

STATE OF MICHIGAN INVESTMENT BOARD MEETING

April 2, 2025

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

APRIL 2, 2025

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:35 a.m. Approval of the 1/8/25 SMIB Meeting Minutes
- 9:40 a.m. Executive Summary & Performance for Periods Ending 12/31/24
- 9:45 a.m. Current Asset Allocation Review
Markets Review and Outlook
- 9:50 a.m. Review of Investment Reports
- Defined Contribution – Update
Guest Speakers: State Street Global Advisors
Mary Guy, Vice President and Account Executive
Brendan Curran, Managing Director and Head of US Retirement
Dan Farley, Executive VP and CIO of Investment Solutions
 - Fixed Income – Update
 - International Equity – Receive and File
 - Domestic Equity – Receive and File
 - Absolute Return – Receive and File
 - Private Equity – Receive and File
 - Real Estate & Infrastructure – Receive and File
 - Real Return & Opportunistic – Receive and File
- 10:55 a.m. Public Comment
- 11:00 a.m. Closing Remarks ~ Adjournment



2025 Meeting Schedule

Wednesday, June 25, 2025
Wednesday, October 1, 2025
Wednesday, December 17, 2025

All meetings start at 9:30 a.m.

State of Michigan Retirement System

MINUTES

State of Michigan Investment Board Meeting

April 2, 2025



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

STATE OF MICHIGAN INVESTMENT BOARD

January 8, 2025 Meeting Minutes

Board Members Present:

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

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

| | | |
|----------------|--------------------|----------------|
| Jon Braeutigam | Greg Parker | Travis Haney |
| Janet Sudac | Allison Wardlaw | Anthony Estell |
| Aaron Haftl | John Sullivan, Jr. | Phil Kivarkis |
| Max Kotary | Ross Addison | Molly Jason |

Many others attended via Microsoft Teams.

Opening Remarks:

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

Approval of Minutes:

Approval of June 12, 2024, SMIB Meeting Minutes – Motion to approve by Reggie Sanders.
Seconded: Jennifer Flood.

Approval of October 1, 2024, SMIB Meeting Minutes – Motion to approve by Jennifer Flood.
Seconded: Reggie Sanders.

AGENDA

Executive Summary

Mr. Jon Braeutigam, Chief Investment Officer of the Bureau of Investments, explained the SMRS 1-year rate of return of 16%, being pretty strong on an absolute basis. The 10-year rate of return, which is probably more indicative of the fund is 9.1%, versus the peer median return of 8%. The difference in return rates gives approximately \$14 billion in excess value compared to median returns over the past ten years. The higher rate of return also adds an estimated \$2 billion to the fiscal year 2026 budget, and for every year sooner the Funds become fully funded, a projected \$3.8 billion is added to the budget annually.

The SMRS portfolio is comprised of \$110.5 billion in assets with \$16.8 billion in unfunded commitments. The Fund had \$975 million in new commitments during the September 2024

quarter and \$1.3 billion net of contributions over the past year were paid out by the combined systems.

Mr. Braeutigam further discussed the Funds plan liquidity and ended by explaining the quarter's new commitments within Absolute Return, International Equity, Real Estate and Infrastructure, and Real Return and Opportunistic.

Asset Allocation Review

Mr. Greg Parker, Director of Asset Allocation and Public Markets, presented a brief markets review. He discussed the U.S. interest rates increasing recently, even since September of 2024, making fixed income even more attractive. Investment grade credit spreads are very tight which is a concern when allocating to fixed income. High yield credit spreads are also very tight historically and currently.

Mr. Parker explained that U.S. equity valuations are more expensive than average and Non-U.S. equities are more of an average value. Equity markets relative valuations shows U.S. equities being expensive compared to the past 20 years and Non-U.S. equities being moderately expensive compared to the past 20 years.

Mr. Parker gave a brief overview of the asset liability study then introduced the Aon guest speakers to discuss further.

Guest Speakers: Phil Kivarkis, Partner – U.S. Director of Investment Policy Services, Aon and John Sullivan, Jr., Associate Partner – Asset-Liability Management, Aon

Topic: Asset Liability Analysis/Asset Allocation Discussion and Recommendation

Mr. Phil Kivarkis presented an overview of the asset liability study, stating the last study was completed in 2022. He explained the purpose of this analysis, the finance equation and ways to achieve this. He discussed some of the differences now versus 2022, such as the OPEB plan being 122% funded today, and the contribution policy which has changed.

Mr. John Sullivan did a thorough walk-through of the 2024 analysis of the study, stressing the importance of the awareness of the changes previously mentioned as well as others before completing this study.

Mr. Sullivan discussed the analysis of the MPSERS pension plan and the MPSERS OPEB plan explaining different asset mixes and options and ultimately proposing separate allocations for each. After the summary and conclusion of the study, many questions were presented and answered.

Action Item:

Resolution Authorizing Asset Allocation Strategy

Motion to approve by Reggie Sanders. Seconded: Jennifer Flood. The motion to adopt the new policy was unanimously approved.

Public Comment:

Multiple individuals and representatives from advocacy groups were present who urged the SMRS policy makers to divest from Israel bonds.

Adjournment:

The meeting concluded at 11:57 am. The next meeting is April 2, 2025.

Approved:

Chairman, Treasurer Rachael Eubanks

State of Michigan Retirement System

EXECUTIVE SUMMARY

State of Michigan Investment Board Meeting

April 2, 2025



Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments

EXECUTIVE SUMMARY

December 31, 2024

Performance

Great long-term returns.

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|------------------------|--------|---------|---------|---------|----------|
| Annualized Returns | 11.0% | 4.5% | 9.2% | 9.1% | 9.0% |
| Policy Returns | 14.5% | 6.4% | 9.4% | 9.2% | 9.2% |
| Peer Median Returns* | 10.0% | 3.9% | 7.7% | 7.6% | 7.8% |

*State Street Universe greater than \$10 billion.

- Across longer time periods, 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 \$60.6 billion December 2014 market value, a ten-year annualized return of 9.0% compared to the 7.8% peer median return added approximately \$15.0 billion in excess value. This equates to roughly an additional \$1.7 billion to the FY2026 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 170 bps which is low by historical standards. At the end of December 2024, the equity (risk) beta was approximately 0.37; 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 \$15.9 billion in illiquid assets. In the December 2024 quarter, \$405.5 million of new commitments were made. To meet the strategic asset allocation targets, the pace of new commitments will have to remain subdued for the next several years.
- The combined systems paid out approximately \$1.5 billion net of contributions over the past twelve months ending in December 2024. This compares to \$248 million a year ago and \$1.2 billion two years ago. Over the next several years, it is expected this figure will grow larger both in dollars and % AUM. A few reasons include MPSERS OPEB is now 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

October 1, 2024 – December 31, 2024

(\$ Millions)

| Asset class | Fund Name / (Managed By) | Commitment |
|---------------------------------------|---|-------------------|
| Absolute Return | | |
| | Nuveen SMRS, LLC (Nuveen Asset Management, LLC) | \$100.5 |
| | Blackstone Capital Opportunities Co-Investment Fund V, LP (Blackstone Private Credit Strategies, LLC) | 50.0 |
| International Equity | | |
| | Blackstone Capital Opportunities Co-Investment Fund V, LP (Blackstone Private Credit Strategies, LLC) | 25.0 |
| Private Equity | | |
| | Summit Partners Growth Equity Fund XII-A, LP (Summit Partners LP) | 100.0 |
| | Accel Growth Fund VII, LP (Accel Growth Fund VII Associates LP) | 20.0 |
| | Accel India VIII, LP (Accel India VIII Associates LP) | 10.0 |
| Real Estate and Infrastructure | | |
| | Duration Transportation Infrastructure Capital Partners, LP (Duration Capital Partners LLC) | 100.0 |
| TOTAL | | \$405.5 |

State of Michigan Retirement System

PERFORMANCE

State of Michigan Investment Board Meeting

April 2, 2025



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 December 31, 2024

| | % of Portfolio 12/31/24 | Ten Years ¹ | | Seven Years ¹ | | Five Years ¹ | | Three Years ¹ | | One Year | | Current Quarter | |
|--|----------------------------|------------------------|-----------|--------------------------|-----------|-------------------------|-----------|--------------------------|-----------|-------------|-----------|-----------------|-----------|
| | | Rate | Rank | Rate | Rank | Rate | Rank | Rate | Rank | Rate | Rank | Rate | Rank |
| TOTAL PLAN | 100.0 | 9.0 | 11 | 9.1 | 11 | 9.2 | 12 | 4.5 | 32 | 11.0 | 21 | 0.2 | 16 |
| Median - Greater than \$10 Billion ² | | 7.8 | | 7.6 | | 7.7 | | 3.9 | | 10.0 | | -0.6 | |
| MPSERS Total Plan Policy | | 9.2 | | 9.2 | | 9.4 | | 6.4 | | 14.5 | | 0.5 | |
| DOMESTIC EQUITIES | 22.0 | 12.6 | 11 | 13.4 | 5 | 13.6 | 6 | 8.9 | 5 | 29.0 | 7 | 3.1 | 3 |
| Median ² | | 9.8 | | 10.4 | | 10.4 | | 5.5 | | 16.2 | | -0.1 | |
| S&P 1500 Index | | 12.8 | | 13.4 | | 14.1 | | 8.5 | | 24.0 | | 2.2 | |
| PRIVATE EQUITY AND VENTURE CAPITAL | 21.6 | 13.3 | 8 | 13.7 | 11 | 13.9 | 11 | 2.5 | 76 | 8.0 | 27 | 2.4 | 11 |
| Median ² | | 8.9 | | 9.3 | | 10.0 | | 5.3 | | 6.9 | | 0.9 | |
| Private Equity and VC Benchmark ³ | | 16.8 | | 17.9 | | 19.4 | | 15.2 | | 40.3 | | 6.7 | |
| INTERNATIONAL EQUITIES | 13.1 | 5.7 | 45 | 4.1 | 78 | 4.6 | 87 | 0.4 | 65 | 6.7 | 19 | -7.5 | 73 |
| Median ² | | 5.6 | | 4.4 | | 5.1 | | 1.2 | | 5.6 | | -7.3 | |
| MSCI AC World ex USA Net Index | | 4.8 | | 3.5 | | 4.1 | | 0.8 | | 5.5 | | -7.6 | |
| ABSOLUTE RETURN | 10.1 | 6.4 | | 7.7 | | 9.0 | | 8.5 | | 13.1 | | 2.8 | |
| FTSE 1 Month T-Bill + 400 bps | | 5.7 | | 6.3 | | 6.5 | | 8.0 | | 9.4 | | 5.2 | |
| HFR Benchmark ⁴ | | 3.7 | | 4.5 | | 5.3 | | 4.0 | | 7.4 | | 1.7 | |
| FIXED INCOME | 9.8 | 2.9 | 27 | 2.4 | 22 | 1.3 | 28 | -0.3 | 32 | 3.4 | 20 | -2.8 | 48 |
| Median ² | | 2.2 | | 1.8 | | 0.7 | | -1.3 | | 2.0 | | -2.8 | |
| Bloomberg US Aggregate Index | | 1.4 | | 1.0 | | -0.3 | | -2.4 | | 1.3 | | -3.1 | |
| REAL RETURN AND OPPORTUNISTIC | 9.2 | 10.2 | | 11.1 | | 10.1 | | 6.4 | | 5.6 | | -0.2 | |
| 50% (CPI + 4%) + 50% (actuarial rate) ⁵ | | 7.3 | | 7.3 | | 7.4 | | 7.2 | | 6.5 | | 1.3 | |
| REAL ESTATE & INFRASTRUCTURE | 8.7 | 8.2 | 22 | 7.6 | 16 | 6.8 | 22 | 7.2 | 9 | 1.8 | 33 | 0.7 | 32 |
| Median ² | | 7.0 | | 4.9 | | 3.8 | | 1.4 | | -0.5 | | 0.7 | |
| NCREIF Property Index ⁶ | | 4.3 | | 2.8 | | 1.8 | | -2.1 | | -0.9 | | 0.6 | |
| NCREIF Open Fund Index Net | | 4.9 | | 3.1 | | 2.0 | | -3.1 | | -2.3 | | 1.0 | |
| CASH EQUIVALENTS | 5.5 | 2.1 | | 2.6 | | 2.7 | | 4.1 | | 5.5 | | 1.3 | |
| FTSE 1 Month T-Bill | | 1.7 | | 2.3 | | 2.5 | | 4.0 | | 5.4 | | 1.2 | |

¹ Annualized Returns and Percentile Rank.

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

³ SP500 + 300 bps with a 3 month lag.

⁴ FOF Conservative 1 month lagged.

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

⁶ NCREIF Property Index is NPI minus 130 bps.

Cumulative and Consecutive Total Fund Returns

MPSERS

Cumulative For Years Ending 12/31/24

| | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| MPSERS | 11.0 | 10.4 | 4.5 | 8.7 | 9.2 | 10.2 | 9.1 | 10.0 | 9.7 | 9.0 |
| Public Plan - Median (> \$10 billion)* | 10.0 | 10.6 | 3.9 | 7.0 | 7.7 | 9.5 | 7.6 | 8.7 | 8.7 | 7.8 |
| Rank | 21 | 60 | 32 | 12 | 12 | 16 | 11 | 11 | 11 | 11 |
| bp Difference - Median | 98 | -23 | 59 | 165 | 147 | 70 | 146 | 125 | 101 | 120 |

Consecutive For Years Ending

| | 12/24 | 12/23 | 12/22 | 12/21 | 12/20 | 12/19 | 12/18 | 12/17 | 12/16 | 12/15 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MPSERS | 11.0 | 9.8 | -6.3 | 22.2 | 11.2 | 15.4 | 2.7 | 16.2 | 7.4 | 2.8 |
| Public Plan - Median (> \$10 billion)* | 10.0 | 11.5 | -7.8 | 17.0 | 12.1 | 16.3 | -2.1 | 15.5 | 7.8 | 0.5 |
| Rank | 21 | 67 | 21 | 6 | 69 | 62 | 6 | 42 | 61 | 4 |
| bp Difference - Median | 98 | -177 | 148 | 519 | -82 | -94 | 477 | 71 | -36 | 233 |

MSERS

Cumulative For Years Ending 12/31/24

| | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| MSERS | 11.0 | 10.4 | 4.5 | 8.7 | 9.2 | 10.2 | 9.1 | 10.0 | 9.7 | 9.0 |
| Public Plan - Median (> \$1 billion)* | 10.2 | 11.0 | 3.8 | 7.0 | 7.7 | 9.5 | 7.6 | 8.6 | 8.7 | 7.8 |
| Rank | 27 | 65 | 35 | 11 | 8 | 15 | 8 | 8 | 8 | 9 |
| bp Difference - Median | 75 | -62 | 67 | 171 | 147 | 71 | 153 | 131 | 103 | 120 |

Consecutive For Years Ending

| | 12/24 | 12/23 | 12/22 | 12/21 | 12/20 | 12/19 | 12/18 | 12/17 | 12/16 | 12/15 |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MSERS | 11.0 | 9.8 | -6.4 | 22.3 | 11.2 | 15.4 | 2.7 | 16.2 | 7.5 | 2.8 |
| Public Plan - Median (> \$1 billion)* | 10.2 | 12.1 | -9.0 | 16.5 | 12.1 | 17.3 | -2.9 | 15.3 | 7.8 | 0.5 |
| Rank | 27 | 74 | 23 | 3 | 69 | 75 | 5 | 38 | 55 | 4 |
| bp Difference - Median | 75 | -234 | 267 | 580 | -89 | -189 | 555 | 96 | -31 | 234 |

Cumulative and Consecutive Total Fund Returns

MSPRS

Cumulative For Years Ending 12/31/24

| | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| MSPRS | 11.0 | 10.4 | 4.5 | 8.7 | 9.2 | 10.2 | 9.1 | 9.9 | 9.7 | 9.0 |
| Public Plan - Median (> \$1 billion)* | 10.2 | 11.0 | 3.8 | 7.0 | 7.7 | 9.5 | 7.6 | 8.6 | 8.7 | 7.8 |
| Rank | 27 | 65 | 35 | 12 | 9 | 16 | 9 | 9 | 9 | 10 |
| bp Difference - Median | 75 | -61 | 66 | 169 | 147 | 70 | 152 | 130 | 101 | 119 |

Consecutive For Years Ending

| | 12/24 | 12/23 | 12/22 | 12/21 | 12/20 | 12/19 | 12/18 | 12/17 | 12/16 | 12/15 |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MSPRS | 11.0 | 9.8 | -6.4 | 22.2 | 11.3 | 15.3 | 2.7 | 16.2 | 7.5 | 2.8 |
| Public Plan - Median (> \$1 billion)* | 10.2 | 12.1 | -9.0 | 16.5 | 12.1 | 17.3 | -2.9 | 15.3 | 7.8 | 0.5 |
| Rank | 27 | 74 | 23 | 4 | 68 | 76 | 5 | 38 | 56 | 5 |
| bp Difference - Median | 75 | -232 | 266 | 575 | -86 | -194 | 554 | 96 | -34 | 233 |

MJRS

Cumulative For Years Ending 12/31/24

| | 1 Year | 2 Year | 3 Year | 4 Year | 5 Year | 6 Year | 7 Year | 8 Year | 9 Year | 10 Year |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| MJRS | 10.7 | 10.2 | 4.4 | 8.2 | 8.8 | 9.9 | 8.8 | 9.7 | 9.5 | 8.8 |
| Public Plan - Median (> \$1 billion)* | 10.2 | 11.0 | 3.8 | 7.0 | 7.7 | 9.5 | 7.6 | 8.6 | 8.7 | 7.8 |
| Rank | 32 | 68 | 36 | 23 | 18 | 32 | 11 | 14 | 14 | 12 |
| bp Difference - Median | 46 | -77 | 58 | 123 | 108 | 37 | 124 | 107 | 80 | 100 |

Consecutive For Years Ending

| | 12/24 | 12/23 | 12/22 | 12/21 | 12/20 | 12/19 | 12/18 | 12/17 | 12/16 | 12/15 |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MJRS | 10.7 | 9.8 | -6.3 | 20.4 | 11.2 | 15.3 | 2.7 | 16.3 | 7.4 | 2.8 |
| Public Plan - Median (> \$1 billion)* | 10.2 | 12.1 | -9.0 | 16.5 | 12.1 | 17.3 | -2.9 | 15.3 | 7.8 | 0.5 |
| Rank | 32 | 75 | 22 | 11 | 69 | 76 | 5 | 36 | 57 | 5 |
| bp Difference - Median | 46 | -235 | 271 | 394 | -91 | -195 | 551 | 105 | -35 | 233 |

State of Michigan Retirement System

ASSET ALLOCATION REVIEW

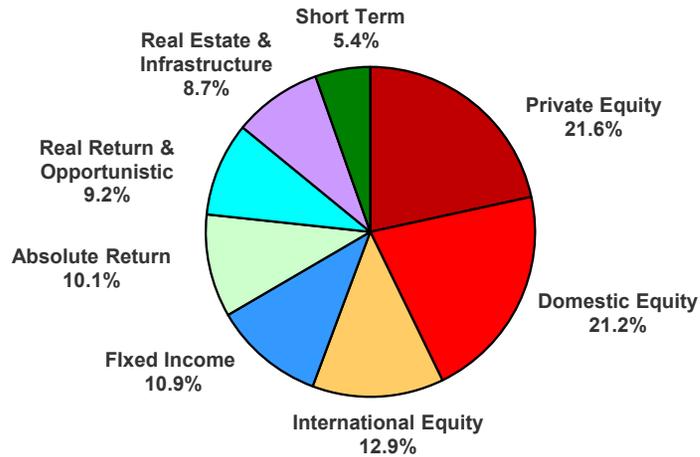
State of Michigan Investment Board Meeting
April 2, 2025



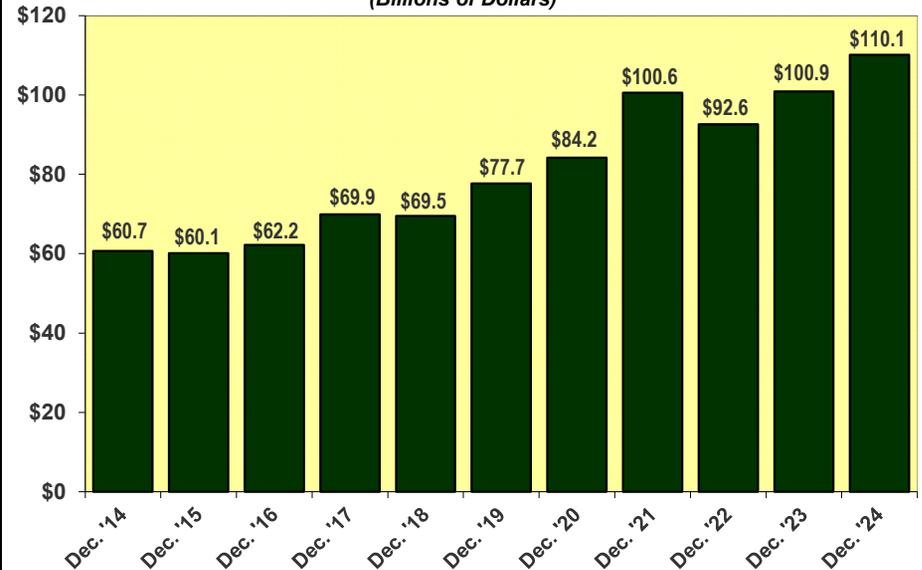
Gregory J. Parker, CFA
Director of Investments – Public Markets
Director of Asset Allocation
Bureau of Investments

STATE OF MICHIGAN RETIREMENT SYSTEM PROFILE - DECEMBER 2024

Asset Allocation ~ 12/31/24



Market Value* (Billions of Dollars)



Asset Allocation By Market Value (In Millions)

| Investment Strategies | 12/31/2024 | | 12/31/2023 | |
|------------------------------|------------------|---------------|------------------|---------------|
| | Mkt. Value | % | Mkt. Value | % |
| Private Equity | \$23,807 | 21.6% | \$22,622 | 22.4% |
| Domestic Equity | 23,346 | 21.2% | 19,730 | 19.5% |
| International Equity | 14,196 | 12.9% | 13,708 | 13.6% |
| Fixed Income | 11,971 | 10.9% | 9,149 | 9.1% |
| Absolute Return | 11,113 | 10.1% | 10,213 | 10.1% |
| Real Return & Opportunistic | 10,098 | 9.2% | 10,551 | 10.5% |
| Real Estate & Infrastructure | 9,631 | 8.7% | 9,890 | 9.8% |
| Short Term | 5,968 | 5.4% | 5,084 | 5.0% |
| TOTAL | \$110,130 | 100.0% | \$100,947 | 100.0% |

Market Value By Plan ~ 12/31/24 (in Millions)

| Pension Plan | OPEB** | | Combined | % |
|------------------|-----------------|-----------------|------------------|---------------|
| | Mkt. Value | Mkt. Value | | |
| MPSERS | \$72,181 | \$14,213 | \$86,394 | 78.4% |
| MSERS - (closed) | 14,360 | 6,570 | 20,930 | 19.0% |
| MSPRS | 2,049 | 474 | 2,523 | 2.3% |
| MJRS - (closed) | 269 | 14 | 283 | 0.3% |
| TOTAL | \$88,859 | \$21,271 | \$110,130 | 100.0% |

MSERS includes the Military Pension Fund

Short Term Equivalents (in Billions)

| | | |
|-------------------------------------|--------------|----------------------------|
| Short Term Strategy | \$6.0 | |
| Short Term in Other Inv. Strategies | 1.6 | |
| TOTAL SHORT TERM | \$7.6 | 6.9% of Total Funds |

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

Pensions & Investments survey - February 12, 2024 issue

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

**OPEB - Other Post Employment Benefits

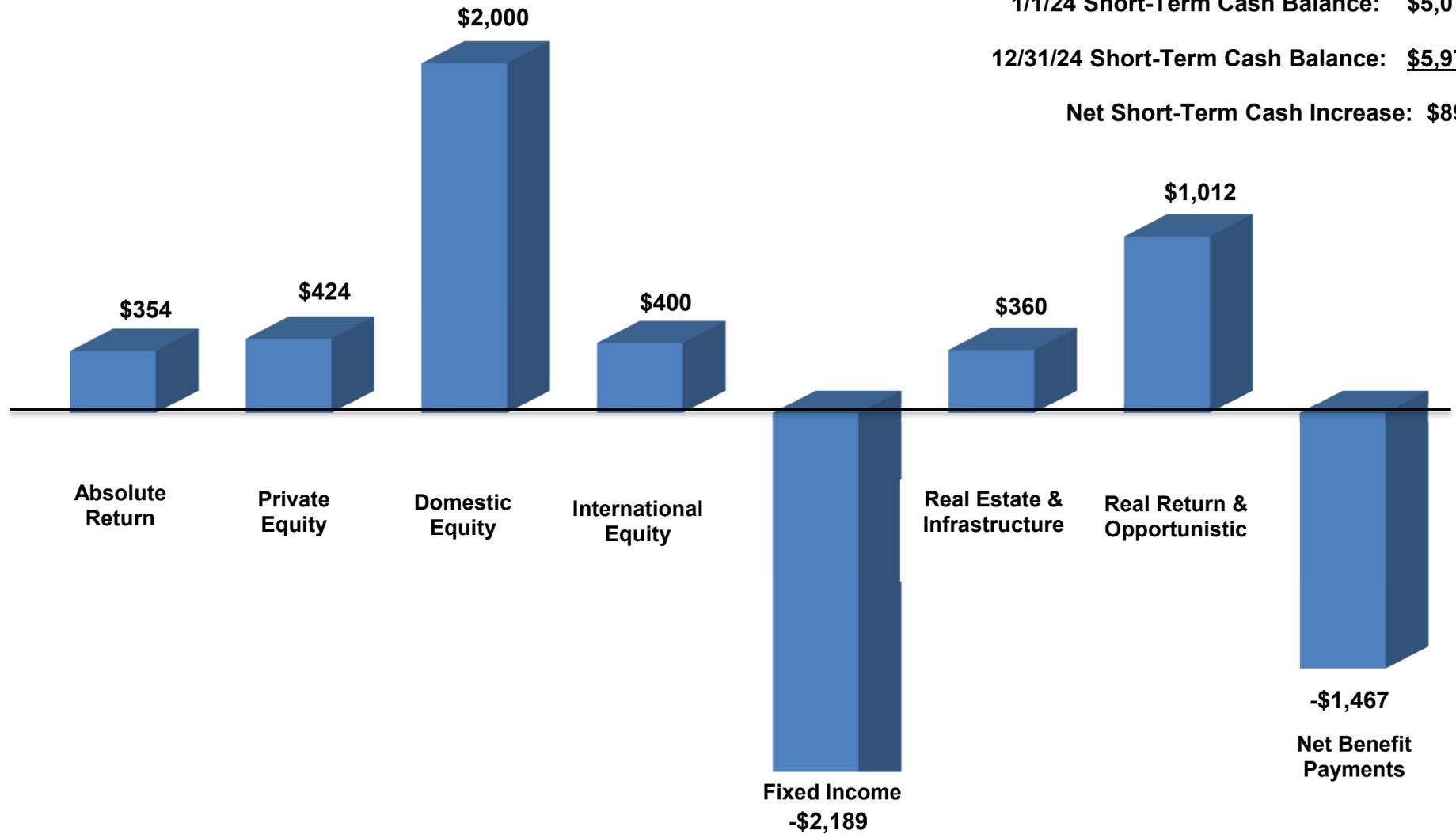
Sources and Uses of Cash

January 2024 ~ December 2024

1/1/24 Short-Term Cash Balance: \$5,075

12/31/24 Short-Term Cash Balance: \$5,970

Net Short-Term Cash Increase: \$895



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 12/31/24

| | MPSERS, MSERS, MSPRS Pensions MSERS & MSPRS OPEBs | | | MPSERS & MJRS OPEBs MJRS Pension | | |
|---|--|-----------------|---------------|-------------------------------------|-----------------|---------------|
| <i>Asset Class</i> | <i>Actual*</i> 12/31/24 | <i>Target**</i> | <i>Ranges</i> | <i>Actual*</i> 12/31/24 | <i>Target**</i> | <i>Ranges</i> |
| Domestic Equity | 22.0% | 21.0% | 13% - 27% | 15.5% | 16.0% | 10% - 20% |
| Private Equity | 21.6% | 16.0% | 13% - 27% | 21.6% | 16.0% | 13% - 27% |
| International Equity | 13.1% | 14.0% | 10% - 20% | 11.4% | 11.0% | 7% - 13% |
| Absolute Return | 10.1% | 13.0% | 7% - 18% | 10.1% | 15.0% | 10% - 20% |
| Long Term Fixed Income | 9.8% | 15.0% | 10% - 20% | 17.8% | 26.0% | 20% - 30% |
| Real Return & Opportunistic | 9.2% | 9.0% | 5% - 15% | 9.2% | 7.0% | 5% - 15% |
| Real Estate & Infrastructure | 8.7% | 8.0% | 5% - 15% | 8.8% | 5.0% | 5% - 15% |
| Short Term Fixed Income | 5.5% | 4.0% | 1% - 8% | 5.6% | 4.0% | 1% - 8% |
| TOTAL | 100.0% | 100.0% | | 100.0% | 100.0% | |

*Individual Trust Allocations may vary slightly

**Complies with basket clause and international restrictions

State of Michigan Retirement System

MARKETS REVIEW AND OUTLOOK

State of Michigan Investment Board Meeting

April 2, 2025



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

CAPITAL MARKETS

Return and Risk Assumptions, Benchmark and Outlook

A starting point.

| MPSERS Plan | Assumed Return* (Arithmetic) | Standard Deviation* | Trailing 10-Year (Benchmark**) |
|--------------------------|---|----------------------------|---|
| Private Equity | 10.9% | 20.0% | 16.8% |
| Real Estate | 9.5% | 21.5% | 4.3% |
| Real Ret / Opportunistic | 9.2% | 14.4% | 7.3% |
| International Equity | 8.5% | 19.5% | 4.8% |
| Domestic Equity | 8.5% | 19.1% | 12.8% |
| Absolute Return | 8.2% | 11.3% | 3.7% |
| Long-Term Fixed Income | 5.4% | 5.4% | 1.3% |
| Short-Term | 4.6% | 1.4% | 1.7% |

* Aon Investment Consultants 2024 Long-Term Return/Risk Assumptions

** Investment Policy Statement; Annualized Returns

*** Actual investments may differ due to changing conditions and the availability of new information

Overview

A market update.

