

# Pennsylvania Municipal Retirement System

Quarterly Performance Report  
As of December 31, 2023



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# Marquette Update



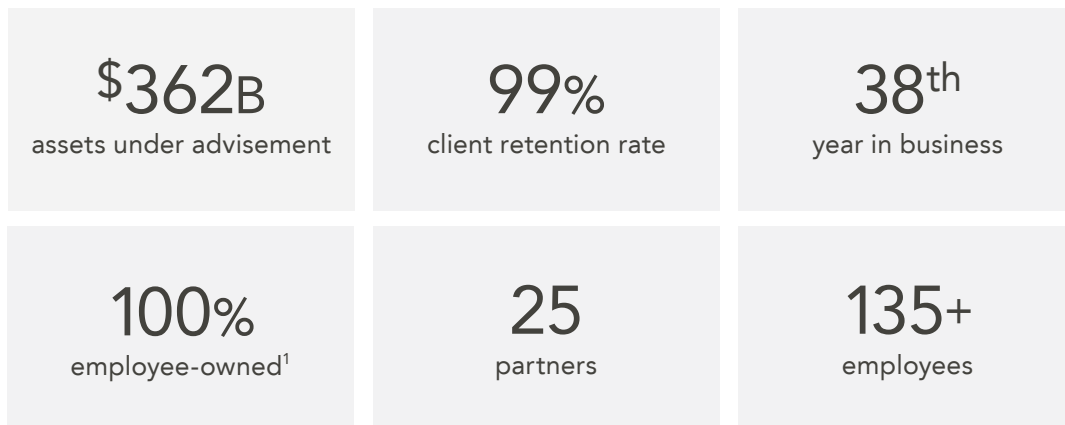
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# Marquette Update

1Q 2024



Our 2024 Market Preview launches January 25 with a live webinar at 1:00pm CT by our research team, featuring in-depth analysis of the final months of 2023 and a look ahead at risks and opportunities to monitor in 2024. Reach out to our team for registration information at [clientservice@marquetteassociates.com](mailto:clientservice@marquetteassociates.com). We'll post the recording to our YouTube channel afterward.



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To register for research and firm updates, please contact our team at [clientservice@marquetteassociates.com](mailto:clientservice@marquetteassociates.com). Client data as of September 30, 2023; firm data as of January 2024. Client retention rate calculated 2013–2022. <sup>1</sup>By current and former employees. Marquette is an independent investment adviser registered under the Investment Advisers Act of 1940, as amended. Registration does not imply a certain level of skill or training. More information about Marquette including our investment strategies, fees and objectives can be found in our ADV Part 2, which is available upon request and on our website.



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Principal

**Stephanie Osten**  
Principal

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Senior Vice President

**Kevin Anderson, CFA**  
Vice President

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VP, Client Service

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**Devon Waskiewicz**  
Sr. Performance Analyst

**Grace Colson**  
Sr. Performance Analyst

**Javier Palma**  
Sr. Performance Analyst

**Michael Kleinman**  
Sr. Performance Analyst

## UPCOMING SPEAKING ENGAGEMENTS

- ▶ Dave Smith speaking at CFNEIA Professional Advisor Education Series 1/17 ([link](#))
- ▶ Lee Martin and Greg Leonberger speaking at KORIED Conference 1/16–1/19
- ▶ Amy Miller speaking at CFA Society Columbus and CAIA Association Event 2/20 ([link](#))
- ▶ Frank Valle speaking at Ohio Institutional Forum 2/29 ([link](#))
- ▶ Ryan P. Tracy speaking at Mountain States Institutional Forum 3/21 ([link](#))

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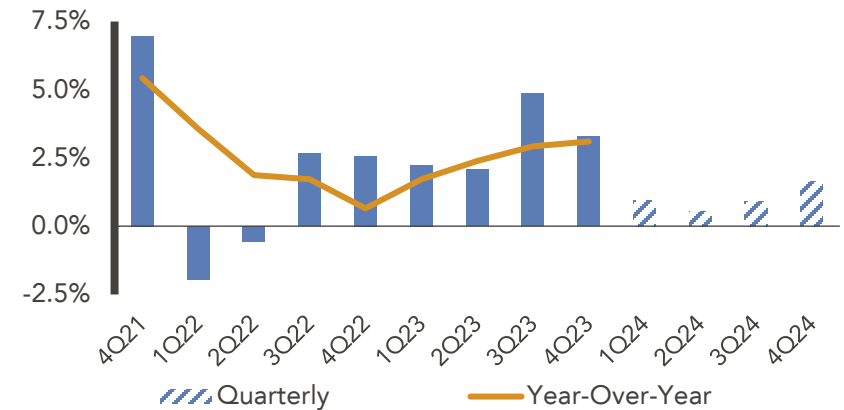
# Market Environment



# U.S. Economy

- U.S. economic growth decelerated slightly in Q4, with real GDP increasing at an annual rate of 3.3%. The slowdown was largely driven by softer consumer spending and lower growth in private inventories compared to Q3.
- Despite the Q4 deceleration, 2023 defied economist expectations of a recession, with data coming in better-than-expected throughout the year. According to The Wall Street Journal's Economic Forecasting Survey from January 2023, the average probability of a recession in the next 12 months was 61% based on the 65 economists who participated.
- While the consumer was a large contributor to unexpected economic strength this year, government spending was abnormally large relative to the strength in the labor market. Based on data from the past 40 years, an unemployment rate below 4% is consistent with a government deficit of approximately 1%, compared to the actual deficit of more than 6%.

U.S. Real GDP Growth<sup>1</sup>



Federal Government Deficit vs. Unemployment Rate

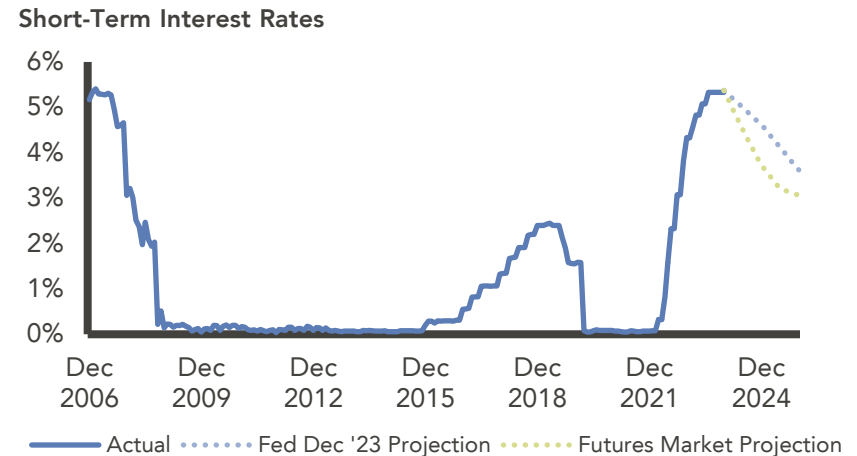
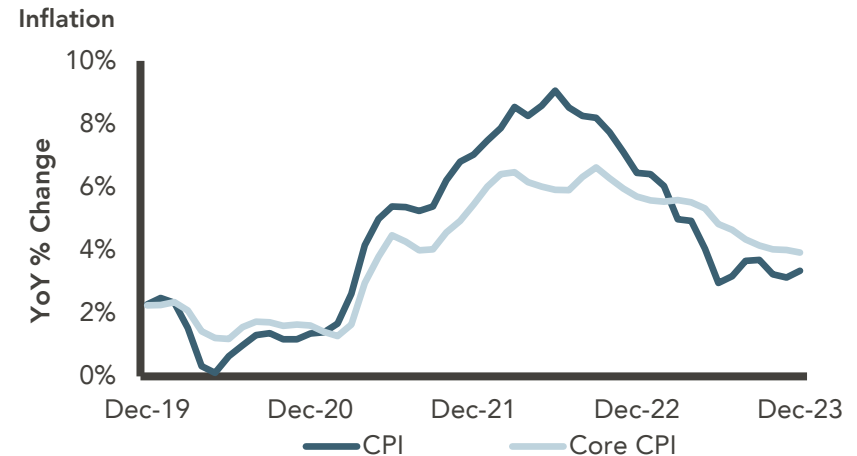


Source: Federal Reserve Bank of St. Louis, Refinitiv, The Wall Street Journal

<sup>1</sup>Striped bars reflect economist estimates from The Wall Street Journal Economic Forecasting Survey

# U.S. Economy

- Though economic growth was strong relative to expectations in 2023, disinflation was notable. Headline CPI and core CPI increased 3.4% and 3.9%, respectively for the year, marking a considerable deceleration from their respective peaks of 9.1% and 6.6% seen in 2022.
- It's an open question how much the historic rate hiking cycle by the Federal Reserve has contributed to the disinflation. In theory, tighter policy restrains spending, discourages investment and weakens the demand for labor. However, given strong economic growth in 2023, it seems that easing supply chain pressures, discounting of goods inventories, and a surge in labor supply likely played a role that was just as, if not more, important than monetary policy.
- Amid lower inflation, the Federal Reserve's base case shows a decrease of 75 basis points in the federal funds rate in 2024. Markets, on the other hand, are pricing in approximately 150 basis points of rate cuts, with the first cut likely to happen in March.

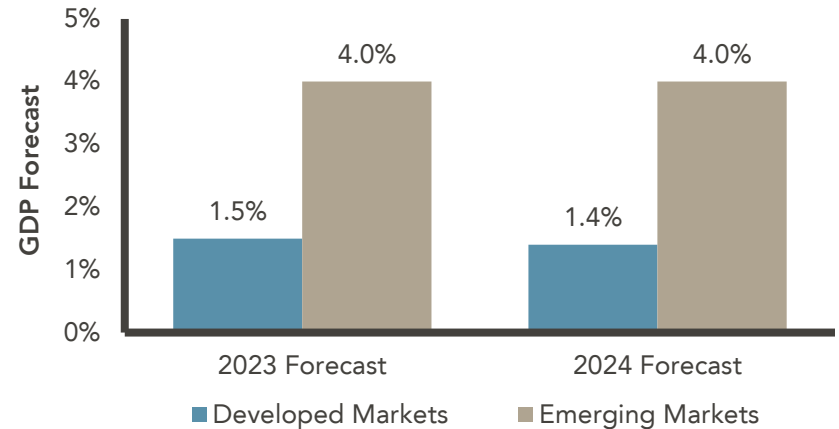


Source: Refinitiv

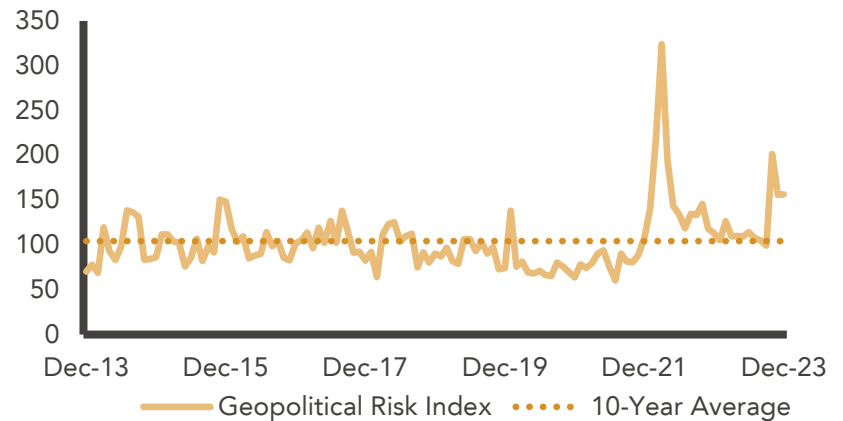
# Global Economy

- Looking ahead to 2024, the IMF sees relatively similar economic growth for both developed and emerging markets economies, respectively. Underneath the surface, however, there is notable dispersion.
- Economic growth in the U.S. is expected to slow amid the lagged effects of monetary policy. In the Eurozone, on the other hand, growth is forecast to accelerate largely due to a rebound in Germany, which has been mired in a manufacturing recession.
- In China, growth is expected to slow as the economy continues to grapple a weak post-COVID rebound amid ongoing deleveraging in the real estate sector.
- While the economic impact from geopolitics is difficult to model, geopolitical risk appears elevated relative to the past decade amid the ongoing Russian invasion of Ukraine and increasing tensions in the Middle East. Further, there are national elections anticipated in 64 countries this year across the world.

Global Economic Growth Forecast



Geopolitical Risk Index

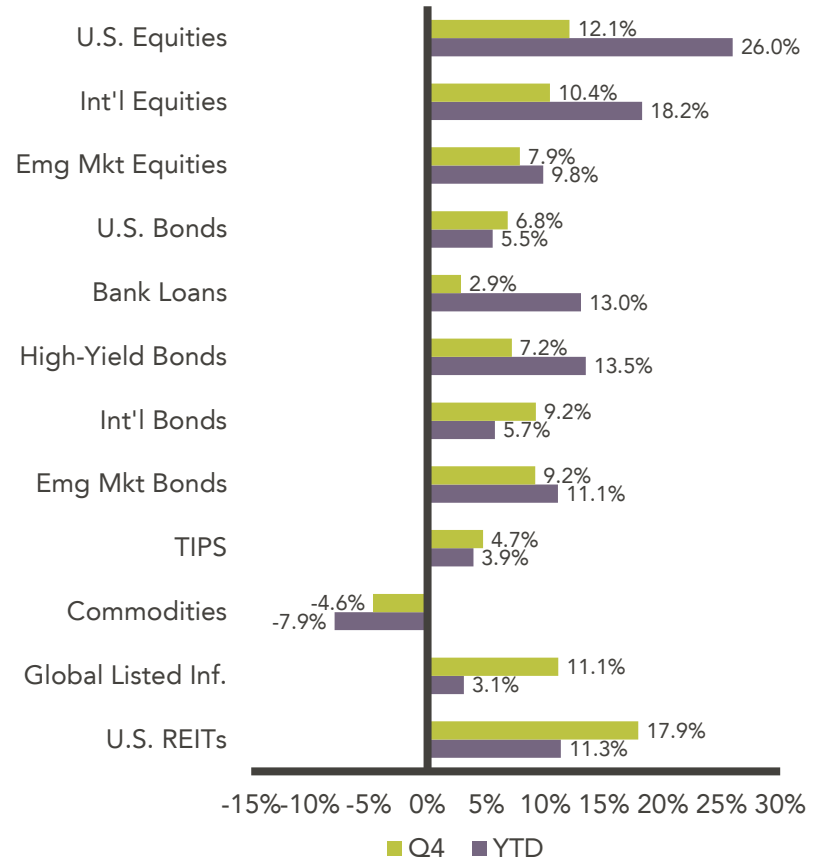


Source: Economic Policy Uncertainty and IMF

# Global Asset Class Performance

- Global equities ended 2023 on a strong note, posting robust gains amid falling interest rates and easing financial conditions. U.S equities outperformed their international counterparts despite U.S. dollar weakness. The greenback contributed approximately 5.5 and 2.3 percentage points, respectively, to international developed and emerging markets returns.
- Fixed income markets were also firmly in the black. Investment-grade bonds generated a return of nearly 7% in Q4 thanks to lower rates across the yield curve. Sub-investment grade debt also generated positive returns, though bank loans underperformed high-yield debt given their floating-rate characteristics.
- Inflation-sensitive assets were mixed in Q4. TIPS posted gains but underperformed their nominal government bond counterparts due to falling inflation expectations. Global listed infrastructure and REITs topped broad global and U.S. equity markets, respectively, as lower rates drove the outperformance. Commodities, on the other hand, were in the red thanks in large part to a 14% plunge in oil prices.

Asset Class Returns: Select Asset Class Performance

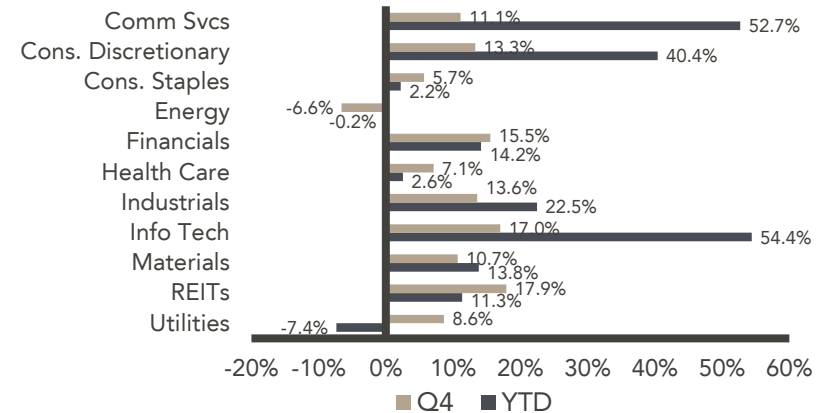


Source: Refinitiv

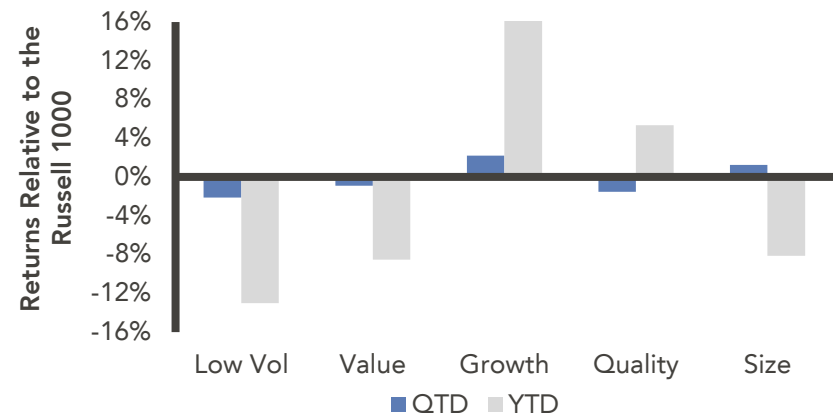
# U.S. Equity Markets

- Economic sector performance was mostly positive in Q4, with all sectors in the black, save Energy. More defensive sectors lagged the broad markets amid the strong gains. At the other end of the spectrum, REITs led the way given falling rates, followed by Information Technology and Financials.
- From a style perspective, growth stocks topped value stocks handily once again in Q4. Value suffered from the underperformance of Energy. For the year, growth outperformed value by nearly 30 percentage points (as measured by their respective Russell 3000 Indices) thanks in large part to outperformance by a handful of mega-cap growth stocks in the first half of the year.
- Lower-quality stocks generally outperformed in Q4, benefiting from falling rates and receding expectations for an economic recession. This led to an improvement in market breadth and strong relative returns for small-cap stocks. Still, all but two of the “Magnificent 7” stocks outperformed the S&P 500 Index in the quarter.

## Sector Returns



## Returns Relative to the Russell 1000

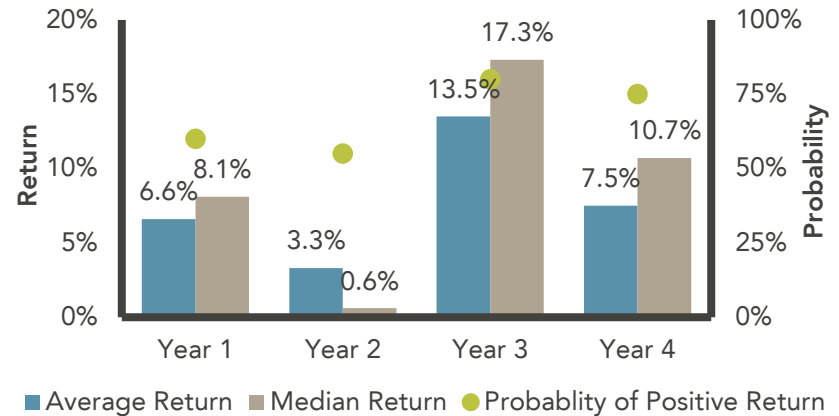


Source: Bloomberg, Refinitiv

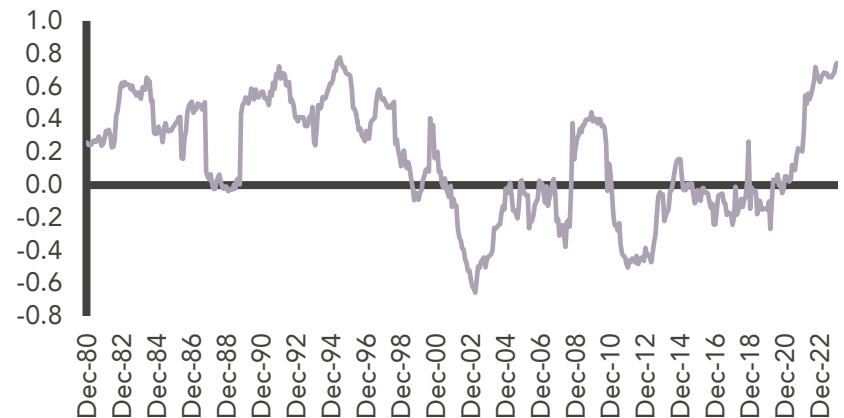
# U.S. Equity Markets

- While the strong 2023 return for U.S. equities masks some intra-year volatility, the U.S. market largely followed the historical script of the presidential cycle, posting double-digit gains.
- If the market continues to align with the historical pattern, history argues that equities will see further, albeit more muted, gains in 2024.
- From a portfolio construction perspective, however, investors should be mindful of the increasingly strong positive correlation between equities and fixed income, which has been a markedly different environment than that witnessed over the previous two decades.
- The relationship was helpful for portfolios in 2023 after hurting returns in 2022. Going forward, it's unclear whether this is a cyclical blip or structural change. With the latter being a material risk, it seems prudent for investors with the size, scale and ability to consider non-traditional asset classes for diversification to have those conversations, at a minimum.

