

# STATE OF MICHIGAN INVESTMENT BOARD MEETING

## June 29, 2023

### 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 29, 2023**

## **Agenda**



- 9:30 a.m.      Call to Order and Opening Remarks**
- Approval of the 3/23/23 SMIB Meeting Minutes**
- 9:35 a.m.      Executive Summary & Performance for Periods Ending 3/31/23**
- 9:45 a.m.      Current Asset Allocation Review**
- Markets Review and Outlook**
- 9:50 a.m.      Review of Investment Reports**
- Private Equity – Update
  - Real Estate & Infrastructure – Receive and File
  - Real Return & Opportunistic – Receive and File
  - Absolute Return – Receive and File
  - Fixed Income – Receive and File
  - Domestic Equity – Receive and File
  - International Equity – Receive and File
  - Defined Contribution – Receive and File
- 10:10 a.m.      Guest Speaker:**  
**David Mussafer, Managing Partner and Chairman**  
**Advent International Corporation**
- 10:55 a.m.      Public Comment**
- 11:00 a.m.      Closing Remarks ~ Adjournment**



### **2023 Meeting Schedule**

**Thursday, September 28, 2023**  
**Wednesday, December 13, 2023**

**All meetings start at 9:30 a.m.**

# State of Michigan Retirement System

## MINUTES

State of Michigan Investment Board Meeting

June 29, 2023



Jon M. Braeutigam  
Chief Investment Officer  
Bureau of Investments

# STATE OF MICHIGAN INVESTMENT BOARD

## March 23, 2023 Meeting Minutes

### Board Members:

Chairman – Treasurer Rachael Eubanks  
Mr. Chris Harkins – State Budget Director  
Ms. Dina Richard  
Mr. Reginald Sanders  
Ms. Denise Ilitch - Absent

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

Robert Brackenbury	Dan Quigley	Giles Feldpausch
Karl Borgquist	Lan Chen	Ann Storberg
Greg Parker	Jack Behar	Tyler Isola
Peter Woodford	Max Kotary	Aaron Bandy
Janet Sudac	Aaron Haftl	Taylor Broekstra
Jon Braeutigam	Steve Cummings	Mitchell Brussel
Mark Porrell	Andrew Higginson	Lewis Brody
Ryan Rathman	Kenji Griffith	Craig Coulter
Todd Warstler	David Klauka	Jeannette Brya
Travis Haney	Krasimir Yankov	Mitchell Kerkstra

Many others attended via Microsoft Teams.

### Opening Remarks:

Treasurer Rachael Eubanks called the meeting to order at 9:35 am. She explained that a new board member has been appointed, Denise Ilitch, who could not attend today.

### Approval of Minutes:

Approval of the December 8, 2022, SMIB Meeting Minutes – Motion to approve by Dina Richard.  
Seconded: Chris Harkins. The vote was unanimous to approve.

## AGENDA

### Executive Summary

Mr. Jon Braeutigam, Chief Investment Officer of the Bureau of Investments, started out by stating that the S&P 500 is up nearly 3% calendar year-to-date, even though the markets continue to be very volatile.

In reviewing SMRS's performance, Mr. Braeutigam stated that 2022 was a tough year with the S&P 500 down -17% and the bond markets down -13%. This happens very seldom with both

declining to this magnitude. SMRS's annualized return is down -6.3% end of year 2022 while peer returns are down -7.8% end-of-year. The 10-year number is what is really focused on however, because SMRS invests on a long-term basis. The 10-year annualized return is 9.6%, with peer median return being 7.9%. He further explained how compounding at a higher than peer return rate adds significant value.

Mr. Braeutigam briefly discussed SMRS's equity portfolio and the quarter's new commitments, with one new commitment in the Private Equity Division and two in the Real Estate and Infrastructure Division. He stated division managers will further discuss their new commitments.

### **Defined Contribution, Trusts & Agencies Update**

Ms. Lan Chen, Senior Investment Manager of the Defined Contribution, Trusts & Agencies Division (DCTA) began the round robin by explaining the purpose of the division. She broke down the portfolio and explained the standard default option for investors. She wrapped up by introducing the DCTA team.

### **Private Equity Update**

Mr. Peter Woodford, Senior Investment Manager of the Private Equity Division (PED) discussed the division's purpose. He broke down their portfolio and discussed division performance. He ended by introducing the PED team.

### **Venture Capital Update**

Mr. Ryan Rathman, Senior Investment Manager of the Venture Capital Division (VCD) discussed the division's strategy. He broke down their portfolio and gave a market update. Mr. Rathman wrapped up by introducing the VCD team.

### **Real Estate & Infrastructure Update**

Mr. Todd Warstler, Senior Investment Manager of the Real Estate and Infrastructure Division (REID) discussed the purpose of the division. He broke down their portfolio and discussed the division's performance. Mr. Warstler ended by introducing the REID team.

### **Real Return and Opportunistic Update**

Mr. Travis Haney, Senior Investment Manager of the Real Return & Opportunistic Division (RRO) discussed the purpose of the division. He broke down their portfolio and discussed the division's performance. Mr. Haney wrapped up by introducing the RRO team.

### **Absolute Return Update**

Mr. Daniel Quigley, Senior Investment Manager for the Absolute Return Division (AR) explained the purpose of the division. He broke down their portfolio and discussed the division's performance. Mr. Quigley ended by introducing the AR team.

### **Fixed Income Update**

Mr. Daniel Quigley, Senior Investment Manager for the Fixed Income Division (FID) explained the purpose of the division. He broke down their portfolio and discussed the division's performance. Mr. Quigley wrapped up by introducing the FID team.

### **Domestic Equity Update**

Mr. Jack Behar, Senior Investment Manager of the Domestic Equity Division (DED) explained the purpose of the division. He broke down their portfolio and discussed the division's performance. He ended by introducing the DED team.

### **International Equity Update**

Mr. Mark Porrell, Senior Assistant Investment Manager of the International Equity Division (IED) explained the purpose of the division. He broke down the portfolio and discussed the division's performance. Mr. Porrell wrapped up by introducing the IED team.

### **Public Comment:**

No public comments.

### **Adjournment:**

Motion to adjourn by Chris Harkins. Seconded: Dina Richard. The meeting concluded at 11:04 am.

Approved:

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Treasurer Rachael Eubanks, Chairman

State of Michigan Retirement System

# EXECUTIVE SUMMARY

State of Michigan Investment Board Meeting

June 29, 2023



Jon M. Braeutigam  
Chief Investment Officer  
Bureau of Investments

# EXECUTIVE SUMMARY

March 31, 2023

## **Performance**

*Great peer comparison.*

<b>MPSERS Plan (03/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Annualized Returns	-1.8%	12.7%	8.8%	9.8%	9.5%
Policy Returns	-3.7%	10.7%	7.9%	9.1%	9.0%
Peer Median Returns*	-3.4%	11.5%	7.2%	8.4%	7.7%

\*State Street Universe greater than \$10 billion.

- Over the past one, 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 \$52.5 billion March 2013 market value, a ten-year annualized return of 9.5% compared to the 7.7% peer median return added approximately \$19.1 billion in excess value. This equates to roughly an additional \$2.2 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 150 bps. At the end of March 2023, the equity risk (beta) is approximately 0.36; lower than peer median of approximately 0.55.
- Liquidity is another fundamental risk assumed and it is managed through asset allocation. The plans have outstanding capital commitments to fund approximately \$17.5 billion in illiquid assets. In the March 2023 quarter, \$421 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 quarters.
- The combined systems paid out approximately \$850 million net of contributions over the past twelve months ending in March 2023. 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, 2023 – March 31, 2023

(\$ Millions)

<b>Asset class</b>	<b>Fund Name / (Managed By)</b>	<b>Commitment</b>
<b>Absolute Return</b>		
	SJC DLF IV 10 Year-J, LLC (Czech Asset Management)	\$20.0
<b>Private Equity</b>		
	Khosla Ventures VIII, LP (Khosla Ventures Associates VIII, LLC)	50.0
	Khosla Ventures Opportunity II, LP (Khosla Ventures Opportunity Associates II, LLC)	12.5
	Khosla Ventures Seed F, LP (Khosla Ventures Seed Associates F, LLC)	12.5
<b>Real Estate and Infrastructure</b>		
	SMP Data Center, LLC (Principal Real Estate Investors, LLC)	326.0
<b>TOTAL</b>		<b>\$421.0</b>

State of Michigan Retirement System

# PERFORMANCE

State of Michigan Investment Board Meeting

June 29, 2023



Jon M. Braeutigam  
Chief Investment Officer  
Bureau of Investments

# ***Bureau of Investments***

## **Mission Statement**

*The Bureau of Investments continually strives to provide quality investment management services, broad professional expertise, and independent advice to the State of Michigan Investment Board as fiduciary of the State of Michigan Retirement System, and independent of the Board, to the State Treasurer for various Michigan trust funds and the State's common cash, for which the State Treasurer is the fiduciary.*

## **SMRS Goals**

*Maintain sufficient liquidity to pay benefits.*

*Meet or exceed the actuarial assumption  
over the long term.*

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

*Diversify assets to reduce risk.*

*Exceed individual asset class benchmarks  
over the long term.*

# MPSERS PENSION

## Time-Weighted Rates of Return

### Periods Ending March 31, 2023

	% of Portfolio 3/31/23	Ten Years <sup>1</sup>		Seven Years <sup>1</sup>		Five Years <sup>1</sup>		Three Years <sup>1</sup>		One Year		Current Quarter	
		Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
<b>TOTAL PLAN</b>	<b>100.0</b>	<b>9.5</b>	<b>12</b>	<b>9.8</b>	<b>12</b>	<b>8.8</b>	<b>12</b>	<b>12.7</b>	<b>23</b>	<b>-1.8</b>	<b>32</b>	<b>2.7</b>	<b>88</b>
Median - Greater than \$10 Billion <sup>2</sup>		7.7		8.4		7.2		11.5		-3.4		3.7	
MPSERS Total Plan Policy		9.0		9.1		7.9		10.7		-3.7		4.9	
<b>PRIVATE EQUITY AND VENTURE CAPITAL</b>	<b>23.5</b>	<b>15.5</b>	<b>6</b>	<b>15.9</b>	<b>10</b>	<b>16.5</b>	<b>14</b>	<b>19.0</b>	<b>18</b>	<b>-5.2</b>	<b>81</b>	<b>0.2</b>	<b>55</b>
Median <sup>2</sup>		10.3		10.6		9.9		14.4		1.5		0.6	
Private Equity and VC Benchmark <sup>3</sup>		15.9		14.8		12.7		10.9		-15.6		8.3	
<b>DOMESTIC EQUITIES</b>	<b>18.8</b>	<b>11.4</b>	<b>29</b>	<b>11.3</b>	<b>26</b>	<b>9.3</b>	<b>32</b>	<b>17.2</b>	<b>29</b>	<b>-9.8</b>	<b>94</b>	<b>8.7</b>	<b>3</b>
Median <sup>2</sup>		9.0		9.4		7.6		15.8		-7.0		5.9	
S&P 1500 Index		12.0		12.2		10.8		18.9		-7.6		7.2	
<b>INTERNATIONAL EQUITIES</b>	<b>13.5</b>	<b>5.0</b>	<b>70</b>	<b>6.4</b>	<b>56</b>	<b>2.7</b>	<b>88</b>	<b>12.0</b>	<b>91</b>	<b>-5.7</b>	<b>90</b>	<b>7.8</b>	<b>36</b>
Median <sup>2</sup>		5.2		6.5		3.5		13.4		-2.9		7.6	
MSCI ACWI ex USA Net Index <sup>4</sup>		4.2		5.9		2.5		11.8		-5.1		6.9	
<b>REAL RETURN AND OPPORTUNISTIC</b>	<b>10.9</b>	<b>12.3</b>		<b>12.5</b>		<b>11.9</b>		<b>13.6</b>		<b>7.2</b>		<b>-4.9</b>	
50% (CPI + 4%) + 50% (actuarial rate) <sup>5</sup>		7.4		7.6		7.5		8.0		7.6		2.1	
<b>REAL ESTATE &amp; INFRASTRUCTURE</b>	<b>10.6</b>	<b>10.9</b>	<b>28</b>	<b>9.7</b>	<b>27</b>	<b>9.5</b>	<b>22</b>	<b>11.0</b>	<b>21</b>	<b>17.6</b>	<b>15</b>	<b>1.2</b>	<b>10</b>
Median <sup>2</sup>		10.3		7.9		8.0		9.4		3.6		-1.9	
NCREIF Property Index <sup>6</sup>		7.0		5.5		5.4		5.8		-2.9		-2.1	
NCREIF Open Fund Index Net		8.5		6.8		6.6		7.5		-3.9		-3.4	
<b>ABSOLUTE RETURN</b>	<b>10.2</b>	<b>5.7</b>		<b>7.0</b>		<b>6.3</b>		<b>7.8</b>		<b>4.6</b>		<b>2.1</b>	
1-Month T-Bill + 400 bps		4.8		5.2		5.4		4.9		6.6		5.1	
HFR Benchmark <sup>7</sup>		3.6		4.2		4.1		5.3		1.8		2.2	
<b>FIXED INCOME</b>	<b>9.2</b>	<b>2.6</b>	<b>17</b>	<b>2.4</b>	<b>25</b>	<b>1.9</b>	<b>21</b>	<b>0.3</b>	<b>23</b>	<b>-4.2</b>	<b>45</b>	<b>2.9</b>	<b>70</b>
Median <sup>2</sup>		1.8		1.6		1.5		-1.2		-4.5		3.3	
Bloomberg US Agg Index		1.4		0.9		0.9		-2.8		-4.8		3.0	
<b>CASH EQUIVALENTS</b>	<b>3.3</b>	<b>1.2</b>		<b>1.5</b>		<b>1.7</b>		<b>1.1</b>		<b>2.7</b>		<b>1.1</b>	
1 Month T-Bill		0.8		1.2		1.4		0.9		2.6		1.1	

<sup>1</sup> Annualized Returns and Percentile Rank.

<sup>2</sup> 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.

<sup>3</sup> SP500 + 300 bps with a 3 month lag.

<sup>4</sup> History from 10/1/2010 to 6/30/14 reflects MSCI ACWI ex USA (gross).

<sup>5</sup> Current actuarial rate is 6%. History prior to 12/1/18 reflects 50% (CPI +5%) + 50% (actuarial rate).

<sup>6</sup> NCREIF Property Index is NPI minus 130 bps.

<sup>7</sup> FOF Conservative 1 month lagged.

Source: State Street Analytics; the NCREIF - NPI (Property Index) source is NCREIF.

## Cumulative and Consecutive Total Fund Returns

### MPSERS

#### Cumulative For Years Ending 3/31/23

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	-1.8	5.9	12.7	9.4	8.8	9.6	9.8	8.7	8.8	9.5
Public Plan - Median (> \$10 billion)*	-3.4	3.6	11.5	8.1	7.2	7.8	8.4	7.2	7.0	7.7
Rank	32	17	23	11	12	11	12	12	12	12
bp Difference - Median	154	239	123	131	152	181	138	154	179	173

#### Consecutive For Years Ending

	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15	03/14
MPSERS	-1.8	14.3	27.5	0.2	6.1	13.8	11.2	1.4	9.3	15.7
Public Plan - Median (> \$10 billion)*	-3.4	10.3	29.1	-1.2	4.3	10.8	11.6	-0.1	6.6	13.1
Rank	32	14	71	20	9	11	55	12	11	7
bp Difference - Median	154	409	-157	135	180	301	-39	149	269	257

### MSERS

#### Cumulative For Years Ending 3/31/23

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	-1.9	5.9	12.7	9.4	8.8	9.6	9.8	8.7	8.8	9.4
Public Plan - Median (> \$1 billion)*	-3.8	2.9	11.2	7.8	6.9	7.7	8.3	7.1	6.9	7.7
Rank	27	11	20	7	7	7	7	7	7	9
bp Difference - Median	197	309	146	164	183	187	152	168	187	179

#### Consecutive For Years Ending

	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15	03/14
MSERS	-1.9	14.4	27.5	0.2	6.1	13.8	11.3	1.3	9.2	15.6
Public Plan - Median (> \$1 billion)*	-3.8	9.4	30.4	-3.2	4.2	10.8	11.7	-0.2	6.6	12.6
Rank	27	9	72	15	7	11	58	10	9	11
bp Difference - Median	197	497	-284	336	189	299	-44	156	266	296

\*State Street Public Funds Universe

## Cumulative and Consecutive Total Fund Returns

### MSPRS

#### Cumulative For Years Ending 3/31/23

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	-1.9	5.9	12.7	9.4	8.8	9.6	9.8	8.7	8.8	9.4
Public Plan - Median (> \$1 billion)*	-3.8	2.9	11.2	7.8	6.9	7.7	8.3	7.1	6.9	7.7
Rank	27	12	22	8	8	8	8	8	8	9
bp Difference - Median	198	307	144	162	182	186	151	166	186	177

#### Consecutive For Years Ending

	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15	03/14
MSPRS	-1.9	14.3	27.5	0.2	6.1	13.8	11.2	1.3	9.2	15.5
Public Plan - Median (> \$1 billion)*	-3.8	9.4	30.4	-3.2	4.2	10.8	11.7	-0.2	6.6	12.6
Rank	27	10	73	15	7	11	58	10	9	14
bp Difference - Median	198	493	-288	336	188	299	-48	156	265	286

### MJRS

#### Cumulative For Years Ending 3/31/23

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	-1.9	5.2	12.1	9.0	8.4	9.3	9.6	8.5	8.6	9.2
Public Plan - Median (> \$1 billion)*	-3.8	2.9	11.2	7.8	6.9	7.7	8.3	7.1	6.9	7.7
Rank	27	13	36	10	9	9	9	9	9	10
bp Difference - Median	194	233	86	121	149	158	128	146	167	154

#### Consecutive For Years Ending

	03/23	03/22	03/21	03/20	03/19	03/18	03/17	03/16	03/15	03/14
MJRS	-1.9	12.8	27.3	0.2	6.1	13.8	11.3	1.3	9.1	14.9
Public Plan - Median (> \$1 billion)*	-3.8	9.4	30.4	-3.2	4.2	10.8	11.7	-0.2	6.6	12.6
Rank	27	16	76	15	7	12	58	10	9	27
bp Difference - Median	194	338	-304	339	188	298	-41	155	251	223

\*State Street Public Funds Universe

State of Michigan Retirement System

# ASSET ALLOCATION REVIEW

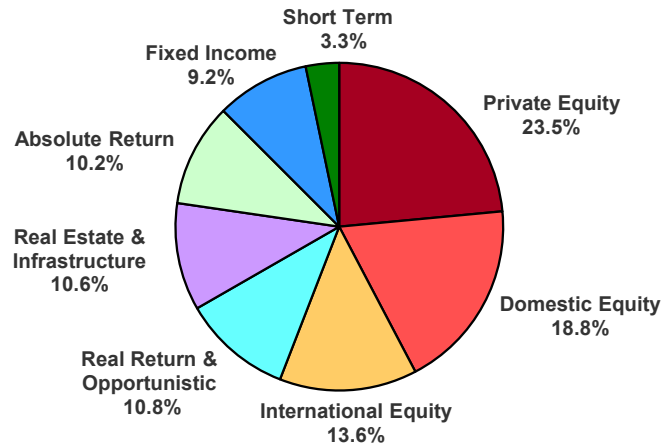
State of Michigan Investment Board Meeting  
June 29, 2023



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

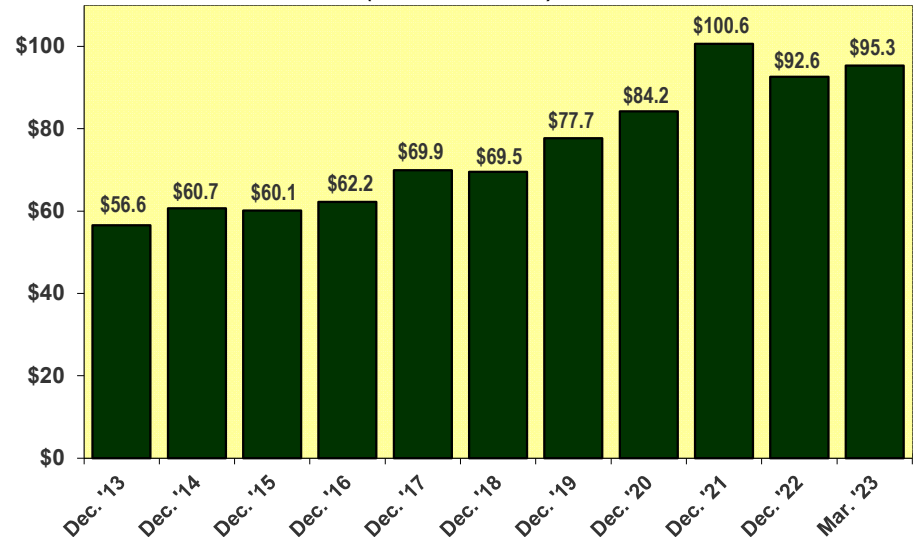
# STATE OF MICHIGAN RETIREMENT SYSTEM PROFILE - MARCH 2023

**Asset Allocation ~ 3/31/23**



**Market Value\***

(Billions of Dollars)



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

Investment Strategies	3/31/2023		3/31/2022	
Private Equity	\$22,367	23.5%	\$23,805	24.2%
Domestic Equity	17,910	18.8%	22,354	22.2%
International Equity	12,992	13.6%	14,699	15.2%
Real Return & Opportunistic	10,340	10.8%	12,468	12.7%
Real Estate & Infrastructure	10,137	10.6%	8,313	8.3%
Absolute Return	9,695	10.2%	6,469	6.5%
Fixed Income	8,776	9.2%	9,276	9.7%
Short Term***	3,123	3.3%	975	1.2%
<b>TOTAL</b>	<b>\$95,340</b>	<b>100.0%</b>	<b>\$98,359</b>	<b>100.0%</b>

**Market Value By Plan ~ 3/31/23**

(in Millions)

	Pension Plan Mkt. Value	OPEB** Mkt. Value	Combined Mkt. Value	%
MPSERS	\$62,517	\$11,400	\$73,917	77.5%
MSERS - (closed)	13,493	5,396	18,889	19.8%
MSPRS	1,858	394	2,252	2.4%
MJRS - (closed)	270	12	282	0.3%
<b>TOTAL</b>	<b>\$78,138</b>	<b>\$17,202</b>	<b>\$95,340</b>	<b>100.0%</b>

MSERS includes the Military Pension Fund

**Short Term Equivalents** (in Billions)

Short Term Strategy***	\$3.1	
Short Term in Other Inv. Strategies	0.7	
<b>TOTAL SHORT TERM</b>	<b>\$3.8</b>	<b>4.0% of Total Funds</b>

**13th Largest State Public Retirement System in the U.S.**

*Pensions & Investments survey - February 13, 2023 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



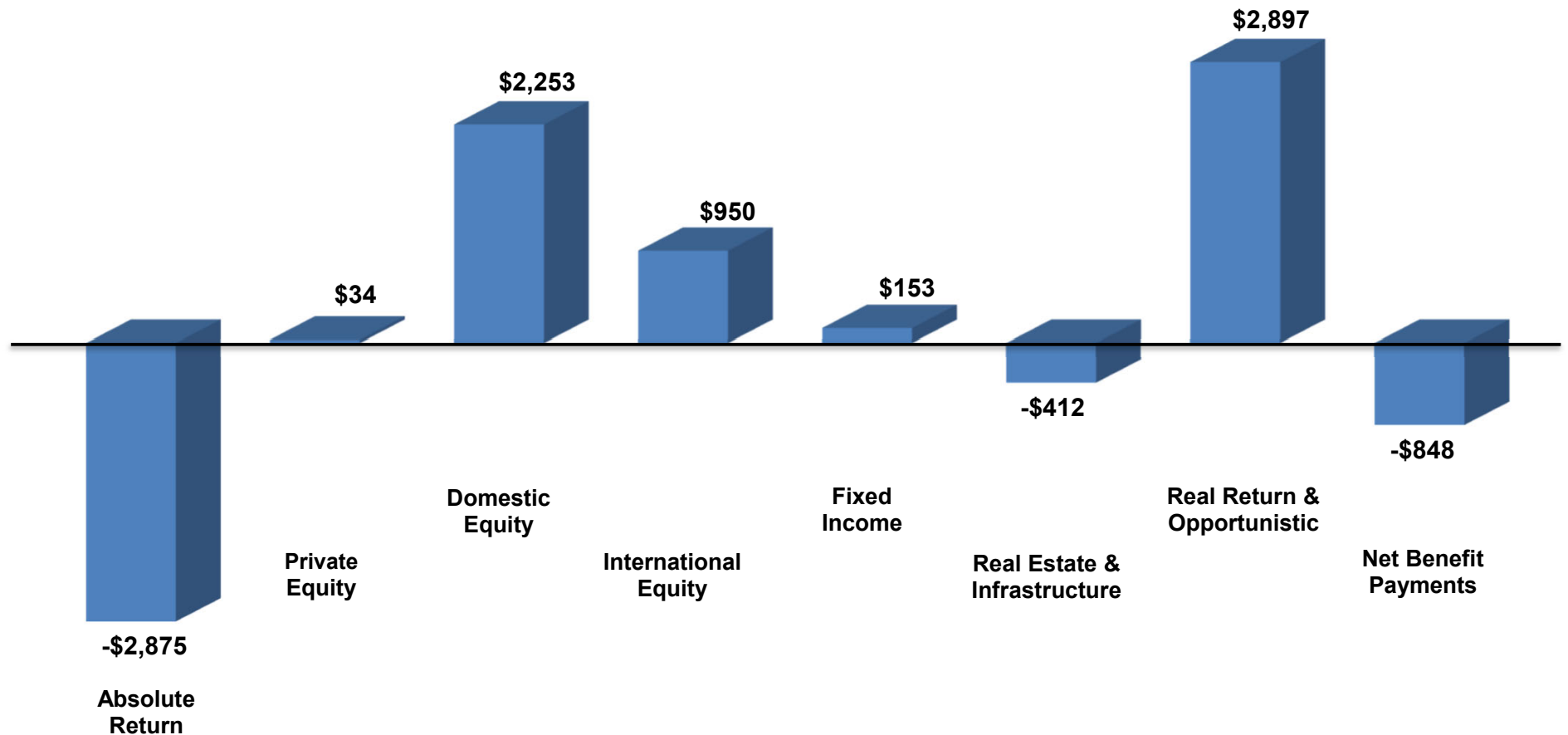
# Sources and Uses of Cash

April 2022 ~ March 2023

4/1/22 Short-Term Cash Balance: \$ 974

3/31/23 Short-Term Cash Balance: 3,126

Net Short-Term Cash Increase: \$ 2,152



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 3/31/23

	MPSERS		MSERS		MSPRS		MJRS		SMRS
<i>Asset Class</i>	<i>3/31/23</i>	<i>Target*</i>	<i>3/31/23</i>	<i>Target*</i>	<i>3/31/23</i>	<i>Target*</i>	<i>3/31/23</i>	<i>Target*</i>	<i>Ranges</i>
Private Equity	23.5%	16.0%	23.7%	16.0%	22.4%	16.0%	23.7%	16.0%	13% - 27%
Domestic Equity	18.8%	25.0%	19.0%	25.0%	17.9%	25.0%	18.9%	25.0%	17% - 32%
International Equity	13.5%	15.0%	13.6%	15.0%	12.8%	15.0%	13.6%	15.0%	12% - 22%
Real Return & Opportunistic	10.9%	10.0%	11.0%	10.0%	10.3%	10.0%	10.9%	10.0%	8% - 18%
Real Estate & Infrastructure	10.6%	10.0%	10.7%	10.0%	10.1%	10.0%	10.7%	10.0%	8% - 18%
Absolute Return	10.2%	9.0%	10.3%	9.0%	9.7%	9.0%	10.3%	9.0%	5% - 11%
Long Term Fixed Income	9.2%	13.0%	9.3%	13.0%	8.8%	13.0%	9.3%	13.0%	8% - 18%
Short Term Fixed Income	3.3%	2.0%	2.4%	2.0%	8.0%	2.0%	2.6%	2.0%	1% - 8%
<b>TOTAL</b>	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 29, 2023



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.*

<b>MPSERS Plan</b>	<b>Assumed Return* (Arithmetic)</b>	<b>Standard Deviation*</b>	<b>Trailing 10-Year 10-Year (Benchmark**)</b>
Private Equity	11.8%	25.0%	15.9%
Real Ret / Opportunistic	9.6%	17.0%	7.4%
Real Estate	9.5%	22.0%	7.0%
International Equity	9.2%	20.5%	4.2%
Domestic Equity	8.1%	17.6%	12.0%
Absolute Return	7.9%	11.6%	3.6%
Long-Term Fixed Income	4.4%	5.0%	1.4%
Short-Term	3.5%	1.5%	0.8%

\* Aon Investment Consultants 2023 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.*

- During the March 2023 quarter, the U.S. Federal Reserve Board increased the policy interest rate twice by a combined 50 basis points and ended the quarter 450 bps higher than one year ago. As a result of these Fed actions, U.S. interest rates are higher across the curve, however the shape of the curve is deeply inverted.
- However, also in March 2023, Silicon Valley Bank failed after a bank run, marking the third-largest bank failure in United States history and the largest since the 2007–2008 financial crisis. It was one of three March 2023 United States bank failures.
- 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 31% discount to U.S. counterparts while emerging markets are at a 45% discount.
- Valuation metrics for the U.S. market are slightly 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.
- Dividend yields on REITs at the end of March 2023 were estimated to be around 3.9%, which is 40 bps higher than the yield of the 10-year U.S. Treasury. However, this is approximately 0.8% below the historical average for the metric.
- The commodities prices broadly, as measured by the CRB index, are down -13.2% over the 12-month period ending March 2023. The price for crude oil was down -24.5% year-over-year and ended March 2023 at \$75.67 per barrel.

