

# Pennsylvania Municipal Retirement System

Performance Report As of December 31, 2021  
Includes February 28th, 2022 Update



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# Marquette Update



# Marquette Update

1Q 2022

\$332B

assets under advisement

99%

client retention rate

11 years

avg. client tenure

36<sup>th</sup>

year in business

19<sup>th</sup>

largest investment consulting firm according to P&I<sup>1</sup>

5

office locations in Chicago, Baltimore, Milwaukee, Philadelphia, and St. Louis

100%

employee-owned

120+

employees

24

full-time partners



Market Preview Video & Letter from the Director of Research: 1/25

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## Marquette Adds Two New Partners

We are excited to announce the election of two new managing partners. As an employee-owned firm, we are thrilled to not only reward and celebrate the contributions of our employees, but ensure our independence for years to come. Marquette now has 24 full-time owners. Reference our 2022 client letter for more information.



**Lauren Cellucci, CIMA®**

Managing Partner

19 years experience

Joined firm in 2016



**Aimee O'Connor, CFP®**

Managing Partner

18 years experience

Joined firm in 2019



### RECENT HIRES

**Junnor Shin**

Client Analyst

**Alberto Rivera**

Sr. Client Analyst, AVP

**Simone Newsome**

DEI Coordinator

**Matt Mierzwa**

IT Services Lead

**Annie Das**

Sr. Private Client Analyst

**Judy Convey**

Sr. Client Analyst

Firm and client statistics as of September 30, 2021. Client retention rate calculated 2011–2020. <sup>1</sup>As of June 30, 2021 per P&I Daily 2021 Investment Management Consultants Survey ranked by worldwide institutional assets under advisement. 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.

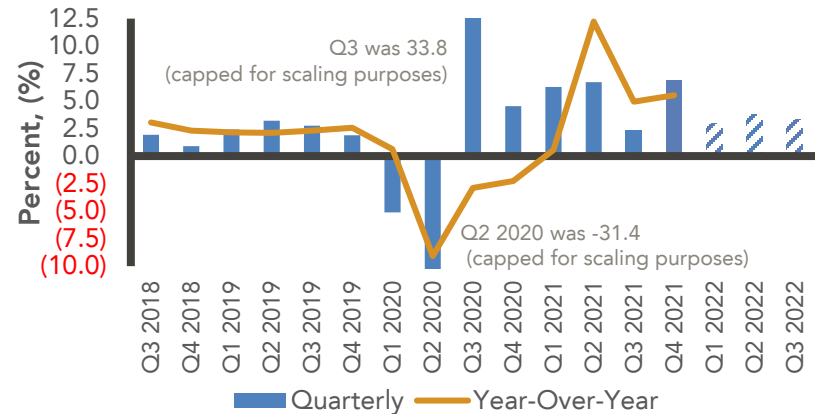
# Market Environment



# U.S. Economy

- Economic activity accelerated in Q4, with real GDP increasing by a better-than-expected annual rate of 6.9%. Growth was primary driven by private inventory accumulation and consumer spending. The former accounted for approximately 70% of real GDP growth.
- For 2022, a continued increase in inventory investment is expected to be a key driver of economic growth as inventories remain near historic lows relative to sales for many industries.
- However, the economy is still grappling with persistent supply chain disruptions. Outside the U.S., several countries are re-imposing lockdown measures, most notably in China. This approach may exacerbate supply chain issues, leaving businesses unable to build their respective inventories as economists currently anticipate.
- Most economists expect inflation to peak in Q1. However, supply chain issues may cause inflation to decelerate less quickly than anticipated through the remainder of 2022.

U.S. Real GDP Growth



U.S. Retail Inventory-to-Sales Ratio

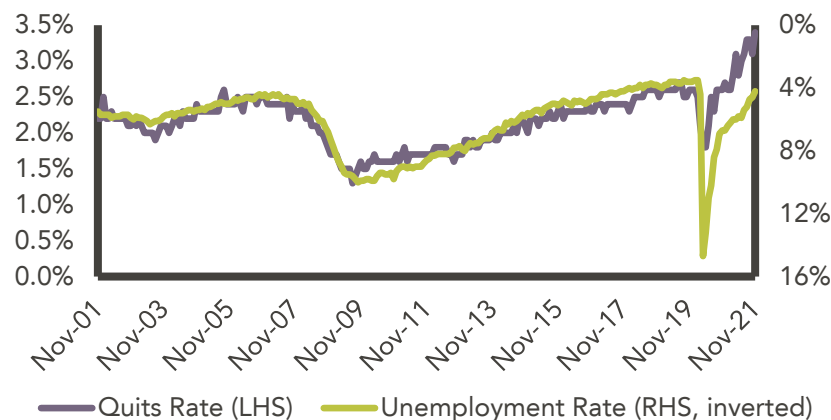


Sources: Refinitiv and The Wall Street Journal. Striped bars reflect estimates.

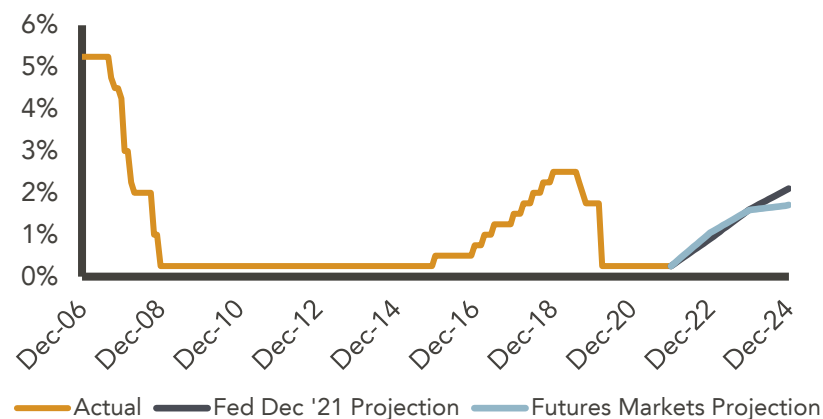
# U.S. Economy

- The labor market continues to tighten amid supply constraints. While the December employment report came in below expectations, the unemployment rate dropped to just 3.9% — its lowest level since before the pandemic.
- Notably, the quits rate, or resignations as a percentage of the workforce, within private industries continued to increase. A record number of workers quit their jobs in November, seeking better opportunities, higher wages, or leaving the workforce entirely. At 3.4%, the quits rate is consistent with an unemployment rate of below 1%.
- A tight labor market, coupled with accelerating inflation across most industries, has led the Federal Reserve to shift its outlook for monetary policy. Specifically, the Fed now anticipates it will halt its current quantitative easing program in March, while raising short-term rates three times this year and another three times in 2023.

U.S. Private Industry Quits Rate



Short-Term Interest Rates



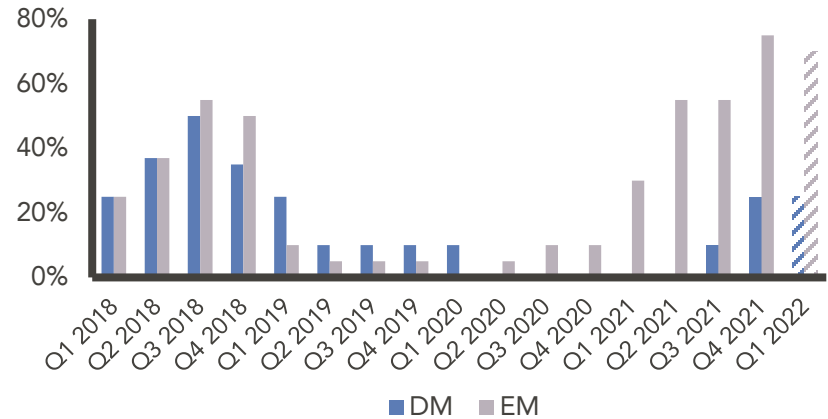
Sources: Refinitiv. The concept for the U.S. Private Industries Quits Rate vs. Unemployment chart was sourced from KKR's *A Different Kind of Recovery* December 2021 publication.



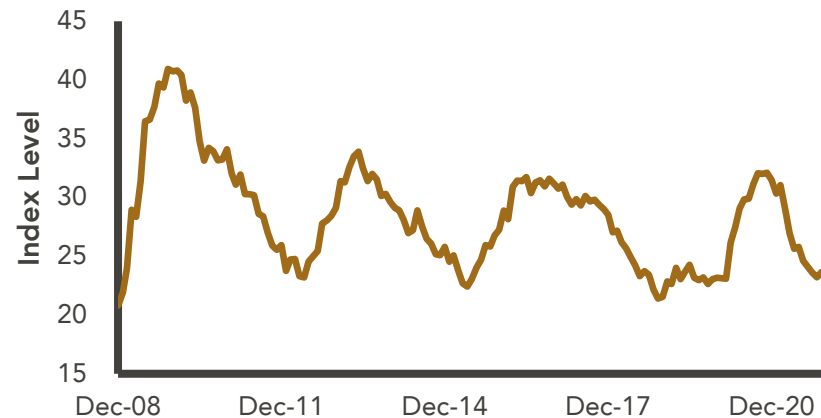
# Global Economy

- Outside the U.S., similar dynamics are playing out across the global economy. Global economic growth appears to have reaccelerated meaningfully from the Q3 slowdown.
- Like the Federal Reserve, global central banks are poised to tighten policy in 2022. Morgan Stanley estimates that nearly 80% and approximately 25% of emerging market and developed market central banks, respectively, will raise rates this year.
- One key exception is China, where economic growth slowed meaningfully in the second half of 2021 amid the country's "zero COVID policy", a challenging property market and subdued credit growth. In fact, the PBOC has eased policy recently, lowering banks' reserve requirement ratios and cutting the one-year loan prime rate. Most economists expect policymakers to continue easing policy throughout 2022.

% of Central Banks Raising Interest Rates



China Credit Impulse

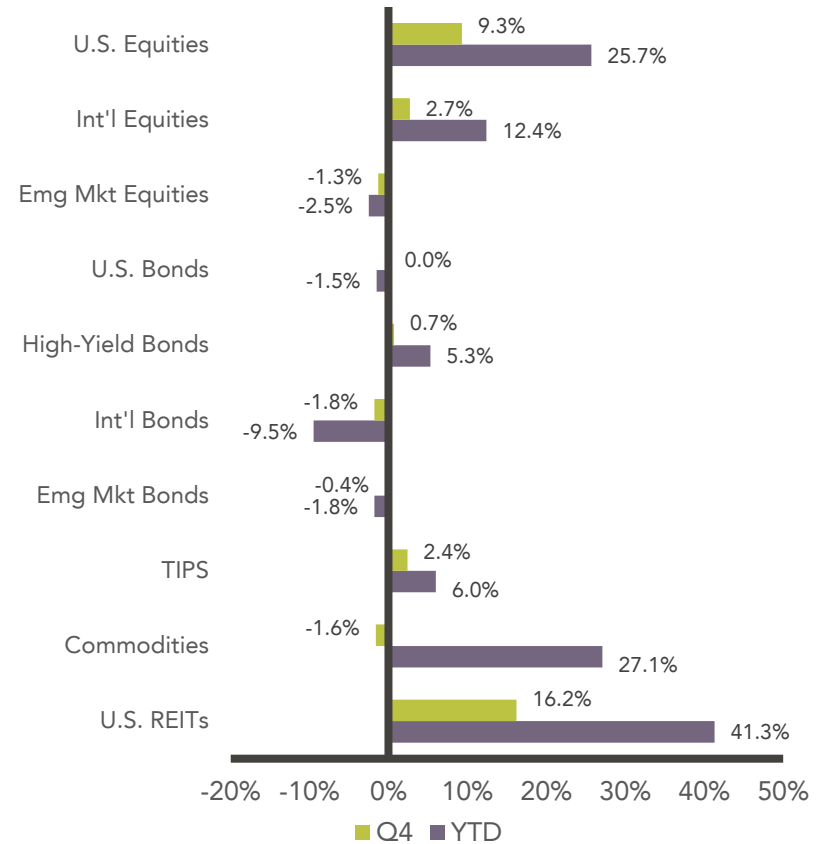


Sources: Morgan Stanley and Bloomberg. Striped bars reflect estimates. The credit impulse is defined as the monthly change of the flow in new credit as a share of GDP.

# Global Asset Class Performance

- **Global equities** ended Q4 firmly in the black as investors focused on strong corporate earnings, though there was a wide dispersion across regions. U.S. equities handily outperformed their international developed and emerging market counterparts. The latter finished in the red once again, with U.S. dollar strength hurting returns, and lagged non-U.S. developed markets by nearly 15 percentage points in 2021.
- **Fixed income** returns were muted during Q4, with investment-grade bonds flat for the quarter. Sub-investment grade debt outperformed, with high-yield bonds and bank loans both returning 0.7% for the quarter.
- **Inflation-sensitive assets** performance was mixed in Q4. TIPS outperformed nominal bonds amid rising inflation expectations, while commodities declined amid demand concerns generated by the emergence of the omicron COVID-19 variant. Finally, REITs topped broad equity markets, with the asset class posting its second-strongest calendar year on record.

Asset Class Returns: Select Asset Class Performance

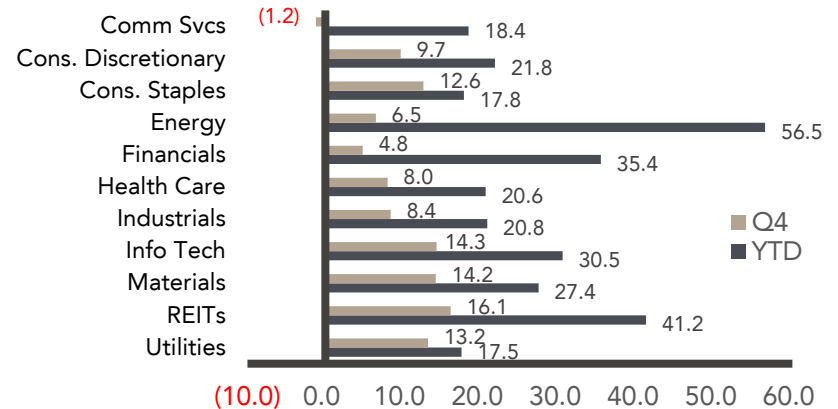


Source: Markov Processes International

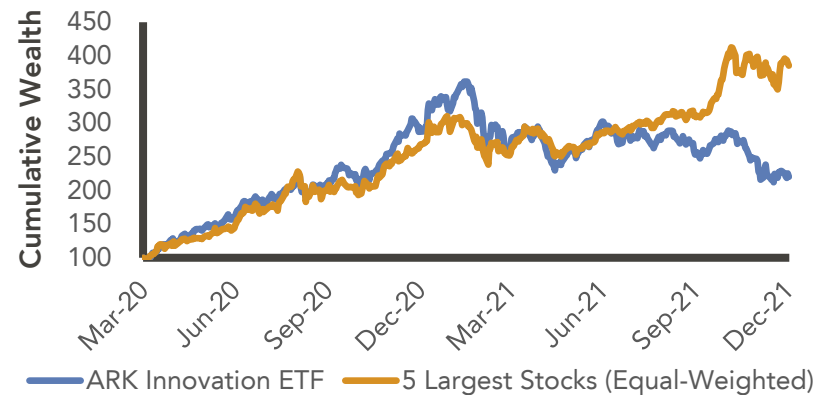
# U.S. Equity Markets

- U.S. equity rallied in Q4, overcoming a late-November sell-off in reaction to the global spread of the omicron variant. All sectors were in the black, except Communication Services, with REITs (+16.1%), Information Technology (+14.3%) and Materials (+14.2%) leading the way.
- Similar to Q3, growth stocks and large caps were best from a style and capitalization perspective, benefitting from the outperformance of Information Technology.
- Further down the capitalization spectrum, however, value outperformed within mid- and small-cap stocks. After a meteoric rise amid the pandemic, many unprofitable small- and mid-cap technology stocks fell dramatically in Q4 amid the prospect of rising interest rates.

