2023. Target date fund assets hit a record high of \$3.5 trillion in 2023, according to Morningstar's 2024 Target-Date Strategy Landscape report. Growth included both market returns and net inflows of \$156 billion.

Assets continue to flow to the lowest-cost options. Only the cheapest 20% of funds saw net inflows; all other expense quintiles saw net outflows. Commensurate with the popularity of low-cost options, collective investment trust (CIT) vehicles, which are often less expensive than mutual funds, continued to garner assets. Morningstar indicates that 67% of net inflows went to collective investment trust vehicles (CITs). CITs currently hold 49% of target date assets, and CIT target date assets are expected to surpass those held by mutual funds by the end of 2024.

In addition, costs for target date funds continued to fall. According to Morningstar, the asset-weighted expense ratio for target-date funds fell to 0.30% in 2023, compared to 0.32% in 2022 and 0.58% in 2014.

SMRS

Defined Contribution Strategies

3/31/24

Markets	Amount		% of Total	Fee per \$1,000
QDIA (\$ in Millions)				
	<u>3/31/24</u>	<u>3/31/23</u>		
Total Target Date Fund	\$5,040	\$3,798	34.1%	\$0.55
Tier I Index Funds				
State Street S&P 500 Index Fund	\$2,267	\$1,746		\$0.13
State Street Bond Market Index Fund	1,177	1,064		0.20
State Street Global All Cap Equity ex-U.S. Index Fund	1,013	823		0.45
State Street S&P Mid Cap Index Fund	886	729		0.20
BlackRock Government Short-Term Investment CL F	288	255		0.56
BlackRock S&P Small Cap 600 Equity Index CL F	181	169		0.25
BlackRock Emerging Markets Index CL F	111	107		0.75
Total Tier I Index	\$5,924	\$4,892	40.1%	\$0.25
Tier II Active Funds				
Stable Value Fund	\$1,132	\$1,246		\$2.16
Dodge & Cox Stock Fund	738	636		4.10
Jennison Large Cap Growth Fund	633	416		2.78
American Funds EuroPacific Growth R6	263	254		4.70
T. Rowe Price Mid-Cap Value Fund	179	154		5.12
Artisan Mid Cap Fund	150	121		6.79
Voya Small Cap Growth Equity Fund	153	126		3.32
PIMCO Total Return I Fund	105	102		4.90
Ceredex Small-Cap Value Eq I	76	72		4.91
Prudential High Yield Fund	45	40		3.76
Total Tier II Active	\$3,475	\$3,168	23.5%	\$3.44
Tier III				
Total Self Directed Brokerage Account	\$353	\$258	2.4%	NA
Total Defined Contribution Assets	<u>\$14,792</u>	<u>\$12,116</u>	<u>100.0%</u>	\$1.09

*Loan Fund \$203M as of 3/31/24

NOTE: Totals may not be exact due to rounding.

Defined Contribution Performance by Fund

3/31/24

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>	<u>Since Inc</u>
State Street Target Retirement Income Fund	\$ 110,217,566	8.4	2.1	4.8	4.2	N/A
State Street Income Custom Index		8.4	2.1	4.7	4.1	N/A
Morningstar Target-Date Retirement		8.5	1.2	3.9	3.7	N/A
Variance State Street Income Custom Index		0.0	0.0	0.1	0.1	N/A
Variance Morningstar Target-Date Retirement		(0.1)	0.9	0.9	0.5	N/A
State Street Target Retirement 2020 Fund	\$130,859,572	8.9	2.3	5.6	5.3	N/A
State Street 2020 Custom Index		9.0	2.3	5.6	5.2	N/A
Morningstar Target-Date 2020		10.7	1.9	5.4	5.2	N/A
Variance State Street 2020 Custom Index		(0.1)	0.0	0.0	0.1	N/A
Variance Morningstar Target-Date 2020		(1.8)	0.4	0.2	0.1	N/A
State Street Target Retirement 2025 Fund	\$303,338,204	11.4	2.6	6.9	6.3	N/A
State Street 2025 Custom Index		11.5	2.6	6.8	6.2	N/A
Morningstar Target-Date 2025		11.6	2.2	5.9	5.6	N/A
Variance State Street 2025 Custom Index		(0.1)	0.0	0.1	0.1	N/A
Variance Morningstar Target-Date 2025		(0.2)	0.4	1.0	0.7	N/A
State Street Target Retirement 2030 Fund	\$438,485,515	14.2	3.2	7.8	6.9	N/A
State Street 2030 Custom Index		14.3	3.1	7.8	6.9	N/A
Morningstar Target-Date 2030		13.7	2.9	7.0	6.4	N/A
Variance State Street 2030 Custom Index		(0.1)	0.1	0.0	0.0	N/A
Variance Morningstar Target-Date 2030		0.5	0.3	0.8	0.5	N/A
State Street Target Retirement 2035 Fund	\$543,823,355	15.6	3.5	8.4	7.3	N/A
State Street 2035 Custom Index		15.7	3.4	8.3	7.3	N/A
Morningstar Target-Date 2035		16.1	3.9	8.0	7.1	N/A
Variance State Street 2035 Custom Index		(0.1)	0.1	0.1	0.0	N/A
Variance Morningstar Target-Date 2035		(0.5)	(0.4)	0.4	0.2	N/A
State Street Target Retirement 2040 Fund	\$571,650,822	16.7	3.8	8.9	7.6	N/A
State Street 2040 Custom Index		16.8	3.8	8.8	7.6	N/A
Morningstar Target-Date 2040		18.4	4.7	8.9	7.7	N/A
Variance State Street 2040 Custom Index		(0.1)	0.0	0.1	0.0	N/A
Variance Morningstar Target-Date 2040		(1.7)	(0.9)	0.0	(0.1)	N/A
State Street Target Retirement 2045 Fund	\$637,040,918	17.8	4.1	9.3	7.9	N/A
State Street 2045 Custom Index		17.9	4.1	9.2	7.9	N/A
Morningstar Target-Date 2045		20.0	5.3	9.5	8.0	N/A
Variance State Street 2045 Custom Index		(0.1)	0.0	0.1	0.0	N/A
Variance Morningstar Target-Date 2045		(2.2)	(1.2)	(0.2)	(0.1)	N/A
State Street Target Retirement 2050 Fund	\$837,654,991	18.8	4.4	9.6	8.1	N/A
State Street 2050 Custom Index		18.9	4.3	9.5	8.0	N/A
Morningstar Target-Date 2050		20.8	5.5	9.8	8.2	N/A
Variance State Street 2050 Custom Index		(0.1)	0.1	0.1	0.1	N/A
Variance Morningstar Target-Date 2050		(2.0)	(1.1)	(0.2)	(0.1)	N/A
State Street Target Retirement 2055 Fund	\$897,943,892	18.9	4.4	9.6	8.1	N/A
State Street 2055 Custom Index		19.0	4.4	9.6	8.0	N/A
Morningstar Target-Date 2055		21.1	5.6	9.9	8.2	N/A
Variance State Street 2055 Custom Index		(0.1)	0.0	0.0	0.1	N/A
Variance Morningstar Target-Date 2055		(2.2)	(1.2)	(0.3)	(0.1)	N/A
State Street Target Retirement 2060 Fund	\$479,692,245	18.9	4.4	9.6	N/A	8.1
State Street 2060 Custom Index		19.0	4.4	9.6	N/A	8.0
Morningstar Target-Date 2060		21.4	5.7	10.0	N/A	8.2
Variance State Street 2060 Custom Index		(0.1)	0.0	0.0	N/A	0.0
Variance Morningstar Target-Date 2060		(2.5)	(1.3)	(0.4)	N/A	(0.2)