## **U.S. Fixed Income**

*Bank failures hit the bond markets.*

- During the March 2023 quarter, the U.S. Federal Reserve Board increased the policy interest rate twice by a combined 50 basis points and ended the quarter 450 bps higher than one year ago. As a result of these Fed actions, U.S. interest rates are higher across the curve, however the shape of the curve is deeply inverted.
- However, also in March 2023, Silicon Valley Bank failed after a bank run, marking the third-largest bank failure in United States history and the largest since the 2007–2008 financial crisis. It was one of three March 2023 United States bank failures.
- As a result, investors fled to the safety of longer-dated U.S. Treasuries; the 10-year Treasury rallied by roughly 50 bps. Meanwhile, credit spread widened intermonth by 30 bps for investment grade bonds and over 100 bps for riskier high yield debt. By the end of April 2023, spreads had settled and were priced just slightly wider than average.
- Interest rates at both the long and short end are earning less than the year-over-year increase in CPI. This fact is indicative of accommodative Federal Reserve policies and critics of the Fed are growing louder. The counter points are that the Fed Funds interest rates continue to increase, inflation is down more than 4% from its recent peak, and the Fed is likely worried about the impact its policies are having on other banks.

## **Domestic Equity**

*Correction in domestic equity prices.*

- The broad U.S. stock market return for the one year ending March 2023 was -7.8%, however the first quarter the market returned 7.1% reversing almost half of the 2022 losses.
- Valuation metrics for the U.S. market are slightly 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.
- 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 five companies make up more than 20% of the index weight. By return, the cap weighted benchmark returned 7.5% in the first quarter, however the average index member return was 2.9%.

## **International Equity**

*Good relative valuations.*

- International equities outperformed domestic equities for the year ending March 2023 by 2.5%. Over the past three, five, seven, and ten years, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -7.1%, -8.4%, -6.3%, and -7.8% annualized, respectively.
- 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 almost -8.5% since then. Year-over-year, the index rose 4.3% and over the past ten years the value has appreciated by approximately 2.2% annually. By several measures, the price is technically and fundamentally stretched.
- 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 31% discount to U.S. counterparts while emerging markets are at a 45% discount.

## **Real Estate**

*Comparing public vs. private real estate.*

- Over the one year ending March 2023, the NAREIT index increased by 1.7% including dividends, which was approximately 4.6% 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 2023 were estimated to be around 3.9%, which is 40 bps higher than the yield of the 10-year U.S. Treasury. However, this is approximately 0.8% below the historical average for the metric.

## **Commodities**

*Inflation; supply and demand issues.*

- Fed policy remains accommodative, and the attention has turned towards inflation. The March reading for non-seasonally adjusted year-over-year CPI was 5.0% which was down from 6.5% the quarter prior. For comparison, the 20-year average for CPI is 2.3%.
- The commodities prices broadly, as measured by the CRB index, are down -13.2% over the 12-month period ending March 2023. The price for crude oil was down -24.5% year-over-year and ended March 2023 at \$75.67 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 2003 - 2022

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
4	Int'l Equity	Int'l Equity	Real Estate	Int'l Equity	Int'l Equity	Gov't Bonds	Int'l Equity	U.S. Equity	Real Estate	Int'l Equity	U.S. Equity	U.S. Equity	Real Estate	U.S. Equity	Int'l Equity	Real Estate	U.S. Equity	U.S. Equity	U.S. Equity	Inflation	Best
	40.82%	20.90%	20.06%	26.65%	16.65%	12.38%	41.44%	16.38%	14.26%	16.83%	32.80%	13.08%	13.32%	11.93%	27.19%	6.71%	30.90%	17.92%	28.45%	6.50%	
	U.S. Equity	Real Estate	Int'l Equity	Real Estate	Real Estate	Cash	U.S. Equity	Real Estate	Gov't Bonds	U.S. Equity	Int'l Equity	Real Estate	U.S. Equity	Real Estate	U.S. Equity	Inflation	Int'l Equity	Int'l Equity	Real Estate	Real Estate	
	29.58%	14.48%	16.62%	16.59%	15.84%	2.05%	27.24%	13.11%	9.02%	16.17%	15.29%	11.81%	1.01%	7.97%	21.13%	1.91%	22.13%	10.65%	17.70%	5.50%	
	Hedge Funds	U.S. Equity	U.S. Equity	U.S. Equity	Gov't Bonds	Inflation	Corp. Bonds	Int'l Equity	Corp. Bonds	Real Estate	Real Estate	Corp. Bonds	Gov't Bonds	Corp. Bonds	Real Estate	Cash	Corp. Bonds	Corp. Bonds	Int'l Equity	Cash	
	9.01%	11.78%	5.65%	15.34%	8.67%	0.10%	16.05%	11.15%	8.35%	10.54%	10.99%	7.53%	0.86%	5.63%	6.96%	1.88%	14.54%	9.89%	8.29%	1.46%	
	Real Estate	Hedge Funds	Hedge Funds	Hedge Funds	Hedge Funds	Corp. Bonds	Hedge Funds	Corp. Bonds	Inflation	Corp. Bonds	Hedge Funds	Gov't Bonds	Inflation	Int'l Equity	Corp. Bonds	Gov't Bonds	Gov't Bonds	Gov't Bonds	Hedge Funds	Hedge Funds	
	8.99%	5.83%	5.13%	9.21%	7.68%	-3.07%	9.65%	8.46%	2.96%	9.37%	7.70%	4.92%	0.66%	4.50%	6.42%	0.88%	6.83%	7.94%	7.56%	0.12%	
	Corp. Bonds	Corp. Bonds	Inflation	Cash	U.S. Equity	Real Estate	Inflation	Gov't Bonds	U.S. Equity	Hedge Funds	Inflation	Hedge Funds	Hedge Funds	Inflation	Hedge Funds	Hedge Funds	Real Estate	Hedge Funds	Inflation	Gov't Bonds	
	7.69%	5.25%	3.42%	4.81%	5.47%	-6.46%	2.72%	5.52%	1.75%	4.22%	1.49%	3.14%	0.37%	2.09%	3.88%	-1.05%	6.42%	4.75%	7.12%	-12.32%	
Worst	Gov't Bonds	Gov't Bonds	Cash	Corp. Bonds	Corp. Bonds	Hedge Funds	Cash	Hedge Funds	Cash	Gov't Bonds	Cash	Inflation	Cash	Hedge Funds	Gov't Bonds	Corp. Bonds	Hedge Funds	Real Estate	Cash	Int'l Equity	
	2.36%	3.48%	3.06%	4.27%	5.10%	-19.86%	0.19%	5.07%	0.10%	2.02%	0.07%	0.68%	0.01%	1.89%	2.30%	-2.51%	4.40%	1.60%	0.05%	-15.57%	
	Inflation	Inflation	Gov't Bonds	Gov't Bonds	Cash	U.S. Equity	Gov't Bonds	Inflation	Hedge Funds	Inflation	Corp. Bonds	Cash	Corp. Bonds	Gov't Bonds	Inflation	U.S. Equity	Inflation	Inflation	Corp. Bonds	Corp. Bonds	
	1.88%	3.25%	2.65%	3.46%	5.03%	-36.72%	-2.19%	1.50%	-3.55%	1.70%	-2.01%	0.04%	-0.77%	1.05%	2.12%	-4.96%	2.29%	1.40%	-1.04%	-15.76%	
	Cash	Cash	Corp. Bonds	Inflation	Inflation	Int'l Equity	Real Estate	Cash	Int'l Equity	Cash	Gov't Bonds	Int'l Equity	Int'l Equity	Cash	Cash	Int'l Equity	Cash	Cash	Gov't Bonds	U.S. Equity	
	1.16%	1.33%	1.95%	2.55%	4.06%	-45.52%	-16.86%	0.13%	-13.71%	0.11%	-2.60%	-3.87%	-5.67%	0.27%	0.84%	-14.20%	2.28%	0.45%	-2.28%	-17.78%	

Annualized Returns 2003 - 2022																				
Return Risk		Cash		Inflat.		Gov't		Hedge		Corp.		Int'l.		R.E.		US Eq.				Return Risk
		1.27%		2.50%		2.61%		3.24%		4.12%		7.21%		8.63%		9.92%				
		0.78%		1.59%		4.83%		5.33%		6.48%		19.31%		4.98%		16.33%				

- 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 29, 2023



Peter A. Woodford  
Senior Investment Manager  
Private Equity Division



# EXECUTIVE SUMMARY

## Performance

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Annualized Returns	-5.2%	19.0%	16.5%	15.9%	15.5%
PE Benchmark Returns	-15.6%	10.9%	12.7%	14.8%	15.9%
Peer Median Returns	1.5%	14.4%	9.9%	10.6%	10.3%

- 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 by 3.3% (ten-year S&P 500 return 12.2%) and underperformed the benchmark by 0.4%.
- Private equity returns have been strong relative to peer median returns, ranking in the top 6.0% 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:
  - \$50.0 million Khosla Ventures VIII, LP managed by Khosla Ventures Associates VIII, LLC.
  - \$12.5 million Khosla Ventures Opportunity II, LP managed by Khosla Ventures Opportunity Associates II, LLC.
  - \$12.5 million Khosla Ventures Seed F, LP managed by Khosla Ventures Seed Associates F, LLC.

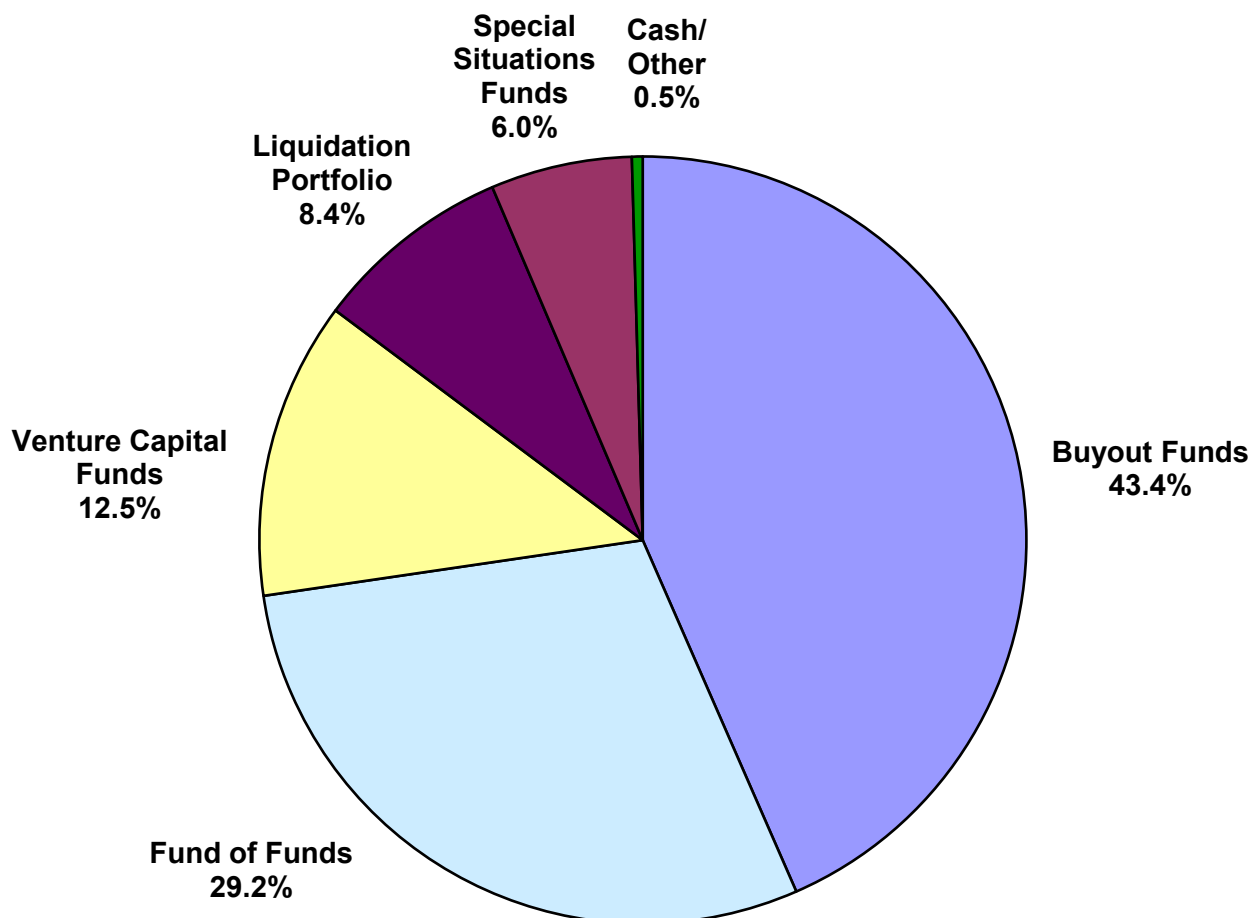
## Strategy Update

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

### 3/31/23



Market Value in Millions				
	3/31/23		3/31/22	
Buyout Funds	\$9,718	43.4%	\$11,362	47.7%
Fund of Funds	6,538	29.2%	6,427	27.0%
Venture Capital Funds	2,804	12.5%	3,219	13.5%
Liquidation Portfolio	1,873	8.4%	692	2.9%
Special Situations Funds	1,333	6.0%	1,687	7.1%
Cash/Other	101	0.5%	325	1.4%
<b>Total</b>	<b>\$22,367</b>	<b>100.0%</b>	<b>\$23,805 *</b>	<b>100.0%</b>

\* 3/31/22 total includes \$93M in Mezzanine Funds

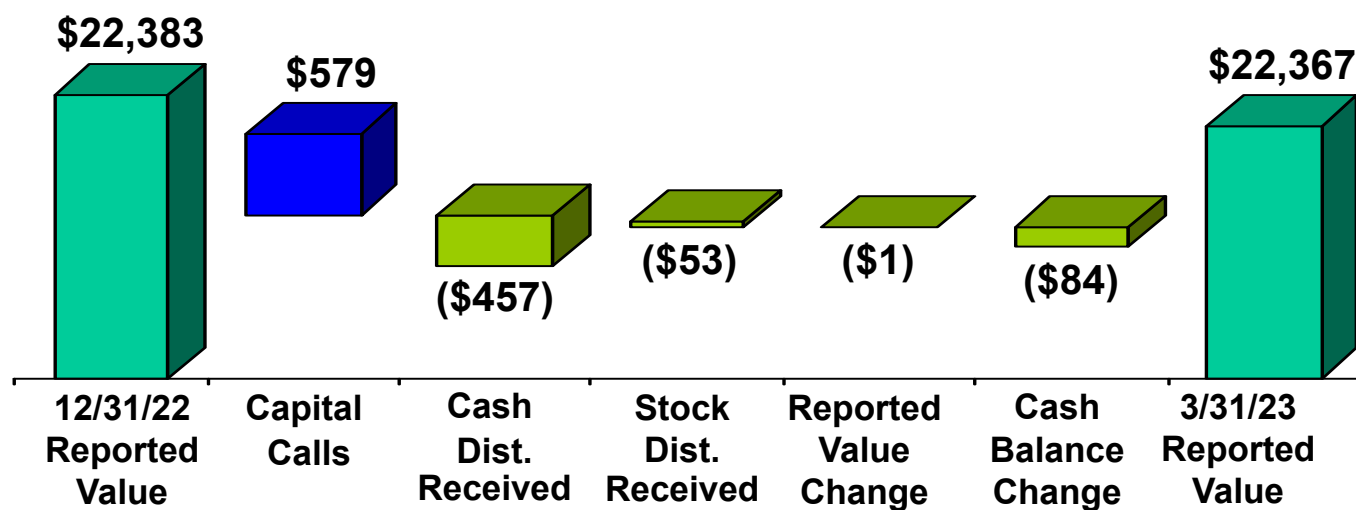
# SMRS

## Private Equity

### 3/31/23

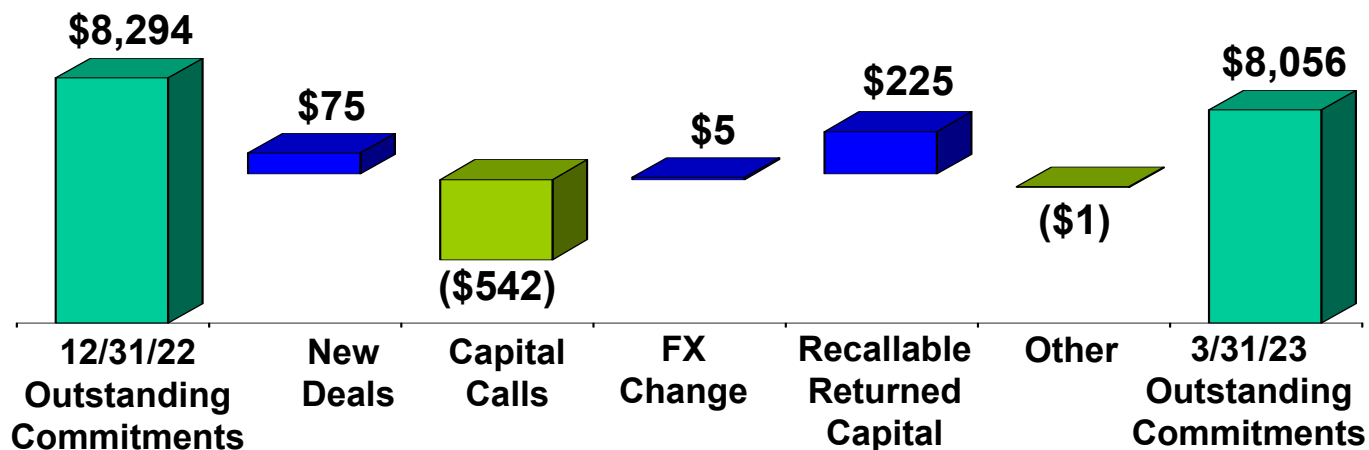
### Invested Commitments

(\$ in Millions)



### Outstanding Commitments

(\$ in Millions)

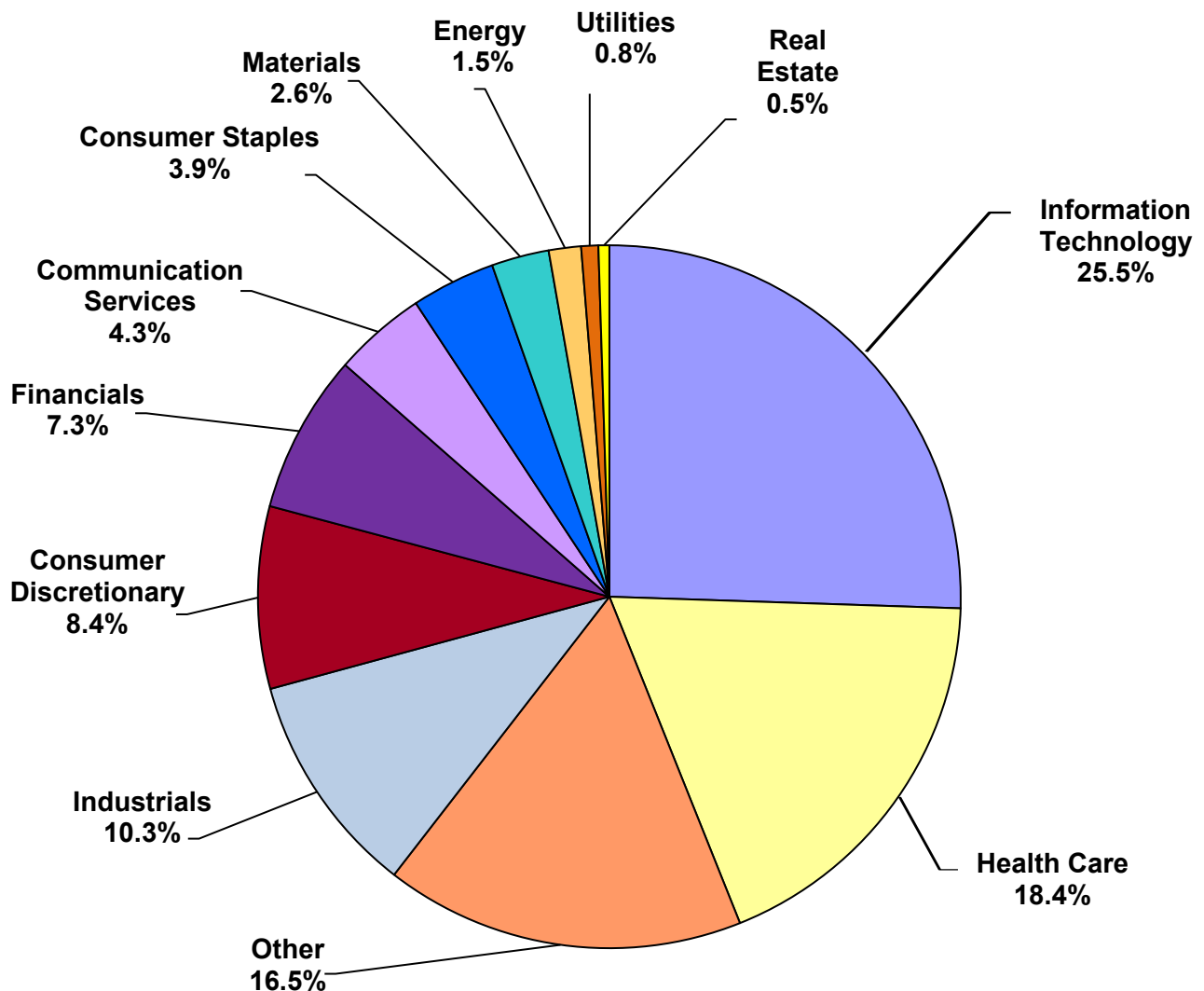


# SMRS

## Private Equity

3/31/23

### Investments by Industry



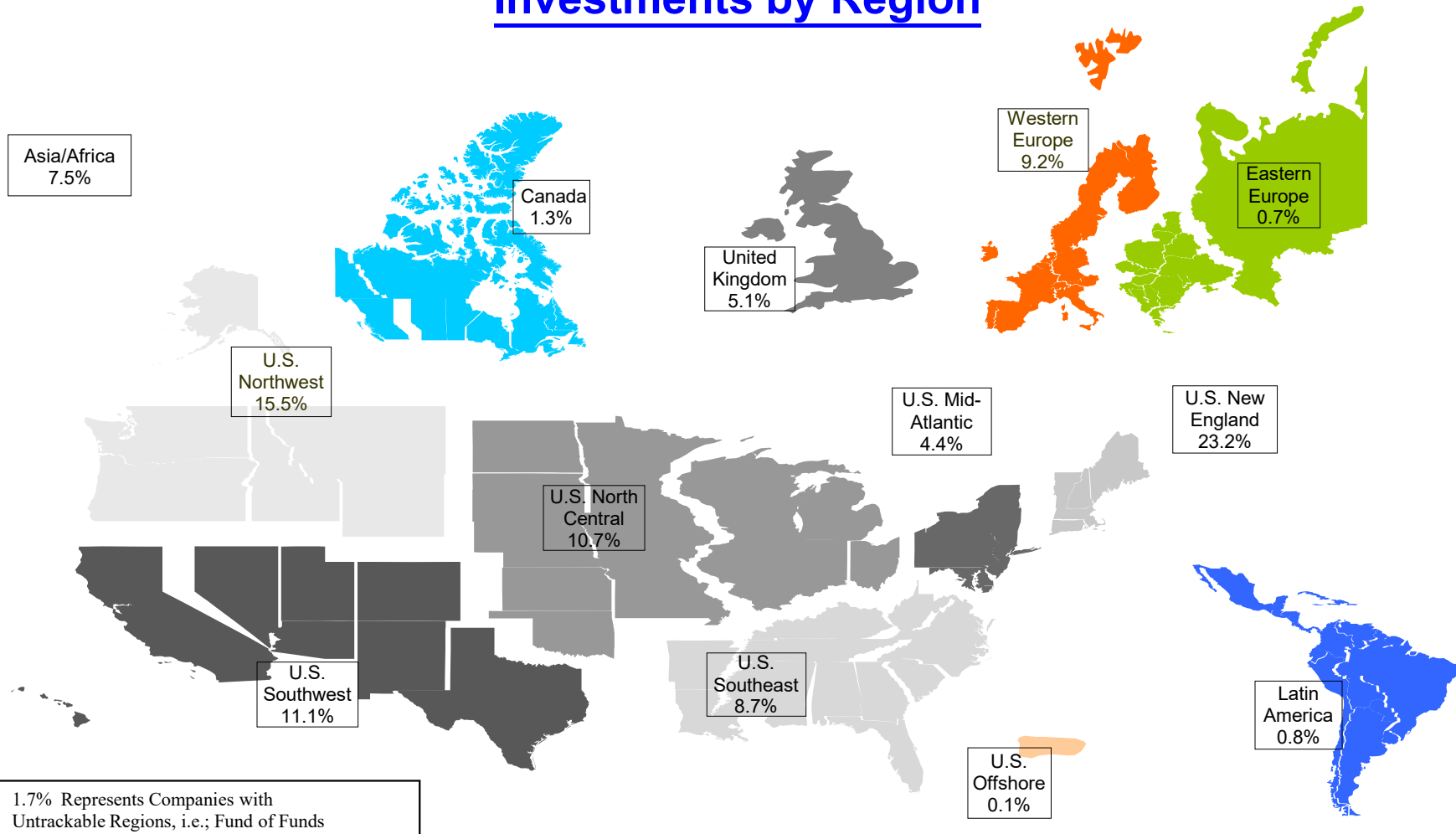
These numbers are based on the most recent available General Partner Data; primarily 12/31/22 and are subject to change.