- The Federal Reserve continued with reductions in its policy rates with two cuts occurring during the quarter. The effective Fed Funds rate has come down 100bps from peak levels, but interest rates remain above the year-over-year growth in CPI.
- U.S. equity markets initially reacted favorably to the U.S. presidential election results and the potential for pro-growth policies. However, the market retraced those gains into the end of the year on reduced expectations of the number of interest rates cuts by the Federal Reserve in 2025.
- Broad U.S. equity market valuations expanded throughout the year and were responsible for more than half of the index return of 23.9% and remain above historical averages.
- International markets remain subdued compared to the U.S., as the MSCI ACWI ex US Index delivered year-end performance of 5.5%. International markets valuations remain below historical averages.

U.S. Fixed Income

Re-emerging term premium.

- Although the U.S. Federal Reserve lowered policy rates during the quarter, U.S. bond markets came under pressure as the Fed communicated it may not cut interest rates as much as markets expected in 2025. Persistently higher than expected inflation figures are the reason for the Fed's change in mindset.
- The U.S. Treasury yield curve steepened in Q4, with the 2-year Treasury rising 60bps to finish the year at 4.24% and the 10-year Treasury moving a notable 79bps higher to finish at 4.57%. Resilient economic growth, inflation expectations, and a potential trade war between the U.S. and its major trading partners are drivers of this move in yields.
- U.S. bonds in general had a rough period to close the year. The Bloomberg U.S. Aggregate Index lost -3.1% as yields rose, while the Bloomberg U.S. Corporate IG Index lost -3.0%. The Bloomberg U.S. Corporate High Yield, however, managed to achieve a gain of 0.2% in the fourth quarter.
- Credit spreads for investment grade and high yield corporate bonds narrowed slightly and are close to historic levels of tightness. That said, the absolute level of yields remains attractive relative to what could be earned in bonds post the Global Financial Crisis.

International Equity

Economic weakness and political instability.

- While international equities, as measured by the MSCI ACWI ex-US Index, fell -7.6% in the fourth quarter, the index did manage to gain 5.5% in 2024. From a valuation perspective, the index is at a PE ratio of 15.5x as of year-end on an LTM basis; slightly below the 20-year average of 15.8x.
- Stock markets across Europe fell in the fourth quarter over concerns of economic weakness and unstable political environments in France and Germany, with equities in the United Kingdom and Japan also declining on pessimistic macro-economic outlooks.
- The MSCI Emerging Markets Index fell -8.0% in the fourth quarter. Efforts to stimulate China's economy is proving to be difficult, while investor concerns over potential new tariffs by the U.S. increase. India's stock market fell in the quarter on slowing economic growth.
- The U.S. dollar rose sharply against the euro, the yen and most other major currencies with a gain of more than 7% during the quarter and for 2024.

Domestic Equity

Information technology stocks drive market gains.

- The broad U.S. market, measured by the S&P 1500 Index, grew 23.9% in 2024 led by mega cap technology companies driven by the artificial intelligence theme. In terms of valuation, the market is trading at a PE ratio of 26.3x at year-end, which is well above the 20-year average of 17.9x.
- According to Factset, estimates for next year's earnings growth are 14.6%. While this level of growth in earnings is elevated compared to history, it does highlight the favorable growth outlook in the U.S. relative to many global markets.
- The broad market rallied post the presidential election on expectations of higher growth, lower taxes and less regulation before weakening into year-end after the Federal Reserve signaled fewer cuts to policy rates in 2025.
- The S&P 500 hit 57 all-time highs in 2024, the fifth most of any year in history. Valuation across many metrics for the S&P 500 are at levels much higher than historical averages, indicating investors have priced significant good news into the market. With estimated earnings growth of 14.6% in 2025, any misstep in corporate fundamentals could lead to increased volatility given elevated market multiples.

Real Estate

REIT dividend yields below U.S. Treasuries.

- The FTSE NAREIT All Equity REITs Index rose 4.9% in 2024, including dividends. Cap rates at the end of the fourth quarter 2024 were 7.0%, in line with the average cap rate since 1982 at 7.0%.
- At year end, the dividend yield on the FTSE NAREIT All Equity REITs Index was 4.0%, 61 basis points less than the yield on the 10-year U.S. Treasury.

Commodities

Inflation concerns.

- Core CPI, excluding food and energy, increased 3.2% year over year in December, slowing from the 3.3% rate in November and marking the first drop since July. Unless there is a further slowing in this measure in the coming months, the Federal Reserve is unlikely to continue with aggressive cuts in policy rates in the coming year.
- In 2024, WTI oil prices were essentially unchanged ending the year at \$71.72, as growth in global oil production and weaker economic demand were offset by increased geopolitical risks.
- Gold had a strong year, returning 27.2% to end the year at \$2,624.50, driven by geopolitical issues, central bank buying, and investor concern on inflation returning in 2025.
- The broad Bloomberg Commodity Index largely remained unchanged over the year, increasing 0.11%.

Annual Total Returns of Key Asset Classes 2005 - 2024

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | | |
|---|--------------|--------------|--------------|-------------|--------------|--------------|-------------|--------------|--------------|--------------|-------------|--------------|--------------|-------------|--------------|--------------|-------------|--------------|--------------|-------------|--------------|--|
| Best ↑ ↓ Worst | 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 | U.S. Equity | U.S. Equity | Best | |
| | 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% | 25.47% | 23.95% | | |
| | 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 | Int'l Equity | Hedge Funds | | |
| | 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% | 16.08% | 7.41% | | |
| | 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 | Corp. Bonds | Real Estate | Cash | Corp. Bonds | Corp. Bonds | Int'l Equity | Cash | Corp. Bonds | Int'l Equity | |
| | 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% | 8.52% | 5.53% | | |
| | 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 | Gov't Bonds | Hedge Funds | Hedge Funds | Cash | Cash | |
| | 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% | 5.13% | 5.38% | | |
| | Inflation | Cash | U.S. Equity | Real Estate | Inflation | Gov't Bonds | U.S. Equity | Hedge Funds | Inflation | Hedge Funds | Hedge Funds | Inflation | Hedge Funds | Hedge Funds | Hedge Funds | Real Estate | Hedge Funds | Inflation | Gov't Bonds | Hedge Funds | Inflation | |
| | 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% | 4.50% | 2.90% | | |
| Cash | Corp. Bonds | Corp. Bonds | Hedge Funds | Cash | Hedge Funds | Cash | Gov't Bonds | Cash | Inflation | Cash | Hedge Funds | Gov't Bonds | Corp. Bonds | Corp. Bonds | Hedge Funds | Real Estate | Cash | Int'l Equity | Gov't Bonds | Corp. Bonds | | |
| 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% | 4.09% | 2.13% | | | |
| 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 | Gov't Bonds | Inflation | U.S. Equity | Inflation | Inflation | Corp. Bonds | Corp. Bonds | Inflation | Gov't Bonds | | |
| 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% | 3.40% | 0.62% | | | |
| 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 | Real Estate | Real Estate | | | |
| 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% | -7.94% | 0.43% | Worst | | |

| | | Annualized Returns 2005 - 2024 | | | | | | | | | | | | | | | | | | | |
|--------|--|--------------------------------|--|--------|--|---------|--|-------|--|-------|--|--------|--|-------|--|--------|--|--|--|--|--------|
| Return | | Cash | | Gov't. | | Inflat. | | Hedge | | Corp. | | Int'l. | | R.E. | | US Eq. | | | | | Return |
| Risk | | 1.53% | | 2.55% | | 2.57% | | 3.14% | | 3.97% | | 4.97% | | 7.01% | | 10.32% | | | | | Risk |
| | | 0.53% | | 4.34% | | 0.54% | | 3.94% | | 6.48% | | 16.97% | | 5.28% | | 15.20% | | | | | |

- Hedge Funds are represented by the HFRI FOF Conservative Index
- U.S. Equity is represented by the S&P 1500 Index
- Inflation is represented by the U.S. Consumer Price Index (SA)
- Real Estate is represented by the NCREIF National Property Index
- International Equity is represented by the MSCI AC World ex USA Index
- Corporate Bonds are represented by the Bloomberg U.S. Corp. Inv. Grade Index
- Cash is represented by FTSE 1 Month T-Bill Index
- Government Bonds are represented by the Bloomberg U.S. Government Index

State of Michigan Retirement System

DEFINED CONTRIBUTION REVIEW

State of Michigan Investment Board Meeting
April 2, 2025



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

EXECUTIVE SUMMARY

Market Environment and Outlook

U.S. stocks continued their upward trajectory during the fourth quarter following Donald Trump's presidential victory, with the S&P 500 Index rising by 2.41% and the Nasdaq Composite advancing by 6.17%. The consumer discretionary and communication services sectors led, while materials and healthcare lagged. Large cap stocks outperformed small caps, and growth stocks significantly beat value stocks.

The U.S. bond market struggled during the quarter on concerns about sticky inflation and the U.S. Federal Reserve's more conservative rate-cut path. The Bloomberg U.S. Aggregate Bond Index declined by -3.06% and the 10-year U.S. Treasury yield rose by more than 80 basis points, ending the quarter at 4.58%. The Fed cut rates by 0.25% in both November and December. However, the central bank now projects just two rate cuts in 2025, reflecting a more cautious stance in response to strong economic data.

After months of noise surrounding the U.S. presidential election, markets have now refocused on macroeconomic data, which offer mixed signals. Key concerns include global geopolitical tensions, especially around tariffs, and deteriorating sentiment tied to mega-cap positioning and broader market weakness.

Legislative Update

The Social Security Fairness Act was signed into law. Having been passed with bi-partisan support, President Biden signed The Social Security Fairness Act into law on January 5, 2025.

The Act repealed two federal policies which reduced Social Security benefits for certain federal annuitants. Specifically, the Act:

- **Eliminates the Windfall Elimination Provision (WEP)**, which reduced Social Security benefits for individuals who worked in jobs not covered by Social Security (e.g., some state or local government positions) and later worked in jobs that were covered.
- **Repeals the Government Pension Offset (GPO)**, which reduces Social Security spousal or survivor benefits for individuals who receive a pension from work not covered by Social Security.

The Act particularly benefits public sector employees, including teachers, police officers, and firefighters, who were often affected by the WEP and GPO.

The Congressional Budget Office estimated that eliminating WEP will increase monthly Social Security payments of impacted individuals by \$360, on average, by December 2025. Eliminating GPO will increase monthly payments by \$700 for impacted spouses and \$1,190 for impacted surviving spouses, on average, by December 2025.

Regulatory Update

The Department of Labor's (DOL's) Retirement Savings Lost and Found Database has gone live. The DOL's Retirement Savings Lost and Found Database for retirement plans

governed by ERISA came online in the fourth quarter. Established under the SECURE 2.0 Act of 2022, the database serves as a centralized platform where individuals or beneficiaries can search for unclaimed or forgotten accounts and receive instructions on how to access their funds.

A 2023 report from the Department of Labor indicated that late Baby Boomers (born 1957 to 1964) held an average of 12.7 jobs between the ages of 18 and 56. Each job change raises the likelihood of employees losing track of their employer-sponsored retirement accounts.

The Department of Labor (DOL) reported in November 2024 that the Employee Benefits Security Administration (EBSA) has recovered over \$7 billion in retirement benefits for participants and beneficiaries since 2017.

Users can locate accounts from previous employers by inputting personal details such as name and Social Security number. Individuals must verify their identity via Login.gov.

During the initial program rollout, plan sponsor participation is voluntary. The DOL has created a secure web portal where administrators may upload plan and participant information, including data previously reported on Form 5500 and details about separated participants who are entitled to benefits. The DOL offers liability protection for data submitted through the RSLF portal. Participants can request to have their information excluded from the database.

SMRS

Defined Contribution Strategies

12/31/24

| Markets | Amount | | % of Total | Fee per \$10,000 |
|---|------------------------|------------------------|----------------------|---------------------|
| QDIA (\$ in Millions) | | | | |
| | <u>12/31/24</u> | <u>12/31/23</u> | | |
| Total Target Date Fund | \$5,753 | \$4,631 | 35.8% | \$5.50 |
| Tier I Index Funds | | | | |
| State Street S&P 500 Index Fund | \$2,523 | \$2,050 | | \$0.80 |
| State Street Bond Market Index Fund | 1,294 | 1,161 | | 1.50 |
| State Street Global All Cap Equity ex-U.S. Index Fund | 1,060 | 949 | | 4.00 |
| State Street S&P Mid Cap Index Fund | 892 | 812 | | 1.50 |
| BlackRock Government Short-Term Investment CL F | 319 | 292 | | 5.50 |
| BlackRock S&P Small Cap 600 Equity Index CL F | 181 | 180 | | 2.30 |
| BlackRock Emerging Markets Index CL F | 112 | 110 | | 7.00 |
| Total Tier I Index | \$6,383 | \$5,555 | 39.7% | \$1.96 |
| Tier II Active Funds | | | | |
| Stable Value Fund | \$1,080 | \$1,154 | | \$21.18 |
| Dodge & Cox Stock Fund | 732 | 694 | | 41.00 |
| Jennison Large Cap Growth Fund | 691 | 556 | | 27.50 |
| American Funds EuroPacific Growth R6 | 240 | 252 | | 47.00 |
| T. Rowe Price Mid-Cap Value Fund | 189 | 162 | | 51.00 |
| Voya Small Cap Growth Equity Fund | 168 | 141 | | 33.30 |
| Artisan Mid Cap Fund | 136 | 136 | | 68.50 |
| PIMCO Total Return I Fund | 115 | 104 | | 25.00 |
| Ceredex Small-Cap Value Eq I | 75 | 74 | | 48.90 |
| Prudential High Yield Fund | 50 | 43 | | 36.00 |
| Total Tier II Active | \$3,475 | \$3,317 | 21.6% | \$33.39 |
| Tier III | | | | |
| Total Self Directed Brokerage Account | \$449 | \$309 | 2.8% | NA |
| Total Defined Contribution Assets | <u>\$16,060</u> | <u>\$13,812</u> | <u>100.0%</u> | \$9.97 |

As of 12/31/24, the Loan Fund is \$193.8M. Total Defined Contribution Assets breakout: 22.9% defined benefit with defined contribution access, 67.5% defined contribution only, 9.5% hybrid and 0.2% forfeitures or stale dated assets.

NOTE: Totals may not be exact due to rounding.

Defined Contribution Performance by Fund 12/31/24

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>10-Years</u> | <u>Since Inc</u> |
|---|------------------------|---------------|----------------|----------------|-----------------|------------------|
| State Street Target Retirement Income Fund | \$ 113,948,243 | 6.9 | 1.5 | 4.4 | 4.4 | N/A |
| State Street Income Custom Index | | 6.9 | 1.4 | 4.3 | 4.4 | N/A |
| Morningstar Target-Date Retirement | | 6.4 | 0.7 | 3.4 | 3.8 | N/A |
| Variance State Street Income Custom Index | | 0.0 | 0.1 | 0.1 | 0.0 | N/A |
| Variance Morningstar Target-Date Retirement | | 0.5 | 0.8 | 1.0 | 0.6 | N/A |
| State Street Target Retirement 2020 Fund | \$131,326,254 | 7.2 | 1.3 | 4.9 | 5.4 | N/A |
| State Street 2020 Custom Index | | 7.1 | 1.3 | 4.8 | 5.4 | N/A |
| Morningstar Target-Date 2020 | | 7.8 | 1.0 | 4.5 | 5.2 | N/A |
| Variance State Street 2020 Custom Index | | 0.1 | 0.0 | 0.1 | 0.0 | N/A |
| Variance Morningstar Target-Date 2020 | | (0.6) | 0.3 | 0.4 | 0.2 | N/A |
| State Street Target Retirement 2025 Fund | \$310,688,019 | 8.6 | 1.5 | 5.9 | 6.4 | N/A |
| State Street 2025 Custom Index | | 8.6 | 1.4 | 5.9 | 6.4 | N/A |
| Morningstar Target-Date 2025 | | 8.2 | 1.1 | 5.0 | 5.7 | N/A |
| Variance State Street 2025 Custom Index | | 0.0 | 0.1 | 0.0 | 0.0 | N/A |
| Variance Morningstar Target-Date 2025 | | 0.4 | 0.4 | 0.9 | 0.7 | N/A |
| State Street Target Retirement 2030 Fund | \$470,860,177 | 10.0 | 1.9 | 6.8 | 7.0 | N/A |
| State Street 2030 Custom Index | | 10.0 | 1.9 | 6.7 | 7.0 | N/A |
| Morningstar Target-Date 2030 | | 9.5 | 1.7 | 5.9 | 6.4 | N/A |
| Variance State Street 2030 Custom Index | | 0.0 | 0.0 | 0.1 | 0.0 | N/A |
| Variance Morningstar Target-Date 2030 | | 0.5 | 0.2 | 0.9 | 0.6 | N/A |
| State Street Target Retirement 2035 Fund | \$616,935,579 | 10.7 | 2.1 | 7.2 | 7.4 | N/A |
| State Street 2035 Custom Index | | 10.7 | 2.1 | 7.2 | 7.4 | N/A |
| Morningstar Target-Date 2035 | | 11.1 | 2.4 | 7.0 | 7.2 | N/A |
| Variance State Street 2035 Custom Index | | 0.0 | 0.0 | 0.0 | 0.0 | N/A |
| Variance Morningstar Target-Date 2035 | | (0.4) | (0.3) | 0.2 | 0.2 | N/A |
| State Street Target Retirement 2040 Fund | \$649,922,529 | 11.4 | 2.4 | 7.7 | 7.8 | N/A |
| State Street 2040 Custom Index | | 11.5 | 2.3 | 7.6 | 7.8 | N/A |
| Morningstar Target-Date 2040 | | 12.5 | 3.1 | 7.9 | 7.8 | N/A |
| Variance State Street 2040 Custom Index | | (0.1) | 0.1 | 0.1 | 0.0 | N/A |
| Variance Morningstar Target-Date 2040 | | (1.1) | (0.7) | (0.2) | 0.0 | N/A |
| State Street Target Retirement 2045 Fund | \$733,669,986 | 12.1 | 2.6 | 8.1 | 8.1 | N/A |
| State Street 2045 Custom Index | | 12.1 | 2.6 | 8.0 | 8.1 | N/A |
| Morningstar Target-Date 2045 | | 13.7 | 3.6 | 8.5 | 8.1 | N/A |
| Variance State Street 2045 Custom Index | | 0.0 | 0.0 | 0.1 | 0.0 | N/A |
| Variance Morningstar Target-Date 2045 | | (1.6) | (1.0) | (0.4) | 0.0 | N/A |
| State Street Target Retirement 2050 Fund | \$966,511,250 | 12.6 | 2.9 | 8.4 | 8.3 | N/A |
| State Street 2050 Custom Index | | 12.7 | 2.9 | 8.4 | 8.2 | N/A |
| Morningstar Target-Date 2050 | | 14.3 | 3.9 | 8.7 | 8.3 | N/A |
| Variance State Street 2050 Custom Index | | (0.1) | 0.0 | 0.0 | 0.1 | N/A |
| Variance Morningstar Target-Date 2050 | | (1.7) | (1.0) | (0.3) | 0.0 | N/A |
| State Street Target Retirement 2055 Fund | \$1,039,343,483 | 12.8 | 2.9 | 8.4 | 8.3 | N/A |
| State Street 2055 Custom Index | | 12.8 | 2.9 | 8.4 | 8.3 | N/A |
| Morningstar Target-Date 2055 | | 14.5 | 4.0 | 8.8 | 8.4 | N/A |
| Variance State Street 2055 Custom Index | | 0.0 | 0.0 | 0.0 | 0.0 | N/A |
| Variance Morningstar Target-Date 2055 | | (1.7) | (1.1) | (0.4) | (0.1) | N/A |
| State Street Target Retirement 2060 Fund | \$581,252,871 | 12.8 | 3.0 | 8.4 | N/A | 8.1 |
| State Street 2060 Custom Index | | 12.8 | 2.9 | 8.4 | N/A | 8.1 |
| Morningstar Target-Date 2060 | | 14.6 | 4.0 | 8.9 | N/A | 8.3 |
| Variance State Street 2060 Custom Index | | 0.0 | 0.1 | 0.0 | N/A | 0.0 |
| Variance Morningstar Target-Date 2060 | | (1.8) | (1.0) | (0.5) | N/A | (0.2) |

Defined Contribution Performance by Fund 12/31/24

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>10-Years</u> | <u>Since Inc</u> |
|---|------------------------|---------------|----------------|----------------|-----------------|------------------|
| State Street Target Retirement 2065 Fund | \$138,611,575 | 12.8 | 3.0 | 8.4 | N/A | 8.4 |
| <i>State Street 2065 Custom Index</i> | | 12.8 | 2.9 | 8.4 | N/A | 8.4 |
| <i>Morningstar Target-Date 2065+</i> | | 14.5 | 4.2 | 8.9 | N/A | 8.7 |
| <i>Variance State Street 2065 Custom Index</i> | | 0.0 | 0.1 | 0.0 | N/A | 0.0 |
| <i>Variance Morningstar Target-Date 2065+</i> | | (1.7) | (1.2) | (0.5) | N/A | (0.3) |
| TIER 1 | | | | | | |
| State Street S&P 500 Index Fund | \$2,523,486,543 | 25.0 | 8.9 | 14.5 | 13.1 | N/A |
| <i>S&P 500 Index</i> | | 25.0 | 8.9 | 14.5 | 13.1 | N/A |
| <i>Morningstar Large Blend</i> | | 21.4 | 7.2 | 12.9 | 11.6 | N/A |
| <i>Variance S&P 500 Index</i> | | 0.0 | 0.0 | 0.0 | 0.0 | N/A |
| <i>Variance Morningstar Large Blend</i> | | 3.6 | 1.7 | 1.6 | 1.5 | N/A |
| State Street US Bond Index Fund | \$1,294,284,528 | 1.4 | (2.4) | (0.3) | 1.3 | N/A |
| <i>Bloomberg U.S. Aggregate Bond Index</i> | | 1.3 | (2.4) | (0.3) | 1.3 | N/A |
| <i>Morningstar Intermediate Core Bond</i> | | 1.7 | (2.3) | (0.2) | 1.3 | N/A |
| <i>Variance Bloomberg U.S. Aggregate Bond Index</i> | | 0.1 | 0.0 | 0.0 | 0.0 | N/A |
| <i>Variance Morningstar Intermediate Core Bond</i> | | (0.3) | (0.1) | (0.1) | 0.0 | N/A |
| State Street Global All Cap Equity ex-U.S. Index Fund | \$1,060,121,173 | 5.1 | 0.7 | 4.3 | 5.2 | N/A |
| <i>MSCI ACWI ex USA IMI (Net)</i> | | 5.2 | 0.5 | 4.1 | 4.9 | N/A |
| <i>Morningstar Foreign Large Blend</i> | | 4.8 | 0.8 | 4.5 | 5.0 | N/A |
| <i>Variance MSCI ACWI ex USA IMI (Net)</i> | | (0.1) | 0.2 | 0.2 | 0.3 | N/A |
| <i>Variance Morningstar Foreign Large Blend</i> | | 0.3 | (0.1) | (0.2) | 0.2 | N/A |
| State Street S&P Mid Cap Index Fund | \$892,355,698 | 13.9 | 4.9 | 10.3 | 9.7 | N/A |
| <i>S&P 400 Index</i> | | 13.9 | 4.9 | 10.3 | 9.7 | N/A |
| <i>Morningstar Mid-Cap Blend</i> | | 14.4 | 4.1 | 9.8 | 8.9 | N/A |
| <i>Variance S&P 400 Index</i> | | 0.0 | 0.0 | 0.0 | 0.0 | N/A |
| <i>Variance Morningstar Mid-Cap Blend</i> | | (0.5) | 0.8 | 0.5 | 0.8 | N/A |
| BlackRock Government Short-Term Investment Fund | \$318,621,975 | 5.3 | 4.0 | 2.5 | 1.8 | N/A |
| <i>FTSE Treasury Bill 1 Mon USD</i> | | 5.4 | 4.0 | 2.5 | 1.7 | N/A |
| <i>Variance FTSE Treasury Bill 1 Mon USD</i> | | (0.1) | 0.0 | 0.0 | 0.1 | N/A |
| BlackRock S&P Small Cap 600 Equity Index Fund | \$181,496,705 | 8.9 | 2.1 | 8.5 | N/A | N/A |
| <i>S&P SmallCap 600 Index</i> | | 8.7 | 1.9 | 8.4 | N/A | N/A |
| <i>Morningstar Small Blend</i> | | 11.1 | 2.6 | 8.6 | N/A | N/A |
| <i>Variance S&P SmallCap 600 Index</i> | | 0.2 | 0.2 | 0.1 | N/A | N/A |
| <i>Variance Morningstar Small Blend</i> | | (2.2) | (0.5) | (0.1) | N/A | N/A |
| BlackRock Emerging Markets Index Fund | \$112,209,619 | 7.1 | (2.3) | 1.4 | 3.5 | N/A |
| <i>MSCI Emerging Market (Net)</i> | | 7.5 | (1.9) | 1.7 | 3.6 | N/A |
| <i>Morningstar Diversified Emerging Mkts</i> | | 6.0 | (2.0) | 2.3 | 3.6 | N/A |
| <i>Variance MSCI Emerging Market (Net)</i> | | (0.4) | (0.4) | (0.3) | (0.1) | N/A |
| <i>Variance Morningstar Diversified Emerging Mkts</i> | | 1.1 | (0.3) | (0.9) | (0.1) | N/A |
| TIER 2 | | | | | | |
| Stable Value Fund | \$1,079,882,559 | 2.5 | 2.2 | 2.1 | 2.2 | N/A |
| <i>BofA Merrill Lynch US 3-Month Treasury Bill Index</i> | | 5.3 | 3.9 | 2.5 | 1.8 | N/A |
| <i>Hueler Universe</i> | | 0.0 | 0.0 | 0.0 | 0.0 | N/A |
| <i>Variance BofA Merrill Lynch US 3-Month Treasury Bill Index</i> | | (2.8) | (1.7) | (0.4) | 0.4 | N/A |
| <i>Variance Hueler Universe</i> | | 2.5 | 2.2 | 2.1 | 2.2 | N/A |
| Dodge & Cox Stock Fund | \$731,764,658 | 14.7 | 7.8 | 11.9 | 10.8 | N/A |
| <i>Russell 1000 Value Index</i> | | 14.4 | 5.6 | 8.7 | 8.5 | N/A |
| <i>Morningstar Large Value</i> | | 14.3 | 6.1 | 9.3 | 8.7 | N/A |
| <i>Variance Russell 1000 Value Index</i> | | 0.3 | 2.2 | 3.2 | 2.3 | N/A |
| <i>Variance Morningstar Large Value</i> | | 0.4 | 1.7 | 2.6 | 2.1 | N/A |