## Sector Returns



## Profitless Tech vs. Mega-Cap Tech

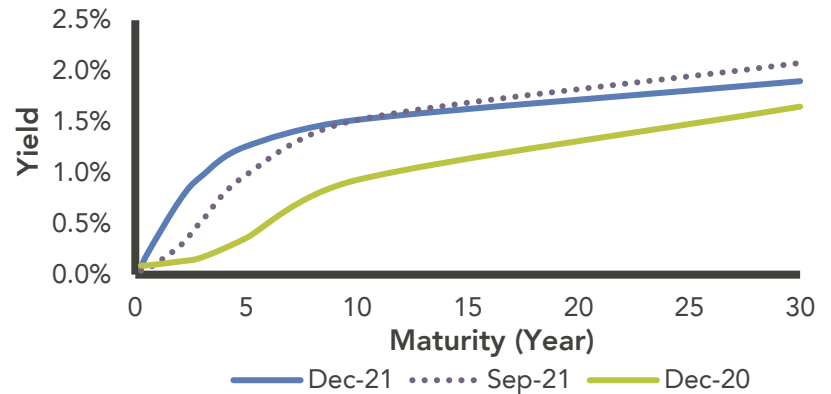


Sources: Refinitiv. The five largest stocks are Microsoft, Apple, Amazon, Tesla and Alphabet. The ARK Innovation ETF is predominantly comprised of smaller, unprofitable technology companies and is widely cited by market participants as a proxy for unprofitable small- and mid-cap technology stocks.

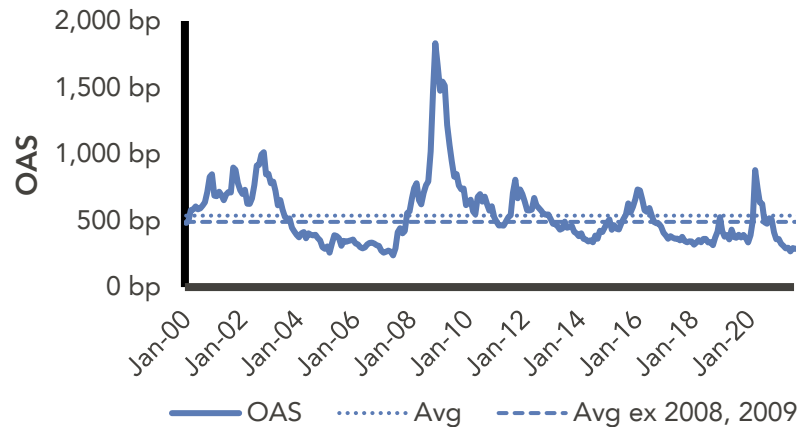
# U.S. Fixed Income

- Interest rates on the short and intermediate part of the Treasury yield curve rose sharply amid the prospects of tighter monetary policy, while yields on long-term bonds fell modestly.
- After very strong returns in both 2019 and 2020, the bond market succumbed to the upward pressure on rates and delivered negative returns in 2021. At **-1.5%**, the Bloomberg Aggregate Bond Index posted just its fourth negative calendar year return since the index began in 1976.
- Sub-investment grade debt continued to outperform their investment-grade counterparts. High yield (+0.7%) and bank loans (+0.7%) posted gains as spreads were little changed. High yield spreads, for example, ended the quarter at 283 basis points—down slightly from 289 at the end of Q2, but well below the long-term average of about 537 basis points.

Yield Curve



High Yield Spread



Sources: Bloomberg Barclays and Refinitiv

# Global Index Returns

DOMESTIC EQUITY	QTR	YTD	1 Year	3 Year	5 Year	10 Year
S&P 500 Index	11.0	28.7	28.7	26.1	18.5	16.6
Russell 3000 Index	9.3	25.7	25.7	25.8	18.0	16.3
Russell 3000 Growth Index	10.9	25.9	25.9	33.2	24.6	19.4
Russell 3000 Value Index	7.5	25.4	25.4	17.6	11.0	12.9
Russell TOP 200 Index	11.0	27.9	27.9	27.3	19.7	17.2
Russell TOP 200 Growth Index	13.7	31.2	31.2	35.6	26.8	20.7
Russell TOP 200 Value Index	7.4	23.5	23.5	16.6	11.1	12.7
Russell 1000 Index	9.8	26.5	26.5	26.2	18.4	16.5
Russell 1000 Growth Index	11.6	27.6	27.6	34.1	25.3	19.8
Russell 1000 Value Index	7.8	25.2	25.2	17.6	11.2	13.0
Russell Mid-Cap Index	6.4	22.6	22.6	23.3	15.1	14.9
Russell Mid-Cap Growth Index	2.8	12.7	12.7	27.5	19.8	16.6
Russell Mid-Cap Value Index	8.5	28.3	28.3	19.6	11.2	13.4
Russell 2000 Index	2.1	14.8	14.8	20.0	12.0	13.2
Russell 2000 Growth Index	0.0	2.8	2.8	21.2	14.5	14.1
Russell 2000 Value Index	4.4	28.3	28.3	18.0	9.1	12.0
<b>DOMESTIC EQUITY BY SECTOR (MSCI)</b>						
Communication Services	(1.2)	18.4	18.4	25.4	12.9	12.6
Consumer Discretionary	9.7	21.8	21.8	32.1	23.0	20.2
Consumer Staples	12.6	17.8	17.8	18.4	11.4	12.2
Energy	6.5	56.5	56.5	4.6	(2.2)	0.3
Financials	4.8	35.4	35.4	20.5	12.7	15.8
Health Care	8.0	20.6	20.6	20.3	17.8	17.5
Industrials	8.4	20.8	20.8	21.0	13.1	14.6
Information Technology	14.3	30.5	30.5	41.6	31.2	23.5
Materials	14.2	27.4	27.4	23.5	14.0	12.6
Real Estate	16.1	41.2	41.2	20.0	12.5	12.1
Utilities	13.2	17.5	17.5	13.4	11.4	11.1

Source: Markov Processes International

# Global Index Returns

INTERNATIONAL/GLOBAL EQUITY	QTR	YTD	1 Year	3 Year	5 Year	10 Year
MSCI EAFE (Net)	2.7	11.3	11.3	13.5	9.6	8.0
MSCI EAFE Growth (Net)	4.1	11.3	11.3	19.0	13.6	10.1
MSCI EAFE Value (Net)	1.2	10.9	10.9	7.8	5.3	5.8
MSCI EAFE Small Cap (Net)	0.1	10.1	10.1	15.6	11.0	10.8
MSCI AC World Index (Net)	6.7	18.5	18.5	20.4	14.4	11.9
MSCI AC World Index Growth (Net)	6.9	17.1	17.1	27.6	19.9	14.7
MSCI AC World Index Value (Net)	6.3	19.6	19.6	12.9	8.7	8.8
MSCI Europe ex UK (Net)	5.7	15.7	15.7	17.0	11.5	9.4
MSCI United Kingdom (Net)	5.6	18.5	18.5	8.7	6.2	5.1
MSCI Pacific ex Japan (Net)	(0.1)	4.7	4.7	9.7	8.3	6.8
MSCI Japan (Net)	(4.0)	1.7	1.7	11.7	8.5	8.3
MSCI Emerging Markets (Net)	(1.3)	(2.5)	(2.5)	10.9	9.9	5.5

Source: Markov Processes International

# Global Index Returns

FIXED INCOME	QTR	YTD	1 Year	3 Year	5 Year	10 Year
Merrill Lynch 3-month T-Bill	0.0	0.0	0.0	1.0	1.1	0.6
Barclays Intermediate Gov't./Credit	(0.6)	(1.4)	(1.4)	3.9	2.9	2.4
Barclays Aggregate Bond	0.0	(1.5)	(1.5)	4.8	3.6	2.9
Barclays Short Government	(0.2)	(0.2)	(0.2)	1.6	1.5	0.9
Barclays Intermediate Government	(0.6)	(1.7)	(1.7)	3.0	2.3	1.7
Barclays Long Government	3.0	(4.6)	(4.6)	8.8	6.5	4.5
Barclays Investment Grade Corp.	0.2	(1.0)	(1.0)	7.6	5.3	4.7
Barclays High Yield Corp. Bond	0.7	5.3	5.3	8.8	6.3	6.8
JPMorgan Global ex US Bond	(1.8)	(9.5)	(9.5)	1.7	2.6	0.3
JPMorgan Emerging Market Bond	(0.4)	(1.8)	(1.8)	5.9	4.7	5.3
INFLATION SENSITIVE						
Consumer Price Index	1.6	7.0	7.0	3.5	2.9	2.1
BC TIPS	2.4	6.0	6.0	8.4	5.3	3.1
Commodities	(1.6)	27.1	27.1	9.9	3.7	(2.9)
Gold	4.0	(4.3)	(4.3)	11.0	8.4	0.7
REITs	16.2	41.3	41.3	19.9	12.5	12.2
FTSE EPRA/NAREIT Global REITs	12.2	31.3	31.3	12.7	7.5	8.6
NCREIF ODCE*	7.7	21.1	21.1	8.2	7.8	9.4
NCREIF Farmland**	1.5	5.5	5.5	4.9	5.5	10.2
NCREIF Timberland**	1.9	5.0	5.0	2.4	2.9	4.9

\*Data are preliminary.

\*\*Data are as of September 30, 2021.

Source: Markov Processes International

# Portfolio Overview





## **Observations**

- Market Value as of December 31, 2021 was \$3.5 billion.
- Q4 '21 Return: Total Fund 3.0% (net) vs. Policy Index 4.9%; investment gain of \$107 million.
- Contributors to Fourth Quarter '21 Performance:
  - Higher quality Equity
  - Core Plus Real Estate
- Detractors from Fourth Quarter '21 Performance:
  - Active Growth Equity Managers
  - Emerging Markets Equity
  - Timber
- 2021 Return: Total Fund 13.1% (net) vs. Policy Index 14.5%; investment gain of \$425 million.
- 5 Year Return: Total Fund 12.3% (net) vs. Policy Index 11.1%; investment gain of \$1.6 billion.
- Estimated Annual Plan Investment Management Expenses has come down dramatically from 0.40% to 0.27%, an estimated annual savings of \$4.5 million.

## **Recent Changes / Looking Ahead**

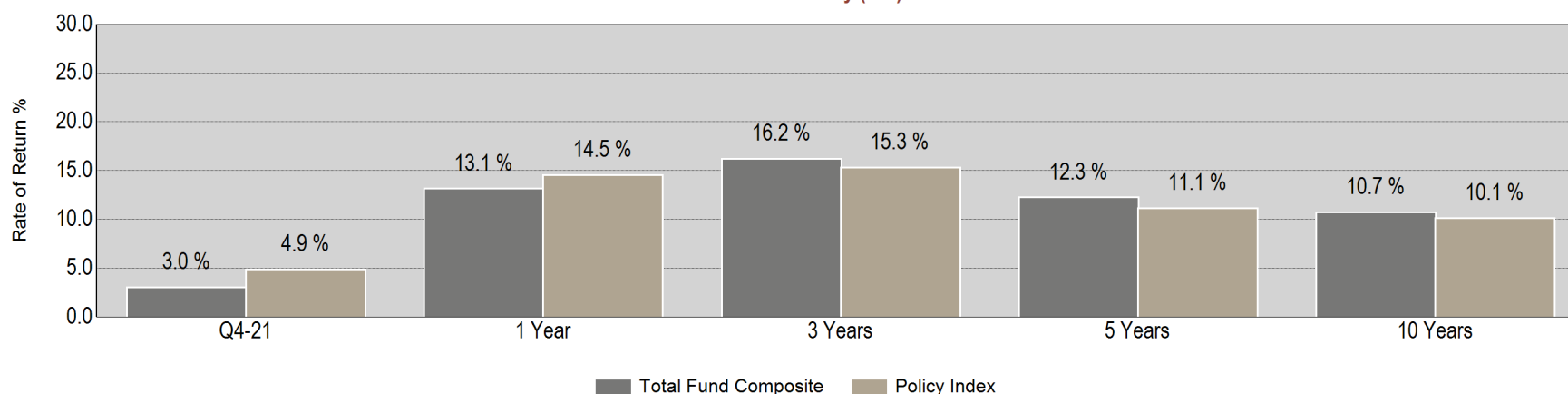
- Transitioned Portfolio to New Equity Structure
- Upcoming Investment Manager Search
  - Fixed Income: Opportunistic Credit

As of December 31, 2021

Summary of Cash Flows

	Fourth Quarter	One Year	Three Years	Five Years	Ten Years
<b>Beginning Market Value</b>	<b>\$3,424,004,219</b>	<b>\$3,175,810,695</b>	<b>\$2,362,559,830</b>	<b>\$2,152,931,984</b>	<b>\$1,482,912,350</b>
Net Cash Flow	\$2,358,069	-\$67,892,585	-\$123,779,186	-\$178,362,739	-\$261,106,364
Net Investment Change	\$107,023,822	\$425,468,001	\$1,294,605,467	\$1,558,816,866	\$2,311,580,125
<b>Ending Market Value</b>	<b>\$3,533,386,110</b>	<b>\$3,533,386,110</b>	<b>\$3,533,386,110</b>	<b>\$3,533,386,110</b>	<b>\$3,533,386,110</b>

Return Summary (Net)