# SMRS

## Private Equity

3/31/23

### Investments by Region



Geographic Report: North America 75.0%, Europe 15%, Asia 7.5%, Other 1.7%, Latin America 0.8%

# SMRS

## Private Equity

### 3/31/23

## Portfolio by Vintage Year

(\$ in Millions)

<b>Asset Vintage</b>	<b>Reported Value</b>	<b>Outstanding Commitment</b>	<b>Total Exposure</b>
1986-2005	\$ 198	\$ 57	\$ 255
2006*	71	87	158
2007	60	41	101
2008	202	68	270
2009	9	0	9
2010	160	3	163
2011	385	52	437
2012	555	41	596
2013	120	41	161
2014	1,105	109	1,214
2015	7,823	1,287	9,110
2016	2,063	209	2,272
2017	1,903	233	2,136
2018	3,510	1,175	4,685
2019	1,980	453	2,433
2020	839	409	1,248
2021	1,046	1,749	2,795
2022	237	1,967	2,204
2023	0	75	75
Income Accruals	(0)	0	(0)
Cash	84	0	84
Act. Small Cap - Stock Dist	17	0	17
<b>Total</b>	<b>\$ 22,367</b>	<b>\$ 8,056</b>	<b>\$ 30,423</b>

\*Liquidation portfolio is 2006 vintage

## FX Exposure

(\$ in Millions)

	<b>Reported Value</b>	<b>Outstanding Commitment</b>	<b>Total Exposure</b>	<b>Total (USD)</b>
Euro (\$1.086/ €)	€ 456	€ 182	€ 638	\$693

# SMRS

## Private Equity

### 3/31/23

### Top 10 Sponsors

(\$ in Millions)

<b>Asset Type</b>	<b>Reported Value</b>	<b>Outstanding Commitment</b>	<b>Total</b>
HarbourVest Partners	\$ 7,298	\$ 1,620	\$ 8,918
Advent International	738	400	1,138
StepStone Group	587	472	1,059
Thoma Bravo	634	285	919
Veritas Capital	710	202	912
Flagship Pioneering	722	180	902
Insight Partners	831	68	899
Leonard Green & Partners	699	147	846
KKR	674	161	835
The Carlyle Group	490	315	805
<b>Top 10 Total Value</b>	<b>\$ 13,383</b>	<b>\$ 3,850</b>	<b>\$ 17,233</b>

### Cash Weighted Rates of Return\*

<b>(Net IRR)</b>	<b>Current Qtr.</b>	<b>1-Year</b>	<b>3-Year</b>	<b>5-Year</b>	<b>10-Year</b>
Buyout	0.7%	-5.9%	20.5%	18.5%	18.2%
Fund of Funds	-0.7%	-3.6%	16.7%	15.1%	14.5%
Special Situations	-0.1%	-6.8%	18.0%	13.7%	13.3%
Venture Capital	-0.1%	-16.3%	26.6%	23.5%	20.7%

\*These numbers are based on most recent available General Partner reported data; primarily 12/31/2022 and are subject to change.

# SMRS

## Private Equity

### 3/31/23

### Net Market Value by Entity

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
5AM Opportunities I, LP	\$ 16,160,120	\$ 0
5AM Opportunities II, LP	8,388,302	17,000,000
5AM Ventures VI, LP	20,906,104	588,162
5AM Ventures VII, LP	3,437,817	20,562,500
Accel Europe I, LP	1,112,124	1
Accel Europe II, LP	24,011,728	3,300,000
Accel Growth Fund II, LP	10,075,426	0
Accel Growth Fund III, LP	13,265,781	280,000
Accel Growth Fund IV, LP	31,399,970	0
Accel Growth Fund V, LP	41,969,558	843,751
Accel Growth Fund VI, LP	11,270,116	12,875,000
Accel India VII, LP	1,865,852	7,875,000
Accel IX, LP	622,875	3,000,000
Accel Leaders 4, LP	0	50,000,000
Accel Leaders Fund 3, LP	28,601,589	8,800,000
Accel Leaders Fund II, LP	11,433,717	0
Accel Leaders Fund, LP	9,113,471	0
Accel London V, LP	48,403,691	1,080,000
Accel London VI, LP	15,664,975	3,000,000
Accel London VII, LP	4,282,300	7,750,000
Accel VI-S, LP	312,698	652,611
Accel VI, LP	451,630	0
Accel X, LP	3,577,016	0
Accel XI, LP	7,489,575	1,440,000
Accel XII, LP	20,485,159	980,000
Accel XIII, LP	21,813,858	1,250,000
Accel XIV LP	14,070,462	1,150,000
Accel XV, LP	4,309,604	5,500,000
Accel-KKR Growth Capital Fund IV, LP	9,102,186	30,022,499
Acorn Bioventures 2, LP	20,608,177	79,000,000
Acorn Bioventures, LP	77,368,262	10,000,000
Advent Global Private Equity V, LP	3,630,853	8,700,000
Advent International GPE IX, LP	311,955,048	22,483,966
Advent International GPE VI-A, LP	20,318,747	0
Advent International GPE VII-B, LP	40,350,518	8,000,000
Advent International GPE VIII-B, LP	277,324,494	0
Advent International GPE X, LP	25,436,735	323,750,000



	<b>Adjusted Reported Value</b>	<b>Unfunded Commitment</b>
Advent International LAPEF VII, LP	27,157,131	34,650,000
Advent Latin American Private Equity Fund VI, LP	31,893,339	2,450,000
Affinity Asia Pacific Fund III, LP	12,384,050	8,520,204
Affinity Asia Pacific Fund IV, LP	55,342,742	14,793,402
Affinity Asia Pacific Fund V, LP	101,655,539	85,167,580
Apax Digital II, LP	1,030,268	96,270,993
Apax Digital, LP	51,537,992	11,386,613
Apax Europe Fund VI, LP	6,893,623	2,297,622
Apax Europe VII, LP	1,137,876	1,618,138
Apax IX, LP	149,158,793	14,420,230
Apax US VII, LP	2,590,719	417,509
Apax VIII - B, LP	23,177,699	3,983,093
Apax X USD, LP	129,653,345	38,679,605
Apax XI USD, LP	0	150,000,000
Apollo Investment Fund IX, LP	89,427,814	31,910,666
Apollo Investment Fund VIII, LP	38,026,374	10,541,767
Arboretum Ventures II, LP	993,123	0
Arboretum Ventures III, LP	4,898,683	0
Arboretum Ventures IV, LP	21,268,448	5,610,000
Arboretum Ventures V, LP	24,117,590	11,269,619
Arboretum Ventures VI, LP	787,500	33,985,000
Ares Corporate Opportunities Fund II, LP	13,199	11,423,773
Ares Corporate Opportunities Fund III, LP	1,306,318	6,656,978
Ares Corporate Opportunities Fund IV, LP	35,332,502	13,701,239
ASF VIII B, LP	99,223,148	70,827,521
AXA ASF Miller Co-Investment, LP	253,717	0
Axiom Asia 6, LP	21,663,022	29,750,000
Axiom Asia Co-Investment Fund I, LP	55,764,233	6,031,825
Axiom Asia Co-Investment Fund II, LP	18,048,782	31,869,177
Axiom Asia IV, LP	55,686,710	6,747,811
Axiom Asia Private Capital Fund III, LP	45,373,184	5,250,002
Axiom Asia V, LP	49,368,616	12,750,000
BC European Capital VII, LP	603,686	0
Berkshire Fund IX Coinvestment Fund, LP	47,509,441	8,968,361
Berkshire Fund IX, LP	187,758,885	14,868,137
Berkshire Fund VI, LP	21,254,416	6,902,067
Berkshire Fund VII, LP	5,575,002	2,441,522
Berkshire Fund VIII, LP	78,426,208	12,028,238
Berkshire Fund X, LP	50,092,175	103,952,453
Blackstone Capital Partners IV, LP	494,413	4,580,765
Blackstone Capital Partners V, LP	2,068,205	13,069,138
Blackstone Capital Partners V-S, LP	0	712,476
Blackstone Capital Partners VI, LP	120,653,478	32,926,549
Blackstone Capital Partners VII, LP	258,878,752	19,328,680
Blackstone Capital Partners VIII, LP	124,304,463	100,156,086
Blackstone Growth II, LP	0	100,000,000

	<b>Adjusted Reported Value</b>	<b>Unfunded Commitment</b>
Carlyle Europe Partners V, SCSp	80,300,417	63,305,870
Carlyle Partners Growth, LP	2,248,869	46,964,442
Carlyle Partners V, LP	15,402,656	10,645,569
Carlyle Partners VI, LP	86,064,654	9,288,430
Carlyle Partners VII, LP	279,420,671	14,693,574
Carlyle Partners VIII, LP	26,795,769	170,512,872
Charlesbank Equity Fund IX, LP	104,333,425	18,666,413
Charlesbank Equity Fund X, LP	49,451,382	56,394,070
Charlesbank Equity Overage Fund X, LP	39,410,067	13,891,224
Charlesbank Fund IX Overage Allocation Program	53,688,381	9,298,010
Clearlake Capital Partners VII, LP	101,589,644	97,253,110
Coller International Partners V, LP	694,997	2,000,000
Coller International Partners VI, LP	15,138,298	5,000,000
Coller International Partners VII, LP	75,085,993	45,871,272
CVC Capital Partners VII, LP	245,532,000	13,226,935
CVC Capital Partners VIII, LP	65,156,887	46,329,055
Dover Street IX, LP	63,875,612	12,000,000
Dover Street X, LP	109,091,038	55,125,000
FirstMark Capital I, LP	72,819,785	196,596
FirstMark Capital IV, LP	80,351,930	1,400,000
FirstMark Capital OF I, LP	18,286,714	0
FirstMark Capital OF II, LP	71,514,009	0
FirstMark Capital OF III, LP	36,524,026	0
FirstMark Capital OF IV, LP	0	35,000,000
FirstMark Capital V, LP	29,768,377	12,600,000
FirstMark Capital VI, LP	0	35,000,000
Flagship Pioneering Fund VII, LP	46,793,943	162,164,488
Flagship Pioneering Special Opp Fund II, LP	101,394,339	16,000,000
Flagship Pioneering VI, LP	321,378,087	2,250,000
Flagship Ventures Fund 2004	1,893	0
Flagship Ventures Fund 2007, LP	3,101,381	0
Flagship Ventures Fund IV, LP	134,484,279	0
Flagship Ventures Fund V, LP	77,555,236	0
Flagship Ventures Opportunities Fund I, LP	37,527,760	0
GCM Grosvenor Fund Investment Program I, LP	3,862,710	1,430,748
GCM Grosvenor Fund Investment Program II, LP	15,263,792	12,818,284
GCM Grosvenor FIP III - 2004	25,770,722	4,218,451
GCM Grosvenor FIP III - 2006	26,209,994	6,546,450
GCM Grosvenor FIP V, LP	32,972,820	8,517,383
GCM Grosvenor FIP VI, LP	22,031,527	1,605,827
GCM Grosvenor FIP VIII, LP	111,006,714	10,999,864
GCM Grosvenor SeasPriFIP, LP (PIS06-10)	18,886,700	7,556,490
GCM Grosvenor SeasPriFIP, LP (PIS14)	297,169,376	14,341,389
GCM Grosvenor SeasPriFIP, LP (Seed)	8,515,050	17,093,149
Genstar Capital Partners IX, LP	99,443,474	11,226,483
Genstar Capital Partners VIII, LP	88,505,705	4,217,985

	Adjusted Reported Value	Unfunded Commitment
Genstar Capital Partners X, LP	59,152,774	43,257,424
Genstar IX Opportunities Fund I, LP	60,002,392	8,835,799
Genstar VIII Opportunities Fund I, LP	78,585,508	3,622,283
Genstar X Opportunities Fund I, LP	15,569,101	10,132,771
Golden Bell Azalea, LLC	28,342,566	0
Green Equity Investors V, LP	5,195,032	14,745,120
Green Equity Investors VI, LP	131,851,983	7,350,245
Green Equity Investors VII, LP	243,831,792	49,345,044
Green Equity Investors VIII, LP	237,241,389	34,151,326
Greenspring Master G, LP	544,096,980	468,000,000
Greenspring Micro II, LP	43,129,087	3,500,000
GTCR Fund XIII, LP	24,666,514	24,427,247
GTCR Fund XIV, LP	0	150,000,000
GTCR Strategic Growth Fund, LP	3,555,512	37,791,000
HarbourVest Dover Street VIII, LP	7,076,275	5,400,000
HarbourVest Int'l III Partnership, LP	137,377	1,200,000
Harbourvest Partners Co-Investment Fund IV, LP	74,373,425	19,107,835
HarbourVest Partners Co-Investment Fund V, LP	227,644,866	45,000,000
Harbourvest Partners Co-Investment Fund VI, LP	66,240,624	130,000,000
HarbourVest V Partnership, LP	122,307	300,000
HarbourVest VI - Direct Fund, LP	347,086	750,000
HarbourVest VI Partnership, LP	244,898	2,000,000
Harvest Partners IX, LP	12,687,108	85,551,481
Harvest Partners VII, LP	113,337,012	7,759,791
Harvest Partners VIII, LP	122,644,875	10,949,988
Hellman & Friedman Capital Partners X, LP	70,355,942	27,857,776
Hg Saturn 3 A, LP	246,575	98,994,521
Insight Partners Fund X Follow-On Fund, LP	34,163,821	10,000,000
Insight Partners XI, LP	141,506,049	2,731,846
Insight Partners XII, LP	86,062,393	45,900,000
Insight Venture Partners GBCF, LP	111,869,465	4,178,070
Insight Venture Partners IX, LP	259,142,560	1,895,805
Insight Venture Partners X, LP	198,121,690	3,044,856
Jade Equity Investors, LP	80,884,669	41,667,239
Kelso Investment Associates IX, LP	53,549,990	9,477,552
Kelso Investment Associates VII, LP	151,794	0
Kelso Investment Associates VIII, LP	7,325,741	7,765,714
Kelso Investment Associates X, LP	153,956,380	16,142,996
Khosla Ventures III, LP	8,735,862	225,000
Khosla Ventures IV, LP	80,966,118	950,000
Khosla Ventures Opportunity I, LP	21,488,836	5,250,000
* <b>Khosla Ventures Opportunity II, LP</b>	0	<b>12,500,000</b>
Khosla Ventures Seed D, LP	21,202,289	940,000
Khosla Ventures Seed E, LP	3,972,273	1,725,000
* <b>Khosla Ventures Seed F, LP</b>	0	<b>12,500,000</b>
Khosla Ventures V, LP	100,955,672	1,750,000

	<b>Adjusted Reported Value</b>	<b>Unfunded Commitment</b>
Khosla Ventures VI, LP	129,143,933	3,750,000
Khosla Ventures VII, LP	34,682,028	17,500,000
* <b>Khosla Ventures VIII, LP</b>	<b>0</b>	<b>50,000,000</b>
KKR 2006 Fund, LP	162,597	6,102,869
KKR Americas Fund XII, LP	233,434,050	23,471,876
KKR Asian, LP	170,198	395,007
KKR Asian Fund II, LP	21,540,665	0
KKR Asian Fund III, LP	112,387,860	15,122,741
KKR China Growth Fund, LP	8,732,233	3,306,040
KKR European Fund II, LP	1,059,840	0
KKR European Fund III, LP	2,417,528	6,430,608
KKR European Fund IV, LP	90,569,178	0
KKR European Fund V (USD), SCSp	110,625,213	21,374,667
KKR Millennium Fund, LP	232,956	0
KKR North America Fund XI, LP	51,207,802	1,336,247
KKR North America Fund XIII, SCSp	41,154,971	83,115,688
Lead Edge Capital IV, LP	30,661,185	9,326,779
Lead Edge Capital V, LP	28,518,331	2,798,171
Lead Edge Capital VI, LP	7,275,024	67,488,520
Lightspeed India Fund IV, LLC	210,000	7,290,000
Lightspeed Opportunity Fund II, LP	5,427,640	19,500,000
Lightspeed Opportunity Fund, LP	30,295,015	500,000
Lightspeed Venture Partners Select IV, LP	28,928,391	2,750,000
Lightspeed Venture Partners Select V, LP	6,004,223	18,250,000
Lightspeed Venture Partners VII, LP	4,466,873	-
Lightspeed Venture Partners XIII, LP	14,676,487	1,200,000
Lightspeed Venture Partners XIV-A, LP	3,615,537	7,425,000
Lightspeed Venture Partners XIV-B, LP	3,374,113	10,037,500
Menlo Special Opportunities Fund II, LP	37,803,853	2,100,000
Menlo Special Opportunities Fund III, LP	3,900,528	20,750,000
Menlo Ventures IX, LP	876,787	0
Menlo Ventures X, LP	2,020,629	0
Menlo Ventures XI, LP	14,074,831	0
Menlo Ventures XIV, LP	14,920,436	0
Menlo Ventures XV, LP	20,689,809	6,250,000
Meritech Capital Partners Franchise Fund, LP	4,095,913	10,987,500
Meritech Capital Partners IV, LP	2,782,764	0
Meritech Capital Partners V, LP	14,506,977	400,000
Meritech Capital Partners VI, LP	43,835,387	2,656,250
Meritech Capital Partners VII, LP	25,494,729	19,656,250
Meritech Capital Partners VIII, LP	0	48,000,000
Meritech Capital Sidecar III, LP	0	12,000,000
Michigan Growth Capital Partners II, LP	100,131,736	0
Michigan Growth Capital Partners III, LP	113,157,670	20,906,746
Michigan Growth Capital Partners IV, LP	26,142,329	52,001,755
Michigan Growth Capital Partners, LP	17,967,977	5,981,028

	<b>Adjusted Reported Value</b>	<b>Unfunded Commitment</b>
Michigan SEMF Barings, LP	58,407,209	96,347,268
Michigan SEMF Grosvenor, LP	43,792,013	109,812,873
New Leaf Biopharma Opportunities II, LP	116,822,536	8,000,000
New Leaf Growth Fund I, LP	12,973,486	0
New Leaf Ventures II, LP	4,809,123	0
New Leaf Ventures III, LP	31,477,719	0
New Leaf Ventures IV, LP	58,093,567	17,000,000
Oak Investments Partners IX, LP	14,617	0
Ocqueoc Holdings, LLC	926,563	47,542,759
Odyssey Investment Partners Fund VI, LP	86,140,062	33,148,377
Permira Growth Opportunities I, LP1	39,671,613	10,644,666
Permira Growth Opportunities II, SCSp	11,368,152	34,825,000
Permira VII, LP 1	74,467,591	11,268,923
Permira VIII, LP 2	21,407,733	60,076,016
Public Pension Capital, LLC	95,776,464	25,118,375
Renaissance Venture Capital Fund IV, LP	7,373,320	17,500,000
Riverside Capital Appreciation Fund VI, LP	20,671,298	9,482,715
Riverside Capital Appreciation Fund VII, LP	98,546,074	19,997,046
Riverside Micro Cap Fund I, LP	10,947,049	4,096,758
Riverside Micro-Cap Fund II, LP	1,404,427	2,735,834
Riverside Micro-Cap Fund III, LP	77,720,378	4,823,424
Riverside Micro-Cap Fund IV, LP	83,236,922	3,617,302
Riverside Micro-Cap Fund IV B, LP	25,378,831	713,421
Riverside Micro-Cap Fund V, LP	119,864,403	16,837,335
Riverside Micro-Cap Fund VI, LP	33,934,117	89,537,517
Science Ventures Fund II, LP	42,882,768	1,500,000
Science Ventures Fund III, LP	12,208,159	12,500,000
Silver Lake Partners III, LP	6,710,463	11,910,583
Silver Lake Partners IV, LP	76,924,687	1,819,311
Silver Lake Partners V, LP	72,703,207	9,549,154
Silver Lake Partners VI, LP	56,928,933	7,933,782
Silver Lake SL SPV-2, LP	58,218,335	0
SK Capital Partners V, LP	57,586,216	3,438,946
SKCP Catalyst Fund I-A, LP	38,839,294	10,466,467
SMRS - TOPE, LLC	4,763,809,362	561,326,571
SMRS-CAPP, LLC	435,921,674	198,831,651
SMRS-NCRP, LLC	1,548,571,132	588,658,994
Summit Partners Growth Equity Fund X, LP	94,789,562	23,333,261
Summit Partners Growth Equity Fund XI-A, LP	18,800,908	81,790,214
The Veritas Capital Fund VIII, LP	103,743,468	142,104,260
The Veritas Capital Vantage Fund, LP	22,186,669	38,315,209
Thoma Bravo Discover Fund II, LP	95,905,900	22,209,320
Thoma Bravo Discover Fund IV, LP	32,687,048	66,748,252
Thoma Bravo Explore II, LP	0	100,000,000
Thoma Bravo Fund XII, LP	153,951,313	36,904,285
Thoma Bravo Fund XIII, LP	182,370,324	10,504,042

	Adjusted Reported Value	Unfunded Commitment
Thoma Bravo Fund XV, LP	51,718,828	46,337,869
Thoma Bravo XIV, LP	117,724,643	1,903,658
TI Platform BOV, LP	19,552,038	4,069,523
TI Platform Fund II, LP	19,531,863	2,510,196
TI Platform Fund III, LP	6,770,499	18,504,501
TI Platform SMRS SMA, LP	111,445,970	29,926,948
TPG Healthcare Partners II, LP	277,454	37,500,000
TPG Healthcare Partners, LP	20,112,729	5,010,923
TPG IV, LP (Texas Pacific Group IV)	95,139	211,725
TPG Partners IX, LP	0	112,500,000
TPG Partners VI, LP	5,559,557	7,467,821
TPG Partners VIII, LP	124,619,974	32,447,715
TPG Partners VII, LP	58,780,002	4,726,436
TPG V, LP(Texas Pacific Group V)	851,074	5,841,509
TSG6, LP	31,469,766	18,377,754
TSG7 A, LP	143,268,996	23,122,601
TSG8, LP	107,657,120	35,485,590
TSG9, LP	7,855,333	167,144,667
Veritas Capital Fund V, LP	158,370,283	150,827,3
Veritas Capital Fund VI, LP	194,185,714	14,826,993
Veritas Capital Fund VII, LP	131,770,034	5,739,038
Veritas V Co-Investors, LP	99,953,789	0
Warburg Pincus Global Growth, LP	174,845,704	18,075,000
Warburg Pincus Private Equity IX, LP	79,155	0
Warburg Pincus Private Equity X, LP	5,482,561	0
Warburg Pincus Private Equity XI, LP	75,830,617	0
Warburg Pincus Private Equity XII Secondary, LP	25,153,145	337,500
Warburg Pincus Private Equity XII, LP	176,023,176	2,362,500
<b>Total Private Equity</b>	<b>\$ 22,265,857,524</b>	<b>\$ 8,056,191,384</b>
Cash	83,966,026	0
Active Small Cap Cash	0	0
Active Small Cap	16,680,247	0
Income Accruals	(2)	0
<b>Grand Total</b>	<b>\$ 22,366,503,795</b>	<b>\$ 8,056,191,384</b>

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 29, 2023



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

# EXECUTIVE SUMMARY

## Performance

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Annualized Returns	17.6%	11.0%	9.5%	9.7%	10.9%
NCREIF NPI	-2.9%	5.8%	5.4%	5.5%	7.0%
Peer Median Returns	3.6%	9.4%	8.0%	7.9%	10.3%

\*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 residential, underweight to office & retail, recovery in the hospitality sector and performance of the infrastructure portfolio. Over the ten-year timeframe, the REID is outperforming the benchmark by 390 basis points.

## Strategy Update

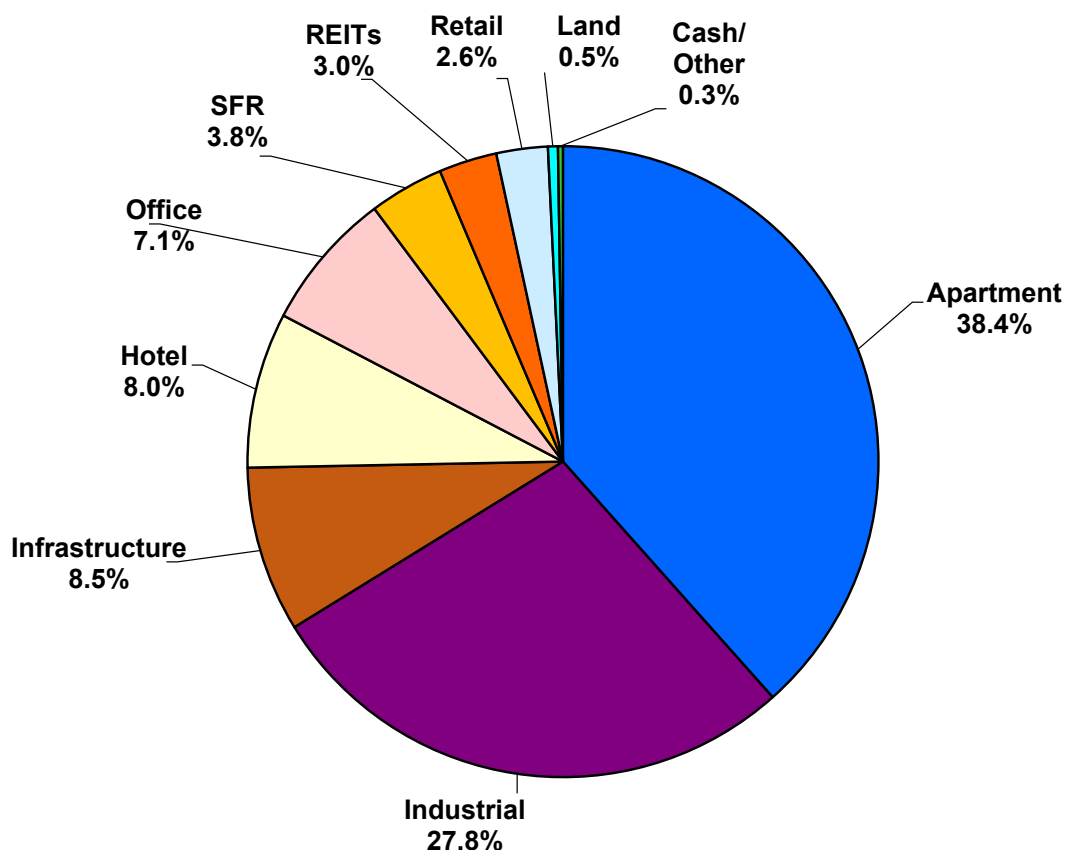
- The COVID-19 global pandemic has largely receded as a primary concern of the US and world economies. Impacts to commercial markets have been uneven across the real estate and infrastructure sectors with some impacts transitory and others of a more lasting nature. New threats to markets emerged in 2022 including 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 sectors we have identified for allocation.
- We have been actively managing the portfolio with capital returned of approximately \$790 million, and funding for new or existing investments of approximately \$1.9 billion over the past 12 months.
- The REID has approximately \$3.4 billion in unfunded commitments. One new commitment was made during the quarter.
  - \$326 million in SMP Data Center, LLC, a separately managed account, focused exclusively on investments in the US data center sector, managed by Principal Real Estate Investors, LLC.