Presidential Cycle Returns



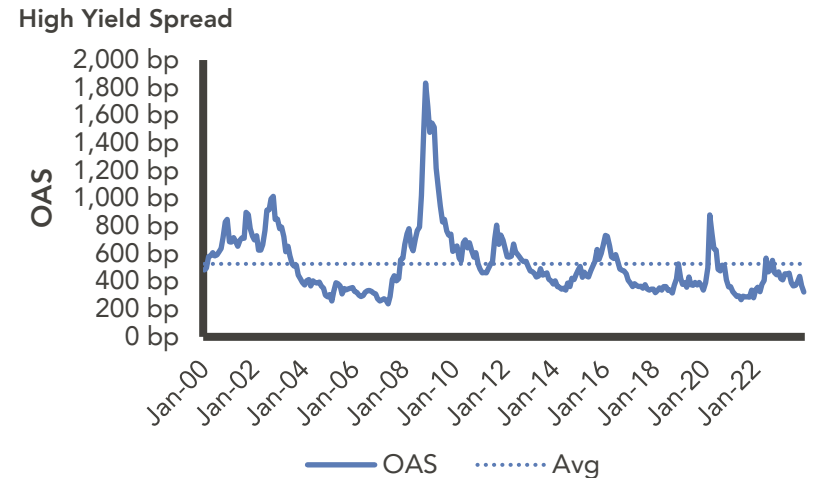
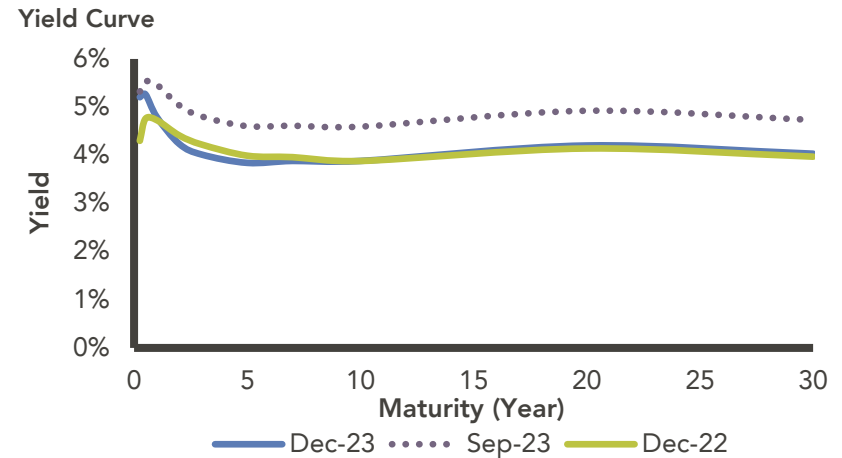
Rolling 2-Year Correlation between Russell 3000 and BBg Aggregate



Source: KKR and Refinitiv

# U.S. Fixed Income

- After setting new cycle highs in October, Treasury yields declined notably by the end of the year amid the Federal Reserve’s long-awaited “pivot” appearing to have taken place at their December policy meeting.
- From a supply perspective, recent treasury issuance has been more heavily skewed to shorter-dated bills, as opposed to coupons, which has also put downward pressure on intermediate- and long-term maturities.
- Given lower rates, the broad investment-grade bond market generated a strong return in Q4, with the Bloomberg Aggregate Index returning 6.8% and bringing its 2023 return firmly in the black.
- Sub-investment grade debt also posted gains amid a strong environment for risk assets, though bank loans underperformed high-yield debt given their floating-rate characteristics. High-yield spreads ended Q4 at their tightest level since December 2021.



Source: Refinitiv



# Global Index Returns

DOMESTIC EQUITY	QTR	YTD	1 Year	3 Year	5 Year	10 Year
S&P 500 Index	11.7	26.3	26.3	10.0	15.7	12.0
Russell 3000 Index	12.1	26.0	26.0	8.5	15.2	11.5
Russell 3000 Growth Index	14.1	41.2	41.2	8.1	18.8	14.3
Russell 3000 Value Index	9.8	11.7	11.7	8.8	10.8	8.3
Russell TOP 200 Index	11.7	29.9	29.9	10.0	16.5	12.7
Russell TOP 200 Growth Index	14.1	46.6	46.6	10.6	20.8	16.1
Russell TOP 200 Value Index	8.0	10.6	10.6	9.0	10.7	8.5
Russell 1000 Index	12.0	26.5	26.5	9.0	15.5	11.8
Russell 1000 Growth Index	14.2	42.7	42.7	9.0	19.5	14.9
Russell 1000 Value Index	9.5	11.5	11.5	8.9	10.9	8.4
Russell Mid-Cap Index	12.8	17.2	17.2	5.9	12.7	9.4
Russell Mid-Cap Growth Index	14.5	25.9	25.9	1.3	13.8	10.6
Russell Mid-Cap Value Index	12.1	12.7	12.7	8.4	11.2	8.3
Russell 2000 Index	14.0	16.9	16.9	2.2	10.0	7.2
Russell 2000 Growth Index	12.7	18.7	18.7	(3.5)	9.2	7.2
Russell 2000 Value Index	15.3	14.6	14.6	7.9	10.0	6.8
<b>DOMESTIC EQUITY BY SECTOR (MSCI)</b>						
Communication Services	11.1	52.7	52.7	2.5	12.4	8.2
Consumer Discretionary	13.3	40.4	40.4	2.8	15.5	12.1
Consumer Staples	5.7	2.2	2.2	6.0	10.9	8.5
Energy	(6.6)	(0.2)	(0.2)	36.6	13.3	2.6
Financials	15.5	14.2	14.2	10.7	11.9	10.0
Health Care	7.1	2.6	2.6	5.4	11.0	11.1
Industrials	13.6	22.5	22.5	10.7	14.7	10.1
Information Technology	17.0	54.4	54.4	12.3	25.2	19.6
Materials	10.7	13.8	13.8	8.6	13.6	8.4
Real Estate	17.9	11.3	11.3	5.6	7.6	7.8
Utilities	8.6	(7.4)	(7.4)	3.3	6.5	8.6

Source: Refinitiv

# Global Index Returns

INTERNATIONAL/GLOBAL EQUITY	QTR	YTD	1 Year	3 Year	5 Year	10 Year
MSCI EAFE (Net)	10.4	18.2	18.2	4.0	8.2	4.3
MSCI EAFE Growth (Net)	12.7	17.6	17.6	0.3	8.8	5.1
MSCI EAFE Value (Net)	8.2	19.0	19.0	7.6	7.1	3.2
MSCI EAFE Small Cap (Net)	11.1	13.2	13.2	(0.7)	6.6	4.8
MSCI AC World Index (Net)	11.0	22.2	22.2	5.7	11.7	7.9
MSCI AC World Index Growth (Net)	12.7	33.2	33.2	3.7	14.6	10.1
MSCI AC World Index Value (Net)	9.2	11.8	11.8	7.3	8.2	5.5
MSCI Europe ex UK (Net)	12.3	21.7	21.7	4.9	9.8	4.7
MSCI United Kingdom (Net)	6.9	14.1	14.1	8.8	6.9	2.5
MSCI Pacific ex Japan (Net)	11.4	6.4	6.4	1.6	5.7	3.9
MSCI Japan (Net)	8.2	20.3	20.3	0.7	6.9	5.0
MSCI Emerging Markets (Net)	7.9	9.8	9.8	(5.1)	3.7	2.7

Source: Refinitiv

# Global Index Returns

FIXED INCOME	QTR	YTD	1 Year	3 Year	5 Year	10 Year
Merrill Lynch 3-month T-Bill	1.4	5.0	5.0	2.2	1.9	1.3
Barclays Intermediate Gov't./Credit	4.6	5.2	5.2	(1.6)	1.6	1.7
Barclays Aggregate Bond	6.8	5.5	5.5	(3.3)	1.1	1.8
Barclays Short Government	2.6	4.3	4.3	(0.1)	1.3	1.1
Barclays Intermediate Government	4.0	4.3	4.3	(1.8)	1.0	1.2
Barclays Long Government	12.7	3.1	3.1	(11.3)	(1.2)	2.3
Barclays Investment Grade Corp.	8.5	8.5	8.5	(3.3)	2.6	3.0
Barclays High Yield Corp. Bond	7.2	13.5	13.5	2.0	5.4	4.6
Credit Suisse Leveraged Loan	2.9	13.0	13.0	5.6	5.6	4.4
JPMorgan Global ex US Bond	9.2	5.7	5.7	(7.2)	(1.6)	(0.8)
JPMorgan Emerging Market Bond	9.2	11.1	11.1	(3.6)	1.7	3.2
INFLATION SENSITIVE						
Consumer Price Index	(0.3)	3.4	3.4	5.6	4.1	2.8
BC TIPS	4.7	3.9	3.9	(1.0)	3.2	2.4
Commodities	(4.6)	(7.9)	(7.9)	10.8	7.2	(1.1)
Gold	11.4	12.8	12.8	2.3	8.9	4.7
REITs	17.9	11.3	11.3	5.6	7.6	7.8
FTSE EPRA/NAREIT Global REITs	14.5	8.7	8.7	0.1	2.1	3.3
NCREIF ODCE*	(5.0)	(12.7)	(12.7)	4.0	3.3	6.3

\*Data are preliminary.

Source: Refinitiv



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Marquette was founded in 1986 with the sole objective of providing investment consulting at the highest caliber of service. Our expertise is grounded in our commitment to client service — our team aims to be a trusted partner and as fiduciaries, our clients' interests and objectives are at the center of everything we do. Our approach brings together the real-world experience of our people and our dedication to creativity and critical thinking in order to empower our clients to meet their goals. Marquette is an independent investment adviser registered under the Investment Advisers Act of 1940, as amended. Registration does not imply a certain level of skill or training. More information about Marquette including our investment strategies, fees and objectives can be found in our ADV Part 2, which is available upon request and on our website. For more information, please visit [www.MarquetteAssociates.com](http://www.MarquetteAssociates.com).

# Portfolio Overview



## Observations

- Market Value as of December 31, 2023, was \$3.3 billion.
- 4<sup>th</sup> Qtr. '23 Return: Total Fund 7.5% (net) vs. Policy Index 7.7%; investment gain of \$230.4 million.
- Contributors to 4<sup>th</sup> Qtr. Performance:
  - Small and Large Cap Growth Equity
  - International Large Cap Core Equity
- Detractors from 4<sup>th</sup> Qtr. Performance:
  - International Growth Equity
  - Timberland
  - Opportunistic Credit
- Longer term performance has been strong:
  - 5-Year Return: 8.6% (35<sup>th</sup> percentile) vs. Policy Index 8.6%; investment gain of \$1.19 billion
  - 10-Year Return: 6.8% (27<sup>th</sup> percentile) vs. Policy Index 6.8%; investment gain of \$1.76 billion
- Low Investment Management Fees: 0.29%

## Looking Ahead

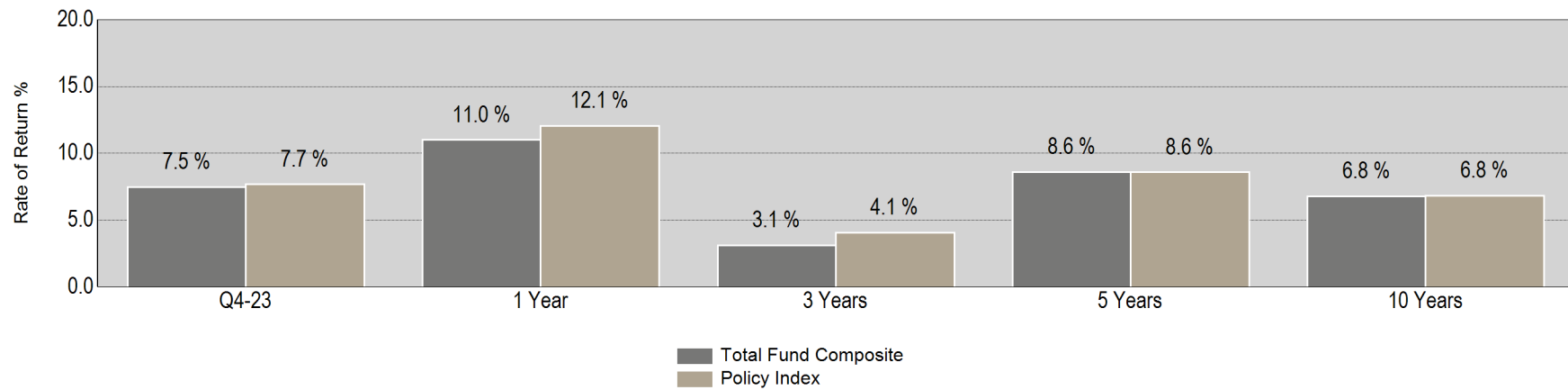
- Transition Manager Search Pending
  - Smith Graham Small Cap Value to Channing Small Cap Value
- International Value Equity discussion – RFPs sent to six semi-finalists

As of December 31, 2023

Summary of Cash Flows

	Fourth Quarter	One Year	Three Years	Five Years	Ten Years
Beginning Market Value	\$3,053,608,056	\$3,021,555,622	\$3,175,810,695	\$2,362,559,830	\$1,946,008,094
Net Cash Flow	\$11,303,231	-\$57,202,989	-\$179,408,090	-\$254,671,394	-\$406,757,105
Net Investment Change	\$230,413,892	\$330,972,546	\$298,922,574	\$1,187,436,743	\$1,756,074,190
Ending Market Value	\$3,295,325,179	\$3,295,325,179	\$3,295,325,179	\$3,295,325,179	\$3,295,325,179

Return Summary (Net)



Asset Allocation vs. Target

	Current	Policy	Difference*
U.S. Equity	33.4%	32.5%	\$31,156,439
Global Equity	4.8%	5.0%	-\$5,789,650
Non-U.S. Equity	15.5%	15.0%	\$17,874,252
Emerging Markets	2.2%	2.5%	-\$8,861,719
Real Assets	16.1%	15.0%	\$35,224,970
U.S. Fixed Income	26.8%	29.0%	-\$73,613,622
Cash Equivalent	1.1%	1.0%	\$4,009,330
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	

As of December 31, 2023

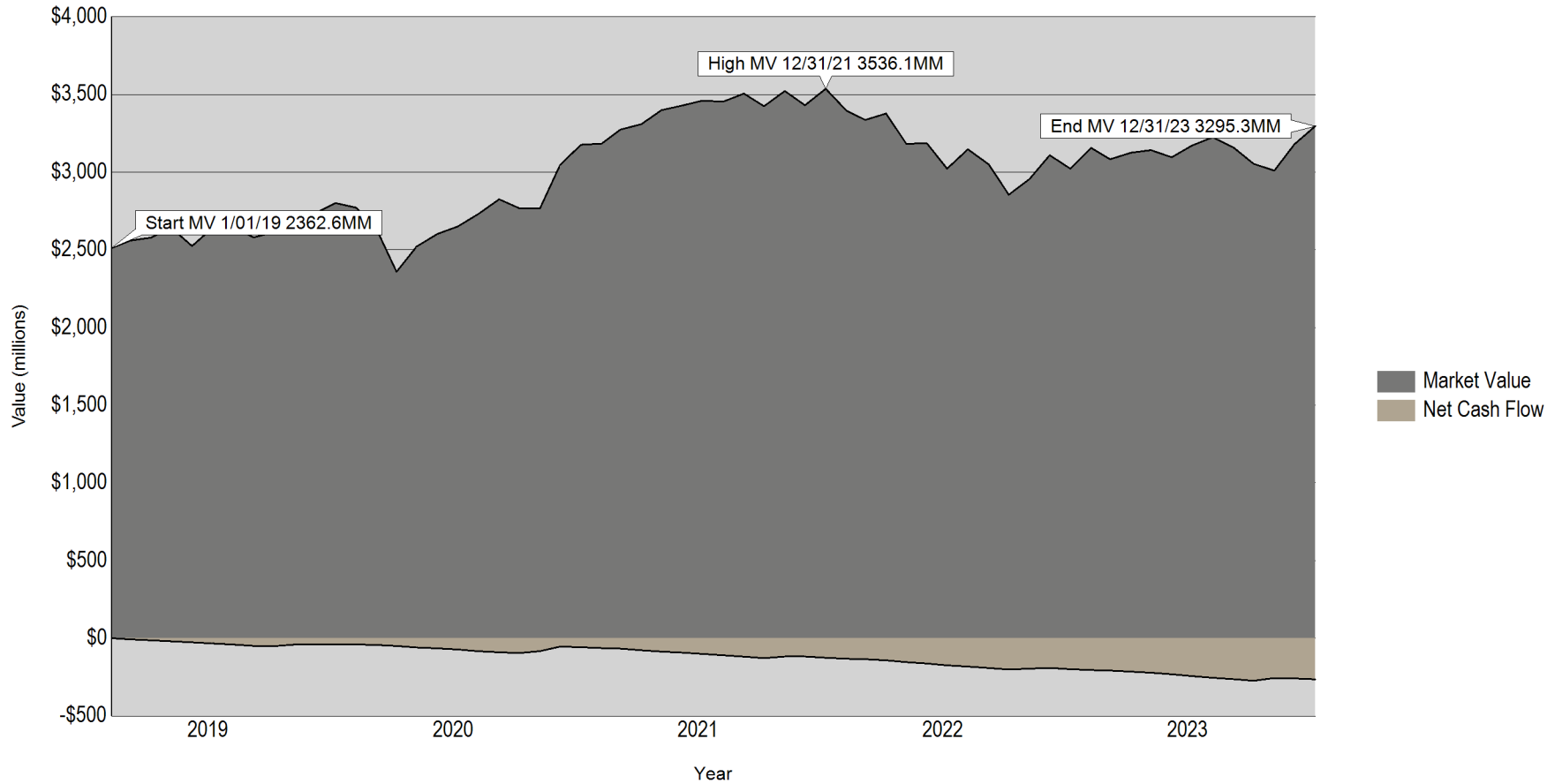
**Cash Flow Summary by Manager From October 01, 2023 to December 31, 2023**

	Beginning Market Value	Net Cash Flow	Net Investment Change	Ending Market Value
MFS Large Cap Value	\$126,488,824	\$0	\$11,955,765	\$138,444,589
Xpance S&P 500	\$264,452,662	\$0	\$30,874,311	\$295,326,973
Northern Trust S&P 500	\$260,371,518	\$0	\$30,431,285	\$290,802,803
Polen Focus Growth	\$102,253,232	\$0	\$14,429,010	\$116,682,242
Northern Trust Dow Jones Completion Index	\$97,913,154	\$0	\$14,779,420	\$112,692,575
Copeland SMID Cap Dividend Growth	\$50,441,429	\$0	\$5,333,020	\$55,774,449
Smith, Graham & Co Small Cap Value	\$42,758,937	\$0	\$5,563,116	\$48,322,053
Emerald Small Cap Growth	\$38,428,136	\$0	\$5,663,305	\$44,091,440
Rhumbline Global Min. Volatility	\$149,341,088	\$0	\$9,635,521	\$158,976,609
SSGA MSCI World ex US	\$250,405,419	\$0	\$26,387,745	\$276,793,164
Hardman Johnston Int'l Equity	\$95,224,380	\$0	\$4,922,580	\$100,146,959
Hudson Edge Int'l Equity	\$119,631,293	\$0	\$15,464,071	\$135,095,364
Jarislowsky, Fraser Limited	\$172,976	\$0	-\$35,434	\$137,542
SSGA MSCI Emerging Markets Index	\$68,203,633	\$0	\$5,317,778	\$73,521,410
Forest Investment Associates	\$144,802,699	\$0	\$4,950,689	\$149,753,387
PRISA LP	\$61,456,369	\$0	-\$3,451,429	\$58,004,940
PRISA II	\$123,758,692	\$0	-\$7,456,404	\$116,302,288
PennMuni-Nuveen U.S. Real Estate Fund	\$203,999,647	\$0	\$0	\$203,999,647
N. Front Street (Nuveen)	\$1,491,859	\$0	-\$28,374	\$1,463,485
SSGA US Aggregate Bond Index	\$329,385,347	\$0	\$22,168,045	\$351,553,392
Federated Hermes Core Aggregate Strategy	\$331,202,909	\$0	\$23,322,915	\$354,525,824
Ares Global Multi-Asset Credit	\$168,032,126	\$0	\$7,919,338	\$175,951,464
Cash Management	\$23,391,729	\$11,303,231	\$2,267,621	\$36,962,582
<b>Total</b>	<b>\$3,053,608,056</b>	<b>\$11,303,231</b>	<b>\$230,413,892</b>	<b>\$3,295,325,179</b>

\*PennMuni-Nuveen RE and N. Front St. Values as of 9/30/2023, adjusted for cash flows where relevant.