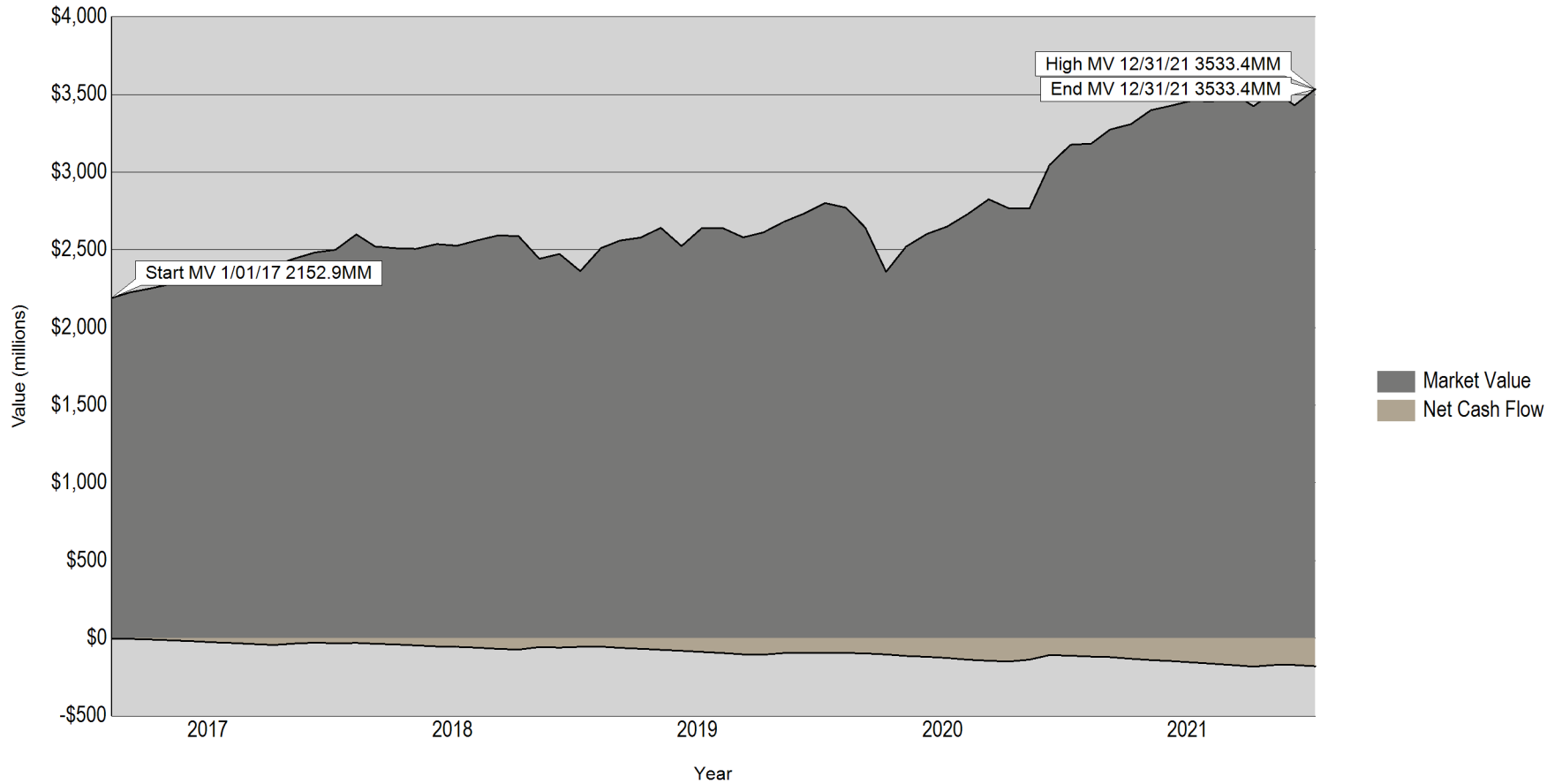


Asset Allocation vs. Target

	Current	Policy
U.S. Equity	32.6%	32.5%
Global Equity	10.2%	10.0%
Non-U.S. Equity	15.3%	15.0%
Emerging Markets	2.4%	2.5%
Real Assets	15.5%	15.0%
U.S. Fixed Income	23.4%	24.0%
Cash Equivalent	0.6%	1.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

The above is an interim policy allocation until Opp. Credit is funded (5% from Global Equity)

Market Value History



As of December 31, 2021

**Cash Flow Summary by Manager From October 01, 2021 to December 31, 2021**

	Beginning Market Value	Net Cash Flow	Net Investment Change	Ending Market Value
LSV Large Cap Value	\$212,975,945	-\$71,976,037	\$11,075,131	\$152,075,039
Xponance S&P 500	--	\$279,511,760	\$6,116,460	\$285,628,221
Northern Trust S&P 500	--	\$292,628,757	\$8,486,965	\$301,115,723
Polen Focus Growth	\$284,800,867	-\$160,160,121	\$10,593,508	\$135,234,255
William & Blair Large Cap Growth	\$79,426,093	-\$85,868,114	\$6,442,025	\$4
Eagle Asset Mgmt	\$232,034,407	-\$234,806,547	\$2,772,785	\$645
SSGA S&P 500	\$116,743,448	-\$123,314,029	\$6,570,581	\$0
Northern Trust Dow Jones Completion Index	--	\$118,324,385	\$3,954,136	\$122,278,522
Smith, Graham & Co Small Cap Value	\$96,392,522	-\$47,786,597	\$4,028,483	\$52,634,408
Copeland Small Cap Dividend Growth	\$59,653,908	-\$10,659,428	\$4,734,749	\$53,729,229
Emerald Small Cap Growth	\$90,829,348	-\$40,691,247	-\$980,358	\$49,157,743
LSV Small Cap Value	\$95,167,086	-\$98,975,956	\$3,821,868	\$12,998
SSGA Russell 2000	\$113,641,830	-\$111,582,712	-\$2,059,118	\$0
AMI Small Cap Growth	\$54,775,564	-\$52,847,277	-\$1,928,273	\$13
Rhumblin Global Min. Volatility	--	\$173,377,688	\$1,491,989	\$174,869,677
iShares MSCI ACWI	--	\$185,002,093	\$197,531	\$185,199,624
SSGA MSCI World ex US	\$167,824,227	\$110,000,000	\$9,511,788	\$287,336,015
Hardman Johnston Int'l Equity	\$181,761,090	-\$50,362,075	-\$7,003,291	\$124,395,725
HGK Int'l Equity	\$169,784,372	-\$40,347,158	-\$453,902	\$128,983,313
Jarislowsky, Fraser Limited	\$311,357	\$0	\$6,591	\$317,948
Mercator Asset Management	\$18,730	\$0	-\$351	\$18,378
GlobeFlex Capital	\$2,817	\$0	-\$53	\$2,764
WHV Investment Management	\$3,098	\$0	-\$58	\$3,040
SSGA MSCI Emerging Markets Index	\$296,928,569	-\$210,000,000	-\$3,007,274	\$83,921,295
Forest Investment Associates	\$135,428,835	-\$400,000	-\$147,359	\$134,881,477
PRISA LP	\$59,619,890	-\$142,317	\$3,832,413	\$63,309,985
PRISA II	\$120,417,196	-\$326,616	\$8,129,981	\$128,220,561
PennMuni-Nuveen U.S. Real Estate Fund	\$212,345,626	-\$2,648,732	\$11,071,996	\$220,768,890
N. Front Street (Nuveen)	\$2,124,536	\$0	\$0	\$2,124,536
SSGA US Aggregate Bond Index	\$635,539,355	\$190,000,000	-\$438,724	\$825,100,631
Cash Management	\$5,453,504	\$10,041,279	\$3,002	\$15,497,785
Abel Noser Transition Account	--	-\$13,632,930	\$20,200,598	\$6,567,668
<b>Total</b>	<b>\$3,424,004,219</b>	<b>\$2,358,069</b>	<b>\$107,023,822</b>	<b>\$3,533,386,110</b>

# Pennsylvania Municipal Retirement System

# Asset Allocation Summary

As of December 31, 2021

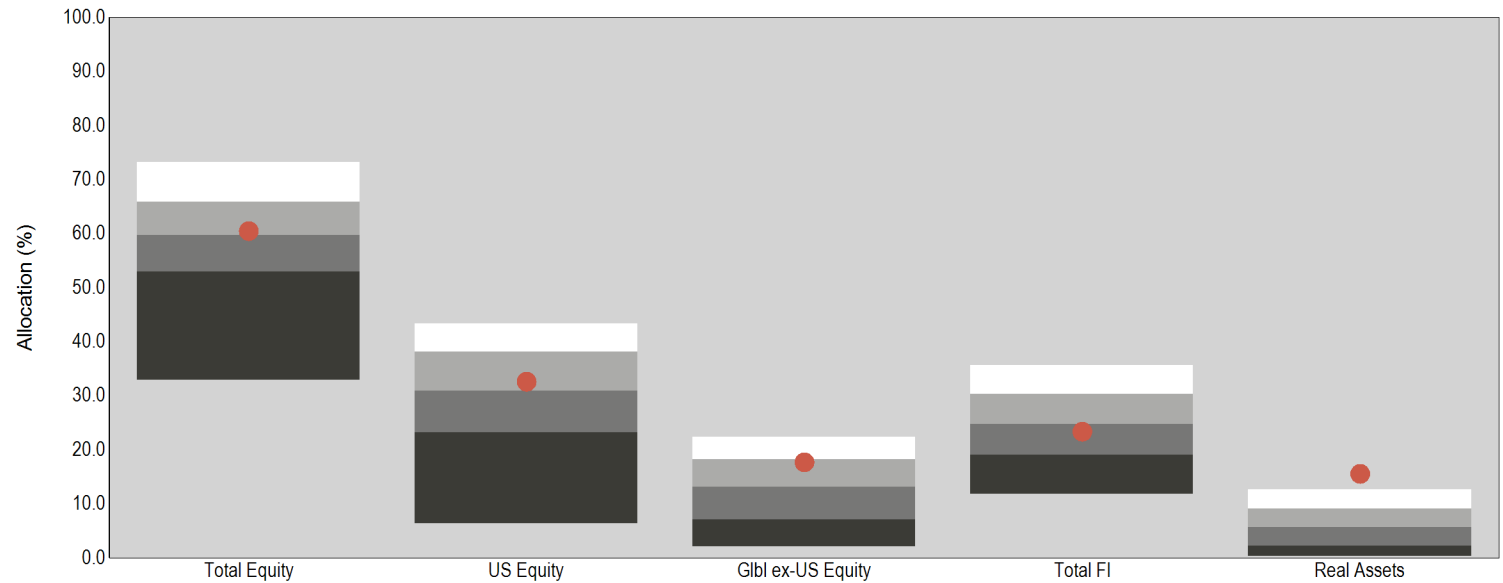
	Market Value	% of Portfolio	Policy %	Policy Difference
<b>Total Fund Composite</b>	<b>3,533,386,110</b>	<b>100.0</b>	<b>100.0</b>	<b>0</b>
<b>Total Equity Composite</b>	<b>2,136,914,578</b>	<b>60.5</b>	<b>60.0</b>	<b>16,882,912</b>
<b>U.S. Equity Composite</b>	<b>1,151,866,800</b>	<b>32.6</b>	<b>32.5</b>	<b>3,516,314</b>
LSV Large Cap Value	152,075,039	4.3		
Xponance S&P 500	285,628,221	8.1		
Northern Trust S&P 500	301,115,723	8.5		
Polen Focus Growth	135,234,255	3.8		
Northern Trust Dow Jones Completion Index	122,278,522	3.5		
Smith, Graham & Co Small Cap Value	52,634,408	1.5		
Copeland Small Cap Dividend Growth	53,729,229	1.5		
Emerald Small Cap Growth	49,157,743	1.4		
<b>Global Equity Composite</b>	<b>360,069,301</b>	<b>10.2</b>	<b>10.0</b>	<b>6,730,690</b>
Rhumblin Global Min. Volatility	174,869,677	4.9		
iShares MSCI ACWI	185,199,624	5.2		
<b>Non-U.S Equity Composite</b>	<b>624,978,478</b>	<b>17.7</b>	<b>17.5</b>	<b>6,635,908</b>
SSGA MSCI World ex US	287,336,015	8.1		
Hardman Johnston Int'l Equity	124,395,725	3.5		
HGK Int'l Equity	128,983,313	3.7		
SSGA MSCI Emerging Markets Index	83,921,295	2.4		
<b>Real Assets Composite</b>	<b>549,305,449</b>	<b>15.5</b>	<b>15.0</b>	<b>19,297,532</b>
Forest Investment Associates	134,881,477	3.8		
PRISA LP	63,309,985	1.8		
PRISA II	128,220,561	3.6		
PennMuni-Nuveen U.S. Real Estate Fund	220,768,890	6.2		
N. Front Street (Nuveen)	2,124,536	0.1		
<b>Total Fixed Income Composite</b>	<b>825,100,631</b>	<b>23.4</b>	<b>24.0</b>	<b>-22,912,036</b>
SSGA US Aggregate Bond Index	825,100,631	23.4		
<b>Cash Composite</b>	<b>22,065,453</b>	<b>0.6</b>	<b>1.0</b>	<b>-13,268,408</b>
Cash Management	15,497,785	0.4		
Abel Noser Transition Account	6,567,668	0.2		

Residual value for Jarislowsky, Mercator, Globeflex, and WHV (approx. \$342k) are included in Non-US Equity and Total Fund Composite values.

Residual values for William Blair, Eagle, AMI, and LSV Small Cap (approx. \$14k) are included in the US Equity and Total Fund Composite values.

Abel Noser Transition Account value is cash.