# SMRS

## Real Estate and Infrastructure

### 3/31/23



#### Market Value in Millions

	3/31/23		3/31/22	
Apartment	\$3,895	38.4%	\$3,020	36.3%
Industrial	2,817	27.8%	1,878	22.6%
Infrastructure	860	8.5%	717	8.6%
Hotel	808	8.0%	659	7.9%
Office	724	7.1%	767	9.2%
Single Family Residential (SFR)	388	3.8%	209	2.5%
REITs	302	3.0%	378	4.5%
Retail	267	2.6%	319	3.8%
Land	51	0.5%	67	0.8%
	<u>\$10,111</u>	<u>99.7%</u>	<u>\$8,014</u>	<u>96.4%</u>
Cash/Other	26	0.3%	299	3.6%
<b>Total Investments</b>	<b><u>\$10,137</u></b>	<b><u>100.0%</u></b>	<b><u>\$8,313</u></b>	<b><u>100.0%</u></b>

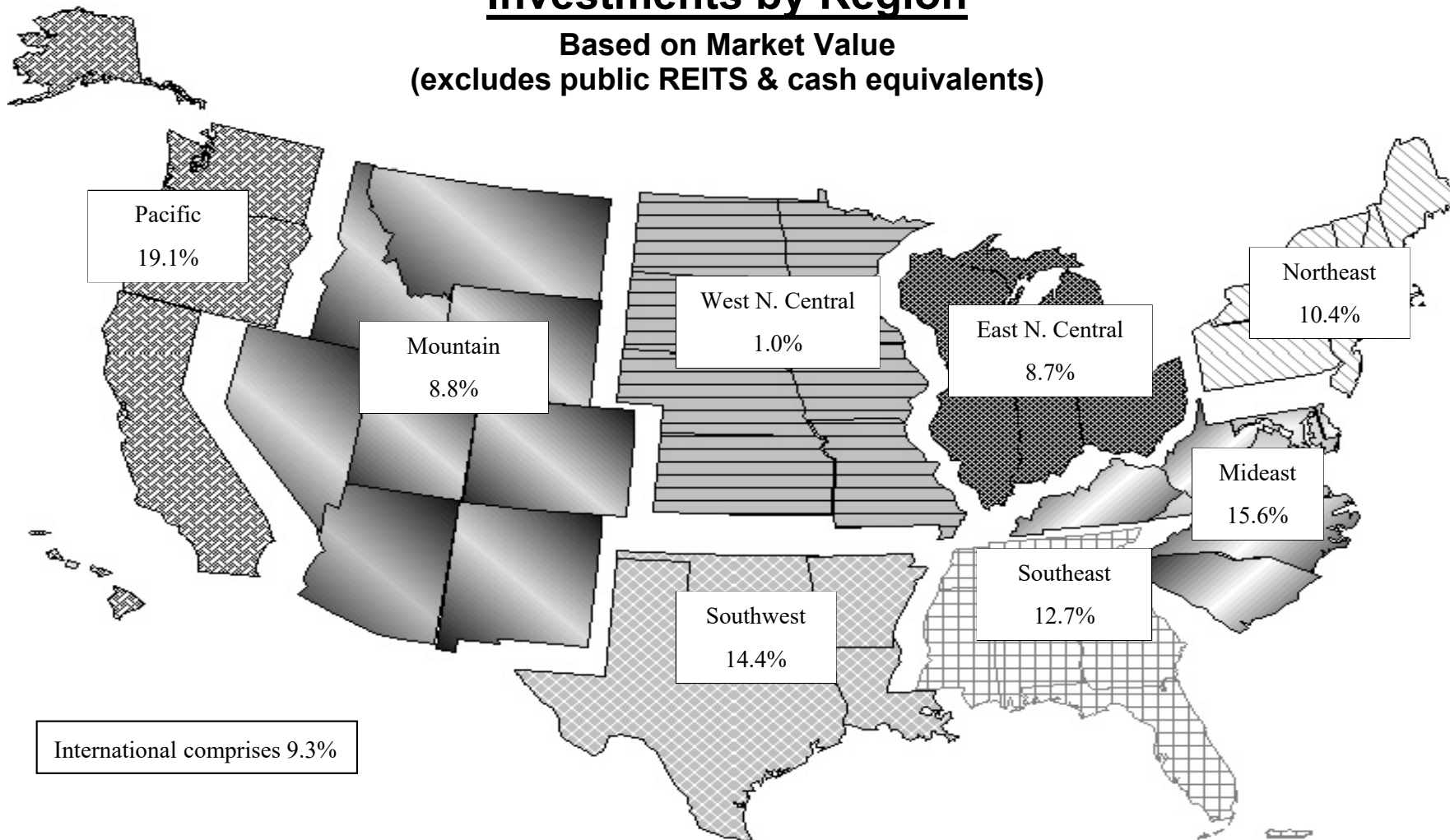
# SMRS

## Real Estate

### 3/31/23

#### Investments by Region

Based on Market Value  
(excludes public REITS & cash equivalents)



Geographic regions defined by NCREIF, whose property index composition is: Pacific 34.4%, Mountain 7.0%, West N. Central 1.0%, Southwest 10.7%, East N. Central 6.0%, Southeast 11.8%, Northeast 18.4%, Midwest 10.7%

# SMRS

## Real Estate and Infrastructure

### 3/31/23

### Top Ten Advisors or Entity

<u>Advisor or Entity</u>	<div style="text-align: right;">(\$ in millions)</div> <b>Market Value</b>
MWT Holdings LLC	\$ 2,932
Principal Real Estate Investors	1,387
Clarion Partners	914
BentallGreenOak	557
Blackstone Group	403
Domain Capital Advisors Inc	340
Lone Star Global	280
Five Star Realty Partners LLC	274
Transwestern Investment Management	236
L&B Realty Advisors	207
	<hr/> <b>\$ 7,530</b> <hr/>

# SMRS

## Real Estate

### 3/31/23

### Net Market Value by Entity

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 21,546,748	\$ 0
AEW Senior Housing III	3,616,529	459,868
AEW Senior Housing Investors IV	34,550,585	9,634,719
Albertsons Companies, Inc.	49,048,260	0
Apollo Asia Real Estate Fund	47,211,032	18,906,162
Asana Partners Fund I, LP	33,425,900	2,449,559
Asana Partners Fund II, LP	39,485,357	16,530,405
Asana Partners Fund III, LP	22,607,518	75,666,667
Avanath Affordable Housing III	65,013,569	1,291,663
Avanath Affordable Housing IV	34,526,085	1,214,355
Avanath Affordable Housing Renaissance Fund, LP	49,607,261	0
BentallGreenOak US Cold Storage, LP	5,515,905	69,273,840
BGO Europe III Co Invest	21,573,902	8,731,119
BentallGreenOak Europe IV, LP	8,741,753	99,921,637
BlackRock MiREIT Fund	100,272,557	0
Blackstone R/E Partners V, LP	42,272	2,087,026
Blackstone R/E Partners VI, LP	1,293,745	3,680,930
Blackstone R/E Partners VIII, LP	58,235,783	10,637,193
Blackstone R/E Partners IX, LP	234,590,901	36,807,651
Blackstone R/E Partners X, LP	748,990	199,251,010
Carlyle Realty Partners IX, LP	3,677,365	94,256,025
Creative Media & Community Trust Corp	2,391,996	0
CIM Fund III, LP	30,341,773	0
CIM Fund VIII, LP	73,848,348	0
CIM VI (Urban REIT), LLC	17,507,711	0
Clarion Gables Multifamily Trust, LP	45,907,116	0
Columbus Circle Holdings, LLC	233,747,738	167,041,964
Crown Small Cap Real Estate	8,286,386	3,280,000
DM2501, LLC	14,079,386	27,344,649
Domain GVA-1, LLC	9,039,946	0
Domain Hotel Properties, LLC	294,609,978	0
Eastport Properties, LLC	62,145,586	0
Gateway Capital Real Estate Fund II, LP	656,538	1,276,875
GreenOak Europe III, LP	59,115,912	25,009,318
Heitman Credit	47,135,215	0
Heitman Global RE Fund II	48,612,895	52,126,829
Heitman MiREIT Fund	101,635,853	0

	Market Value	Unfunded Commitment
IDR Core Property Index Fund, LLC	128,584,005	0
India Property Fund II, LLC	11,101,209	5,897,418
Invesco Mortgage Recovery Feeder Fund	282,321	2,152,585
Invesco Mortgage Recovery Fund II, LP	23,041,014	21,394,854
Invesco Strategic Opportunities III, LP	24,263,948	82,461,385
IPF II Co-Invest, LP	10,473,190	2,168,655
ISO III SMRS Sidecar, LP	20,984,873	60,034,000
JBC Funds North LaSalle, LLC	24,000	0
KBS/SM Fund III, LP	218,179	0
KBS/SM Fund IV, LP	103,008,950	0
L-A Saturn Acquisition	1,991,615	250,799
L&B Spartan Holdings	167,336,921	98,668,589
Landmark Real Estate Partners V, LP	176,230	0
LaSalle Asia Opportunity Fund III, LP	1,249,707	0
Lion Industrial Trust	570,597,830	0
Lion Mexico Fund, LP	3,282,608	0
Lombard GVA0016	274,457,756	71,096,099
Lone Star Fund X, LP	85,616,464	21,734,113
Lone Star Fund XI, LP	194,589,495	55,704,382
Lone Star Fund XII, LP	0	300,000,000
Lubert-Adler Real Estate Fund VII, LP	41,079,756	1,875,000
M1 Westgate ColInvest, LLC	224,553	0
M301W ColInvest, LLC	378,734	0
MERS Acquisitions Ltd.	40,170,870	0
MIP Holdco, LLC	203,165,060	11,004,910
MSREF V - International	560,716	0
MSRESS Fund III Institutional, LP	1,610,407	0
MWT Holdings, LLC	2,932,460,292	0
Northpark Land Associates	40,646,252	4,868,345
Paladin Realty Brazil Investors III (USA), LP	1,345,563	0
Paladin Realty Latin America Investors IV-CI, LP	27,397,876	0
Paladin Realty TB COINV V, LP	10,811,815	0
Penmain Office, LLC	43,458,982	0
Principal MiREIT	100,135,265	0
Principal Separate Account	260,004,578	30,094,645
Proprium RE Spec. Situations Fund, LP	124,453,705	0
Rialto Credit Partnership, LP	8,435,810	0
Rialto Real Estate Fund III-Debt, LP	42,052,819	0
Rialto Real Estate Fund III-Property, LP	29,350,079	0
Rialto Real Estate Fund IV-Debt, LP	77,029,868	19,531,172
SFR CM, LP	97,925,739	4,950,495
SM Brell II, L.P.	179,465	0
* <b>SMP Data Center</b>	1,005,651,091	662,892,917
Stockbridge RE Fund II-C, LP	883,631	0
Strategic II, LLC	462,213,360	62,216,632
TPG RE Finance Trust Inc.	35,023,997	0
TPG Real Estate Partners II	8,324,478	6,560,629

	<b>Market Value</b>	<b>Unfunded Commitment</b>
TPG Real Estate Partners III	35,744,535	17,502,379
TPG Real Estate Partners IV, LP	9,492,046	140,507,954
TSP Fund III	14,520,813	59,341,555
TSP Spartan II Co-Invest, LLC	190,001	0
TSP Value & Income Fund II, LP	18,658,603	6,790,952
True North Real Estate Fund III, LLC	21,155,019	5,000,000
Warwick UK Real Estate Fund I	50,212,300	0
	<hr/>	<hr/>
	\$ 9,250,623,016	\$ 2,681,579,927
Short-Term Investments and Other	14,449,356	0
	<hr/>	<hr/>
<b>Total Real Estate Investments</b>	<b>\$ 9,265,072,372</b>	<b>\$ 2,681,579,927</b>

\* New or additional commitment made during the quarter reported

# SMRS Infrastructure 3/31/23

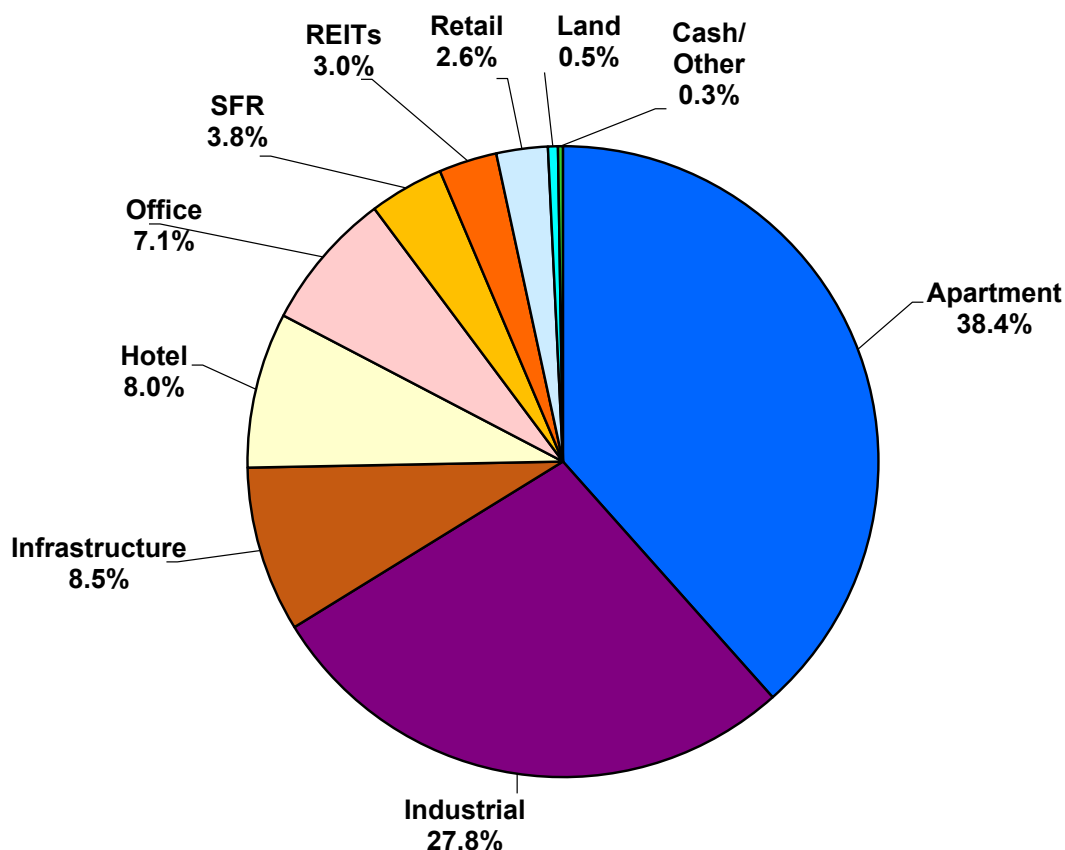
## Net Market Value by Entity

	<u>Market Value</u>	<u>Unfunded Commitment</u>
Arclight Energy Partners VI, LP	\$ 22,382,859	\$ 7,004,763
Arclight Energy Partners VII, LP	46,040,433	20,295,402
ASF VI Infrastructure B, LP	9,863,340	4,919,972
ASF VII Infrastructure Fund B, LP	24,568,873	7,241,981
ASF VIII Infrastructure Fund B, LP	10,891,393	88,417,118
ASF Como Co-Investment, LP	1,307,488	1,512,388
Basalt Infrastructure Partners, LP	10,470,954	2,219,045
Blackstone Energy Partners, LP	12,562,625	4,728,291
Blackstone Energy Partners II, LP	72,438,188	15,540,808
Blackstone Energy Transition Partners IV, LP	0	100,000,000
Blackstone Green Private Credit Fund III, LP	0	100,000,000
Brookfield Infrastructure Fund II-B, LP	44,196,176	2,847,442
Customized Infrastructure Strategies, LP	10,136,693	4,473,600
Dalmore Capital Fund	56,926,709	0
GCM Grosvenor Infrastructure IP, LP	103,301,992	49,304
GCM Grosvenor CIS II, LP	35,545,881	6,271,848
GCM Grosvenor CIS III, LP	55,937,276	47,236,407
Global E&P Infrastructure Fund II, LP	26,227,812	2,237,661
GSO Energy Select Opportunities Fund, LP	7,298,328	23,025,768
GSO Energy Select Opportunities Fund II, LP	16,018,073	34,803,707
JPMorgan AIRRO India SideCar Fund US, LLC	80,256,771	369,357
JPMorgan AIRRO Fund II	10,839,254	6,693,471
Irradiant Renewables Opportunities Partners	34,603,107	73,343,726
KKR Eagle CoInvest, LP	41,153,723	1,853,268
KKR Global Infrastructure Investors IV, LP	40,613,936	58,547,906
Ridgewood Water & Strategic IF, LP	39,076,795	12,323,877
Ridgewood Water & Strategic IF II, LP	1,453,758	73,546,242
RPEP SMRS Infra II, LLC	13,725,347	0
StonePeak Infrastructure Fund, LP	32,367,774	8,287,899
	<hr/> \$ 860,205,557	<hr/> \$ 707,791,251
Short-Term Investments and Other	11,443,368	0
<b>Total Infrastructure Investments</b>	<hr/> <b>\$ 871,648,925</b>	<hr/> <b>\$ 707,791,251</b>
<b>TOTAL INVESTMENTS</b>	<hr/> <b>\$ 10,136,721,297</b>	<hr/> <b>\$ 3,389,371,178</b>

# SMRS

## Real Estate and Infrastructure

### 3/31/23



#### Market Value in Millions

	3/31/23		3/31/22	
Apartment	\$3,895	38.4%	\$3,020	36.3%
Industrial	2,817	27.8%	1,878	22.6%
Infrastructure	860	8.5%	717	8.6%
Hotel	808	8.0%	659	7.9%
Office	724	7.1%	767	9.2%
Single Family Residential (SFR)	388	3.8%	209	2.5%
REITs	302	3.0%	378	4.5%
Retail	267	2.6%	319	3.8%
Land	51	0.5%	67	0.8%
	<u>\$10,111</u>	<u>99.7%</u>	<u>\$8,014</u>	<u>96.4%</u>
Cash/Other	26	0.3%	299	3.6%
<b>Total Investments</b>	<b><u>\$10,137</u></b>	<b><u>100.0%</u></b>	<b><u>\$8,313</u></b>	<b><u>100.0%</u></b>



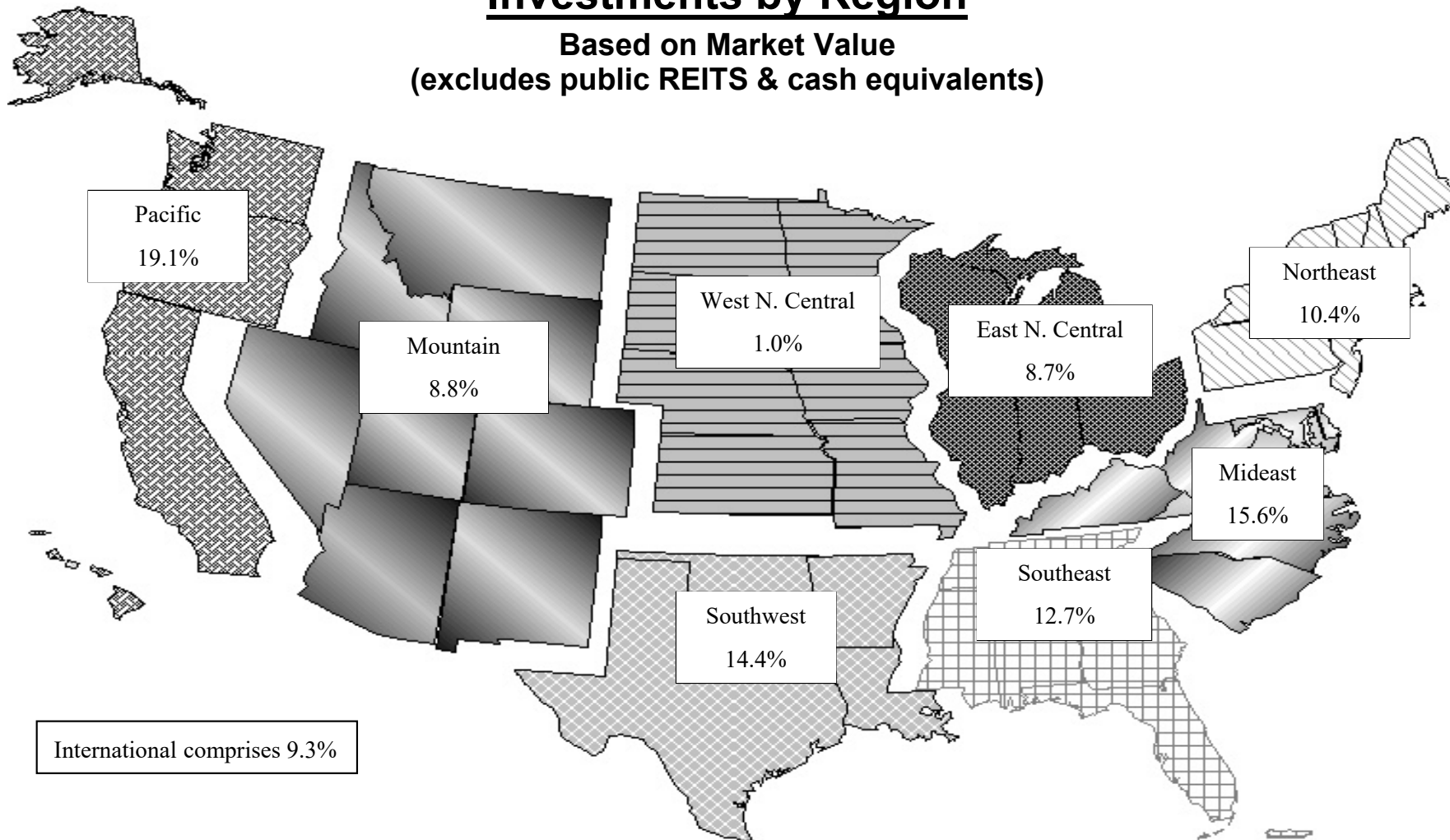
# SMRS

## Real Estate

3/31/23

### Investments by Region

Based on Market Value  
(excludes public REITS & cash equivalents)



Geographic regions defined by NCREIF, whose property index composition is: Pacific 34.4%, Mountain 7.0%, West N. Central 1.0%, Southwest 10.7%, East N. Central 6.0%, Southeast 11.8%, Northeast 18.4%, Mideast 10.7%

# SMRS

## Real Estate and Infrastructure

### 3/31/23

### Top Ten Advisors or Entity

<u>Advisor or Entity</u>	<div style="text-align: right;">(\$ in millions)</div> <b>Market Value</b>
MWT Holdings LLC	\$ 2,932
Principal Real Estate Investors	1,387
Clarion Partners	914
BentallGreenOak	557
Blackstone Group	403
Domain Capital Advisors Inc	340
Lone Star Global	280
Five Star Realty Partners LLC	274
Transwestern Investment Management	236
L&B Realty Advisors	207
	<hr/> <b>\$ 7,530</b> <hr/>

# SMRS

## Real Estate

### 3/31/23

### Net Market Value by Entity

	<u>Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 21,546,748	\$ 0
AEW Senior Housing III	3,616,529	459,868
AEW Senior Housing Investors IV	34,550,585	9,634,719
Albertsons Companies, Inc.	49,048,260	0
Apollo Asia Real Estate Fund	47,211,032	18,906,162
Asana Partners Fund I, LP	33,425,900	2,449,559
Asana Partners Fund II, LP	39,485,357	16,530,405
Asana Partners Fund III, LP	22,607,518	75,666,667
Avanath Affordable Housing III	65,013,569	1,291,663
Avanath Affordable Housing IV	34,526,085	1,214,355
Avanath Affordable Housing Renaissance Fund, LP	49,607,261	0
BentallGreenOak US Cold Storage, LP	5,515,905	69,273,840
BGO Europe III Co Invest	21,573,902	8,731,119
BentallGreenOak Europe IV, LP	8,741,753	99,921,637
BlackRock MiREIT Fund	100,272,557	0
Blackstone R/E Partners V, LP	42,272	2,087,026
Blackstone R/E Partners VI, LP	1,293,745	3,680,930
Blackstone R/E Partners VIII, LP	58,235,783	10,637,193
Blackstone R/E Partners IX, LP	234,590,901	36,807,651
Blackstone R/E Partners X, LP	748,990	199,251,010
Carlyle Realty Partners IX, LP	3,677,365	94,256,025
Creative Media & Community Trust Corp	2,391,996	0
CIM Fund III, LP	30,341,773	0
CIM Fund VIII, LP	73,848,348	0
CIM VI (Urban REIT), LLC	17,507,711	0
Clarion Gables Multifamily Trust, LP	45,907,116	0
Columbus Circle Holdings, LLC	233,747,738	167,041,964
Crown Small Cap Real Estate	8,286,386	3,280,000
DM2501, LLC	14,079,386	27,344,649
Domain GVA-1, LLC	9,039,946	0
Domain Hotel Properties, LLC	294,609,978	0
Eastport Properties, LLC	62,145,586	0
Gateway Capital Real Estate Fund II, LP	656,538	1,276,875
GreenOak Europe III, LP	59,115,912	25,009,318
Heitman Credit	47,135,215	0
Heitman Global RE Fund II	48,612,895	52,126,829
Heitman MiREIT Fund	101,635,853	0

	Market Value	Unfunded Commitment
IDR Core Property Index Fund, LLC	128,584,005	0
India Property Fund II, LLC	11,101,209	5,897,418
Invesco Mortgage Recovery Feeder Fund	282,321	2,152,585
Invesco Mortgage Recovery Fund II, LP	23,041,014	21,394,854
Invesco Strategic Opportunities III, LP	24,263,948	82,461,385
IPF II Co-Invest, LP	10,473,190	2,168,655
ISO III SMRS Sidecar, LP	20,984,873	60,034,000
JBC Funds North LaSalle, LLC	24,000	0
KBS/SM Fund III, LP	218,179	0
KBS/SM Fund IV, LP	103,008,950	0
L-A Saturn Acquisition	1,991,615	250,799
L&B Spartan Holdings	167,336,921	98,668,589
Landmark Real Estate Partners V, LP	176,230	0
LaSalle Asia Opportunity Fund III, LP	1,249,707	0
Lion Industrial Trust	570,597,830	0
Lion Mexico Fund, LP	3,282,608	0
Lombard GVA0016	274,457,756	71,096,099
Lone Star Fund X, LP	85,616,464	21,734,113
Lone Star Fund XI, LP	194,589,495	55,704,382
Lone Star Fund XII, LP	0	300,000,000
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True North Real Estate Fund III, LLC	21,155,019	5,000,000
Warwick UK Real Estate Fund I	50,212,300	0
	<hr/>	<hr/>
	\$ 9,250,623,016	\$ 2,681,579,927
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<b>Total Real Estate Investments</b>	<b>\$ 9,265,072,372</b>	<b>\$ 2,681,579,927</b>

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# SMRS Infrastructure 3/31/23

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	<u>Market Value</u>	<u>Unfunded Commitment</u>
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Blackstone Energy Partners, LP	12,562,625	4,728,291
Blackstone Energy Partners II, LP	72,438,188	15,540,808
Blackstone Energy Transition Partners IV, LP	0	100,000,000
Blackstone Green Private Credit Fund III, LP	0	100,000,000
Brookfield Infrastructure Fund II-B, LP	44,196,176	2,847,442
Customized Infrastructure Strategies, LP	10,136,693	4,473,600
Dalmore Capital Fund	56,926,709	0
GCM Grosvenor Infrastructure IP, LP	103,301,992	49,304
GCM Grosvenor CIS II, LP	35,545,881	6,271,848
GCM Grosvenor CIS III, LP	55,937,276	47,236,407
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KKR Eagle CoInvest, LP	41,153,723	1,853,268
KKR Global Infrastructure Investors IV, LP	40,613,936	58,547,906
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StonePeak Infrastructure Fund, LP	32,367,774	8,287,899
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Short-Term Investments and Other	11,443,368	0
<b>Total Infrastructure Investments</b>	<hr/> <b>\$ 871,648,925</b>	<hr/> <b>\$ 707,791,251</b>
<b>TOTAL INVESTMENTS</b>	<hr/> <b>\$ 10,136,721,297</b>	<hr/> <b>\$ 3,389,371,178</b>

State of Michigan Retirement System

# REAL RETURN & OPPORTUNISTIC REVIEW

State of Michigan Investment Board Meeting  
June 29, 2023



Travis L. Haney, CFA, CAIA  
Senior Investment Manager  
Real Return & Opportunistic Division

# EXECUTIVE SUMMARY

## **Performance**

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Real & Opportunistic	7.2%	13.6%	11.9%	12.5%	12.3%
Custom Benchmark	7.6%	8.0%	7.5%	7.6%	7.4%

- The portfolio value is \$10.3 billion with a one-year return of 7.2%. As markets continued to slowly rebound in the first quarter of 2023, the valuation of our portfolio holdings was slightly down.
- Performance for the year was driven by i) income earned from entertainment royalties, investments in asset managers, and natural resource strategies; and ii) capital appreciation of our natural resources and media and entertainment assets.