Defined Contribution Performance by Fund 12/31/24

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>10-Years</u> | <u>Since Inc</u> |
|---|----------------------|---------------|----------------|----------------|-----------------|------------------|
| Jennison Large Cap Growth Equity Fund | \$691,069,653 | 29.9 | 6.5 | 17.1 | 16.2 | 16.0 |
| <i>Russell 1000 Growth Index</i> | | 33.4 | 10.5 | 19.0 | 16.8 | 16.9 |
| <i>Morningstar Large Growth</i> | | 29.0 | 6.7 | 15.4 | 14.0 | 13.4 |
| <i>Variance Russell 1000 Growth Index</i> | | (3.5) | (4.0) | (1.9) | (0.6) | (0.9) |
| <i>Variance Morningstar Large Growth</i> | | 0.9 | (0.2) | 1.7 | 2.2 | 2.6 |
| American Funds EuroPacific Growth R6 Fund | \$239,733,418 | 5.0 | (2.0) | 3.9 | 5.7 | N/A |
| <i>MSCI ACWI Ex USA NR USD</i> | | 5.5 | 0.8 | 4.1 | 4.8 | N/A |
| <i>Morningstar Foreign Large Growth</i> | | 4.8 | 0.8 | 4.5 | 5.0 | N/A |
| <i>Variance MSCI ACWI Ex USA NR USD</i> | | (0.5) | (2.8) | (0.2) | 0.9 | N/A |
| <i>Variance Morningstar Foreign Large Growth</i> | | 0.2 | (2.8) | (0.6) | 0.7 | N/A |
| T. Rowe Price Mid-Cap Value Fund | \$188,634,386 | 16.6 | 10.0 | 12.7 | 10.2 | N/A |
| <i>Russell Midcap Value Index</i> | | 13.1 | 3.9 | 8.6 | 8.1 | N/A |
| <i>Morningstar Mid-Cap Value</i> | | 11.4 | 5.2 | 9.0 | 8.0 | N/A |
| <i>Variance Russell Midcap Value Index</i> | | 3.5 | 6.1 | 4.1 | 2.1 | N/A |
| <i>Variance Morningstar Mid-Cap Value</i> | | 5.2 | 4.8 | 3.7 | 2.2 | N/A |
| Voya Small Cap Growth Equity Fund | \$167,720,099 | 19.4 | 3.0 | 7.8 | 7.6 | N/A |
| <i>Russell 2000 Growth Index</i> | | 15.2 | 0.2 | 6.9 | 8.1 | N/A |
| <i>Morningstar Small Growth</i> | | 15.0 | (1.3) | 8.5 | 9.3 | N/A |
| <i>Variance Russell 2000 Growth Index</i> | | 4.2 | 2.8 | 0.9 | (0.5) | N/A |
| <i>Variance Morningstar Small Growth</i> | | 4.4 | 4.3 | (0.7) | (1.7) | N/A |
| Artisan Mid Cap Fund | \$135,976,893 | 12.8 | (3.7) | 9.3 | 10.0 | N/A |
| <i>Russell Midcap Growth Index</i> | | 22.1 | 4.0 | 11.5 | 11.5 | N/A |
| <i>Morningstar Mid-Cap Growth</i> | | 16.5 | (0.1) | 9.3 | 10.1 | N/A |
| <i>Variance Russell Midcap Growth Index</i> | | (9.3) | (7.7) | (2.2) | (1.5) | N/A |
| <i>Variance Morningstar Mid-Cap Growth</i> | | (3.7) | (3.6) | 0.0 | (0.1) | N/A |
| PIMCO Total Return I Fund | \$115,471,383 | 2.6 | (2.1) | 0.2 | 1.7 | N/A |
| <i>Bloomberg U.S. Aggregate Bond Index</i> | | 1.3 | (2.4) | (0.3) | 1.3 | N/A |
| <i>Morningstar Intermediate Core-Plus Bond</i> | | 2.4 | (1.9) | 0.2 | 1.6 | N/A |
| <i>Variance Bloomberg U.S. Aggregate Bond Index</i> | | 1.3 | 0.3 | 0.5 | 0.4 | N/A |
| <i>Variance Morningstar Intermediate Core-Plus Bond</i> | | 0.2 | (0.2) | 0.0 | 0.1 | N/A |
| Virtus Ceredex Small-Cap Value Eq I Fund | \$75,274,438 | 10.0 | 4.6 | 8.2 | 7.7 | N/A |
| <i>Russell 2000 Value Index</i> | | 8.1 | 1.9 | 7.3 | 7.1 | N/A |
| <i>Morningstar Small Blend</i> | | 11.1 | 2.6 | 8.6 | 7.9 | N/A |
| <i>Variance Russell 2000 Value Index</i> | | 1.9 | 2.7 | 0.9 | 0.6 | N/A |
| <i>Variance Morningstar Small Blend</i> | | (1.1) | 2.0 | (0.4) | (0.2) | N/A |
| Prudential High Yield Fund | \$49,807,920 | 7.9 | 1.9 | 3.8 | 5.2 | 4.9 |
| <i>Bloomberg U.S. Corp. HY 1% Issuer Cap Index</i> | | 8.2 | 3.0 | 4.1 | 5.1 | 4.6 |
| <i>Morningstar High Yield Bond</i> | | 7.6 | 2.8 | 3.7 | 4.3 | 3.6 |
| <i>Variance Bloomberg U.S. Corp. HY 1% Issuer Cap Index</i> | | (0.3) | (1.1) | (0.3) | 0.1 | 0.3 |
| <i>Variance Morningstar High Yield Bond</i> | | 0.3 | (0.9) | 0.1 | 0.9 | 1.3 |

TIER 3

| | |
|----------------------|-------------------------|
| Self Directed | \$448,822,215 |
| TOTAL | \$16,059,803,828 |
| Loan Fund: | \$193,810,893 |

State of Michigan Retirement System
FIXED INCOME REVIEW

State of Michigan Investment Board Meeting
April 2, 2025



LeAnn L. Auer
Senior Investment Manager
Fixed Income Division

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|-------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns | 3.4% | -0.3% | 1.3% | 2.4% | 2.9% |
| Bloomberg U.S. Agg Index | 1.3% | -2.4% | -0.3% | 1.0% | 1.4% |
| Peer Median Returns | 2.0% | -1.3% | 0.7% | 1.8% | 2.2% |

- Across all time periods, the fixed income portfolio outperformed its benchmark and peer group. The portfolio also benefited from an overweight to structured credit and high yield bonds during these periods.
- The fourth quarter delivered weak Fixed Income performance. The U.S. Treasury yield curve rose across most tenors throughout the quarter. Notably, the 10-year Treasury ended the quarter at 4.6%, up 80 bps from September. The yield curve also experienced material steepening as the spread between the 10-year Treasury and the 2-year Treasury increased by 32 bps during the quarter. The Federal Reserve’s FOMC committee met twice during the period and decreased their overnight rate by a total of 50 bps. The market also brought down its expectations for the number of rate cuts during 2025 due to 4th quarter economic data coming in stronger than expected and inflation exhibiting slower declines. Further, post-election uncertainty regarding fiscal policies under the pending, new administration drove long-term yields higher. Investment Grade and High Yield credit spreads tightened modestly during the quarter, by -8 and -12 bps, respectively, whereas in Securitized assets, ABS and CMBS spreads tightened by -13 and -20 bps, respectively.
- Total Return performance for the 12-month U.S. Aggregate Bond Index was 1.25% and -3.06% for the three months ending December 31, 2024. For both time periods, Securitized ABS and CMBS were the best-performing sectors, while U.S. Treasuries and Agency MBS were the worst performers.
- Securitized Credit, particularly in CLOs and CMBS, were the best performing portfolios for both the past year and the quarter ending December 31, 2024. These portfolios returned 10.4% and 16.1%, respectively, on a 1-year basis, and 2.1% and 1.0%, respectively, for the fourth quarter 2024.

Strategy Update

- The objective of the Fixed Income Division portfolio is to meet or exceed the returns of the Bloomberg U.S. Aggregate Bond Index while satisfying the overall characteristics of a core fixed income portfolio. The portfolio has a higher yield-to-maturity (YTM) than the benchmark, 5.8% versus 4.9%. Further, the portfolio exhibits risk characteristics that are in line with the historical volatility of traditional fixed income benchmarks.
- The portfolio characteristics are:
 - **Income:** The return coupon of the portfolio is 4.1% and is approximately 70 bps higher than the benchmark.
 - **Liquidity:** The portfolio has 35.4% invested in U.S. Treasuries, TIPS, government-related securities, and cash. These investments can typically be liquidated within one trading day.
 - **Principal preservation:** The portfolio has a large allocation to U.S. Treasuries (32.2%). The average credit rating of the portfolio is investment grade.
 - **Diversification from equity market risk:** The estimated equity beta of the portfolio is 0.16 and aligned with the U.S. Aggregate benchmark.
- The Fixed Income portfolio “Core-Plus” strategy relied on out-of-benchmark assets to generate returns given the low yield environment of the prior decade. During the years between 2010 through 2021, the yield to maturity of the benchmark U.S. Aggregate index averaged between 2-3%. Although this strategy is still important to overall performance, higher yields within the core fixed income sectors are compelling.
- The Core-Plus strategy implemented to achieve the goals includes:
 - Core: As of December 31, 2024, the portfolio’s allocation to U.S. Treasuries, Investment Grade Corporate Bonds, government-guaranteed U.S. Agency Debentures, Agency MBS, ABS, and CMBS was 68.7%. This includes a 35.4% allocation to U.S. Treasuries, TIPS, government-related securities, and cash.
 - Plus: The portfolio maintains a strategic out-of-benchmark allocation to High Yield corporate bonds, 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 December 31, 2024, the allocation to the Plus portfolio was 31.3%.

Market Environment and Outlook

- The case for traditional fixed income investing is the strongest it has been in two decades. However, as the changing macro-economic landscape shifts, certain risks are present.
 - The yield to maturity of the U.S. Aggregate Index as of December 31, 2024 was 5.8% which ranks in the second decile for yields over the past twenty years.
 - Fixed Income continues to offer a good risk-adjusted rate of return relative to U.S. equities given higher yields. While U.S. equities are still expected to return a higher rate of return over the long term vs. bonds, the difference in return is at or near the lowest spread in over two decades.
 - Among the core fixed income sectors, Agency MBS continues to offer compelling yields and opportunity for carry. The 30-year Mortgage Basis spread to U.S. Treasuries is historically cheap on 5-year and 10-year basis, and performance should be defensive as the Fed cuts interest rates, volatility declines, and the yield curve steepens.
 - Interest rate volatility has declined, but remains elevated as the market evaluates macro-economic data, particularly inflation and employment, and its potential impact on future FOMC policy actions and the forward path of interest rates. Fiscal policies continue to weigh on volatility and investor's minds as we enter 2025.
 - Investment grade and high yield credit spreads remain at their pre-GFC tight, but continue to offer solid yields for investors. As of December 31, 2024, investment grade credit spreads were 80 bps and offered an index yield of 5.3%, while high yield spreads were 287 bps and offered an index yield of 7.6%. Credit fundamentals remain benign; however, any potential of an economic slowdown presents spread risk across these sectors as there is little cushion to absorb such scenarios.

Conclusion

- The market for traditional fixed income securities is very attractive on a 20-year historical basis. Relative to U.S. equities, fixed income offers opportunity for good risk-adjusted rates of return. Out-of-benchmark securities continue to add to the return potential of the portfolio, however in-benchmark securities now offer better return potential. Overall, the portfolio is defensively positioned for the risks posed by tight credit spreads and shifting market and macro-economic narratives.

SMRS

Fixed Income Strategy

12/31/24

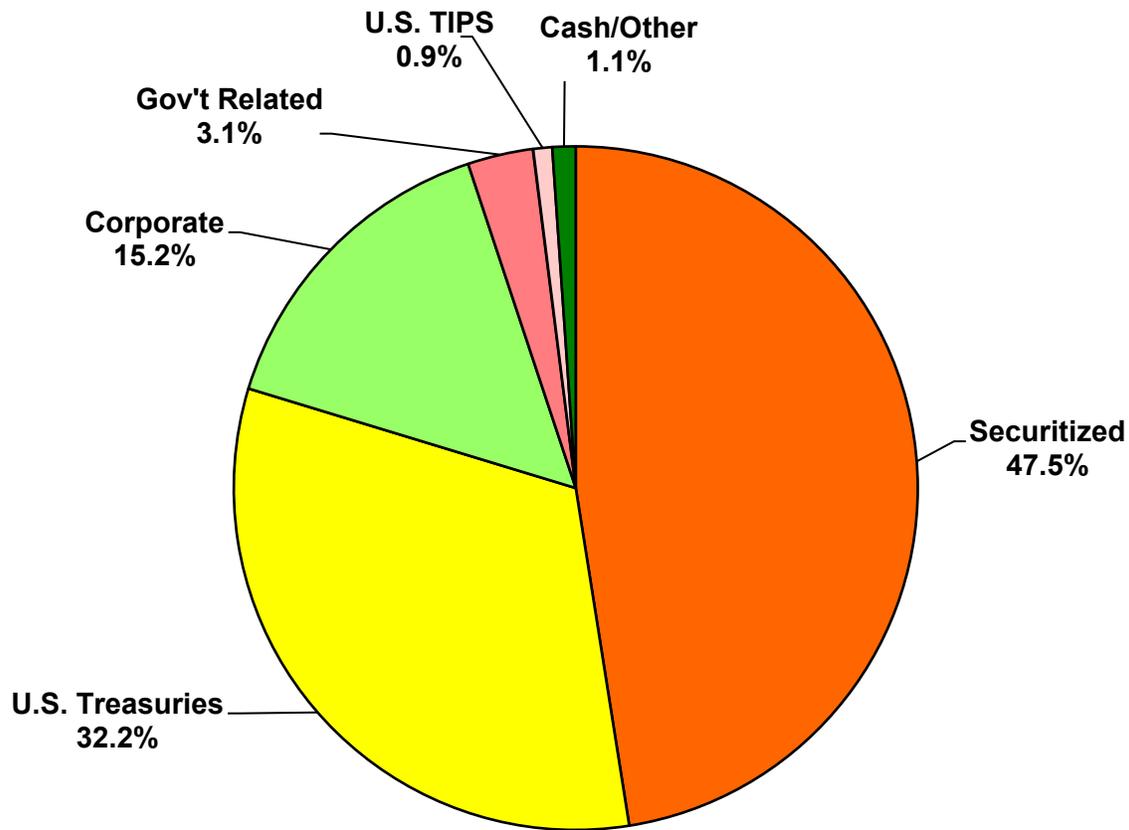
| | Amount | Total | % of Total |
|-------------------------------|---------|------------------------|----------------------|
| Core (\$ in Millions) | | | |
| FID Internal | \$5,940 | | |
| PIMCO Mortgage Fund | 2,064 | | |
| PGIM Investment Grade Credit | 219 | | |
| Total Core | | \$8,223 | 68.7% |
| Tactical | | | |
| Fidelity Tactical | \$521 | | |
| Guggenheim Core Plus | 496 | | |
| TCW Core Plus | 415 | | |
| Total Tactical | | \$1,432 | 12.0% |
| Securitized Debt | | | |
| Met West Securitized Ops | \$673 | | |
| Principal CMBS | 620 | | |
| TICP CLO Debt | 328 | | |
| Napier Park Strategic Loan | 4 | | |
| Napier Park ABS Income | 3 | | |
| Total Securitized Debt | | \$1,628 | 13.6% |
| High Yield | | | |
| PGIM High Yield | \$391 | | |
| Crescent Direct Lending | 21 | | |
| Total High Yield | | \$412 | 3.4% |
| Global | | | |
| T. Rowe Global Multi-Sector | \$276 | | |
| Total Global | | \$276 | 2.3% |
| TOTAL | | <u>\$11,971</u> | <u>100.0%</u> |

NOTE: Totals may not be exact due to rounding.

SMRS

Fixed Income By Asset Type

12/31/24



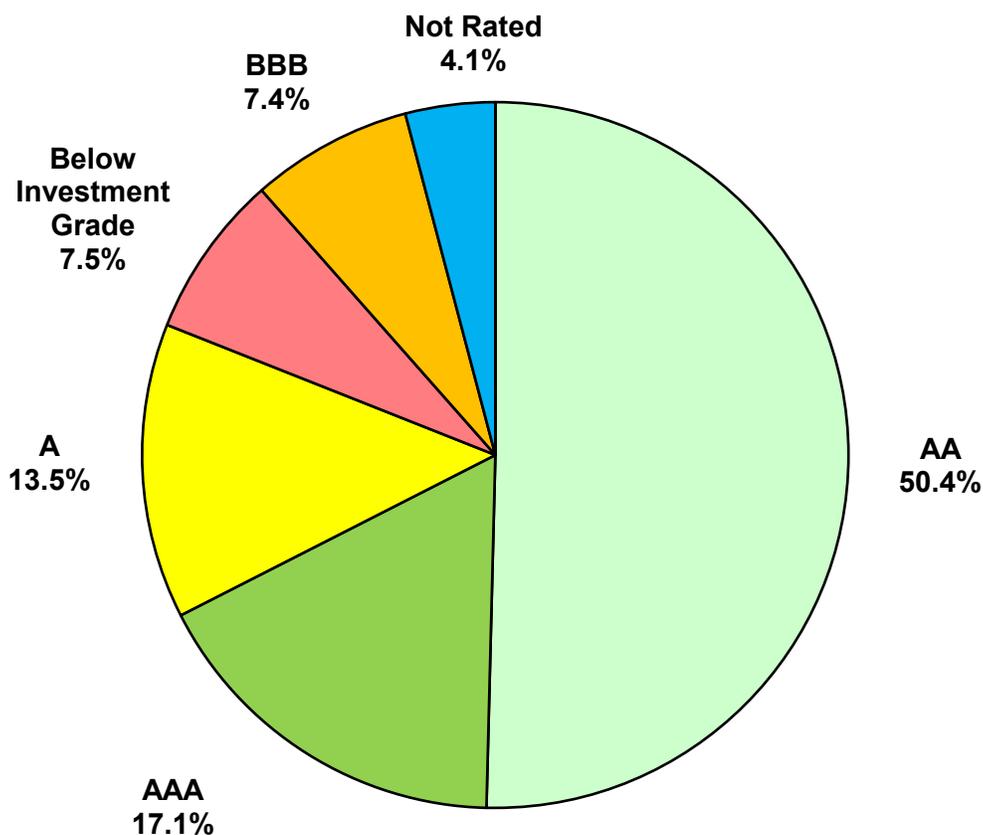
| Market Value in Millions | | | | |
|---------------------------------|------------------------|----------------------|----------------------|-------------------|
| 12/31/24 | | | | |
| | <u>Assets</u> | <u>Percent</u> | <u>Benchmark</u> | <u>Difference</u> |
| Securitized | \$5,697 | 47.5% | 27.1% | 20.4% |
| U.S. Treasuries | 3,853 | 32.2% | 44.2% | -12.0% |
| Corporate | 1,818 | 15.2% | 24.3% | -9.1% |
| Gov't Related | 367 | 3.1% | 4.4% | -1.3% |
| U.S. TIPS | 103 | 0.9% | 0.0% | 0.9% |
| Cash/Other | 133 | 1.1% | 0.0% | 1.1% |
| Total Investments | <u>\$11,971</u> | <u>100.0%</u> | <u>100.0%</u> | |

Benchmark: Bloomberg U.S. Aggregate Index

SMRS

Fixed Income By Rating

12/31/24



| Market Value in Millions | | | | |
|---------------------------------|------------------------|----------------------|----------------------|-------------------|
| 12/31/24 | | | | |
| | <u>Assets</u> | <u>Percent</u> | <u>Benchmark</u> | <u>Difference</u> |
| AAA | \$2,042 | 17.1% | 2.5% | 14.6% |
| AA | 6,034 | 50.4% | 72.7% | -22.3% |
| A | 1,619 | 13.5% | 10.3% | 3.2% |
| * Below Investment Grade | 901 | 7.5% | 0.2% | 7.3% |
| BBB | 884 | 7.4% | 12.9% | -5.5% |
| Not Rated | 491 | 4.1% | 1.4% | 2.7% |
| Total Investments | <u>\$11,971</u> | <u>100.0%</u> | <u>100.0%</u> | |

* Comprised of approximately 3.7% High Yield Credit and 3.8% High Yield RMBS/ABS

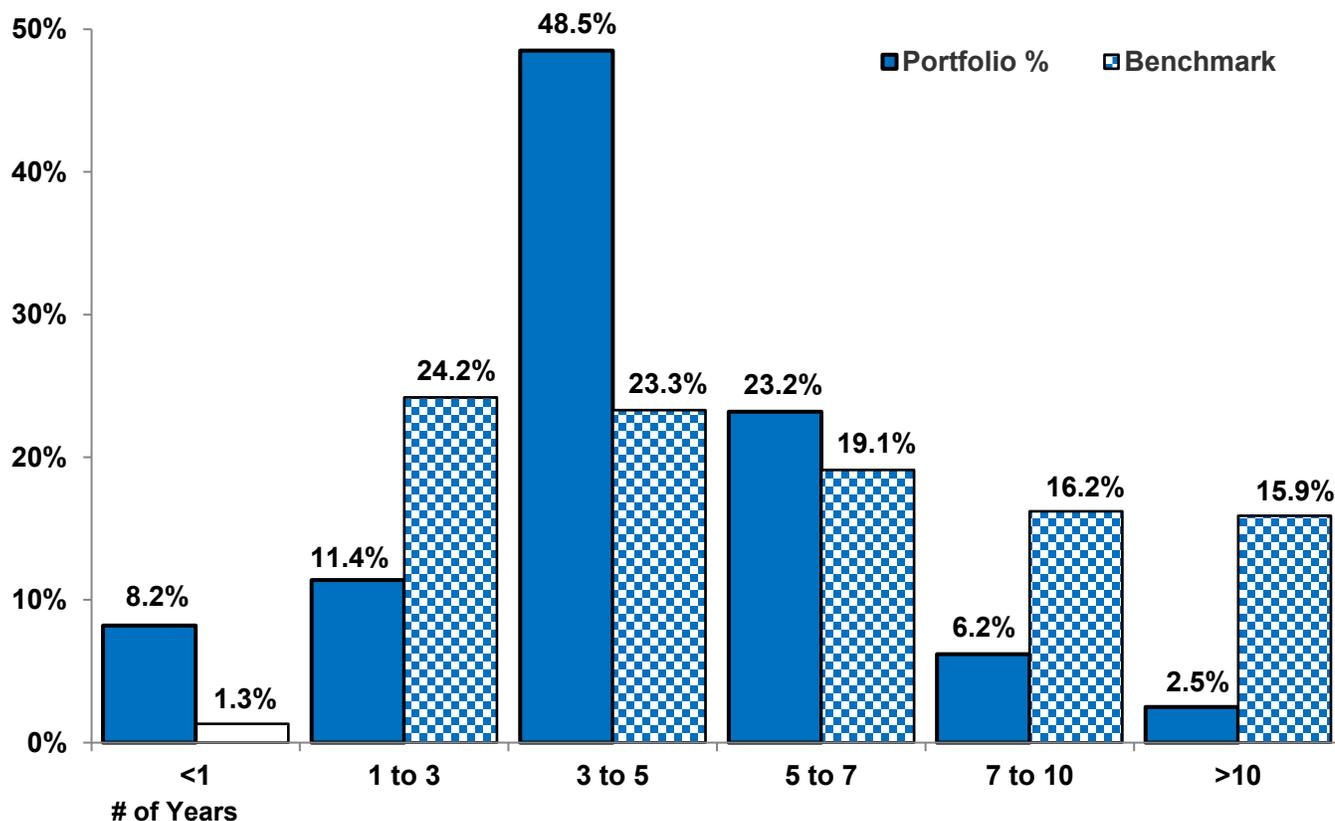
Benchmark: Bloomberg U.S. Aggregate Index

SMRS

Duration Distribution

Fixed Income Composite Versus Benchmark

12/31/24



| Market Value in Millions | | | | | |
|---------------------------------|-----------------|-------------------------|-------------------------|----------------------------|----------------------------|
| Duration | Assets | Portfolio Weight | Benchmark Weight | Portfolio Duration* | Benchmark Duration* |
| <1 | \$977 | 8.2% | 1.3% | 0.0 | 0.9 |
| 1 to 3 | 1,369 | 11.4% | 24.2% | 2.1 | 1.9 |
| 3 to 5 | 5,810 | 48.5% | 23.3% | 3.9 | 3.9 |
| 5 to 7 | 2,779 | 23.2% | 19.1% | 6.1 | 6.0 |
| 7 to 10 | 737 | 6.2% | 16.2% | 7.8 | 7.7 |
| >10 | 299 | 2.5% | 15.9% | 15.5 | 14.1 |
| Total | \$11,971 | 100.0% | 100.0% | 6.3 | 6.0 |

* Effective Duration

Benchmark: Bloomberg U.S. Aggregate Index

Fixed Income Performance - Net of Fees (MPERS) 12/31/24

| | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>10-Years</u> |
|---|-------------------------|---------------|----------------|----------------|----------------|-----------------|
| Total Fixed Income | \$11,970,740,074 | 3.22% | -0.53% | 1.04% | 2.18% | 2.73% |
| <i>Bloomberg Aggregate Bond Index</i> | <i>N/A</i> | <i>1.25%</i> | <i>-2.41%</i> | <i>-0.33%</i> | <i>0.97%</i> | <i>1.35%</i> |
| Internal Core Fixed Income | \$5,940,051,185 | 0.79% | -2.31% | -0.02% | 1.43% | 2.08% |
| Externally Managed Fixed Income | \$6,030,688,888 | 5.35% | 1.20% | 2.00% | 2.86% | 3.37% |
| External Core Fixed Income | \$2,064,264,280 | 11.01% | -1.64% | -0.17% | 0.89% | 1.62% |
| PIMCO Mortgage Fund | 2,064,264,280 | 0.59% | -2.51% | -0.92% | 0.40% | |
| <i>Bloomberg US MBS Agy Fixed Index</i> | <i>N/A</i> | <i>1.20%</i> | <i>-2.13%</i> | <i>-0.74%</i> | <i>0.49%</i> | |
| Investment Grade Credit | \$219,093,787 | 2.91% | -2.05% | 0.79% | 2.15% | 2.79% |
| PGIM Investment Grade | 219,093,787 | 2.91% | -2.05% | 0.79% | 2.15% | 2.79% |
| <i>Bloomberg Credit Index</i> | <i>N/A</i> | <i>2.03%</i> | <i>-2.20%</i> | <i>0.23%</i> | <i>1.72%</i> | <i>2.29%</i> |
| Tactical Fixed Income | \$1,431,799,363 | 2.27% | -0.99% | 1.41% | 2.55% | 2.97% |
| Fidelity Tactical Bond Fund | 521,420,465 | 3.41% | -0.74% | 1.57% | 2.81% | 3.41% |
| Guggenheim Core Plus | 495,806,659 | 3.26% | | | | |
| TCW Core Plus | 414,572,238 | 1.32% | | | | |
| <i>Bloomberg Aggregate Bond Index</i> | <i>N/A</i> | <i>1.25%</i> | <i>-2.41%</i> | <i>-0.33%</i> | <i>0.97%</i> | <i>1.35%</i> |
| High Yield Fixed Income | \$412,151,995 | 7.84% | 2.78% | 4.27% | 4.92% | 5.30% |
| PGIM High Yield | 391,134,830 | 7.66% | 2.27% | 4.32% | 5.10% | 5.45% |
| Crescent Direct Lending | 21,017,165 | 9.99% | 7.31% | 7.35% | | |
| <i>Bloomberg US HY BA/B 1% Cap</i> | <i>N/A</i> | <i>6.78%</i> | <i>2.48%</i> | <i>3.79%</i> | <i>4.48%</i> | <i>4.90%</i> |
| Structured Fixed Income | \$1,627,653,899 | 10.57% | 4.14% | 3.45% | 3.88% | |
| TICP CLO Debt | 327,781,916 | 12.81% | 7.12% | 7.34% | 6.07% | |
| MetWest Securitized Opportunities | 672,520,316 | 8.29% | 3.03% | 3.17% | 3.39% | 3.58% |
| Principal CMBS | 619,895,585 | 16.12% | 0.92% | 1.85% | 3.07% | 3.28% |
| Napier Park ABS Income | 3,473,232 | -35.81% | -19.20% | -6.96% | -2.72% | |
| Napier Park Strategic Loan LP | 3,982,849 | -35.98% | -14.41% | -6.96% | -2.72% | |
| <i>Bloomberg Aggregate Bond Index</i> | <i>N/A</i> | <i>1.25%</i> | <i>-2.41%</i> | <i>-0.33%</i> | <i>0.97%</i> | <i>1.35%</i> |
| <i>Blended CMBS Benchmark</i> | <i>N/A</i> | <i>4.96%</i> | <i>-0.53%</i> | <i>0.97%</i> | <i>1.99%</i> | <i>2.34%</i> |
| Global Fixed Income | \$275,725,565 | 4.55% | 1.12% | 1.91% | 2.64% | |
| T. Rowe Global Multi-Sector | 275,725,565 | 4.55% | 1.12% | 1.91% | 2.64% | |
| <i>Custom GMS Benchmark</i> | <i>N/A</i> | <i>6.66%</i> | <i>1.35%</i> | <i>1.65%</i> | | |

State of Michigan Retirement System

INTERNATIONAL EQUITY REVIEW

State of Michigan Investment Board Meeting

April 2, 2025



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

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|--------------------------|--------|---------|---------|---------|----------|
| Annualized Returns | 6.7% | 0.4% | 4.6% | 4.1% | 5.7% |
| MSCI ACWI ex USA Returns | 5.5% | 0.8% | 4.1% | 3.5% | 4.8% |
| Peer Median Returns | 5.6% | 1.2% | 5.1% | 4.4% | 5.6% |

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

- The IED's outperformance over the last year was driven by the Stock Plus strategy that outperformed the division's benchmark, MSCI ACWI ex USA index, by 2.1%.
- The Active strategy also outperformed but to a lesser extent over the last year adding nearly 0.7% above the benchmark.
- The IED underperformed the benchmark during the prior three-year measurement period. During this time, the Active strategy was under review and the IED had only implemented about half of the planned changes to the external manager lineup. The strategy underperformed the benchmark by -5.4% during this period with the quality factor and some China exposure explaining most of the underperformance.