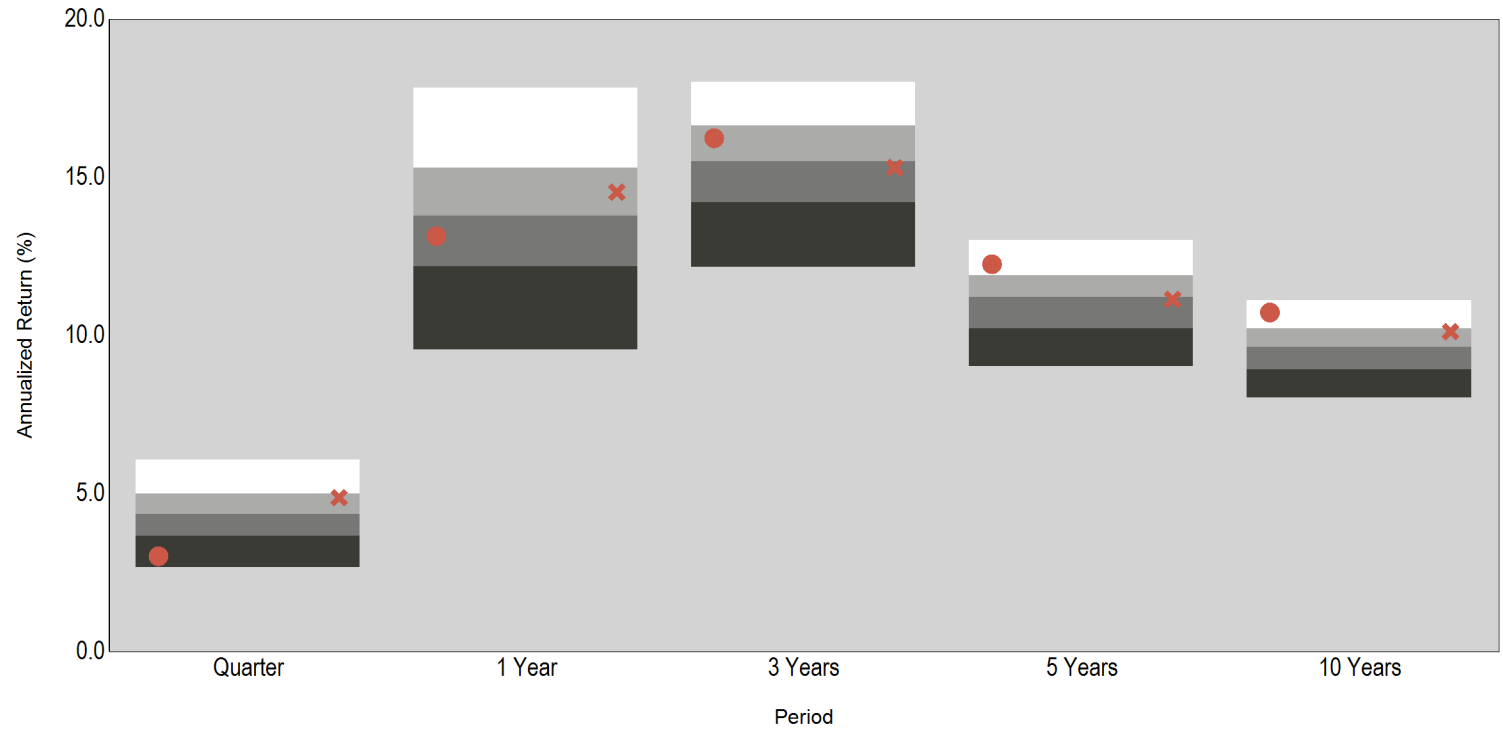
Total Plan Allocation vs. InvMetrics Public DB Net  
As of December 31, 2021



Allocation (Rank)

5th Percentile	73.3		43.3		22.3		35.7		12.6	
25th Percentile	65.9		38.2		18.2		30.4		9.1	
Median	59.7		30.9		13.1		24.7		5.7	
75th Percentile	52.9		23.2		7.1		19.0		2.2	
95th Percentile	32.9		6.4		2.1		11.9		0.3	
# of Portfolios	183		91		133		180		58	
● Total Fund Composite	60.5	(49)	32.6	(47)	17.7	(28)	23.4	(57)	15.5	(2)

InvMetrics Public DB Net Return Comparison



Return (Rank)

5th Percentile	6.1		17.8		18.0		13.0		11.1	
25th Percentile	5.0		15.3		16.6		11.9		10.2	
Median	4.4		13.8		15.5		11.2		9.6	
75th Percentile	3.7		12.2		14.2		10.2		8.9	
95th Percentile	2.7		9.6		12.2		9.0		8.0	
# of Portfolios	565		559		546		526		442	
● Total Fund Composite	3.0	(92)	13.1	(61)	16.2	(35)	12.3	(17)	10.7	(13)
▲ Policy Index	4.9	(31)	14.5	(35)	15.3	(55)	11.1	(53)	10.1	(29)

**RISK RETURN STATISTICS**  
January 01, 2017 Through December 31, 2021

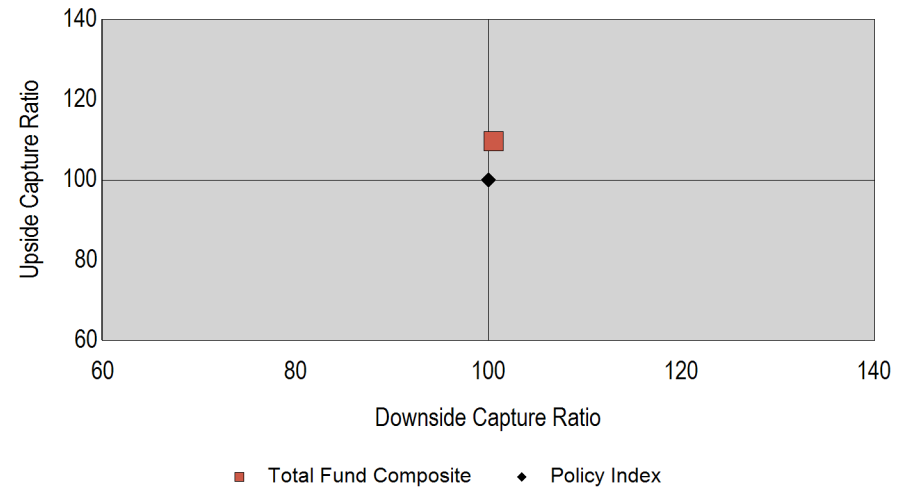
	Total Fund Composite	Policy Index
<b>RETURN SUMMARY STATISTICS</b>		
Number of Periods	20	20
Maximum Return	13.50	12.26
Minimum Return	-15.37	-14.88
Annualized Return	12.26	11.14
Total Return	78.25	69.59
Annualized Excess Return Over Risk Free	11.18	10.06
Annualized Excess Return	1.11	0.00

	Total Fund Composite	Policy Index
<b>RISK SUMMARY STATISTICS</b>		
Beta	1.06	1.00
Upside Deviation	7.40	6.75
Downside Deviation	14.76	14.32

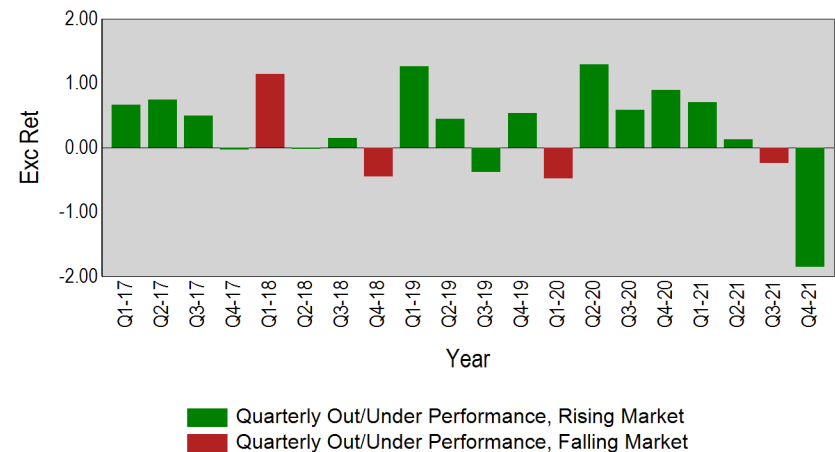
	Total Fund Composite	Policy Index
<b>RISK/RETURN SUMMARY STATISTICS</b>		
Annualized Standard Deviation	13.08	12.30
Alpha	0.11	0.00
Sharpe Ratio	0.85	0.82
Excess Return Over Market / Risk	0.09	0.00
Tracking Error	1.48	0.00
Information Ratio	0.75	--

	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, 2021



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





**Characteristics**

	Portfolio	MSCI ACWI IMI Net USD
Number of Holdings	6,017	9,292
Weighted Avg. Market Cap. (\$B)	311.6	380.3
Median Market Cap. (\$B)	6.8	2.3
Price To Earnings	20.3	20.2
Price To Book	3.8	3.6
Price To Sales	2.4	2.3
Return on Equity (%)	19.5	18.9
Yield (%)	1.6	1.8

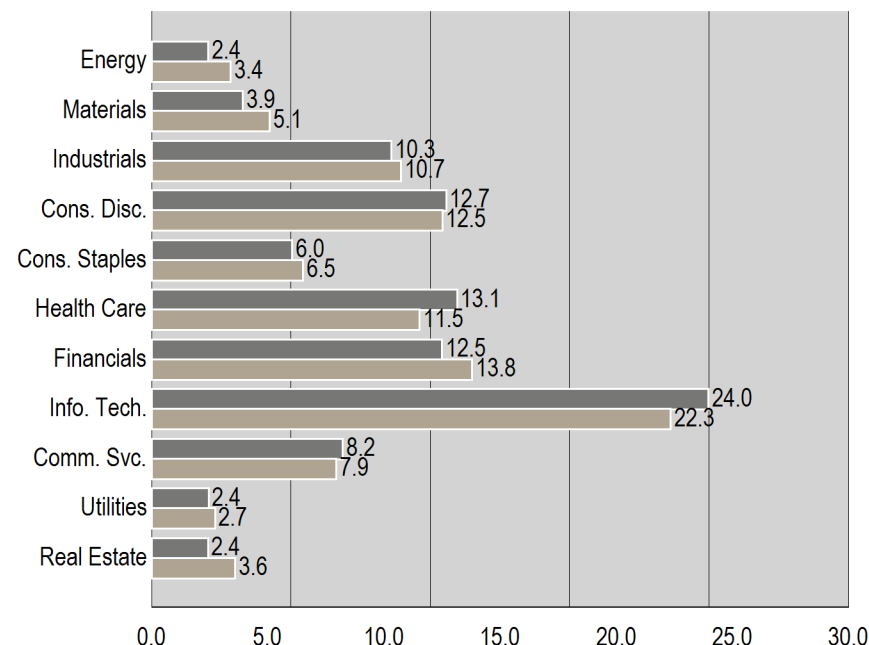
**Top Holdings**

MICROSOFT CORP	2.5%
APPLE INC	2.3%
AMAZON.COM INC	1.7%
META PLATFORMS INC	1.1%
ISHARES MSCI EMERGING MARKETS MIN VOL FACTOR ETF	1.0%
ALPHABET INC	1.0%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	0.9%
ALPHABET INC	0.9%
TESLA INC	0.7%
UNITEDHEALTH GROUP INC	0.7%
<b>Total</b>	<b>12.8%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Total Equity Composite	16.3%	17.1%	64.7%	1.9%
MSCI ACWI IMI Net USD	16.3%	15.2%	68.5%	0.0%
<i>Weight Over/Under</i>	<i>0.0%</i>	<i>1.8%</i>	<i>-3.8%</i>	<i>1.9%</i>

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



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	1.9%	2.9%	-1.0%
United States	64.1%	60.3%	3.8%
Europe Ex U.K.	12.2%	12.6%	-0.3%
United Kingdom	3.0%	3.9%	-0.9%
Pacific Basin Ex Japan	3.0%	3.0%	0.0%
Japan	5.3%	5.9%	-0.6%
Emerging Markets	9.9%	11.1%	-1.3%
Other	0.6%	0.3%	0.3%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

# Pennsylvania Municipal Retirement System

## Performance Summary (Net)

As of December 31, 2021

	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	Inception	Inception Date
<b>Total Fund Composite</b>	<b>3.0</b>	<b>13.1</b>	<b>16.2</b>	<b>12.3</b>	<b>10.7</b>	<b>9.1</b>	<b>Jan-86</b>
<i>Policy Index</i>	4.9	14.5	15.3	11.1	10.1	9.5	Jan-86
<i>InvMetrics Public DB Net Rank</i>	92	61	35	17	13	27	Jan-86
<b>Total Equity Composite</b>	<b>3.2</b>	<b>17.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>30.5</b>	<b>Oct-20</b>
<i>MSCI ACWI IMI Net USD</i>	6.1	18.2	--	--	--	28.5	Oct-20
<b>U.S. Equity Composite</b>	<b>4.9</b>	<b>23.6</b>	<b>25.2</b>	<b>17.4</b>	<b>15.8</b>	<b>10.2</b>	<b>Jan-06</b>
<i>Russell 3000</i>	9.3	25.7	25.8	18.0	16.3	10.9	Jan-06
<i>InvMetrics Public DB US Eq Net Rank</i>	98	83	25	25	35	64	Jan-06
LSV Large Cap Value	6.4	27.2	17.5	11.4	13.2	9.1	Apr-04
<i>Russell 1000 Value</i>	7.8	25.2	17.6	11.2	13.0	8.7	Apr-04
<i>S&amp;P 500</i>	11.0	28.7	26.1	18.5	16.6	10.7	Apr-04
<i>eV US Large Cap Value Equity Net Rank</i>	81	45	61	64	45	46	Apr-04
Xponance S&P 500	--	--	--	--	--	--	Dec-21
<i>eV US Large Cap Core Equity Net Rank</i>	--	--	--	--	--	--	Dec-21
Northern Trust S&P 500	--	--	--	--	--	--	Dec-21
<i>eV US Large Cap Core Equity Net Rank</i>	--	--	--	--	--	--	Dec-21
Polen Focus Growth	5.4	24.5	32.3	26.2	19.6	19.2	Oct-10
<i>Russell 1000 Growth</i>	11.6	27.6	34.1	25.3	19.8	18.9	Oct-10
<i>eV US Large Cap Growth Equity Net Rank</i>	79	43	33	14	14	6	Oct-10
Northern Trust Dow Jones Completion Index	--	--	--	--	--	--	Dec-21
<i>eV US Small-Mid Cap Core Equity Net Rank</i>	--	--	--	--	--	--	Dec-21
Smith, Graham & Co Small Cap Value	5.0	23.4	23.1	10.0	--	10.5	Dec-16
<i>Russell 2000 Value</i>	4.4	28.3	18.0	9.1	--	9.8	Dec-16
<i>Russell 2000</i>	2.1	14.8	20.0	12.0	--	12.4	Dec-16
<i>eV US Small Cap Equity Net Rank</i>	57	51	38	73	--	74	Dec-16
Copeland Small Cap Dividend Growth	8.3	26.5	20.5	--	--	13.9	Sep-17
<i>Russell 2000</i>	2.1	14.8	20.0	--	--	11.5	Sep-17
<i>eV US Small Cap Core Equity Net Rank</i>	18	40	62	--	--	38	Sep-17
Emerald Small Cap Growth	-0.5	3.9	23.5	16.5	16.6	11.6	Oct-98
<i>Russell 2000 Growth</i>	0.0	2.8	21.2	14.5	14.1	8.9	Oct-98
<i>eV US Small Cap Growth Equity Net Rank</i>	66	79	71	75	48	57	Oct-98