Market Value History



# Pennsylvania Municipal Retirement System

# Asset Allocation Summary

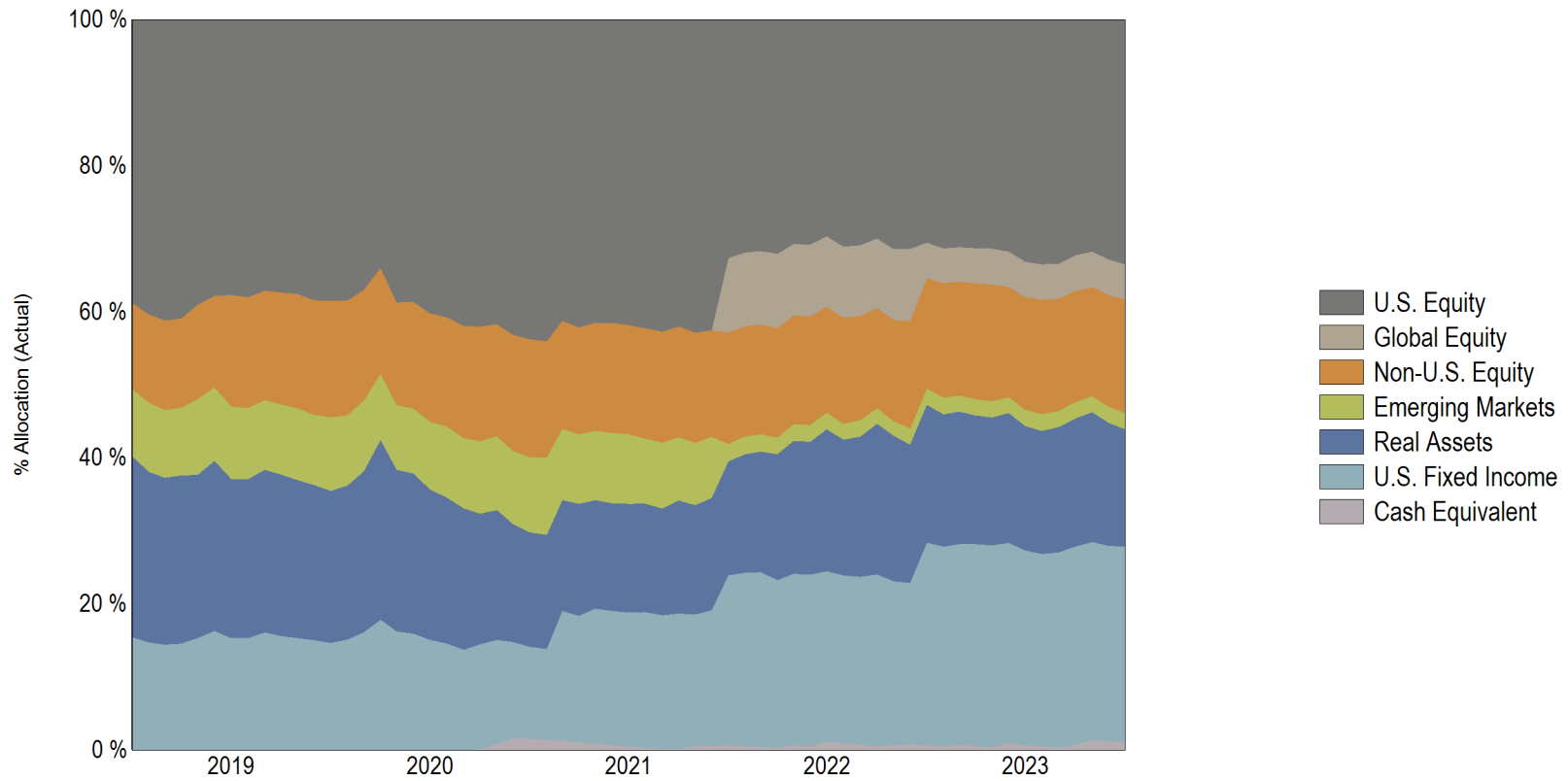
As of December 31, 2023

	Market Value	% of Portfolio	Policy %	Policy Difference
<b>Total Fund Composite</b>	<b>3,295,325,179</b>	<b>100.0</b>	<b>100.0</b>	<b>0</b>
<b>Total Equity Composite</b>	<b>1,846,808,171</b>	<b>56.0</b>	<b>55.0</b>	<b>34,379,322</b>
<b>U.S. Equity Composite</b>	<b>1,102,137,123</b>	<b>33.4</b>	<b>32.5</b>	<b>31,156,439</b>
MFS Large Cap Value	138,444,589	4.2		
Xponance S&P 500	295,326,973	9.0		
Northern Trust S&P 500	290,802,803	8.8		
Polen Focus Growth	116,682,242	3.5		
Northern Trust Dow Jones Completion Index	112,692,575	3.4		
Copeland SMID Cap Dividend Growth	55,774,449	1.7		
Smith, Graham & Co Small Cap Value	48,322,053	1.5		
Emerald Small Cap Growth	44,091,440	1.3		
<b>Global Equity Composite</b>	<b>158,976,609</b>	<b>4.8</b>	<b>5.0</b>	<b>-5,789,650</b>
Rhumblin Global Min. Volatility	158,976,609	4.8		
<b>Non-U.S Equity Composite</b>	<b>585,694,439</b>	<b>17.8</b>	<b>17.5</b>	<b>9,012,533</b>
SSGA MSCI World ex US	276,793,164	8.4		
Hardman Johnston Int'l Equity	100,146,959	3.0		
Hudson Edge Int'l Equity	135,095,364	4.1		
SSGA MSCI Emerging Markets Index	73,521,410	2.2		
<b>Real Assets Composite</b>	<b>529,523,747</b>	<b>16.1</b>	<b>15.0</b>	<b>35,224,970</b>
Forest Investment Associates	149,753,387	4.5		
PRISA LP	58,004,940	1.8		
PRISA II	116,302,288	3.5		
PennMuni-Nuveen U.S. Real Estate Fund	203,999,647	6.2		
N. Front Street (Nuveen)	1,463,485	0.0		
<b>Total Fixed Income Composite</b>	<b>882,030,680</b>	<b>26.8</b>	<b>29.0</b>	<b>-73,613,622</b>
SSGA US Aggregate Bond Index	351,553,392	10.7		
Federated Hermes Core Aggregate Strategy	354,525,824	10.8		
Ares Global Multi-Asset Credit	175,951,464	5.3		
<b>Cash Composite</b>	<b>36,962,582</b>	<b>1.1</b>	<b>1.0</b>	<b>4,009,330</b>

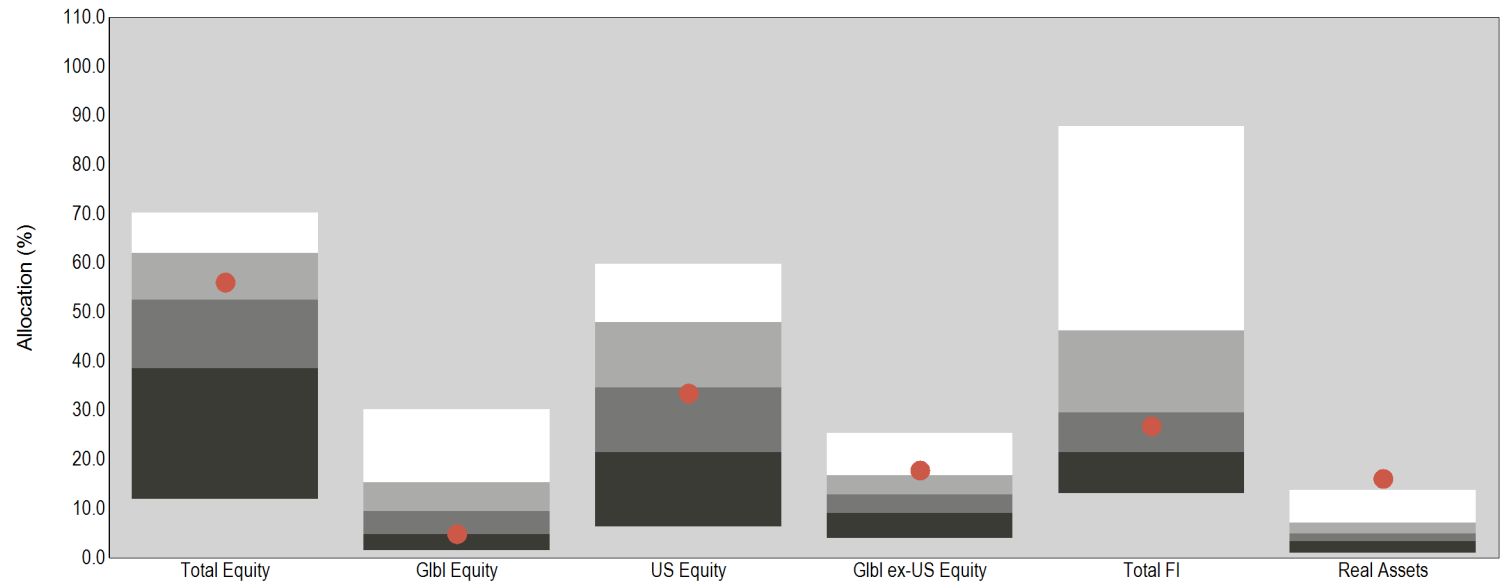
\*PennMuni-Nuveen RE and N. Front St. Values as of 9/30/2023, adjusted for cash flows where relevant.

\*Residual value for Jarislowsky (approx. \$138K) included in Non-US Equity and Total Fund Composite values.

Asset Allocation History



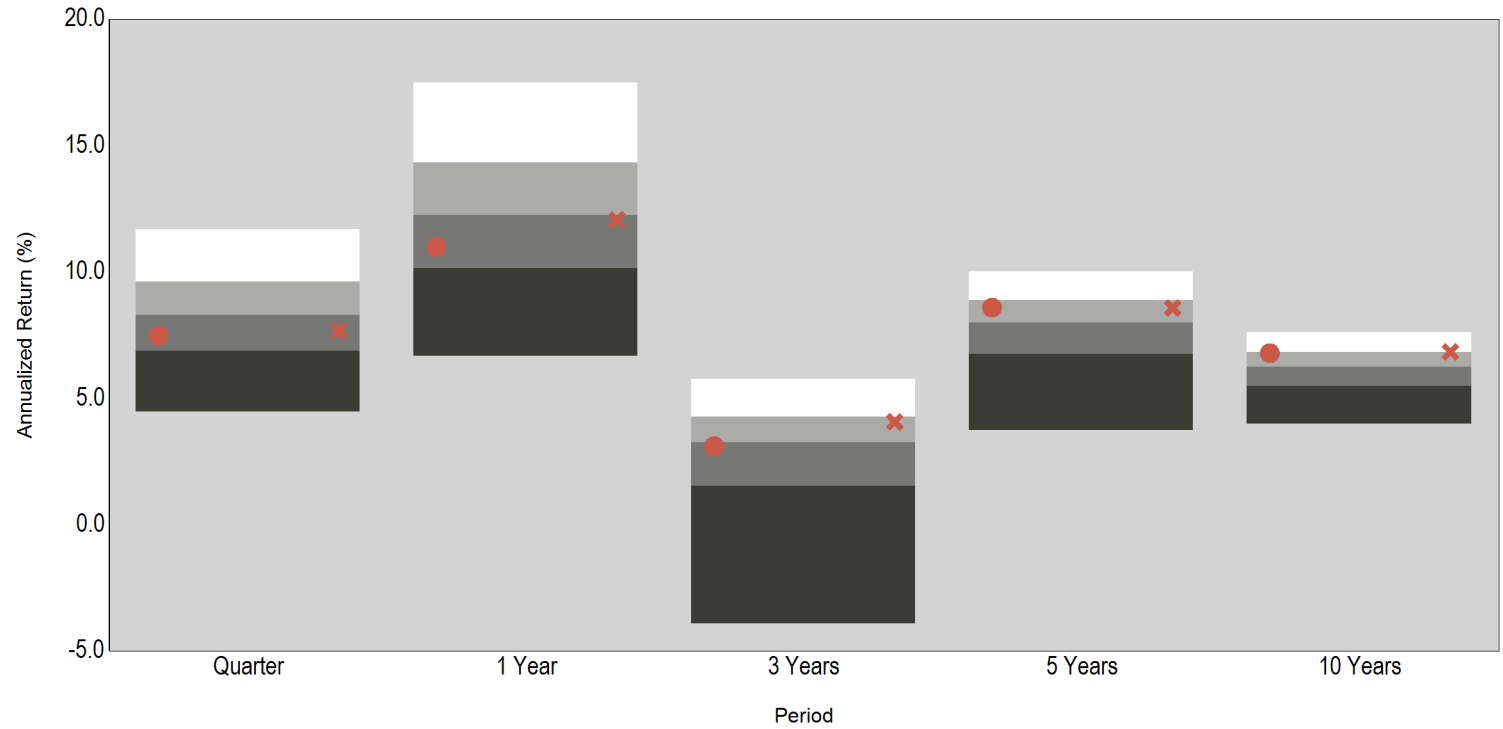
Total Plan Allocation vs. InvMetrics All DB Net  
As of December 31, 2023



Allocation (Rank)

5th Percentile	70.2	30.3	59.8	25.4	87.9	13.8						
25th Percentile	62.1	15.3	48.0	16.8	46.2	7.1						
Median	52.6	9.4	34.7	12.9	29.6	4.9						
75th Percentile	38.6	4.8	21.4	9.1	21.5	3.3						
95th Percentile	11.9	1.6	6.4	4.0	13.2	1.0						
# of Portfolios	1,326	313	1,236	1,149	1,374	303						
● Total Fund Composite	56.0	(43)	4.8	(75)	33.4	(53)	17.8	(23)	26.8	(58)	16.1	(4)

InvMetrics All DB Net Return Comparison

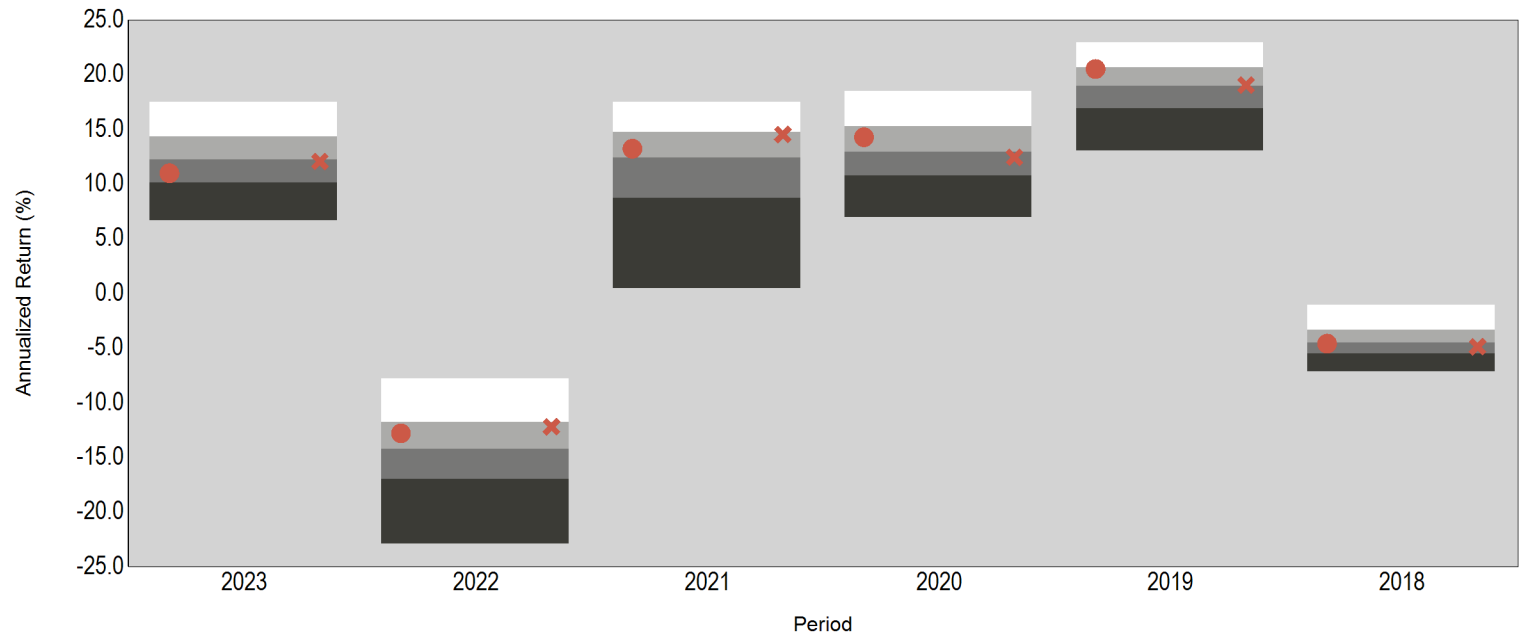


Return (Rank)

5th Percentile	11.7		17.5		5.8		10.0		7.6	
25th Percentile	9.6		14.3		4.3		8.9		6.8	
Median	8.3		12.2		3.2		8.0		6.2	
75th Percentile	6.9		10.1		1.5		6.7		5.5	
95th Percentile	4.5		6.7		-3.9		3.7		4.0	
# of Portfolios	1,467		1,452		1,399		1,362		1,142	
● Total Fund Composite	7.5	(67)	11.0	(66)	3.1	(54)	8.6	(35)	6.8	(27)
▲ Policy Index	7.7	(63)	12.1	(53)	4.1	(31)	8.6	(36)	6.8	(25)

As of December 31, 2023

InvMetrics All DB Net Return Comparison



	2023		2022		2021		2020		2019		2018	
<b>Return (Rank)</b>												
5th Percentile	17.5		-7.8		17.5		18.5		23.0		-1.1	
25th Percentile	14.3		-11.8		14.7		15.3		20.7		-3.3	
Median	12.2		-14.2		12.4		12.9		18.9		-4.5	
75th Percentile	10.1		-17.0		8.7		10.8		16.9		-5.5	
95th Percentile	6.7		-22.9		0.5		7.0		13.0		-7.2	
# of Portfolios	1,452		1,531		1,646		1,745		1,580		1,647	
● Total Fund Composite	11.0	(66)	-12.8	(35)	13.2	(42)	14.3	(36)	20.5	(27)	-4.6	(53)
▲ Policy Index	12.1	(53)	-12.2	(30)	14.5	(27)	12.4	(56)	19.0	(49)	-4.9	(60)

**RISK RETURN STATISTICS**  
January 01, 2019 Through December 31, 2023

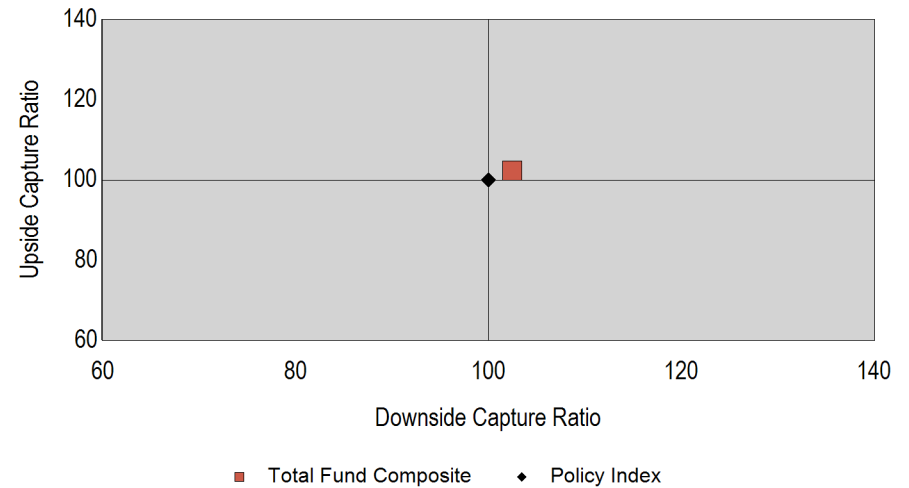
	Total Fund Composite	Policy Index
<b>RETURN SUMMARY STATISTICS</b>		
Number of Periods	20	20
Maximum Return	13.40	12.26
Minimum Return	-15.48	-14.88
Annualized Return	8.58	8.57
Total Return	50.94	50.84
Annualized Excess Return Over Risk Free	6.79	6.78
Annualized Excess Return	0.01	0.00

	Total Fund Composite	Policy Index
<b>RISK SUMMARY STATISTICS</b>		
Beta	1.04	1.00
Upside Deviation	7.23	6.83
Downside Deviation	10.94	10.81

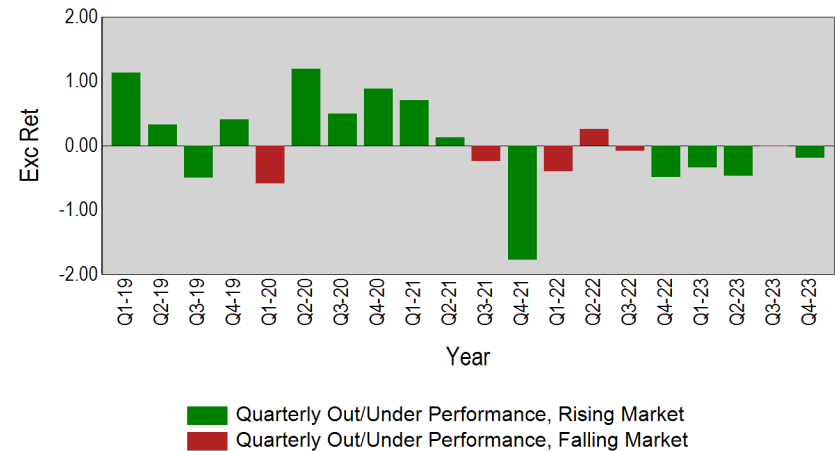
	Total Fund Composite	Policy Index
<b>RISK/RETURN SUMMARY STATISTICS</b>		
Annualized Standard Deviation	14.30	13.69
Alpha	-0.07	0.00
Sharpe Ratio	0.47	0.49
Excess Return Over Market / Risk	0.00	0.00
Tracking Error	1.39	0.00
Information Ratio	0.01	--

	Total Fund Composite	Policy Index
<b>CORRELATION STATISTICS</b>		
R-Squared	0.99	1.00
Correlation	1.00	1.00

**Upside Capture Ratio vs. Downside Capture Ratio**  
5 Years Ending December 31, 2023



**Quarterly Excess Performance**  
Total Fund Composite vs. Policy Index



# Pennsylvania Municipal Retirement System

## Performance Summary (Net)

As of December 31, 2023

	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	Market Value	Inception	Inception Date
<b>Total Fund Composite</b>	<b>7.5</b>	<b>11.0</b>	<b>3.1</b>	<b>8.6</b>	<b>6.8</b>	<b>3,295,325,179</b>	<b>8.4</b>	<b>Jan-86</b>
Policy Index	7.7	12.1	4.1	8.6	6.8		8.9	Jan-86
InvMetrics All DB Net Rank	67	66	54	35	27		31	Jan-86
<b>Total Equity Composite</b>	<b>10.8</b>	<b>19.0</b>	<b>4.9</b>	<b>--</b>	<b>--</b>	<b>1,846,808,171</b>	<b>10.3</b>	<b>Oct-20</b>
MSCI ACWI IMI Net USD	11.1	21.6	5.5	--	--		9.8	Oct-20
<b>U.S. Equity Composite</b>	<b>12.1</b>	<b>23.2</b>	<b>7.4</b>	<b>14.5</b>	<b>10.6</b>	<b>1,102,137,123</b>	<b>9.0</b>	<b>Jan-06</b>
Russell 3000	12.1	26.0	8.5	15.2	11.5		9.7	Jan-06
InvMetrics Public DB US Eq Net Rank	32	58	79	47	45		44	Jan-06
MFS Large Cap Value	9.5	8.3	--	--	--	138,444,589	11.3	Jun-22
Russell 1000 Value	9.5	11.5	--	--	--		11.8	Jun-22
eV US Large Cap Value Equity Net Rank	60	78	--	--	--		63	Jun-22
Xponance S&P 500	11.7	26.2	--	--	--	295,326,973	1.7	Dec-21
S&P 500	11.7	26.3	--	--	--		1.7	Dec-21
eV US Large Cap Core Equity Net Rank	45	24	--	--	--		40	Dec-21
Northern Trust S&P 500	11.7	26.3	--	--	--	290,802,803	1.7	Dec-21
S&P 500	11.7	26.3	--	--	--		1.7	Dec-21
eV US Large Cap Core Equity Net Rank	45	24	--	--	--		40	Dec-21
Polen Focus Growth	14.1	37.5	2.4	14.9	14.2	116,682,242	14.8	Oct-10
Russell 1000 Growth	14.2	42.7	8.9	19.5	14.9		15.9	Oct-10
eV US Large Cap Growth Equity Net Rank	41	53	83	76	16		26	Oct-10
Northern Trust Dow Jones Completion Index	15.1	25.1	--	--	--	112,692,575	-4.0	Dec-21
Dow Jones U.S. Completion Total Stock Market	14.9	25.0	--	--	--		-4.2	Dec-21
eV US Small-Mid Cap Core Equity Net Rank	5	12	--	--	--		80	Dec-21
Copeland SMID Cap Dividend Growth	10.6	19.4	9.5	12.7	--	55,774,449	9.9	Sep-17
Russell 2500	13.4	17.4	2.4	10.1	--		6.5	Sep-17
Russell 2000	14.0	16.9	2.2	10.0	--		6.5	Sep-17
eV US Small Cap Core Equity Net Rank	81	28	25	36	--		19	Sep-17
Smith, Graham & Co Small Cap Value	12.9	13.3	4.2	11.3	--	48,322,053	6.1	Dec-16
Russell 2000 Value	15.3	14.6	7.9	10.0	--		6.6	Dec-16
Russell 2000	14.0	16.9	2.2	10.0	--		7.7	Dec-16
eV US Small Cap Value Equity Net Rank	46	72	95	56	--		81	Dec-16
Emerald Small Cap Growth	14.7	18.9	-2.3	11.1	8.9	44,091,440	10.2	Oct-98
Russell 2000 Growth	12.7	18.7	-3.5	9.2	7.2		7.6	Oct-98
eV US Small Cap Growth Equity Net Rank	8	34	49	55	43		57	Oct-98