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.
- Commitments closed during the quarter include:
 - \$25 million in Blackstone Capital Opportunities Co-Investment Fund V, LP, a closed-end co-investment vehicle managed by Blackstone Private Credit Strategies, LLC. The fund will focus on providing private credit solutions on an opportunistic basis across a wide array of investment structures and collateral types.
- Persistent factor exposures create consistent, transparent, low-cost, efficient returns.
 - Current portfolio drivers of risk and return. The tracking error of the portfolio is approximately 1.9%, which is below the division's risk budget of 3.0%.
- Quarterly changes to International Equity Division allocation.
 - Rebalanced \$1.1 billion of equity swaps to match the division's long-term equity factor strategy.

Market Environment and Outlook

Market Environment

- International stock markets were up 5.5% over the last twelve months. Earnings per share (EPS) over the same period were essentially flat up only 0.1% indicating that multiple most likely expanded approximately 2.9% over the last year.
- Emerging markets outperformed the MSCI ACWI ex USA by 2.0% over the last year. Developed markets underperformed the broader index by -0.8%.
- The U.S. dollar has gained 7.2% over the last year relative to a basket of developed market currencies.
- The Bloomberg Commodity Index was practically unchanged at 0.1% over the last year. Oil, a primary driver, was up only 0.1%, gold increased 27.5%, and copper, a barometer for the economic cycle, gained 3.5% over the last twelve months.
- Global government interest rates (index-weighted) remained low by historical standards at 3.1%.

Outlook

- Commodities, based on broad indexes such as the Bloomberg Commodity Index, are now trending higher for the first time since 2021.
- Higher commodity prices contradict the general market narrative that inflation will return to 2.0%. Central banks cannot print or control commodity prices or the housing supply, which are key drivers of inflation. Interest rates are indirect mechanisms the central banks utilize to achieve stable prices.
- Major central banks, outside the United States, are cutting monetary policy rates. The Federal Reserve, however, has ceased with any further cuts until there is clarity on the direction of inflation.
- Political movements in Europe are paralleling what took place in the United States during 2024. Major European economies such as Germany, France, and the United Kingdom are all witnessing the rise of political parties focused on a nationalism as a key plank rather than globalism. The IED believes this may potentially contribute to higher prices if tariffs and less global trade ensues.
- Long-term interest rates investments may remain at higher levels due to potentially stubborn inflation. Equity market returns will struggle in such an environment due to high capital formation costs, higher starting valuation multiples, slowing economic growth. These forces will be offset by accommodative central bank policies but may lead to flat equity returns over the next five years.
- Europe's sales per share year-over-year were down -5.3%. The earnings per share decreased -5.3%. Forward-looking sales per share are expected to be up over the next 12 months, 2.6% and earnings are expected to increase 7.5%.

- Japan's sales per share increase year-over-year by 6.1% while earnings per share increased by 3.0%. Forward-looking sales per share growth is expected to increase by 1.9% and earnings are expected to grow by 8.5% over the next twelve months.
- Analysts' forward-looking one-year estimates for the MSCI ACWI ex USA index sales and earnings per share growth are 4.3% and 9.4% respectively.
- Go-forward returns for the MSCI ACWI ex USA index on an annualized basis are estimated at 8.6%. This rate is based on the current price and actual fundamentals over multiple periods to remove fundamental variability and better estimate the earnings power of the index.
- A ten-year blended international government yield of 3.1% implies an international equity risk premium of 5.5%.

Conclusion

International stocks are expected to grow earnings per share by 9.4% in the next twelve months. The market on a forward basis trades at 13.3x price to earnings, which is above its twenty-one-year average of 13.1x but questions remain if earnings will be impacted by higher interest rates and inflation despite the narratives in financial markets. The annualized go-forward return of 8.6% is still a wide spread relative to global risk-free rates.

SMRS

International Equity Strategies

12/31/24

| Markets | Amount | Total | % of Total |
|--------------------------------|---------|----------------|--------------|
| Active (\$ in Millions) | | | |
| BlackRock MSCI | \$2,389 | | |
| IED Quality Equity | 927 | | |
| Martin Currie | 342 | | |
| AQR | 263 | | |
| Wellington | 245 | | |
| LSV | 202 | | |
| WCM | 179 | | |
| UBS | 153 | | |
| Brown | 137 | | |
| Baillie Gifford | 124 | | |
| Vontobel | 117 | | |
| Morgan Stanley | 107 | | |
| Baron | 74 | | |
| Total Active* | | \$5,261 | 37.0% |
| Stock Plus | | | |
| Internal Swaps | \$3,742 | | |
| PIMCO | 2,372 | | |
| Total Stock Plus | | \$6,114 | 43.0% |
| Indexed | | | |
| SSGA | \$1,574 | | |
| BlackRock | 1,247 | | |
| Total Indexed | | \$2,821 | 20.0% |

TOTAL

\$14,196

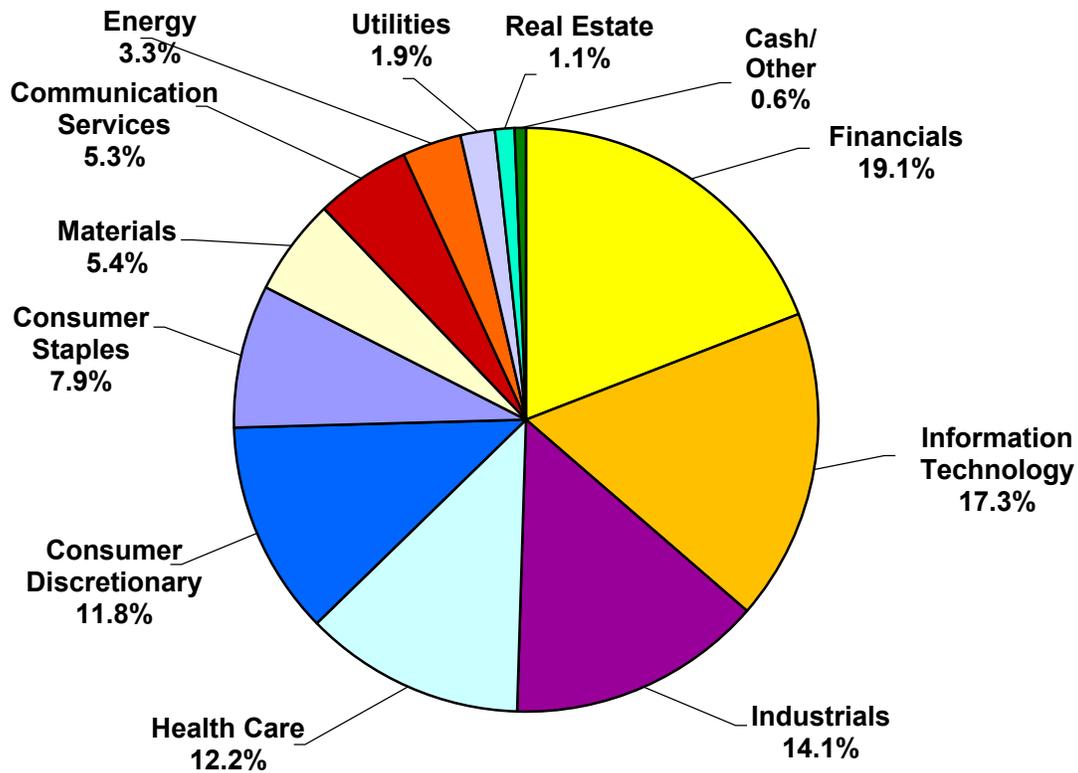
100.0%

*Includes cash balance of \$2.2M

SMRS

International Equity By Sector

12/31/24



| Market Value in Millions | | | | |
|---------------------------------|-----------------|----------------|------------------|-------------------|
| 12/31/24 | | | | |
| | <u>Assets</u> | <u>Percent</u> | <u>Benchmark</u> | <u>Difference</u> |
| Financials | \$2,713 | 19.1% | 22.4% | -3.3% |
| Information Technology | 2,449 | 17.3% | 12.8% | 4.5% |
| Industrials | 2,006 | 14.1% | 9.3% | 4.8% |
| Health Care | 1,736 | 12.2% | 13.8% | -1.6% |
| Consumer Discretionary | 1,682 | 11.8% | 11.4% | 0.4% |
| Consumer Staples | 1,124 | 7.9% | 7.3% | 0.6% |
| Materials | 761 | 5.4% | 7.1% | -1.7% |
| Communication Services | 750 | 5.3% | 5.7% | -0.4% |
| Energy | 464 | 3.3% | 5.1% | -1.8% |
| Utilities | 271 | 1.9% | 3.2% | -1.3% |
| Real Estate | 151 | 1.1% | 1.9% | -0.8% |
| Total Investments | \$14,105 | 99.4% | 100.0% | |
| Cash/Other | 91 | 0.6% | 0.0% | 0.6% |
| Total | \$14,196 | 100.0% | 100.0% | |

Benchmark: MSCI ACWI ex USA

SMRS

International Equities

12/31/24

| Date: | <u>12/31/24</u> | <u>9/30/24</u> | <u>6/30/24</u> | <u>3/31/24</u> |
|--------------------------|-----------------|----------------|----------------|----------------|
| Assets (\$ in Millions): | \$14,196 | \$15,777 | \$14,805 | \$14,555 |
| Number of Securities: | 2,376 | 2,495 | 2,567 | 2,497 |
| Active Share: | 34% | 36% | 35% | 36% |

Benchmark: MSCI ACWI ex USA

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

| Portfolio Characteristics: | SMRS | | MSCI ACWI ex USA | |
|---|-------------|-------------------|-------------------------|-------------------|
| | <u>LTM</u> | <u>Normalized</u> | <u>LTM</u> | <u>Normalized</u> |
| Return: | | | | |
| Annualized Total Return | 9.5% | 9.6% | 8.8% | 8.6% |
| Sustainable Growth Rate | 5.4% | 6.3% | 5.3% | 5.8% |
| Dividend Yield | 2.7% | 2.5% | 2.6% | 2.4% |
| Buyback Yield | 1.1% | 0.4% | 0.9% | 0.4% |
| Collateral Yield | 0.4% | 0.4% | -- | -- |
| Risk: | | | | |
| Beta | 1.05 | -- | 1.00 | -- |
| Volatility | 16.6% | -- | 16.2% | -- |
| Tracking Error | 1.9% | -- | 0.0% | -- |
| Information Ratio | 0.4 | 0.6 | -- | -- |
| Fundamental: | | | | |
| Average Capitalization (\$ in Billions) | 116.9 | -- | 108.4 | -- |
| Price/Earnings | 14.4 | 16.0 | 15.9 | 18.1 |
| Price/Book | 1.7 | 1.9 | 1.9 | 2.1 |
| ROE | 11.9% | 11.8% | 12.2% | 11.6% |

TOP TEN HOLDINGS

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

| | <u>Portfolio Weight</u> | <u>Market Capitalization*</u> | <u>FY1 P/E</u> | <u>Market Value**</u> |
|--|-------------------------|-------------------------------|----------------|-------------------------|
| Taiwan Semiconductor Manufacturing Co., Ltd. | 2.7% | \$850.3 | 23.9 | \$377.7 |
| ASML Holding NV | 2.0% | 280.8 | 35.6 | 276.9 |
| Roche Holding Ltd. Dividend Right Cert. | 1.3% | 229.8 | 13.8 | 190.4 |
| Novo Nordisk A.S Class B. | 1.3% | 294.5 | 27.4 | 188.0 |
| Samsung Electronics Co., Ltd. | 1.1% | 240.4 | 10.6 | 159.2 |
| Novartis AG | 1.1% | 214.2 | 12.9 | 156.8 |
| AstraZeneca PLC | 1.0% | 203.3 | 15.9 | 141.0 |
| Nestle S.A. | 1.0% | 216.4 | 16.2 | 136.0 |
| Tencent Holdings Ltd. | 0.9% | 495.2 | 17.3 | 127.8 |
| China Construction Bank Corp. Class H | <u>0.8%</u> | <u>212.1</u> | 4.6 | <u>120.4</u> |
| TOTAL | <u>13.2%</u> | <u>\$3,237.2</u> | | <u>\$1,874.1</u> |

International Equity Performance - Net of Fees

12/31/24

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Incept.</u> | <u>Incept. Date</u> |
|---|-------------------------|---------------|----------------|----------------|----------------|----------------|---------------------|
| Total International Equity | \$14,195,670,932 | 6.4% | 0.2% | 4.4% | 3.9% | 5.6% | 1/1/04 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 5.7% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 5.6% | |
| Excess Return | | 0.9% | -0.6% | 0.3% | 0.4% | -0.1% | |
| <i>Pct Rank vs. Lipper Int'l Multi-Cap Core</i> | | 24 | 75 | 49 | 42 | 37 | |
| Total International Active Strategy* | \$5,261,046,288 | 6.0% | -1.4% | 3.8% | 3.1% | 4.8% | 5/1/05 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 5.2% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 5.2% | |
| Excess Return | | 0.5% | -2.2% | -0.3% | -0.5% | -0.4% | |
| <i>Pct Rank vs Lipper Int'l Multi-Cap Core</i> | | 32 | 95 | 73 | 80 | 67 | |
| BlackRock MSCI Systematic Return | \$2,389,091,958 | 6.3% | 1.6% | 5.9% | -- | 7.9% | 12/1/18 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | -- | 5.9% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | -- | 6.2% | |
| Excess Return | | 0.7% | 0.8% | 1.8% | -- | 2.0% | |
| <i>Pct Rank vs Lipper Int'l Multi-Cap Core</i> | | 30 | 38 | 12 | -- | 5 | |
| IED Quality Equity | \$927,250,931 | 4.3% | -2.7% | -- | -- | 5.9% | 2/1/20 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | -- | -- | 4.8% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | -- | -- | 5.1% | |
| Excess Return | | -1.3% | -3.5% | -- | -- | 1.2% | |
| <i>Pct Rank vs Lipper Int'l Multi-Cap Core</i> | | 66 | 99 | -- | -- | 25 | |
| Martin Currie International Long-Term | \$342,239,264 | -8.0% | -10.0% | 1.9% | 3.9% | 6.0% | 2/1/17 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 5.8% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 6.0% | |
| Excess Return | | -13.6% | -10.8% | -2.3% | 0.3% | 0.1% | |
| <i>Pct Rank vs Lipper Int'l Multi-Cap Core</i> | | 100 | 100 | 97 | 42 | 47 | |
| AQR Enhanced Value | \$262,550,578 | 7.2% | -- | -- | -- | 10.0% | N/A |
| MSCI ACWI ex USA | | 5.5% | -- | -- | -- | 6.5% | |
| Lipper International Large-Cap Core | | 5.2% | -- | -- | -- | 6.7% | |
| Excess Return | | 1.6% | -- | -- | -- | 3.4% | |
| <i>Pct Rank vs Lipper Int'l Large-Cap Core</i> | | 16 | -- | -- | -- | 9 | |
| LSV Int'l Concentrated Value Fund | \$201,640,317 | 9.8% | -- | -- | -- | 12.3% | 4/1/23 |
| MSCI ACWI ex USA | | 5.5% | -- | -- | -- | 7.7% | |
| Lipper Int'l Lg-Cap Core | | 5.2% | -- | -- | -- | 7.9% | |
| Excess Return | | 4.2% | -- | -- | -- | 4.6% | |
| <i>Pct Rank vs Lipper Int'l Lg-Cap Core</i> | | 7 | -- | -- | -- | 1 | |
| WCM Focused Growth International | \$178,964,832 | 6.7% | -3.7% | -- | -- | -1.6% | 10/1/21 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | -- | -- | 1.3% | |
| Lipper Int'l Lg-Cap Core | | 5.2% | 5.2% | -- | -- | 1.9% | |
| Excess Return | | 1.1% | -4.5% | -- | -- | -2.9% | |
| <i>Pct Rank vs Lipper Int'l Lg-Cap Core</i> | | 22 | 99 | -- | -- | 98 | |
| UBS China A Opportunity Fund | \$153,394,211 | 10.9% | -10.0% | -- | -- | -0.7% | 5/1/20 |
| MSCI ChinaOn shore | | 11.6% | -10.5% | -- | -- | 1.7% | |
| Lipper Emerging Markets | | 6.3% | 6.3% | -- | -- | 7.1% | |
| Excess Return | | -0.7% | 0.5% | -- | -- | -2.4% | |
| <i>Pct Rank vs. Lipper Emerging Markets</i> | | 17 | 99 | -- | -- | 99 | |
| Brown Capital Int'l Small Company Fund | \$136,992,210 | 9.1% | -- | -- | -- | 3.8% | 3/1/22 |
| MSCI ACWI ex USD | | 5.5% | -- | -- | -- | 2.9% | |
| Lipper Int'l Lg-Cap Core | | 5.2% | -- | -- | -- | 3.7% | |
| Excess Return | | 3.6% | -- | -- | -- | 0.8% | |
| <i>Pct Rank vs. Lipper Int'l Lg-Cap Core</i> | | 8 | -- | -- | -- | 41 | |
| Wellington Select China Equity | \$130,422,932 | 10.8% | -13.1% | 0.8% | -- | 1.6% | 9/1/19 |
| MSCI ChinaOn shore | | 11.6% | -10.5% | 0.9% | -- | 2.8% | |
| Lipper Emerging Markets | | 6.3% | -1.9% | 2.4% | -- | 4.5% | |
| Excess Return | | -0.8% | -2.6% | -0.1% | -- | -1.3% | |
| <i>Pct Rank vs Lipper Emerging Markets</i> | | 18 | 100 | 73 | -- | 90 | |

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Incept.</u> | <u>Incept. Date</u> |
|--|------------------------|---------------|----------------|----------------|----------------|----------------|---------------------|
| Baillie Gifford Int'l Concentrated Growth | \$124,205,438 | 18.2% | -7.0% | -- | -- | -7.9% | 11/1/21 |
| S&P 1500 Value | | 5.5% | 0.8% | -- | -- | 2.1% | |
| Style & Risk Adj Benchmark | | 5.2% | 1.2% | -- | -- | 2.7% | |
| Excess Return | | 12.7% | -7.8% | -- | -- | -10.0% | |
| Pct. Rank vs Lipper Multi-Cap Value | | 1 | 100 | -- | -- | 100 | |
| Vontobel Int'l Quality Growth Fund | \$116,704,787 | 7.4% | -- | -- | -- | 6.8% | 5/1/2022 |
| S&P 1500 Growth | | 5.5% | -- | -- | -- | 5.6% | |
| Style & Risk Adj Benchmark | | 5.2% | -- | -- | -- | 6.5% | |
| Lipper Multi-Cap Growth | | 1.8% | -- | -- | -- | 1.2% | |
| Pct. Rank vs Lipper Multi-Cap Growth | | 15 | -- | -- | -- | 39 | |
| Wellington Int'l Contrarian Value Fund | \$114,513,184 | 4.4% | -- | -- | -- | 11.8% | 5/1/23 |
| MSCI ACWI ex USA | | 5.5% | -- | -- | -- | 10.1% | |
| Lipper Int'l Lg-Cap Core | | 5.2% | -- | -- | -- | 9.8% | |
| Excess Return | | -1.1% | -- | -- | -- | 1.7% | |
| Pct Rank vs Lipper Int'l Lg-Cap Core | | 63 | -- | -- | -- | 14 | |
| Morgan Stanley Int'l Opportunity Fund | \$106,563,575 | 20.4% | -- | -- | -- | -1.7% | 2/1/22 |
| MSCI ACWI ex USA | | 5.5% | -- | -- | -- | 2.2% | |
| Lipper International Large-Cap Core | | 5.2% | -- | -- | -- | 2.5% | |
| Excess Return | | 14.8% | -- | -- | -- | -3.8% | |
| Pct Rank vs Lipper Int'l Lg-Cap Core | | 1 | -- | -- | -- | 98 | |
| Baron Global Advantage | \$74,357,777 | 22.6% | -5.7% | -- | -- | -5.5% | 1/1/22 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | -- | -- | 0.8% | |
| Lipper Int'l Lg-Cap Core | | 5.2% | 1.2% | -- | -- | 1.2% | |
| Excess Return | | 17.1% | -6.5% | -- | -- | -6.3% | |
| Pct Rank vs Lipper Int'l Lg-Cap Core | | 1 | 100 | -- | -- | 100 | |
| Total Int'l Stock Plus Strategy** | \$6,113,570,171 | 7.3% | 1.3% | 4.9% | 4.7% | 7.0% | 1/1/09 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 6.7% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 7.0% | |
| Excess Return | | 1.8% | 0.4% | 0.8% | 1.2% | 0.3% | |
| Pct Rank vs Lipper Int'l Multi-Cap Core | | 15 | 43 | 32 | 13 | 41 | |
| Internal Stock Plus | \$3,741,750,634 | 7.6% | 1.5% | 4.5% | 4.8% | 5.8% | 9/1/11 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 5.0% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 5.8% | |
| Excess Return | | 2.0% | 0.6% | 0.4% | 1.3% | 0.8% | |
| Pct Rank vs Lipper Int'l Multi-Cap Core | | 15 | 41 | 43 | 13 | 52 | |
| PIMCO StocksPLUS | \$2,371,819,537 | 6.9% | 0.9% | 5.5% | -- | 6.9% | 4/1/19 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | -- | 5.3% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | -- | 5.7% | |
| Excess Return | | 1.3% | 0.1% | 1.3% | -- | 1.6% | |
| Pct Rank vs Lipper Int'l Multi-Cap Core | | 18 | 51 | 21 | -- | 11 | |
| Total Int'l Index Strategy | \$2,821,054,473 | 5.5% | 1.0% | 4.3% | 4.1% | 6.9% | 7/1/09 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 6.0% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 6.7% | |
| Excess Return | | 0.0% | 0.1% | 0.2% | 0.5% | 0.9% | |
| Pct Rank vs Lipper Int'l Multi-Cap Core | | 37 | 50 | 52 | 32 | 32 | |
| SSGA MSCI ACWI ex USA Index | \$1,574,125,380 | 5.6% | 1.0% | 4.4% | 3.7% | 4.1% | 11/1/17 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | 3.5% | 3.9% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | 3.8% | 4.1% | |
| Excess Return | | 0.1% | 0.1% | 0.3% | 0.2% | 0.2% | |
| Pct Rank vs Lipper Int'l Multi-Cap Core | | 35 | 50 | 49 | 51 | 41 | |
| Blackrock ACWI ex USA Index | \$1,246,929,093 | 5.4% | 0.9% | 4.3% | -- | 3.7% | 3/1/18 |
| MSCI ACWI ex USA | | 5.5% | 0.8% | 4.1% | -- | 3.8% | |
| Lipper Int'l Multi-Cap Core | | 5.2% | 1.2% | 4.5% | -- | 3.9% | |
| Excess Return | | -0.2% | 0.1% | 0.2% | -- | -0.1% | |
| Pct Rank vs Lipper Int'l Multi-Cap Core | | 39 | 51 | 55 | -- | 53 | |

* The total includes the cash balance of closed funds, a total of \$2.2 million

** Includes \$1,312 Transition account

State of Michigan Retirement System

DOMESTIC EQUITY REVIEW

State of Michigan Investment Board Meeting
April 2, 2025



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

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|-------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns | 29.0% | 8.9% | 13.6% | 13.4% | 12.6% |
| S&P 1500 | 24.0% | 8.5% | 14.1% | 13.4% | 12.8% |
| Peer Median Return | 16.2% | 5.5% | 10.4% | 10.4% | 9.8% |

*State Street Universe greater than \$1 billion

- For the year ended December 31, 2024, the Domestic Equity Division (DED) outperformed its peer group over all time periods, including by 1280 bps over the past twelve months. This performance beat the median larger sized pension fund equity portfolio by nearly a cumulative 32%, or 280 bps annualized, over the past decade.
- DED also outperformed the S&P 1500 by 500 bps over the past year and by 40 bps annualized over the past three years, while underperforming the market on a five-and-ten year basis.
- Over the past few years, the division particularly benefitted from investments in the likes of Meta Platforms, Nvidia, American Express, Apollo Global Management, AT&T and Alphabet.
- Results were especially strong across our internal manager lineup, with all of our six portfolio managers outperforming the S&P 1500 by 500 bps or more. As of December 31, 2024, our internal management group is outperforming the S&P 1500 over all time periods and ranks in the top 15% of active managers over the past decade – at less than the cost of an index fund.
- On the external manager side:
 - LA Capital had a good year, beating the S&P 1500 by over 8%. Over the past decade LA Capital has compounded returns at 14.3%, net of fees, with an approach that is both different and diversifying to the division.
 - Patient Capital beat its value benchmark by 15% while also outperforming the S&P 1500 by nearly 300 bps - despite its mid cap value investing style being out of favor. Patient Capital is a young firm that is relatively new to our manager lineup, and we believe it has a bright future going forward.
 - Michigan based Ancora Small Cap beat its benchmark by over 600 bps.
 - Michigan based Seizert Capital has also been a strong, steady performer for SMRS, compounding returns at over 13% since inception of our relationship in 2009, and consistency beating value benchmarks since then – including over the past year.

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 trades at a slight discount to the S&P 1500 on this year's earnings, while being more profitable and growing faster than the market. This means that it has the capacity to pay more dividends than the market, while also growing those payouts faster.
- While it may well be late in the economic cycle, and it's possible that today's higher level of interest rates coupled with growth in high-cost credit usage on the part of the American consumer could at some point send the economy into recession, we believe the market is nevertheless poised to return roughly 8% over the next decade from current levels.
- DED is overweight technology related communication services companies, healthcare and financials.
- The beta of the division remains roughly 1.1 . This will provide a tailwind to returns in an up market, and a headwind in the event of recession. Over time and most often the market appreciates alongside economic growth.

Market Environment and Outlook

- At ~23x forward earnings, equity markets trade at an earnings yield (earnings/price) of 4.3%, or 30 bps less than 10-year treasury bonds at 4.6%.
- Historically, stocks have traded at earnings yield approximately 125 bps higher than bonds, suggesting that stocks are expensive relative to bonds.
 - One could also argue that the market deserves to trade at a higher multiple than it has historically given the benchmark's larger concentration of dominant and fast-growing technology companies relative to the past.
- Over time we calculate the market's go forward return at roughly 8.0% - below its historical average of 10% - driven by a dividend yield of 1.3% and dividend per share growth of 6.7%.
 - Dividends per share driven by capital reinvestment rate of 4.8% and further 1.9% growth via share buybacks.