## **Strategy Update**

- The objective of the Real Return & Opportunistic portfolio is to provide an inflation hedge and/or to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- 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 \$3.1 billion of unfunded commitments. No new commitments were closed during the quarter.
- In addition to monitoring the impact of COVID-19 and pace of economic recovery, 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

### 3/31/23

### Top Ten Advisors or Entities

(\$ in Millions)

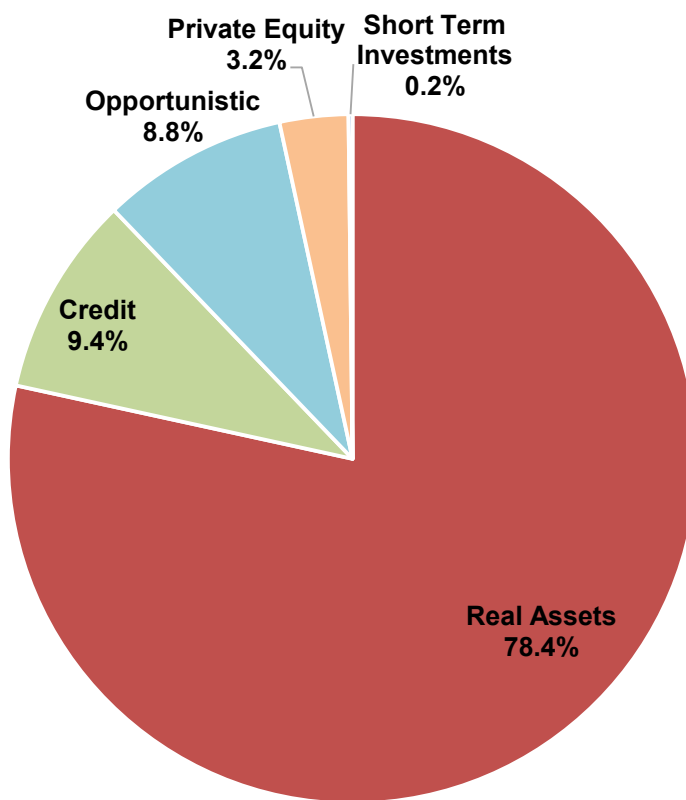
<u>Advisor or Entity</u>	<u>Market Value</u>
Great Mountain Partners	\$ 7,049
Domain Capital Group LLC	913
Blackstone Alternative Asset Management	683
Sixth Street Partners	578
Apollo Global Management	434
Clearlake Capital Group	162
Broadriver	147
BlackRock	136
Sycamore Partners	91
American Industrial Partners	77
<b>Total Market Value</b>	<b>\$ 10,270</b>

# SMRS

## Real Return and Opportunistic

### 3/31/23

### Investments By Strategy



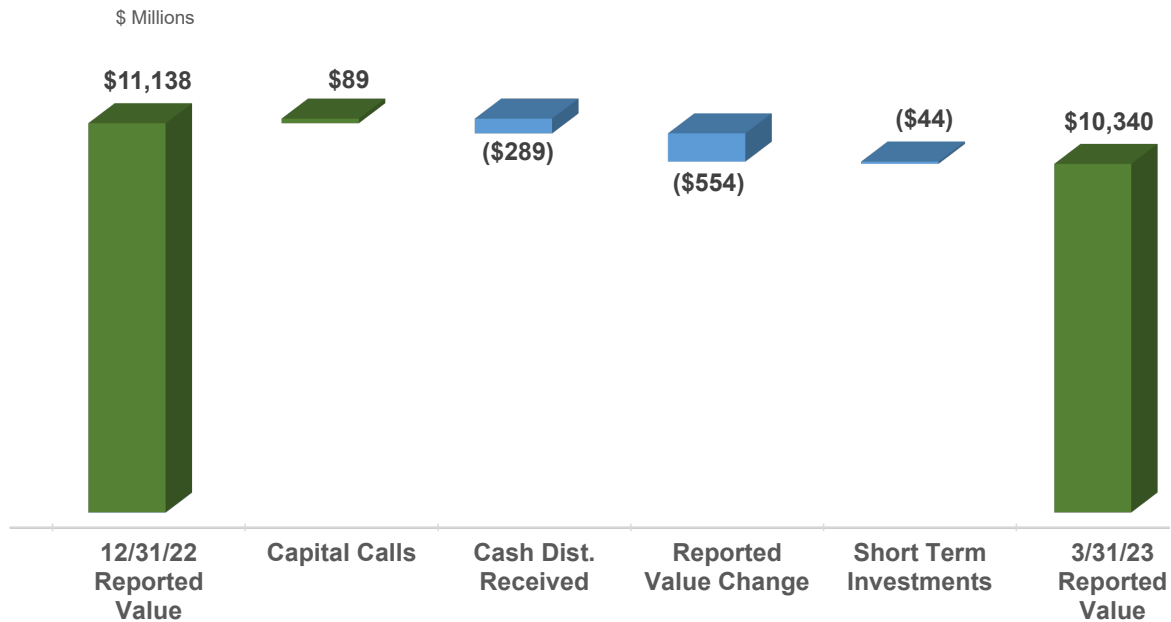
Market Value in Millions	
	3/31/23
Real Assets	\$8,108
Credit	\$973
Opportunistic	\$906
Private Equity	\$333
Short Term Investments	\$20
<b>Total Investments</b>	<b>\$10,340</b>

# SMRS

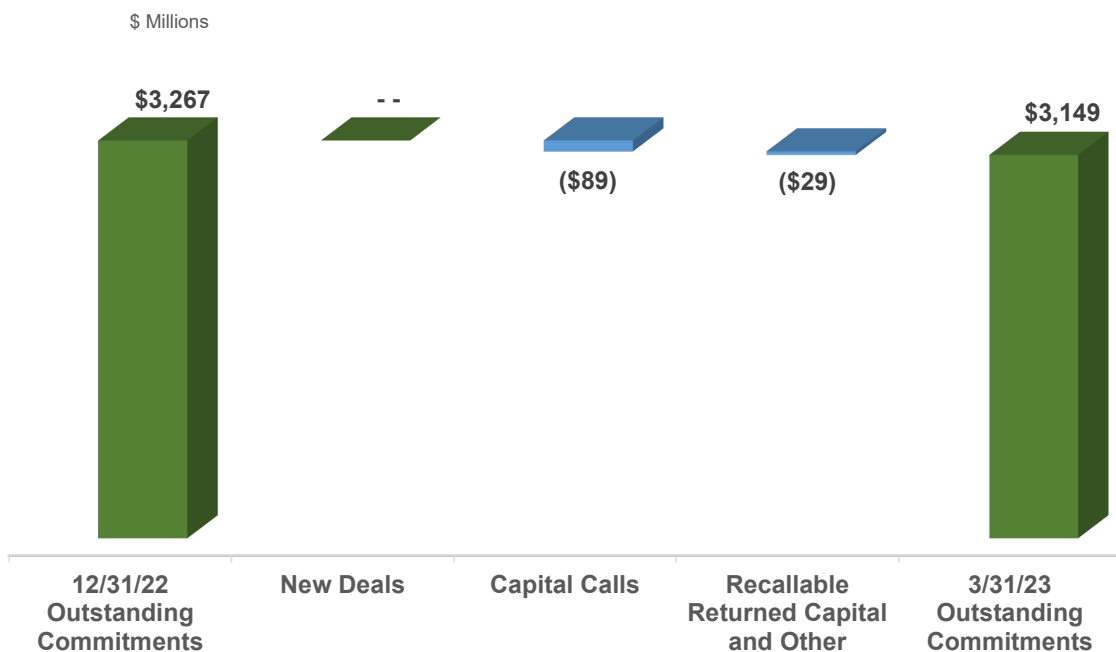
## Real Return and Opportunistic

### 3/31/23

#### Invested Commitments



#### Outstanding Commitments



# SMRS

## Real Return and Opportunistic

### 3/31/23

### Net Market Value by Entity

	Net Market Value	Unfunded Commitment
* Abernathy Fund I, LLC	\$ 258,330,554	\$ 4,948,241
* Abernathy Fund II, LP	12,268,076	10,605,019
American Industrial Partners VII, LP	72,495,544	19,553,380
Apollo Financial Credit Investments Fund II, LP	234,723,167	269,804,408
* Apollo Financial Credit Investments Fund III, LP	195,574,561	213,044,977
* Axton Holdings, LLC	3,292,327,102	0
Blackstone Strategic Capital Holdings (Side Car), LP	101,481,140	(984,735)
Blackstone Strategic Capital Holdings II, LP	142,426,987	117,991,755
Blackstone Strategic Capital Holdings, LP	128,674,683	19,397,976
Blue Peninsula Fund, LP	136,387,178	15,653,370
BroadRiver III, LP	143,910,151	59,487,103
BSCH Parallel (MLG) I, LP	280,915,568	0
Centerbridge Capital Partners III, LP	73,630,848	6,140,418
CircleUp Credit Fund I, LP	19,686,446	900,364
Clearlake Capital Partners VI, LP	105,470,117	2,094,019
Clearlake Opportunities Partners II, LP	43,788,588	29,121,931
Clearlake Opportunities Partners III, LP	10,996,558	88,955,497
Content Holdings, LLC	288,478,570	28,354,311
Energy Transition Holdings LLC	1,006,895,809	0
Green Equity Investors IX, LP	0	275,000,000
Green Range Holdings LLC	2,439,971,124	1,015,670,204
Hopen Life Sciences Fund II, LP	2,164,053	365,000
Jade Equity Investors II, LP	0	150,000,000
Nyanza I, LLC	0	2,222
Nyanza II, LLC	140,342,944	156,398,300
* Renaissance Venture Cap Fund II, LP	27,717,599	0
* Renaissance Venture Cap Fund III, LP	29,960,997	4,250,000
Shamrock Capital Content Fund I, P	26,063,797	36,178,636
Sixth Street Agriculture Partners I, LP	83,339,157	23,197,629
Sixth Street Growth Partners (A), LP	241,523,304	81,337,300
Sixth Street Growth Partners II (A), LP	25,993,424	172,584,910
Sixth Street TAO Partners (B), LP	227,515,032	120,360,351
* Social Network Holdings, LLC	301,000,698	0
Sycamore Partners III, LP	91,422,416	36,978,486
TPG Rise Climate, LP	62,102,711	184,170,418
Vida Insurance Credit Opportunity Fund II, LP	73,015,505	7,464,742
<b>Total Real Return and Opportunistic</b>	<b>\$ 10,320,594,409</b>	<b>\$ 3,149,026,231</b>
Short-Term Investments & Other	19,500,000	
<b>Grand Total</b>	<b>\$ 10,340,094,409</b>	<b>\$ 3,149,026,231</b>

\* Fund of Funds

State of Michigan Retirement System

# ABSOLUTE RETURN REVIEW

State of Michigan Investment Board Meeting  
June 29, 2023



Daniel J. Quigley  
Senior Investment Manager  
Absolute Return Strategy

# EXECUTIVE SUMMARY

## Performance

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Absolute Return	4.6%	7.8%	6.3%	7.0%	5.7%
HFRI FOF Conservative	1.8%	5.3%	4.1%	4.2%	3.6%

- The value of the Absolute Return portfolio is \$9.7 billion with a one-year return of 4.6%. The portfolio performance was positive for the year despite negative performance for both equities and fixed income markets. All underlying strategies contributed to performance.
- Private Credit was a large driver of positive returns for the year, with senior credit, mortgage, and housing related exposures driving performance. This primarily floating rate allocation has benefitted from rising short-term interest rates.
- In the Hedge Fund portfolio, core managers in the Multi-Strategy sleeve of the portfolio served as an effective diversifier. This was due to a combination of non-directional exposures across asset classes.
- Hedge Fund Credit and Special Situations investments also contributed positive performance as managers were able to take advantage of market dislocations. This credit outperformance was driven by the mortgage and specialty finance strategies.
- The Hedge Fund Macro equity managers did well as they were able to take advantage of market volatility and profited from higher rates and a stronger dollar. Equities were flat, as L/S equity managers generated negative absolute returns with mixed alpha. Quant equity managers, on the other hand, contributed positively, benefitting from increased and sustained volatility and dispersion.
- Insurance-related investments were mixed as the portfolio experienced negative performance in event driven strategies which was offset by positive performance in equity-oriented insurance positions.

## 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.

- Commitments closed during the quarter include:
  - \$20 million in SJC DLF IV 10 YEAR-J, LLC, a dedicated co-investment vehicle, managed by Czech Asset Management, for the SJC Direct Lending Fund IV strategy that will invest in a senior credit opportunity.
- In terms of allocation priorities, we will continue to increase exposure to high quality hedge fund alternatives in order to preserve portfolio liquidity. 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 Strategies

**3/31/23**

	Amount	Total	% of Total
<b>Hedge Funds</b> (\$ in Millions)			
Multi-Strategy & Event	\$4,835		
Equity	439		
Credit	3		
<b>Total Hedge Funds</b>		<b>\$5,277</b>	<b>54.4%</b>
<b>Private Credit</b>			
Direct Lending	\$2,519		
Asset Backed	936		
Special Situations & Distressed	666		
Mezzanine	276		
<b>Total Private Credit</b>		<b>\$4,397</b>	<b>45.4%</b>
<b>Cash</b>			
Cash		<b>\$21</b>	<b>0.2%</b>

**Total Absolute Return**

**\$9,695**

**100.0%**

Note: Totals may not be exact due to rounding.



# SMRS

## Absolute Return

### 3/31/23

#### Net Market Value by Entity

	<b>Net Market Value</b>	<b>Unfunded Commitment</b>
Acacia Co-Invest, LP	\$ 327,628,319	\$ 60,000,000
AG Essential Housing, LP	69,830,662	58,000,000
Angelo Gordon Credit Solutions Fund II, LP	49,740,477	45,000,000
Angelo Gordon Credit Solutions Fund, LP	94,773,029	4,325,340
Apollo Accord+	163,552,142	130,499,970
Apollo MidCap FinCo Holdings, LTD	323,156,643	0
Apollo SCRF IV, LP	64,418,802	147,742,521
Blackstone Capital Opportunities Fund IV	54,907,480	97,729,461
Blackstone Capital Opportunities Fund IV Co-Invest	21,522,676	13,926,702
Blue Range Holdings, LLC	723,925,138	301,032,643
Castle Credit SMRS Holdings, LLC	149,249,530	81,739,828
Castle Credit SMRS Holdings, LLC Series C	86,336,138	14,924,111
Cerberus Manitou Residential Loan Fund, LP	218,476,945	58,580,645
Cerberus SMRS Partners, LP	11,908,910	23,304,657
EnTrust White Pine Partners, LP	2,701,513	0
Farallon Special Situations Fund II, LP	44,228,431	56,900,397
Fortress FCO MA MI, LP	117,728,873	27,789,658
Fortress MSR Opportunities Fund I A, LP	40,428,236	15,662,214
GSO Capital Opportunities Fund III, LP	35,028,362	29,611,166
GSO COF III Co-Investment Fund, LP	11,058,313	13,604,970
HarbourVest Credit Opportunities Fund II, LP	73,513,314	3,750,000
Harbourvest Direct Lending Fund	89,210,450	30,000,000
HarbourVest Partners Mezzanine Income Fund	36,094,237	16,310,000
HPS Mezzanine Partners 2019, LP	43,124,172	10,888,829
HPS Red Cedar Fund, LP	285,622,539	140,629,006
Irradiant CLO Partners Fund II, LP (fka Kayne CLO Partners FD II)	63,092,544	21,183,140
Irradiant Solutions Fund II, LP	117,815,375	131,236,781
Irradiant Solutions Fund, LP (fka Kayne)	111,326,428	128,427,066
Jana Strategic Investment Fund IV, LP	111,779,547	9,500
Kayne Anderson BDC, LLC (KABDC)	82,278,242	27,862,131
Marathon CLO Equity Fund, LP	10,740,202	0
Monument Park, LLC	61,926,514	0
MP Securitized Credit Fund, LP	466,767	0
Oaktree Opportunities Fund VIII, LP	213,166	0

	<b>Net Market Value</b>	<b>Unfunded Commitment</b>
OCM Opportunities Fund VII, LP	584,932	0
OCM Opportunities Fund VIIb, LP	19,215	2,500,000
Owl Rock Technology Finance Corp II (ORTF II)	36,195,247	163,172,598
Owl Rock Technology Holdings II (ORTH II)	673,910	24,326,090
PGIM Fixed Income Global Liquidity Relative Value Fund I, LP	3,045,828	0
PIMCO Aviation Co-Invest Vehicle Onshore Feeder, LP	13,217,372	90,000,000
PIMCO Private Income Fund Onshore Feeder, LLC	95,695,324	0
Redding Ridge Holdings, LP	96,907,952	17,163,814
Sixth Street Lending Partners	157,125,081	343,903,710
Sixth Street Opportunities Partners IV (A), LP	86,303,842	23,527,790
Sixth Street Opportunities Partners V (A), LP	33,191,627	88,953,011
Sixth Street Specialty Lending Europe II (USD Feeder), LP	37,744,835	84,838,204
<b>** SJC DLF IV 10 Year-J, LLC</b>	14,702,130	5,000,000
SJC Onshore Direct Lending Fund IV-SMRS, LP	274,387,582	136,291,940
SMRS-HVDL, LLC	101,018,278	130,120,000
<b>* Tahquamenon Fund, LP</b>	4,832,214,972	0
TCW/Crescent Mezzanine Partners V, LP	627,819	12,395,466
TCW/Crescent Mezzanine Partners VC Secondary	301,551	0
TICP CLO Partners II, LP	28,975,652	1,480,904
TICP CLO Partners III, LP	73,847,038	13,395,382
Turning Rock Fund I, LP	41,440,886	16,319,293
Turning Rock Fund II, LP	47,880,985	28,009,631
<b>* Visium Balanced Fund, LP</b>	2	0
<b>Total Absolute Return Strategies</b>	<b>\$ 9,673,906,174</b>	<b>\$ 2,872,068,568</b>
Short-Term Investments & Other	21,272,934	\$ 0
<b>Grand Total</b>	<b>\$ 9,695,179,108</b>	<b>\$ 2,872,068,568</b>

\* Fund of Funds

**\*\* New Commitment**

State of Michigan Retirement System

# FIXED INCOME REVIEW

State of Michigan Investment Board Meeting  
June 29, 2023



Daniel J. Quigley  
Senior Investment Manager  
Fixed Income Division

## EXECUTIVE SUMMARY

### Performance

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Annualized Returns	-4.2%	0.3%	1.9%	2.4%	2.6%
Bloomberg Barclays US Agg	-4.8%	-2.8%	0.9%	0.9%	1.4%
Peer Median Returns	-4.5%	-1.2%	1.5%	1.6%	1.8%

- The fixed income portfolio outperformed its benchmark and peer group across all time periods. Recent outperformance was driven by maintaining a shorter interest rate duration than the benchmark during a rising rate environment. The portfolio also benefitted from an overweight to structured fixed income and high yield bonds as coupon income helped to offset interest rate related losses and an underweight to investment grade corporate bonds and U.S. Agency Mortgage-backed securities.
- The U.S. Aggregate Bond Index experienced a recovery during the quarter as intermediate and long-term interest rates declined. One year performance was still negative core fixed income with the Bloomberg U.S. Aggregate having a return of -4.2% on a year-over-year (YoY) basis. All sectors of the core fixed income index also experienced negative performance YoY. Investment Grade Corporate bonds were the worst performing component of the index with a one-year return of -5.5%, driven by rate increases and credit spread widening. U.S. Treasuries and RMBS also had negative performance, returning -4.2% and -4.5% respectively for the year.
- The High Yield allocation was the best performing portion of the portfolio on a relative basis with a one-year performance of -2.2%, outperforming the index by roughly 260 bp. Structured Fixed Income was also a contributor to the portfolio's outperformance with one-year performance of -3.4%. This was mainly due to the floating rate exposure in this portfolio as well as the strong fundamental performance of mortgage credit.

### Strategy Update

- The objective of the Fixed Income Division portfolio is to meet or exceed the returns of the Bloomberg U.S. Aggregate Bond Index while satisfying the overall characteristics of a core fixed income portfolio. These characteristics are income, liquidity, principal preservation, and diversification from equity market risk. The portfolio has a higher yield than the benchmark while having a risk profile that is similar to the long-term volatility experienced in traditional core fixed income. The yield-to-maturity of the portfolio is currently 6.3% versus a benchmark yield of 4.4%. In addition to this, the

portfolio exhibits risk characteristics that are in line with the historical volatility of traditional fixed income benchmarks and has an equity beta of 0.1.

- The Core-plus strategy implemented to achieve this goal includes:
  - Core: As of March 31, 2023, the portfolio's allocation to U.S. Treasuries, Investment Grade corporate bonds, government-guaranteed U.S. Agency Debentures, RMBS, and Commercial Mortgage-Backed Securities (CMBS) was 72.7%. This includes a 30.1% allocation to U.S. Treasuries, TIPS, 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, 2023, the allocation to the Plus portfolio was 27.3%.

### **Tactical Update**

- The allocation to securitized credit, primarily in CMBS, ABS, non-agency RMBS, and CLO securities, was 20.3% of the portfolio at the end of the quarter. The combination of low interest rate duration and high coupon income (often floating rate) offers attractive characteristics for the overall fixed income portfolio in this low interest rate environment. The one-year return on this portfolio was -3.4%.
- The allocation to HY strategies was 4.2% at the end of the quarter. This out-of-benchmark position has outperformed since it has been added to the portfolio. Recent outperformance has been driven by the shorter duration of this portfolio versus the benchmark as well as the higher coupon income in a rising rate environment. The one-year performance of this allocation was -2.2%, outperforming the core index by roughly 460 bp.
- The portfolio has a meaningful allocation to floating rate securities, including AAA CLO investments and investment-grade floating rate corporate bonds. This allocation accounts for approximately 15% of portfolio assets. This allocation will underperform during risk-off markets when interest rates decline, however, it should exhibit strong risk-adjusted return characteristics on a go forward basis in this low interest rate environment.

## **Market Environment and Outlook**

- The yield curve for U.S. Treasury securities remained inverted. The spread between 2-year and 10-year U.S. Treasury Notes was flat during the quarter, ending at -56 bp. The spread between 3-month and 10-year Treasuries decreased during the quarter, ending at -128 bp. This inversion is a reliable predictor of future recessions. This inversion has been driven primarily by a 475 bp increase in the Fed Funds rate since the end of 2021 as the Federal Reserve has started an aggressive tightening cycle to fight inflation pressures.
- Inflation expectations were contained during the quarter with ten-year breakeven inflation ending the period at 2.32%. These expectations have declined by 50bp on a YoY basis.
- Credit markets were mixed during the quarter as Investment grade (IG) spreads widened and HY spreads tightened. IG spreads increased by 8 bp to 128 bp during the quarter. HY spreads ended the quarter at 455 bp, 14 bp lower than their year-end level. Both IG and HY spreads remain above their five-year averages.
- Emerging Markets (EM) credit spreads ended the quarter at 358 bp after widening by 19 bp over the past three months.

## **Conclusion**

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

# SMRS

## Fixed Income Holdings

### Portfolio Characteristics

**Benchmark: Barclays Aggregate**

**3/31/23**

<b>Characteristic</b>	<b>Portfolio</b>	<b>Benchmark</b>
Average Maturity (Yrs)	10.0	8.4
Duration (Yrs)	6.0	6.3
Spread Duration (Yrs)	6.6	6.3
Coupon (%)	4.1	2.8
Yield to Maturity (%)	6.3	4.4
Credit Rating	A+	AA
VaR (%)	10.8	11.6
Tracking Error (%)	3.0	NA
Beta (vs S&P 500)	0.12	0.12

#### **Commentary**

##### **Objectives**

Income:

Liquidity:

Principal Preservation:

Diversification:

##### **Highlights**

The coupon of the portfolio is approximately 130 bps higher than the benchmark. Interest rate movement has been the main driver of U.S. bond market returns for the year, but Income is the primary driver of long-term performance.

30.1% of the portfolio is invested in cash, U.S. Treasuries, and TIPS. These investments can be liquidated via same-day trading.

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

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

# SMRS

## Fixed Income Strategy

**3/31/23**

	Amount	Total	% of Total
<b>Core</b> (\$ in Millions)			
FID Internal	\$4,373		
PIMCO Mortgage Fund	530		
PGIM Investment Grade Credit	203		
<b>Total Core</b>		<b>\$5,106</b>	<b>58.2%</b>
<b>Tactical</b>			
Fidelity Tactical	\$490		
TCW Core Plus	399		
Guggenheim Core Plus	388		
<b>Total Tactical</b>		<b>\$1,276</b>	<b>14.5%</b>
<b>Securitized Debt</b>			
TICP CLO Debt	\$678		
Met West Securitized Ops	587		
Principal CMBS	475		
Napier Park ABS Income	27		
Napier Park Strategic Loan	17		
<b>Total Securitized Debt</b>		<b>\$1,785</b>	<b>20.3%</b>
<b>High Yield</b>			
PGIM High Yield	\$337		
Crescent Direct Lending	30		
<b>Total High Yield</b>		<b>\$368</b>	<b>4.2%</b>
<b>Global</b>			
T. Rowe Global Multi-Sector	\$240		
<b>Total Global</b>		<b>\$240</b>	<b>2.7%</b>
<b>TOTAL</b>		<b><u>\$8,776</u></b>	<b><u>100.0%</u></b>

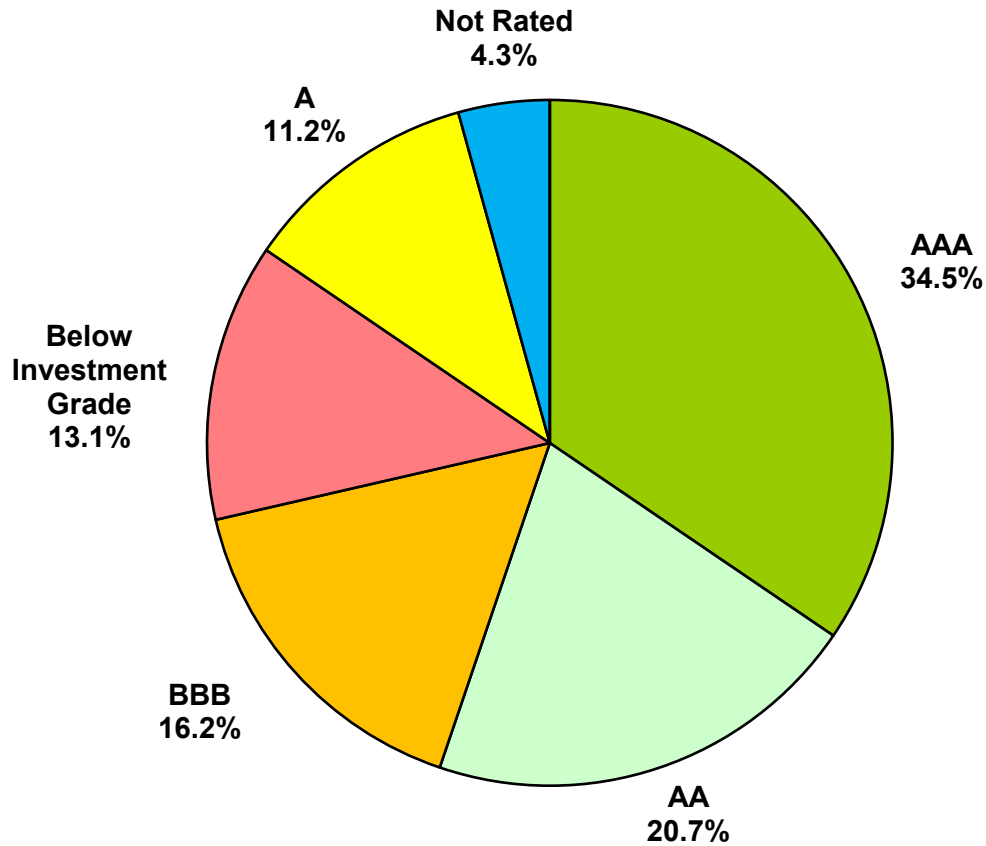
NOTE: Totals may not be exact due to rounding.