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>	<u>Since Inc</u>
State Street Target Retirement 2065 Fund	\$89,310,217	18.9	4.4	N/A	N/A	8.5
<i>State Street 2065 Custom Index</i>		19.0	4.4	N/A	N/A	8.4
<i>Morningstar Target-Date 2065+</i>		21.5	5.8	N/A	N/A	9.3
<i>Variance State Street 2065 Custom Index</i>		(0.1)	0.0	N/A	N/A	0.0
<i>Variance Morningstar Target-Date 2065+</i>		(2.6)	(1.4)	N/A	N/A	(0.9)
TIER 1						
State Street S&P 500 Index Fund	\$2,266,746,271	29.9	11.5	15.0	12.9	N/A
<i>S&P 500 Index</i>		29.9	11.5	15.0	13.0	N/A
<i>Morningstar Large Blend</i>		27.2	9.9	13.6	11.5	N/A
<i>Variance S&P 500 Index</i>		0.0	0.0	0.0	(0.1)	N/A
<i>Variance Morningstar Large Blend</i>		2.7	1.6	1.4	1.4	N/A
State Street US Bond Index Fund	\$1,177,440,623	1.7	(2.5)	0.4	1.5	N/A
<i>Bloomberg U.S. Aggregate Bond Index</i>		1.7	(2.5)	0.4	1.5	N/A
<i>Morningstar Intermediate Core Bond</i>		2.0	(2.5)	0.4	1.4	N/A
<i>Variance Bloomberg U.S. Aggregate Bond Index</i>		0.0	0.0	0.0	0.0	N/A
<i>Variance Morningstar Intermediate Core Bond</i>		(0.3)	0.0	0.0	0.1	N/A
State Street Global All Cap Equity ex-U.S. Index Fund	\$1,012,923,969	13.1	1.9	6.2	4.5	N/A
<i>MSCI ACWI ex USA IMI (Net)</i>		13.2	1.7	6.0	4.3	N/A
<i>Morningstar Foreign Large Blend</i>		13.5	2.9	6.6	4.5	N/A
<i>Variance MSCI ACWI ex USA IMI (Net)</i>		(0.1)	0.2	0.2	0.2	N/A
<i>Variance Morningstar Foreign Large Blend</i>		(0.4)	(1.0)	(0.4)	0.0	N/A
State Street S&P Mid Cap Index Fund	\$886,348,631	23.4	7.0	11.7	10.0	N/A
<i>S&P 400 Index</i>		23.3	7.0	11.7	10.0	N/A
<i>Morningstar Mid-Cap Blend</i>		22.5	6.5	10.9	9.0	N/A
<i>Variance S&P 400 Index</i>		0.1	0.0	0.0	0.0	N/A
<i>Variance Morningstar Mid-Cap Blend</i>		0.9	0.5	0.8	1.0	N/A
BlackRock Government Short-Term Investment Fund	\$288,291,708	5.4	2.7	2.0	1.4	N/A
<i>FTSE Treasury Bill 1 Mon USD</i>		5.4	2.7	2.0	1.3	N/A
<i>Variance FTSE Treasury Bill 1 Mon USD</i>		0.0	0.0	0.0	0.1	N/A
BlackRock S&P Small Cap 600 Equity Index Fund	\$181,272,317	16.2	2.4	9.2	N/A	N/A
<i>S&P SmallCap 600 Index</i>		15.9	2.3	9.1	N/A	N/A
<i>Morningstar Small Blend</i>		18.9	3.4	9.3	N/A	N/A
<i>Variance S&P SmallCap 600 Index</i>		0.3	0.1	0.1	N/A	N/A
<i>Variance Morningstar Small Blend</i>		(2.7)	(1.0)	(0.1)	N/A	N/A
BlackRock Emerging Markets Index Fund	\$111,344,132	7.1	(5.4)	2.0	2.8	N/A
<i>MSCI Emerging Market (Net)</i>		8.2	(5.1)	2.2	2.9	N/A
<i>Morningstar Diversified Emerging Mkts</i>		10.3	(3.8)	3.2	3.0	N/A
<i>Variance MSCI Emerging Market (Net)</i>		(1.1)	(0.3)	(0.2)	(0.1)	N/A
<i>Variance Morningstar Diversified Emerging Mkts</i>		(3.2)	(1.6)	(1.2)	(0.2)	N/A
TIER 2						
Stable Value Fund	\$1,132,206,149	2.4	2.0	2.1	2.2	N/A
<i>BofA Merrill Lynch US 3-Month Treasury Bill Index</i>		5.2	2.6	2.0	1.4	N/A
<i>Hueler Universe</i>		3.0	2.3	2.3	2.1	N/A
<i>Variance BofA Merrill Lynch US 3-Month Treasury Bill Index</i>		(2.8)	(0.6)	0.1	0.8	N/A
<i>Variance Hueler Universe</i>		(0.6)	(0.3)	(0.2)	0.1	N/A
Dodge & Cox Stock Fund	\$738,428,638	25.8	10.6	13.5	11.0	N/A
<i>Russell 1000 Value Index</i>		20.3	8.1	10.3	9.0	N/A
<i>Morningstar Large Value</i>		20.7	8.9	10.9	9.1	N/A
<i>Variance Russell 1000 Value Index</i>		5.5	2.5	3.2	2.0	N/A
<i>Variance Morningstar Large Value</i>		5.1	1.7	2.6	1.9	N/A
Jennison Large Cap Growth Equity Fund	\$633,362,329	46.7	8.2	16.6	15.8	15.6
<i>Russell 1000 Growth Index</i>		39.0	12.5	18.5	16.0	15.7
<i>Morningstar Large Growth</i>		36.5	8.0	14.9	13.2	12.4
<i>Variance Russell 1000 Growth Index</i>		7.7	(4.3)	(1.9)	(0.2)	(0.1)
<i>Variance Morningstar Large Growth</i>		10.2	0.2	1.7	2.6	3.2

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>	<u>Since Inc</u>
American Funds EuroPacific Growth R6 Fund	\$262,789,790	13.5	(0.2)	6.9	5.6	N/A
MSCI ACWI Ex USA NR USD		13.3	1.9	6.0	4.3	N/A
Morningstar Foreign Large Growth		13.0	0.0	7.2	5.7	N/A
Variance MSCI ACWI Ex USA NR USD		0.2	(2.1)	0.9	1.3	N/A
Variance Morningstar Foreign Large Growth		0.5	(0.2)	(0.3)	(0.1)	N/A
T. Rowe Price Mid-Cap Value Fund	\$179,289,235	28.8	11.5	13.5	10.4	N/A
Russell Midcap Value Index		20.4	6.8	9.9	8.6	N/A
Morningstar Mid-Cap Value		20.8	8.0	10.6	8.2	N/A
Variance Russell Midcap Value Index		8.4	4.7	3.6	1.8	N/A
Variance Morningstar Mid-Cap Value		8.0	3.5	2.9	2.2	N/A
Voya Small Cap Growth Equity Fund	\$153,186,196	24.7	1.0	7.6	7.3	N/A
Russell 2000 Growth Index		20.3	(2.7)	7.4	7.9	N/A
Morningstar Small Growth		18.1	(2.0)	9.1	8.8	N/A
Variance Russell 2000 Growth Index		4.4	3.7	0.2	(0.6)	N/A
Variance Morningstar Small Growth		6.6	3.0	(1.5)	(1.5)	N/A
Artisan Mid Cap Fund	\$150,005,849	22.3	(0.2)	11.7	10.2	N/A
Russell Midcap Growth Index		26.3	4.6	11.8	11.4	N/A
Morningstar Mid-Cap Growth		23.0	1.1	10.6	10.1	N/A
Variance Russell Midcap Growth Index		(4.0)	(4.8)	(0.1)	(1.2)	N/A
Variance Morningstar Mid-Cap Growth		(0.7)	(1.3)	1.1	0.1	N/A
PIMCO Total Return I Fund	\$105,106,168	3.3	(2.2)	0.8	1.8	N/A
Bloomberg U.S. Aggregate Bond Index		1.7	(2.5)	0.4	1.5	N/A
Morningstar Intermediate Core-Plus Bond		2.9	(2.3)	0.7	1.7	N/A
Variance Bloomberg U.S. Aggregate Bond Index		1.6	0.3	0.4	0.3	N/A
Variance Morningstar Intermediate Core-Plus Bond		0.4	0.1	0.1	0.1	N/A
Virtus Ceredex Small-Cap Value Eq I Fund	\$75,994,634	15.4	6.5	8.3	7.3	N/A
Russell 2000 Value Index		18.8	2.2	8.2	6.9	N/A
Morningstar Small Blend		18.9	3.4	9.3	7.7	N/A
Variance Russell 2000 Value Index		(3.4)	4.3	0.1	0.4	N/A
Variance Morningstar Small Blend		(3.5)	3.1	(1.0)	(0.4)	N/A
Prudential High Yield Fund	\$44,872,381	10.0	1.6	4.3	N/A	4.6
Bloomberg U.S. Corp. HY 1% Issuer Cap Index		11.2	2.2	4.1	N/A	4.6
Morningstar High Yield Bond		10.4	2.1	3.8	N/A	3.5
Variance Bloomberg U.S. Corp. HY 1% Issuer Cap Index		(1.2)	(0.6)	0.2	N/A	0.1
Variance Morningstar High Yield Bond		(0.4)	(0.5)	0.5	N/A	1.1

TIER 3

Self Directed	\$352,573,206
TOTAL	\$14,792,199,524
Loan Fund:	\$202,725,219

State of Michigan Retirement System

DOMESTIC EQUITY REVIEW

State of Michigan Investment Board Meeting
June 12, 2024



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	35.6%	10.2%	14.0%	13.8%	12.4%
S&P 1500	29.2%	11.0%	14.7%	13.7%	12.7%
Peer Median Return	20.9%	6.6%	11.0%	11.2%	9.5%

*State Street Universe greater than \$1 billion

- For the year ended March 31 2024, the Domestic Equity Division (DED) outperformed its peer group over all time periods, including by 1470 bps over the past twelve months. This performance beat the median larger sized pension fund equity portfolio by a cumulative 33%, or 290 bps annualized, over the past decade.
- DED also outperformed the S&P 1500 by 640 bps over the past year and by 10 bps over the last 7 years, while underperforming the market over other time periods.
- Technology related communication services companies rebounded strongly in 2023, and continued their upward rise in Q1 of 2024, fueling outperformance from a number of our managers and driving the division's 35.6% one-year return.
- Performance was especially strong across our internal manager lineup, with all of our six portfolio managers outperforming the S&P 1500. As of March 31, 2024, our internal management group is outperforming the S&P 1500 over one, three, five and seven years.
- On the external manager side, Patient Capital beat the S&P 1500 by over 10%, LA Capital beat the market by over 5% and Michigan-based Ancora Small Cap outperformed by nearly 2%.
 - Patient Capital is a young firm that is relatively new to our lineup. Headed by Samantha McLemore, who has over 20 years of experience in the industry and an exceptional track record of outperformance, it is an intrinsic value focused shop that owns a diverse assortment of companies that are often owned by managers with differing styles.
 - LA Capital has been in our lineup for nearly 20 years, has an outstanding track record over that time and is generally one of our most consistent managers.
 - Ancora Small Cap's outperformance is especially notable because small cap stocks have been out of favor for the past year and have trailed the market by a significant margin.

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's portfolio remains undervalued when measured against ours and outside analysts' estimates of fair value, trading at roughly a 5% discount to the S&P 1500 on this year's earnings. In addition, the portfolio is more profitable and growing faster than the market.
- While it's still possible that the Fed's aggressive rate hikes over the past year could send the economy into recession, we believe the market is nevertheless poised to return from 8%-9% over the next decade from current levels.
- DED continues to be overweight technology related communication services companies as well as financials.
- With a beta of 1.10, an up market would be a tailwind for the division, while a recession or stock correction would be a headwind. Over time and most often the stock market appreciates alongside economic growth.