SMRS

Domestic Equity Strategies

12/31/24

| Markets | Amount | Total | % of Total |
|--|----------|-----------------|--------------|
| Internal Indexed (\$ in Millions) | | | |
| Indexed Portfolios | \$15,101 | | |
| Total Indexed | | \$15,101 | 64.7% |
| Internal Active | | | |
| Active Portfolios | \$5,936 | | |
| Total Internal Active | | \$5,936 | 25.4% |
| External Active | | | |
| Martin Currie US LT Unconstrained | \$407 | | |
| Los Angeles Capital | 334 | | |
| ARK Investments | 310 | | |
| Patient Capital | 229 | | |
| Bivium Capital | 220 | | |
| Clarkston Capital Partners | 198 | | |
| Seizert Capital Partners | 193 | | |
| Attucks Asset Management | 161 | | |
| Ancora | 139 | | |
| Managed Asset Portfolios | 118 | | |
| Total External Active | | \$2,309 | 9.9% |

Total Domestic Equity

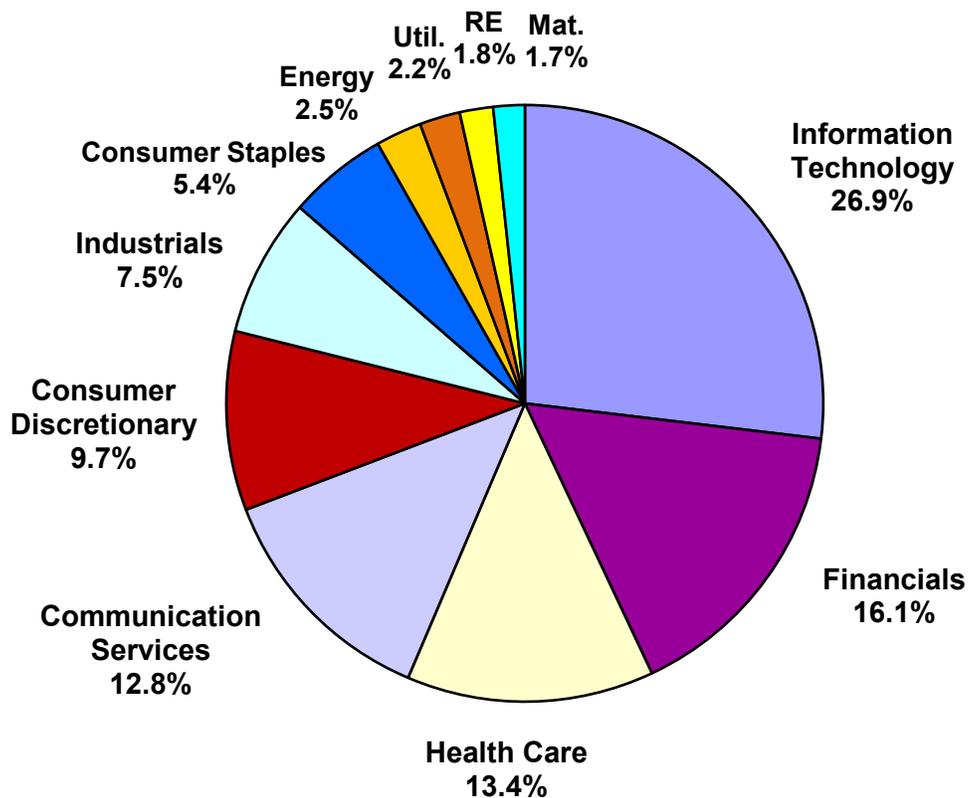
\$23,346

100.0%

SMRS

Domestic Equity By Sector

12/31/24



| Market Value in Millions | | | | |
|---------------------------------|------------------------|----------------------|----------------------|-------------------|
| 12/31/24 | | | | |
| | <u>Assets</u> | <u>Percent</u> | <u>Benchmark</u> | <u>Difference</u> |
| Information Technology | \$6,285 | 26.9% | 30.8% | -3.9% |
| Financials | 3,760 | 16.1% | 14.0% | 2.1% |
| Health Care | 3,122 | 13.4% | 10.1% | 3.3% |
| Communication Services | 2,993 | 12.8% | 8.8% | 4.0% |
| Consumer Discretionary | 2,270 | 9.7% | 11.5% | -1.8% |
| Industrials | 1,746 | 7.5% | 9.1% | -1.6% |
| Consumer Staples | 1,264 | 5.4% | 5.4% | 0.0% |
| Energy | 571 | 2.5% | 3.3% | -0.8% |
| Utilities | 522 | 2.2% | 2.3% | -0.1% |
| Real Estate | 414 | 1.8% | 2.5% | -0.7% |
| Materials | 399 | 1.7% | 2.2% | -0.5% |
| Total | <u>\$23,346</u> | <u>100.0%</u> | <u>100.0%</u> | |

Benchmark: S&P 1500

SMRS

Domestic Equities Composite

12/31/24

| | <u>12/31/24</u> | <u>9/30/24</u> | <u>6/30/24</u> | <u>3/31/24</u> |
|--------------------------|-----------------|----------------|----------------|----------------|
| Assets (\$ in Millions): | \$23,346 | \$23,605 | \$22,357 | \$22,527 |
| Number of Securities: | 1,982 | 1,918 | 1,959 | 2,043 |
| Active Share: | 30% | 30% | 31% | 35% |

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

| | <u>SMRS</u> | <u>S&P 1500</u> |
|------------------------------------|-------------|---------------------|
| Characteristics: | | |
| Market Cap. (\$ in Billions) | \$1,078.1 | \$1,029.6 |
| FY1 P/E | 22.2 | 23.3 |
| P/E upside to S&P 1500 | 5.0% | 0.0 |
| Return on Equity | 25.6% | 19.1% |
| Risk Metrics | | |
| Beta | 1.10 | 1.00 |
| Tracking Error | 2.7% | 0.0% |
| Projected Returns | | |
| Dividend Yield | 1.4% | 1.3% |
| Buyback Yield | 2.0% | 1.9% |
| Reinvestment Rate | <u>6.4%</u> | <u>4.8%</u> |
| Projected Investment Return | 9.8% | 8.0% |

TOP TEN EXPOSURES - Domestic Equities vs S&P 1500

| <u>Domestic Equity Portfolio</u> | | <u>S&P 1500</u> | |
|----------------------------------|-------------------------|---------------------------------|----------------------|
| <u>Company Name</u> | <u>Portfolio Weight</u> | <u>Company Name</u> | <u>Market Weight</u> |
| NVIDIA Corporation | 6.5% | Apple Inc. | 7.0% |
| Apple Inc. | 5.6% | NVIDIA Corporation | 6.1% |
| Meta Platforms Inc Class A | 5.4% | Microsoft Corporation | 5.8% |
| Microsoft Corporation | 4.9% | Amazon.com, Inc. | 3.8% |
| Cash and Equivalents | 4.8% | Meta Platforms Inc Class A | 2.4% |
| Amazon.com, Inc. | 3.4% | Tesla, Inc. | 2.1% |
| Alphabet Inc. Class A | 3.3% | Alphabet Inc. Class A | 2.1% |
| UnitedHealth Group Incorporated | 3.0% | Broadcom Inc. | 2.0% |
| American Express Company | 2.3% | Alphabet Inc. Class C | 1.7% |
| Apollo Global Management Inc | <u>2.1%</u> | Berkshire Hathaway Inc. Class B | <u>1.5%</u> |
| TOTAL | <u>41.3%</u> | TOTAL | <u>34.4%</u> |

Domestic Equity Performance - Net of Fees

12/31/24

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Incept.</u> | <u>Incept. Date</u> |
|---|-------------------------|---------------|----------------|----------------|----------------|----------------|---------------------|
| SMRS S&P 500 Index | \$14,283,272,854 | 24.9% | 8.9% | 14.5% | 13.8% | -- | N/A |
| S&P 500 | | 25.0% | 8.9% | 14.5% | 13.8% | -- | |
| Style & Risk Adj Benchmark | | 25.0% | 8.9% | 14.5% | 13.8% | -- | |
| Lipper Lg-Cap Core | | 22.3% | 7.6% | 13.4% | 12.8% | -- | |
| <i>Excess Return</i> | | <i>-0.1%</i> | <i>0.0%</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 Lg-Cap Core</i> | | <i>30</i> | <i>28</i> | <i>32</i> | <i>26</i> | <i>--</i> | |
| SMRS Large-Cap Core | \$2,191,269,475 | 82.0% | 34.1% | 29.1% | 24.8% | 14.6% | 8/31/07 |
| S&P 500 | | 25.0% | 8.9% | 14.5% | 13.8% | 10.5% | |
| Style & Risk Adj Benchmark | | 17.9% | 10.0% | 19.1% | 18.1% | 12.4% | |
| Lipper Large-Cap Core | | 22.3% | 7.6% | 13.4% | 12.8% | 9.8% | |
| <i>Excess Return</i> | | <i>57.0%</i> | <i>25.1%</i> | <i>14.6%</i> | <i>11.0%</i> | <i>4.1%</i> | |
| <i>Alpha</i> | | <i>64.1%</i> | <i>24.1%</i> | <i>10.0%</i> | <i>6.7%</i> | <i>2.2%</i> | |
| <i>Pct Rank vs Lipper Lg-Cap Core</i> | | <i>1</i> | <i>1</i> | <i>1</i> | <i>1</i> | <i>1</i> | |
| SMRS All-Cap Garp | \$1,037,140,864 | 30.4% | 2.9% | 8.0% | 8.0% | 11.2% | 4/30/11 |
| S&P 1500 Super Composite | | 24.0% | 8.5% | 14.1% | 13.4% | 13.3% | |
| Style & Risk Adj Benchmark | | 29.6% | 9.8% | 15.3% | 14.5% | 14.0% | |
| Lipper Multi-Cap Core | | 18.4% | 5.5% | 11.5% | 10.8% | 11.2% | |
| <i>Excess Return</i> | | <i>6.4%</i> | <i>-5.6%</i> | <i>-6.1%</i> | <i>-5.3%</i> | <i>-2.1%</i> | |
| <i>Alpha</i> | | <i>0.8%</i> | <i>-6.9%</i> | <i>-7.3%</i> | <i>-6.5%</i> | <i>-2.8%</i> | |
| <i>Pct. Rank vs Lipper Multi-Cap Core</i> | | <i>2</i> | <i>81</i> | <i>89</i> | <i>88</i> | <i>55</i> | |
| SMRS Mid-Cap Index | \$817,410,939 | 14.1% | 5.0% | 10.4% | 9.2% | 0.0% | N/A |
| S&P 400 | | 13.9% | 4.9% | 10.3% | 9.1% | 0.0% | |
| Style & Risk Adj Benchmark | | 13.9% | 4.9% | 10.3% | 9.0% | 0.0% | |
| Lipper Mid-Cap Core | | 13.1% | 4.2% | 9.4% | 8.5% | 0.0% | |
| <i>Excess Return</i> | | <i>0.2%</i> | <i>0.2%</i> | <i>0.1%</i> | <i>0.1%</i> | <i>0.0%</i> | |
| <i>Alpha</i> | | <i>0.2%</i> | <i>0.2%</i> | <i>0.1%</i> | <i>0.1%</i> | <i>0.0%</i> | |
| <i>Pct. Rank vs Lipper Mid-Cap Core</i> | | <i>43</i> | <i>40</i> | <i>30</i> | <i>35</i> | <i>0</i> | |
| SMRS Large-Cap Growth | \$802,236,408 | 29.2% | 6.4% | 16.0% | 16.3% | 11.9% | 5/31/05 |
| S&P 500 Growth | | 36.1% | 7.7% | 17.1% | 16.3% | 12.3% | |
| Style & Risk Adj Benchmark | | 38.5% | 7.5% | 16.1% | 15.8% | 12.1% | |
| Lipper Large-Cap Growth | | 29.9% | 7.9% | 16.3% | 15.8% | 11.8% | |
| <i>Excess Return</i> | | <i>-6.8%</i> | <i>-1.3%</i> | <i>-1.1%</i> | <i>-0.1%</i> | <i>-0.4%</i> | |
| <i>Alpha</i> | | <i>-9.2%</i> | <i>-1.1%</i> | <i>0.0%</i> | <i>0.5%</i> | <i>-0.2%</i> | |
| <i>Pct Rank vs Lipper Lg-Cap Growth</i> | | <i>60</i> | <i>80</i> | <i>56</i> | <i>40</i> | <i>43</i> | |
| Value, Quality, Momentum Composite | \$794,385,109 | 20.7% | 5.5% | -- | -- | 12.5% | 10/1/20 |
| S&P 1500 | | 35.5% | 11.5% | -- | -- | 15.7% | |
| Style & Risk Adj Benchmark | | 27.4% | 8.5% | -- | -- | 15.8% | |
| Lipper Multi-Cap Core | | 18.4% | 5.5% | -- | -- | 13.0% | |
| <i>Excess Return</i> | | <i>-3.3%</i> | <i>-3.0%</i> | <i>--</i> | <i>--</i> | <i>-3.3%</i> | |
| <i>Alpha</i> | | <i>-6.7%</i> | <i>-3.0%</i> | <i>--</i> | <i>--</i> | <i>-3.3%</i> | |
| <i>Pct. Rank vs Lipper Multi-Cap Core</i> | | <i>42</i> | <i>56</i> | <i>--</i> | <i>--</i> | <i>64</i> | |
| Large-Cap Consistent Growth | \$754,162,850 | 34.0% | 4.5% | 12.7% | 14.4% | 13.6% | 3/1/15 |
| S&P 500 | | 25.0% | 8.9% | 14.5% | 13.8% | 13.0% | |
| Style & Risk Adj Benchmark | | 52.5% | 8.4% | 18.6% | 17.1% | 15.7% | |
| Lipper Large-Cap Core | | 22.3% | 7.6% | 13.4% | 12.8% | 11.9% | |
| <i>Excess Return</i> | | <i>9.0%</i> | <i>-4.4%</i> | <i>-1.8%</i> | <i>0.5%</i> | <i>0.5%</i> | |
| <i>Alpha</i> | | <i>-18.5%</i> | <i>-3.8%</i> | <i>-5.8%</i> | <i>-2.8%</i> | <i>-2.2%</i> | |
| <i>Pct. Rank vs Lipper Lg-Cap Core</i> | | <i>3</i> | <i>90</i> | <i>68</i> | <i>17</i> | <i>9</i> | |
| Martin Currie | \$407,356,189 | 12.4% | -3.0% | -- | -- | 6.2% | 11/1/20 |
| S&P 1500 Growth | | 34.1% | 7.3% | -- | -- | 16.0% | |
| Style & Risk Adj Benchmark | | 27.4% | 7.8% | -- | -- | 18.2% | |
| Lipper Multi-Cap Growth | | 27.4% | 3.5% | -- | -- | 10.0% | |
| <i>Excess Return</i> | | <i>-21.8%</i> | <i>-10.3%</i> | <i>--</i> | <i>--</i> | <i>-9.8%</i> | |
| <i>Alpha</i> | | <i>-15.0%</i> | <i>-10.8%</i> | <i>--</i> | <i>--</i> | <i>-11.9%</i> | |
| <i>Pct. Rank vs Lipper Multi-Cap Growth</i> | | <i>96</i> | <i>90</i> | <i>--</i> | <i>--</i> | <i>81</i> | |

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Incept.</u> | <u>Incept. Date</u> |
|--|----------------------|---------------|----------------|----------------|----------------|----------------|---------------------|
| LA Capital All-Cap Growth | \$333,768,040 | 32.7% | 9.1% | 15.3% | 14.7% | 13.0% | 5/31/05 |
| S&P 1500 Growth | | 34.1% | 7.3% | 16.5% | 15.7% | 12.1% | |
| Style & Risk Adj Benchmark | | 33.1% | 7.1% | 15.7% | 14.8% | 12.3% | |
| Lipper Multi-Cap Growth | | 27.4% | 3.5% | 13.3% | 13.5% | 10.9% | |
| Excess Return | | -1.5% | 1.8% | -1.1% | -1.0% | 0.9% | |
| Alpha | | -0.4% | 2.0% | -0.4% | -0.1% | 0.7% | |
| Pct. Rank vs Lipper Multi-Cap Growth | | 32 | 8 | 29 | 37 | 14 | |
| Ark Investments | \$310,260,585 | 5.6% | -17.5% | -1.5% | 2.3% | 10.4% | 3/1/16 |
| S&P 1500 Growth | | 34.1% | 7.3% | 16.5% | 15.7% | 17.1% | |
| Style & Risk Adj Benchmark | | 22.9% | -1.6% | 10.6% | 10.5% | 26.8% | |
| Lipper Multi-Cap Growth | | 27.4% | 3.5% | 13.3% | 13.5% | 15.2% | |
| Excess Return | | -28.5% | -24.8% | -18.0% | -13.5% | -6.7% | |
| Alpha | | -17.3% | -15.9% | -12.2% | -8.3% | -16.5% | |
| Pct. Rank vs Lipper Multi-Cap Growth | | 99 | 100 | 100 | 100 | 95 | |
| Disruptive Innovation Momentum | \$229,433,314 | 59.7% | -2.4% | -- | -- | 3.2% | 9/1/20 |
| MSCI Momentum Index | | 32.9% | 5.8% | -- | -- | 8.4% | |
| Style & Risk Adj Benchmark | | 22.0% | 9.3% | -- | -- | 13.6% | |
| Lipper Multi-Cap Growth | | 27.4% | 3.5% | -- | -- | 8.5% | |
| Excess Return | | 26.8% | -8.2% | -- | -- | -5.2% | |
| Alpha | | 37.7% | -11.7% | -- | -- | -10.4% | |
| Pct. Rank vs Lipper Multi-Cap Growth | | 1 | 90 | -- | -- | 85 | |
| Patient Capital | \$228,625,091 | 27.3% | 4.6% | -- | -- | 1.9% | 10/1/21 |
| S&P 1500 Value | | 12.1% | 8.8% | -- | -- | 10.8% | |
| Style & Risk Adjusted Benchmark | | 12.6% | 5.0% | -- | -- | 7.5% | |
| Lipper Multi-Cap Value | | 13.7% | 6.1% | -- | -- | 8.1% | |
| Excess Return | | 15.2% | -4.3% | -- | -- | -8.9% | |
| Alpha | | 14.7% | -0.5% | -- | -- | -5.6% | |
| Pct. Rank vs Lipper Multi-Cap Value | | 1 | 77 | -- | -- | 98 | |
| Bivium Capital Partners | \$220,013,129 | 22.9% | 7.1% | 9.0% | 8.4% | 7.5% | 11/30/07 |
| S&P 1500 Value | | 12.1% | 8.8% | 10.4% | 10.1% | 7.8% | |
| Style & Risk Adj Benchmark | | 24.2% | 8.4% | 13.8% | 13.3% | 10.3% | |
| Lipper Multi-Cap Value | | 13.7% | 6.1% | 9.4% | 8.4% | 7.0% | |
| Excess Return | | 10.7% | -1.7% | -1.5% | -1.7% | -0.4% | |
| Alpha | | -1.3% | -1.2% | -4.8% | -4.9% | -2.8% | |
| Pct. Rank vs Lipper Multi-Cap Value | | 1 | 39 | 58 | 53 | 35 | |
| Clarkston Capital Small/Mid-Cap | \$197,415,051 | 8.1% | 5.5% | 9.0% | 8.8% | 10.3% | 1/1/14 |
| S&P 400 | | 12.3% | 4.0% | 9.7% | 8.6% | 9.4% | |
| Style & Risk Adj Benchmark | | 10.8% | 5.7% | 8.2% | 6.9% | 7.1% | |
| Lipper Mid-Cap Core | | 13.1% | 4.2% | 9.4% | 8.5% | 8.4% | |
| Excess Return | | -4.3% | 1.5% | -0.8% | 0.1% | 1.0% | |
| Alpha | | -2.7% | -0.2% | 0.8% | 1.9% | 3.2% | |
| Pct. Rank vs Lipper Mid-Cap Core | | 90 | 31 | 69 | 46 | 5 | |
| Seizert Capital Partners | \$192,505,602 | 17.5% | 7.3% | 12.5% | 11.4% | 13.2% | 11/30/09 |
| S&P 1500 Value | | 12.1% | 8.8% | 10.4% | 10.1% | 12.1% | |
| Style & Risk Adj Benchmark | | 12.2% | 5.8% | 8.4% | 10.0% | 12.1% | |
| Lipper Multi-Cap Value | | 13.7% | 6.1% | 9.4% | 8.4% | 10.6% | |
| Excess Return | | 5.3% | -1.5% | 2.1% | 1.3% | 1.1% | |
| Alpha | | 5.3% | 1.5% | 4.1% | 1.4% | 1.1% | |
| Pct. Rank vs Lipper Multi-Cap Value | | 17 | 36 | 8 | 5 | 3 | |
| Attucks Asset Management | \$161,255,572 | 15.1% | 7.4% | 9.0% | 9.1% | 7.8% | 11/30/07 |
| S&P 1500 | | 24.0% | 8.5% | 14.1% | 13.4% | 10.2% | |
| Style & Risk Adj Benchmark | | 11.4% | 8.7% | 10.1% | 9.7% | 7.4% | |
| Lipper Multi-Cap Core | | 18.4% | 5.5% | 11.5% | 10.8% | 8.5% | |
| Excess Return | | -8.9% | -1.2% | -5.1% | -4.3% | -2.4% | |
| Alpha | | 3.6% | -1.3% | -1.1% | -0.6% | 0.4% | |
| Pct. Rank vs Lipper Multi-Cap Core | | 66 | 35 | 82 | 79 | 74 | |

| <u>Fund Name</u> | <u>Market Value</u> | <u>1-Year</u> | <u>3-Years</u> | <u>5-Years</u> | <u>7-Years</u> | <u>Incept.</u> | <u>Incept. Date</u> |
|--|----------------------|---------------|----------------|----------------|----------------|----------------|---------------------|
| Ancora | \$139,142,025 | 18.5% | 7.2% | 11.1% | 9.5% | 9.7% | 10/1/17 |
| S&P 1000 | | 12.3% | 4.0% | 9.7% | 8.6% | 9.1% | |
| Style & Risk Adj. Benchmark | | 12.9% | 4.0% | 9.7% | 8.6% | 9.1% | |
| Lipper Mid-Cap Core | | 13.1% | 4.2% | 9.4% | 8.5% | 9.0% | |
| <i>Excess Return</i> | | 6.2% | 3.2% | 1.4% | 0.8% | 0.5% | |
| <i>Alpha</i> | | 5.6% | 3.2% | 1.4% | 0.9% | 0.6% | |
| <i>Pct. Rank vs Lipper Mid-Cap Core</i> | | 6 | 9 | 16 | 27 | 33 | |
| Managed Asset Portfolios | \$118,440,000 | 10.4% | 3.8% | 7.9% | 8.5% | 10.7% | 2/29/16 |
| S&P 1500 Value | | 12.1% | 8.8% | 10.4% | 10.1% | 12.3% | |
| Style & Risk Adj. Benchmark | | 9.9% | 8.1% | 9.0% | 8.2% | 9.8% | |
| Lipper Multi-Cap Value | | 13.7% | 6.1% | 9.4% | 8.4% | 10.7% | |
| <i>Excess Return</i> | | -1.7% | -5.1% | -2.5% | -1.6% | -1.6% | |
| <i>Alpha</i> | | 0.5% | -4.3% | -1.0% | 0.3% | 0.8% | |
| <i>Pct. Rank vs Lipper Multi-Cap Value</i> | | 81 | 82 | 77 | 51 | 54 | |
| All-Cap Core | \$75,311,914 | 29.9% | -- | -- | -- | 21.8% | 5/1/22 |
| S&P 1500 | | 24.0% | -- | -- | -- | 15.5% | |
| Style & Risk Adj. Benchmark | | 26.9% | -- | -- | -- | 18.6% | |
| Lipper Multi-Cap Core | | 18.4% | -- | -- | -- | 12.0% | |
| <i>Excess Return</i> | | 6.0% | -- | -- | -- | 6.4% | |
| <i>Alpha</i> | | 3.1% | -- | -- | -- | 3.3% | |
| <i>Pct. Rank vs Lipper Multi-Cap Core</i> | | 2 | -- | -- | -- | 1 | |

State of Michigan Retirement System

ABSOLUTE RETURN REVIEW

State of Michigan Investment Board Meeting
April 2, 2025



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

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|-------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Absolute Return | 13.1% | 8.5% | 9.0% | 7.7% | 6.4% |
| HFRI FOF Conservative | 7.4% | 4.0% | 5.3% | 4.5% | 3.7% |

- The value of the Absolute Return portfolio is \$11.1 billion with a one-year return of 13.1%. The portfolio's performance was positive for both Private Credit and Hedge Funds.
- A contributor to Private Credit's positive performance this year has been higher interest rates on an absolute basis when compared to recent historical averages. In addition to this yield, credit instruments have experienced price appreciation as credit spreads have tightened. Senior corporate credit, mortgage credit, and housing-related exposures were all positive drivers of performance.
- In the Hedge Fund portfolio, core managers in the Credit and Multi-Strategy sleeves of the portfolio were the primary drivers of positive returns. Macro and Quant strategies exhibited significant outperformance versus the benchmark. Equity strategies were positive but underperformed.
- Hedge Fund Credit strategies focused on Special Situations and Mortgage Credit investments outperformed as managers were able to take advantage of market dislocations. This credit outperformance was primarily driven by mortgage servicing and specialty finance strategies.
- In total, Hedge Fund and Private Credit strategies have taken advantage of higher market volatility and higher interest rates to generate strong risk-adjusted returns.

Strategy Update

- The objective of the Absolute Return portfolio is to diversify the total plans' holdings, targeting returns above investment-grade fixed income with lower volatility than the equity portfolio. The portfolio utilizes a diverse mix of managers that invest both long and short to target specific exposures and seek to hedge out unwanted risk.
- Commitments closed during the quarter include:
 - \$100.5 million in Nuveen SMRS, LLC, a fund of one investment vehicle managed by Nuveen Asset Management, LLC. The fund will invest in collateralized loan obligation ("CLO") liability and equity securities.
 - \$50 million in Blackstone Capital Opportunities Co-Investment Fund V, LP, a closed-end co-investment vehicle managed by Blackstone Private Credit Strategies, LLC. The fund will focus on providing private credit solutions on an opportunistic basis across a wide array of investment structures and collateral types.

- In terms of allocation priorities, the division expects to maintain the current allocation to hedge funds and private credit and will review investments on a relative value basis. Staff will also review credit strategies on an opportunistic basis.

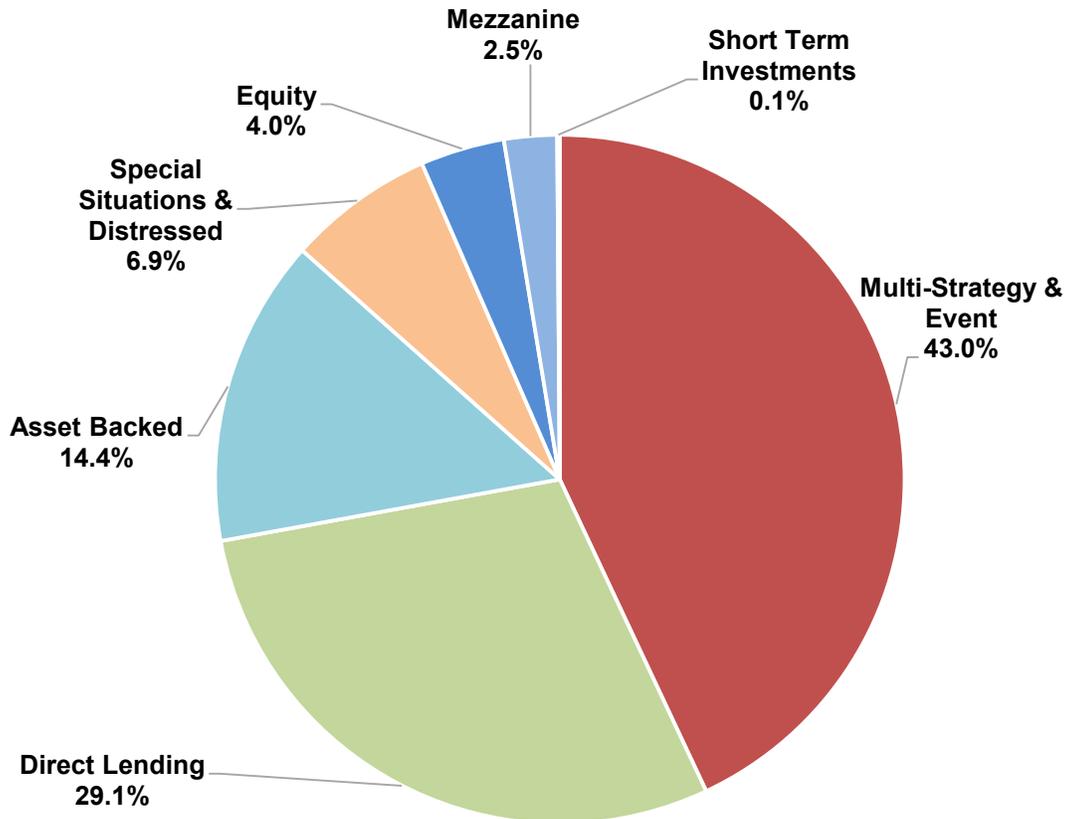
Overall, staff will continue to focus on opportunities that seek to provide diversification, protect the downside, and deliver absolute return.