# Pennsylvania Municipal Retirement System

## Performance Summary (Net)

As of December 31, 2023

	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	Market Value	Inception	Inception Date
<b>Global Equity Composite</b>	<b>6.4</b>	<b>7.4</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>158,976,609</b>	<b>-3.3</b>	<b>Dec-21</b>
<i>Global Equity Policy Index</i>	6.5	7.7	--	--	--		-3.5	Dec-21
<i>InvMetrics Public DB Gbl Eq Net Rank</i>	98	99	--	--	--		94	Dec-21
Rhumblin Global Min. Volatility	6.4	7.4	--	--	--	158,976,609	-1.7	Dec-21
<i>MSCI ACWI Minimum Volatility Index</i>	6.5	7.7	--	--	--		-1.7	Dec-21
<i>MSCI ACWI</i>	11.0	22.2	--	--	--		-0.1	Dec-21
<i>eV Global Low Volatility Equity Net Rank</i>	74	73	--	--	--		74	Dec-21
<b>Non-U.S Equity Composite</b>	<b>9.7</b>	<b>14.9</b>	<b>0.4</b>	<b>8.0</b>	<b>4.7</b>	<b>585,694,439</b>	<b>6.9</b>	<b>May-12</b>
<i>MSCI ACWI ex USA IMI</i>	9.8	15.6	1.5	7.2	4.0		6.4	May-12
<i>InvMetrics Public DB ex-US Eq Net Rank</i>	54	72	59	31	18		25	May-12
SSGA MSCI World ex US	10.5	18.3	4.7	8.8	4.7	276,793,164	6.2	Apr-12
<i>MSCI World ex USA</i>	10.5	17.9	4.4	8.5	4.3		5.8	Apr-12
<i>eV ACWI ex-US Core Equity Net Rank</i>	39	31	16	35	47		39	Apr-12
Hardman Johnston Int'l Equity	5.2	5.7	-6.5	8.2	5.6	100,146,959	7.1	Apr-12
<i>MSCI EAFE</i>	10.4	18.2	4.0	8.2	4.3		6.0	Apr-12
<i>MSCI ACWI ex USA Growth</i>	11.1	14.0	-2.7	7.5	4.5		5.5	Apr-12
<i>eV EAFE All Cap Equity Net Rank</i>	99	99	96	40	16		22	Apr-12
Hudson Edge Int'l Equity	12.8	18.1	5.5	10.8	5.9	135,095,364	8.8	Feb-12
<i>MSCI EAFE</i>	10.4	18.2	4.0	8.2	4.3		6.3	Feb-12
<i>MSCI ACWI ex USA Value</i>	8.4	17.3	5.8	6.3	2.9		4.4	Feb-12
<i>eV EAFE All Cap Equity Net Rank</i>	10	46	25	11	13		9	Feb-12
SSGA MSCI Emerging Markets Index	7.8	9.6	-5.2	3.6	2.5	73,521,410	6.3	Nov-08
<i>MSCI Emerging Markets</i>	7.9	9.8	-5.1	3.7	2.7		6.5	Nov-08
<i>eV Emg Mkts Equity Net Rank</i>	54	64	61	80	78		76	Nov-08

# Pennsylvania Municipal Retirement System

## Performance Summary (Net)

As of December 31, 2023

	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	Market Value	Inception	Inception Date
<b>Real Assets Composite</b>	<b>-0.8</b>	<b>-4.9</b>	<b>4.3</b>	<b>3.7</b>	<b>5.9</b>	<b>529,523,747</b>	<b>7.2</b>	<b>Apr-93</b>
<i>Real Assets Policy Index</i>	-1.9	-5.7	7.5	5.4	7.4		7.4	Apr-93
Forest Investment Associates	3.6	7.5	9.8	4.9	5.7	149,753,387	4.4	Mar-99
<i>NCREIF Timberland Property Index</i>	4.3	9.5	10.5	6.6	5.8		6.4	Mar-99
PRISA LP	-4.8	-11.5	4.0	3.8	6.7	58,004,940	6.0	Jan-86
<i>NFI-ODCE</i>	-5.0	-12.7	4.0	3.3	6.3		5.9	Jan-86
<i>InvMetrics Public DB Real Estate Priv Net Rank</i>	62	38	55	41	37		--	Jan-86
PRISA II	-5.4	-13.3	3.8	3.5	7.1	116,302,288	3.6	Jul-07
<i>NFI-ODCE</i>	-5.0	-12.7	4.0	3.3	6.3		4.3	Jul-07
<i>InvMetrics Public DB Real Estate Priv Net Rank</i>	77	42	58	61	35		56	Jul-07
PennMuni-Nuveen U.S. Real Estate Fund	0.0	-5.9	1.3	3.4	6.1	203,999,647	5.2	Dec-08
<i>NFI-ODCE</i>	-5.0	-12.7	4.0	3.3	6.3		5.1	Dec-08
<i>InvMetrics Public DB Real Estate Priv Net Rank</i>	5	18	91	64	67		55	Dec-08
N. Front Street (Nuveen)	0.0	4.4	-7.8	-4.8	--	1,463,485	-7.2	Sep-16
<i>Consumer Price Index</i>	-0.3	3.4	5.6	4.1	--		3.4	Sep-16
<b>Total Fixed Income Composite</b>	<b>6.4</b>	<b>7.0</b>	<b>-3.1</b>	<b>1.3</b>	<b>1.9</b>	<b>882,030,680</b>	<b>5.6</b>	<b>Jan-86</b>
<i>Bloomberg US Aggregate TR</i>	6.8	5.5	-3.3	1.1	1.8		5.6	Jan-86
<i>InvMetrics Public DB US Fix Inc Net Rank</i>	50	23	80	84	56		--	Jan-86
SSGA US Aggregate Bond Index	6.7	5.7	-3.3	1.1	1.8	351,553,392	4.3	Apr-97
<i>Bloomberg US Aggregate TR</i>	6.8	5.5	-3.3	1.1	1.8		4.3	Apr-97
<i>eV US Core Fixed Inc Net Rank</i>	57	65	70	85	77		78	Apr-97
Federated Hermes Core Aggregate Strategy	7.0	5.2	--	--	--	354,525,824	1.4	Jul-22
<i>Bloomberg US Aggregate TR</i>	6.8	5.5	--	--	--		1.6	Jul-22
<i>eV US Core Fixed Inc Net Rank</i>	28	83	--	--	--		83	Jul-22
Ares Global Multi-Asset Credit	4.7	13.7	--	--	--	175,951,464	13.7	Dec-22
<i>50% Bloomberg HY / 50% CSFB Lev Loans</i>	5.0	13.3	--	--	--		13.3	Dec-22
<i>eV US High Yield Fixed Inc Net Rank</i>	84	14	--	--	--		14	Dec-22
<b>Cash Composite</b>						<b>36,962,582</b>		

\*PennMuni-Nuveen RE and N. Front St. Values as of 9/30/2023, adjusted for cash flows where relevant.

\*NCREIF Timberland Property Index return not available at time of reporting.

As of December 31, 2023

Investment Manager	Asset Class	Status	Reason
MFS Large Cap Value	US Stock Large Cap Value	In Compliance	---
Xponance S&P 500	US Stock Large Cap Core	In Compliance	---
Northern Trust S&P 500	US Stock Large Cap Core	In Compliance	---
Polen Focus Growth	US Stock Large Cap Growth	In Compliance	---
Northern Trust Dow Jones Completion Index	US Stock SMID Cap Core	In Compliance	---
Smith, Graham & Co Small Cap Value	US Stock Small Cap Value	Alert	Organizational Issues
Copeland Small Cap Dividend Growth	US Stock Small Cap Core	In Compliance	---
Emerald Small Cap Growth	US Stock Small Cap Growth	In Compliance	---
Rhumblin Global Min. Volatility	Global Stock Low Volatility	In Compliance	---
SSGA MSCI World ex US	Non-US Stock All Cap Core	In Compliance	---
Hardman Johnston Int'l Equity	Non-US Stock All Cap Core	In Compliance	---
HGK Int'l Equity	Non-US Stock All Cap Core	In Compliance	---
SSGA MSCI Emerging Markets Index	Non-US Stock Emerging	In Compliance	---
Forest Investment Associates	Real Assets - Timberland	In Compliance	---
PRISA LP	Real Estate	In Compliance	---
PRISA II	Real Estate	In Compliance	---
PennMuni-Nuveen U.S. Real Estate Fund	Real Estate	In Compliance	---
N. Front Street (Nuveen)	Real Estate	In Compliance	---
SSGA US Aggregate Bond Index	US Fixed Income Core	In Compliance	---
Federated Hermes Core Aggregate Strategy	US Fixed Income Core	In Compliance	---
Ares Global Multi-Asset Credit Fund	Opportunistic Credit	In Compliance	---

### Investment Manager Evaluation Terminology

The following terminology has been developed by Marquette Associates to facilitate efficient communication between the investment program's responsible parties. Each term signifies a particular status with the investment program.

**In Compliance** – Marquette has not been notified of any issues or changes to the investment manager that would materially impede upon its ability to execute the investment strategy or adhere to any applicable investment guidelines.

**Alert** – The investment manager has experienced a problem in performance (usually relative to a benchmark), a change in investment characteristics, an alteration in management style, ownership, or key investment professionals, and/or any other irregularities that may impede upon its ability to execute the investment strategy or adhere to any applicable investment guidelines.

**On Notice** – The investment manager has experienced continued concern with one or more Alert issues. Failure to improve upon stated issues within a certain time frame may justify termination.

**Termination** – The investment manager has been terminated and transition plans are in place.

**Policy Index History**

<b>Total Fund Composite</b>		
12/1/2022	Present	32.5% Russell 3000 / 5% Global Equity Policy Index / 17.5% MSCI ACWI ex USA IMI / 15% Real Assets Policy Index / 29% Bloomberg US Aggregate TR / 1% 91 Day T-Bills
1/1/2022	11/30/2022	32.5% Russell 3000 / 10% Global Equity Policy Index / 17.5% MSCI ACWI ex USA IMI / 15% Real Assets Policy Index / 24% Bloomberg US Aggregate TR / 1% 91 Day T-Bills
10/1/2020	12/31/2021	25% S&P 500 / 15% Russell 2000 / 15% MSCI EAFE / 10% MSCI Emerging Markets / 20% NFI-ODCE / 15% Bloomberg US Aggregate TR
<b>Total Equity Composite</b>		
10/1/2020	Present	MSCI ACWI IMI Net USD
<b>U.S. Equity Composite</b>		
1/1/2006	Present	Russell 3000
<b>Large Cap U.S. Equity Composite</b>		
1/1/1986	Present	S&P 500
<b>SMID Cap U.S. Equity Composite</b>		
1/1/1993	Present	Russell 2000
<b>Global Equity Composite</b>		
12/1/2022	Present	100% MSCI ACWI Minimum Volatility Index
1/1/2022	11/30/2022	50% MSCI ACWI / 50% MSCI ACWI Minimum Volatility Index
<b>Non-U.S Equity Composite</b>		
5/31/2012	Present	MSCI ACWI ex USA IMI
<b>Developed Non-U.S. Equity Composite</b>		
1/1/1993	Present	MSCI EAFE
<b>Emerging Markets Composite</b>		
1/1/2009	Present	MSCI Emerging Markets
<b>Real Assets Composite</b>		
1/1/2024	Present	0.00
1/1/2022	12/31/2023	66.67% NFI-ODCE / 33.33% NCREIF Timberland Property Index
4/1/1993	12/31/2021	100% NFI-ODCE
<b>Total Fixed Income Composite</b>		
1/31/1986	Present	Bloomberg US Aggregate TR
<b>Cash Composite</b>		
	Present	91 Day T-Bills

# Pennsylvania Municipal Retirement System

## Fee Summary

As of December 31, 2023

Account	Fee Schedule	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
MFS Large Cap Value	0.35% of First 100.0 Mil, 0.33% Thereafter	4.2%	\$474,945	0.34%
Xponance S&P 500	0.02% of Assets	9.1%	\$59,065	0.02%
Northern Trust S&P 500	0.00% of Assets	8.9%	\$11,632	0.00%
Polen Focus Growth	0.50% of First 100.0 Mil, 0.40% Thereafter	3.6%	\$566,729	0.49%
Northern Trust Dow Jones Completion Index	0.02% of Assets	3.5%	\$16,904	0.02%
Copeland SMID Cap Dividend Growth	0.50% of Assets	1.7%	\$278,872	0.50%
Smith, Graham & Co Small Cap Value	0.75% of First 50.0 Mil, 0.60% Thereafter	1.5%	\$362,415	0.75%
Emerald Small Cap Growth	0.60% of First 10.0 Mil, 0.55% of Next 5.0 Mil, 0.50% Thereafter	1.4%	\$232,957	0.53%
Rhumblin Global Min. Volatility	0.07% of Assets	4.9%	\$103,335	0.06%
SSGA MSCI World ex US	0.04% of Assets	8.5%	\$110,717	0.04%
Hardman Johnston Int'l Equity	0.75% of First 25.0 Mil, 0.60% Thereafter	3.1%	\$638,382	0.64%
Hudson Edge Int'l Equity	0.65% of Assets	4.1%	\$878,120	0.65%
SSGA MSCI Emerging Markets Index	0.05% of Assets	2.3%	\$36,761	0.05%
Forest Investment Associates	0.75% of Assets	4.6%	\$1,123,150	0.75%
PRISA LP	1.00% of First 25.0 Mil, 0.95% of Next 25.0 Mil, 0.85% of Next 50.0 Mil, 0.75% of Next 100.0 Mil, 0.70% of Next 100.0 Mil, 0.65% Thereafter	1.8%	\$555,542	0.96%

# Pennsylvania Municipal Retirement System

## Fee Summary

As of December 31, 2023

Account	Fee Schedule	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
PRISA II	1.20% of First 25.0 Mil, 1.15% of Next 25.0 Mil, 1.05% of Next 50.0 Mil, 0.95% of Next 100.0 Mil, 0.90% of Next 100.0 Mil, 0.85% Thereafter	3.6%	\$1,267,372	1.09%
PennMuni-Nuveen U.S. Real Estate Fund	0.85% of Assets	6.3%	\$1,733,997	0.85%
N. Front Street (Nuveen)	0.85% of Assets	0.0%	\$12,440	0.85%
SSGA US Aggregate Bond Index	0.02% of First 100.0 Mil, 0.01% of Next 300.0 Mil, 0.01% Thereafter	10.8%	\$45,155	0.01%
Federated Hermes Core Aggregate Strategy	0.12% of First 100.0 Mil, 0.10% of Next 400.0 Mil, 0.07% Thereafter	10.9%	\$374,526	0.11%
Ares Global Multi-Asset Credit	0.35% of Assets	5.4%	\$615,830	0.35%
<b>Investment Management Fee</b>		<b>100.0%</b>	<b>\$9,498,847</b>	<b>0.29%</b>

**Characteristics**

	Portfolio	MSCI ACWI IMI Net USD
Number of Holdings	6,255	9,034
Weighted Avg. Market Cap. (\$B)	319.6	421.9
Median Market Cap. (\$B)	5.7	2.1
Price To Earnings	19.4	19.0
Price To Book	3.0	3.3
Price To Sales	1.6	1.7
Return on Equity (%)	17.5	18.7
Yield (%)	1.9	2.1

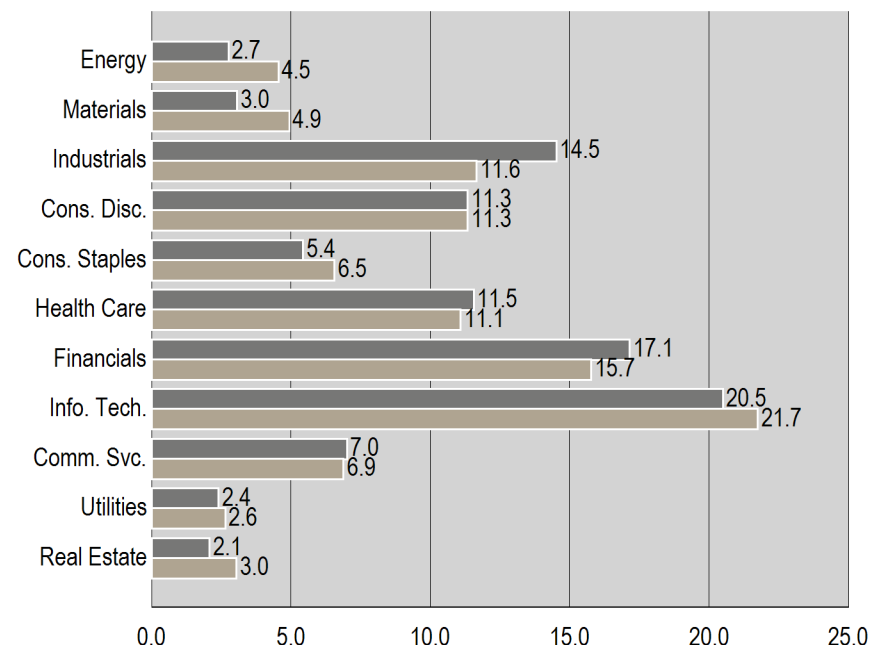
**Top Holdings**

MICROSOFT CORP	2.9%
APPLE INC	2.3%
AMAZON.COM INC	1.6%
DAIFUKU CO LTD	1.3%
DAI-ICHI LIFE HOLDINGS INC	1.2%
ISHARES MSCI EMERGING MARKETS MIN VOL FACTOR ETF	1.1%
SUZUKI MOTOR CORP	1.0%
T&D HOLDINGS INC	1.0%
NVIDIA CORPORATION	1.0%
ALPHABET INC	0.9%
<b>Total</b>	<b>14.3%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Total Equity Composite	16.0%	18.6%	61.9%	3.5%
MSCI ACWI IMI Net USD	15.6%	15.4%	69.0%	0.0%
<i>Weight Over/Under</i>	<i>0.4%</i>	<i>3.2%</i>	<i>-7.1%</i>	<i>3.5%</i>

**Sector Allocation (%) vs MSCI ACWI IMI Net USD**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.5%	2.9%	-2.4%
United States	63.3%	61.5%	1.8%
Europe Ex U.K.	6.7%	12.1%	-5.4%
United Kingdom	1.8%	3.7%	-1.9%
Pacific Basin Ex Japan	1.3%	2.9%	-1.6%
Japan	20.3%	6.0%	14.4%
Emerging Markets	5.8%	10.7%	-4.9%
Other	0.3%	0.3%	-0.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Characteristics**

	Portfolio	Russell 3000
Number of Holdings	3,736	2,967
Weighted Avg. Market Cap. (\$B)	484.6	631.9
Median Market Cap. (\$B)	2.5	2.7
Price To Earnings	22.9	23.5
Price To Book	3.9	4.1
Price To Sales	2.1	2.5
Return on Equity (%)	20.7	22.2
Yield (%)	1.5	1.5

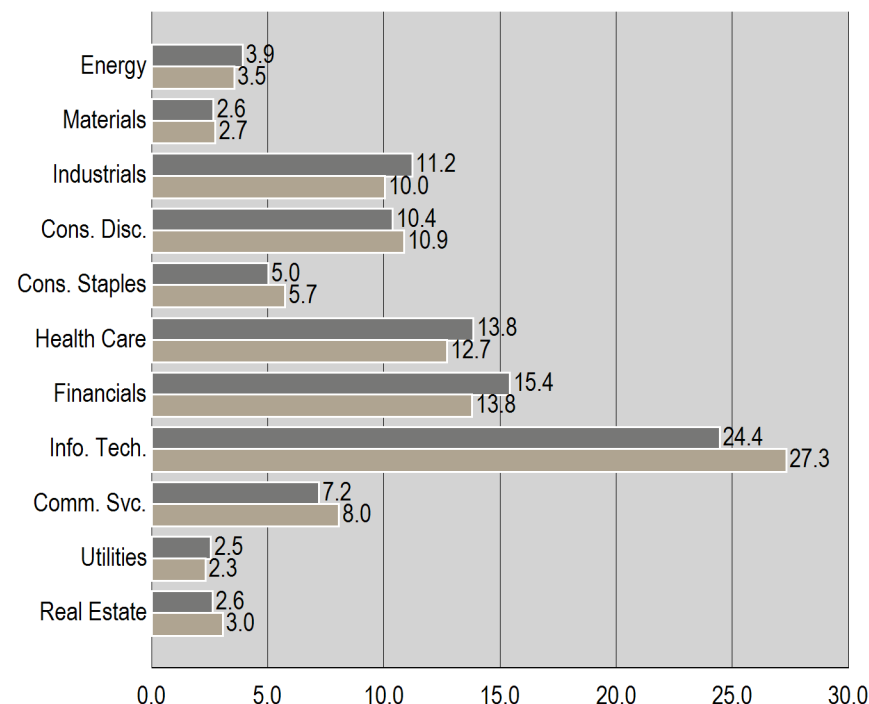
**Top Holdings**

MICROSOFT CORP	4.8%
APPLE INC	3.8%
AMAZON.COM INC	2.6%
NVIDIA CORPORATION	1.6%
ALPHABET INC	1.5%
ALPHABET INC	1.3%
JPMORGAN CHASE & CO	1.2%
VISA INC	1.1%
ADOBE INC	1.1%
META PLATFORMS INC	1.0%
<b>Total</b>	<b>20.0%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
U.S. Equity Composite	8.4%	21.7%	66.4%	3.5%
Russell 3000	5.8%	20.4%	73.8%	0.0%
<i>Weight Over/Under</i>	2.5%	1.3%	-7.3%	3.5%

**Sector Allocation (%) vs Russell 3000**





Common Holdings Matrix

	<i>MFS Large Cap Value</i>		<i>Xponance S&amp;P 500</i>		<i>Northern Trust S&amp;P 500</i>		<i>Polen Focus Growth</i>		<i>Northern Trust Dow Jones Completion Index</i>		<i>Copeland SMID Cap Dividend Growth</i>		<i>Smith, Graham &amp; Co Small Cap Value</i>		<i>Emerald Small Cap Growth</i>	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
MFS Large Cap Value	--	--	66	17	66	17	2	8	1	1	0	0	0	0	0	0
Xponance S&P 500	66	94	--	--	502	100	22	94	5	0	10	14	0	0	0	0
Northern Trust S&P 500	66	94	502	100	--	--	22	94	9	0	10	14	1	1	0	0
Polen Focus Growth	2	3	22	23	22	23	--	--	1	1	0	0	0	0	0	0
Northern Trust Dow Jones Completion Index	1	1	5	1	9	1	1	3	--	--	55	80	66	98	111	95
Copeland SMID Cap Dividend Growth	0	0	10	0	10	0	0	0	55	5	--	--	1	2	6	5
Smith, Graham & Co Small Cap Value	0	0	0	0	1	0	0	0	66	3	1	2	--	--	2	1
Emerald Small Cap Growth	0	0	0	0	0	0	0	0	111	5	6	9	2	2	--	--