Market Environment and Outlook

- At ~20.3x forward earnings, equity markets trade at an earnings yield (earnings/price) of 4.9%, or ~40 bps higher than 10-year treasury bonds at roughly 4.5%, or ~22.2x earnings.
- Historically, stocks have traded at an earnings yield approximately 125 bps higher than bonds, or 85 bps higher than they are now, suggesting that stocks are slightly expensive relative to bonds.
 - One could also argue that the market deserves to trade at a higher multiple than it has historically given its larger concentration of dominant and fast-growing technology companies relative to the past.
- Over time we calculate the market's go forward return at roughly 8.4% - below its historical average of 10% - driven by a dividend yield of 1.4% and dividend per share growth of 7.0%.
 - Dividends per share driven by capital reinvestment rate of 4.9% and further 2.1% growth via share buybacks.

SMRS

Domestic Equity Strategies

3/31/24

Markets	Amount	Total	% of Total
Internal Indexed (\$ in Millions)			
Indexed Portfolios	\$13,990		
Total Indexed		\$13,990	62.1%
Internal Active			
Active Portfolios	\$5,948		
Total Internal Active		\$5,948	26.4%
External Active			
Martin Currie US LT Unconstrained	\$611		
Los Angeles Capital	330		
ARK Investments	298		
Clarkston Capital Partners	258		
Seizert Capital Partners	240		
Bivium Capital	222		
Attucks Asset Management	200		
Patient Capital	187		
Ancora	130		
Managed Asset Portfolios	113		
Total External Active		\$2,589	11.5%

Total Domestic Equity

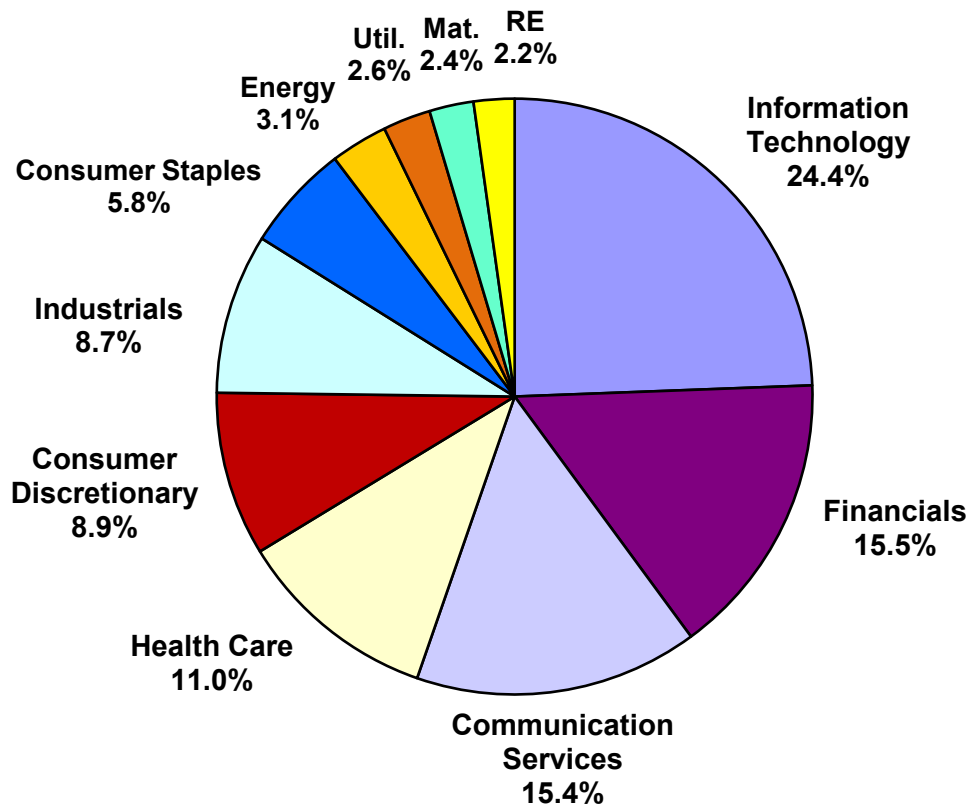
\$22,527

100.0%

SMRS

Domestic Equity By Sector

3/31/24



Market Value in Millions				
3/31/24				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Information Technology	\$5,508	24.4%	28.0%	-3.6%
Financials	3,496	15.5%	13.5%	2.1%
Communication Services	3,466	15.4%	8.4%	7.0%
Health Care	2,474	11.0%	12.1%	-1.1%
Consumer Discretionary	1,997	8.9%	10.8%	-1.9%
Industrials	1,963	8.7%	9.8%	-1.1%
Consumer Staples	1,314	5.8%	5.8%	0.0%
Energy	695	3.1%	4.1%	-1.0%
Utilities	586	2.6%	2.3%	0.3%
Materials	537	2.4%	2.7%	-0.3%
Real Estate	491	2.2%	2.7%	-0.5%
Total	<u>\$22,527</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: S&P 1500

SMRS

Domestic Equities Composite

3/31/24

	<u>3/31/24</u>	<u>12/31/23</u>	<u>9/30/23</u>	<u>6/30/23</u>
Assets (\$ in Millions):	\$22,527	\$19,730	\$18,565	\$19,168
Number of Securities:	2,043	1,696	1,954	1,940
Active Share:	35%	27%	27%	31%

Description: The Domestic Equities Composite seeks to deliver excess returns through a blend of index investing and active management with value-added, but diverse strategies. While the goal is for most managers to outperform in the long run, the composite is designed such that they do so during differing parts of the business cycle.

	<u>SMRS</u>	<u>S&P 1500</u>
Characteristics:		
Market Cap. (\$ in Billions)	\$805.8	\$739.5
FY1 P/E	20.3	21.4
P/E upside to S&P 1500	5.5%	0.0
Return on Equity	31.3%	19.4%
Risk Metrics		
Beta	1.10	1.00
Tracking Error	2.7%	0.0%
Projected Returns		
Dividend Yield	1.7%	1.4%
Buyback Yield	2.2%	2.1%
Reinvestment Rate	<u>6.3%</u>	<u>4.9%</u>
Projected Investment Return	10.2%	8.4%

TOP TEN EXPOSURES - Domestic Equities vs S&P 1500

<u>Domestic Equity Portfolio</u>		<u>S&P 1500</u>	
<u>Company Name</u>	<u>Portfolio Weight</u>	<u>Company Name</u>	<u>Market Weight</u>
Meta Platforms Inc. Class A	6.7%	Microsoft Corporation	6.5%
Microsoft Corporation	5.7%	Apple Inc.	5.2%
NVIDIA Corporation	5.2%	NVIDIA Corporation	4.7%
Cash and Equivalents	4.3%	Amazon.com Inc.	3.4%
Alphabet Inc. Class A	4.0%	Meta Platforms Inc. Class A	2.2%
Apple Inc.	4.0%	Alphabet Inc. Class A	1.9%
Amazon.com Inc.	3.0%	Berkshire Hathaway Inc. Cl. B	1.6%
American Express Company	2.0%	Alphabet Inc. Class C	1.6%
Apollo Global Management Inc	1.9%	Eli Lilly and Company	1.3%
Verizon Communications Inc.	<u>1.6%</u>	Broadcom Inc.	<u>1.2%</u>
TOTAL	<u>38.2%</u>	TOTAL	<u>29.5%</u>