# SMRS

## Fixed Income By Rating

3/31/23



### Market Value in Millions

3/31/23

	Assets	Percent	Benchmark	Difference
AAA	\$3,027	34.5%	72.2%	-37.7%
AA	1,816	20.7%	2.6%	18.1%
A	981	11.2%	10.0%	1.2%
BBB	1,428	16.2%	13.4%	2.8%
* Below Investment Grade	1,148	13.1%	0.2%	12.9%
Not Rated	376	4.3%	1.6%	2.7%
<b>Total Investments</b>	<b>\$8,776</b>	<b>100.0%</b>	<b>100.0%</b>	

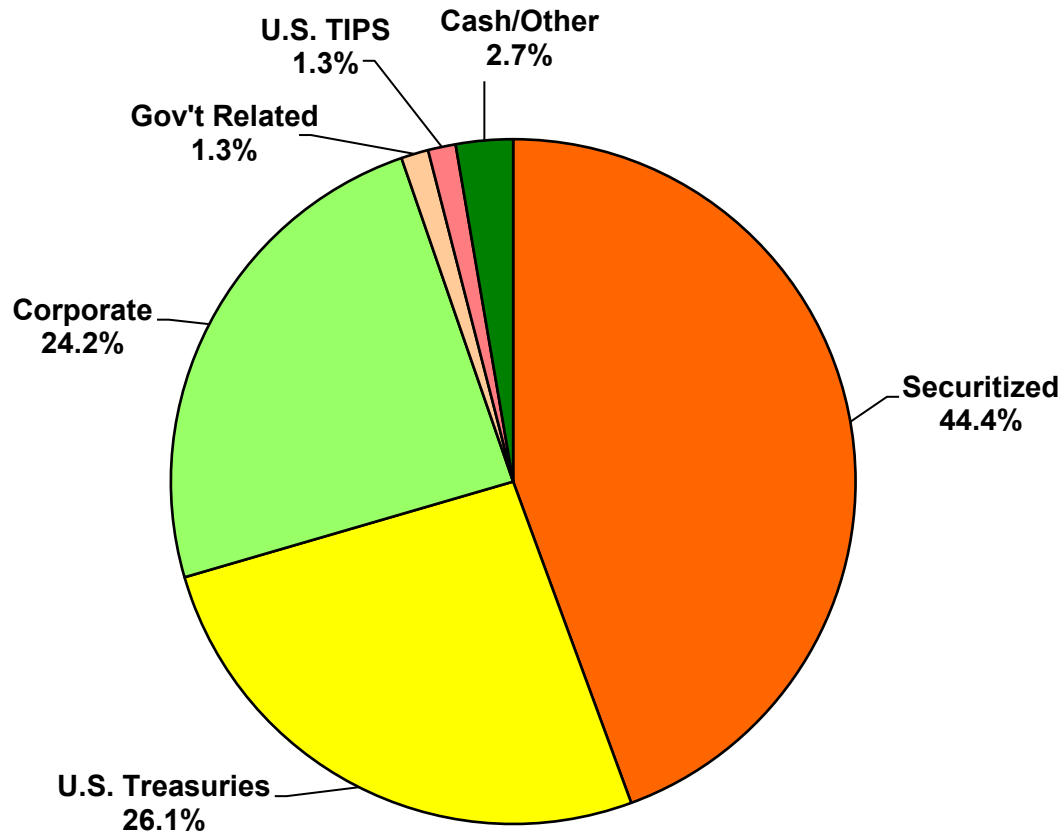
\* Comprised of approximately 6.8% High Yield Credit and 6.3% High Yield RMBS/ABS

Benchmark: Barclays US Aggregate

# SMRS

## Fixed Income By Asset Type

3/31/23



### Market Value in Millions

3/31/23

	Assets	Percent	Benchmark	Difference
Securitized	\$3,901	44.4%	29.3%	15.1%
U.S. Treasuries	2,291	26.1%	41.1%	-15.0%
Corporate	2,122	24.2%	24.5%	-0.3%
Government Related	116	1.3%	5.1%	-3.8%
U.S. TIPS	113	1.3%	0.0%	1.3%
Cash/Other	233	2.7%	0.0%	2.7%
<b>Total Investments</b>	<b>\$8,776</b>	<b>100.0%</b>	<b>100.0%</b>	

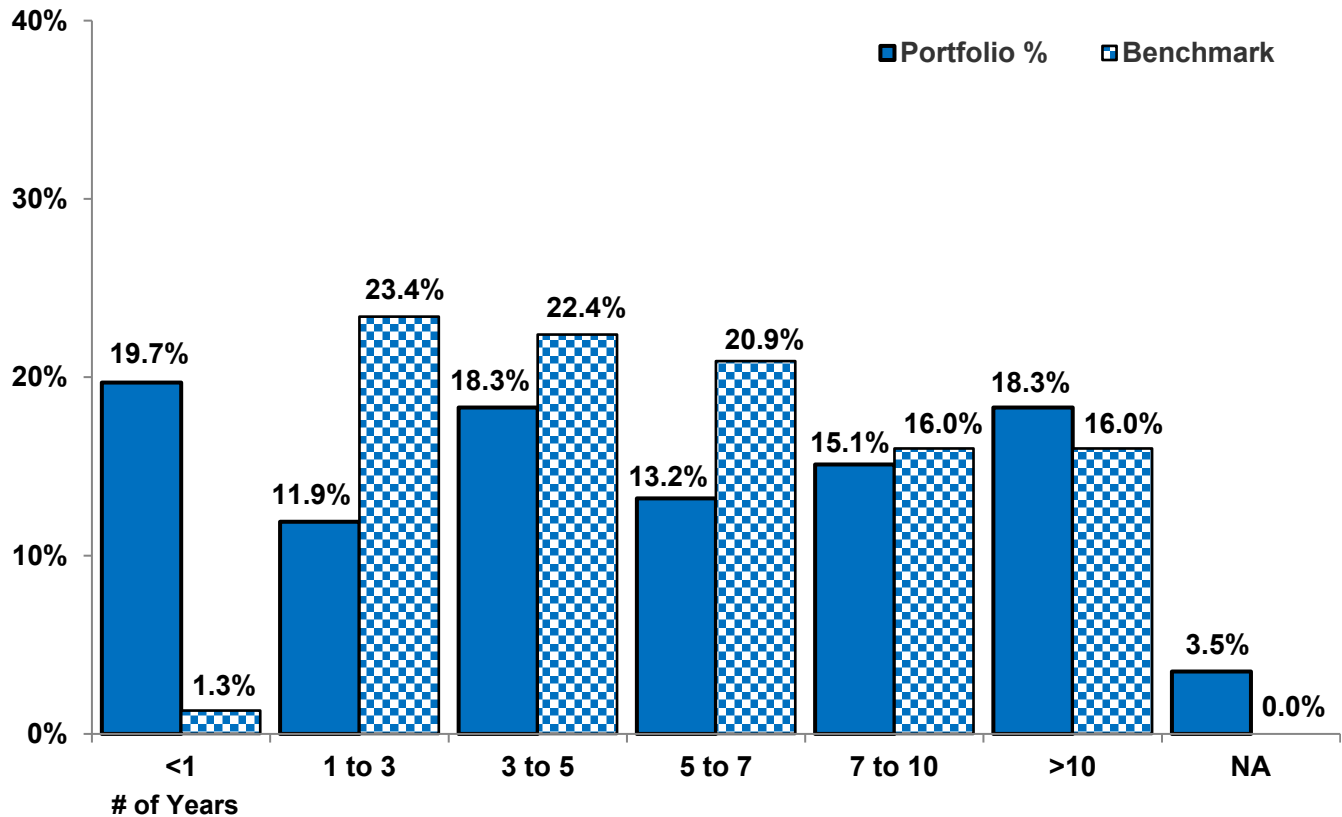
Benchmark: Barclays US Aggregate

# SMRS

## Duration Distribution

### Fixed Income Composite Versus Benchmark

#### 3/31/23



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$1,727	19.7%	1.3%	0.0	0.9
1 to 3	1,045	11.9%	23.4%	2.0	2.0
3 to 5	1,611	18.3%	22.4%	4.0	4.0
5 to 7	1,155	13.2%	20.9%	6.1	6.0
7 to 10	1,325	15.1%	16.0%	7.7	7.6
>10	1,604	18.3%	16.0%	16.8	15.1
NA	309	3.5%	0.0%	NA	NA
<b>Total</b>	<b>\$8,776</b>	<b>100.0%</b>	<b>100.0%</b>	<b>6.1</b>	<b>6.3</b>

\* Effective Duration

Benchmark: Barclays US Aggregate

# Fixed Income Performance - Net of Fees (MPERS) 3/31/23

	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>10-Yrs</u>
<b>Total Fixed Income</b>	<b>\$8,775,772,987</b>	<b>-4.36%</b>	<b>0.09%</b>	<b>1.68%</b>	<b>2.23%</b>	<b>2.42%</b>
<i>Bloomberg Aggregate Bond Index</i>	<i>N/A</i>	<i>-4.78%</i>	<i>-2.77%</i>	<i>0.91%</i>	<i>0.88%</i>	<i>1.36%</i>
<b>Internal Core Fixed Income</b>	<b>\$4,373,298,873</b>	<b>-4.62%</b>	<b>1.56%</b>	<b>1.55%</b>	<b>1.72%</b>	<b>2.16%</b>
<b>Externally Managed Fixed Income</b>	<b>\$4,402,474,114</b>	<b>-4.08%</b>	<b>1.76%</b>	<b>1.76%</b>	<b>2.92%</b>	<b>2.72%</b>
<b>External Core Fixed Income</b>	<b>530,295,325</b>	<b>-6.16%</b>	<b>-3.37%</b>	<b>0.11%</b>	<b>0.90%</b>	<b>1.24%</b>
<b>PIMCO Mortgage Fund</b>	530,295,325	-6.16%	-3.37%	0.15%		
<i>Bloomberg US MBS Agy Fixed Indx</i>	<i>N/A</i>	<i>-4.85%</i>	<i>-3.31%</i>	<i>0.20%</i>		
<b>Investment Grade Credit</b>	<b>\$202,740,967</b>	<b>-5.77%</b>	<b>0.38%</b>	<b>1.88%</b>	<b>2.36%</b>	<b>2.59%</b>
<b>PGIM Investment Grade</b>	202,740,967	-5.77%	0.38%	1.88%	2.36%	2.63%
<i>Bloomberg Credit Index</i>	<i>N/A</i>	<i>-5.31%</i>	<i>-0.70%</i>	<i>1.54%</i>	<i>1.89%</i>	<i>2.18%</i>
<b>Tactical Fixed Income</b>	<b>\$1,276,056,159</b>	<b>-4.69%</b>	<b>2.31%</b>	<b>2.51%</b>	<b>3.20%</b>	<b>3.29%</b>
<b>Fidelity Tactical Bond Fund</b>	489,807,370	-4.31%	2.44%	2.80%	3.69%	
<b>Guggenheim Core Plus</b>	387,557,373	-4.73%				
<b>TCW Core Plus</b>	398,691,416	NA				
<i>Bloomberg Aggregate Bond Index</i>	<i>N/A</i>	<i>-4.78%</i>	<i>-2.77%</i>	<i>0.91%</i>	<i>0.88%</i>	<i>1.36%</i>
<b>High Yield Fixed Income</b>	<b>\$367,730,083</b>	<b>-2.19%</b>	<b>6.07%</b>	<b>4.08%</b>	<b>4.96%</b>	
<b>PGIM High Yield</b>	337,397,811	-3.06%	7.00%	4.26%	5.30%	
<b>Crescent Direct Lending</b>	30,332,272	5.77%	6.36%			
<i>Bloomberg US HY BA/B 1% Cap</i>	<i>N/A</i>	<i>-2.63%</i>	<i>5.60%</i>	<i>3.40%</i>	<i>4.74%</i>	
<b>Structured Fixed Income</b>	<b>\$1,785,398,019</b>	<b>-3.36%</b>	<b>2.23%</b>	<b>1.63%</b>		
<b>TICP CLO Debt</b>	678,467,664	0.20%	8.89%	3.94%		
<b>Opportunities</b>	587,017,247	-2.25%	2.36%	1.64%	3.12%	
<b>Principal CMBS</b>	475,389,693	-9.90%	1.84%	0.55%	1.73%	2.66%
<b>Napier Park ABS Income</b>	27,496,029	-4.01%	5.94%	7.80%	9.00%	
<b>Napier Park Strategic Loan LP</b>	17,027,386	6.53%	3.71%	4.60%		
<i>Bloomberg Aggregate Bond Index</i>	<i>N/A</i>	<i>-4.78%</i>	<i>-2.77%</i>	<i>0.91%</i>	<i>0.88%</i>	<i>1.36%</i>
<i>Blended CMBS Benchmark</i>	<i>N/A</i>	<i>-4.09%</i>	<i>-1.30%</i>	<i>1.35%</i>	<i>1.25%</i>	<i>2.01%</i>
<b>Global Fixed Income</b>	<b>\$240,253,561</b>	<b>-5.75%</b>	<b>0.21%</b>	<b>0.82%</b>	<b>0.0199</b>	
<b>T. Rowe Global Multi-Sector</b>	240,253,561	-5.75%	1.42%	1.10%	0.0223	
<i>Custom GMS Benchmark</i>	<i>N/A</i>	<i>-2.52%</i>	<i>0.17%</i>	<i>1.23%</i>		

State of Michigan Retirement System

# DOMESTIC EQUITY REVIEW

State of Michigan Investment Board Meeting  
June 29, 2023



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

# EXECUTIVE SUMMARY

## Performance

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Annualized Returns	-9.8%	17.2%	9.3%	11.3%	11.4%
S&P 1500	-7.6%	18.9%	10.8%	12.2%	12.0%
Peer Median Return	-7.0%	15.8%	7.6%	9.4%	9.0%

\*State Street Universe greater than \$1 billion

- For the year ended March 31, 2023, the Domestic Equity Division (DED) underperformed its peer group and the S&P 1500 by 280 basis points (bps) and 220 bps respectively, with incurred tracking error of 1.9%.
- DED significantly outperformed its peers over all other time periods, beating the median larger sized pension fund by 240 bps annualized over the past decade. Returns lagged the S&P 1500 by 60 bps annualized over this same time period.
- Energy, defensive and value stocks did well over the past year, while growth companies, where DED was overweight, underperformed.
  - Several growth managers in the portfolio outperformed their respective benchmarks, including SMRS' Large Cap Growth Fund, LA Capital Growth and Martin Currie, which helped to limit SMRS' underperformance versus the S&P 1500.
- The Disruptive Innovation space continued to be a detractor to performance, but we continue to believe it is a good value at these levels and will rebound strongly as inflation dissipates and the economy heals.
- As a group our value managers did reasonably well, beating the S&P 1500 while falling short of their value benchmarks because of significant small and mid-cap stock exposure. As with our growth portfolios, we would expect such small and mid-cap exposure to become a tailwind for the portfolio as markets recover.

## 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 nearly an 8% discount to the S&P 1500 on this year's earnings and an even further discount to normalized earnings.
- The correction we have seen in stocks, bonds and housing is both healthy and supportive of the Fed's goal of reducing inflationary demand in the economy. Significant declines in money supply measures since the beginning of the Fed's tightening cycle also portend a more balanced inflationary environment in the second half of 2023.
- While it's possible that the Fed's aggressive tightening campaign could send the economy into recession in 2023, we believe stock prices will be materially higher than current levels looking forward over the next few years.
- DED is overweight technology related communication services companies as well as financials, highlighting the significant expected return opportunity that has presented itself in these sectors. Portfolio underweights include consumer discretionary, industrials, real estate and utilities.

## **Market Environment and Outlook**

- At ~18.3x forward earnings, equity markets trade at an earnings yield (earnings/price) of nearly 5.5%, or ~190 bps higher than 10-year treasury bonds at ~3.6%, or ~28x earnings.
- Historically, stocks have traded at an earnings yield approximately 125 bps higher than bonds, versus today's spread of 190 bps, suggesting that stocks have appreciation potential longer term, especially with bond yields remaining at or near these levels.
- Similarly, while in the short-term the lagged effects of the Fed's aggressive tightening campaign could cause further downside market volatility, we would expect such moves to be followed by a sustained and lasting recovery.
- Over time we expect the market to return roughly 8.8%, driven by a dividend yield of 1.6% and dividend per share growth of 7.2%.
  - Dividend per share growth driven by nominal economic growth of 4.7% and further 2.5% growth driven by share buybacks from cash flow rich companies.

# SMRS

## Domestic Equity Strategies

**3/31/23**

Markets	Amount	Total	% of Total
<b>Internal Indexed</b> (\$ in Millions)			
Indexed Portfolios	\$10,799		
<b>Total Indexed</b>		<b>\$10,799</b>	<b>60.3%</b>
<b>Internal Active</b>			
Active Portfolios	\$4,627		
<b>Total Internal Active</b>		<b>\$4,627</b>	<b>25.8%</b>
<b>External Active</b>			
Martin Currie US LT Unconstrained	\$493		
Los Angeles Capital	478		
Clarkston Capital Partners	337		
Seizert Capital Partners	329		
ARK Investments	229		
Attucks Asset Management	163		
Patient Capital	134		
Bivium Capital	121		
Managed Asset Portfolios	101		
Ancora	99		
<b>Total External Active</b>		<b>\$2,484</b>	<b>13.9%</b>

**Total Domestic Equity**

**\$17,910**

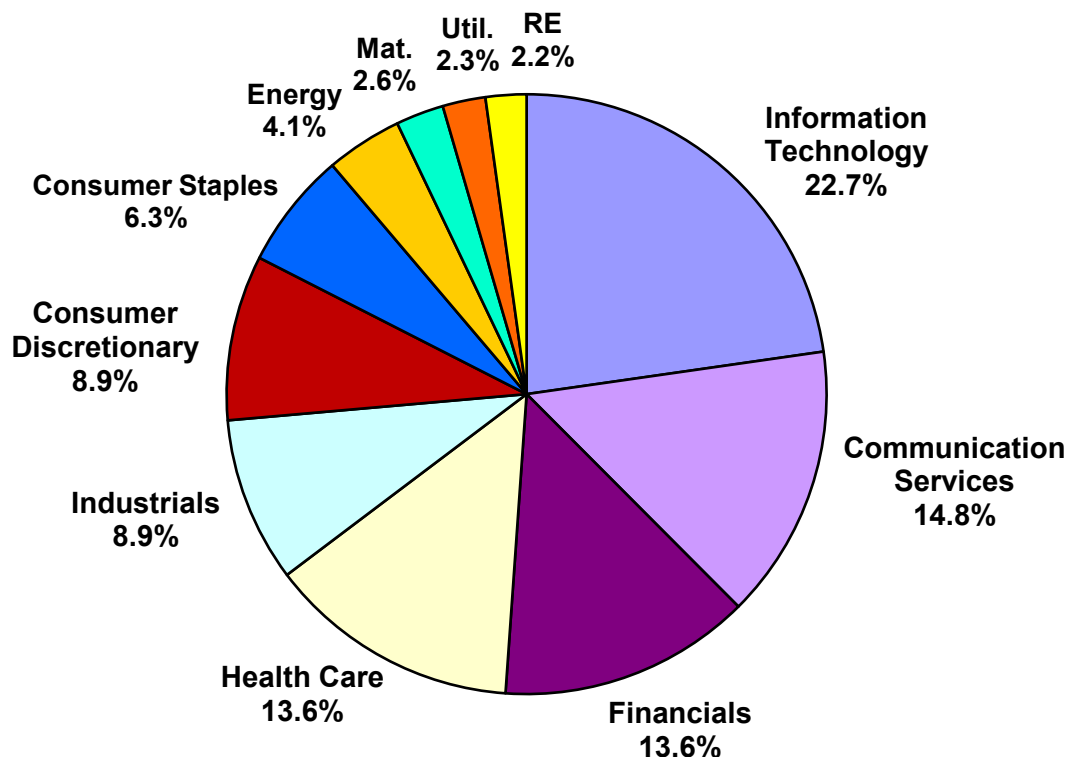
**100.0%**



# SMRS

## Domestic Equity By Sector

### 3/31/23



Market Value in Millions				
3/31/23				
	Assets	Percent	Benchmark	Difference
Information Technology	\$4,073	22.7%	24.8%	-2.1%
Communication Services	2,655	14.8%	7.6%	7.2%
Financials	2,435	13.6%	13.1%	0.5%
Health Care	2,427	13.6%	13.9%	-0.3%
Industrials	1,591	8.9%	9.6%	-0.7%
Consumer Discretionary	1,586	8.9%	10.4%	-1.5%
Consumer Staples	1,133	6.3%	7.0%	-0.7%
Energy	741	4.1%	4.8%	-0.7%
Materials	457	2.6%	3.0%	-0.4%
Utilities	412	2.3%	2.9%	-0.6%
Real Estate	400	2.2%	2.9%	-0.7%
<b>Total</b>	<b>\$17,910</b>	<b>100.0%</b>	<b>100.0%</b>	

Benchmark: S&P 1500

# SMRS

## Domestic Equities Composite

### 3/31/23

<b>Date:</b>	<b><u>3/31/23</u></b>	<b><u>12/31/22</u></b>	<b><u>9/30/22</u></b>	<b><u>6/30/22</u></b>
Assets (\$ in Millions):	\$17,910	\$17,200	\$16,271	\$17,652
Number of Securities:	1,812	1,664	1,785	1,856
Active Share:	29%	24%	25%	28%

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.

	<b>SMRS</b>	<b>S&amp;P 1500</b>
<b>Characteristics:</b>		
Market Cap. (\$ in Billions)	\$480.5	\$500.3
FY1 P/E	17.0	18.3
P/E upside to S&P 1500	7.7%	0.0
Return on Equity	25.2%	18.6%
<b>Risk Metrics</b>		
Beta	1.15	1.00
Tracking Error	3.2%	0.0%
<b>Projected Returns</b>		
Dividend Yield	1.9%	1.6%
Buyback Yield	2.6%	2.5%
Reinvestment Rate	<u>6.2%</u>	<u>4.7%</u>
<b>Projected Investment Return</b>	10.7%	8.8%

### TOP TEN EXPOSURES – Domestic Equities vs S&P 1500 3/31/23

<b><u>Domestic Equity Portfolio</u></b>		<b><u>S&amp;P 1500</u></b>	
<b><u>Company Name</u></b>	<b><u>Portfolio Weight</u></b>	<b><u>Company Name</u></b>	<b><u>Market Weight</u></b>
Meta Platforms, Inc., Class A	6.5%	Apple, Inc.	6.6%
Apple, Inc.	5.4%	Microsoft Corporation	5.7%
Microsoft Corporation	4.6%	Amazon.com, Inc.	2.4%
Alphabet Inc., Class A	2.5%	NVIDIA Corporation	1.8%
U.S. Dollar	2.3%	Alphabet Inc., Class A	1.7%
Amazon.com, Inc.	2.0%	Berkshire Hathaway Inc., Class B	1.5%
Verizon Communications, Inc.	1.8%	Alphabet Inc., Class C	1.5%
NVIDIA Corporation	1.8%	Tesla, Inc.	1.4%
AT&T, Inc.	1.6%	Exxon Mobil Corporation	1.3%
Apollo Global Management, Inc.	<u>1.4%</u>	Meta Platforms, Inc., Class A	<u>1.3%</u>
<b>TOTAL</b>	<b><u>29.9%</u></b>	<b>TOTAL</b>	<b><u>25.2%</u></b>