**Characteristics**

	Portfolio	MSCI ACWI IMI Net USD
Number of Holdings	282	9,034
Weighted Avg. Market Cap. (\$B)	103.7	421.9
Median Market Cap. (\$B)	20.8	2.1
Price To Earnings	17.7	19.0
Price To Book	3.2	3.3
Price To Sales	1.3	1.7
Return on Equity (%)	19.6	18.7
Yield (%)	2.6	2.1

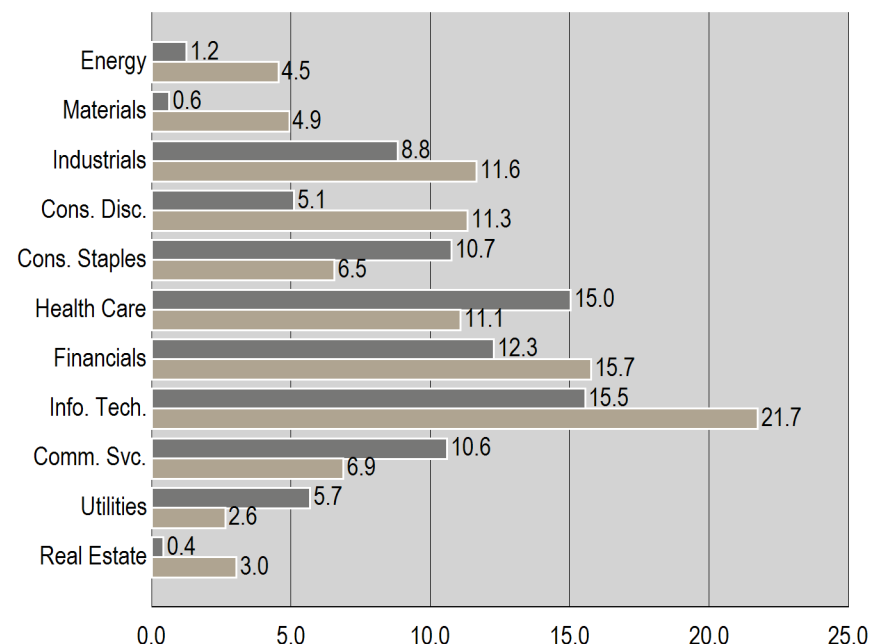
**Top Holdings**

ISHARES MSCI EMERGING MARKETS MIN VOL FACTOR ETF	12.4%
CISCO SYSTEMS INC	1.6%
ROPER TECHNOLOGIES INC	1.5%
MERCK & CO INC	1.4%
WASTE MANAGEMENT INC.	1.4%
MOTOROLA SOLUTIONS INC	1.4%
T-MOBILE US INC	1.3%
WALMART INC	1.3%
PEPSICO INC	1.2%
JOHNSON & JOHNSON	1.2%
<b>Total</b>	<b>24.6%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Global Equity Composite	17.5%	24.2%	57.5%	0.8%
MSCI ACWI IMI Net USD	15.6%	15.4%	69.0%	0.0%
<i>Weight Over/Under</i>	1.9%	8.8%	-11.5%	0.8%

**Sector Allocation (%) vs MSCI ACWI IMI Net USD**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	1.2%	2.9%	-1.7%
United States	68.8%	61.5%	7.4%
Europe Ex U.K.	6.1%	12.1%	-5.9%
United Kingdom	0.3%	3.7%	-3.4%
Pacific Basin Ex Japan	3.5%	2.9%	0.6%
Japan	10.6%	6.0%	4.6%
Emerging Markets	8.4%	10.7%	-2.3%
Other	1.0%	0.3%	0.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Characteristics**

	Portfolio	MSCI ACWI ex USA IMI
Number of Holdings	2,510	6,637
Weighted Avg. Market Cap. (\$B)	64.1	80.9
Median Market Cap. (\$B)	9.4	1.8
Price To Earnings	15.1	14.2
Price To Book	2.0	2.4
Price To Sales	1.1	1.1
Return on Equity (%)	11.7	14.1
Yield (%)	2.4	3.1

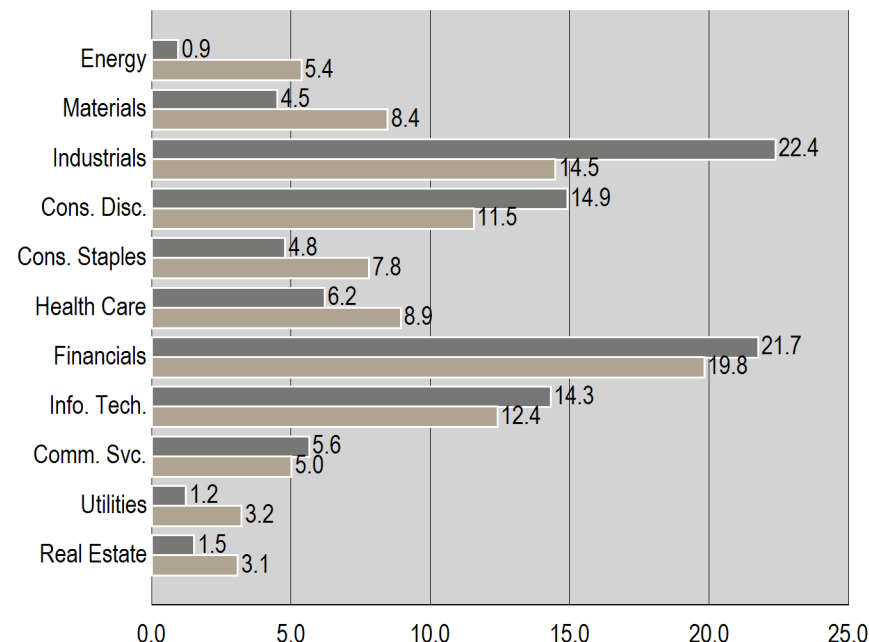
**Top Holdings**

DAIFUKU CO LTD	4.2%
DAI-ICHI LIFE HOLDINGS INC	3.9%
SUZUKI MOTOR CORP	3.3%
T&D HOLDINGS INC	3.3%
TOYOTA MOTOR CORP	2.4%
SAMSUNG ELECTRONICS CO LTD	2.3%
SONY GROUP CORPORATION	2.2%
PT BANK CENTRAL ASIA TBK	1.9%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.7%
PT BANK RAKYAT INDONESIA TBK	1.5%
<b>Total</b>	<b>26.8%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Non-U.S Equity Composite	15.7%	34.4%	45.6%	4.3%
MSCI ACWI ex USA IMI	25.2%	22.4%	52.3%	0.0%
<i>Weight Over/Under</i>	-9.5%	11.9%	-6.7%	4.3%

**Sector Allocation (%) vs MSCI ACWI ex USA IMI**



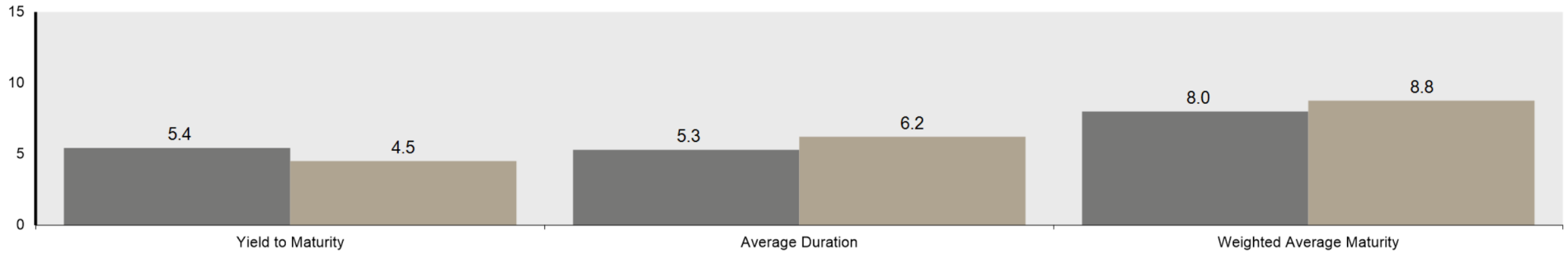
**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.9%	7.5%	-6.6%
United States	1.3%	0.0%	1.3%
Europe Ex U.K.	13.4%	31.3%	-17.9%
United Kingdom	3.4%	9.5%	-6.1%
Pacific Basin Ex Japan	2.8%	7.5%	-4.7%
Japan	61.9%	15.5%	46.5%
Emerging Markets	16.2%	27.8%	-11.6%
Other	0.1%	0.9%	-0.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

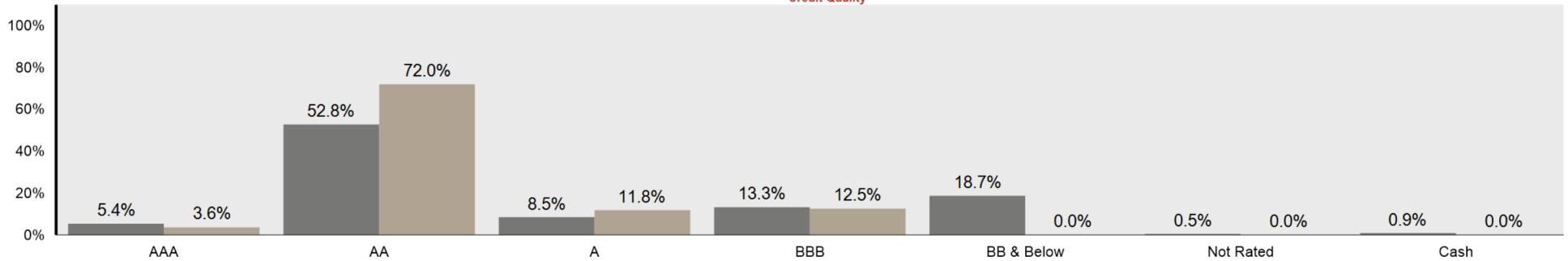
Common Holdings Matrix

	<i>SSGA MSCI World ex US</i>		<i>Hardman Johnston Int'l Equity</i>		<i>Hudson Edge Int'l Equity</i>		<i>SSGA MSCI Emerging Markets Index</i>	
	#	%	#	%	#	%	#	%
SSGA MSCI World ex US	--	--	18	87	28	82	2	0
Hardman Johnston Int'l Equity	18	2	--	--	3	7	4	0
Hudson Edge Int'l Equity	28	7	3	19	--	--	3	11
SSGA MSCI Emerging Markets Index	2	0	4	11	3	8	--	--

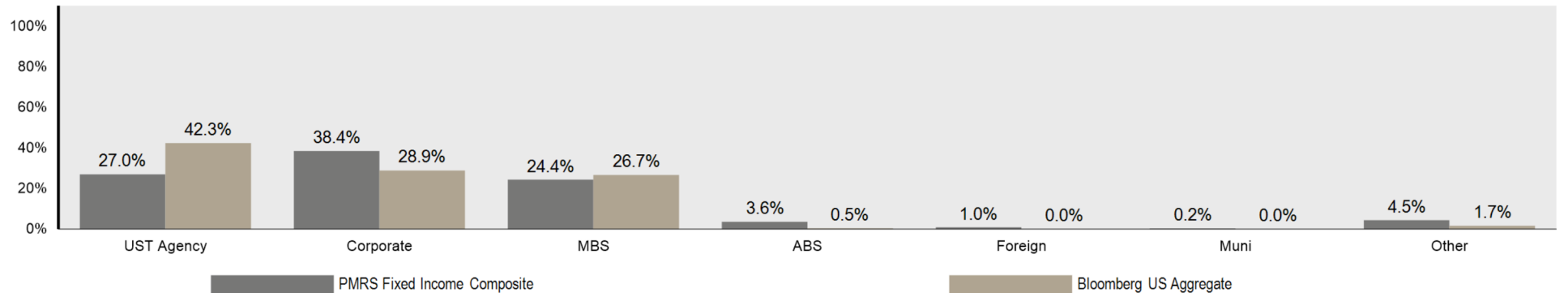
Yield to Maturity



Credit Quality



US Sector



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# Investment Managers



As of December 31, 2023

**Manager Summary:** Active strategy holding diversified portfolio of 70-80 stocks. Stock selection focuses on bottom-up company analysis seeking to identify high quality undervalued stocks that have durable franchises, significant free cash flow, solid balance sheets and strong management teams.

**Characteristics**

	Portfolio	Russell 1000 Value
Number of Holdings	73	845
Weighted Avg. Market Cap. (\$B)	130.7	142.0
Median Market Cap. (\$B)	79.4	13.6
Price To Earnings	19.5	17.3
Price To Book	3.0	2.4
Price To Sales	2.1	1.8
Return on Equity (%)	21.7	15.1
Yield (%)	2.4	2.3

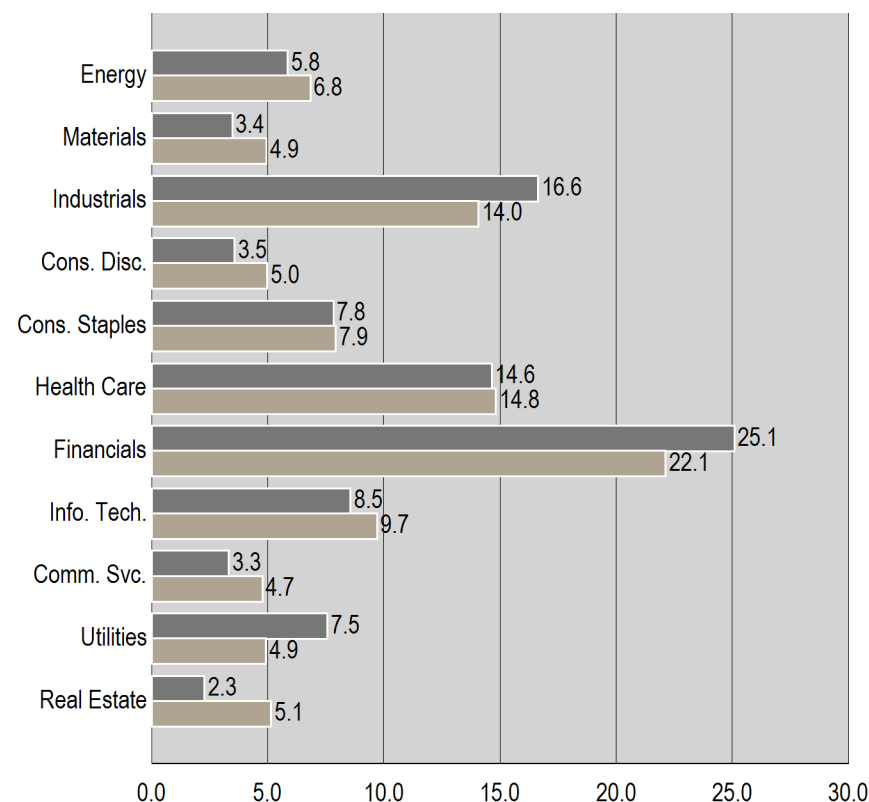
**Top Holdings**

JPMORGAN CHASE & CO	4.5%
THE CIGNA GROUP	2.9%
PROGRESSIVE CORP (THE)	2.9%
CONOCOPHILLIPS	2.8%
COMCAST CORP	2.6%
MARSH & MCLENNAN COMPANIES INC	2.4%
MCKESSON CORP	2.3%
JOHNSON & JOHNSON	2.3%
NORTHROP GRUMMAN CORP	2.3%
UNION PACIFIC CORP	2.2%
<b>Total</b>	<b>27.0%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
MFS Large Cap Value	0.0%	10.2%	89.8%
Russell 1000 Value	2.8%	31.8%	65.4%
<i>Weight Over/Under</i>	-2.8%	-21.6%	24.4%

**Sector Allocation (%) vs Russell 1000 Value**





**Manager Summary:** Passive strategy that seeks to replicate the return of the Standard & Poor's 500 index. This strategy is a low-cost option to gain diversified exposure to U.S. domiciled companies by owning the 500 largest companies by market capitalization in the U.S.

**Characteristics**

	Portfolio	S&P 500
Number of Holdings	505	503
Weighted Avg. Market Cap. (\$B)	716.4	718.0
Median Market Cap. (\$B)	33.2	33.1
Price To Earnings	24.3	24.3
Price To Book	4.4	4.4
Price To Sales	2.9	2.9
Return on Equity (%)	28.3	28.4
Yield (%)	1.5	1.5

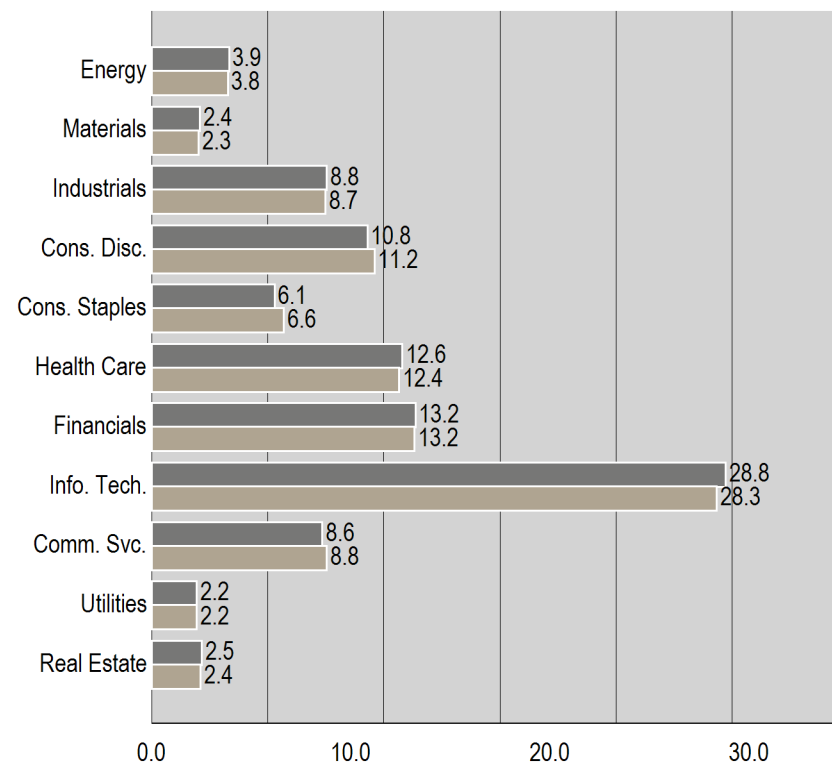
**Top Holdings**

APPLE INC	7.0%
MICROSOFT CORP	7.0%
AMAZON.COM INC	3.4%
NVIDIA CORPORATION	3.0%
ALPHABET INC	2.1%
META PLATFORMS INC	2.0%
ALPHABET INC	1.7%
TESLA INC	1.7%
BERKSHIRE HATHAWAY INC	1.6%
JPMORGAN CHASE & CO	1.2%
<b>Total</b>	<b>30.8%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Xpounce S&P 500	0.0%	14.4%	85.6%
S&P 500	0.5%	14.2%	85.4%
<i>Weight Over/Under</i>	<i>-0.5%</i>	<i>0.2%</i>	<i>0.3%</i>

**Sector Allocation (%) vs S&P 500**



**Manager Summary:** Passive strategy that seeks to replicate the return of the Standard & Poor’s 500 index. This strategy is a low-cost option to gain diversified exposure to U.S. domiciled companies by owning the 500 largest companies by market capitalization in the U.S.

**Characteristics**

	Portfolio	S&P 500
Number of Holdings	505	503
Weighted Avg. Market Cap. (\$B)	716.8	718.0
Median Market Cap. (\$B)	33.0	33.1
Price To Earnings	24.3	24.3
Price To Book	4.4	4.4
Price To Sales	2.9	2.9
Return on Equity (%)	28.5	28.4
Yield (%)	1.5	1.5

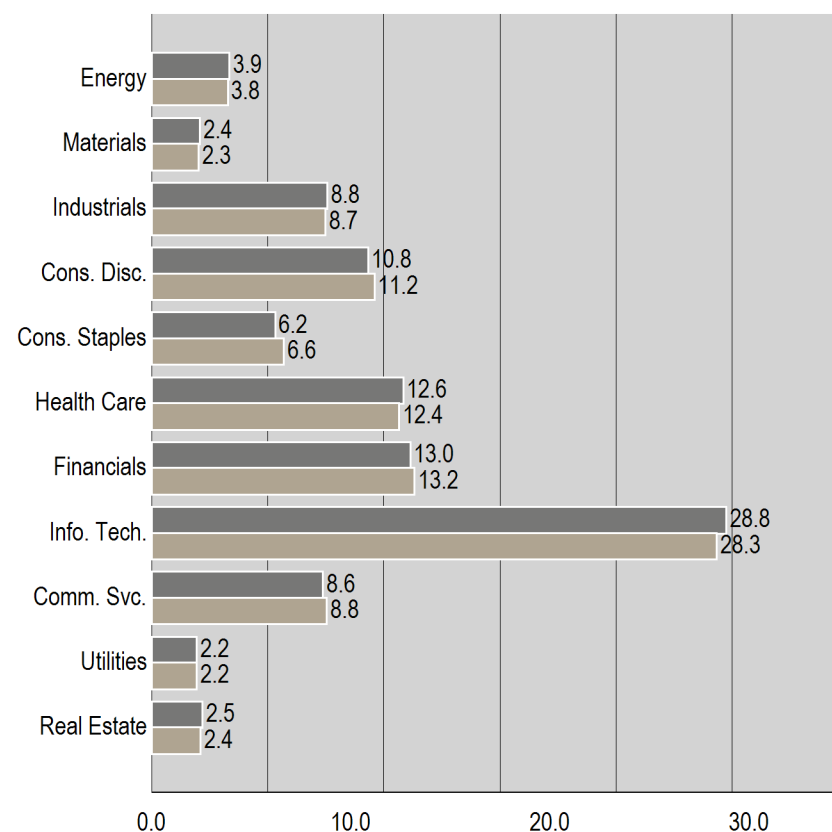
**Top Holdings**

APPLE INC	7.0%
MICROSOFT CORP	7.0%
AMAZON.COM INC	3.4%
NVIDIA CORPORATION	3.1%
ALPHABET INC	2.1%
META PLATFORMS INC	2.0%
ALPHABET INC	1.8%
TESLA INC	1.7%
BERKSHIRE HATHAWAY INC	1.6%
JPMORGAN CHASE & CO	1.2%
<b>Total</b>	<b>30.8%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Northern Trust S&P 500	0.0%	14.5%	85.5%
S&P 500	0.5%	14.2%	85.4%
<i>Weight Over/Under</i>	<i>-0.5%</i>	<i>0.3%</i>	<i>0.2%</i>

**Sector Allocation (%) vs S&P 500**



**Manager Summary:** Concentrated U.S. large cap growth portfolio with 20-30 names. Investment process begins with negative screening, only including names with robust financials, strong management and attractive earnings growth potential. Then team of generalists perform bottom-up fundamental analysis reviewing industry dynamics, competitive advantage, free cash flow modeling, meet with mgmt. and perform worst case scenarios. High active share. Position limit: 50% limit on sector exposure. Low portfolio turnover (30%).