Domestic Equity Performance - Net of Fees

3/31/24

<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>Incept.</u>	<u>Incept. Date</u>
SMRS S&P 500 Index	\$13,202,647,831	29.8%	11.4%	15.0%	14.1%	--	N/A
S&P 500		29.9%	11.5%	15.0%	14.1%	--	
Style & Risk Adj Benchmark		29.9%	11.5%	15.0%	14.1%	--	
Lipper Lg-Cap Core		29.5%	10.5%	14.3%	13.4%	--	
<i>Excess Return</i>		-0.1%	-0.1%	-0.1%	0.0%	--	
<i>Alpha</i>		-0.1%	0.0%	0.0%	0.0%	--	
<i>Pct. Rank vs Lipper LI-Cap Core</i>		52	34	33	32	--	
SMRS Large-Cap Core	\$2,325,390,868	104.0%	32.2%	26.1%	23.4%	13.7%	8/31/07
S&P 500		29.9%	11.5%	15.0%	14.1%	10.2%	
Style & Risk Adj Benchmark		54.9%	13.4%	17.6%	18.8%	12.1%	
Lipper Large-Cap Core		29.5%	10.5%	14.3%	13.4%	9.7%	
<i>Excess Return</i>		74.1%	20.7%	11.0%	9.3%	3.5%	
<i>Alpha</i>		49.1%	18.8%	8.5%	4.6%	1.6%	
<i>Pct Rank vs Lipper Lg-Cap Core</i>		1	1	1	1	1	
SMRS All-Cap Garp	\$1,084,840,628	37.4%	5.2%	8.4%	8.5%	11.0%	4/30/11
S&P 1500 Super Composite		29.2%	11.0%	14.7%	13.7%	13.1%	
Style & Risk Adj Benchmark		33.2%	12.9%	15.9%	14.8%	13.8%	
Lipper Multi-Cap Core		25.3%	8.2%	12.5%	11.7%	11.2%	
<i>Excess Return</i>		8.2%	-5.8%	-6.3%	-5.2%	-2.1%	
<i>Alpha</i>		4.2%	-7.7%	-7.5%	-6.3%	-2.8%	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		3	85	93	90	61	
SMRS Mid-Cap Index	\$787,645,701	23.5%	7.0%	11.7%	10.4%	0.0%	N/A
S&P 400		23.3%	7.0%	11.7%	10.3%	0.0%	
Style & Risk Adj Benchmark		23.3%	7.0%	11.7%	10.2%	0.0%	
Lipper Mid-Cap Core		22.0%	7.3%	11.0%	9.6%	0.0%	
<i>Excess Return</i>		0.2%	0.1%	0.0%	0.1%	0.0%	
<i>Alpha</i>		0.3%	0.1%	0.0%	0.2%	0.0%	
<i>Pct. Rank vs Lipper Mid-Cap Core</i>		31	54	32	38	0	
Value, Quality, Momentum Composite	\$794,051,196	30.1%	8.1%	--	--	13.2%	10/1/20
S&P 1500		29.2%	11.0%	--	--	15.5%	
Style & Risk Adj Benchmark		29.2%	10.8%	--	--	15.4%	
Lipper Multi-Cap Core		25.3%	8.2%	--	--	13.4%	
<i>Excess Return</i>		1.0%	-2.9%	--	--	-2.3%	
<i>Alpha</i>		0.9%	-2.7%	--	--	-2.2%	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		22	63	--	--	63	
SMRS Large-Cap Growth	\$754,459,340	32.5%	10.6%	16.0%	16.9%	11.6%	5/31/05
S&P 500 Growth		33.7%	10.2%	15.8%	15.9%	11.7%	
Style & Risk Adj Benchmark		33.1%	9.7%	14.9%	15.3%	11.5%	
Lipper Large-Cap Growth		39.3%	9.4%	15.9%	16.2%	11.5%	
<i>Excess Return</i>		-1.2%	0.4%	0.2%	1.0%	-0.1%	
<i>Alpha</i>		-0.6%	0.8%	1.1%	1.7%	0.1%	
<i>Pct Rank vs Lipper Lg-Cap Growth</i>		87	39	51	37	37	
Large-Cap Consistent Growth	\$745,243,946	47.3%	11.9%	14.6%	16.3%	13.9%	3/1/15
S&P 500		29.9%	11.5%	15.0%	14.1%	12.7%	
Style & Risk Adj Benchmark		46.2%	11.2%	17.0%	16.7%	14.6%	
Lipper Large-Cap Core		29.5%	10.5%	14.3%	13.4%	11.7%	
<i>Excess Return</i>		17.4%	0.4%	-0.4%	2.2%	1.2%	
<i>Alpha</i>		1.1%	0.7%	-2.4%	-0.3%	-0.8%	
<i>Pct. Rank vs Lipper Lg-Cap Core</i>		2	26	48	2	3	
Martin Currie	\$610,899,119	23.9%	4.6%	--	--	8.1%	11/1/20
S&P 1500 Growth		33.2%	9.8%	--	--	13.9%	
Style & Risk Adj Benchmark		40.7%	11.3%	--	--	16.2%	
Lipper Multi-Cap Growth		33.0%	2.9%	--	--	8.0%	
<i>Excess Return</i>		-9.2%	-5.2%	--	--	-5.8%	
<i>Alpha</i>		-16.8%	-6.7%	--	--	-8.1%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		81	43	--	--	55	

<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>Incept.</u>	<u>Incept. Date</u>
LA Capital All-Cap Growth	\$330,109,885	35.5%	11.6%	14.4%	14.3%	12.6%	5/31/05
S&P 1500 Growth		33.2%	9.8%	15.4%	15.4%	11.6%	
Style & Risk Adj Benchmark		33.1%	9.4%	14.6%	14.5%	11.7%	
Lipper Multi-Cap Growth		33.0%	2.9%	12.7%	13.7%	10.4%	
<i>Excess Return</i>		2.4%	1.8%	-1.0%	-1.1%	1.0%	
<i>Alpha</i>		2.5%	2.2%	-0.1%	-0.2%	0.8%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		46	4	36	43	10	
Ark Investments	\$298,357,994	30.2%	-25.9%	-1.5%	8.1%	10.8%	3/1/16
S&P 1500 Growth		33.2%	9.8%	15.4%	15.4%	16.3%	
Style & Risk Adj Benchmark		36.5%	1.3%	12.6%	24.1%	25.5%	
Lipper Multi-Cap Growth		33.0%	2.9%	12.7%	13.7%	14.6%	
<i>Excess Return</i>		-3.0%	-35.7%	-16.9%	-7.3%	-5.4%	
<i>Alpha</i>		-6.3%	-27.2%	-14.1%	-15.9%	-14.7%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		66	100	100	95	91	
Clarkston Capital Small/Mid-Cap	\$257,539,362	15.2%	3.5%	11.1%	9.8%	10.8%	1/1/14
S&P 400		21.1%	5.5%	10.9%	9.7%	9.6%	
Style & Risk Adj Benchmark		24.9%	6.3%	8.4%	7.0%	7.0%	
Lipper Mid-Cap Core		22.0%	7.3%	11.0%	9.6%	8.8%	
<i>Excess Return</i>		-5.8%	-2.1%	0.1%	0.1%	1.2%	
<i>Alpha</i>		-9.6%	-2.8%	2.6%	2.8%	3.8%	
<i>Pct. Rank vs Lipper Mid-Cap Core</i>		92	92	48	47	5	
Seizert Capital Partners	\$240,148,481	24.7%	9.7%	14.1%	11.7%	13.3%	11/30/09
S&P 1500 Value		24.7%	11.6%	13.0%	11.1%	12.4%	
Style & Risk Adj Benchmark		18.6%	5.0%	9.4%	10.9%	12.4%	
Lipper Multi-Cap Value		21.6%	8.8%	10.9%	9.5%	10.9%	
<i>Excess Return</i>		0.0%	-1.9%	1.1%	0.5%	0.9%	
<i>Alpha</i>		6.1%	4.7%	4.7%	0.7%	0.9%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		30	36	8	10	4	
Bivium Capital Partners	\$222,402,926	27.2%	9.3%	9.8%	8.8%	7.1%	11/30/07
S&P 1500 Value		24.7%	11.6%	13.0%	11.1%	7.9%	
Style & Risk Adj Benchmark		29.0%	10.7%	14.5%	13.6%	10.0%	
Lipper Multi-Cap Value		21.6%	8.8%	10.9%	9.5%	7.0%	
<i>Excess Return</i>		2.5%	-2.3%	-3.3%	-2.3%	-0.8%	
<i>Alpha</i>		-1.8%	-1.4%	-4.8%	-4.8%	-2.9%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		15	45	75	67	46	
Attucks Asset Management	\$199,847,274	22.7%	9.3%	10.8%	10.0%	7.7%	11/30/07
S&P 1500		29.2%	11.0%	14.7%	13.7%	9.9%	
Style & Risk Adj Benchmark		23.4%	11.5%	12.6%	10.8%	7.4%	
Lipper Multi-Cap Core		25.3%	8.2%	12.5%	11.7%	8.3%	
<i>Excess Return</i>		-6.4%	-1.7%	-3.9%	-3.7%	-2.1%	
<i>Alpha</i>		-0.7%	-2.2%	-1.8%	-0.8%	0.3%	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		71	47	77	81	71	
Patient Capital	\$187,264,697	40.2%	--	--	--	-2.6%	10/1/21
S&P 1500 Value		24.7%	--	--	--	12.4%	
Style & Risk Adjusted Benchmark		24.3%	--	--	--	6.5%	
Lipper Multi-Cap Value		21.6%	--	--	--	8.7%	
<i>Excess Return</i>		15.5%	--	--	--	-15.0%	
<i>Alpha</i>		15.8%	--	--	--	-9.1%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		1	--	--	--	100	
Disruptive Innovation Momentum	\$159,404,195	37.9%	-21.8%	--	--	-6.2%	9/1/20
MSCI Momentum Index		36.2%	6.6%	--	--	7.0%	
Style & Risk Adj Benchmark		69.2%	13.0%	--	--	15.6%	
Lipper Multi-Cap Growth		33.0%	2.9%	--	--	6.4%	
<i>Excess Return</i>		1.6%	-28.4%	--	--	-13.2%	
<i>Alpha</i>		-31.3%	-34.8%	--	--	-21.7%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		33	100	--	--	94	

<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>Incept.</u>	<u>Incept. Date</u>
Ancora	\$129,847,275	31.0%	7.2%	11.6%	--	9.7%	10/1/17
S&P 1000		21.1%	5.5%	10.9%	--	9.5%	
Style & Risk Adj. Benchmark		22.5%	7.1%	10.1%	--	8.6%	
Lipper Mid-Cap Core		22.0%	7.3%	11.0%	--	9.4%	
<i>Excess Return</i>		9.9%	1.6%	0.6%	--	0.2%	
<i>Alpha</i>		8.4%	0.1%	1.5%	--	1.1%	
<i>Pct. Rank vs Lipper Mid-Cap Core</i>		6	53	35	--	47	
Managed Asset Portfolios	\$112,752,744	11.1%	5.2%	9.2%	9.6%	11.1%	2/29/16
S&P 1500 Value		24.7%	11.6%	13.0%	11.1%	12.9%	
Style & Risk Adj. Benchmark		20.0%	10.5%	10.6%	8.9%	10.1%	
Lipper Multi-Cap Value		21.6%	8.8%	10.9%	9.5%	11.2%	
<i>Excess Return</i>		-13.6%	-6.4%	-3.8%	-1.5%	-1.8%	
<i>Alpha</i>		-8.9%	-5.3%	-1.4%	0.7%	1.0%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		97	92	82	48	53	
All-Cap Core	\$63,595,797	37.3%	--	--	--	20.6%	5/1/22
S&P 1500		29.2%	--	--	--	14.9%	
Style & Risk Adj. Benchmark		42.4%	--	--	--	17.8%	
Lipper Multi-Cap Core		25.3%	--	--	--	12.6%	
<i>Excess Return</i>		8.1%	--	--	--	5.6%	
<i>Alpha</i>		-5.1%	--	--	--	2.7%	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		3	--	--	--	1	

State of Michigan Retirement System

INTERNATIONAL EQUITY REVIEW

State of Michigan Investment Board Meeting

June 12, 2024



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

EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	15.8%	2.0%	6.9%	6.6%	5.4%
MSCI ACWI ex USA Returns	13.3%	1.9%	6.0%	5.9%	4.3%
Peer Median Returns	15.1%	3.6%	7.3%	6.9%	5.2%

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

- The IED portfolio outperformed the benchmark by 2.6% over the last twelve months.
- The outperformance was driven by the IED's core strategy of quality, value, and momentum (QVM) which outperformed the MSCI ACWI ex USA index by 4.7% over the last twelve months.
- Within the core strategy all three factors outperformed the benchmark over the last twelve months. The value factor led with excess returns of 7.2%, the quality factor 5.9%, and the momentum factor outperformed the index by 4.7%.