SMRS

Absolute Return

12/31/24

Investments By Strategy



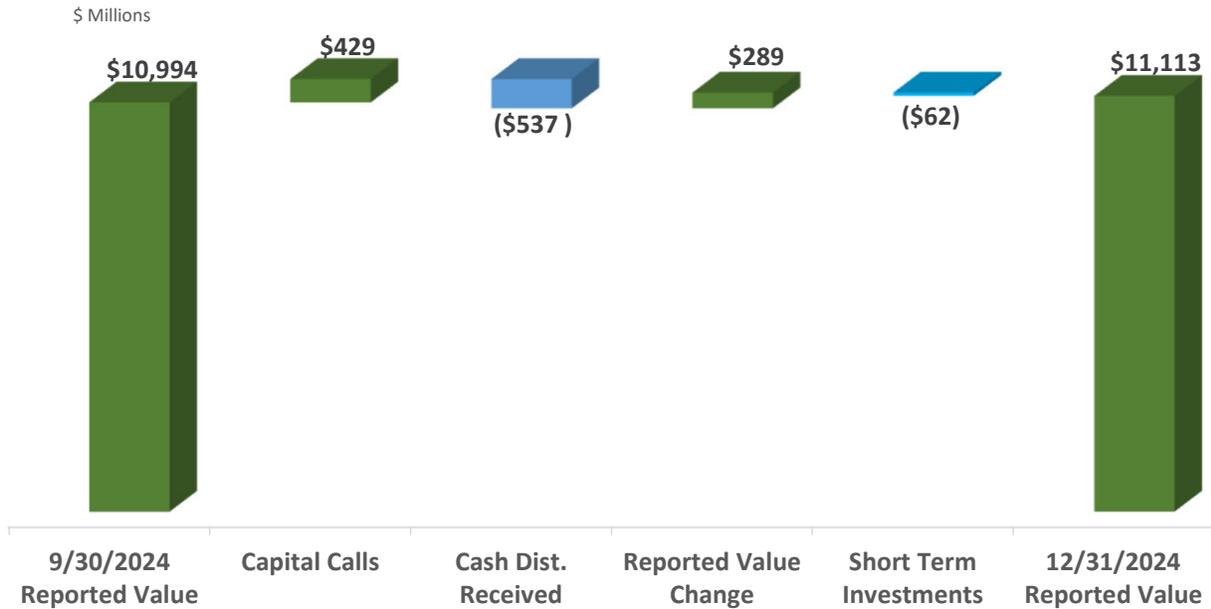
| Market Value in Millions | |
|---------------------------------|--------------------------------|
| | <u>12/31/24</u> |
| Multi-Strategy & Event | \$ 4,781 |
| Direct Lending | 3,235 |
| Asset Backed | 1,604 |
| Special Situations & Distressed | 765 |
| Equity | 439 |
| Mezzanine | 275 |
| Short Term Investments | 14 |
| Total Investments | \$ <u><u>11,113</u></u> |

SMRS

Absolute Return

12/31/24

Invested Commitments



Outstanding Commitments



SMRS

Absolute Return

12/31/24

Net Market Value by Entity

| | Net Market Value | Unfunded Commitment |
|---|---------------------|------------------------|
| Acacia Co-Invest, LP | \$ 333,601,265 | \$ 0 |
| AG Essential Housing, LP | 4,095,428 | 58,000,000 |
| AMG Comvest Senior Lending Feeder Fund II, LP | 79,359,498 | 71,189,024 |
| Angelo Gordon Credit Solutions Fund II, LP | 81,386,956 | 18,958,905 |
| Angelo Gordon Credit Solutions Fund, LP | 40,589,419 | 4,325,340 |
| Apollo Accord+ II Fund, LP | 75,082,904 | 224,917,096 |
| Apollo Accord+, LP | 325,146,147 | 37,564,136 |
| Apollo MidCap FinCo Holdings, LTD | 330,784,421 | 0 |
| ** Blackstone Capital Opportunities Co-Investment Fund V, LP | 0 | 50,000,000 |
| Blackstone Capital Opportunities Fund IV Co-Invest, LP | 27,980,325 | 2,991,865 |
| Blackstone Capital Opportunities Fund IV, LP | 90,863,924 | 69,894,487 |
| Blackstone Capital Opportunities Fund V, LP | 0 | 100,000,000 |
| Blue Range Holdings, LLC | 658,281,136 | 210,175,447 |
| Castle Credit SMRS Holdings, LLC Series A | 150,737,879 | 71,382,271 |
| Castle Credit SMRS Holdings, LLC Series C | 104,502,527 | 10,424,795 |
| Cerberus Manitou Residential Loan Fund, LP | 342,459,948 | 73,000,000 |
| Cerberus SMRS Partners, LP | 7,172,023 | 23,304,657 |
| EnTrust White Pine Partners, LP | 1,145,659 | 0 |
| Farallon Special Situations Fund II, LP | 80,829,315 | 22,889,836 |
| Fortress FCO MA MI, LP | 102,497,460 | 23,523,189 |
| Fortress MSR Opportunities Fund I A, LP | 0 | 15,662,214 |
| GSO Capital Opportunities Fund III, LP | 22,571,858 | 26,504,941 |
| GSO COF III Co-Investment Fund, LP | 2,572,602 | 13,463,876 |
| HarbourVest Credit Opportunities Fund II, LP | 65,752,834 | 2,250,000 |
| HarbourVest Credit Opportunities Fund III, LP | 1,012,895 | 75,000,000 |
| Harbourvest Direct Lending Fund, LP | 89,674,708 | 12,500,000 |
| HarbourVest Direct Lending II, LP | 12,000,000 | 48,000,000 |
| HarbourVest Partners Mezzanine Income Fund, LP | 22,530,585 | 16,310,000 |
| HPS Mezzanine Partners 2019, LP | 41,743,377 | 9,084,002 |
| HPS Red Cedar Fund, LP | 341,509,756 | 94,872,700 |
| Irradiant CLO Partners Fund II, LP (fka Kayne CLO Partners FD II) | 44,213,344 | 28,171,442 |
| Irradiant CLO Partners III, LP | 78,575,647 | 27,990,171 |
| Irradiant Solutions Fund II, LP | 166,004,330 | 195,672,196 |
| Irradiant Solutions Fund, LP (fka Kayne) | 86,817,167 | 143,230,444 |
| Jana Strategic Investment Fund IV, LP | 105,437,970 | 381,103 |
| Kayne Anderson BDC, LLC (KABDC) | 110,690,089 | 0 |
| Lone Star Residential Mortgage Fund III, LP | 47,456,173 | 50,617,917 |
| Marathon CLO Equity Fund, LP | 6,457,419 | 0 |
| Monument Park, LLC | 82,554,454 | 0 |
| MP Securitized Credit Fund, LP | 466,767 | 0 |
| ** Nuveen SMRS, LLC | 9,452,736 | 90,547,264 |

| | Net Market Value | Unfunded Commitment |
|--|-----------------------------|--------------------------------|
| Oaktree Opportunities Fund VIII, LP | 100,971 | 0 |
| Owl Rock Technology Finance Corp II (ORTF II), LLC | 119,436,156 | 82,684,408 |
| Owl Rock Technology Holdings II (ORTH II), LLC | 1,264,173 | 22,727,169 |
| PIMCO Aviation Co-Invest Vehicle Onshore Feeder, LP | 18,896,892 | 34,647,702 |
| PIMCO Private Income Fund Onshore Feeder, LLC | 95,022,608 | 0 |
| Redding Ridge Holdings, LP | 142,236,088 | 17,163,814 |
| Sixth Street CLO Equity Fund IV, LP | 31,617,980 | 70,132,257 |
| Sixth Street Lending Partners, LP | 306,459,685 | 250,177,883 |
| Sixth Street Opportunities Partners IV (A), LP | 66,760,505 | 12,668,929 |
| Sixth Street Opportunities Partners V (A), LP | 104,559,246 | 29,336,712 |
| Sixth Street Specialty Lending Europe II (USD Feeder), LP | 85,781,433 | 62,870,797 |
| Sixth Street Specialty Lending Europe III (USD Feeder), LP | 0 | 125,000,000 |
| SJC DLF IV 10 YEAR-J, LLC | 11,667,510 | 5,000,000 |
| SJC Onshore Direct Lending Fund IV-SMRS, LP | 327,699,511 | 122,989,896 |
| SMRS-HVDL, LLC | 107,598,818 | 15,000,000 |
| Suttons Bay Fund, LP | 513,712,192 | 188,623,146 |
| * Tahquamenon Fund, LP | 4,780,048,239 | 0 |
| TCW/Crescent Mezzanine Partners V, LP | 27,891 | 12,395,466 |
| TICP CLO Partners II, LP | 21,934,318 | 0 |
| TICP CLO Partners III, LP | 52,465,922 | 4,411,277 |
| Turning Rock Fund I, LP | 31,557,097 | 16,319,293 |
| Turning Rock Fund II, LP | 59,647,947 | 6,932,538 |
| Turning Rock Fund III, LP | 46,446,146 | 45,194,865 |
| * Visium Balanced Fund, LP | 2 | 0 |
| Total Absolute Return Strategies | \$ 11,098,952,276 | \$ 3,047,075,471 |
| Short-Term Investments & Other | 14,299,204 | 0 |
| Grand Total | \$ 11,113,251,479 | \$ 3,047,075,471 |

* Fund of Funds

** New Commitments made during quarter reported

State of Michigan Retirement System

PRIVATE EQUITY REVIEW

State of Michigan Investment Board Meeting
April 2, 2025



Peter A. Woodford
Senior Investment Manager
Private Equity Division

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|------------------------|--------|---------|---------|---------|----------|
| Annualized Returns | 8.0% | 2.5% | 13.9% | 13.7% | 13.3% |
| PE Benchmark Returns | 40.3% | 15.2% | 19.4% | 17.9% | 16.8% |
| Peer Median Returns | 6.9% | 5.3% | 10.0% | 9.3% | 8.9% |

- 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 0.2% (ten-year S&P 500 return 13.1%) and underperformed the benchmark by 3.5%.
- Private equity returns have been strong relative to peer median returns, ranking in the top 8.0% of peers over the past ten years. Outperformance to peers is attributable to strategy as well as fund and co-investment selectivity.
- Commitments closed during the quarter:
 - \$100 million to Summit Partners Growth Equity Fund XII-A, LP, managed by Summit Partners LP, focused on growth equity investments.
 - \$20 million to Accel Growth Fund VII, LP, managed by Accel Growth Fund VII Associates LP, focused on later-stage/technology investments.
 - \$10 million to Accel India VIII, LP, managed by Accel India VIII Associates LP, focused on early-stage/technology investments.

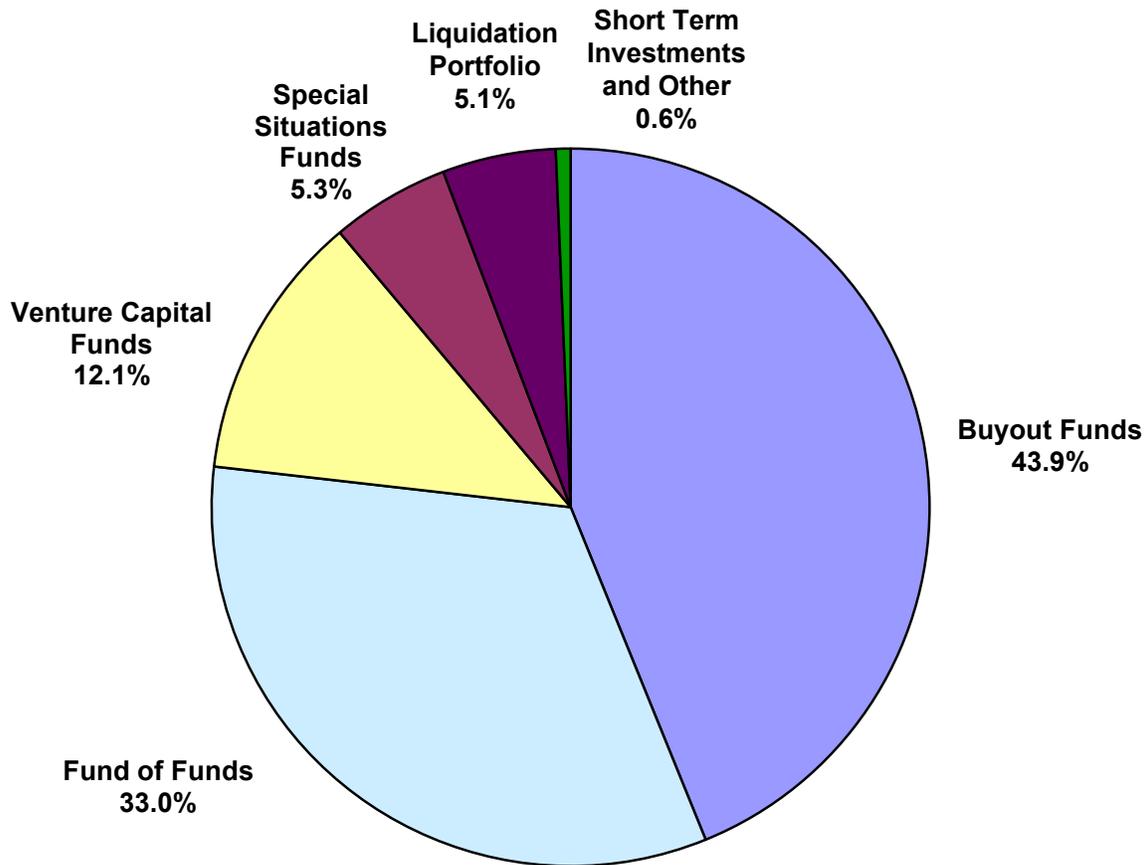
Strategy Update

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

12/31/24



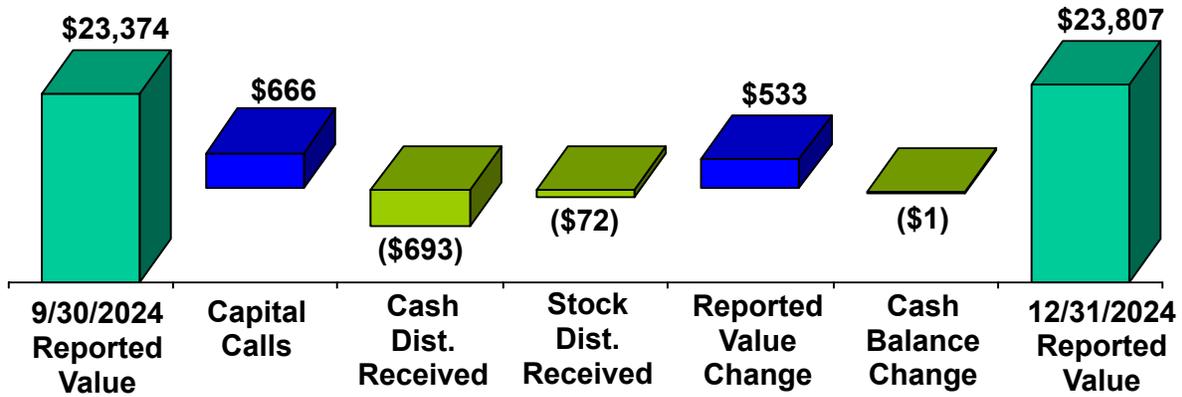
| Market Value in Millions | | | | |
|----------------------------------|------------------------|----------------------|------------------------|----------------------|
| | <u>12/31/2024</u> | | <u>12/31/2023</u> | |
| Buyout Funds | \$10,444 | 43.9% | \$10,131 | 44.8% |
| Fund of Funds | \$7,844 | 32.9% | \$6,938 | 30.7% |
| Venture Capital Funds | \$2,876 | 12.1% | \$2,633 | 11.6% |
| Special Situations Funds | \$1,274 | 5.3% | \$1,473 | 6.5% |
| Liquidation Portfolio | \$1,217 | 5.1% | \$1,295 | 5.7% |
| Short Term Investments and Other | \$152 | 0.6% | \$152 | 0.7% |
| Total | <u>\$23,807</u> | <u>100.0%</u> | <u>\$22,622</u> | <u>100.0%</u> |

SMRS

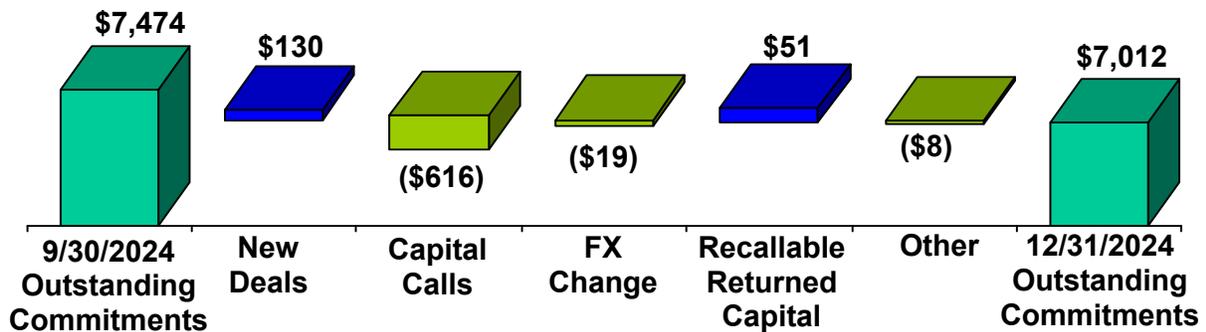
Private Equity

12/31/2024

Invested Commitments



Outstanding Commitments

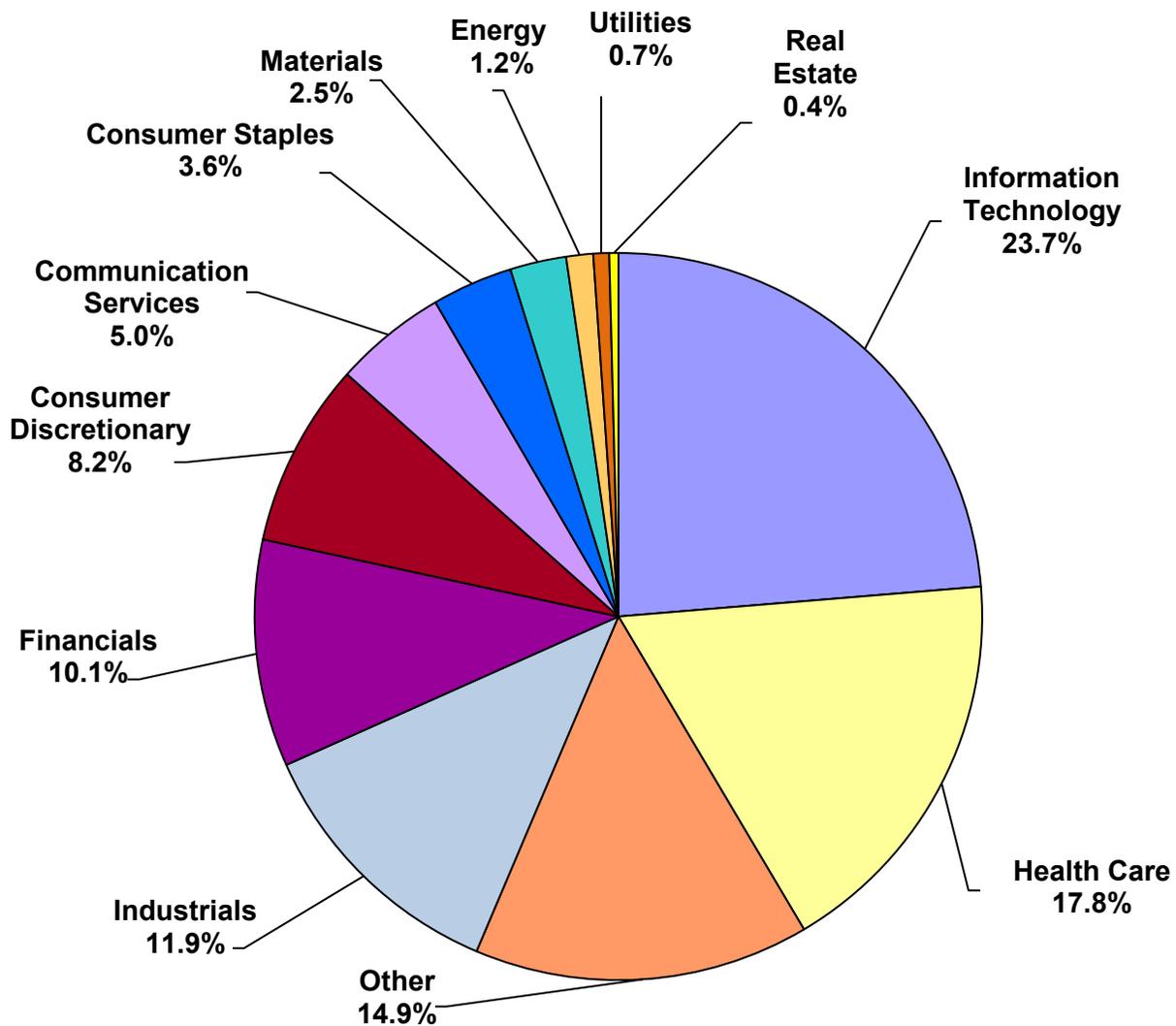


SMRS

Private Equity

12/31/24

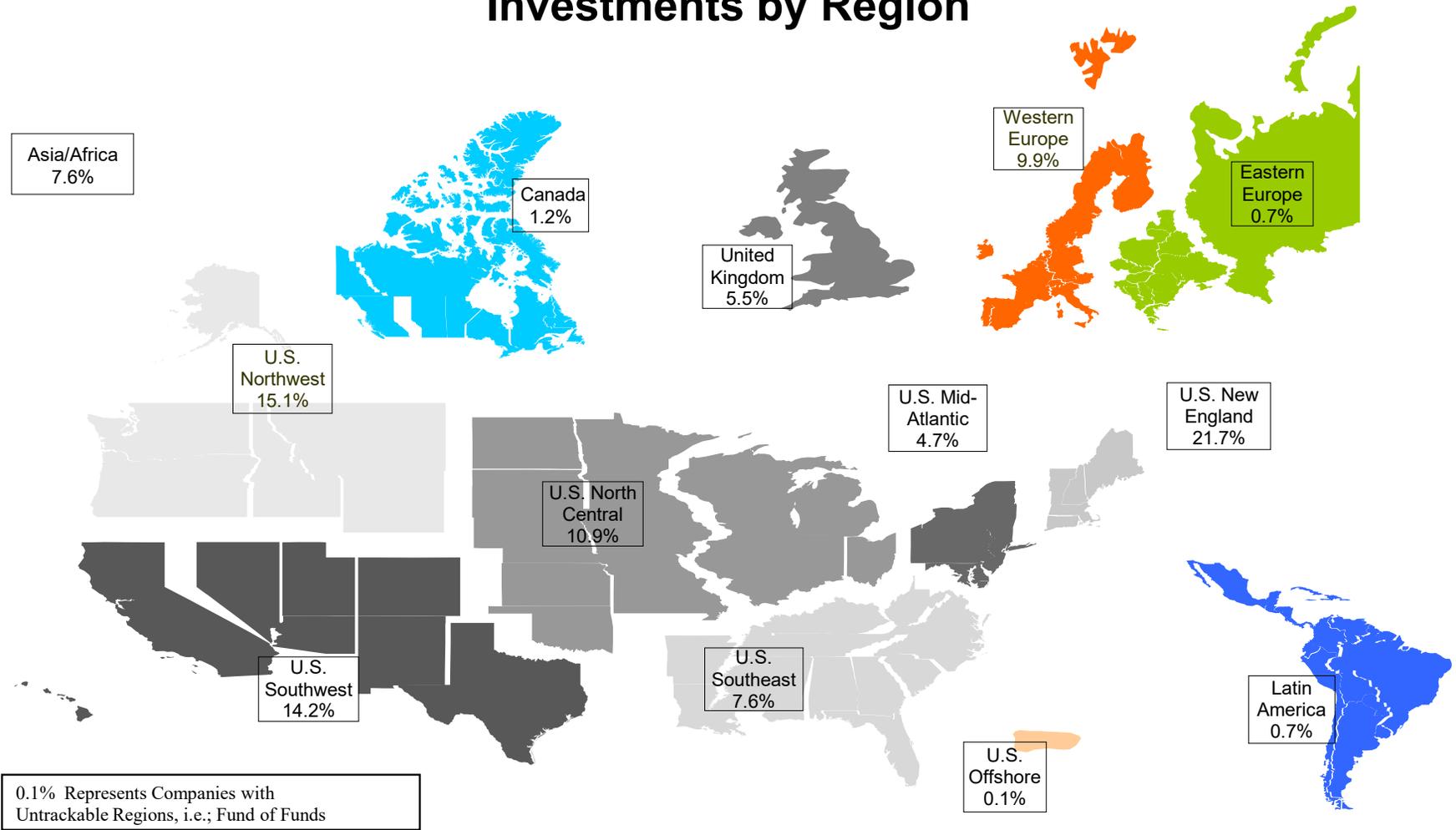
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 9/30/2024 and are subject to change.