# Pennsylvania Municipal Retirement System

## Performance Summary (Net)

As of December 31, 2021

	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	Inception	Inception Date
<b>Global Equity Composite</b>	--	--	--	--	--	--	<b>Dec-21</b>
Rhumbline Global Min. Volatility	--	--	--	--	--	--	Dec-21
<i>eV Global Low Volatility Equity Net Rank</i>	--	--	--	--	--	--	Dec-21
iShares MSCI ACWI	--	--	--	--	--	--	Dec-21
<i>eV Global Large Cap Core Eq Net Rank</i>	--	--	--	--	--	--	Dec-21
<b>Non-U.S Equity Composite</b>	<b>0.2</b>	<b>5.2</b>	<b>15.3</b>	<b>12.1</b>	<b>--</b>	<b>8.9</b>	<b>May-12</b>
MSCI ACWI ex USA IMI	1.6	8.5	13.6	9.8	--	8.2	May-12
<i>InvMetrics Public DB ex-US Eq Net Rank</i>	78	88	30	10	--	32	May-12
SSGA MSCI World ex US	3.2	12.9	14.4	10.0	--	7.3	Apr-12
MSCI World ex USA	3.1	12.6	14.1	9.6	--	7.0	Apr-12
<i>eV ACWI ex-US Core Equity Net Rank</i>	40	35	71	71	--	58	Apr-12
Hardman Johnston Int'l Equity	-3.4	1.3	22.5	17.0	--	11.1	Apr-12
MSCI EAFE	2.7	11.3	13.5	9.5	--	7.1	Apr-12
<i>eV EAFE All Cap Equity Net Rank</i>	97	99	3	1	--	5	Apr-12
HGK Int'l Equity	1.0	13.1	17.2	12.9	--	10.3	Feb-12
MSCI EAFE	2.7	11.3	13.5	9.5	--	7.5	Feb-12
<i>eV EAFE All Cap Equity Net Rank</i>	75	26	30	22	--	15	Feb-12
SSGA MSCI Emerging Markets Index	-1.0	-2.6	10.9	9.8	5.4	8.3	Nov-08
MSCI Emerging Markets	-1.3	-2.5	10.9	9.9	5.5	8.5	Nov-08
<i>eV Emg Mkts Equity Net Rank</i>	54	65	68	55	74	71	Nov-08

# Pennsylvania Municipal Retirement System

## Performance Summary (Net)

As of December 31, 2021

	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	Inception	Inception Date
<b>Real Assets Composite</b>	<b>4.2</b>	<b>13.1</b>	<b>6.1</b>	<b>6.2</b>	<b>7.7</b>	<b>7.7</b>	<b>Apr-93</b>
Real Assets Policy Index	7.7	21.1	8.2	7.7	9.4	7.8	Apr-93
InvMetrics Public DB Real Assets/Commodities Net Rank	16	60	70	39	20	--	Apr-93
Forest Investment Associates	-0.3	6.5	0.7	2.4	4.4	3.8	Mar-99
NCREIF Timberland Property Index	4.6	9.2	3.7	3.6	5.3	6.0	Mar-99
InvMetrics Public DB Real Assets/Commodities Net Rank	92	97	98	96	71	--	Mar-99
PRISA LP	6.2	20.6	8.9	8.1	9.7	6.6	Jan-86
NFI-ODCE	7.7	21.1	8.2	7.7	9.4	6.5	Jan-86
InvMetrics Public DB Real Estate Priv Net Rank	92	74	65	61	54	--	Jan-86
PRISA II	6.5	21.9	9.0	8.4	10.8	4.7	Jul-07
NFI-ODCE	7.7	21.1	8.2	7.7	9.4	5.4	Jul-07
InvMetrics Public DB Real Estate Priv Net Rank	91	59	64	60	29	66	Jul-07
PennMuni-Nuveen U.S. Real Estate Fund	5.3	10.8	7.9	8.1	9.2	6.5	Dec-08
NFI-ODCE	7.7	21.1	8.2	7.7	9.4	6.5	Dec-08
NCREIF Property Index	6.2	17.7	8.4	7.8	9.3	7.7	Dec-08
InvMetrics Public DB Real Estate Priv Net Rank	94	99	85	64	81	44	Dec-08
N. Front Street (Nuveen)	0.0	3.1	0.8	-3.9	--	-5.0	Sep-16
Consumer Price Index	1.6	7.0	3.5	2.9	--	2.8	Sep-16
<b>Total Fixed Income Composite</b>							
SSGA US Aggregate Bond Index	0.0	-1.6	4.8	3.6	2.9	5.0	Apr-97
Bloomberg US Aggregate TR	0.0	-1.5	4.8	3.6	2.9	5.0	Apr-97
eV US Core Fixed Inc Net Rank	28	54	74	73	80	68	Apr-97
<b>Cash Composite</b>							
Cash Management							
Abel Noser Transition Account							

\*Nuveen return represents manager provided estimate. N. Front Street as of 09/30/2021.

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## IV. Composites



**Characteristics**

	Portfolio	Russell 3000
Number of Holdings	3,774	3,065
Weighted Avg. Market Cap. (\$B)	429.5	568.6
Median Market Cap. (\$B)	2.3	2.8
Price To Earnings	22.0	24.9
Price To Book	4.1	4.5
Price To Sales	2.6	3.4
Return on Equity (%)	21.8	22.9
Yield (%)	1.3	1.3

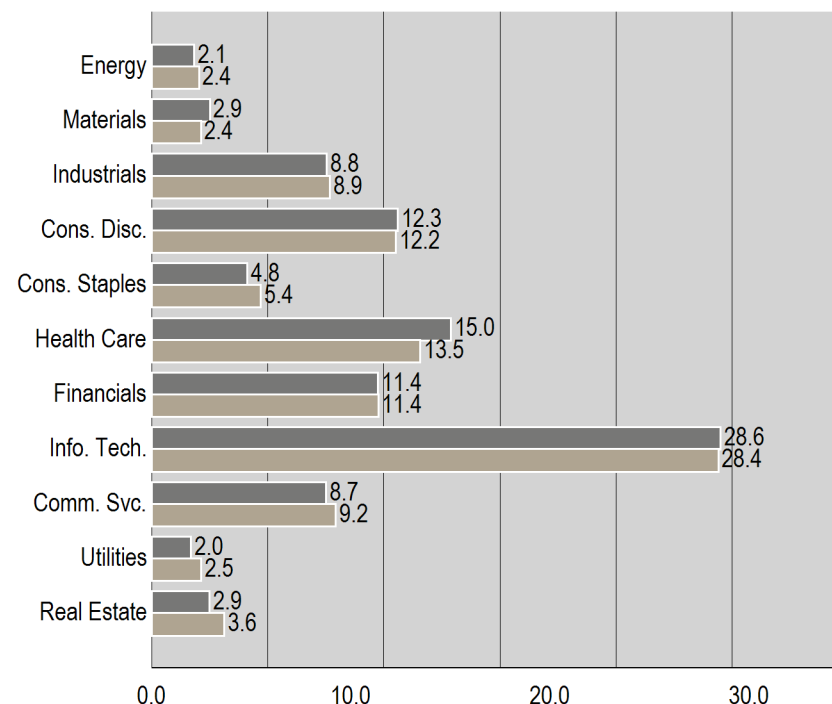
**Top Holdings**

MICROSOFT CORP	4.0%
APPLE INC	3.6%
AMAZON.COM INC	2.6%
META PLATFORMS INC	1.8%
ALPHABET INC	1.5%
ALPHABET INC	1.5%
TESLA INC	1.1%
UNITEDHEALTH GROUP INC	1.1%
MASTERCARD INC	1.0%
ABBOTT LABORATORIES	1.0%
<b>Total</b>	<b>19.2%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
U.S. Equity Composite	12.2%	26.8%	60.0%	1.0%
Russell 3000	5.6%	23.1%	71.2%	0.0%
<i>Weight Over/Under</i>	6.6%	3.6%	-11.2%	1.0%

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



**Characteristics**

	Portfolio	MSCI ACWI IMI Net USD
Number of Holdings	2,348	9,292
Weighted Avg. Market Cap. (\$B)	278.2	380.3
Median Market Cap. (\$B)	16.5	2.3
Price To Earnings	22.4	20.2
Price To Book	4.0	3.6
Price To Sales	2.7	2.3
Return on Equity (%)	21.9	18.9
Yield (%)	1.8	1.8

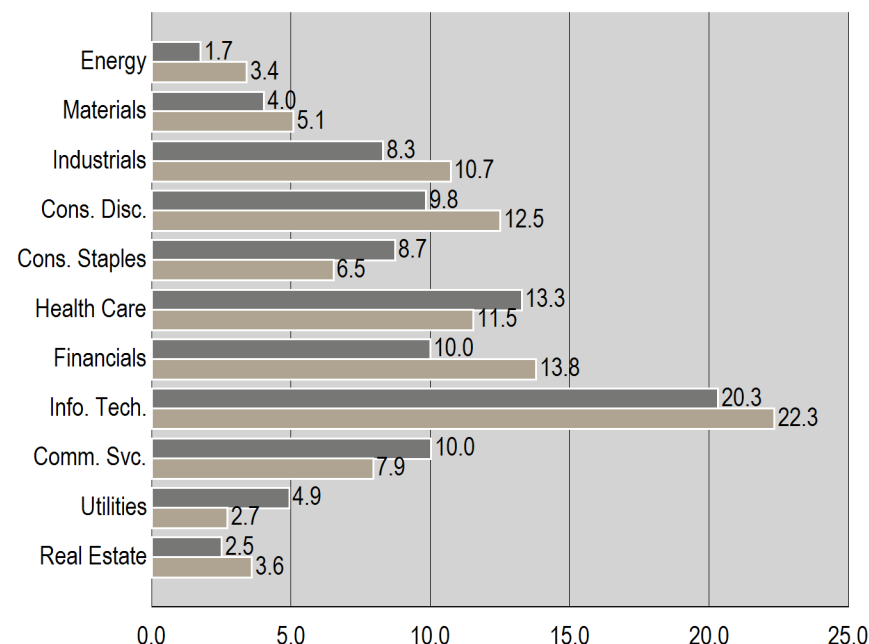
**Top Holdings**

ISHARES MSCI EMERGING MARKETS MIN VOL FACTOR ETF	5.9%
APPLE INC	2.1%
MICROSOFT CORP	1.9%
AMAZON.COM INC	1.4%
ROCHE HOLDING AG	0.9%
NESTLE SA, CHAM UND VEVEY	0.9%
VERIZON COMMUNICATIONS INC	0.9%
WASTE MANAGEMENT INC.	0.8%
JOHNSON & JOHNSON	0.8%
ALPHABET INC	0.8%
<b>Total</b>	<b>16.4%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Global Equity Composite	10.5%	18.5%	70.0%	1.1%
MSCI ACWI IMI Net USD	16.3%	15.2%	68.5%	0.0%
<i>Weight Over/Under</i>	<i>-5.8%</i>	<i>3.2%</i>	<i>1.5%</i>	<i>1.1%</i>

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



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	2.4%	2.9%	-0.5%
United States	63.7%	60.3%	3.4%
Europe Ex U.K.	13.4%	12.6%	0.8%
United Kingdom	2.0%	3.9%	-1.8%
Pacific Basin Ex Japan	3.0%	3.0%	0.0%
Japan	7.7%	5.9%	1.7%
Emerging Markets	6.9%	11.1%	-4.2%
Other	0.9%	0.3%	0.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>



Common Holdings Matrix

	<i>Rhumbleline Global Min. Volatility</i>		<i>iShares MSCI ACWI</i>	
	#	%	#	%
Rhumbleline Global Min. Volatility	--	--	275	29
iShares MSCI ACWI	275	84	--	--

**Characteristics**

	Portfolio	MSCI ACWI ex USA IMI
Number of Holdings	2,171	6,706
Weighted Avg. Market Cap. (\$B)	98.6	85.0
Median Market Cap. (\$B)	9.7	2.0
Price To Earnings	16.4	15.3
Price To Book	3.2	2.7
Price To Sales	1.9	1.5
Return on Equity (%)	14.6	14.0
Yield (%)	2.0	2.6

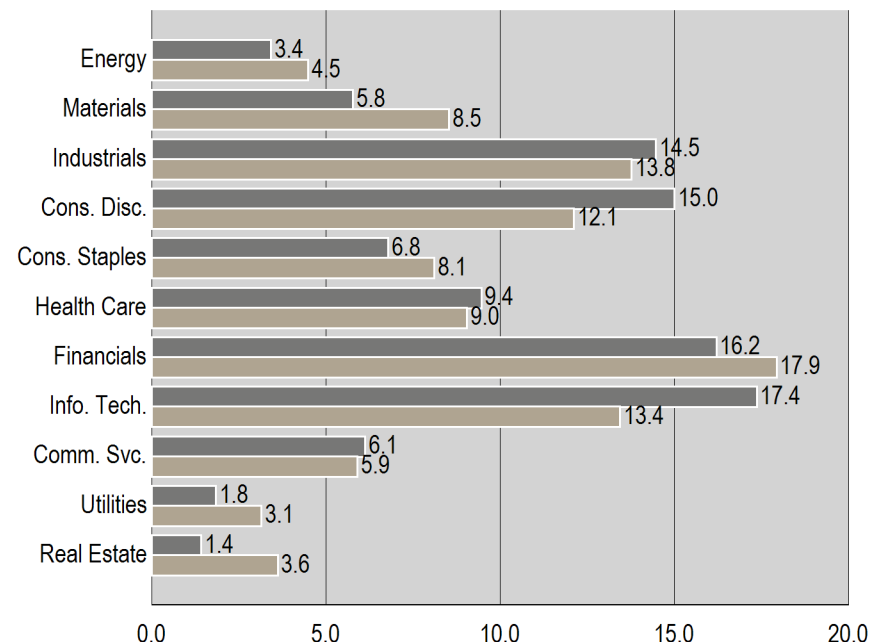
**Top Holdings**

TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	3.1%
ASML HOLDING NV	1.7%
ASTRAZENECA PLC	1.4%
KEYENCE CORP	1.3%
AIRBUS SE	1.3%
TENCENT HOLDINGS LTD	1.2%
AIA GROUP LTD	1.2%
SAMSUNG ELECTRONICS CO LTD	1.2%
TOYOTA MOTOR CORP	1.1%
PUMA SE	1.1%
<b>Total</b>	<b>14.7%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Non-U.S Equity Composite	10.7%	26.8%	58.2%	4.3%
MSCI ACWI ex USA IMI	25.8%	21.2%	53.0%	0.0%
<i>Weight Over/Under</i>	-15.1%	5.6%	5.2%	4.3%