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 division allocates capital with the intention of persistent exposure to the quality factor, momentum factor, and value factor.
- Persistent factor exposures create consistent, transparent, low-cost, efficient returns.
 - Current portfolio drivers of risk and return. The tracking error of the portfolio is approximately 1.5%, which is below the division's risk budget of 3.0%.
- Quarterly changes to International Equity Division allocation.
 - Rebalanced \$908.0 million of equity swaps to match the division's long-term equity factor strategy.

Market Environment and Outlook

Market Environment

- International stock markets were up 13.1% over the last twelve months. Earnings per share (EPS) over the same period were down -3.5%.
- Emerging markets underperformed the MSCI ACWI ex USA by -5.2% over the last year. Developed markets outperformed the broader index by 2.1%.
- The U.S. dollar over the last year gained 2.0% to developed market currencies.
- The Bloomberg Commodity Index declined -5.7% over the last year. Oil declined -10.7%, gold increased 13.4%, and copper, a barometer for the economic cycle, gained 2.1%.
- Global government interest rates (index-weighted) remained low by historical standards at 3.0%.

Outlook

- Commodities, based on broad indexes such as the Bloomberg Commodity Index, are trading above the 200-day moving average for the first time since last fall when the narrative that “inflation is subsiding” began. It is worth noting higher commodity prices may nullify the consensus in the market that inflation will return to 2.0%. Central banks cannot control commodity prices.
- Major central banks continue to remove liquidity from the financial system albeit at a decreased pace as of May 2024. The continued withdrawal of liquidity will act as a headwind for further gains across all asset classes and those business models that require large amounts of leverage to function.
- Europe’s sales and earnings per share expanded year-over-year by 1.3% and 0.8%. Forward-looking sales per share are expected to be up over the next 12 months, 1.2% and earnings are expected to increase 5.2%. Both numbers have been revised upwards over the last year.
- Japan’s sales per share decreased year-over-year by -5.0% while earnings per share decreased by -0.4%. Forward-looking sales per share growth are expected to grow at 1.2% and earnings per share are expected to grow by 9.1% over the next twelve months.
- Major central banks, apart from the Bank of Japan, have changed monetary policies from accommodative to tightening in 2022 to rein in inflation. Currently, the market continues to believe that central banks will win the fight against inflation and so far, the evidence is in their favor.
- Analysts’ forward-looking one-year estimates for the MSCI ACWI ex USA index sales and earnings per share growth are 2.9% and 9.1% respectively.

- Go-forward returns for the MSCI ACWI ex USA index on an annualized basis are estimated at 8.6%. This rate is based on the current price and actual fundamentals over multiple periods to remove fundamental variability, and better estimate the earnings power of the index.
- A ten-year blended international government yield of 3.0% implies an international equity risk premium of 5.6%. The equity risk premium decreased in the quarter with the increase in long-term government interest rates and relatively no change in forward-looking earning estimates.

Conclusion

International stocks are expected to grow earnings per share by 9.1% in the next twelve months. The market on a forward basis trades at 13.7x price to earnings, which is below its twenty-three-year average of 15.9x but questions remain if earnings will be impacted by higher interest rates and inflation. The annualized go-forward return of 8.6% is still a widespread relative to global risk-free rates.

SMRS

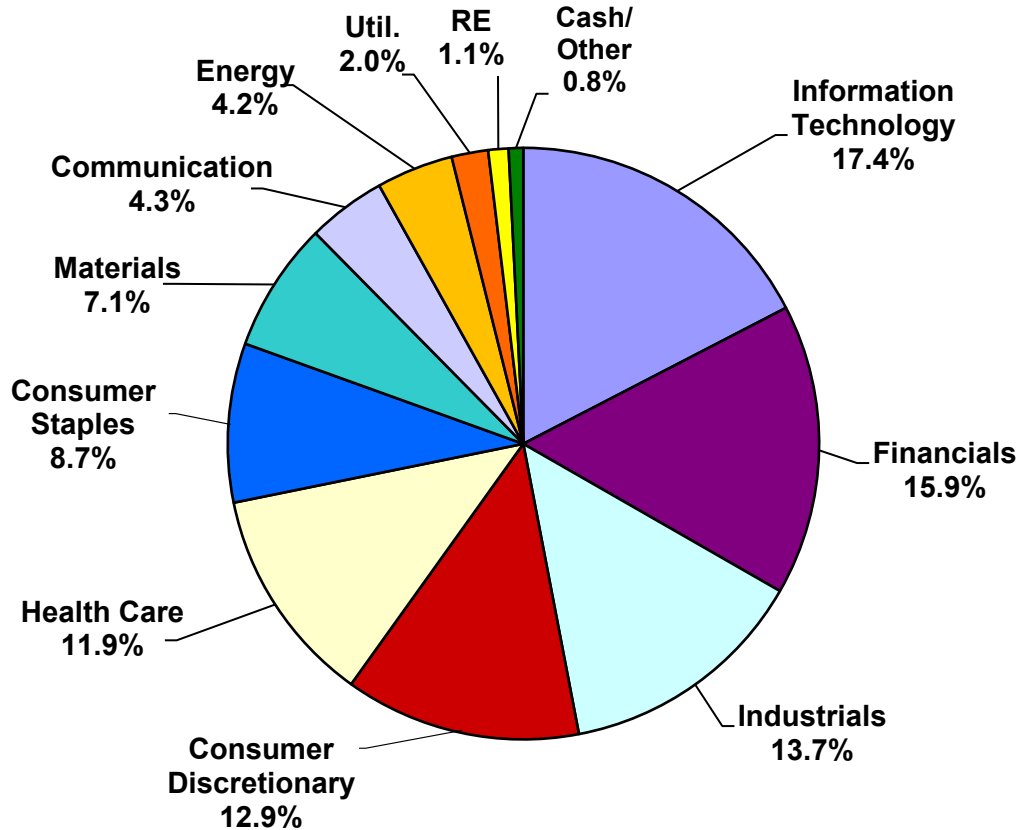
International Equity Strategies

3/31/24

Markets	Amount	Total	% of Total
Active (\$ in Millions)			
BlackRock MSCI	\$2,500		
IED Quality Equity	1,124		
Martin Currie	400		
AQR	264		
Wellington	226		
LSV	193		
WCM	188		
UBS	141		
Brown	127		
Baillie Gifford	117		
Vontobel	116		
Morgan Stanley	96		
Baron	63		
Cash	2		
Total Active		\$5,556	38.2%
Stock Plus			
Internal Swaps	\$3,727		
PIMCO	2,213		
Total Stock Plus		\$6,103	41.9%
Indexed			
SSGA	\$1,561		
BlackRock	1,335		
Total Indexed		\$2,896	19.9%
TOTAL		<u>\$14,555</u>	<u>100.0%</u>

SMRS International Equity By Sector

3/31/24



Market Value in Millions				
3/31/24				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Information Technology	\$2,535	17.4%	13.4%	4.0%
Financials	2,318	15.9%	21.4%	-5.5%
Industrials	1,998	13.7%	13.8%	-0.1%
Consumer Discretionary	1,882	12.9%	11.7%	1.2%
Health Care	1,735	11.9%	9.1%	2.8%
Consumer Staples	1,265	8.7%	7.4%	1.3%
Materials	1,033	7.1%	7.5%	-0.4%
Communication Services	628	4.3%	5.1%	-0.8%
Energy	608	4.2%	5.7%	-1.5%
Utilities	284	2.0%	3.0%	-1.0%
Real Estate	158	1.1%	1.9%	-0.8%
Total Investments	\$14,444	99.2%	100.0%	
Cash/Other	111	0.8%	0.0%	0.8%
Total	\$14,555	100.0%	100.0%	

Benchmark: MSCI ACWI ex USA

SMRS

International Equities

3/31/24

Date:	<u>3/31/24</u>	<u>12/31/23</u>	<u>9/30/23</u>	<u>6/30/23</u>
Assets (\$ in Millions):	\$14,555	\$13,708	\$12,498	\$12,959
Number of Securities:	2,597	2,630	2,607	2,622
Active Share:	36%	36%	36%	36%

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	10.0%	9.5%	9.4%	8.6%
Sustainable Growth Rate	6.2%	6.4%	6.1%	5.9%
Dividend Yield	2.7%	2.4%	2.5%	2.3%
Buyback Yield	0.9%	0.4%	0.8%	0.4%
Collateral Yield	0.3%	0.3%	--	--
Risk:				
Beta	1.03	--	1.00	--
Volatility	15.4%	--	14.9%	--
Tracking Error	1.5%	--	0.0%	--
Information Ratio	0.4	0.6	--	--
Fundamental:				
Average Capitalization (\$ in Billions)	121.3	--	103.4	--
Price/Earnings	14.2	16.5	15.5	18.2
Price/Book	1.8	2.0	1.9	2.1
ROE	12.5%	11.9%	12.4%	11.5%