SMRS Private Equity 12/31/24

Investments by Region



SMRS

Private Equity

12/31/24

Portfolio by Vintage Year

(\$ in Millions)

| <u>Asset Vintage</u> | <u>Reported Value</u> | <u>Outstanding Commitment</u> | <u>Total Exposure</u> |
|----------------------------------|---------------------------|-----------------------------------|---------------------------|
| 1986-2005 | \$ 123 | \$ 57 | \$ 180 |
| 2006* | 58 | 68 | 126 |
| 2007 | 44 | 40 | 84 |
| 2008 | 125 | 57 | 182 |
| 2009 | 3 | 0 | 3 |
| 2010 | 31 | 3 | 34 |
| 2011 | 246 | 33 | 279 |
| 2012 | 397 | 27 | 424 |
| 2013 | 130 | 32 | 162 |
| 2014 | 614 | 52 | 666 |
| 2015 | 7,881 | 905 | 8,786 |
| 2016 | 1,620 | 170 | 1,790 |
| 2017 | 1,836 | 190 | 2,026 |
| 2018 | 3,830 | 892 | 4,722 |
| 2019 | 2,242 | 293 | 2,535 |
| 2020 | 1,082 | 244 | 1,326 |
| 2021 | 2,073 | 1,034 | 3,107 |
| 2022 | 1,177 | 1,535 | 2,712 |
| 2023 | 104 | 672 | 776 |
| 2024 | 39 | 708 | 747 |
| Income Accruals | 0 | 0 | 0 |
| Short Term Investments and Other | 152 | 0 | 152 |
| Total | <u>\$ 23,807</u> | <u>\$ 7,012</u> | <u>\$ 30,819</u> |

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ in Millions)

| <u></u> | <u>Reported Value</u> | <u>Outstanding Commitment</u> | <u>Total Exposure</u> | <u>Total (USD)</u> |
|-------------------|---------------------------|-----------------------------------|---------------------------|------------------------|
| Euro (\$1.036/ €) | € 548 | € 202 | € 750 | \$776 |

SMRS

Private Equity

12/31/24

Net Market Value by Entity

| | Adjusted Reported Value | Unfunded Commitment |
|--|----------------------------|------------------------|
| 5AM Opportunities I, LP | \$ 11,976,348 | \$ 0 |
| 5AM Opportunities II, LP | 21,811,056 | 0 |
| 5AM Ventures VI, LP | 18,724,171 | 0 |
| 5AM Ventures VII, LP | 12,105,068 | 12,500,000 |
| Accel Europe I, LP | 1,112,916 | 1 |
| Accel Europe II, LP | 29,826,903 | 3,300,000 |
| Accel Growth Fund II, LP | 7,752,498 | 0 |
| Accel Growth Fund III, LP | 10,451,063 | 280,000 |
| Accel Growth Fund IV, LP | 22,259,765 | 0 |
| Accel Growth Fund V, LP | 36,395,970 | 0 |
| Accel Growth Fund VI, LP | 18,753,089 | 4,562,500 |
| ** Accel Growth Fund VII, LP | 0 | 20,000,000 |
| Accel India VII, LP | 5,328,268 | 4,075,000 |
| ** Accel India VIII, LP | 0 | 10,000,000 |
| Accel IX, LP | 611,244 | 3,000,000 |
| Accel Leaders 4, LP | 27,631,495 | 22,750,000 |
| Accel Leaders Fund 3, LP | 35,188,705 | 800,000 |
| Accel Leaders Fund II, LP | 10,022,291 | 0 |
| Accel Leaders Fund, LP | 14,891,632 | 0 |
| Accel London V, LP | 29,259,522 | 600,000 |
| Accel London VI, LP | 14,989,074 | 1,625,000 |
| Accel London VII, LP | 7,530,979 | 4,000,000 |
| Accel London VIII, LP | 1,200,000 | 8,800,000 |
| Accel VI-S | 317,522 | 652,611 |
| Accel VI, LP | 475,099 | 0 |
| Accel X, LP | 2,687,622 | 0 |
| Accel XI, LP | 6,265,395 | 1,440,000 |
| Accel XII, LP | 25,103,743 | 980,000 |
| Accel XIII, LP | 17,189,595 | 1,000,000 |
| Accel XIV, LP | 11,337,638 | 1,150,000 |
| Accel XV, LP | 6,005,726 | 3,100,000 |
| Accel XVI, LP | 350,000 | 9,650,000 |
| Accel-KKR Growth Capital Fund IV, LP | 20,139,995 | 19,860,005 |
| Acorn Bioventures 2, LP | 46,699,013 | 50,000,000 |
| Acorn Bioventures, LP | 92,732,311 | 0 |
| Advent Global Private Equity V, LP | 3,488,545 | 8,700,000 |
| Advent International GPE IX, LP | 318,410,829 | 11,250,261 |
| Advent International GPE VI-A, LP | 16,069,982 | 0 |
| Advent International GPE VII-B, LP | 22,147,975 | 8,000,000 |
| Advent International GPE VIII-B, LP | 196,102,807 | 0 |
| Advent International GPE X, LP | 220,295,452 | 168,837,964 |
| Advent International LAPEF VII, LP | 39,512,222 | 19,650,000 |
| Advent Latin American Private Equity Fund VI, LP | 27,770,442 | 2,450,000 |
| Affinity Asia Pacific Fund III, LP | 10,893,997 | 8,520,204 |
| Affinity Asia Pacific Fund IV, LP | 77,261,275 | 10,143,475 |
| Affinity Asia Pacific Fund V, LP | 122,009,056 | 60,307,258 |

| | Adjusted Reported Value | Unfunded Commitment |
|--|------------------------------------|--------------------------------|
| Apax Digital II, LP | 32,797,023 | 68,278,083 |
| Apax Digital, LP | 69,136,675 | 4,546,237 |
| Apax Europe Fund VI, LP | 4,648,136 | 2,189,873 |
| Apax Europe VII, LP | 1,893,178 | 1,542,254 |
| Apax IX, LP | 107,295,260 | 16,039,252 |
| Apax US VII, LP | 2,895,724 | 417,509 |
| Apax VIII - B, LP | 9,089,603 | 3,983,093 |
| Apax X USD, LP | 165,565,217 | 28,483,288 |
| Apax XI USD, LP | 27,974,028 | 123,240,017 |
| Apollo Investment Fund IX, LP | 95,107,461 | 24,641,923 |
| Apollo Investment Fund VIII, LP | 25,622,555 | 10,027,504 |
| Arboretum Ventures II, LP | 0 | 0 |
| Arboretum Ventures III, LP | 2,505,177 | 0 |
| Arboretum Ventures IV, LP | 9,212,888 | 3,300,001 |
| Arboretum Ventures V, LP | 25,021,344 | 6,125,000 |
| Arboretum Ventures VI, LP | 8,810,570 | 24,604,993 |
| Ares Corporate Opportunities Fund III, LP | 0 | 1,424,582 |
| Ares Corporate Opportunities Fund IV, LP | 15,146,836 | 1,624,990 |
| ASF VIII B | 128,709,994 | 31,768,400 |
| AXA ASF Miller Co-Investment | 122,863 | 0 |
| Axiom Asia 6, LP | 31,415,675 | 19,500,000 |
| Axiom Asia Co-Investment Fund I, LP | 50,171,397 | 4,831,107 |
| Axiom Asia Co-Investment Fund II, LP | 29,461,255 | 24,891,037 |
| Axiom Asia IV, LP | 50,953,482 | 5,747,811 |
| Axiom Asia Private Capital Fund III, LP | 30,897,898 | 5,250,002 |
| Axiom Asia V, LP | 50,609,422 | 9,500,000 |
| BC European Capital VII, LP | 571,213 | 0 |
| Berkshire Fund IX Coinvestment Fund, LP | 60,603,211 | 3,415,332 |
| Berkshire Fund IX, LP | 202,191,625 | 16,732,056 |
| Berkshire Fund VI, LP | 7,699,308 | 6,902,061 |
| Berkshire Fund VII, LP | 6,661,973 | 2,441,522 |
| Berkshire Fund VIII, LP | 34,091,803 | 4,465,738 |
| Berkshire Fund X, LP | 123,728,106 | 35,400,966 |
| Blackstone Capital Partners IV, LP | 144,747 | 4,413,477 |
| Blackstone Capital Partners V, LP | 1,093,068 | 13,069,138 |
| Blackstone Capital Partners V-S | 0 | 712,476 |
| Blackstone Capital Partners VI, LP | 70,438,428 | 32,926,549 |
| Blackstone Capital Partners VII, LP | 225,403,333 | 15,783,358 |
| Blackstone Capital Partners VIII, LP | 183,235,505 | 60,940,739 |
| Blackstone Growth II, LP | 0 | 100,000,000 |
| Carlyle Europe Partners V, SCSp | 108,924,665 | 24,036,514 |
| Carlyle Partners Growth, LP | 16,216,437 | 32,555,436 |
| Carlyle Partners V, LP | 14,009,730 | 10,645,569 |
| Carlyle Partners VI, LP | 37,571,986 | 9,288,430 |
| Carlyle Partners VII, LP | 276,843,903 | 10,438,900 |
| Carlyle Partners VIII, LP | 120,638,338 | 91,636,415 |
| Charlesbank Equity Fund IX, LP | 103,322,819 | 24,071,664 |
| Charlesbank Equity Fund X, LP | 94,829,639 | 20,995,501 |
| Charlesbank Equity Overage Fund X, LP | 60,002,577 | 13,979,551 |
| Charlesbank Fund IX Overage Allocation Program | 32,653,336 | 17,826,614 |
| Clearlake Capital Partners VII, LP | 149,568,105 | 67,076,107 |
| Clearlake Capital Partners VIII, LP | 4,959,743 | 95,040,257 |
| Coller International Partners VI, LP | 6,559,581 | 5,000,000 |
| Coller International Partners VII, LP | 51,439,983 | 45,871,272 |
| CVC Capital Partners Fund IX (A), LP | 24,634,573 | 129,287,450 |
| CVC Capital Partners VII, LP | 188,248,407 | 351,794 |

| | Adjusted Reported Value | Unfunded Commitment |
|--|------------------------------------|--------------------------------|
| CVC Capital Partners VIII, LP | 107,704,153 | 4,215,867 |
| Dover Street IX, LP | 46,289,480 | 9,000,000 |
| Dover Street X, LP | 134,907,694 | 30,000,000 |
| Dover Street XI, LP | 31,132,582 | 75,000,000 |
| FirstMark Capital I, LP | 34,765,993 | 196,596 |
| FirstMark Capital IV, LP | 68,860,697 | 0 |
| FirstMark Capital OF I, LP | 8,029,948 | 0 |
| FirstMark Capital OF II, LP | 54,217,238 | 0 |
| FirstMark Capital OF III, LP | 28,312,760 | 0 |
| FirstMark Capital OF IV, LP | 4,142,759 | 29,925,000 |
| FirstMark Capital V, LP | 39,177,614 | 2,100,000 |
| FirstMark Capital VI, LP | 8,263,058 | 26,075,000 |
| Flagship Pioneering Fund VII, LP | 115,449,354 | 109,000,000 |
| Flagship Pioneering Fund VIII, LP | 14,856,680 | 183,000,000 |
| Flagship Pioneering Special Opportunities Fund II, LP | 92,719,201 | 1,500,000 |
| Flagship Pioneering VI, LP | 303,104,670 | 0 |
| Flagship Ventures Fund 2004, LP | 23,022 | 0 |
| Flagship Ventures Fund 2007, LP | 1,437,024 | 0 |
| Flagship Ventures Fund IV, LP | 16,896,990 | 0 |
| Flagship Ventures Fund V, LP | 48,743,871 | 0 |
| Flagship Ventures Opportunities Fund I, LP | 30,189,283 | 0 |
| GCM Grosvenor Fund Investment Program I, LP | 2,357,721 | 1,023,516 |
| GCM Grosvenor Fund Investment Program II, LP | 13,908,213 | 12,840,574 |
| GCM Grosvenor Fund Investment Program III - 2004 | 17,944,972 | 3,996,786 |
| GCM Grosvenor Fund Investment Program III - 2006 | 25,908,580 | 6,467,901 |
| GCM Grosvenor Fund Investment Program V, LP | 22,804,986 | 8,960,898 |
| GCM Grosvenor Fund Investment Program VI, LP | 15,732,312 | 885,851 |
| GCM Grosvenor Fund Investment Program VIII, LP | 93,461,014 | 8,503,438 |
| GCM Grosvenor SeasPriFIP, LP (PIS06-10) | 16,155,995 | 9,194,401 |
| GCM Grosvenor SeasPriFIP, LP (PIS14) | 173,514,351 | 20,159,013 |
| GCM Grosvenor SeasPriFIP, LP (Seed) | 4,615,713 | 16,979,668 |
| Genstar Capital Partners IX, LP | 104,067,049 | 9,363,294 |
| Genstar Capital Partners VIII, LP | 84,631,649 | 4,144,830 |
| Genstar Capital Partners X, LP | 103,876,996 | 1,975,734 |
| Genstar Capital Partners XI, LP | 11,297,602 | 115,114,691 |
| Genstar IX Opportunities Fund I, LP | 66,756,478 | 5,860,823 |
| Genstar VIII Opportunities Fund I, LP | 63,972,386 | 3,310,751 |
| Genstar X Opportunities Fund I, LP | 25,037,421 | 2,793,621 |
| Genstar XI Opportunities Fund I, LP (Priority Co-Investment Vehicle) | 8,572,961 | 17,326,551 |
| Golden Bell Azalea, LLC | 121,159 | 0 |
| Green Equity Investors IX, LP | 113,450,532 | 173,671,069 |
| Green Equity Investors V, LP | 1,115,728 | 14,745,120 |
| Green Equity Investors VI, LP | 119,417,543 | 2,578,335 |
| Green Equity Investors VII, LP | 135,141,017 | 28,729,242 |
| Green Equity Investors VIII, LP | 303,437,435 | 32,846,847 |
| Greenspring Master G, LP | 719,354,720 | 371,562,500 |
| Greenspring Micro II, LP | 38,404,055 | 1,000,000 |
| GTCR Fund XIII, LP | 46,261,152 | 9,642,247 |
| GTCR Fund XIV, LP | 17,301,828 | 134,280,000 |
| GTCR Strategic Growth Fund, LP | 20,782,259 | 22,605,750 |
| HarbourVest Co-Investment Fund VII Combined, LP | 1,260,590 | 100,000,000 |
| HarbourVest Dover Street VIII, LP | 3,266,800 | 5,400,000 |
| HarbourVest Int'l III Partnership, LP | 0 | 1,200,000 |
| Harbourvest Partners Co-Investment Fund IV, LP | 77,880,032 | 19,107,835 |
| HarbourVest Partners Co-Investment Fund V, LP | 228,947,820 | 45,000,000 |
| Harbourvest Partners Co-Investment Fund VI, LP | 199,100,820 | 30,000,000 |

| | Adjusted Reported Value | Unfunded Commitment |
|--|------------------------------------|--------------------------------|
| HarbourVest V Partnership, LP | 0 | 300,000 |
| HarbourVest VI - Direct Fund, LP | 1,123,766 | 750,000 |
| HarbourVest VI Partnership, LP | 0 | 2,000,000 |
| Harvest Partners IX, LP | 39,608,457 | 59,677,486 |
| Harvest Partners VII, LP | 92,935,135 | 7,734,486 |
| Harvest Partners VIII, LP | 96,324,867 | 9,281,268 |
| Hellman & Friedman Capital Partners X, LP | 92,241,247 | 20,247,187 |
| Hg Saturn 3 A, LP | 61,935,574 | 45,615,299 |
| Insight Partners Fund X Follow-On Fund, LP | 39,542,443 | 5,850,000 |
| Insight Partners XI, LP | 144,096,008 | 2,992,458 |
| Insight Partners XII, LP | 127,986,087 | 19,650,000 |
| Insight Partners XIII, LP | 4,138,388 | 146,250,000 |
| Insight Venture Partners Growth-Buyout Coinvestment Fund, LP | 81,875,931 | 4,856,050 |
| Insight Venture Partners IX, LP | 179,935,612 | 830,984 |
| Insight Venture Partners X, LP | 187,154,429 | 13,723,989 |
| Jade Equity Investors II, LP | 37,310,279 | 112,452,746 |
| Jade Equity Investors, LP | 131,176,429 | 14,399,012 |
| Kelso Investment Associates IX, LP | 55,910,274 | 10,233,695 |
| Kelso Investment Associates VII, LP | 137,781 | 0 |
| Kelso Investment Associates VIII, LP | 526,082 | 7,693,622 |
| Kelso Investment Associates X, LP | 145,035,953 | 12,568,457 |
| Khosla Ventures III, LP | 2,555,981 | 0 |
| Khosla Ventures IV, LP | 59,720,498 | 950,000 |
| Khosla Ventures Opportunity I, LP | 31,145,477 | 1,375,000 |
| Khosla Ventures Opportunity II, LP | 4,949,373 | 7,512,500 |
| Khosla Ventures Seed D, LP | 21,155,693 | 940,000 |
| Khosla Ventures Seed E, LP | 5,851,918 | 500,000 |
| Khosla Ventures Seed F, LP | 7,542,587 | 6,000,000 |
| Khosla Ventures V, LP | 61,116,355 | 1,750,000 |
| Khosla Ventures VI, LP | 179,096,816 | 3,750,000 |
| Khosla Ventures VII, LP | 45,224,417 | 10,600,000 |
| Khosla Ventures VIII, LP | 20,118,328 | 30,750,000 |
| KKR 2006 Fund, LP | 0 | 4,951,985 |
| KKR Americas Fund XII, LP | 228,730,160 | 21,526,645 |
| KKR Asian Fund, LP | 22,514 | 0 |
| KKR Asian Fund II, LP | 21,141,324 | 0 |
| KKR Asian Fund III, LP | 116,565,801 | 14,041,003 |
| KKR China Growth Fund, LP | 0 | 3,306,040 |
| KKR European Fund III, LP | 1,489,092 | 4,394,157 |
| KKR European Fund IV, LP | 80,838,223 | 357,456 |
| KKR European Fund V (USD) SCSp | 116,110,174 | 13,777,816 |
| KKR Millennium Fund, LP | 0 | 0 |
| KKR North America Fund XI, LP | 46,855,297 | 225,237 |
| KKR North America Fund XIII SCSp | 99,490,021 | 42,211,094 |
| Lead Edge Capital IV, LP | 30,665,600 | 9,521,879 |
| Lead Edge Capital V, LP | 36,219,704 | 4,180,330 |
| Lead Edge Capital VI, LP | 21,796,323 | 23,750,774 |
| Lightspeed India Fund IV, LLC | 3,251,160 | 3,945,000 |
| Lightspeed Opportunity Fund II, LP | 25,851,757 | 1,500,000 |
| Lightspeed Opportunity Fund, LP | 23,551,677 | 250,000 |
| Lightspeed Venture Partners Select IV, LP | 27,705,777 | 1,250,000 |
| Lightspeed Venture Partners Select V, LP | 20,546,046 | 4,000,000 |
| Lightspeed Venture Partners VII, LP | 2,117,106 | 0 |
| Lightspeed Venture Partners XIII, LP | 12,225,223 | 800,000 |
| Lightspeed Venture Partners XIV-A, LP | 9,905,540 | 2,587,500 |
| Lightspeed Venture Partners XIV-B, LP | 14,209,165 | 3,712,500 |

| | Adjusted Reported Value | Unfunded Commitment |
|--|------------------------------------|--------------------------------|
| Menlo Special Opportunities Fund II, LP | 42,424,161 | 900,000 |
| Menlo Special Opportunities Fund III, LP | 12,346,996 | 12,250,000 |
| Menlo Ventures IX, LP | 0 | 0 |
| Menlo Ventures X, LP | 1,171,965 | 0 |
| Menlo Ventures XI, LP | 12,307,255 | 0 |
| Menlo Ventures XIV, LP | 14,695,309 | 0 |
| Menlo Ventures XV, LP | 26,061,326 | 750,000 |
| Menlo Ventures XVI, LP | 6,521,797 | 8,100,000 |
| Meritech Capital Partners Franchise Fund, LP | 9,748,862 | 5,700,000 |
| Meritech Capital Partners IV, LP | 1,746,095 | 0 |
| Meritech Capital Partners V, LP | 10,910,116 | 400,000 |
| Meritech Capital Partners VI, LP | 43,430,053 | 1,275,000 |
| Meritech Capital Partners VII, LP | 42,472,593 | 3,718,750 |
| Meritech Capital Partners VIII, LP | 0 | 48,000,000 |
| Meritech Capital Sidecar III, LP | 0 | 12,000,000 |
| Michigan Growth Capital Partners II, LP | 86,330,433 | 0 |
| Michigan Growth Capital Partners III, LP | 82,503,136 | 7,992,812 |
| Michigan Growth Capital Partners IV, LP | 46,808,993 | 47,058,233 |
| Michigan Growth Capital Partners, LP | 11,131,965 | 4,731,989 |
| Michigan SEMF Barings | 110,558,033 | 91,642,661 |
| Michigan SEMF Grosvenor | 113,165,112 | 87,146,138 |
| New Leaf Biopharma Opportunities II, LP | 114,799,954 | 0 |
| New Leaf Growth Fund I, LP | 0 | 0 |
| New Leaf Ventures II, LP | 0 | 0 |
| New Leaf Ventures III, LP | 22,418,672 | 0 |
| New Leaf Ventures IV, LP | 58,376,585 | 2,250,000 |
| Oak Investments Partners IX, LP | 6,574 | 246,728 |
| Ocqueoc Holdings, LLC | 1,658,759 | 12,473 |
| Odyssey Investment Partners Fund VI, LP | 101,038,653 | 23,446,338 |
| Permira Growth Opportunities I, LP1 | 49,171,665 | 5,619,666 |
| Permira Growth Opportunities II SCSp | 14,492,449 | 32,856,595 |
| Permira VII, LP 1 | 88,012,393 | 9,970,357 |
| Permira VIII, LP 2 | 42,667,643 | 37,224,635 |
| Public Pension Capital, LLC | 86,949,903 | 9,209,469 |
| Renaissance Venture Capital Fund IV, LP | 13,059,448 | 11,250,000 |
| Renaissance Venture Capital Fund V, LP | 670,770 | 19,000,000 |
| Riverside Capital Appreciation Fund VI, LP | 24,146,771 | 6,262,007 |
| Riverside Capital Appreciation Fund VII, LP | 60,352,112 | 20,531,974 |
| Riverside Micro Cap Fund I, LP | 87,303 | 4,096,758 |
| Riverside Micro-Cap Fund II, LP | 0 | 2,735,834 |
| Riverside Micro-Cap Fund III, LP | 35,391,284 | 4,823,424 |
| Riverside Micro-Cap Fund IV, LP | 73,240,126 | 6,709,650 |
| Riverside Micro-Cap Fund IV B, LP | 25,637,145 | 576,806 |
| Riverside Micro-Cap Fund V, LP | 125,127,713 | 1,517,048 |
| Riverside Micro-Cap Fund VI, LP | 67,798,186 | 57,382,384 |
| Science Ventures Fund II, LP | 47,185,477 | 500,000 |
| Science Ventures Fund III, LP | 19,297,692 | 6,250,000 |
| Silver Lake Partners III, LP | 6,512,193 | 11,910,583 |
| Silver Lake Partners IV, LP | 70,953,676 | 1,440,657 |
| Silver Lake Partners V, LP | 70,531,703 | 8,778,952 |
| Silver Lake Partners VI, LP | 84,587,729 | 7,729,129 |
| Silver Lake SL SPV-2 | 47,327,101 | 0 |
| SK Capital Partners V, LP | 52,520,685 | 8,779,662 |
| SKCP Catalyst Fund I-A, LP | 39,585,182 | 6,792,369 |
| SMRS - TOPE, LLC | 5,522,404,554 | 411,551,571 |
| SMRS-CAPP, LLC | 516,866,244 | 193,831,651 |

| | Adjusted Reported Value | Unfunded Commitment |
|--|------------------------------------|--------------------------------|
| SMRS-NCRP, LLC | 1,216,982,482 | 361,158,994 |
| Summit Partners Growth Equity Fund X, LP | 112,081,990 | 31,076,979 |
| Summit Partners Growth Equity Fund XI-A, LP | 39,128,034 | 64,470,854 |
| ** Summit Partners Growth Equity Fund XII-A, LP | 0 | 100,000,000 |
| The Veritas Capital Fund VIII, LP | 234,262,548 | 42,386,073 |
| The Veritas Capital Vantage Fund, LP | 34,040,211 | 33,144,006 |
| Thoma Bravo Discover Fund II, LP | 84,197,526 | 21,468,815 |
| Thoma Bravo Discover Fund IV, LP | 87,554,498 | 27,734,766 |
| Thoma Bravo Discover Fund V, LP | 0 | 100,000,000 |
| Thoma Bravo Explore II, LP | 0 | 100,000,000 |
| Thoma Bravo Fund XII, LP | 173,747,942 | 36,904,285 |
| Thoma Bravo Fund XIII, LP | 155,606,523 | 9,263,445 |
| Thoma Bravo Fund XV, LP | 101,305,175 | 20,049,735 |
| Thoma Bravo Fund XVI, LP | 0 | 50,000,000 |
| Thoma Bravo XIV, LP | 136,078,270 | 19,517,081 |
| TI Platform BOV, LP | 16,048,425 | 2,751,206 |
| TI Platform Fund II, LP | 16,290,107 | 991,928 |
| TI Platform Fund III, LP | 14,628,883 | 12,890,498 |
| TI Platform SMRS SMA, LP | 132,147,234 | 56,004,340 |
| TPG Healthcare Partners II, L.P. | 14,515,748 | 24,575,267 |
| TPG Healthcare Partners, LP | 26,576,053 | 3,313,976 |
| TPG IV (Texas Pacific Group IV), LP | 54,324 | 211,725 |
| TPG Partners IX, LP | 62,951,470 | 54,384,452 |
| TPG Partners VI, LP | 2,758,077 | 4,219,844 |
| TPG Partners VIII, LP | 142,108,124 | 15,790,364 |
| TPG Partners, VII, LP | 48,275,649 | 15,206,610 |
| TSG6, LP | 458,670 | 11,725,177 |
| TSG7 A, LP | 73,691,972 | 17,459,542 |
| TSG8, LP | 120,620,187 | 9,878,559 |
| TSG9, LP | 55,089,530 | 112,280,253 |
| Veritas Capital Fund IX, LP | 969,288 | 149,030,712 |
| Veritas Capital Fund V, LP | 46,067,741 | 1,508,273 |
| Veritas Capital Fund VI, LP | 67,906,219 | 12,911,500 |
| Veritas Capital Fund VII, LP | 135,743,667 | 4,427,813 |
| Veritas V Co-Investors, LP | 356,676 | 0 |
| Warburg Pincus Global Growth, LP | 175,031,591 | 8,700,000 |
| Warburg Pincus Private Equity IX, LP | 223,680 | 0 |
| Warburg Pincus Private Equity X, LP | 5,804,241 | 0 |
| Warburg Pincus Private Equity XI, LP | 50,577,932 | 0 |
| Warburg Pincus Private Equity XII Secondary, LP | 18,193,718 | 0 |
| Warburg Pincus Private Equity XII, LP | 127,374,407 | 0 |
| Total | \$ 23,654,941,286 | \$ 7,012,442,900 |
| Short Term Investements and Other | 151,669,745 | 0 |
| Income Accruals | (4) | 0 |
| Grand Total | \$ 23,806,611,027 | \$ 7,012,442,900 |

* 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
April 2, 2025



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

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|-------------------------------|---------------|----------------|----------------|----------------|-----------------|
| Annualized Returns | 1.8% | 7.2% | 6.8% | 7.6% | 8.2% |
| NCREIF NPI | -0.9% | -2.1% | 1.8% | 2.8% | 4.3% |
| Peer Median Returns | -0.5% | 1.4% | 3.8% | 4.9% | 7.0% |

*State Street Universe greater than \$1 billion

- Outperformance relative to the one-year benchmark resulted primarily from the Real Estate and Infrastructure Division’s (REID) strategy of being overweight in hospitality, underweight to office, and exposure to infrastructure and REIT sectors. Over the ten-year timeframe the REID is outperforming the benchmark by 390 basis points.

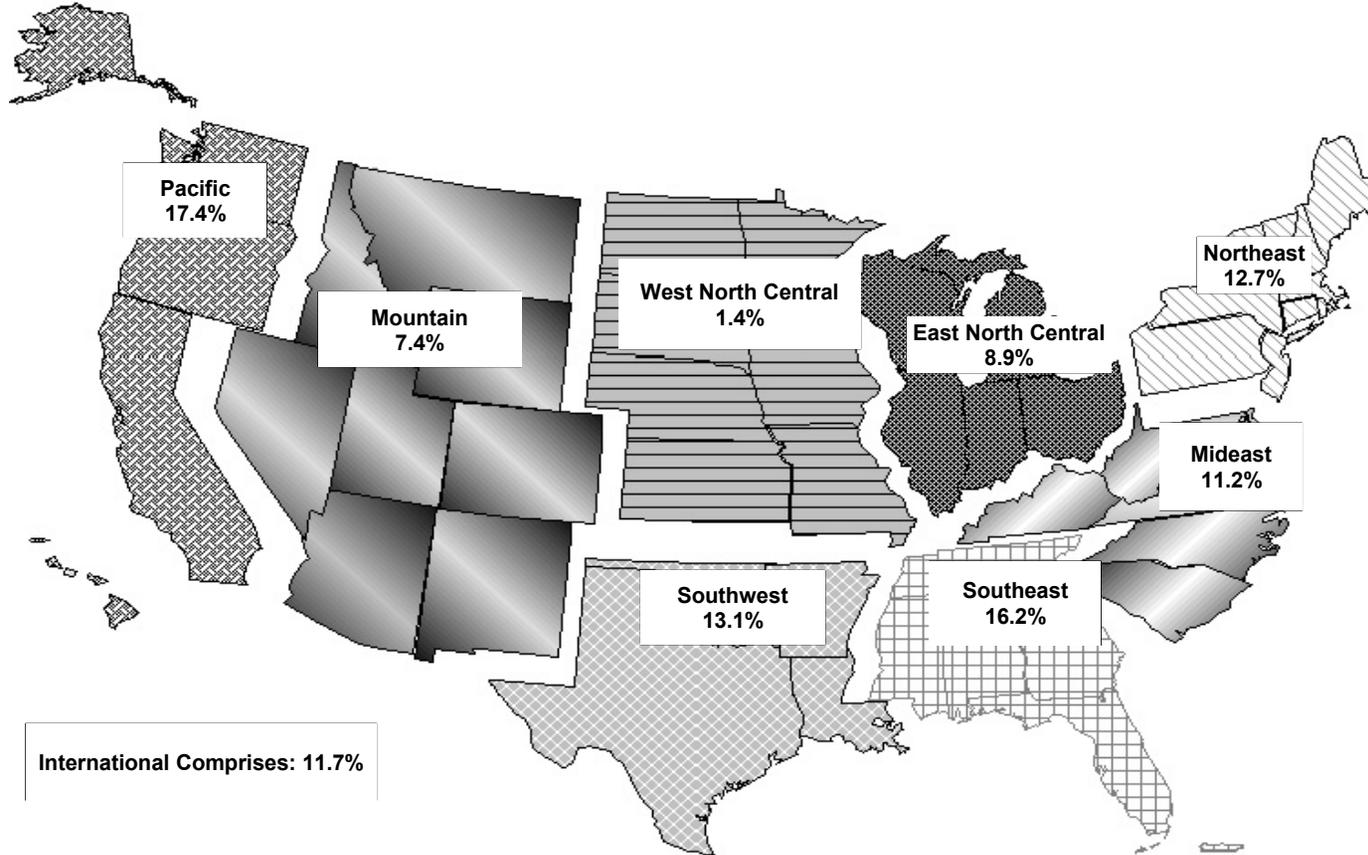
Strategy Update

- Impacts to commercial markets from the global pandemic were uneven across the real estate and infrastructure sectors. There was a mix of negative and positive impacts with some transitory and others that continue to shape the market and will for years to come. New threats to markets have emerged and continued through the fourth quarter of 2024 including escalating geopolitical tensions, elevated levels of inflation and 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 select sector strategies and to identify those managers with top performing track records and best in class investment teams, who are pursuing opportunities in those sectors we have identified for allocation.
- We have been actively managing the portfolio with capital returned of approximately \$1.1 billion, and funding for new or existing investments of approximately \$1.2 billion over the past 12 months.
- The REID has approximately \$2.8 billion in unfunded commitments. One new commitment was made during the quarter.
 - \$100 million in Duration Transportation Infrastructure Capital Partners, LP, an open-end US fund investing in diverse segments of the US transportation infrastructure market, managed by Duration Capital Partners LLC.