# Domestic Equity Performance - Net of Fees

## 3/31/23

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>SMRS S&amp;P 500 Index</b>	<b>\$10,161,093,177</b>	<b>-7.7%</b>	<b>18.5%</b>	<b>11.1%</b>	<b>12.4%</b>	<b>--</b>	<b>N/A</b>
S&P 500		-7.7%	18.6%	11.2%	12.4%	--	
Style & Risk Adj Benchmark		-7.7%	18.6%	11.2%	12.4%	--	
Lipper Lg-Cap Core		-7.8%	17.3%	10.3%	11.5%	--	
<i>Excess Return</i>		<i>0.0%</i>	<i>-0.1%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>--</i>	
<i>Alpha</i>		<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>--</i>	
<i>Pct. Rank vs Lipper LI-Cap Core</i>		<i>48</i>	<i>22</i>	<i>30</i>	<i>25</i>	<i>--</i>	
<b>SMRS Large-Cap Core</b>	<b>1,463,141,753</b>	<b>-1.3%</b>	<b>35.9%</b>	<b>11.9%</b>	<b>13.6%</b>	<b>9.6%</b>	<b>8/31/07</b>
S&P 500		-7.7%	18.6%	11.2%	12.4%	9.0%	
Style & Risk Adj Benchmark		-6.9%	9.1%	10.0%	13.3%	7.8%	
Lipper Large-Cap Core		-1.0%	21.5%	12.5%	13.9%	8.0%	
<i>Excess Return</i>		<i>6.4%</i>	<i>17.3%</i>	<i>0.7%</i>	<i>1.2%</i>	<i>0.5%</i>	
<i>Alpha</i>		<i>-0.3%</i>	<i>14.5%</i>	<i>-0.6%</i>	<i>-0.2%</i>	<i>1.6%</i>	
<i>Pct Rank vs Lipper Lg-Cap Core</i>		<i>2</i>	<i>1</i>	<i>10</i>	<i>2</i>	<i>11</i>	
<b>SMRS All-Cap Garp</b>	<b>1,030,922,155</b>	<b>-27.2%</b>	<b>6.7%</b>	<b>2.6%</b>	<b>6.0%</b>	<b>9.1%</b>	<b>4/30/11</b>
S&P 1500 Super Composite		-7.6%	18.9%	10.8%	12.2%	11.9%	
Style & Risk Adj Benchmark		-22.1%	8.0%	9.8%	12.0%	12.0%	
Lipper Multi-Cap Core		-9.0%	19.6%	11.6%	12.9%	12.3%	
<i>Excess Return</i>		<i>-19.6%</i>	<i>-12.2%</i>	<i>-8.3%</i>	<i>-6.2%</i>	<i>-2.8%</i>	
<i>Alpha</i>		<i>-18.1%</i>	<i>-12.9%</i>	<i>-9.0%</i>	<i>-6.8%</i>	<i>-3.2%</i>	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		<i>100</i>	<i>99</i>	<i>96</i>	<i>95</i>	<i>74</i>	
<b>Value, Quality, Momentum Composite</b>	<b>796,435,357</b>	<b>-9.9%</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>7.1%</b>	<b>10/1/20</b>
S&P 1500		-7.6%	--	--	--	10.4%	
Style & Risk Adj Benchmark		-0.3%	--	--	--	10.3%	
Lipper Multi-Cap Core		-7.6%	--	--	--	8.7%	
<i>Excess Return</i>		<i>-2.3%</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-3.4%</i>	
<i>Alpha</i>		<i>-9.6%</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-3.2%</i>	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		<i>82</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>75</i>	
<b>SMRS Mid-Cap Index</b>	<b>637,515,597</b>	<b>-5.0%</b>	<b>22.0%</b>	<b>7.7%</b>	<b>10.2%</b>	<b>--</b>	<b>N/A</b>
S&P 400		-5.1%	22.1%	7.7%	9.9%	--	
Style & Risk Adj Benchmark		-5.1%	22.0%	7.6%	9.9%	--	
Lipper Mid-Cap Core		-7.0%	20.7%	7.1%	9.0%	--	
<i>Excess Return</i>		<i>0.1%</i>	<i>-0.1%</i>	<i>0.0%</i>	<i>0.2%</i>	<i>--</i>	
<i>Alpha</i>		<i>0.1%</i>	<i>0.0%</i>	<i>0.1%</i>	<i>0.3%</i>	<i>--</i>	
<i>Pct. Rank vs Lipper Mid-Cap Core</i>		<i>28</i>	<i>26</i>	<i>41</i>	<i>19</i>	<i>--</i>	

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>SMRS Large-Cap Growth</b>	<b>632,095,810</b>	<b>-11.6%</b>	<b>16.4%</b>	<b>12.9%</b>	<b>13.6%</b>	<b>10.6%</b>	<b>5/31/05</b>
S&P 500 Growth		-15.3%	16.8%	11.9%	13.5%	10.6%	
Style & Risk Adj Benchmark		-13.9%	15.8%	11.4%	12.9%	10.4%	
Lipper Large-Cap Growth		-12.8%	14.9%	11.0%	12.9%	10.0%	
<i>Excess Return</i>		3.8%	-0.4%	1.0%	0.1%	0.0%	
<i>Alpha</i>		2.3%	0.6%	1.5%	0.7%	0.1%	
<i>Pct Rank vs Lipper Lg-Cap Growth</i>		37	32	18	30	26	
<b>Large-Cap Consistent Growth</b>	<b>532,706,067</b>	<b>-8.8%</b>	<b>12.1%</b>	<b>9.2%</b>	<b>11.0%</b>	<b>10.3%</b>	<b>3/1/15</b>
S&P 500		-7.7%	18.6%	11.2%	12.4%	10.7%	
Style & Risk Adj Benchmark		-15.8%	18.3%	12.1%	13.9%	12.0%	
Lipper Large-Cap Core		-7.8%	17.3%	10.3%	11.5%	9.7%	
<i>Excess Return</i>		-1.0%	-6.5%	-2.0%	-1.4%	-0.4%	
<i>Alpha</i>		7.0%	-6.2%	-2.9%	-2.9%	-1.7%	
<i>Pct. Rank vs Lipper Lg-Cap Core</i>		70	96	80	73	33	
<b>Martin Currie</b>	<b>492,936,161</b>	<b>-3.6%</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>2.1%</b>	<b>11/1/20</b>
S&P 1500 Growth		-14.7%	--	--	--	6.8%	
Style & Risk Adj Benchmark		-19.1%	--	--	--	7.9%	
Lipper Multi-Cap Growth		-15.0%	--	--	--	0.1%	
<i>Excess Return</i>		11.1%	--	--	--	-4.7%	
<i>Alpha</i>		15.5%	--	--	--	-5.8%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		4	--	--	--	47	
<b>LA Capital All-Cap Growth</b>	<b>478,421,837</b>	<b>-10.0%</b>	<b>16.1%</b>	<b>10.4%</b>	<b>11.4%</b>	<b>11.4%</b>	<b>5/31/05</b>
S&P 1500 Growth		-14.7%	17.0%	11.4%	13.2%	10.5%	
Style & Risk Adj Benchmark		-13.8%	15.6%	10.7%	12.2%	10.6%	
Lipper Multi-Cap Growth		-15.0%	13.6%	9.2%	11.8%	9.4%	
<i>Excess Return</i>		4.7%	-0.9%	-1.0%	-1.8%	0.9%	
<i>Alpha</i>		3.8%	0.5%	-0.3%	-0.8%	0.8%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		25	35	35	56	8	
<b>Clarkston Capital Small/Mid-Cap</b>	<b>336,142,455</b>	<b>-4.3%</b>	<b>18.1%</b>	<b>8.7%</b>	<b>9.9%</b>	<b>10.4%</b>	<b>1/1/14</b>
S&P 400		-6.2%	22.0%	7.3%	9.9%	8.5%	
Style & Risk Adj Benchmark		-2.4%	21.2%	6.2%	7.3%	6.3%	
Lipper Mid-Cap Core		-7.0%	20.7%	7.1%	9.0%	7.5%	
<i>Excess Return</i>		2.0%	-3.8%	1.4%	0.1%	1.9%	
<i>Alpha</i>		-1.9%	-3.1%	2.5%	2.7%	4.0%	
<i>Pct. Rank vs Lipper Mid-Cap Core</i>		20	83	19	24	2	

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>Seizert Capital Partners</b>	<b>329,191,063</b>	<b>-7.1%</b>	<b>20.8%</b>	<b>9.4%</b>	<b>11.7%</b>	<b>12.5%</b>	<b>11/30/09</b>
S&P 1500 Value		-0.6%	19.7%	9.3%	10.4%	11.5%	
Style & Risk Adj Benchmark		-7.3%	21.8%	9.2%	10.3%	11.6%	
Lipper Multi-Cap Value		-5.3%	19.7%	7.4%	9.1%	10.2%	
<i>Excess Return</i>		-6.5%	1.1%	0.1%	1.3%	0.9%	
<i>Alpha</i>		0.3%	-1.0%	0.2%	1.4%	0.9%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		81	34	14	5	4	
<b>Ark Investments</b>	<b>229,210,455</b>	<b>-39.8%</b>	<b>-6.3%</b>	<b>-4.4%</b>	<b>7.3%</b>	<b>8.3%</b>	<b>3/1/16</b>
S&P 1500 Growth		-14.7%	17.0%	11.4%	13.2%	14.1%	
Style & Risk Adj Benchmark		-22.5%	28.0%	7.7%	19.6%	20.9%	
Lipper Multi-Cap Growth		-15.0%	13.6%	9.2%	11.8%	12.6%	
<i>Excess Return</i>		-25.1%	-23.2%	-15.8%	-5.9%	-5.7%	
<i>Alpha</i>		-17.3%	-34.3%	-12.1%	-12.3%	-12.5%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		100	100	100	94	93	
<b>Attucks Asset Management</b>	<b>163,290,106</b>	<b>-5.9%</b>	<b>16.9%</b>	<b>7.4%</b>	<b>9.1%</b>	<b>6.8%</b>	<b>11/30/07</b>
S&P 1500		-7.6%	18.9%	10.8%	12.2%	8.7%	
Style & Risk Adj Benchmark		-0.6%	19.3%	9.0%	10.0%	8.5%	
Lipper Multi-Cap Core		-7.6%	17.3%	8.6%	10.4%	7.2%	
<i>Excess Return</i>		1.7%	-2.0%	-3.4%	-3.1%	-1.9%	
<i>Alpha</i>		-5.3%	-2.5%	-1.6%	-0.9%	-1.7%	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		28	64	74	79	61	
<b>Patient Capital</b>	<b>133,612,843</b>	<b>-24.4%</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-23.6%</b>	<b>10/1/21</b>
S&P 1500 Value		-0.6%	--	--	--	4.8%	
Style & Risk Adjusted Benchmark		-7.3%	--	--	--	2.0%	
Lipper Multi-Cap Value		-5.3%	--	--	--	1.0%	
<i>Excess Return</i>		-23.9%	--	--	--	-28.4%	
<i>Alpha</i>		-17.1%	--	--	--	-25.6%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		100	--	--	--	100	
<b>Bivium Capital Partners</b>	<b>121,075,270</b>	<b>-8.8%</b>	<b>12.9%</b>	<b>5.3%</b>	<b>7.9%</b>	<b>5.9%</b>	<b>11/30/07</b>
S&P 1500 Value		-0.6%	19.7%	9.3%	10.4%	6.9%	
Style & Risk Adj Benchmark		-7.3%	17.7%	10.7%	12.1%	8.8%	
Lipper Multi-Cap Value		-5.3%	19.7%	7.4%	9.1%	6.2%	
<i>Excess Return</i>		-8.3%	-6.8%	-4.0%	-2.6%	-1.0%	
<i>Alpha</i>		-1.6%	-4.7%	-5.5%	-4.3%	-2.9%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		91	98	90	84	62	
<b>Disruptive Innovation Momentum</b>	<b>115,607,105</b>	<b>-39.6%</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-19.1%</b>	<b>9/1/20</b>
MSCI Momentum Index		-15.4%	--	--	--	-2.5%	
Style & Risk Adj Benchmark		-21.4%	--	--	--	11.4%	
Lipper Multi-Cap Growth		-15.0%	--	--	--	-1.6%	
<i>Excess Return</i>		-24.1%	--	--	--	-16.6%	
<i>Alpha</i>		-18.1%	--	--	--	-30.5%	
<i>Pct. Rank vs Lipper Multi-Cap Growth</i>		100	--	--	--	96	

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>Managed Asset Portfolios</b>	<b>101,471,898</b>	<b>-4.9%</b>	<b>16.7%</b>	<b>8.4%</b>	<b>10.3%</b>	<b>11.0%</b>	<b>2/29/16</b>
S&P 1500 Value		-0.6%	19.7%	9.3%	10.4%	11.3%	
Style & Risk Adj. Benchmark		0.3%	16.7%	7.5%	9.6%	10.3%	
Lipper Multi-Cap Value		-5.3%	19.7%	7.4%	9.1%	9.9%	
<i>Excess Return</i>		-4.4%	-3.0%	-0.9%	-0.1%	-0.3%	
<i>Alpha</i>		-5.2%	0.0%	0.8%	0.7%	0.8%	
<i>Pct. Rank vs Lipper Multi-Cap Value</i>		43	84	29	19	41	
<b>Ancora</b>	<b>99,152,714</b>	<b>-5.5%</b>	<b>20.6%</b>	<b>5.9%</b>	<b>--</b>	<b>6.2%</b>	<b>10/1/17</b>
S&P 1000		-6.2%	22.0%	7.3%	--	7.6%	
Style & Risk Adj. Benchmark		-3.9%	24.9%	7.7%	--	7.3%	
Lipper Mid-Cap Core		-7.0%	20.7%	7.1%	--	7.1%	
<i>Excess Return</i>		0.7%	-1.4%	-1.4%	--	-1.3%	
<i>Alpha</i>		-1.6%	-4.3%	-1.8%	--	-1.1%	
<i>Pct. Rank vs Lipper Mid-Cap Core</i>		33	48	75	--	69	
<b>All-Cap Core</b>	<b>10,462,397</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>4.2%</b>	
S&P 1500		--	--	--	--	0.2%	
Style & Risk Adj. Benchmark		--	--	--	--	0.7%	
Lipper Multi-Cap Core		--	--	--	--	0.2%	
<i>Excess Return</i>		--	--	--	--	3.1%	
<i>Alpha</i>		--	--	--	--	3.5%	
<i>Pct. Rank vs Lipper Multi-Cap Core</i>		--	--	--	--	9	

State of Michigan Retirement System

# INTERNATIONAL EQUITY REVIEW

State of Michigan Investment Board Meeting

June 29, 2023



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

## EXECUTIVE SUMMARY

### **Performance**

<b>MPSERS Plan (3/31/23)</b>	<b>1-Year</b>	<b>3-Years</b>	<b>5-Years</b>	<b>7-Years</b>	<b>10-Years</b>
Annualized Returns	-5.7%	12.0%	2.7%	6.4%	5.0%
MSCI ACWI ex USA Returns	-5.1%	11.8%	2.5%	5.9%	4.2%
Peer Median Returns	-2.9%	13.4%	3.5%	6.5%	5.2%

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

- The portfolio underperformed the benchmark by 0.6% over the last twelve months.
- The underperformance through a factor lens was primarily driven by the under exposure to the value factor, and over exposure to the quality factor.
- From a sector view the underperformance was primarily driven by under exposure to the energy sector and the banking sector.

### **Asset Class Goals**

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

### **Strategy**

- The 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 2.4%, which is below the division's risk budget of 3.0%.
  - The division's core strategy of exposure to the quality, value, and momentum factors (QVM), accounts for collectively 3.8% of the total tracking error, indicating that long-term, the portfolio is not materially exposed to any single risk.
- Quarterly changes to International Equity Division allocation.
  - Raised \$250.0 million through equity sales in the core strategy as well as index funds to provide additional liquidity for SMRS.
  - Rebalanced \$859.0 million of equity swaps to match the division's long-term equity factor strategy.



- Allocated to three new managers in the active strategy after several years of analysis and due diligence. Each of the managers align with the value factor in the IED's core strategy. Allocation to each manager were based on the impact to risk and return as well as the division's overall balanced factor strategy. The allocations were as follows: AQR Capital Management \$220.0 million, LSV Asset Management \$165.0 million, and Wellington Asset Management \$100.0 million.

## **Market Environment and Outlook**

### Market Environment

- International stock markets were down -5.1% over the last twelve months. Earnings per share (EPS) over the same period were down -1.7%.
- Performance of the quality, value, and momentum factors (QVM) remains strategically important to the IED. Over the last twelve months, the value factor outperformed the MSCI ACWI ex USA by 1.4%. The momentum factor and quality factor continued to lag, underperforming the benchmark -5.6% and -0.8% respectively. IED's core strategy remains balanced and consistent despite the strategy underperforming the division's benchmark by -0.9% over the last year, ending March 31, 2023.
- Emerging markets underperformed the MSCI ACWI ex USA by -10.1% over the last year. Developed markets underperformed the broader index by -2.7%.
- The U.S. dollar gained 3.9% over the last year relative to developed currencies.
- Commodities have declined significantly from the 2022 peak, down -15.2% year over year. Oil suffered big decline down -24.5% since March 2022. Gold was up slightly in the last year 1.6% and copper declined -13.8%.
- Global government interest rates (index weighted) remain low by historical standards at 2.8% down from 3.9% in late 2022.

### Outlook

- Commodities have trended down over the last year indicating global inflation is most likely cooling across asset classes. As such global interest rates have fallen from their peak in 2022 and global stock prices have risen.
- Major central banks continue to remove liquidity from the financial system despite evidence of significant stresses in the banking system. The impact of this withdrawal will act as a headwind for further gains across all asset classes.
- The global economy is slowing and may contract in 2023. International stock markets' earnings per share declined year-over-year at -1.7%. The decline in earnings growth has been persistent from the peak of 35.5% set in May 2022 for this cycle.
- Europe's sales and earnings per share expanded year-over-year by 9.3% and 5.8%. Forward-looking sales per share are expected to be up over the next 12 months, 2.5% and earnings are expected to increase 4.2%.

- Japan's sales and earnings per share increased year-over-year by 0.1% and -4.3% respectively. Forward-looking sales and earnings per share growth are expected to rise 4.2% and 6.2% 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. If that belief proves incorrect interest rates will remain structurally higher for longer than the markets are pricing in. This will impact the discount rates in corporate boardrooms and may impact future corporate investments.
- If the major central banks stop tightening, their respective currencies will come under significant pressure, similar to what has occurred in Japan this year. Temporarily this may cause inflation to flatline well above the 2.0% target creating a more hawkish interest rate environment towards the end of 2023.
- Analysts' forward-looking one-year estimates for the MSCI ACWI ex USA index sales and earnings per share growth are 4.1% and 3.2% 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 2.8% implies an international equity risk premium of 5.8%. The equity risk premium increased by 0.2% in the quarter due to decline of long-term government interest rates and an increase in the forward-looking returns of international stocks.

## **Conclusion**

International stock market fundamentals are slowing towards a more normal rate of growth. Global government bond yields have moved higher but remain near all-time lows. International stocks are expected to grow earnings per share by 3.2% in the next twelve months. The market trades at 12.7x price to earnings which is below its twenty-three-year average of 16.0x 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. To capture the spread to bonds, international stock investors will need a long investment horizon as the short-term environment may experience increased volatility.

# SMRS

## International Equity Strategies

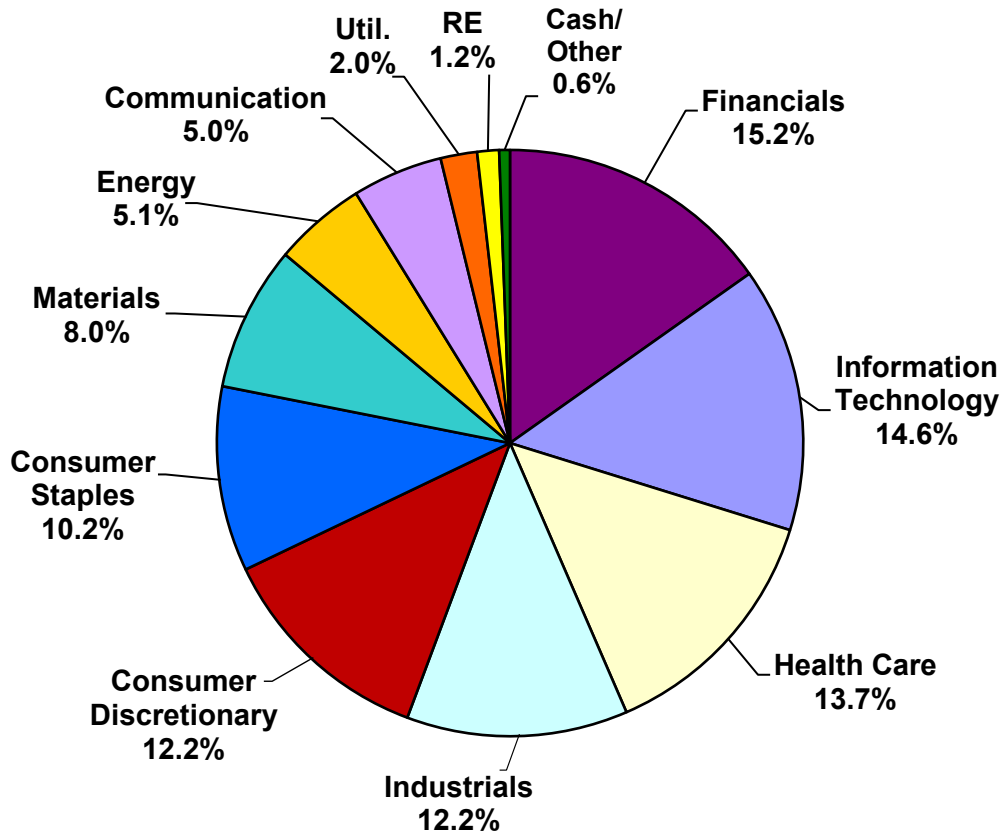
3/31/23

Markets	Amount	Total	% of Total
<b>Active</b> (\$ in Millions)			
BlackRock MSCI	\$2,248		
IED Quality Equity	1,008		
Martin Currie	373		
AQR	169		
WCM	161		
UBS	157		
Wellington	145		
Brown	112		
Baillie Gifford	108		
Vontobel	102		
Morgan Stanley	85		
Baron	48		
Cash	17		
<b>Total Active</b>		<b>\$4,732</b>	<b>36.4%</b>
<b>Stock Plus</b>			
Internal	\$3,288		
PIMCO	2,294		
<b>Total Stock Plus</b>		<b>\$5,582</b>	<b>43.0%</b>
<b>Indexed</b>			
SSGA	\$1,376		
BlackRock	1,302		
<b>Total Indexed</b>		<b>\$2,678</b>	<b>20.6%</b>
<b>TOTAL</b>		<b><u>\$12,992</u></b>	<b><u>100.0%</u></b>

# SMRS

## International Equity By Sector

### 3/31/23



Market Value in Millions				
3/31/23				
	Assets	Percent	Benchmark	Difference
Financials	\$1,975	15.2%	20.0%	-4.8%
Information Technology	1,890	14.6%	11.7%	2.9%
Health Care	1,784	13.7%	9.6%	4.1%
Industrials	1,584	12.2%	12.7%	-0.5%
Consumer Discretionary	1,577	12.2%	11.8%	0.4%
Consumer Staples	1,323	10.2%	8.9%	1.3%
Materials	1,042	8.0%	8.2%	-0.2%
Energy	666	5.1%	5.7%	-0.6%
Communication Services	651	5.0%	6.1%	-1.1%
Utilities	262	2.0%	3.2%	-1.2%
Real Estate	155	1.2%	2.1%	-0.9%
<b>Total Investments</b>	<b>\$12,909</b>	<b>99.4%</b>	<b>100.0%</b>	
Cash/Other	83	0.6%	0.0%	0.6%
<b>Total</b>	<b>\$12,992</b>	<b>100.0%</b>	<b>100.0%</b>	

Benchmark: MSCI ACWI ex USA

# SMRS

## International Equities

### 3/31/23

<b>Date:</b>	<b><u>3/31/23</u></b>	<b><u>12/31/22</u></b>	<b><u>9/30/22</u></b>	<b><u>6/30/22</u></b>
Assets (\$ in Millions):	\$12,992	\$12,622	\$11,105	\$12,519
Number of Securities:	2,422	2,398	2,436	2,432
Active Share:	35%	34%	34%	34%

Benchmark: MSCI ACWI ex USA

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

<b>Portfolio Characteristics:</b>	<b>SMRS</b>		<b>MSCI ACWI ex USA</b>	
	<b><u>LTM</u></b>	<b><u>Normalized</u></b>	<b><u>LTM</u></b>	<b><u>Normalized</u></b>
<b>Return:</b>				
Annualized Total Return	11.2%	9.8%	9.3%	8.6%
Sustainable Growth Rate	6.7%	6.4%	5.6%	5.9%
Dividend Yield	2.9%	2.5%	2.7%	2.5%
Buyback Yield	1.1%	0.4%	1.0%	0.3%
Collateral Yield	0.5%	0.5%	--	--
<b>Risk:</b>				
Beta	0.92	--	1.00	--
Volatility	17.2%	--	17.4%	--
Tracking Error	2.4%	--	0.0%	--
Information Ratio	0.8	0.5	--	--
<b>Fundamental:</b>				
Average Capitalization (\$ in Billions)	95.3	--	87.2	--
Price/Earnings	12.5	15.9	14.5	17.5
Price/Book	1.7	1.9	1.8	2.0
ROE	13.4%	11.7%	12.1%	11.2%

### TOP TEN HOLDINGS

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

	<b><u>Portfolio Weight</u></b>	<b><u>Market Capitalization*</u></b>	<b><u>FY1 P/E</u></b>	<b><u>Market Value**</u></b>
Novo Nordisk A/S Class B	2.2%	\$276.0	33.8	\$280.8
ASML Holding NV	2.1%	273.8	33.6	273.7
Taiwan Semiconductor Manufacturing Co., Ltd.	1.7%	454.0	15.9	222.6
Nestle S.A.	1.5%	335.5	22.3	198.0
LVMH Moet Hennessy Louis Vuitton SE	1.4%	460.6	26.4	177.3
Novartis AG	1.2%	208.8	13.9	153.2
BHP Group Ltd.	1.2%	160.2	10.7	150.0
Roche Holding Ltd. Dividend Right Cert.	1.1%	232.8	13.5	143.5
Samsung Electronics Co., Ltd.	1.1%	327.5	35.6	139.8
Sanofi	<u>0.8%</u>	<u>137.3</u>	12.2	<u>106.6</u>
<b>TOTAL</b>	<b><u>14.2%</u></b>	<b><u>\$2,866.6</u></b>		<b><u>\$1,845.4</u></b>

# International Equity Performance - Net of Fees

## 3/31/23

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>Total International Equity</b>	<b>\$12,992,117,764</b>	<b>-5.9%</b>	<b>11.8%</b>	<b>2.5%</b>	<b>6.2%</b>	<b>5.3%</b>	<b>1/1/04</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	5.9%	5.5%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	5.9%	5.3%	
<i>Excess Return</i>		-0.8%	0.0%	0.0%	0.4%	-0.1%	
<i>Pct Rank vs. Lipper Int'l Multi-Cap Core</i>		92	72	56	35	34	

<b>Total International Active Strategy*</b>	<b>\$4,731,960,369</b>	<b>-5.9%</b>	<b>10.1%</b>	<b>2.0%</b>	<b>5.3%</b>	<b>4.5%</b>	<b>5/1/05</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	5.9%	4.9%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	5.9%	4.8%	
<i>Excess Return</i>		-0.8%	-1.7%	-0.4%	-0.5%	-0.4%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		92	88	81	76	69	

<b>BlackRock MSCI Systematic Return</b>	<b>2,247,667,175</b>	<b>-5.5%</b>	<b>12.6%</b>	<b>--</b>	<b>--</b>	<b>7.3%</b>	<b>12/1/18</b>
MSCI ACWI ex USA		-5.1%	11.8%	--	--	5.1%	
Lipper Int'l Multi-Cap Core		--	12.6%	--	--	5.6%	
<i>Excess Return</i>		-0.5%	0.8%	--	--	2.1%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		90	55	--	--	9	

<b>IED Quality Equity**</b>	<b>1,008,196,264</b>	<b>-5.8%</b>	<b>12.5%</b>	<b>--</b>	<b>--</b>	<b>5.8%</b>	<b>2/1/20</b>
MSCI ACWI ex USA		-5.1%	11.8%	--	--	3.1%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	--	--	3.7%	
<i>Excess Return</i>		-0.7%	0.7%	--	--	2.7%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		91	56	--	--	10	

<b>Martin Currie International Long-Term</b>	<b>372,539,975</b>	<b>-5.4%</b>	<b>11.4%</b>	<b>7.5%</b>	<b>--</b>	<b>9.2%</b>	<b>2/1/17</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	--	5.3%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	--	5.5%	
<i>Excess Return</i>		-0.3%	-0.4%	5.0%	--	3.9%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		90	78	3	--	1	