TOP TEN HOLDINGS

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

	<u>Portfolio Weight</u>	<u>Market Capitalization*</u>	<u>FY1 P/E</u>	<u>Market Value**</u>
ASML Holding NV.	2.5%	\$385.0	47.2	\$358.7
Taiwan Semiconductor Manufacturing Co., Ltd.	2.3%	631.3	19.9	341.3
Novo Nordisk A/S Class B	2.1%	439.2	37.7	307.7
Samsung Electronics Co., Ltd.	1.2%	407.0	17.9	179.8
Toyota Motor Corp.	1.2%	408.8	11.2	170.5
LVMH Moet Hennessy Louis Vuitton	1.1%	451.5	25.8	159.8
Nestle S.A.	1.1%	283.8	19.2	153.3
Novartis AG	0.9%	212.4	13.7	130.8
AstraZeneca PLC	0.9%	209.1	16.6	124.5
Tencent Holdings Ltd.	<u>0.8%</u>	<u>367.3</u>	14.7	<u>113.5</u>
TOTAL	<u>14.0%</u>	<u>\$3,795.4</u>		<u>\$2,039.8</u>

International Equity Performance - Net of Fees

3/31/24

<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>Incept.</u>	<u>Incept. Date</u>
Total International Equity	\$14,555,425,615	15.6%	1.8%	6.6%	6.4%	5.8%	1/1/04
MSCI ACWI ex USA		13.3%	1.9%	6.0%	5.9%	5.8%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	5.8%	5.7%	
Excess Return		2.3%	-0.1%	0.6%	0.5%	0.0%	
<i>Pct Rank vs. Lipper Int'l Multi-Cap Core</i>		26	73	40	37	32	
Total International Active Strategy*	\$5,556,461,531	13.2%	-0.1%	5.9%	5.6%	5.0%	5/1/05
MSCI ACWI ex USA		13.3%	1.9%	6.0%	5.9%	5.3%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	5.8%	5.1%	
Excess Return		0.0%	-2.0%	0.0%	-0.3%	-0.3%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		56	96	65	69	67	
BlackRock MSCI Systematic Return	\$2,499,623,280	17.6%	3.6%	8.4%	--	9.1%	12/1/18
MSCI ACWI ex USA		13.3%	1.9%	6.0%	--	6.6%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	--	6.7%	
Excess Return		4.3%	1.6%	2.5%	--	2.5%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		16	36	7	--	2	
IED Quality Equity	\$1,123,565,613	11.1%	0.9%	--	--	7.0%	2/1/20
MSCI ACWI ex USA		13.3%	1.9%	--	--	5.4%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	--	--	5.7%	
Excess Return		-2.1%	-1.0%	--	--	1.6%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		74	88	--	--	21	
Martin Currie International Long-Term	\$400,391,906	7.5%	-0.4%	8.3%	8.3%	9.0%	2/1/17
MSCI ACWI ex USA		13.3%	1.9%	6.0%	5.9%	6.3%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	5.8%	6.3%	
Excess Return		-5.8%	-2.4%	2.4%	2.4%	2.6%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		93	96	7	2	1	
AQR Enhanced Value	\$264,169,390	21.4%	--	--	--	17.6%	N/A
MSCI ACWI ex USA		13.3%	--	--	--	10.2%	
Lipper International Large-Cap Core		13.5%	--	--	--	10.8%	
Excess Return		8.2%	--	--	--	7.4%	
<i>Pct Rank vs Lipper Int'l Large-Cap Core</i>		4	--	--	--	5	
LSV Int'l Concentrated Value Fund	\$193,466,122	--	--	--	--	17.3%	4/1/23
MSCI ACWI ex USA		--	--	--	--	12.9%	
Lipper Int'l Lg-Cap Core		--	--	--	--	13.6%	
Excess Return		--	--	--	--	4.4%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		--	--	--	--	1	
WCM Focused Growth International	\$187,787,996	16.4%	--	--	--	-0.1%	10/1/21
MSCI ACWI ex USA		13.3%	--	--	--	1.4%	
Lipper Int'l Lg-Cap Core		13.5%	--	--	--	2.2%	
Excess Return		3.1%	--	--	--	-1.5%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		21	--	--	--	91	
UBS China A Opportunity Fund	\$140,616,680	-10.5%	-15.9%	--	--	-3.1%	5/1/20
MSCI China On shore		-17.3%	-11.7%	--	--	-1.0%	
Lipper Emerging Markets		10.0%	10.0%	--	--	7.4%	
Excess Return		6.8%	-4.2%	--	--	-2.1%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		100	99	--	--	99	
Brown Capital Int'l Small Company Fund	\$127,179,612	13.8%	--	--	--	1.5%	3/1/22
MSCI ACWI ex USD		13.3%	--	--	--	3.6%	
Lipper Int'l Lg-Cap Core		13.5%	--	--	--	4.8%	
Excess Return		0.6%	--	--	--	-2.1%	
<i>Pct Rank vs. Lipper Int'l Lg-Cap Core</i>		45	--	--	--	97	
Baillie Gifford Int'l Concentrated Growth	\$116,888,661	8.5%	--	--	--	-12.4%	11/1/21
S&P 1500 Value		13.3%	--	--	--	2.5%	
Style & Risk Adj Benchmark		13.5%	--	--	--	3.3%	
Excess Return		-4.8%	--	--	--	-14.9%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		88	--	--	--	100	

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Incept.</u>	<u>Incept. Date</u>
Vontobel Int'l Quality Growth Fund	\$115,593,968	12.9%	--	--	--	9.1%	5/1/2022
S&P 1500 Growth		13.3%	--	--	--	7.4%	
Style & Risk Adj Benchmark		13.5%	--	--	--	9.0%	
Lipper Multi-Cap Growth		-0.3%	--	--	--	1.6%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		56	--	--	--	48	
Wellington Int'l Contrarian Value Fund	\$114,365,415	--	--	--	--	20.3%	5/1/23
MSCI ACWI ex USA		--	--	--	--	15.5%	
Lipper Int'l Lg-Cap Core		--	--	--	--	15.5%	
<i>Excess Return</i>		--	--	--	--	4.8%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		--	--	--	--	14	
Wellington Select China Equity	\$111,927,791	-22.6%	-22.3%	--	--	-1.5%	9/1/19
MSCI ChinaOn shore		-17.3%	-11.7%	--	--	0.7%	
Lipper Emerging Markets		10.0%	-3.7%	--	--	4.4%	
<i>Excess Return</i>		-5.3%	-10.6%	--	--	-2.2%	
<i>Pct Rank vs Lipper Emerging Markets</i>		100	99	--	--	96	
Morgan Stanley Int'l Opportunity Fund	\$95,560,523	12.0%	--	--	--	-7.1%	2/1/22
MSCI ACWI ex USA		13.3%	--	--	--	2.5%	
Lipper International Large-Cap Core		13.5%	--	--	--	3.1%	
<i>Excess Return</i>		-1.3%	--	--	--	-9.7%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		66	--	--	--	100	
Baron Global Advantage	\$62,714,018	30.3%	--	--	--	-13.6%	1/1/22
MSCI ACWI ex USA		13.3%	--	--	--	0.7%	
Lipper Int'l Lg-Cap Core		13.5%	--	--	--	1.4%	
<i>Excess Return</i>		17.0%	--	--	--	-14.3%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		1	--	--	--	100	
Total Int'l Stock Plus Strategy**	\$6,102,769,597	19.0%	3.4%	7.5%	7.1%	7.3%	1/1/09
MSCI ACWI ex USA		13.3%	1.9%	6.0%	5.9%	6.9%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	5.8%	7.2%	
<i>Excess Return</i>		5.7%	1.5%	1.5%	1.2%	0.4%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		11	39	21	6	42	
Internal Stock Plus	\$3,727,271,659	18.6%	3.9%	7.1%	6.8%	6.2%	9/1/11
MSCI ACWI ex USA		13.3%	1.9%	6.0%	5.9%	5.2%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	5.8%	5.9%	
<i>Excess Return</i>		5.4%	2.0%	1.2%	1.0%	1.0%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		12	29	31	17	47	
PIMCO StocksPLUS	\$2,375,497,938	19.5%	2.6%	8.0%	--	8.0%	4/1/19
MSCI ACWI ex USA		13.3%	1.9%	6.0%	--	6.0%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	--	6.2%	
<i>Excess Return</i>		6.2%	0.7%	2.1%	--	2.1%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		8	56	9	--	9	
Total Int'l Index Strategy **	\$2,896,194,487	13.4%	2.1%	6.2%	6.5%	7.2%	7/1/09
MSCI ACWI ex USA		13.3%	1.9%	6.0%	5.9%	6.2%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	5.8%	6.8%	
<i>Excess Return</i>		0.2%	0.2%	0.2%	0.7%	0.9%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		50	64	51	32	32	
SSGA MSCI ACWI ex USA Index	\$1,561,251,280	13.5%	2.1%	6.2%	--	4.5%	11/1/17
MSCI ACWI ex USA		13.3%	1.9%	6.0%	--	4.2%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	--	4.2%	
<i>Excess Return</i>		0.2%	0.2%	0.2%	--	0.2%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		50	64	51	--	44	
Blackrock ACWI ex USA Index	\$1,334,943,207	13.4%	2.1%	6.2%	--	4.1%	3/1/18
MSCI ACWI ex USA		13.3%	1.9%	6.0%	--	4.3%	
Lipper Int'l Multi-Cap Core		13.5%	2.8%	6.2%	--	4.0%	
<i>Excess Return</i>		0.2%	0.2%	0.2%	--	-0.3%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		50	64	51	--	52	

* The total includes the cash balance of closed funds, a total of \$2 million

**Includes \$1,272 transition account

State of Michigan Retirement System
FIXED INCOME REVIEW

State of Michigan Investment Board Meeting
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EXECUTIVE SUMMARY

Performance

MPSERS Plan (3/31/24)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	5.1%	-0.1%	1.9%	2.6%	3.0%
Bloomberg Barclays U.S. Agg	1.7%	-2.5%	0.4%	1.1%	1.5%
Peer Median Returns	2.4%	-1.6%	1.1%	1.6%	1.9%

- The fixed income portfolio outperformed its benchmark and peer group across all time periods. The portfolio benefitted from an overweight to structured fixed income and high yield bonds.
- The benchmark U.S. Aggregate index exhibited a low rate of return over the past decade. This was due to, in large part, the rise in long-term interest rates. Peers, in general, have a lower allocation to long-term interest rates than the benchmark. Over the past decade, the fixed income portfolio had a lower allocation to long-term interest than both peers and the benchmark.
- CLO and CMBS were the best performing portfolios for the past year, returning 17.8% and 12.3% respectively.