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



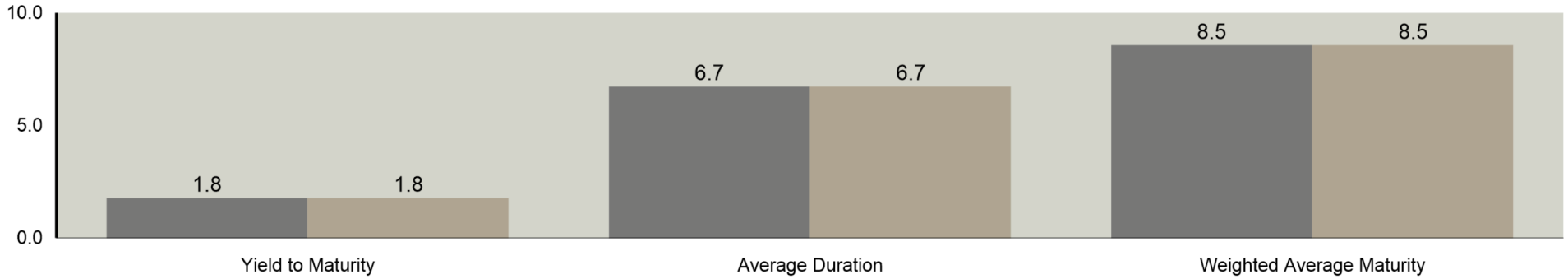
**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	5.1%	7.4%	-2.2%
United States	0.8%	0.0%	0.8%
Europe Ex U.K.	31.3%	31.6%	-0.3%
United Kingdom	8.1%	9.7%	-1.6%
Pacific Basin Ex Japan	8.5%	7.5%	1.1%
Japan	14.3%	14.9%	-0.6%
Emerging Markets	30.8%	28.0%	2.8%
Other	1.0%	0.9%	0.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

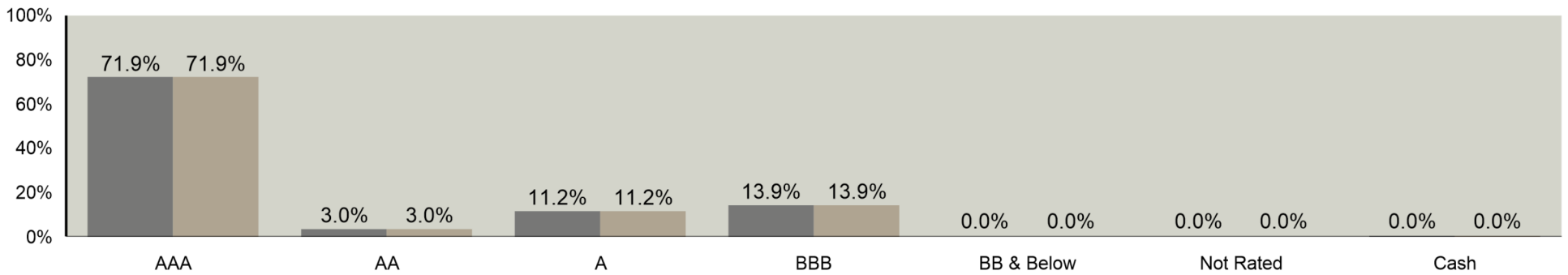
Common Holdings Matrix

	<i>SSGA MSCI World ex US</i>		<i>Hardman Johnston Int'l Equity</i>		<i>HGK Int'l Equity</i>		<i>SSGA MSCI Emerging Markets Index</i>	
	#	%	#	%	#	%	#	%
SSGA MSCI World ex US	--	--	19	73	18	67	933	94
Hardman Johnston Int'l Equity	19	7	--	--	1	3	4	9
HGK Int'l Equity	18	3	1	2	--	--	1	1
SSGA MSCI Emerging Markets Index	933	29	4	12	1	5	--	--

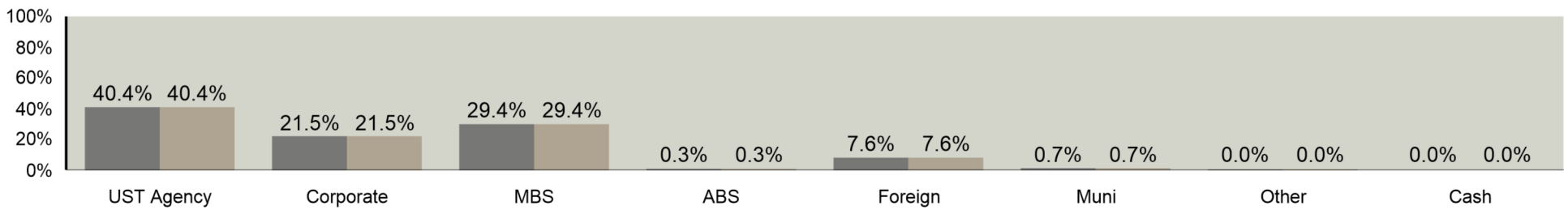
Summary Characteristics



Credibility Quality Allocation



US Sector Allocation



Fixed Income Composite

BBgBarc U.S. Aggregate Bond

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## V. Investment Managers



As of December 31, 2021

**Manager Summary:** Quantitative model that selects deep value stocks. Model ranks stocks based on fundamental measures of value and indicators of price recovery. The model contains three basic blocks of variables: 1) Cheapness/Fundamentals (60%), 2) Past Long-Term Performance/Contrarian (15%) and 3) Momentum (25%). The top 15% of stocks are ranked by expected return and then optimized for risk control. The resulting portfolio consists of approximately 100-160 stocks.

**Characteristics**

	Portfolio	S&P 500
Number of Holdings	153	504
Weighted Avg. Market Cap. (\$B)	73.2	670.5
Median Market Cap. (\$B)	16.3	34.6
Price To Earnings	12.5	26.2
Price To Book	2.5	4.9
Price To Sales	1.1	3.7
Return on Equity (%)	23.4	30.4
Yield (%)	2.3	1.3

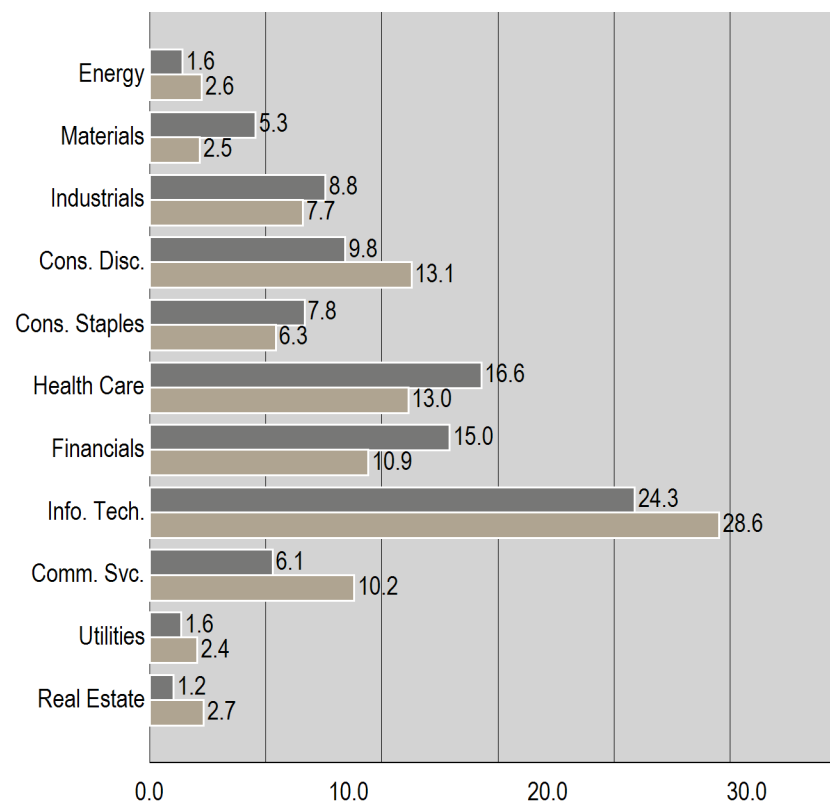
**Top Holdings**

PFIZER INC	2.7%
ORACLE CORP	2.3%
CISCO SYSTEMS INC	2.0%
MERCK & CO INC	1.8%
INTEL CORP	1.7%
AMGEN INC	1.6%
INTERNATIONAL BUSINESS MACHINES CORP	1.5%
APPLIED MATERIALS INC	1.4%
VERIZON COMMUNICATIONS INC	1.4%
MCKESSON CORP	1.4%
<b>Total</b>	<b>17.8%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
LSV Large Cap Value	5.3%	56.6%	38.1%
S&P 500	0.0%	16.4%	83.6%
<i>Weight Over/Under</i>	5.3%	40.2%	-45.5%

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



As of December 31, 2021

**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.

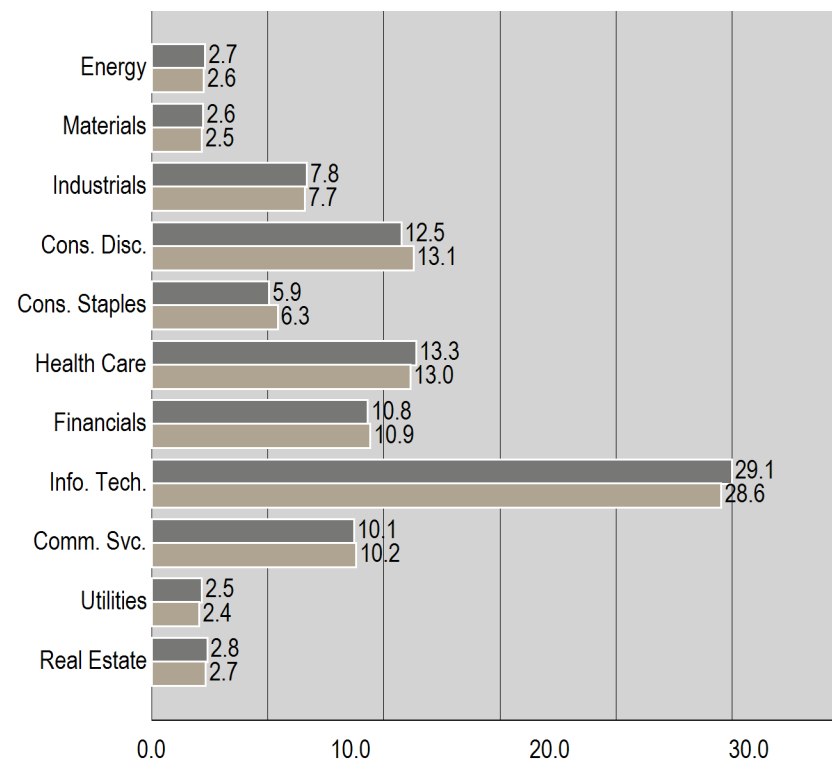
Number of Holdings	506	504
Weighted Avg. Market Cap. (\$B)	665.1	670.5
Median Market Cap. (\$B)	34.6	34.6
Price To Earnings	26.2	26.2
Price To Book	4.9	4.9
Price To Sales	3.8	3.7
Return on Equity (%)	30.6	30.4
Yield (%)	1.3	1.3

**Top Holdings**

APPLE INC	6.8%
MICROSOFT CORP	6.2%
AMAZON.COM INC	3.6%
ALPHABET INC	2.2%
TESLA INC	2.1%
ALPHABET INC	2.0%
META PLATFORMS INC	2.0%
NVIDIA CORPORATION	1.8%
BERKSHIRE HATHAWAY INC	1.4%
UNITEDHEALTH GROUP INC	1.2%
<b>Total</b>	<b>29.3%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Xponance S&P 500	0.0%	16.6%	83.4%
S&P 500	0.0%	16.4%	83.6%
<i>Weight Over/Under</i>	<i>0.0%</i>	<i>0.2%</i>	<i>-0.2%</i>





As of December 31, 2021

**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.

Number of Holdings	507	504
Weighted Avg. Market Cap. (\$B)	665.6	670.5
Median Market Cap. (\$B)	34.3	34.6
Price To Earnings	26.2	26.2
Price To Book	4.9	4.9
Price To Sales	3.8	3.7
Return on Equity (%)	30.6	30.4
Yield (%)	1.3	1.3

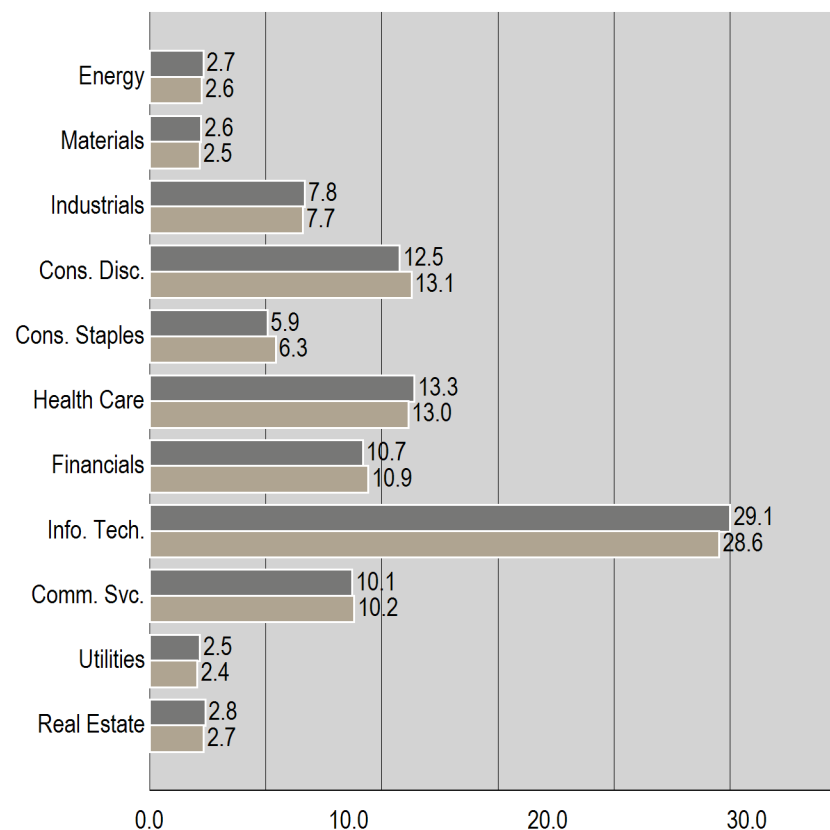
**Top Holdings**

APPLE INC	6.9%
MICROSOFT CORP	6.3%
AMAZON.COM INC	3.6%
ALPHABET INC	2.2%
TESLA INC	2.1%
ALPHABET INC	2.0%
META PLATFORMS INC	2.0%
NVIDIA CORPORATION	1.8%
BERKSHIRE HATHAWAY INC	1.4%
UNITEDHEALTH GROUP INC	1.2%
<b>Total</b>	<b>29.3%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Northern Trust S&P 500	0.0%	16.6%	83.4%
S&P 500	0.0%	16.4%	83.6%
<i>Weight Over/Under</i>	<i>0.0%</i>	<i>0.3%</i>	<i>-0.2%</i>