**Characteristics**

	Portfolio	Russell 1000 Growth
Number of Holdings	25	441
Weighted Avg. Market Cap. (\$B)	705.8	1,105.8
Median Market Cap. (\$B)	220.0	19.6
Price To Earnings	41.3	34.7
Price To Book	9.5	11.4
Price To Sales	6.4	4.8
Return on Equity (%)	37.9	46.3
Yield (%)	0.5	0.8

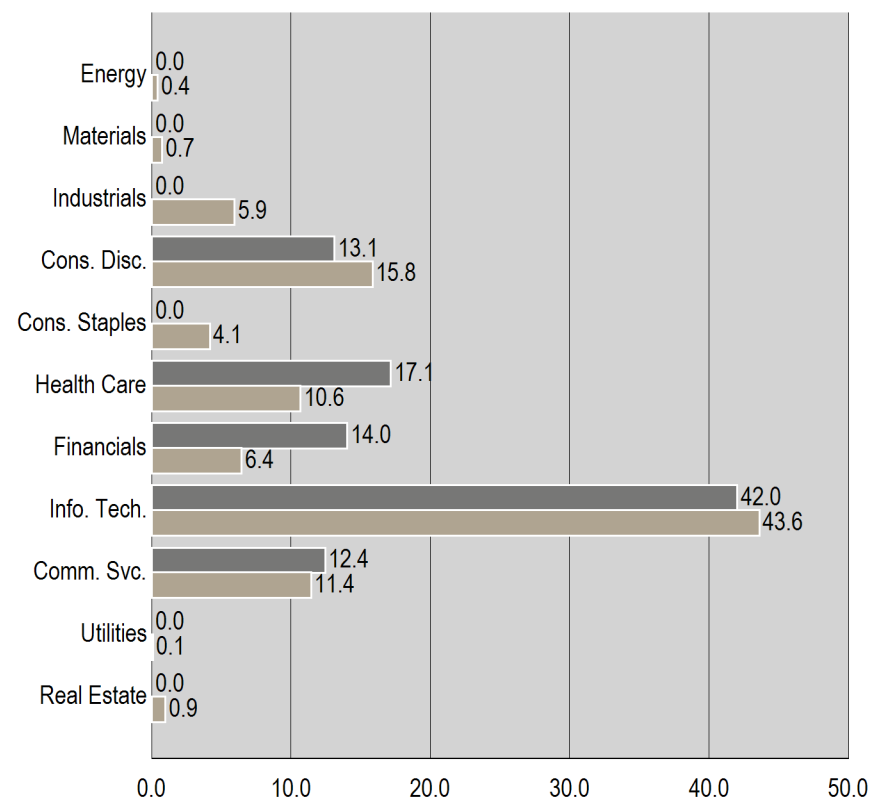
**Top Holdings**

MICROSOFT CORP	10.2%
SERVICENOW INC	7.4%
AMAZON.COM INC	7.2%
ADOBE INC	6.7%
SALESFORCE INC	5.6%
NETFLIX INC	5.6%
MASTERCARD INC	5.4%
VISA INC	5.1%
ALPHABET INC	5.1%
ACCENTURE PLC	4.3%
<b>Total</b>	<b>62.4%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Polen Focus Growth	0.0%	3.6%	96.4%
Russell 1000 Growth	1.5%	9.9%	88.7%
<i>Weight Over/Under</i>	-1.5%	-6.2%	7.7%

**Sector Allocation (%) vs Russell 1000 Growth**



As of December 31, 2023

**Manager Summary:** The fund employs a replication technique in order to approximate the risk and return characteristics of the Dow Jones U.S. Completion Total Stock Market Index. This Index is commonly used to represent the small and mid cap segments of the U.S. equity market. The 'completion' index is a sub-set of the DJ US Total Stock Market Index that excludes components of the S&P500.

**Characteristics**

	Portfolio	Dow Jones U.S. Completion Total Stock Market
Number of Holdings	3,216	3,583
Weighted Avg. Market Cap. (\$B)	11.0	11.0
Median Market Cap. (\$B)	0.8	0.7
Price To Earnings	17.7	17.7
Price To Book	2.8	2.8
Price To Sales	1.5	1.5
Return on Equity (%)	4.8	4.8
Yield (%)	1.4	1.4

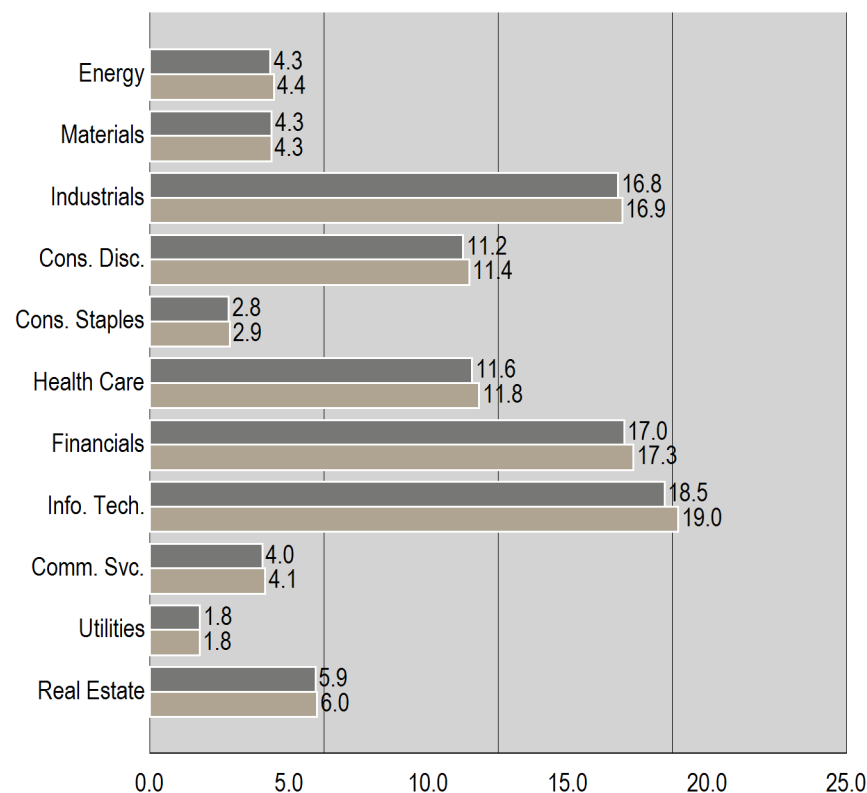
**Top Holdings**

SNOWFLAKE INC	1.0%
CROWDSTRIKE HOLDINGS INC	0.9%
WORKDAY INC	0.9%
KKR & CO INC	0.8%
MARVELL TECHNOLOGY INC	0.8%
BLOCK INC	0.7%
APOLLO GLOBAL MANAGEMENT INC	0.6%
CHENIERE ENERGY INC	0.6%
FERGUSON (OTC)	0.6%
ATLASSIAN CORP	0.6%
<b>Total</b>	<b>7.5%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Northern Trust Dow Jones Completion Index	29.4%	65.3%	5.3%
Dow Jones U.S. Completion Total Stock Market	38.1%	57.3%	4.7%
<i>Weight Over/Under</i>	<i>-8.7%</i>	<i>8.0%</i>	<i>0.7%</i>

**Sector Allocation (%) vs Dow Jones U.S. Completion Total Stock Market**



**Manager Summary:** Minority-owned investment management firm with fundamental bottom-up process. Stocks are first screened based on earnings, book value, and cash flow criteria with fundamental analysis performed on the top 20% within each respective sector. Sell candidates are companies that have dropped to the bottom 40% of their screen. The strategy holds 50-75 positions and is typically within plus/minus 5% of index sector weightings.

**Characteristics**

	Portfolio	Russell 2000 Value
Number of Holdings	69	1,428
Weighted Avg. Market Cap. (\$B)	3.1	2.7
Median Market Cap. (\$B)	1.6	0.9
Price To Earnings	13.0	12.4
Price To Book	1.8	1.6
Price To Sales	0.6	1.0
Return on Equity (%)	10.7	5.0
Yield (%)	1.5	2.3

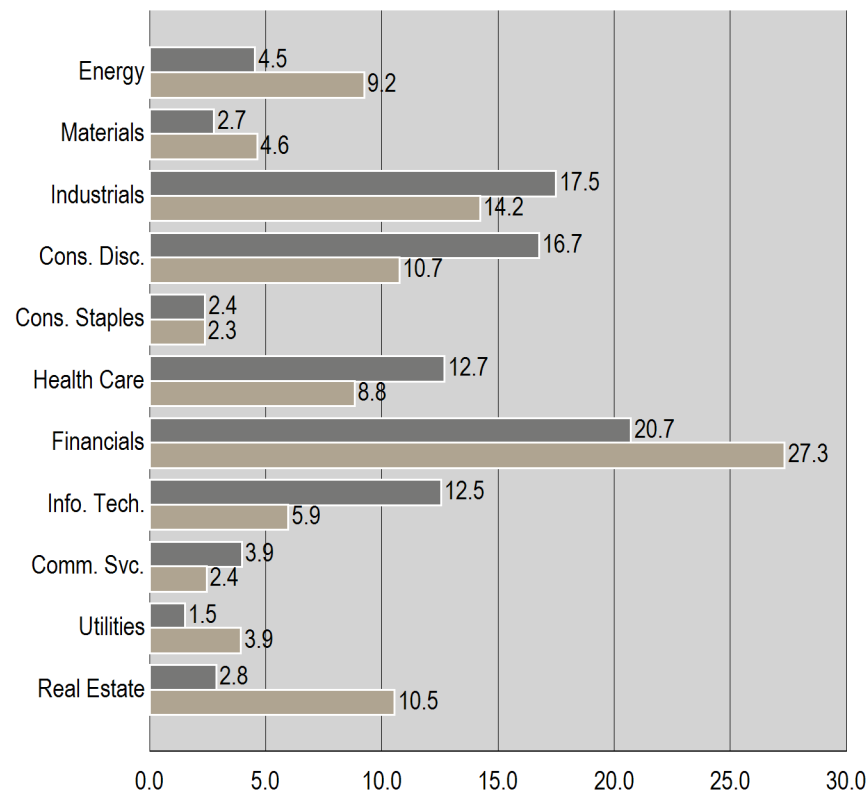
**Top Holdings**

KOPPERS HOLDINGS INC	2.8%
HIBBETT INC	2.8%
DYCOM INDUSTRIES INC.	2.7%
GRIFFON CORP.	2.7%
LITHIA MOTORS INC.	2.5%
GROUP 1 AUTOMOTIVE INC.	2.5%
SELECTIVE INSURANCE GROUP INC	2.3%
M.D.C. HOLDINGS INC.	2.3%
SCANSOURCE INC	2.2%
DECKERS OUTDOOR CORP	2.2%
<b>Total</b>	<b>25.0%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Smith, Graham & Co Small Cap Value	72.8%	27.2%	0.0%
Russell 2000 Value	79.1%	20.9%	0.0%
<i>Weight Over/Under</i>	<i>-6.3%</i>	<i>6.3%</i>	<i>0.0%</i>

**Sector Allocation (%) vs Russell 2000 Value**



**Manager Summary:** A bottom-up fundamental manager who views dividend growth as a litmus test for earnings quality and focuses on attributes such as dividend coverage, cash flow strength, earnings growth, and return on capital. Fundamental research is focused on identifying companies with strong competitive positions that support steadily rising dividends. Strategy invests in larger, more established small cap firms while tending to underweight the lower market cap ranges. The strategy seeks sector diversification with 45-60 holdings.

**Characteristics**

	Portfolio	Russell 2500
Number of Holdings	69	2,460
Weighted Avg. Market Cap. (\$B)	8.0	7.1
Median Market Cap. (\$B)	6.5	1.6
Price To Earnings	20.5	17.0
Price To Book	3.5	2.6
Price To Sales	1.9	1.4
Return on Equity (%)	19.2	8.9
Yield (%)	1.8	1.6

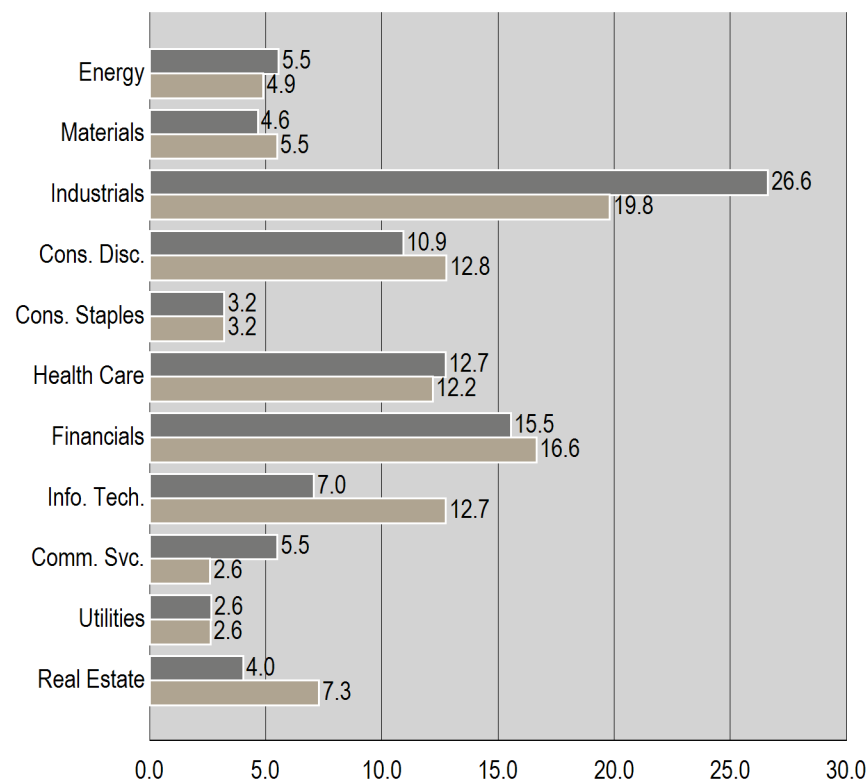
**Top Holdings**

HAMILTON LANE INC	2.2%
ENSIGN GROUP INC (THE)	2.2%
RELIANCE STEEL & ALUMINUM CO	2.0%
UNIVERSAL DISPLAY CORPORATION	1.9%
BOOZ ALLEN HAMILTON HOLDING CORPORATION	1.9%
BROADRIDGE FINANCIAL SOLUTIONS INC	1.9%
BANK OZK	1.9%
COHEN & STEERS INC	1.8%
BRUNSWICK CORP	1.8%
CASEY'S GENERAL STORES INC.	1.7%
<b>Total</b>	<b>19.2%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Copeland SMID Cap Dividend Growth	21.5%	78.5%	0.0%
Russell 2500	36.8%	63.2%	0.0%
<i>Weight Over/Under</i>	<i>-15.3%</i>	<i>15.3%</i>	<i>0.0%</i>

**Sector Allocation (%) vs Russell 2500**



As of December 31, 2023

**Manager Summary:** Core growth strategy, fundamental, bottom-up process seeking companies with a competitive advantage, market leadership, growth rates exceeding peers, differentiated growth drivers, and low research coverage. Analysts work across the market cap spectrum supporting small, mid, and all-cap strategies with coverage of dynamic sectors. The strategy holds 110-125 companies and portfolio construction limits of no more than 15% in any one industry group.

**Characteristics**

	Portfolio	Russell 2000 Growth
Number of Holdings	118	1,070
Weighted Avg. Market Cap. (\$B)	4.4	3.9
Median Market Cap. (\$B)	3.5	1.3
Price To Earnings	26.6	23.4
Price To Book	4.4	4.0
Price To Sales	2.9	1.9
Return on Equity (%)	-4.9	3.4
Yield (%)	0.5	0.7

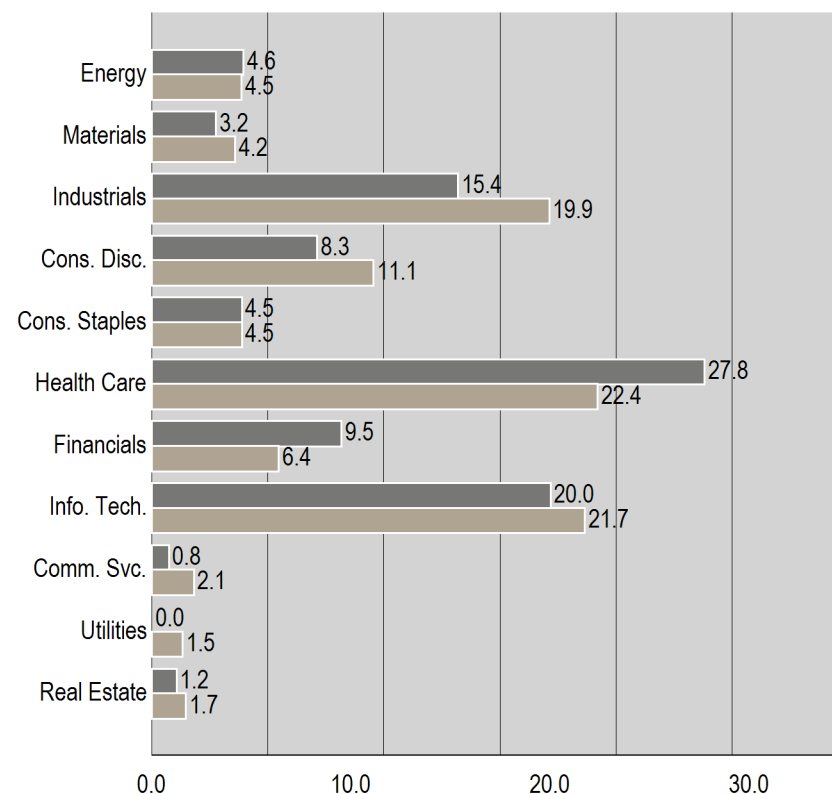
**Top Holdings**

IMMUNOGEN INC	2.4%
ACADIA PHARMACEUTICALS INC	2.2%
CARPENTER TECHNOLOGY CORP	2.1%
FRESHPET INC	2.1%
BLUEPRINT MEDICINES CORP	1.9%
VARONIS SYSTEMS INC	1.9%
SUPER MICRO COMPUTER INC	1.9%
CHURCHILL DOWNS INC	1.9%
TRANSMEDICS GROUP INC	1.8%
FTAI AVIATION LTD	1.8%
<b>Total</b>	<b>20.1%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Emerald Small Cap Growth	49.1%	50.9%	0.0%
Russell 2000 Growth	62.8%	37.2%	0.0%
<b>Weight Over/Under</b>	<b>-13.6%</b>	<b>13.6%</b>	<b>0.0%</b>

**Sector Allocation (%) vs Russell 2000 Growth**



**Manager Summary:** The fund invests primarily in U.S. and foreign stocks that are expected to minimize volatility relative to the global equity market. To reduce volatility, the fund will consider stocks' risk and diversification characteristics and seek to hedge away most of the currency exposure resulting from its foreign stock holdings.

**Characteristics**

	Portfolio	MSCI ACWI
Number of Holdings	282	2,914
Weighted Avg. Market Cap. (\$B)	103.7	471.3
Median Market Cap. (\$B)	20.8	13.4
Price To Earnings	17.7	19.4
Price To Book	3.2	3.5
Price To Sales	1.3	1.9
Return on Equity (%)	19.6	21.3
Yield (%)	2.6	2.1

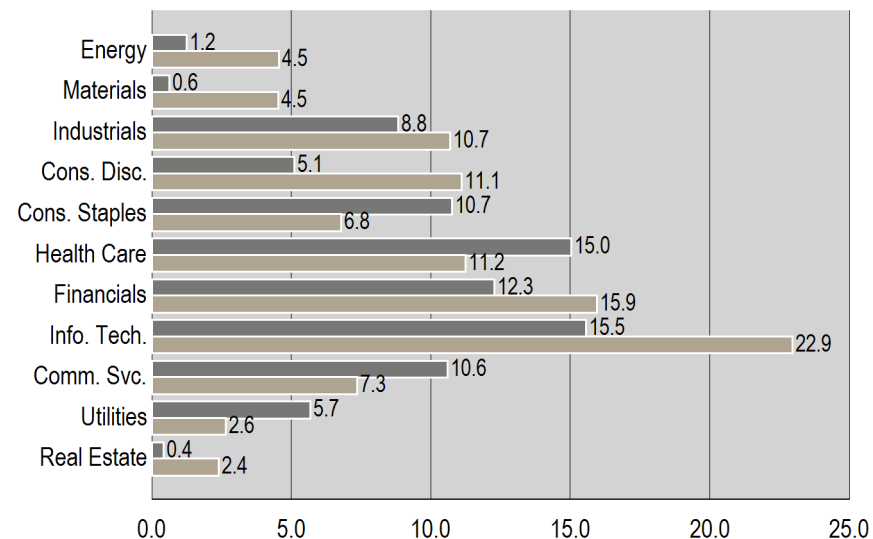
**Top Holdings**

ISHARES MSCI EMERGING MARKETS MIN VOL FACTOR ETF	12.4%
CISCO SYSTEMS INC	1.6%
ROPER TECHNOLOGIES INC	1.5%
MERCK & CO INC	1.4%
WASTE MANAGEMENT INC.	1.4%
MOTOROLA SOLUTIONS INC	1.4%
T-MOBILE US INC	1.3%
WALMART INC	1.3%
PEPSICO INC	1.2%
JOHNSON & JOHNSON	1.2%
<b>Total</b>	<b>24.6%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Rhumblin Global Min. Volatility	17.5%	24.2%	57.5%	0.8%
MSCI ACWI	5.7%	16.5%	77.7%	0.0%
<i>Weight Over/Under</i>	<i>11.7%</i>	<i>7.7%</i>	<i>-20.3%</i>	<i>0.8%</i>

**Sector Allocation (%) vs MSCI ACWI**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	1.2%	2.9%	-1.7%
United States	68.8%	62.6%	6.2%
Europe Ex U.K.	6.1%	12.2%	-6.1%
United Kingdom	0.3%	3.5%	-3.2%
Pacific Basin Ex Japan	3.5%	2.7%	0.8%
Japan	10.6%	5.4%	5.2%
Emerging Markets	8.4%	10.4%	-2.0%
Other	1.0%	0.2%	0.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>



**Manager Summary:** Passive strategy that seeks to replicate the returns of the MSCI ACWI ex US index. This strategy is a low-cost option to gain diversified exposure to internationally based companies.