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. The yield-to-maturity (YTM) of the portfolio is currently 6.2% versus a benchmark yield of 5.1%.
- The portfolio characteristics are:
 - **Income:** The return coupon of the portfolio is 4.2% and is approximately 122 bps higher than the benchmark.
 - **Liquidity:** The portfolio has almost 40% invested in U.S. Treasuries, TIPS, government guaranteed agency debentures, and cash. These investments can typically be liquidated within one trading day.
 - **Principal preservation:** The average credit rating of the portfolio is investment grade.
 - **Diversification from equity market risk:** The estimated equity beta of the portfolio is 0.14 and in-line with the U.S. Aggregate benchmark.
- During the years between 2010 through 2021, the yield to maturity of the benchmark U.S. Aggregate index averaged between 2-3%. Given that backdrop, the Fixed Income portfolio “Core-Plus” strategy relied on out-of-benchmark assets to generate returns.

- The Core-plus strategy implemented to achieve the goals includes:
 - Core: As of March 31, 2024, the portfolio's allocation to U.S. Treasuries, Investment Grade corporate bonds, government-guaranteed U.S. Agency Debentures, RMBS, and Commercial MBS (CMBS) was 76.1%. This includes a 45.2% allocation to U.S. Treasuries, TIPS, government guaranteed agency debentures, and cash.
 - Plus: The portfolio maintains a strategic out-of-benchmark allocation to HY 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. As of March 31, 2024, the allocation to the Plus portfolio was 23.9%.

Market Environment and Outlook

- The case for traditional fixed income investing is the strongest it has been in two decades. However, plenty of risks remain.
 - The yield to maturity of the U.S. Aggregate Index as of March 2024 was 4.8% which ranks in the second decile for yields over the past twenty years.
 - The plans' actuarial rates of returns can be earned on fixed income securities at the intersection between low-end investment grade and high-end, high-yield. Over the past twenty years, that has only happened one other time during the depths of the Global Financial Crisis of 2008-2009. Throughout most of the past two decades, securities rated at the lowest end of high yield, or worse, were needed to earn the actuarial rate of return.
 - Fixed income offers a good risk-adjusted rate of return relative to U.S. equities in particular. While U.S. equities are still expected to return a higher rate of return over the long term vs. bonds, the difference in return is at or near the lowest spread in over two decades.
 - Credit spreads are historically tight. Investment grade credit spreads are roughly 85 bps, and high yield spreads are approximately 300 bps. Both spread metrics are at the bottom decile over the past two decades.
 - The yield curve, measured at the 10-year and 2-year Treasury rate, is deeply inverted.

Conclusion

- The market for traditional fixed income securities is very attractive relative to the past twenty years. Interest rates are at the high end of the historical ranges, but credit spreads are at the low end. Relative to U.S. equities, the return to risk outlook for fixed income is at the high end of the range. The inverted yield curve historically has suggested future economic weakening. Out-of-benchmark securities continue to add to the return potential of the portfolio, however, at the expense of higher volatility and lower liquidity.

SMRS

Fixed Income Holdings

Portfolio Characteristics

Benchmark: Barclays Aggregate

3/31/24

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>
Average Maturity (Yrs)	9.1	8.4
Duration (Yrs)	6.1	6.1
Spread Duration (Yrs)	5.4	6.0
Coupon (%)	4.3	3.2
Yield to Maturity (%)	6.2	4.9
Credit Rating	A+	AA-
Tracking Error (%)	1.5	NA
Beta (vs S&P 500)	0.14	0.14

Commentary

Objectives

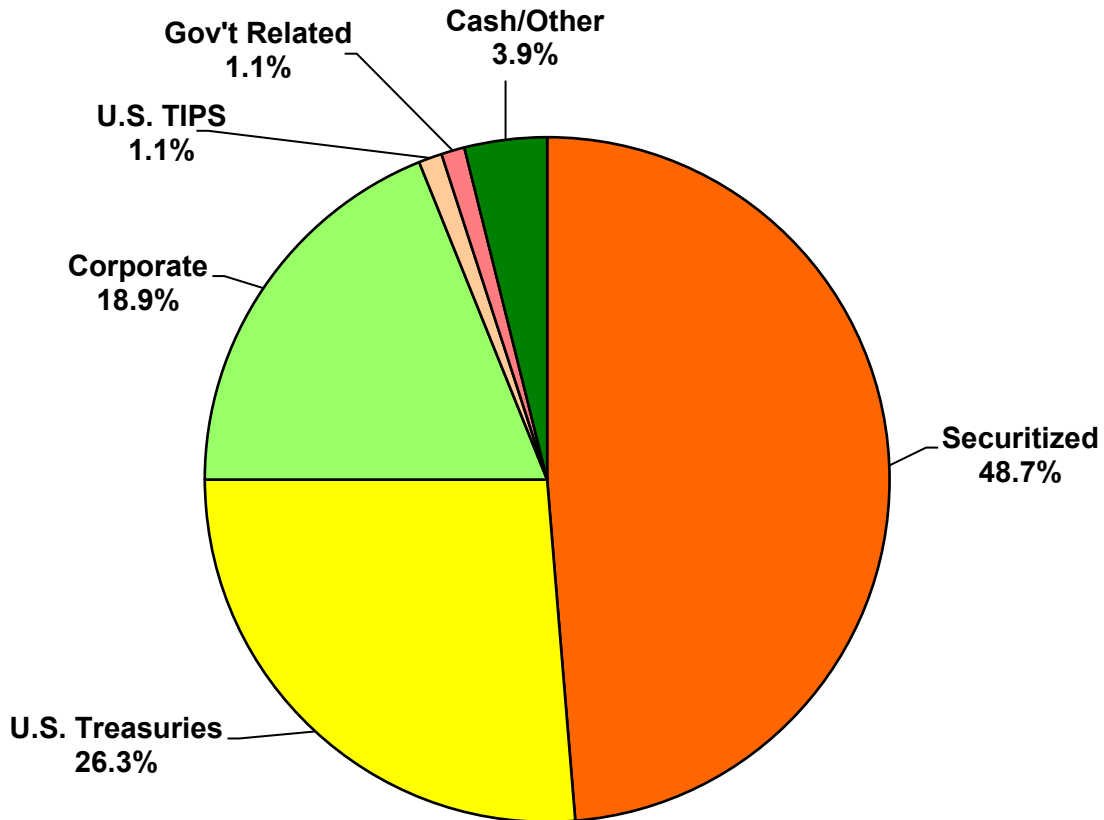
Highlights

Income:	The coupon of the portfolio is approximately 110bps higher than the benchmark. Coupon interest is an important component of total returns along with price returns.
Liquidity:	45.2% of the portfolio is invested in U.S. Treasuries, TIPS, government guaranteed agency debentures, and cash. These investments can typically be liquidated within one trading day.
Principal Preservation:	The portfolio has a large allocation to U.S. Treasuries (26.3%) and carries an investment grade rating.
Diversification:	The equity beta of the portfolio is approximately 0.14, meaning that the portfolio has a low correlation with Equity market movements.

SMRS

Fixed Income By Asset Type

3/31/24



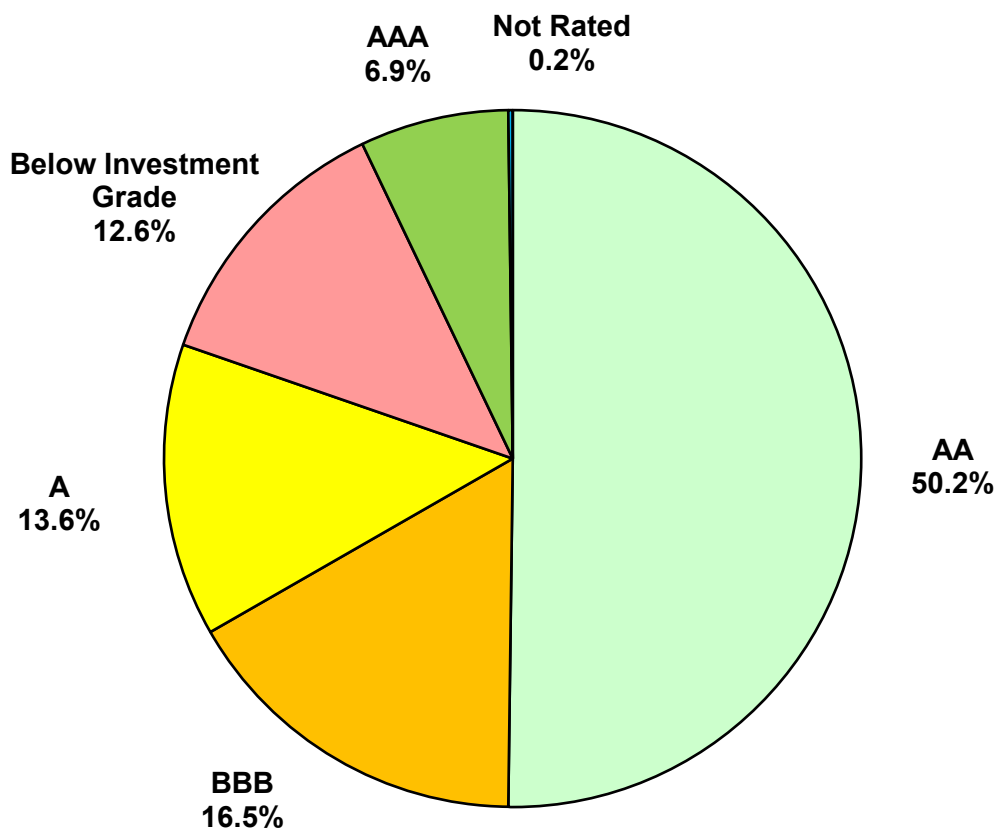
Market Value in Millions				
3/31/24				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Securitized	\$4,481	48.7%	27.9%	20.8%
U.S. Treasuries	2,421	26.3%	42.7%	-16.4%
Corporate	1,742	18.9%	25.8%	-6.9%
U.S. TIPS	107	1.1%	0.0%	1.1%
Government Related	99	1.1%	3.1%	-2.0%
Cash/Other	356	3.9%	0.5%	3.4%
Total Investments	<u><u>\$9,206</u></u>	<u><u>100.0%</u></u>	<u><u>100.0%</u></u>	