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>AQR Enhanced Value</b>	<b>168,693,019</b>	--	--	--	--	-0.6%	
MSCI ACWI ex USA		--	--	--	--	-1.7%	
Lipper International Large-Cap Core		--	--	--	--	--	
<i>Excess Return</i>		--	--	--	--	1.1%	
<i>Pct Rank vs Lipper Int'l Large-Cap Core</i>		--	--	--	--	0	
<b>WCM Focused Growth International</b>	<b>161,329,350</b>	<b>-3.7%</b>	--	--	--	<b>-9.8%</b>	<b>10/1/21</b>
MSCI ACWI ex USA		-5.1%	--	--	--	-5.8%	
Lipper Int'l Lg-Cap Core		-2.2%	--	--	--	-4.3%	
<i>Excess Return</i>		1.3%	--	--	--	-4.0%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		66	--	--	--	98	
<b>UBS China A Opportunity Fund</b>	<b>157,034,875</b>	<b>-10.6%</b>	--	--	--	<b>-0.4%</b>	<b>5/1/20</b>
MSCI China On shore		-6.3%	--	--	--	1.7%	
Lipper Emerging Markets		-9.2%	--	--	--	5.3%	
<i>Excess Return</i>		-4.3%	--	--	--	-2.1%	
<i>Pct Rank vs. Lipper Emerging Markets</i>		65	--	--	--	94	
<b>Wellington Select China Equity</b>	<b>144,580,483</b>	<b>-19.9%</b>	<b>3.3%</b>	--	--	<b>5.3%</b>	<b>9/1/19</b>
MSCI China On shore		-6.3%	1.3%	--	--	1.7%	
Lipper Emerging Markets		-9.2%	8.5%	--	--	1.6%	
<i>Excess Return</i>		-13.6%	2.0%	--	--	3.6%	
<i>Pct Rand vs Lipper Emerging Markets</i>		96	93	--	--	19	
<b>Brown Capital Int'l Small Company Fund</b>	<b>111,726,392</b>	<b>-8.2%</b>	--	--	--	<b>-8.7%</b>	<b>3/1/22</b>
MSCI ACWI ex USD		-5.1%	--	--	--	-4.5%	
Lipper Int'l Lg-Cap Core		-2.2%	--	--	--	-2.2%	
<i>Excess Return</i>		-3.1%	--	--	--	-4.2%	
<i>Pct Rank vs. Lipper Int'l Lg-Cap Core</i>		0	--	--	--	0	
<b>Baillie Gifford Int'l Concentrated Growth</b>	<b>107,760,259</b>	<b>-9.9%</b>	--	--	--	<b>-24.7%</b>	<b>12/1/21</b>
MSCI ACWI ex USA		-5.1%	--	--	--	-7.7%	
Lipper Int'l Lg-Cap Core		-2.2%	--	--	--	-6.2%	
<i>Excess Return</i>		-4.8%	--	--	--	-17.0%	
<i>Pct Rank vs. Lipper Int'l Lg-Cap Core</i>		0	--	--	--	0	

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>Vontobel International Quality Growth Fund</b>	<b>102,349,773</b>	--	--	--	--	<b>-5.3%</b>	<b>5/1/22</b>
MSCI ACWI ex USD		--	--	--	--	4.6%	
Lipper Int'l Lg-Cap Core		--	--	--	--	1.3%	
<i>Excess Return</i>		--	--	--	--	4.0%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		--	--	--	--	3.3%	
<b>Morgan Stanley Int'l Opportunity Fund</b>	<b>85,348,373</b>	<b>-10.7%</b>	--	--	--	<b>-20.8%</b>	<b>2/1/22</b>
MSCI ACWI ex USA		-5.1%	--	--	--	-5.9%	
Lipper International Large-Cap Core		-2.2%	--	--	--	-4.4%	
<i>Excess Return</i>		-5.6%	--	--	--	-14.9%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		0	--	--	--	0	
<b>Baron Global Advantage</b>	<b>48,145,232</b>	<b>-31.1%</b>	--	--	--	<b>-36.7%</b>	<b>1/1/22</b>
MSCI ACWI ex USA		-5.1%	--	--	--	-4.9%	
Lipper Int'l Lg-Cap Core		-2.2%	--	--	--	-3.4%	
<i>Excess Return</i>		-26.0%	--	--	--	-31.8%	
<i>Pct Rank vs Lipper Int'l Lg-Cap Core</i>		0	--	--	--	0	

<b>Total International Stock Plus Strategy**</b>	<b>\$5,582,030,526</b>	<b>-6.6%</b>	<b>13.1%</b>	<b>2.8%</b>	<b>6.9%</b>	<b>6.6%</b>	<b>1/1/09</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	5.9%	6.5%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	5.9%	6.8%	
<i>Excess Return</i>		-1.5%	1.3%	0.3%	1.1%	0.1%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		96	41	42	11	56	
<b>Internal Stock Plus</b>	<b>3,287,561,529</b>	<b>-6.7%</b>	<b>13.0%</b>	<b>2.7%</b>	<b>5.5%</b>	<b>5.1%</b>	<b>9/1/11</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	5.9%	4.5%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	5.9%	5.5%	
<i>Excess Return</i>		-1.7%	1.2%	0.2%	-0.3%	0.5%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		96	43	47	68	65	
<b>PIMCO StocksPLUS</b>	<b>2,294,339,802</b>	<b>-6.4%</b>	<b>13.3%</b>	--	--	<b>5.4%</b>	<b>4/1/19</b>
MSCI ACWI ex USA		-5.1%	11.8%	--	--	4.2%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	--	--	4.8%	
<i>Excess Return</i>		-1.3%	1.5%	--	--	1.2%	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		95	35	--	--	32	



<u>Fund Name</u>	<u>Market Value</u>	<u>1-Yr</u>	<u>3-Yrs</u>	<u>5-Yrs</u>	<u>7-Yrs</u>	<u>Incept.</u>	<u>Incept. Date</u>
<b>Total International Index Strategy</b>	<b>\$2,678,126,868</b>	<b>-4.9%</b>	<b>12.1%</b>	<b>2.7%</b>	<b>6.5%</b>	<b>6.7%</b>	<b>7/1/09</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	5.9%	5.8%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	5.9%	6.4%	
<i>Excess Return</i>		<i>0.2%</i>	<i>0.3%</i>	<i>0.3%</i>	<i>0.6%</i>	<i>1.0%</i>	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		<i>83</i>	<i>63</i>	<i>47</i>	<i>18</i>	<i>21</i>	
<b>SSGA MSCI ACWI ex USA Index</b>	<b>1,376,201,405</b>	<b>-4.9%</b>	<b>12.2%</b>	<b>2.7%</b>	<b>--</b>	<b>2.9%</b>	<b>11/1/17</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	--	3.1%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	--	3.0%	
<i>Excess Return</i>		<i>-0.2%</i>	<i>0.4%</i>	<i>0.2%</i>	<i>--</i>	<i>-0.2%</i>	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		<i>84</i>	<i>63</i>	<i>47</i>	<i>--</i>	<i>50</i>	
<b>Blackrock ACWI ex USA Index</b>	<b>1,301,925,463</b>	<b>-4.8%</b>	<b>12.1%</b>	<b>2.8%</b>	<b>--</b>	<b>2.3%</b>	<b>3/1/18</b>
MSCI ACWI ex USA		-5.1%	11.8%	2.5%	--	2.6%	
Lipper Int'l Multi-Cap Core		-2.2%	12.6%	2.9%	--	2.7%	
<i>Excess Return</i>		<i>0.3%</i>	<i>0.3%</i>	<i>0.3%</i>	<i>--</i>	<i>-0.2%</i>	
<i>Pct Rank vs Lipper Int'l Multi-Cap Core</i>		<i>83</i>	<i>64</i>	<i>46</i>	<i>--</i>	<i>54</i>	

\* The total includes the cash balance of closed funds, a total of \$16,589,199

\*\*Includes \$129,195 transition account

State of Michigan Retirement System

# DEFINED CONTRIBUTION REVIEW

State of Michigan Investment Board Meeting  
June 29, 2023



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

# EXECUTIVE SUMMARY

## **Market Environment and Outlook**

The financial markets were positive in the first quarter but volatile as concerns with inflation and interest rates tugged asset prices up and down. At its first 2023 policy meeting, the Federal Reserve raised interest rates by 25 basis points (0.25%), driving market rates higher while pulling down bond prices and crimping the values of rate-sensitive technology stocks.

Market focus shifted dramatically in March as the sudden failure of several U.S. regional banks and the collapse of Credit Suisse shook the banking sector. Markets regrouped after the federal government intervened to protect depositors. The Federal Reserve, seeking to avoid further accidents tied to higher rates, took a restrained step and increased the Fed funds rate by another 25 basis points at its March policy meeting.

The 10-year U.S. Treasury yield fell from nearly 3.9% in early January to less than 3.5% by the quarter's end. Falling rates helped both stocks and bonds. The S&P 500 Index gained 7.50%, and the Bloomberg U.S. Aggregate Bond Index gained 2.96%. Easing rates also gave growth stocks an advantage over value stocks. Across the capitalization spectrum, growth styles posted gains significantly greater than those of value styles.

## **Regulatory Update**

**Sponsors and recordkeepers implement Secure 2.0 mandates.** The Secure 2.0 Act of 2022 Retirement introduced sweeping changes to the retirement plan landscape, with an implementation timeline extending over a decade. Key Secure 2.0 plan regulations coming online in defined contribution plans in 2023 include:

- Later beginning dates for RMDs: The required beginning age for required minimum distributions (RMDs) is age 73, starting in 2023. The beginning age extends to age 75 in 2033.
- Eliminating the "First Day of the Month" requirement for governmental plans: Plans may permit participants in 457(b) plans to change their contribution election at any time.
- Reducing required disclosures for unenrolled participants: Plans are now allowed to provide much more limited information to employees who are not contributing to a plan and have no balance in the plan.

These follow a host of new rules that became effective in 2022. The year 2023 will also see various changes to IRAs, small employer plans, and multiple employer plans.

## **Industry Update**

**Defined contribution plans held 28% of Americans' retirement assets at the end of 2022.** The Investment Company Institute (ICI) has reported that Americans held \$9.3 trillion in defined contribution (DC) plans, such as 401(k), 403(b), and 457 plans, at the end of 2022. This total was down from \$11.2 trillion at the end of 2021. DC plans comprised the second largest U.S. pool of retirement assets: individual retirement accounts (IRAs), which held an estimated \$11.5 trillion at the end of 2022, were the largest.

Other findings from the ICI survey of DC Plan Recordkeepers:

- 8.0% of defined contribution plan participants made asset allocation changes within their accounts in 2022, down from 9.1% in 2021. By comparison, 10.6% of participants made balance allocation changes in the volatile year of 2020.
- The percentage of participants taking withdrawals from DC plans held at a steady 4.1% in 2021 and 2022. However, the rate of hardship withdrawals increased from 1.7% of participants in 2021 to 2.0% in 2022.
- Similarly, the ICI saw an increase in the portion of DC participants who stopped contributing, from 2.2% in 2021 to 2.5% in 2022.
- Lastly, the ICI found that DC plan loan activity increased, from 12.5% of participants taking plan loans in 2021 to 13.3% in 2022.

# SMRS

## Defined Contribution Strategies

### 3/31/23

Markets	Amount		% of Total	Fee per \$1,000
QDIA (\$ in Millions)				
	<u>3/31/23</u>	<u>3/31/22</u>		
Total Target Date Fund	\$3,798	\$3,564	31.3%	\$0.55
Tier I Index Funds				
State Street S&P 500 Index Fund	\$1,746	\$1,863		\$0.13
State Street Bond Market Index Fund	1,064	1,088		0.20
State Street Global All Cap Equity ex-U.S. Index Fund	823	829		0.45
State Street S&P Mid Cap Index Fund	729	765		0.20
BlackRock Government Short-Term Investment CL F	255	226		0.56
BlackRock S&P Small Cap 600 Equity Index CL F	169	182		0.25
BlackRock Emerging Markets Index CL F	107	120		0.69
Total Tier I Index	\$4,892	\$5,071	40.4%	\$0.24
Tier II Active Funds				
Stable Value Fund	\$1,246	\$1,248		\$2.14
Dodge & Cox Stock Fund	636	707		4.10
Jennison Large Cap Growth Fund	416	531		2.93
American Funds EuroPacific Growth R6	254	293		4.60
T. Rowe Price Mid-Cap Value Fund	154	158		6.20
Artisan Mid Cap Fund	121	152		7.03
Voya Small Cap Growth Equity Fund	126	144		3.32
PIMCO Total Return I Fund	102	111		4.60
Virtus Ceredex Small-Cap Value Eq I	72	75		6.50
Prudential High Yield Fund	40	47		3.76
Total Tier II Active	\$3,168	\$3,466	26.2%	\$3.51
Tier III				
Total Self Directed Brokerage Account	\$258	\$298	2.1%	NA
Total Defined Contribution Assets	\$12,116	\$12,399	100.0%	\$1.19

\*Loan Fund \$191M as of 3/31/23

NOTE: Totals may not be exact due to rounding.

# Defined Contribution Performance by Fund

3/31/23

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
<b>State Street Target Retirement Income Fund</b>	<b>\$108,534,790</b>	<b>(4.9)</b>	<b>5.8</b>	<b>4.0</b>	<b>3.7</b>
State Street Income Custom Index		(5.0)	5.7	3.9	3.8
Morningstar Target-Date Retirement		(4.9)	3.9	2.9	3.4
<i>Variance State Street Income Custom Index</i>		0.1	0.1	0.1	(0.1)
<i>Variance Morningstar Target-Date Retirement</i>		0.0	1.9	1.1	0.3
<b>State Street Target Retirement 2020 Fund</b>	<b>\$130,761,530</b>	<b>(5.6)</b>	<b>7.6</b>	<b>4.6</b>	<b>5.4</b>
State Street 2020 Custom Index		(5.7)	7.5	4.6	5.4
Morningstar Target-Date 2020		(5.8)	6.7	4.0	5.4
<i>Variance State Street 2020 Custom Index</i>		0.1	0.1	0.0	0.0
<i>Variance Morningstar Target-Date 2020</i>		0.2	0.9	0.6	0.0
<b>State Street Target Retirement 2025 Fund</b>	<b>\$268,919,662</b>	<b>(6.4)</b>	<b>9.1</b>	<b>5.4</b>	<b>6.4</b>
State Street 2025 Custom Index		(6.6)	9.0	5.3	6.4
Morningstar Target-Date 2025		(6.1)	7.6	4.3	5.6
<i>Variance State Street 2025 Custom Index</i>		0.2	0.1	0.1	0.0
<i>Variance Morningstar Target-Date 2025</i>		(0.3)	1.5	1.1	0.8
<b>State Street Target Retirement 2030 Fund</b>	<b>\$357,426,470</b>	<b>(6.8)</b>	<b>10.0</b>	<b>5.7</b>	<b>6.9</b>
State Street 2030 Custom Index		(7.1)	9.8	5.7	6.9
Morningstar Target-Date 2030		(6.4)	9.4	4.9	6.3
<i>Variance State Street 2030 Custom Index</i>		0.3	0.2	0.0	0.0
<i>Variance Morningstar Target-Date 2030</i>		(0.4)	0.6	0.8	0.6
<b>State Street Target Retirement 2035 Fund</b>	<b>\$420,129,159</b>	<b>(7.1)</b>	<b>11.0</b>	<b>6.0</b>	<b>7.2</b>
State Street 2035 Custom Index		(7.4)	10.8	5.9	7.2
Morningstar Target-Date 2035		(6.8)	11.2	5.5	7.0
<i>Variance State Street 2035 Custom Index</i>		0.3	0.2	0.1	0.0
<i>Variance Morningstar Target-Date 2035</i>		(0.3)	(0.2)	0.5	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>
<b>State Street Target Retirement 2040 Fund</b>	<b>\$431,283,825</b>	<b>(7.4)</b>	<b>12.0</b>	<b>6.2</b>	<b>7.5</b>
State Street 2040 Custom Index		(7.7)	11.8	6.2	7.5
Morningstar Target-Date 2040		(7.0)	12.6	5.9	7.4
Variance State Street 2040 Custom Index		0.3	0.2	0.0	0.0
Variance Morningstar Target-Date 2040		(0.4)	(0.6)	0.3	0.1
<b>State Street Target Retirement 2045 Fund</b>	<b>\$470,108,438</b>	<b>(7.6)</b>	<b>12.9</b>	<b>6.4</b>	<b>7.7</b>
State Street 2045 Custom Index		(8.0)	12.8	6.3	7.7
Morningstar Target-Date 2045		(7.0)	13.6	6.2	7.6
Variance State Street 2045 Custom Index		0.4	0.1	0.1	0.0
Variance Morningstar Target-Date 2045		(0.6)	(0.7)	0.2	0.1
<b>State Street Target Retirement 2050 Fund</b>	<b>\$610,695,445</b>	<b>(7.8)</b>	<b>13.4</b>	<b>6.5</b>	<b>7.8</b>
State Street 2050 Custom Index		(8.1)	13.2	6.5	7.8
Morningstar Target-Date 2050		(7.1)	13.9	6.3	7.7
Variance State Street 2050 Custom Index		0.3	0.2	0.0	0.0
Variance Morningstar Target-Date 2050		(0.7)	(0.5)	0.2	0.1
<b>State Street Target Retirement 2055 Fund</b>	<b>\$649,247,939</b>	<b>(7.8)</b>	<b>13.4</b>	<b>6.5</b>	<b>7.8</b>
State Street 2055 Custom Index		(8.1)	13.2	6.5	7.8
Morningstar Target-Date 2055		(7.1)	14.1	6.4	7.8
Variance State Street 2055 Custom Index		0.3	0.2	0.0	0.0
Variance Morningstar Target-Date 2055		(0.7)	(0.7)	0.1	0.0
<b>State Street Target Retirement 2060 Fund</b>	<b>\$314,877,714</b>	<b>(7.8)</b>	<b>13.4</b>	<b>6.5</b>	<b>N/A</b>
State Street 2060 Custom Index		(8.1)	13.2	6.5	N/A
Morningstar Target-Date 2060		(7.1)	14.3	6.4	N/A
Variance State Street 2060 Custom Index		0.3	0.2	0.0	N/A
Variance Morningstar Target-Date 2060		(0.7)	(0.9)	0.1	N/A
<b>State Street Target Retirement 2065 Fund</b>	<b>\$35,804,509</b>	<b>(7.8)</b>	<b>13.4</b>	<b>N/A</b>	<b>N/A</b>
State Street 2065 Custom Index		(8.1)	13.2	N/A	N/A
Morningstar Target-Date 2065+		(7.2)	14.6	N/A	N/A
Variance State Street 2065 Custom Index		0.3	0.2	N/A	N/A
Variance Morningstar Target-Date 2065+		(0.6)	(1.2)	N/A	N/A

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
<b>TIER 1</b>					
<b>State Street S&amp;P 500 Index Fund</b>	<b>\$1,746,215,784</b>	<b>(7.8)</b>	<b>18.6</b>	<b>11.2</b>	<b>12.2</b>
S&P 500 Index		(7.7)	18.6	11.2	12.2
Morningstar Large Blend		(7.4)	17.7	9.7	10.9
<i>Variance S&amp;P 500 Index</i>		(0.1)	0.0	0.0	0.0
<i>Variance Morningstar Large Blend</i>		(0.4)	0.9	1.5	1.3
<b>State Street US Bond Index Fund</b>	<b>\$1,063,743,157</b>	<b>(4.8)</b>	<b>(2.8)</b>	<b>0.9</b>	<b>1.3</b>
Bloomberg US Aggregate Bond Index		(4.8)	(2.8)	0.9	1.4
Morningstar Intermediate Core Bond		(5.1)	(2.3)	0.8	1.2
<i>Variance Bloomberg US Aggregate Bond Index</i>		0.0	0.0	0.0	(0.1)
<i>Variance Morningstar Intermediate Core Bond</i>		0.3	(0.5)	0.1	0.1
<b>State Street Global All Cap Equity ex-U.S. Index Fund</b>	<b>\$822,603,676</b>	<b>(4.8)</b>	<b>12.8</b>	<b>2.6</b>	<b>4.5</b>
MSCI ACWI ex USA IMI (Net)		(5.8)	12.2	2.4	4.3
Morningstar Foreign Large Blend		(2.3)	12.5	2.9	4.7
<i>Variance MSCI ACWI ex USA IMI (Net)</i>		1.0	0.6	0.2	0.2
<i>Variance Morningstar Foreign Large Blend</i>		(2.5)	0.3	(0.3)	(0.2)
<b>State Street S&amp;P Mid Cap Index Fund</b>	<b>\$728,711,498</b>	<b>(5.2)</b>	<b>22.1</b>	<b>7.6</b>	<b>9.7</b>
S&P 400 Index		(5.1)	22.1	7.7	9.8
Morningstar Mid-Cap Blend		(6.8)	19.6	7.1	9.0
<i>Variance S&amp;P 400 Index</i>		(0.1)	0.0	(0.1)	(0.1)
<i>Variance Morningstar Mid-Cap Blend</i>		1.6	2.5	0.5	0.7
<b>BlackRock Government Short-Term Investment Fund</b>	<b>\$254,856,745</b>	<b>2.7</b>	<b>1.0</b>	<b>1.4</b>	<b>0.9</b>
FTSE Treasury Bill 1 Mon USD		1.5	0.7	1.2	0.7
<i>Variance FTSE Treasury Bill 1 Mon USD</i>		1.2	0.3	0.2	0.2
<b>BlackRock S&amp;P Small Cap 600 Equity Index Fund</b>	<b>\$168,602,907</b>	<b>(8.7)</b>	<b>21.8</b>	<b>6.4</b>	<b>N/A</b>
S&P SmallCap 600 Index		(8.8)	21.7	6.3	N/A
Morningstar Small Blend		(7.9)	20.9	5.7	N/A
<i>Variance S&amp;P SmallCap 600 Index</i>		0.1	0.1	0.1	N/A
<i>Variance Morningstar Small Blend</i>		(0.8)	0.9	0.7	N/A



<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
<b>BlackRock Emerging Markets Index Fund</b>	<b>\$106,848,070</b>	<b>(9.9)</b>	<b>7.7</b>	<b>(1.1)</b>	<b>1.9</b>
MSCI Emerging Market (Net)		(10.7)	7.8	(0.9)	2.0
Morningstar Diversified Emerging Mkts		(9.4)	9.3	(0.8)	1.9
Variance MSCI Emerging Market (Net)		0.8	(0.1)	(0.2)	(0.1)
Variance Morningstar Diversified Emerging Mkts		(0.5)	(1.6)	(0.3)	0.0
<b>TIER 2</b>					
<b>Stable Value Fund</b>	<b>\$1,246,416,945</b>	<b>2.0</b>	<b>2.0</b>	<b>2.3</b>	<b>2.2</b>
BofA Merrill Lynch US 3-Mth Treasury Bill Index		2.5	0.9	1.4	0.9
Hueler Universe		2.1	2.0	2.2	2.0
Variance BofA Merrill Lynch US 3-Mth Treasury Bill Index		(0.5)	1.1	0.9	1.3
Variance Hueler Universe		(0.1)	0.0	0.1	0.2
<b>Dodge &amp; Cox Stock Fund</b>	<b>\$636,397,826</b>	<b>(6.7)</b>	<b>22.9</b>	<b>9.3</b>	<b>11.3</b>
Russell 1000 Value Index		(5.9)	17.9	7.5	9.1
Morningstar Large Value		(5.1)	18.9	7.8	9.1
Variance Russell 1000 Value Index		(0.8)	5.0	1.8	2.2
Variance Morningstar Large Value		(1.6)	4.0	1.5	2.2
<b>Jennison Large Cap Growth Equity Fund</b>	<b>\$416,428,350</b>	<b>(17.2)</b>	<b>13.7</b>	<b>10.5</b>	<b>N/A</b>
Russell 1000 Growth Index		(10.9)	18.6	13.7	N/A
Morningstar Large Growth		(12.7)	14.8	10.2	N/A
Variance Russell 1000 Growth Index		(6.3)	(4.9)	(3.2)	N/A
Variance Morningstar Large Growth		(4.5)	(1.1)	0.3	N/A
<b>American Funds EuroPacific Growth R6 Fund</b>	<b>\$253,831,363</b>	<b>(3.3)</b>	<b>12.1</b>	<b>3.3</b>	<b>6.0</b>
MSCI ACWI Ex USA NR USD		(5.1)	11.8	2.5	4.2
Morningstar Foreign Large Growth		(5.6)	10.6	3.9	5.8
Variance MSCI ACWI Ex USA NR USD		1.8	0.3	0.8	1.8
Variance Morningstar Foreign Large Growth		2.3	1.5	(0.6)	0.2
<b>T. Rowe Price Mid-Cap Value Fund</b>	<b>\$154,000,150</b>	<b>(5.5)</b>	<b>23.7</b>	<b>7.8</b>	<b>9.8</b>
Russell Midcap Value Index		(9.2)	20.7	6.5	8.8
Morningstar Mid-Cap Value		(6.3)	22.6	6.7	8.4
Variance Russell Midcap Value Index		3.7	3.0	1.3	1.0
Variance Morningstar Mid-Cap Value		0.8	1.1	1.1	1.4

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
<b>Voya Small Cap Growth Equity Fund</b>	<b>\$125,910,644</b>	<b>(9.4)</b>	<b>13.4</b>	<b>2.9</b>	<b>7.3</b>
Russell 2000 Growth Index		(10.6)	13.4	4.3	8.5
Morningstar Small Growth		(12.0)	16.2	7.3	9.6
Variance Russell 2000 Growth Index		1.2	0.0	(1.4)	(1.2)
Variance Morningstar Small Growth		2.6	(2.8)	(4.4)	(2.3)
<b>Artisan Mid Cap Fund</b>	<b>\$121,376,812</b>	<b>(15.4)</b>	<b>12.5</b>	<b>10.1</b>	<b>10.8</b>
Russell Midcap Growth Index		(8.5)	15.2	9.1	11.2
Morningstar Mid-Cap Growth		(11.9)	14.8	8.1	10.3
Variance Russell Midcap Growth Index		(6.9)	(2.7)	1.0	(0.4)
Variance Morningstar Mid-Cap Growth		(3.5)	(2.3)	2.0	0.5
<b>PIMCO Total Return I Fund</b>	<b>\$101,865,309</b>	<b>(5.8)</b>	<b>(2.2)</b>	<b>0.9</b>	<b>1.3</b>
Bloomberg US Aggregate Bond Index		(4.8)	(2.8)	0.9	1.4
Morningstar Intermediate Core-Plus Bond		(5.4)	(1.1)	0.9	1.5
Variance Bloomberg US Aggregate Bond Index		(1.0)	0.6	0.0	(0.1)
Variance Morningstar Intermediate Core-Plus Bond		(0.4)	(1.1)	0.0	(0.2)
<b>Virtus Ceredex Small-Cap Value Eq I Fund</b>	<b>\$71,934,038</b>	<b>0.6</b>	<b>22.5</b>	<b>5.6</b>	<b>7.9</b>
Russell 2000 Value Index		(13.0)	21.0	4.5	7.2
Morningstar Small Blend		(7.9)	20.9	5.7	8.2
Variance Russell 2000 Value Index		13.6	1.5	1.1	0.7
Variance Morningstar Small Blend		8.5	1.6	(0.1)	(0.3)
<b>Prudential High Yield Fund</b>	<b>\$40,202,561</b>	<b>(4.4)</b>	<b>5.9</b>	<b>3.7</b>	<b>N/A</b>
Bloomberg US. Corp. HY 1% Issuer Cap Index		(3.3)	5.9	3.1	N/A
Morningstar High Yield Bond		(3.6)	5.6	2.5	N/A
Variance Bloomberg US Corp. HY 1% Issuer Cap Index		(1.1)	0.0	0.6	N/A
Variance Morningstar High Yield Bond		(0.8)	0.3	1.2	N/A
<b>TIER 3</b>					
<b>Self Directed</b>	<b>\$258,031,355</b>				
<b>TOTAL</b>	<b>\$12,115,766,673</b>				

**Loan Fund:** **\$191,029,928**

# **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.**