**Characteristics**

	Portfolio	MSCI World ex USA
Number of Holdings	1,026	869
Weighted Avg. Market Cap. (\$B)	58.2	85.6
Median Market Cap. (\$B)	11.2	13.6
Price To Earnings	13.9	14.7
Price To Book	2.0	2.5
Price To Sales	1.0	1.3
Return on Equity (%)	11.2	15.1
Yield (%)	2.4	3.2

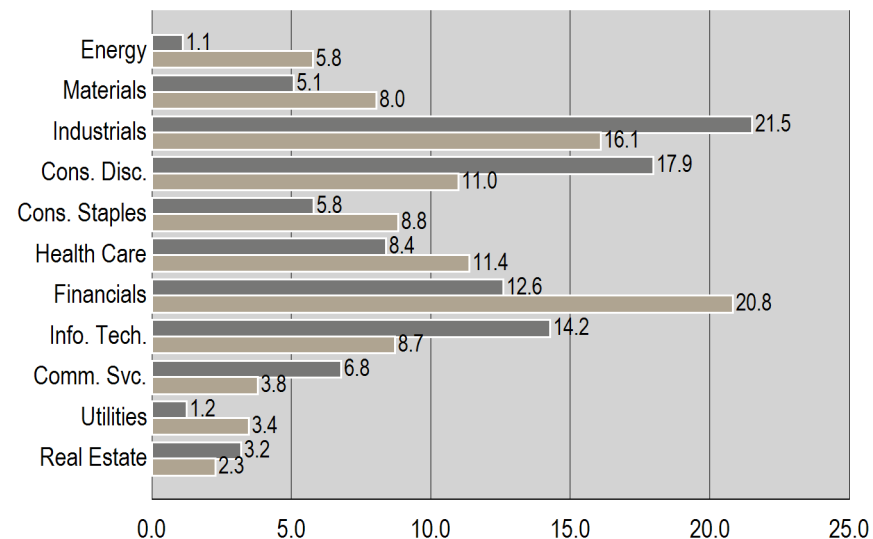
**Top Holdings**

TOYOTA MOTOR CORP	5.1%
SONY GROUP CORPORATION	3.1%
MITSUBISHI UFJ FINANCIAL GROUP	2.6%
KEYENCE CORP	2.2%
TOKYO ELECTRON LTD	2.2%
SHIN-ETSU CHEMICAL CO LTD	2.0%
HITACHI LTD	1.7%
SUMITOMO MITSUI FINANCIAL GROUP INC	1.6%
RECRUIT HOLDINGS CO LTD	1.6%
MITSUBISHI CORP	1.4%
<b>Total</b>	<b>23.6%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
SSGA MSCI World ex US	10.9%	32.7%	53.9%	2.4%
MSCI World ex USA	8.1%	25.5%	66.4%	0.0%
<i>Weight Over/Under</i>	2.8%	7.2%	-12.5%	2.4%

**Sector Allocation (%) vs MSCI World ex USA**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.8%	10.7%	-9.9%
United States	2.0%	0.0%	2.0%
Europe Ex U.K.	3.0%	45.3%	-42.2%
United Kingdom	0.3%	13.2%	-12.9%
Pacific Basin Ex Japan	0.8%	10.2%	-9.3%
Japan	92.9%	20.1%	72.9%
Emerging Markets	0.0%	0.0%	0.0%
Other	0.1%	0.6%	-0.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Manager Summary:** Concentrated portfolio (20-30 names). Utilizes fundamental research invests in quality companies with 10% EPS growth and market leaders, invest at attractive valuation. Turnover is between 20-30%. Maximum position is 5%. Given the concentrated nature of the portfolio, high idiosyncratic risk in the portfolio and sizable tracking error. High active share (around 90-95%). No currency hedge.

**Characteristics**

	Portfolio	MSCI EAFE
Number of Holdings	30	781
Weighted Avg. Market Cap. (\$B)	67.6	89.2
Median Market Cap. (\$B)	48.0	13.5
Price To Earnings	17.3	14.5
Price To Book	1.6	2.6
Price To Sales	0.9	1.2
Return on Equity (%)	11.1	15.6
Yield (%)	2.0	3.2

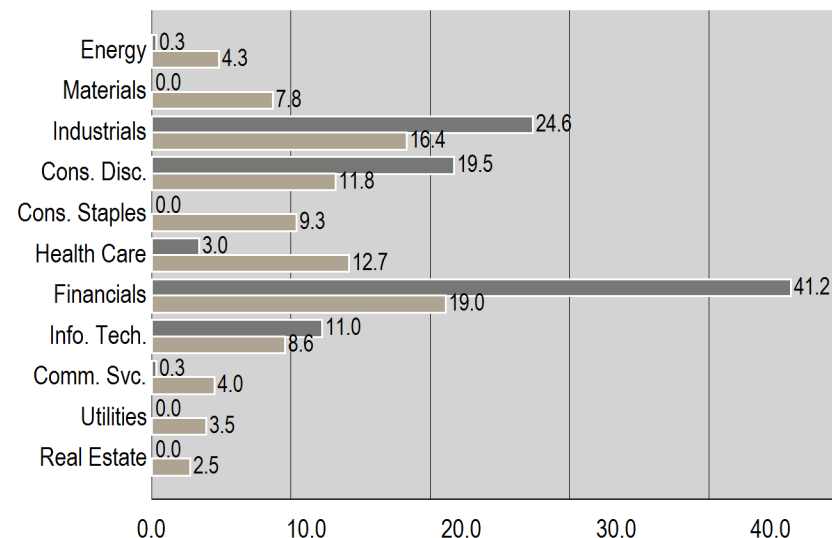
**Top Holdings**

DAIFUKU CO LTD	23.6%
DAI-ICHI LIFE HOLDINGS INC	20.9%
T&D HOLDINGS INC	18.3%
SUZUKI MOTOR CORP	17.5%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	9.3%
AIA GROUP LTD	1.7%
GENMAB A/S	1.6%
NORDIC SEMICONDUCTOR	1.3%
MEITUAN	1.0%
NOVO NORDISK A/S	0.8%
<b>Total</b>	<b>96.1%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Hardman Johnston Int'l Equity	43.4%	40.9%	15.3%	0.4%
MSCI EAFE	8.0%	25.3%	66.6%	0.0%
<i>Weight Over/Under</i>	35.4%	15.5%	-51.4%	0.4%

**Sector Allocation (%) vs MSCI EAFE**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.0%	0.0%	0.0%
United States	0.0%	0.0%	0.0%
Europe Ex U.K.	6.0%	50.7%	-44.6%
United Kingdom	0.8%	14.8%	-14.0%
Pacific Basin Ex Japan	1.9%	11.4%	-9.5%
Japan	80.3%	22.5%	57.8%
Emerging Markets	10.7%	0.0%	10.7%
Other	0.3%	0.7%	-0.4%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Manager Summary:** Bottom-up fundamental manager looking for businesses that are undergoing structural change. Analysts are generalists who are unconstrained in their candidates. Looking for upside over a time horizon of 2-3 years through assessing and predicting earnings estimates. Concentrated portfolio: 25-35 names equally weighted with a max of 5% initial allocation. Sector and countries limits of 30%. Turnover is roughly 30-40%.

**Characteristics**

	Portfolio	MSCI EAFE
Number of Holdings	34	781
Weighted Avg. Market Cap. (\$B)	61.6	89.2
Median Market Cap. (\$B)	25.5	13.5
Price To Earnings	18.7	14.5
Price To Book	2.5	2.6
Price To Sales	2.0	1.2
Return on Equity (%)	13.2	15.6
Yield (%)	2.2	3.2

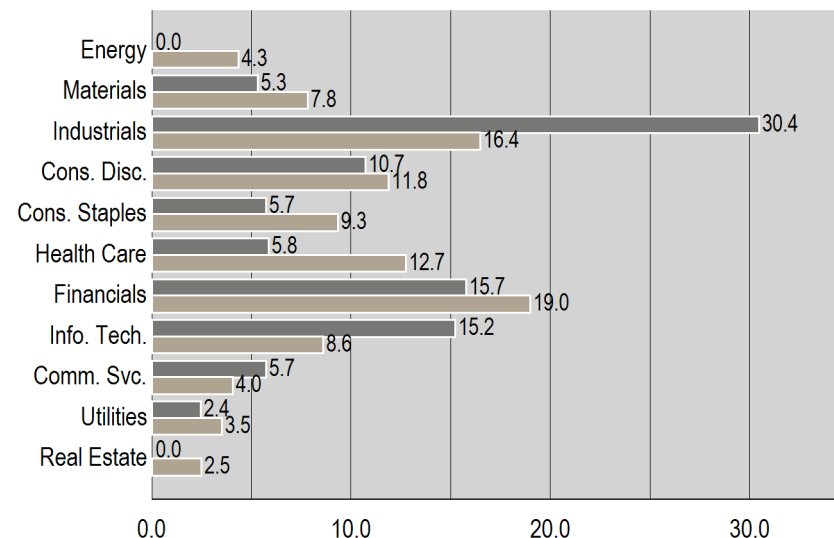
**Top Holdings**

BAE SYSTEMS PLC	4.9%
VESTAS WIND SYSTEMS A/S	4.9%
RHEINMETALL	4.6%
SAMSUNG ELECTRONICS CO LTD	3.9%
GETLINK SE	3.9%
THALES SA	3.8%
RYANAIR HOLDINGS PLC	3.7%
DEUTSCHE BOERSE AG	3.6%
UNIVERSAL MUSIC GROUP INC	3.5%
STMICROELECTRONICS NV	3.4%
<b>Total</b>	<b>40.2%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Hudson Edge Int'l Equity	3.1%	39.0%	47.1%	10.8%
MSCI EAFE	8.0%	25.3%	66.6%	0.0%
<i>Weight Over/Under</i>	<i>-4.9%</i>	<i>13.7%</i>	<i>-19.6%</i>	<i>10.8%</i>

**Sector Allocation (%) vs MSCI EAFE**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	2.4%	0.0%	2.4%
United States	0.0%	0.0%	0.0%
Europe Ex U.K.	48.5%	50.7%	-2.1%
United Kingdom	14.1%	14.8%	-0.6%
Pacific Basin Ex Japan	9.1%	11.4%	-2.3%
Japan	17.5%	22.5%	-5.0%
Emerging Markets	8.4%	0.0%	8.4%
Other	0.0%	0.7%	-0.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Manager Summary:** Passive strategy that seeks to replicate the return of the MSCI Emerging Markets index. This strategy is a low-cost option to gain diversified exposure to emerging market based companies.

**Characteristics**

	Portfolio	MSCI Emerging Markets
Number of Holdings	1,479	1,436
Weighted Avg. Market Cap. (\$B)	85.9	113.9
Median Market Cap. (\$B)	7.4	7.5
Price To Earnings	14.2	13.0
Price To Book	2.2	2.5
Price To Sales	1.3	1.1
Return on Equity (%)	11.7	14.2
Yield (%)	3.3	2.9

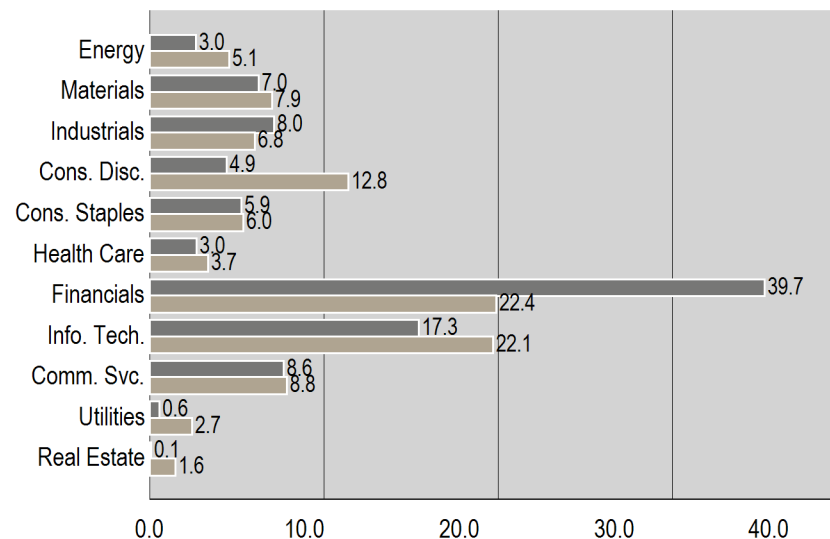
**Top Holdings**

PT BANK CENTRAL ASIA TBK	15.0%
PT BANK RAKYAT INDONESIA TBK	11.3%
SAMSUNG ELECTRONICS CO LTD	10.9%
PT BANK MANDIRI (PERSERO) TBK	6.6%
TELEKOMUNIKASI INDONESIA	5.7%
ASTRA INTERNATIONAL	3.4%
PT BANK NEGARA INDONESIA (PERSERO) TBK	2.4%
SK HYNIX INC	2.2%
PT GOTO GOJEK TOKOPEDIA TBK	1.5%
SUMBER ALFARIA TRIJAYA	1.5%
<b>Total</b>	<b>60.6%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
SSGA MSCI Emerging Markets Index	6.3%	19.6%	69.1%	5.0%
MSCI Emerging Markets	13.3%	26.6%	60.1%	0.0%
<i>Weight Over/Under</i>	<i>-7.0%</i>	<i>-6.9%</i>	<i>9.0%</i>	<i>5.0%</i>

**Sector Allocation (%) vs MSCI Emerging Markets**



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.0%	0.0%	0.0%
United States	2.4%	0.0%	2.4%
Europe Ex U.K.	0.0%	0.5%	-0.5%
United Kingdom	0.0%	0.0%	0.0%
Pacific Basin Ex Japan	0.1%	0.0%	0.1%
Japan	0.0%	0.0%	0.0%
Emerging Markets	97.5%	98.8%	-1.3%
Other	0.0%	0.8%	-0.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Characteristics**

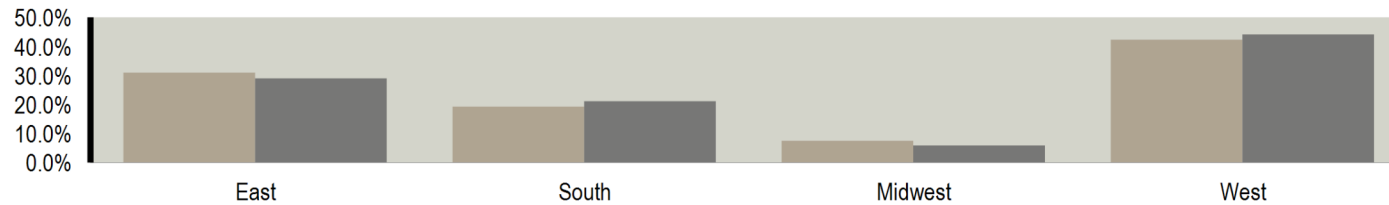
Fund GAV (\$MM)	\$29,800.0
Fund NAV (\$MM)	\$23,161.0
Cash (% of NAV)	2.1%
# of Investments	284
% in Top 10 by NAV	18.3%
Leverage %	24.1%
Occupancy	92.4%
# of MSAs	45
1-Year Dividend Yield	3.1%
As of Date	31-Dec-23

**Strategy Breakdown**

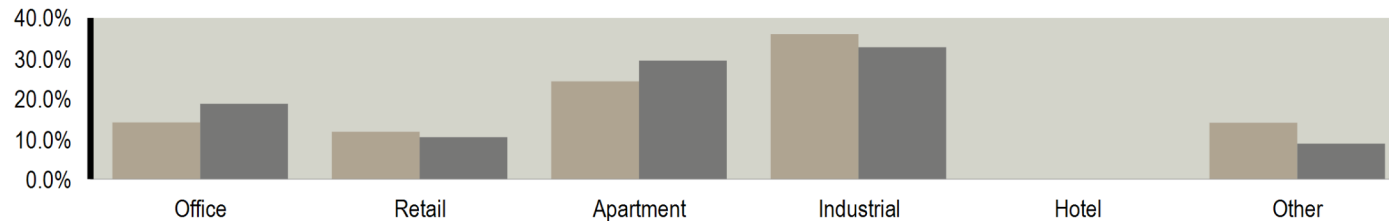
	% of Portfolio
Pre-Development	1.1%
Development	2.1%
Initial Leasing	0.5%
Operating	96.4%
Re-Development	
Other	
<u>Queue In:</u>	
Contribution Queue (\$MM)	\$34.48
Anticipated Drawdown (Months)	

Top Five Metro Areas	% of NAV
Los Angeles-Long Beach, CA	22.9%
New York-Newark, NY-NJ-CT-F	13.0%
Washington-Baltimore-Arlington	10.6%
San Jose-San Francisco-Oaklar	6.8%
Boston-Worcester-Providence,	4.6%
<u>Queue Out:</u>	
Redemption Queue (\$MM)	\$3,159.81
Anticipated Payout (Months)	

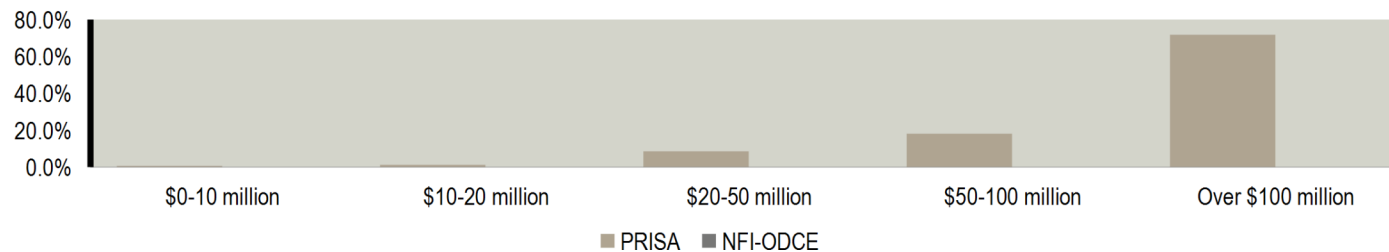
**Regional Breakdown by NAV (Excluding Cash & Debt)**



**Property Type Breakdown by NAV (Excluding Cash & Debt)**



**Property Size Breakdown by NAV (Excluding Cash & Debt)**



■ PRISA ■ NFI-ODCE

**Characteristics**

Fund GAV (\$MM)	\$15,726.0
Fund NAV (\$MM)	\$8,933.0
Cash (% of NAV)	0.8%
# of Investments	143
% in Top 10 by NAV	30.3%
Leverage %	39.4%
Occupancy	85.8%
# of MSAs	68
1-Year Dividend Yield	2.4%
As of Date	31-Dec-23

**Strategy Breakdown**

	% of Portfolio
Pre-Development	5.0%
Development	10.1%
Initial Leasing	9.3%
Operating	68.2%
Re-Development	
Other	7.4%

Top Five Metro Areas	% of NAV
Northern NJ	9.7%
San Francisco	7.6%
Boston	7.3%
Riverside	5.9%
Fort Lauderdale	5.3%

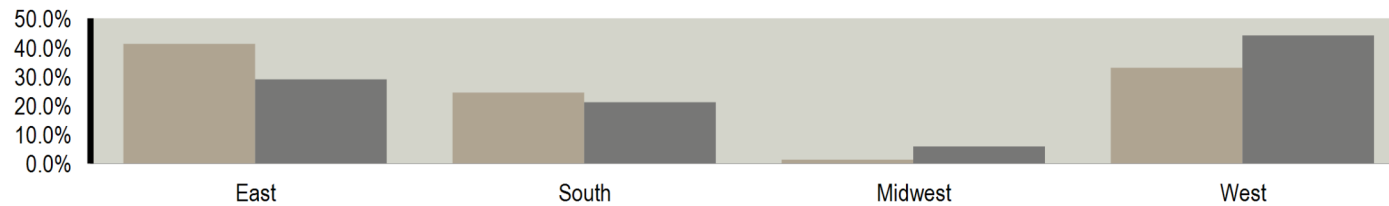
Queue In:

Contribution Queue (\$MM)	\$750.00
Anticipated Drawdown (Months)	

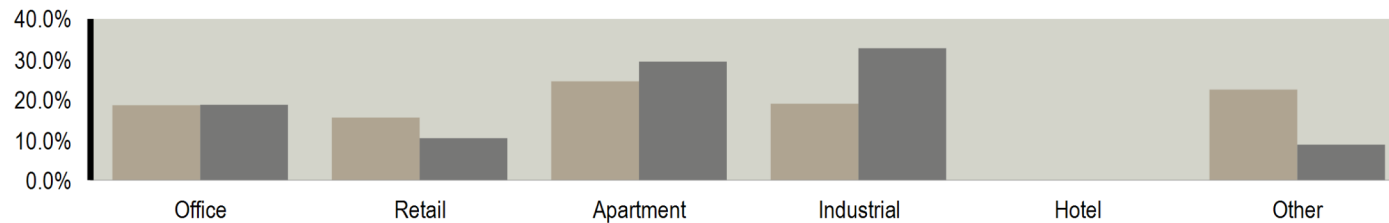
Queue Out:

Redemption Queue (\$MM)	\$1,358.80
Anticipated Payout (Months)	

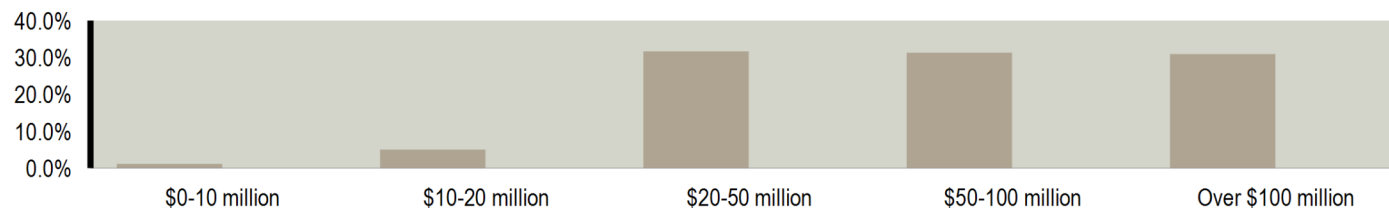
**Regional Breakdown by NAV (Excluding Cash & Debt)**



**Property Type Breakdown by NAV (Excluding Cash & Debt)**



**Property Size Breakdown by NAV (Excluding Cash & Debt)**



■ PRISA II ■ NFI-ODCE

**Characteristics**

Fund NAV (\$MM)	\$255.0
Cash (% of NAV)	1.9%
# of Investments	8
Occupancy	90.4%
NOI	3.9%
Loan to Value	7.1%
As of Date	9/30/2023