**SECTOR ALLOCATION (%) VS S&P 500**



As of December 31, 2021

**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	26	503
Weighted Avg. Market Cap. (\$B)	608.5	992.3
Median Market Cap. (\$B)	248.9	20.3
Price To Earnings	42.8	36.1
Price To Book	11.1	13.4
Price To Sales	9.5	6.6
Return on Equity (%)	37.5	42.3
Yield (%)	0.4	0.7

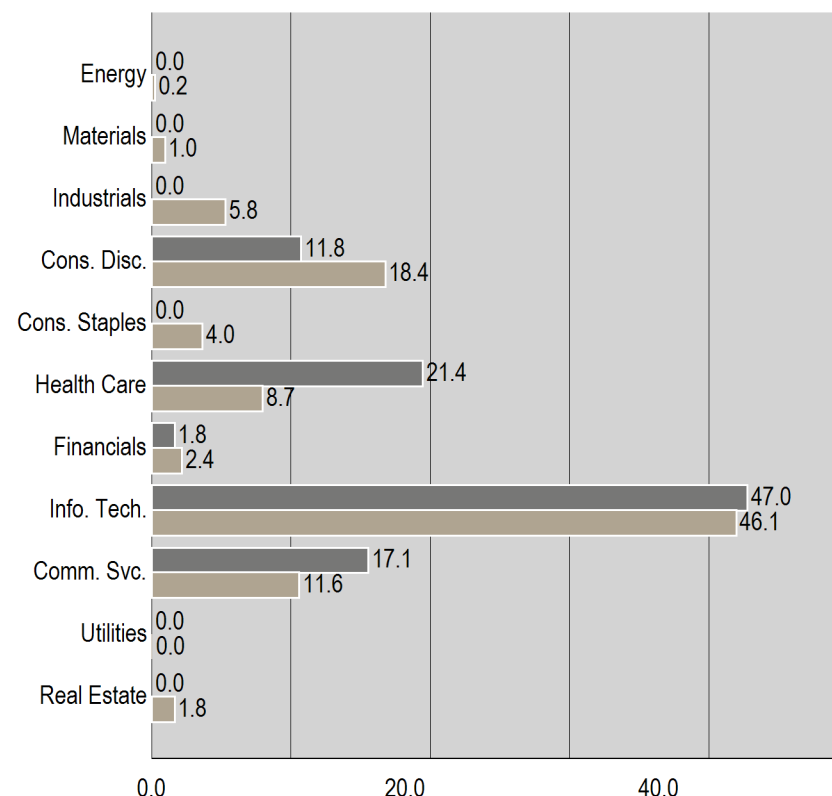
**Top Holdings**

META PLATFORMS INC	7.0%
AMAZON.COM INC	6.5%
MICROSOFT CORP	6.4%
ABBOTT LABORATORIES	6.2%
MASTERCARD INC	5.6%
ADOBE INC	5.4%
SALESFORCE.COM INC	5.3%
ACCENTURE PLC	5.0%
ZOETIS INC	4.9%
VISA INC	4.4%
<b>Total</b>	<b>56.6%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Polen Focus Growth	0.0%	5.0%	95.0%
Russell 1000 Growth	1.1%	12.9%	86.0%
<i>Weight Over/Under</i>	<i>-1.1%</i>	<i>-7.9%</i>	<i>9.0%</i>

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



As of December 31, 2021

**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.

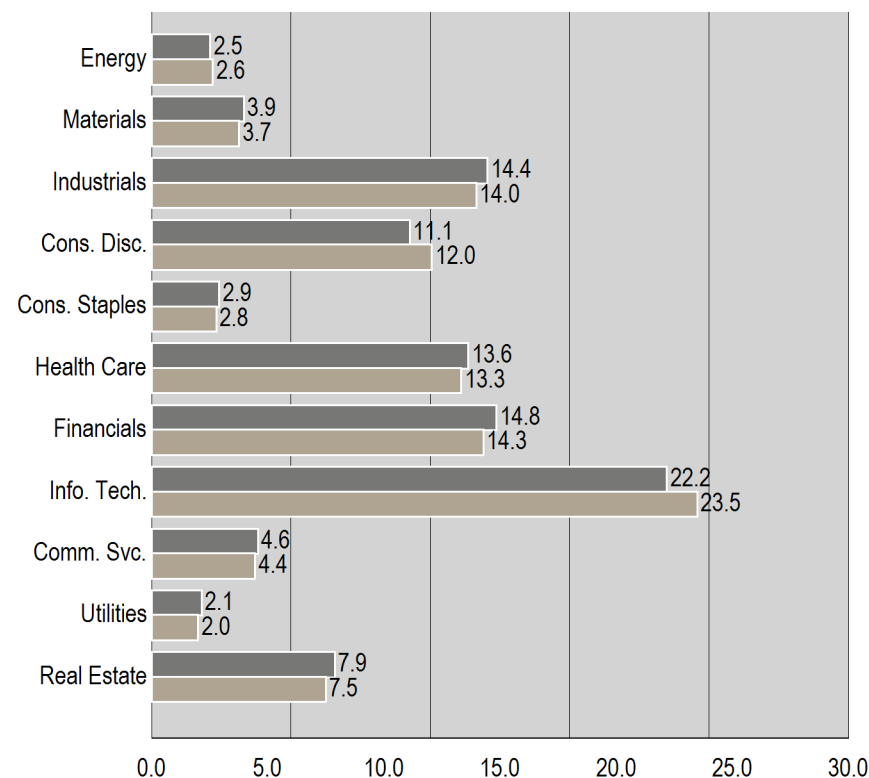
		Market
Number of Holdings	3,254	3,693
Weighted Avg. Market Cap. (\$B)	14.6	14.6
Median Market Cap. (\$B)	0.9	0.9
Price To Earnings	18.5	18.5
Price To Book	3.4	3.3
Price To Sales	2.4	2.5
Return on Equity (%)	3.6	3.6
Yield (%)	1.0	1.0

**Top Holdings**

BLACKSTONE GROUP INC	1.2%
MARVELL TECHNOLOGY INC	0.9%
UBER TECHNOLOGIES INC	0.9%
BLOCK INC	0.8%
PALO ALTO NETWORKS INC	0.7%
WORKDAY INC	0.7%
SNAP INC	0.7%
LULULEMON ATHLETICA INC	0.6%
DATADOG INC	0.6%
TWILIO INC	0.6%
<b>Total</b>	<b>7.7%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Northern Trust Dow Jones Completion Index	29.8%	59.6%	10.6%
Dow Jones U.S. Completion Total Stock Market	36.2%	54.2%	9.6%
<i>Weight Over/Under</i>	-6.4%	5.4%	1.0%



As of December 31, 2021

**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.

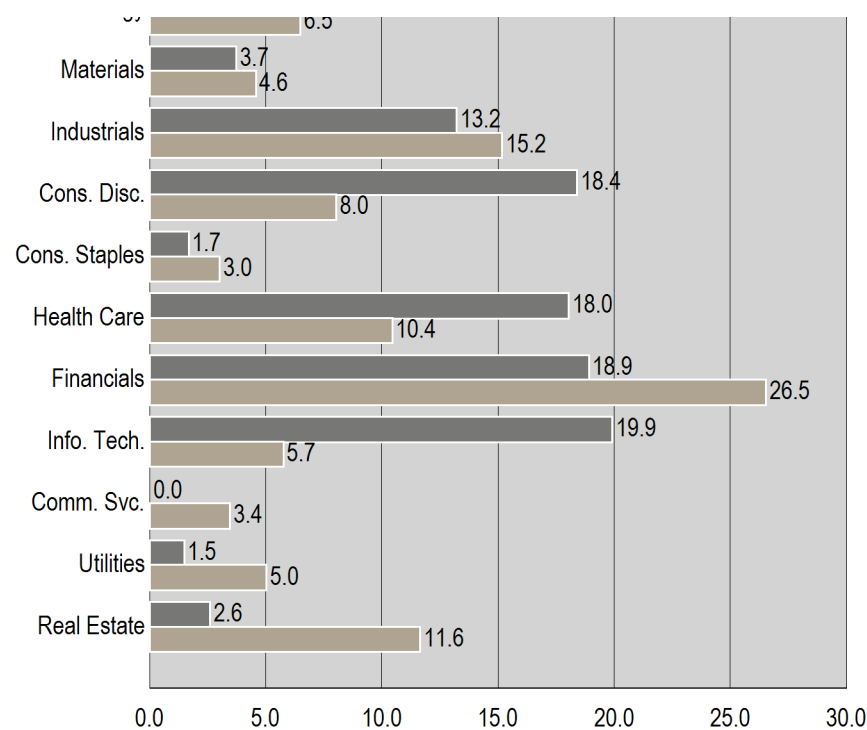
Weighted Avg. Market Cap. (\$B)	3.1	3.0
Median Market Cap. (\$B)	2.3	1.1
Price To Earnings	13.0	14.2
Price To Book	2.0	1.8
Price To Sales	0.9	1.5
Return on Equity (%)	11.8	5.3
Yield (%)	1.2	1.7

**Top Holdings**

SYNAPTICS INC	2.9%
ULTRA CLEAN HOLDINGS INC	2.8%
OWENS & MINOR INC.	2.7%
DYCOM INDUSTRIES INC.	2.6%
ATLAS AIR WORLDWIDE HOLDINGS INC.	2.5%
GROUP 1 AUTOMOTIVE INC.	2.4%
HIBBETT INC	2.4%
DECKERS OUTDOOR CORP	2.2%
LIGAND PHARMACEUTICALS INC	2.1%
ENCORE CAPITAL GROUP INC	2.1%
<b>Total</b>	<b>24.7%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Smith, Graham & Co Small Cap Value	82.0%	18.0%	0.0%
Russell 2000 Value	80.6%	19.4%	0.0%
<i>Weight Over/Under</i>	<i>1.4%</i>	<i>-1.4%</i>	<i>0.0%</i>



As of December 31, 2021

**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.

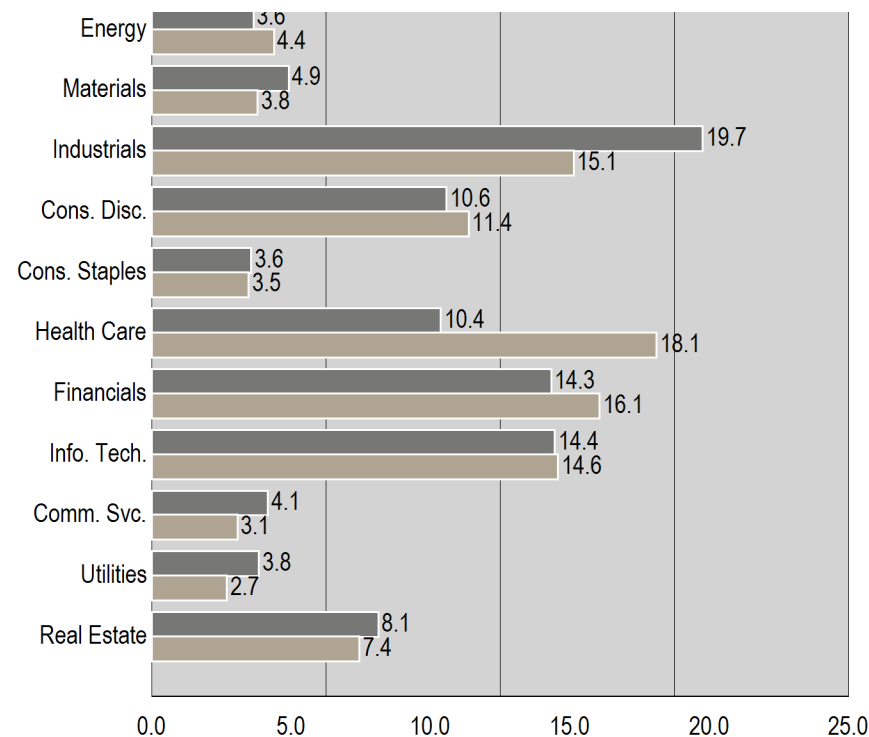
Median Market Cap. (\$B)	4.1	1.2
Price To Earnings	18.9	17.7
Price To Book	3.2	2.7
Price To Sales	2.5	1.9
Return on Equity (%)	18.7	3.6
Yield (%)	1.6	1.1

**Top Holdings**

ENSIGN GROUP INC (THE)	2.6%
BANK OZK	2.5%
NEXSTAR MEDIA GROUP INC.	2.5%
CMC MATERIALS INC	2.3%
STANDEX INTERNATIONAL CORP	2.3%
UMH PROPERTIES INC	2.2%
INNOVATIVE INDUSTRIAL PROPERTIES INC	2.2%
CHEMED CORP	2.2%
LEMAITRE VASCULAR INC	2.2%
UFP INDUSTRIES INC	2.1%
<b>Total</b>	<b>23.0%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Copeland Small Cap Dividend Growth	56.2%	43.8%	0.0%
Russell 2000	71.3%	28.7%	0.0%
<b>Weight Over/Under</b>	<b>-15.2%</b>	<b>15.2%</b>	<b>0.0%</b>



As of December 31, 2021

**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.

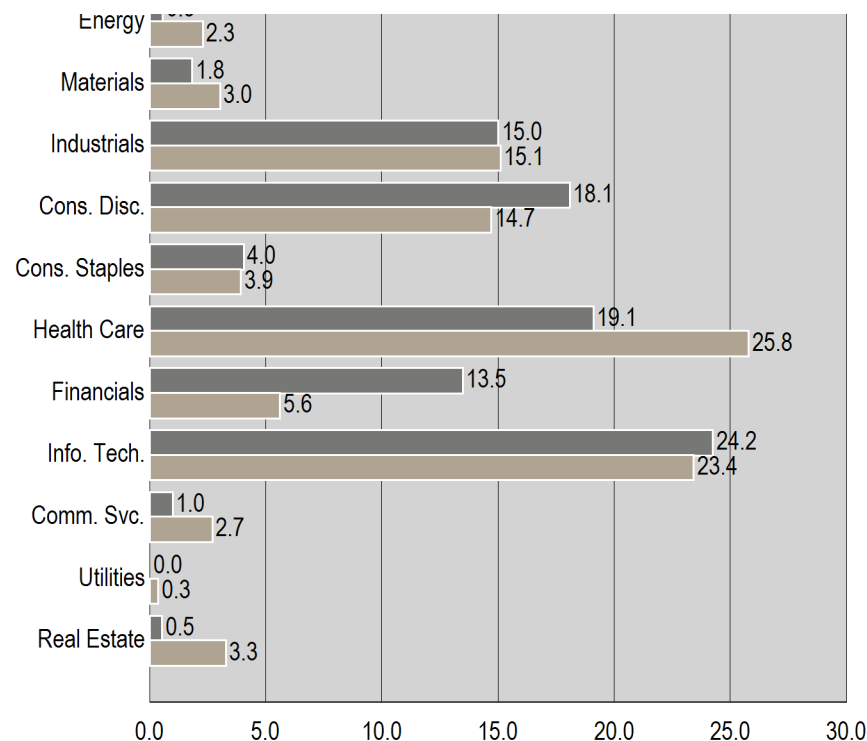
Median Market Cap. (\$B)	3.4	1.4
Price To Earnings	26.7	25.3
Price To Book	4.3	4.9
Price To Sales	3.8	2.7
Return on Equity (%)	7.9	1.4
Yield (%)	0.4	0.4

**Top Holdings**

RAPID7 INC	2.5%
MACOM TECHNOLOGY SOLUTIONS HOLDINGS INC	2.3%
CHART INDUSTRIES INC	2.1%
CHURCHILL DOWNS INC	2.1%
PERFICIENT INC	2.1%
SIMPLY GOOD FOODS CO (THE)	2.0%
MOELIS & CO	1.9%
AVIENT CORP	1.9%
ONTO INNOVATION INC	1.8%
PACIFIC PREMIER BANCORP INC	1.7%
<b>Total</b>	<b>20.3%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap
Emerald Small Cap Growth	60.1%	39.9%	0.0%
Russell 2000 Growth	62.1%	37.9%	0.0%
<b>Weight Over/Under</b>	<b>-2.0%</b>	<b>2.0%</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.