Benchmark: Barclays US Aggregate

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Fixed Income By Rating

3/31/24



Market Value in Millions				
3/31/24				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$635	6.9%	2.7%	4.2%
AA	4,625	50.2%	71.6%	-21.4%
A	1,249	13.6%	10.6%	3.0%
BBB	1,520	16.5%	13.4%	3.1%
* Below Investment Grade	1,157	12.6%	0.2%	12.4%
Not Rated	20	0.2%	1.5%	-1.3%
Total Investments	<u>\$9,206</u>	<u>100.0%</u>	<u>100.0%</u>	

* Comprised of approximately 4.9% High Yield Credit and 7.7% High Yield RMBS/ABS

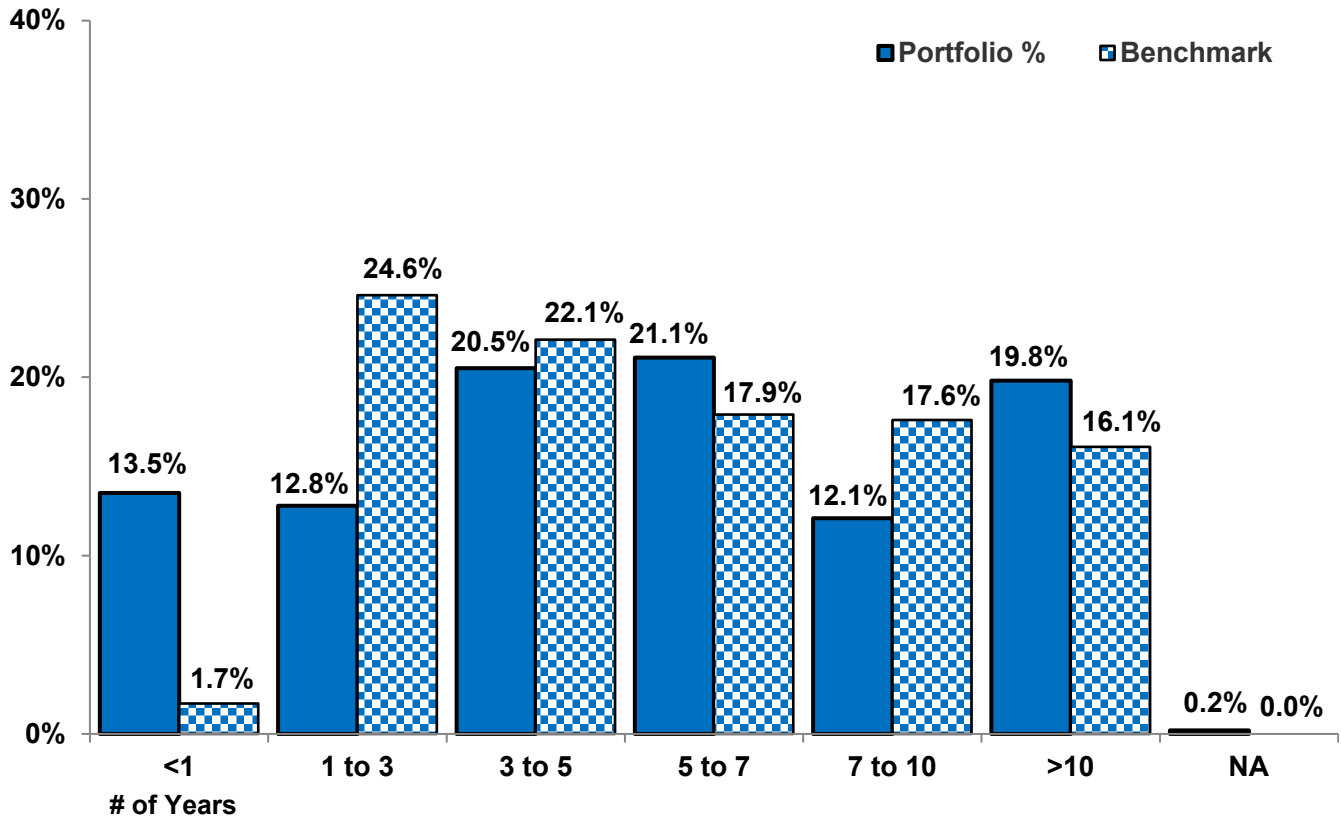
Benchmark: Barclays US Aggregate

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Duration Distribution

Fixed Income Composite Versus Benchmark

3/31/24



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,241	13.5%	1.7%	0.1	0.6
1 to 3	1,178	12.8%	24.6%	2.1	2.0
3 to 5	1,891	20.5%	22.1%	3.9	4.0
5 to 7	1,943	21.1%	17.9%	6.1	6.0
7 to 10	1,112	12.1%	17.6%	7.7	7.8
>10	1,825	19.8%	16.1%	15.7	14.6
NA	16	0.2%	0.0%	NA	NA
Total	\$9,206	100.0%	100.0%	6.3	6.2

* Effective Duration

Benchmark: Barclays US Aggregate

Fixed Income Performance - Net of Fees (MPERS)

3/31/24

	<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	\$9,205,918,175	4.89%	-0.27%	1.68%	2.34%	2.82%
<i>Bloomberg Aggregate Bond Index</i>	<i>N/A</i>	<i>1.70%</i>	<i>-2.46%</i>	<i>0.36%</i>	<i>1.06%</i>	<i>1.54%</i>
Internal Core Fixed Income	\$4,426,096,612	1.99%	-1.61%	0.93%	1.72%	2.33%
Externally Managed Fixed Income	\$4,779,821,563	7.66%	1.10%	2.36%	2.94%	3.31%
External Core Fixed Income	\$717,802,229	2.46%	-2.71%	-0.31%	0.66%	1.42%
PIMCO Mortgage Fund	717,802,229	2.46%	-2.71%	-0.28%		
<i>Bloomberg US MBS Agy Fixed Indx</i>	<i>N/A</i>	<i>1.39%</i>	<i>-2.84%</i>	<i>-0.39%</i>		
Investment Grade Credit	\$213,134,768	5.13%	-1.67%	1.98%	2.49%	2.95%
PGIM Investment Grade	213,134,768	5.13%	-1.67%	1.98%	2.49%	2.95%
<i>Bloomberg Credit Index</i>	<i>N/A</i>	<i>4.15%</i>	<i>-1.86%</i>	<i>1.39%</i>	<i>2.06%</i>	<i>2.49%</i>
Tactical Fixed Income	\$1,319,509,522	3.43%	-0.53%	2.33%	2.72%	3.09%
Fidelity Tactical Bond Fund	510,039,393	4.13%	-0.18%	2.61%	3.05%	
Guggenheim Core Plus	403,783,242	4.24%				
TCW Core Plus	405,686,887	1.77%				
<i>Bloomberg Aggregate Bond Index</i>	<i>N/A</i>	<i>1.70%</i>	<i>-2.46%</i>	<i>0.36%</i>	<i>1.06%</i>	<i>1.54%</i>
High Yield Fixed Income	\$394,022,779	9.01%	2.19%	4.57%	4.64%	4.75%
PGIM High Yield	368,405,522	9.08%	1.92%	4.72%	4.85%	4.90%
Crescent Direct Lending	25,617,257	7.67%	4.22%	6.73%		
<i>Bloomberg US HY BA/B 1% Cap</i>	<i>N/A</i>	<i>10.22%</i>	<i>2.08%</i>	<i>4.18%</i>	<i>4.37%</i>	<i>4.40%</i>
Structured Fixed Income	\$1,869,116,426	12.25%	3.45%	3.10%	3.65%	
TICP CLO Debt	688,121,194	17.29%	6.16%	6.80%	5.57%	
MetWest Securitized Opportunities	633,091,724	7.85%	1.58%	2.40%	3.24%	3.25%
Principal CMBS	531,762,293	11.88%	0.13%	1.54%	2.66%	3.14%
Napier Park ABS Income	7,837,244	-13.88%	-0.16%	3.28%	5.02%	
Napier Park Strategic Loan LP	8,303,971	-14.20%	-1.59%	0.15%	1.98%	
<i>Bloomberg Aggregate Bond Index</i>	<i>N/A</i>	<i>1.70%</i>	<i>-2.46%</i>	<i>0.36%</i>	<i>1.06%</i>	<i>1.54%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>4.56%</i>	<i>-1.39%</i>	<i>1.16%</i>	<i>1.80%</i>	<i>2.68%</i>
Global Fixed Income	\$266,235,838	10.82%	0.23%	2.38%	2.65%	
T. Rowe Global Multi-Sector	266,235,838	10.82%	0.45%	2.64%	2.90%	
<i>Custom GMS Benchmark</i>	<i>N/A</i>	<i>7.92%</i>	<i>-0.05%</i>	<i>-0.05%</i>		

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.