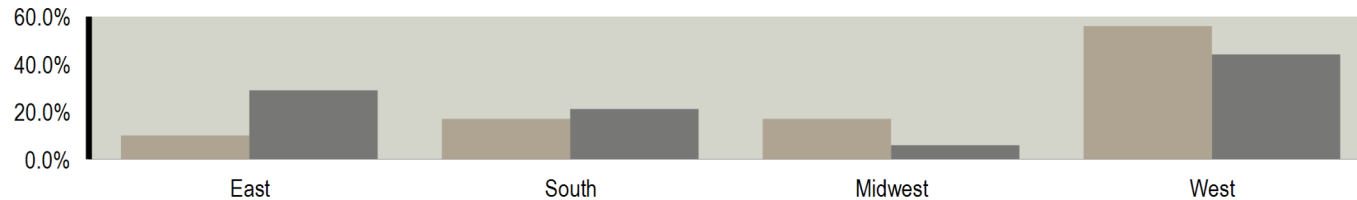
**Asset Summary**

Property	Acquisition
Copley Corporate Center	2010
SR Ranch	2011
Des Peres Corners	2010
708 Uptown	2014
Fairway Center II	2016
Republic Distribution Center	2013
526 Route 46	2014
Shoppes at Monarch Lakes	2010

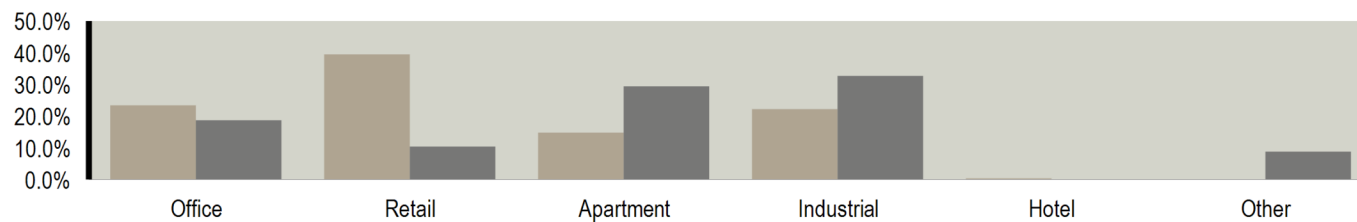
**Portfolio Allocation**

#	Property	Type	Location	% of Fund NAV
1	Copley Corporate Center	Office	San Diego, CA	11.7%
2	SR Ranch	Retail	San Diego, CA	18.0%
3	Des Peres Corners	Retail	Des Peres, MO	16.3%
4	708 Uptown	Apartment	Seattle, WA	14.8%
5	Fairway Center II	Office	Brea, CA	11.7%
6	Republic Distribution Center	Industrial	Houston, TX	12.8%
7	526 Route 46	Industrial	Teterboro, NJ	9.5%
8	Shoppes at Monarch Lakes	Retail	Miramar, FL	5.3%
<b>Total</b>				<b>100.0%</b>

**Regional Breakdown by NAV**



**Property Type Breakdown by NAV**



Net Assets (\$MM) 149.8

**Portfolio Allocation**

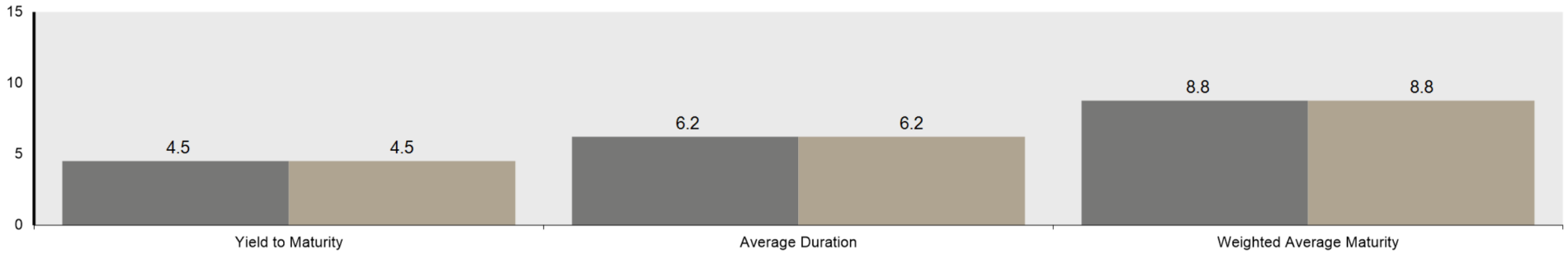
#	Property	Type	Location	% of Fund NAV
1	Bear Island	Pine	Virginia	5.8%
2	Fitz-Weller	Pine	New York	3.7%
3	Carter Pasture	Douglas Fir/Cedar	Texas	8.6%
4	Dupont	Douglas Fir/Hemlock	Georgia	20.9%
5	Black River	Pine	South Carolina	16.9%
6	Coquille	Pine	Oregon	18.9%
7	Bucktails	Pine	Pennsylvania	8.5%
8	North River	Maple/Oak	Washington	16.7%
<b>Total</b>				<b>100.0%</b>

**Regional Breakdown by NAV**

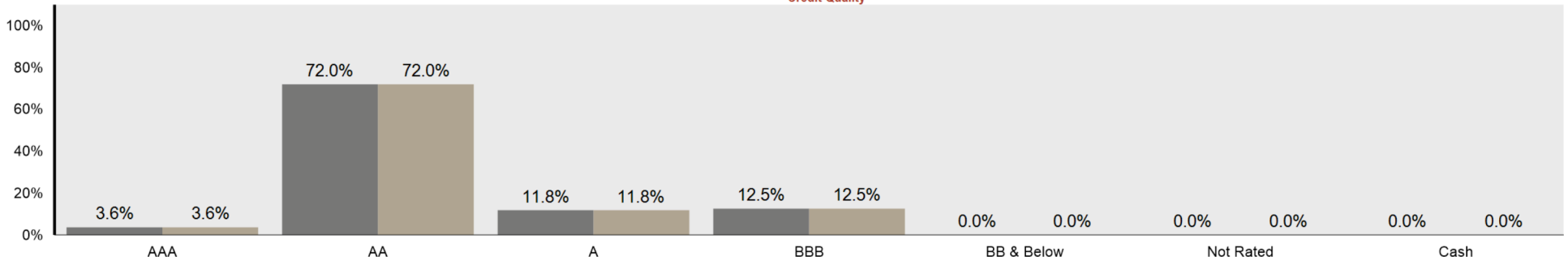




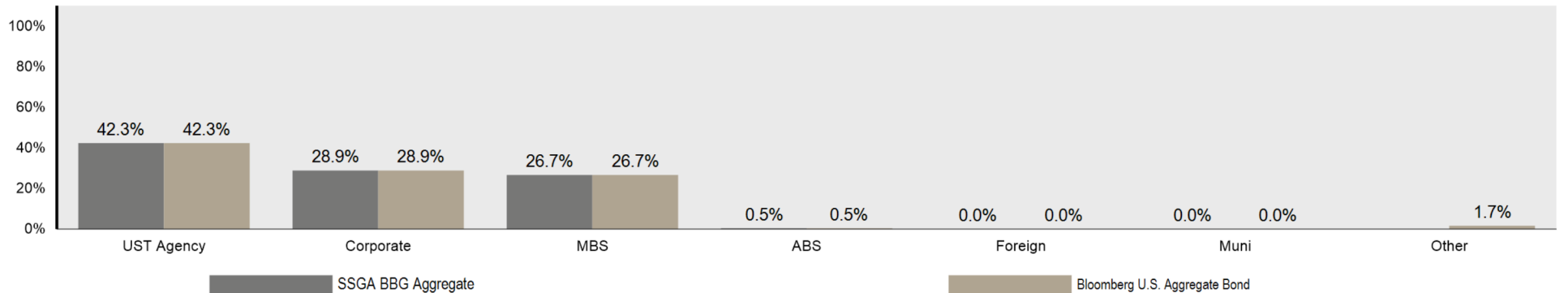
Yield to Maturity

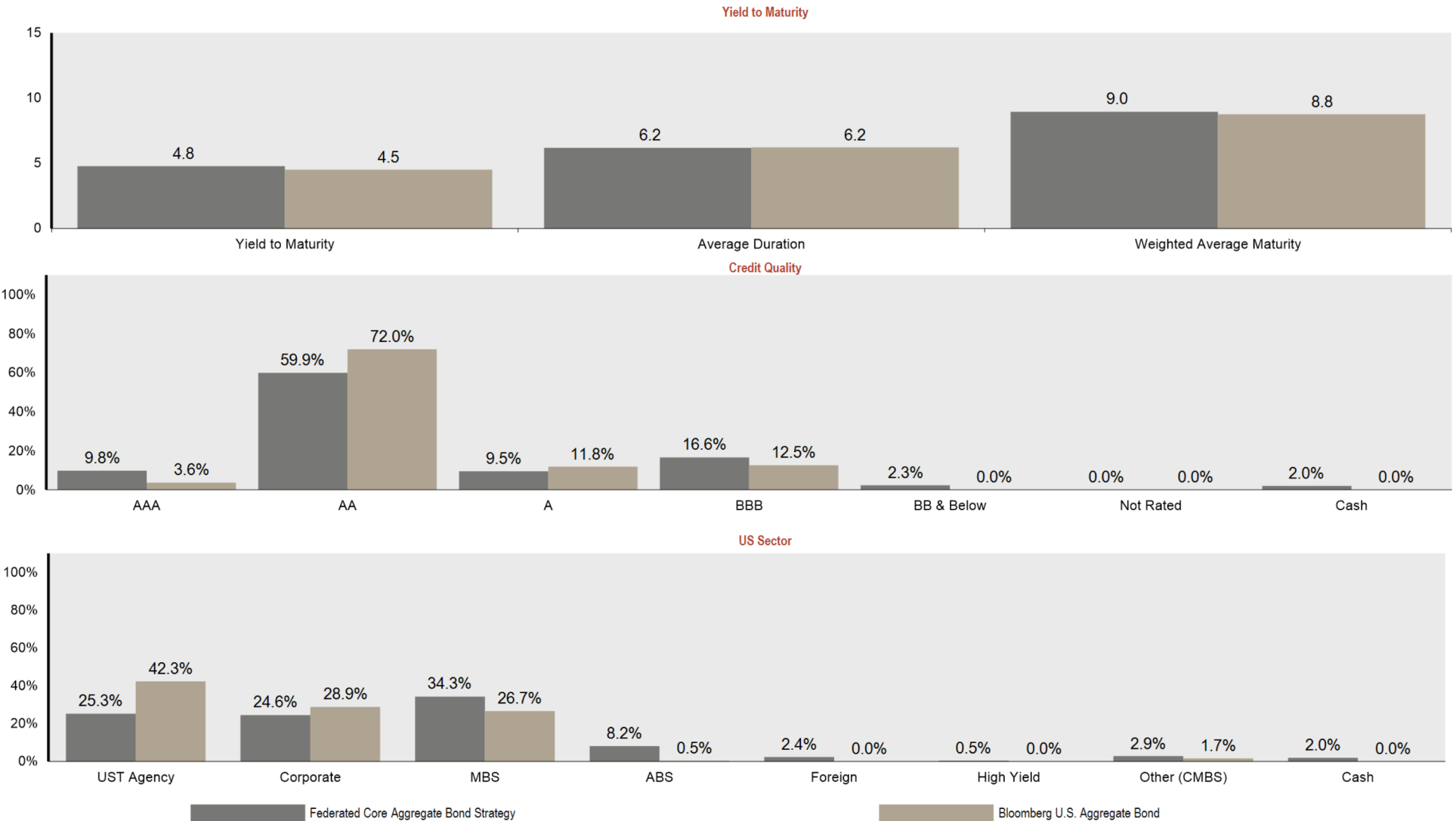


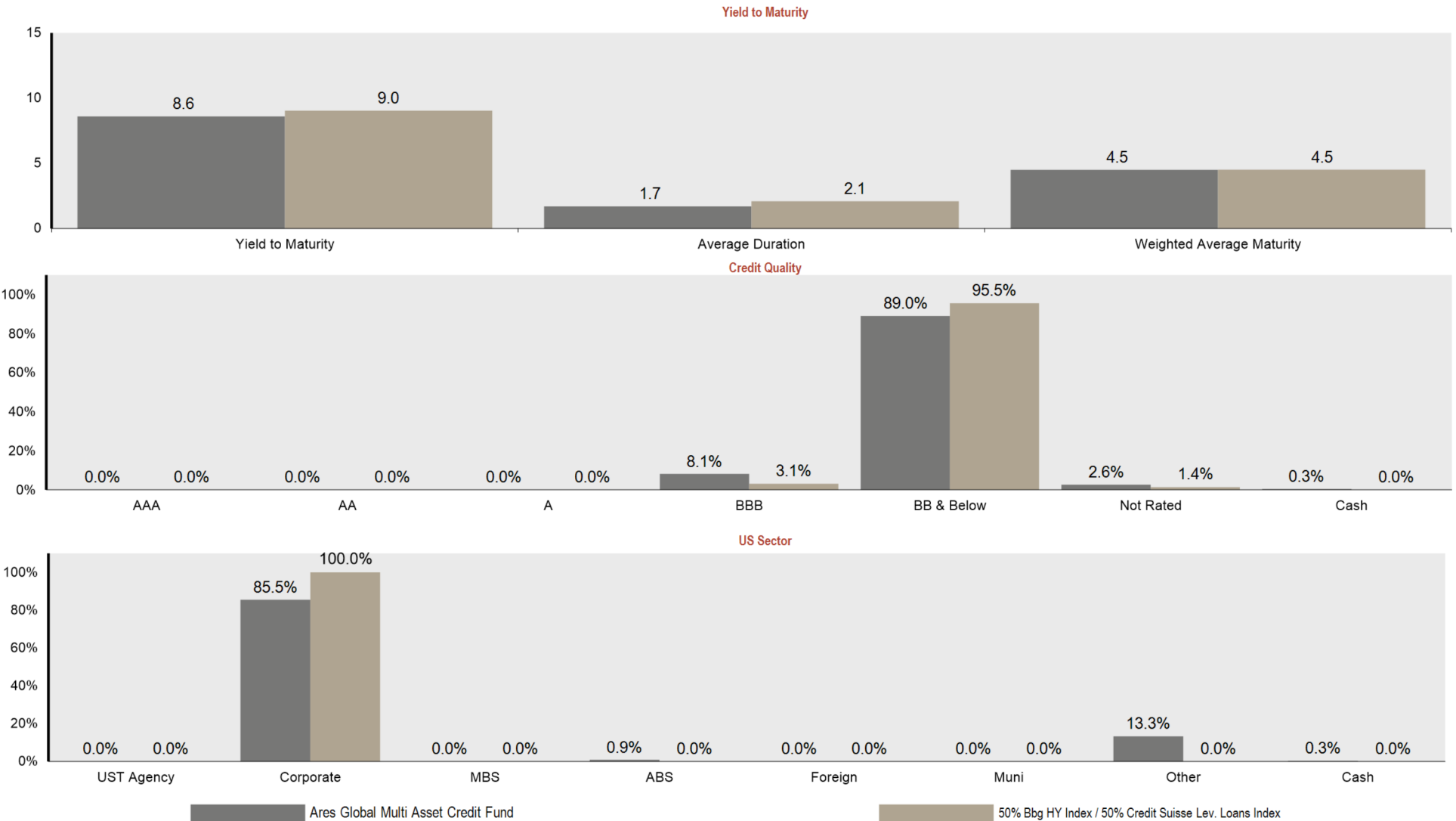
Credit Quality



US Sector







# **International Large Cap Value Equity Search Update**

# Characteristics

## Portfolio Characteristics

Firm	# of Holdings	% In Top Ten	Med. Cap (\$MM)	Avg. Cap (\$MM)	Trailing P/E	P/B Ratio	Dividend Yield
Barrow, Hanley	56	26.2%	\$18,694	\$28,474	10.2	1.3	4.2%
Boston Partners	90	22.4%	\$25,980	\$61,767	9.9	1.5	3.1%
Lazard	71	25.5%	\$29,995	\$56,948	16.1	2.1	3.0%
MFS Investment	64	25.4%	\$30,355	\$60,957	11.0	1.4	3.9%
Sprucegrove	79	22.2%	\$10,865	\$57,077	12.2	1.4	3.2%
Vanguard*	201	14.8%	\$19,553	\$70,762	12.6	1.7	3.1%
ARGA	65	35.4%	\$21,125	\$75,857	10.5	1.3	3.7%
Causeway	65	30.7%	\$48,290	\$72,654	10.5	1.7	3.1%
Dodge & Cox	69	30.6%	\$37,000	\$77,000	9.5	1.2	3.2%
Mondrian Investment	102	22.3%	\$26,228	\$62,356	11.3	1.2	4.1%
Schroders Investment	514	12.0%	\$6,276	\$56,972	9.3	1.4	4.0%
Silchester	134	23.9%	\$4,741	\$28,138	14.7	0.9	4.2%
MSCI EAFE Value	484	19.6%	\$6,887	\$15,686	10.5	1.2	4.4%

\*Vanguard strategy is sub-advised by ARGA (25%), Lazard (40%), and Sprucegrove (35%).

Data from Marquette ILCV search: 9-30-2023

# Transition Management Candidate Comparison

# Pennsylvania Municipal Retirement System:

## Transition Management



Presented by

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Managing Director

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# Firm Information

	Abel Noser	Loop Capital	Macquarie	Northern Trust
U.S. Headquarters	New York, NY	Chicago, IL	New York, NY	Chicago, IL
Year Founded	1975	1997	1969	1889
Employee Ownership (%)	25%	90%	-	-
MWBE Ownership	Yes	Yes	-	-
Total Employees	20	254	3,269	-

- Abel Noser is 25% employee owned and 75% owned by Estancia Partners, an MBE qualified private equity firm. Abel Noser is currently in a management buyout process to purchase Estancia Partners' stake. The firm offers global trade analytics and compliance solutions.
- Loop Capital is a privately held LLC, majority owned by James Reynolds, Jr., Founder and CEO. The firm offers investment banking, brokerage and advisory services.
- Macquarie's independent transition management team was formed in 2009. They are a publicly traded company on the Australian Stock Exchange (ticker: MGL) with global HQ in Sydney, Australia and US offices in NY and Philadelphia. The firm offers investment banking, brokerage and advisory services.
- Northern Trust is a publicly traded company (ticker: NTRS) that began providing transition management services in 1987. The firm offers investment banking, brokerage and advisory services.



# Transition Team Breakdown

	Abel Noser	Loop Capital	Macquarie	Northern Trust
Trading Analysis	2	4	17	4
Transition Strategists	2	2	17	5
Transition PM's	2	0	17	5
Trading and Execution	8	17	14	35
Transition Support	2	7	11	42
Compliance and Risk Mgmt	1	2	2	-
<b>Total</b>	<b>20</b>	<b>39</b>	<b>54</b>	<b>99</b>

- As smaller, private companies, Abel Noser and Loop have smaller transition team headcounts.
- All four firms have consistently larger Trading and Execution teams, while Macquarie has consistently large teams dedicated to each specialty.

# Transition Activity: Past 3 Years

	Abel Noser		Loop Capital		Macquarie		Northern Trust	
	#	\$(Mil)	#	\$(Mil)	#	\$(Mil)	#	\$(Mil)
<b>&lt; \$100 million</b>	290	\$12,990	14	\$620	270	\$7,300	143	\$3,143
<b>\$100-250 million</b>	48	\$9,280	11	\$1,526	60	\$9,600	118	\$10,550
<b>\$250-500 million</b>	44	\$17,630	16	\$6,263	46	\$15,700	101	\$18,620
<b>Over \$500 million</b>	42	\$52,620	23	\$29,634	59	\$66,900	185	\$188,289

- A typical transition management project at PMRS will range from \$50 - \$200 million.
- Abel Noser, Macquarie, and Northern Trust have performed considerably more transaction activity than Loop Capital over the past three years, particularly in the below \$250 million range.

# Transition Activity: Yearly Totals

Year	Abel Noser		Loop Capital		Macquarie		Northern Trust	
	#	\$(Mil)	#	\$(Mil)	#	\$(Mil)	#	\$(Mil)
2023	135	\$29,660	27	\$14,776	138	\$25,344	156	\$41,816
2022	147	\$30,440	14	\$8,799	174	\$37,409	195	\$65,592
2021	142	\$31,960	23	\$14,468	135	\$36,900	196	\$72,294
2020	175	\$32,540	18	\$9,822	123	\$32,732	226	\$96,760
2019	170	\$28,300	33	\$11,978	158	\$62,300	209	\$99,985

# Liquidity Sources

Liquidity Source	Abel Noser	Loop Capital	Macquarie	Northern Trust
In-Kind Transfer	14%	3%	18%	12%
Internal Crossing	0%	1%	14%	11%
External Crossing	11%	6%	15%	16%
Primary Exchanges	75%	90%	52%	61%
Principal Trades	0%	0%	1%	0%

- **In-Kind Transfer:** occurs when the legacy and target portfolio have the same holding, whereby the common holding is transferred directly to the target portfolio “in-kind.”
- **Internal Crossing:** the ability of a transition manager to trade securities during a transition through their own internal funds, or other client portfolios.
- **External Crossing:** the ability of a transition manager to access and trade securities through external specialist networks built for transition purposes.
- **Primary Exchanges:** selling a security on the open exchange marketplace, at its current market value, and then buying whatever new security one needs in its place, again, in the market.
- **Principal Trades:** executing broker accepts the execution risk, by guaranteeing a total value to the client for all trades executed. Least common trade type that includes risk of conflicting interest if TM uses their own brokerage organizations to trade.

# Fee Estimates

Asset Class	Abel Noser	Loop Capital	Macquarie	Northern Trust
<b>U.S. Equity</b>	0.5 - 1.2 cps	0.4-0.7 cps	0.4-0.9 cps	0.5- 1 cps
<b>Non-U.S. Dev Equity</b>	3-5 bps	3-6 bps	3-5 bps	3-5 bps
<b>EM Equity</b>	5-15 bps	6-8 bps	5-8 bps	3-8 bps
<b>US Fixed</b>	2-8 bps	3-5 bps	-	3-5 bps
<b>Govt./Agency</b>	-	-	1-2 bps	-
<b>Corp. Bond</b>	-	-	4-10 bps	-

\*CPS = "Cents Per Share"

\*BPS = "Basis Points"

The above are estimates quoted for purposes of RFP completion. Transition mandates are typically priced on a case-by-case basis. Factors considered include the mandate size, liquidity profile of the underlying securities, and operational complexity.

# Timeline

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- Determine who and contract with Transition Manager/s
- Receive executed Channing contract back from the Commonwealth
- Notify Dana (ex-Smith Graham) of contract termination
- Open Channing account at BNY
- Receive portfolio buy list from Channing and identify stocks that require transactions vs. in-kind transfers
- Provide current and target portfolios to Transition Manager/s for review and provide both anticipated execution costs and pre-trade analysis
- Transition Occurs
- Post-trade review

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The sources of information used in this report are believed to be reliable. Marquette Associates, Inc. has not independently verified all of the information and its accuracy cannot be guaranteed. Opinions, estimates, projections and comments on financial market trends constitute our judgment and are subject to change without notice. References to specific securities are for illustrative purposes only and do not constitute recommendations. Past performance does not guarantee future results.

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