SMRS Real Estate 12/31/24

Investments by Region

(excludes public REITs & cash equivalents)



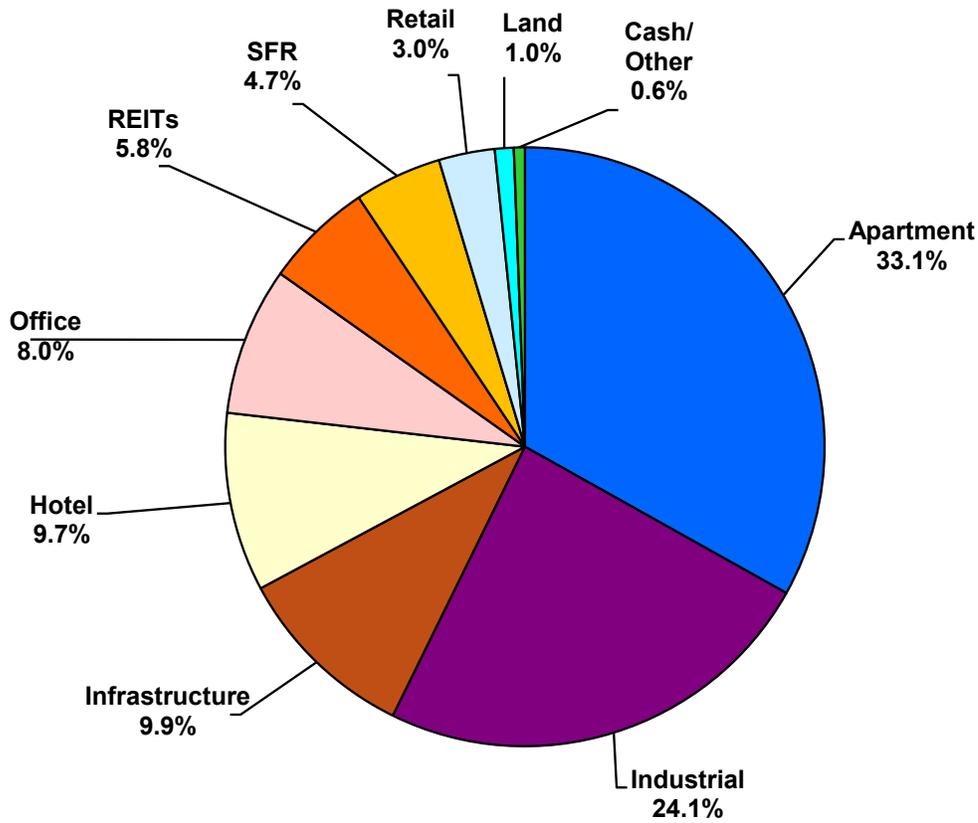
Geographic regions defined by NCREIF, whose property index composition is:

| Pacific | Southeast | Southwest | Northeast | Midwest | East North Central | Mountain | West North Central |
|---------|-----------|-----------|-----------|---------|--------------------|----------|--------------------|
| 26.2% | 17.3% | 13.8% | 13.0% | 9.8% | 8.9% | 8.6% | 2.3% |

SMRS

Real Estate and Infrastructure

12/31/24



| Market Value in Millions | | | | |
|---------------------------------|-----------------------|----------------------|-----------------------|----------------------|
| | <u>12/31/24</u> | | <u>12/31/23</u> | |
| Apartment | \$3,190 | 33.1% | \$3,380 | 34.2% |
| Industrial | 2,325 | 24.1% | 2,909 | 29.4% |
| Infrastructure | 954 | 9.9% | 892 | 9.0% |
| Hotel | 930 | 9.7% | 839 | 8.5% |
| Office | 769 | 8.0% | 725 | 7.3% |
| REITs | 562 | 5.8% | 331 | 3.3% |
| SFR | 455 | 4.7% | 350 | 3.5% |
| Retail | 292 | 3.0% | 309 | 3.1% |
| Land | 97 | 1.0% | 105 | 1.1% |
| | <u>\$9,574</u> | <u>99.4%</u> | <u>\$9,840</u> | <u>99.5%</u> |
| Cash/Other | 57 | 0.6% | 50 | 0.5% |
| Total Investments | <u>\$9,631</u> | <u>100.0%</u> | <u>\$9,890</u> | <u>100.0%</u> |

SMRS

Real Estate

12/31/24

Market Values by Entity

| | <u>Market Value</u> | <u>Unfunded Commitment</u> |
|---|---------------------|--------------------------------|
| 801 Grand Avenue Capital, LLC | \$ 20,361,769 | \$ 0 |
| AEW Senior Housing Investors III, LP | 3,338,819 | 258,896 |
| AEW Senior Housing Investors IV, LP | 35,500,636 | 6,089,469 |
| Albertsons Companies, Inc. | 46,357,451 | 0 |
| Apollo Asia Real Estate Fund, LP | 33,895,401 | 10,367,391 |
| Asana Partners Fund I, LP | 32,262,267 | 2,449,559 |
| Asana Partners Fund II, LP | 47,696,792 | 5,592,905 |
| Asana Partners Fund III, LP | 50,361,976 | 45,666,667 |
| Avanath Affordable Housing III, LLC | 58,360,069 | 709,078 |
| Avanath Affordable Housing IV, LLC | 28,986,292 | 52,292 |
| Avanath Affordable Housing Renaissance Fund, LP | 43,558,698 | 0 |
| BentallGreenOak Asia (USD) IV, LP | 0 | 100,000,000 |
| BentallGreenOak Europe IV, LP | 44,391,431 | 59,135,997 |
| BentallGreenOak US Cold Storage, LP | 31,061,452 | 42,798,740 |
| BGO Europe III Co-Investment, LP | 18,644,653 | 8,320,134 |
| BGO Europe IV King II/ King III Co-Investment, LP | 25,654,636 | 1,383,860 |
| BlackRock MiREIT Fund | 222,194,897 | 0 |
| Blackstone Real Estate Partners IX, LP | 219,416,826 | 30,997,583 |
| Blackstone Real Estate Partners V.TE.2, LP | 58,963 | 208,703 |
| Blackstone Real Estate Partners VI, LP | 38,379 | 552,139 |
| Blackstone Real Estate Partners VIII, LP | 50,242,088 | 8,686,449 |
| Blackstone Real Estate Partners X, LP | 59,191,526 | 148,577,711 |
| Carlyle Realty Partners IX, LP | 44,057,074 | 55,832,480 |
| CIM Fund III, LP | 15,420,773 | 0 |
| CIM Fund VIII, LP | 30,290,062 | 0 |
| CIM VI (Urban REIT), LLC | 9,000,305 | 0 |
| Clarion Gables Multifamily Trust, LP | 35,143,079 | 0 |
| Columbus Circle Holdings, LLC | 289,564,927 | 160,527,982 |
| Crown Small Cap Real Estate Fund II-T, LP | 6,823,911 | 3,280,000 |
| DM2501, LLC | 15,195,447 | 16,105,096 |
| Domain GVA-1, LLC | 7,390,053 | 0 |
| Domain Hotel Properties, LLC | 446,759,732 | 4,938,106 |
| Eastport Properties, LLC | 88,808,322 | 273,619 |
| GreenOak Europe III, LP | 49,791,556 | 18,964,958 |
| Heitman Core Real Estate Debt Income Trust, LP | 39,511,543 | 0 |
| Heitman Global Real Estate Fund II, LP | 76,494,574 | 22,308,683 |
| Heitman MiREIT Fund | 225,932,495 | 0 |
| IDR Core Property Index Fund, LLC | 103,790,423 | 0 |
| India Property Fund II, LLC | 2,339,116 | 5,897,418 |
| Invesco Mortgage Recovery Fund II, LP | 4,485,741 | 18,116,596 |
| Invesco Strategic Opportunities III, LP | 17,890,972 | 82,461,385 |
| IPF II Co-Invest, LP | 1,856,038 | 2,168,655 |
| ISO III SMRS Sidecar, LP | 9,592,880 | 51,086,951 |
| KBS/SM Fund IV, LP | 89,567,078 | 0 |
| L&B Spartan Holdings, LP | 181,917,380 | 81,425,398 |
| Landmark Real Estate Partners V, LP | 82,394 | 0 |
| LaSalle Asia Opportunity Fund III, LP | 386,267 | 1,732,325 |
| Lion Industrial Trust | 394,660,846 | 0 |
| Lion Mexico Fund, LP | 2,311,431 | 0 |

| | <u>Market Value</u> | <u>Unfunded Commitment</u> |
|--|-------------------------|--------------------------------|
| Lombard International Life Assurance Company GVA0016 | 351,577,050 | 1,907,506 |
| Lone Star Fund X (U.S), LP | 110,049,977 | 21,734,113 |
| Lone Star Fund XI, LP | 176,642,715 | 14,259,006 |
| Lone Star Fund XII, LP | 54,799,432 | 232,675,463 |
| Lubert-Adler Real Estate Fund VII, LP | 24,319,782 | 1,875,000 |
| M1-Westgate Co-Investor, LLC | 32,768 | 0 |
| M-301W Co-Investor, LLC | 347,280 | 0 |
| MERS Acquisitions, Ltd | 968,006 | 0 |
| MIP Holdco, LLC | 232,032,739 | 10,148,751 |
| Morgan Stanley Real Estate Special Situations Fund III Institutional, LP | 853,201 | 0 |
| MWT Holdings, LLC | 2,295,811,783 | 0 |
| Northpark Land Associates, LLLP | 36,881,956 | 4,599,833 |
| Paladin Realty Brazil Investors III (US-A), LP | 612,598 | 0 |
| Paladin Realty Latin America Investors IV-CI, LP | 25,832,129 | 0 |
| Paladin Realty TB Co-Investment, LP | 11,720,473 | 0 |
| Penmain Office, LLC | 703 | 0 |
| Principal Data Center Growth & Income Fund, LP | 693,335,040 | 350,000,000 |
| Principal Life Insurance Company GA4-43579 | 226,836,148 | 38,100,357 |
| Principal MiREIT | 114,131,953 | 0 |
| Proprium Real Estate Special Situations Fund Institutional, LP | 128,231,256 | 0 |
| Rialto Credit Partnership, LP | 2,248,926 | 0 |
| Rialto Real Estate Fund III-Debt, LP | 38,078,094 | 0 |
| Rialto Real Estate Fund III-Property, LP | 16,438,353 | 0 |
| Rialto Real Estate Fund IV - Debt, LP | 74,941,010 | 9,531,172 |
| Rialto Real Estate Fund V-Debt, LP | 22,937,480 | 77,500,000 |
| SFR CM, LP | 100,469,655 | 4,950,495 |
| SM Brell II, LP | 110,324 | 0 |
| Stockbridge Real Estate Fund II-C, LP | 915,677 | 0 |
| Strategic II, LLC | 403,157,301 | 38,767,818 |
| TPG Real Estate Partners III, LP | 28,292,085 | 14,407,357 |
| TPG Real Estate Partners IV, LP | 39,653,212 | 104,484,105 |
| Transwestern Strategic Partners Fund III, LP | 71,453,611 | 7,677,926 |
| Transwestern Strategic Partners Fund IV, LP | 0 | 75,000,000 |
| True North Real Estate Fund III, LLC | 13,798,435 | 5,000,000 |
| TSP Value and Income Fund II, LP | 225,653 | 6,790,952 |
| Warwick UK Real Estate Fund I | 61,890,847 | 0 |
| | \$ 8,620,267,088 | \$ 2,021,558,204 |
| Short-Term Investments & Other | 22,146,731 | 0 |
| Total Real Estate Investments | \$ 8,642,413,819 | \$ 2,021,558,204 |

SMRS

Infrastructure

12/31/24

Market Values by Entity

| | <u>Market Value</u> | <u>Unfunded Commitment</u> |
|--|-------------------------|--------------------------------|
| ArcLight Energy Partners Fund VI, LP | \$ 17,032,266 | \$ 7,004,763 |
| ArcLight Energy Partners VII, LP | 43,429,745 | 14,691,794 |
| ASF Como Co-Investment, LP | 844,104 | 1,441,464 |
| ASF VI Infrastructure B, LP | 9,491,120 | 4,919,972 |
| ASF VII Infrastructure Fund B, LP | 25,311,322 | 6,271,268 |
| ASF VIII Infrastructure B, LP | 36,829,305 | 65,700,863 |
| Basalt Infrastructure Partners, LP | 5,049,642 | 2,219,045 |
| Blackstone Energy Partners II, LP | 59,329,086 | 12,752,989 |
| Blackstone Energy Partners, LP | 9,163,300 | 4,728,291 |
| Blackstone Energy Transition Partners IV, LP | 0 | 100,000,000 |
| Blackstone Green Private Credit Fund III, LP | 23,107,302 | 77,544,146 |
| Brookfield Infrastructure Fund II-B, LP | 42,340,572 | 2,825,603 |
| Customized Infrastructure Strategies, LP | 2,748,933 | 4,364,067 |
| Dalmore Capital Fund, LP | 53,813,873 | 0 |
| * Duration Transportation Infrastructure Capital Partners, LP | 0 | 100,000,000 |
| GCM Grosvenor Customized Infrastructure Strategies II, LP | 16,575,453 | 6,002,006 |
| GCM Grosvenor Customized Infrastructure Strategies III, LP | 63,546,646 | 43,173,559 |
| GCM Grosvenor Infrastructure Investment Program, LP Global | 126,777,184 | 18,339,396 |
| Energy & Power Infrastructure Fund II, LP | 21,125,441 | 2,237,661 |
| GSO Energy Select Opportunities Fund II, LP | 5,109,102 | 34,486,225 |
| GSO Energy Select Opportunities Fund, LP | 2,629,926 | 22,445,028 |
| Irradiant Renewable Opportunities Partners (TE), LP | 74,338,993 | 26,777,648 |
| KKR Eagle Co-Invest, LP | 45,665,908 | 1,917,282 |
| KKR Global Infrastructure Investors IV (USD) SCSp | 93,915,977 | 20,636,759 |
| KKR Global Infrastructure Investors V, LP | 0 | 100,000,000 |
| KKR Global Infrastructure Investors, LP | 18,514 | 2,943,773 |
| KKR Global Infrastructure Investors, LP | 48,108,640 | 5,191,321 |
| Ridgewood Water & Infrastructure Fund, LP | 29,711,776 | 45,050,611 |
| Ridgewood Water & Strategic Infrastructure Fund II, LP RPEP | 67,910 | 0 |
| SMRS Holdings, LLC | 15,284,749 | 7,349,329 |
| StonePeak Infrastructure Fund, LP | 2,521,279 | 6,480,150 |
| TRG AIRRO Fund II, LLC | 79,855,097 | 0 |
| TRG AIRRO India SideCar Fund US, LLC | \$ 953,743,166 | \$ 747,495,013 |
| Short-Term Investments & Other | 34,609,555 | 0 |
| Total Infrastructure Investments | \$ 988,352,720 | \$ 747,495,013 |
| Total Real Estate & Infrastructure Investments | \$ 9,630,766,539 | \$ 2,769,053,217 |

* New or additional commitment made during the quarter reported

State of Michigan Retirement System

REAL RETURN & OPPORTUNISTIC REVIEW

State of Michigan Investment Board Meeting
April 2, 2025



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

EXECUTIVE SUMMARY

Performance

| MPSERS Plan (12/31/24) | 1-Year | 3-Years | 5-Years | 7-Years | 10-Years |
|------------------------|--------|---------|---------|---------|----------|
| Real & Opportunistic | 5.6% | 6.4% | 10.1% | 11.1% | 10.2% |
| Custom Benchmark | 6.5% | 7.2% | 7.4% | 7.3% | 7.3% |

- The portfolio value is \$10.1 billion with a return of 5.6% for the past twelve-month period.
- Performance for the year has been positive for both the Real Asset and Opportunistic strategies. The portfolio underperformed the benchmark on a one-year and three-year basis but outperformed on a five-, seven-, and ten-year basis. Positive performance was primarily driven by income distributions and asset appreciation within the entertainment royalties and real assets strategies along with gains in the Opportunistic Equity portfolio.

Strategy Update

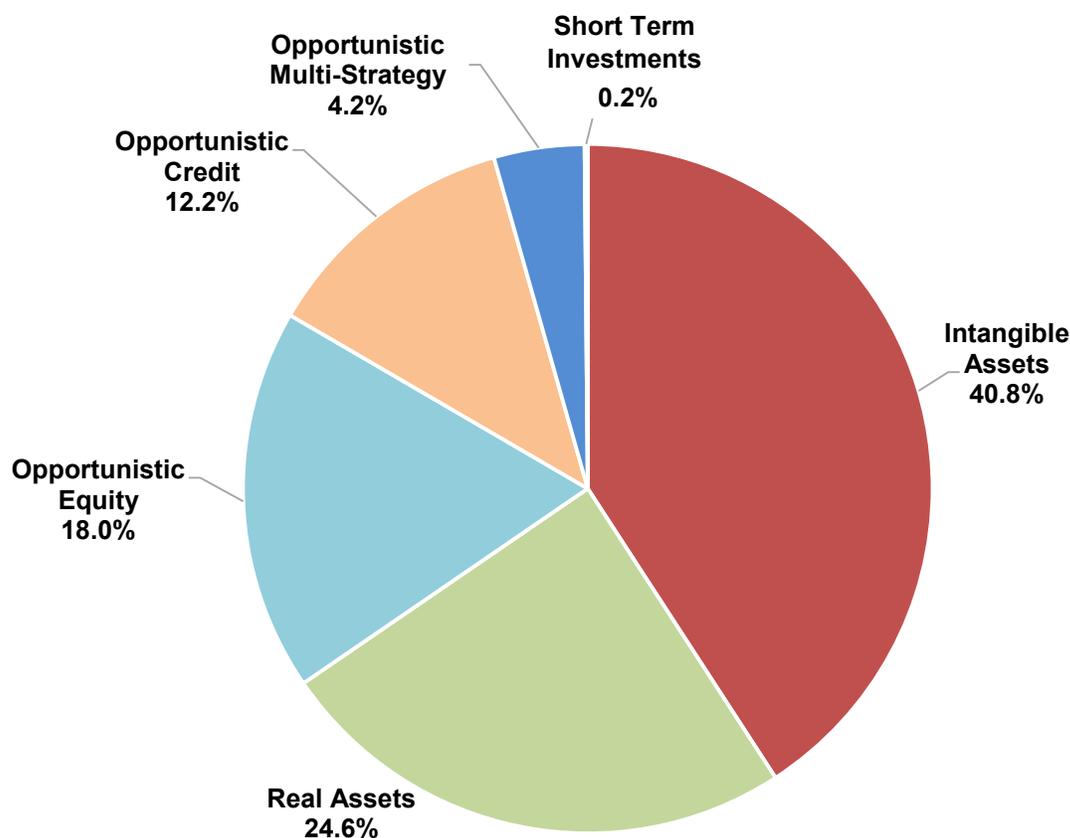
- The objective of the Real Return & Opportunistic portfolio is to provide an inflation hedge and to gain exposure to attractive opportunities that may not fit in any other plan portfolio.
- During the quarter, the Real Return & Opportunistic portfolio continued to benefit from exposure to assets with low equity beta and diversity of strategy, industry, and geography.
- The Real Return & Opportunistic portfolio has approximately \$3.1 billion of unfunded commitments. There were no new commitments closed during the quarter.
- In addition to monitoring opportunities in the private capital markets along with macroeconomic developments, staff remains focused on finding differentiated strategies that are additive to the current portfolio mix and continues to favor niche private markets strategies with some scalability. Staff prefers opportunities that have defensible, contractual cash flows and offer structural downside protection and has a preference for opportunities with experienced investment teams and proven track records.

SMRS

Real Return and Opportunistic

12/31/24

Investments By Strategy

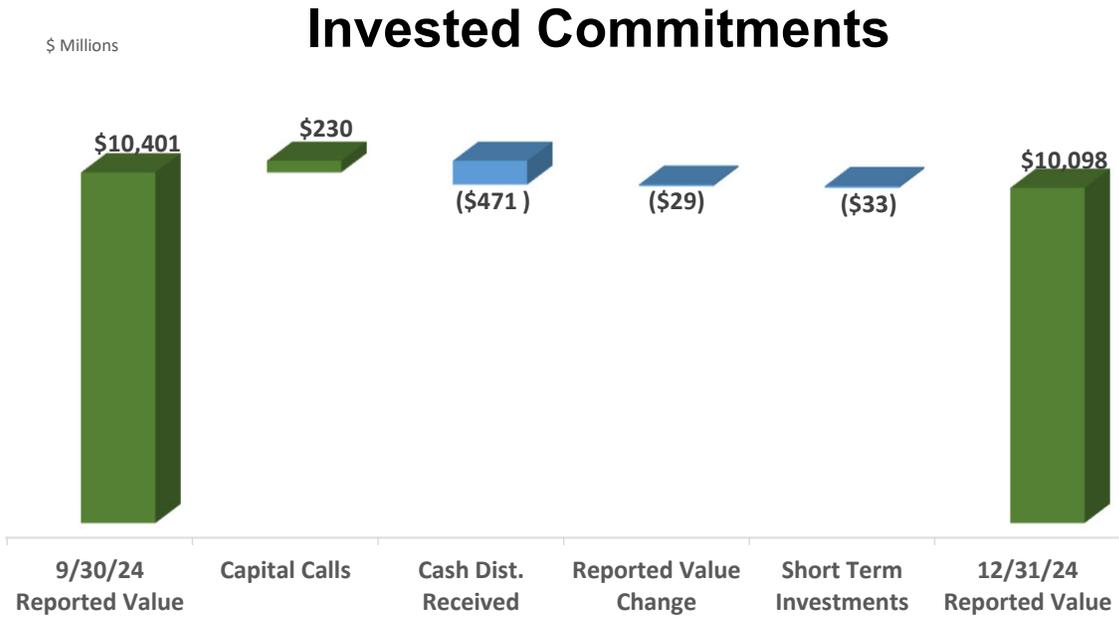


| Market Value in Millions | |
|---------------------------------|-------------------------------|
| | <u>12/31/24</u> |
| Intangible Assets | \$4,124 |
| Real Assets | \$2,484 |
| Opportunistic Equity | \$1,813 |
| Opportunistic Credit | \$1,233 |
| Opportunistic Multi-Strategy | \$428 |
| Short Term Investments | \$16 |
| Total Investments | <u><u>\$10,098</u></u> |

SMRS

Real Return and Opportunistic

12/31/24



SMRS

Real Return and Opportunistic

12/31/24

Net Market Value by Entity

| | Net Market Value | Unfunded Commitment |
|---|--------------------------|-------------------------|
| * Abernathy Fund I, LLC | \$ 215,307,382 | \$ 4,948,241 |
| * Abernathy Fund II, LLC | 30,714,235 | 36,931,418 |
| American Industrial Partners Capital Fund VIII, LP | 46,925,995 | 51,676,364 |
| American Industrial Partners VII, LP | 118,423,452 | 10,808,745 |
| Apollo Financial Credit Investments Fund II, LP | 213,513,738 | 301,950,061 |
| Apollo Financial Credit Investments Fund III, LP | 148,556,876 | 282,605,871 |
| Axton Holdings, LLC | 3,847,335,690 | 0 |
| Blackstone Strategic Capital Holdings (Side Car), LP | 126,113,928 | 0 |
| Blackstone Strategic Capital Holdings II, LP | 169,027,478 | 94,764,155 |
| Blackstone Strategic Capital Holdings, LP | 139,285,139 | 16,164,930 |
| Blue Peninsula Fund, LP | 110,851,983 | 9,988,856 |
| BroadRiver III, LP | 143,736,677 | 59,487,103 |
| BSCH Parallel (MLG) I, LP | 402,570,055 | 0 |
| Castle Credit SMRS Holdings, LLC Series D | 23,302,196 | 442,443 |
| Castle Credit SMRS Holdings, LLC Series E | 83,815,088 | 123,000,000 |
| Centerbridge Capital Partners III, LP | 58,786,611 | 5,306,590 |
| CircleUp Credit Fund I, LP | 569,461 | 900,364 |
| Clearlake Capital Partners VI, LP | 113,918,895 | 3,718,307 |
| Clearlake Opportunities Partners II, LP | 46,546,357 | 25,044,407 |
| Clearlake Opportunities Partners III, LP | 24,774,331 | 77,006,311 |
| Content Holdings, LLC | 11,268,293 | 0 |
| Dawson (Co-Invest) GP Finance 2, LP | 4,036,010 | 46,576,054 |
| Dawson Partners GP Finance 2, LP | 5,956,328 | 146,256,552 |
| Energy Transition Holdings, LLC | 232,359,638 | 0 |
| Green Range , LLC | 2,157,999,330 | 982,260,122 |
| Hopen Life Sciences Fund II, LP | 1,114,366 | 97,500 |
| Nyanza I, LLC | 0 | 2,222 |
| Nyanza II, LLC | 232,522,594 | 66,061,723 |
| Origami Opportunities Fund V, LP | 39,305,591 | 65,835,064 |
| Origami Opportunities Overflow Fund V, LP | 32,210,692 | 75,678,316 |
| * Renaissance Venture Cap Fund II, LP | 19,353,164 | 0 |
| * Renaissance Venture Cap Fund III, LP | 29,393,210 | 1,500,000 |
| Shamrock Capital Content Fund I, LP | 33,300,587 | 34,763,337 |
| Sixth Street Agriculture Partners I, LP | 92,930,584 | 15,604,122 |
| Sixth Street Growth Partners (A), LP | 154,172,268 | 61,073,186 |
| Sixth Street Growth Partners II (A), LP | 93,674,070 | 113,748,954 |
| Sixth Street TAO Partners (B), LP | 278,469,951 | 85,895,203 |
| * Social Network Holdings, LLC | 236,761,164 | 0 |
| Sycamore Partners III, LP | 107,451,234 | 45,544,155 |
| TPG Rise Climate II, LP | 0 | 150,000,000 |
| TPG Rise Climate, LP | 172,468,007 | 100,202,807 |
| Vida Insurance Credit Opportunity Fund II, LP | 82,882,385 | 37,944,695 |
| Total Real Return and Opportunistic Strategies | \$ 10,081,705,033 | \$ 3,133,788,176 |
| Short-Term Investments & Other | 15,907,501 | 0 |
| Grand Total | \$ 10,097,612,534 | \$ 3,133,788,176 |

* Fund of Funds

** New Commitments made during quarter reported

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.