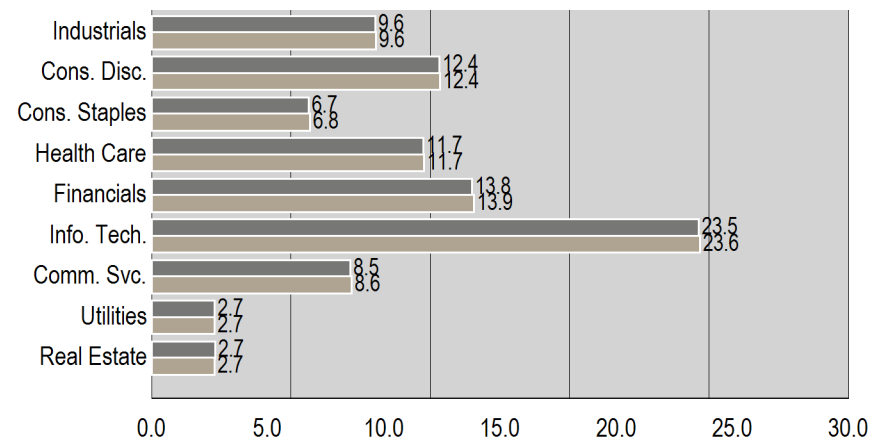
Price To Earnings	20.7	20.6
Price To Book	3.9	3.8
Price To Sales	2.6	2.5
Return on Equity (%)	21.7	21.4
Yield (%)	1.8	1.8

**Top Holdings**

APPLE INC	4.2%
MICROSOFT CORP	3.4%
AMAZON.COM INC	2.2%
TESLA INC	1.3%
ALPHABET INC	1.2%
ALPHABET INC	1.2%
META PLATFORMS INC	1.1%
NVIDIA CORPORATION	1.0%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	0.8%
UNITEDHEALTH GROUP INC	0.7%
<b>Total</b>	<b>17.1%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
iShares MSCI ACWI	4.4%	16.2%	77.6%	1.8%
MSCI ACWI	5.8%	16.2%	78.0%	0.0%
<i>Weight Over/Under</i>	-1.4%	0.0%	-0.4%	1.8%



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	1.8%	2.9%	-1.1%
United States	68.5%	61.3%	7.2%
Europe Ex U.K.	12.3%	12.6%	-0.3%
United Kingdom	0.3%	3.6%	-3.3%
Pacific Basin Ex Japan	2.5%	2.7%	-0.2%
Japan	9.9%	5.5%	4.4%
Emerging Markets	3.7%	11.1%	-7.4%
Other	0.9%	0.2%	0.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

As of December 31, 2021

**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.

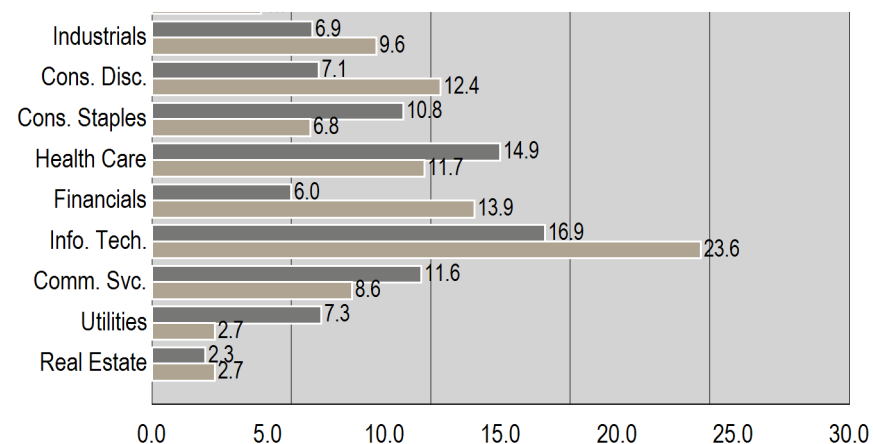
Price To Earnings	25.1	20.6
Price To Book	4.1	3.8
Price To Sales	3.0	2.5
Return on Equity (%)	22.6	21.4
Yield (%)	1.9	1.8

**Top Holdings**

ISHARES MSCI EMERGING MARKETS MIN VOL FACTOR ETF	12.0%
ROCHE HOLDING AG	1.5%
VERIZON COMMUNICATIONS INC	1.5%
WASTE MANAGEMENT INC.	1.5%
NESTLE SA, CHAM UND VEVEY	1.3%
REGENERON PHARMACEUTICALS INC	1.2%
NEWMONT CORPORATION	1.1%
NEXTERA ENERGY INC	1.1%
MOTOROLA SOLUTIONS INC	1.1%
PEPSICO INC	1.1%
<b>Total</b>	<b>23.4%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Rhumblin Global Min. Volatility	17.0%	20.8%	61.9%	0.2%
MSCI ACWI	5.8%	16.2%	78.0%	0.0%
<i>Weight Over/Under</i>	<i>11.2%</i>	<i>4.7%</i>	<i>-16.1%</i>	<i>0.2%</i>



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	1.8%	2.9%	-1.1%
United States	68.5%	61.3%	7.2%
Europe Ex U.K.	12.3%	12.6%	-0.3%
United Kingdom	0.3%	3.6%	-3.3%
Pacific Basin Ex Japan	2.5%	2.7%	-0.2%
Japan	9.9%	5.5%	4.4%
Emerging Markets	3.7%	11.1%	-7.4%
Other	0.9%	0.2%	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 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	1,856	917
Weighted Avg. Market Cap. (\$B)	98.7	83.5
Median Market Cap. (\$B)	10.9	14.7
Price To Earnings	15.4	17.1
Price To Book	2.8	2.7
Price To Sales	1.6	1.7
Return on Equity (%)	15.0	14.6
Yield (%)	2.6	2.7

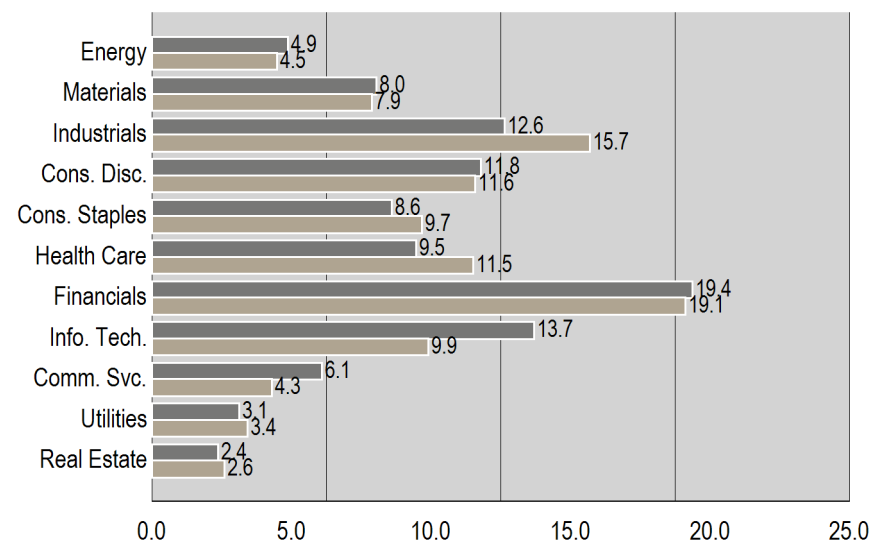
**Top Holdings**

TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	2.0%
NESTLE SA, CHAM UND VEVEY	1.5%
TENCENT HOLDINGS LTD	1.3%
ASML HOLDING NV	1.2%
SAMSUNG ELECTRONICS CO LTD	1.2%
ROCHE HOLDING AG	1.1%
ALIBABA GROUP HOLDING LTD	0.9%
LVMH MOET HENNESSY LOUIS VUITTON SE	0.9%
TOYOTA MOTOR CORP	0.7%
NOVARTIS AG	0.7%
<b>Total</b>	<b>11.4%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
SSGA MSCI World ex US	11.2%	24.4%	61.4%	2.9%
MSCI World ex USA	7.8%	25.2%	67.0%	0.0%
<i>Weight Over/Under</i>	3.4%	-0.7%	-5.6%	2.9%

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



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	7.6%	10.5%	-3.0%
United States	0.2%	0.0%	0.2%
Europe Ex U.K.	33.7%	45.7%	-11.9%
United Kingdom	7.9%	13.1%	-5.2%
Pacific Basin Ex Japan	8.8%	9.9%	-1.1%
Japan	14.5%	20.1%	-5.7%
Emerging Markets	26.0%	0.0%	26.0%
Other	1.4%	0.7%	0.7%
<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	26	828
Weighted Avg. Market Cap. (\$B)	111.0	85.5
Median Market Cap. (\$B)	53.7	14.7
Price To Earnings	31.3	17.1
Price To Book	5.4	2.8
Price To Sales	4.7	1.6
Return on Equity (%)	13.2	14.6
Yield (%)	0.6	2.7

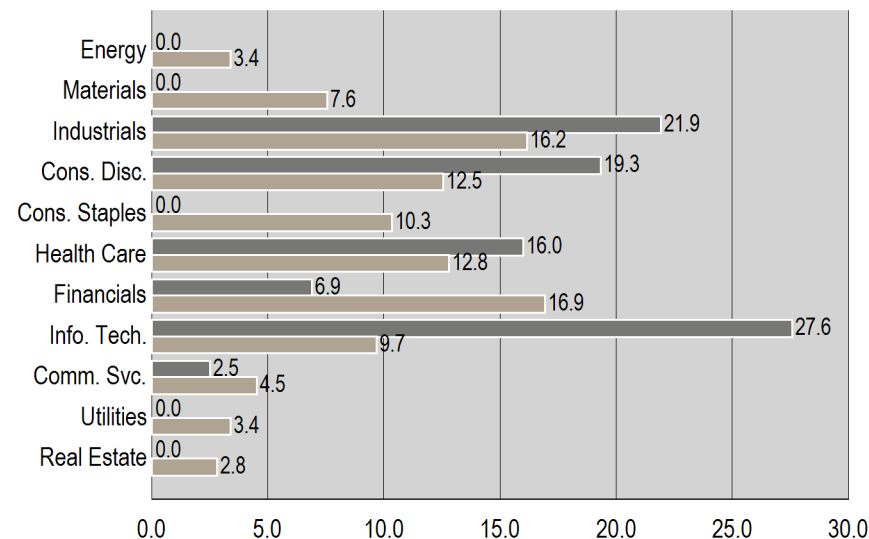
**Top Holdings**

AIRBUS SE	5.6%
KEYENCE CORP	5.5%
ASTRAZENECA PLC	5.5%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	5.5%
PUMA SE	5.4%
ASML HOLDING NV	5.4%
APTIV PLC	5.3%
ATLASSIAN CORP PLC	5.3%
ICICI BANK LTD	5.1%
GENMAB A/S	5.0%
<b>Total</b>	<b>53.5%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
Hardman Johnston Int'l Equity	7.0%	18.6%	68.5%	5.9%
MSCI EAFE	7.8%	25.3%	67.0%	0.0%
<i>Weight Over/Under</i>	-0.7%	-6.7%	1.5%	5.9%

**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.	40.2%	51.1%	-10.9%
United Kingdom	10.8%	14.6%	-3.9%
Pacific Basin Ex Japan	14.1%	11.1%	3.0%
Japan	18.4%	22.5%	-4.1%
Emerging Markets	16.6%	0.0%	16.6%
Other	0.0%	0.7%	-0.7%
<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	28	828
Weighted Avg. Market Cap. (\$B)	49.1	85.5
Median Market Cap. (\$B)	25.2	14.7
Price To Earnings	15.8	17.1
Price To Book	3.0	2.8
Price To Sales	2.2	1.6
Return on Equity (%)	12.8	14.6
Yield (%)	1.7	2.7

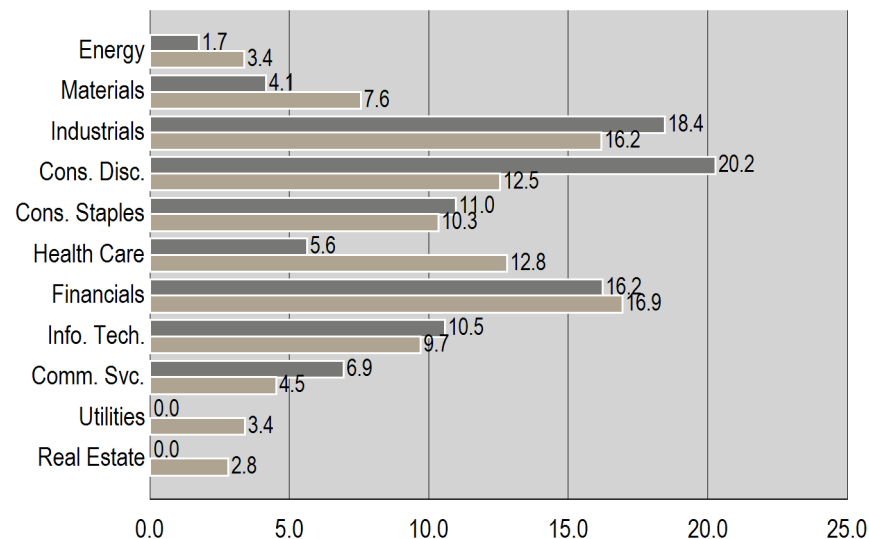
**Top Holdings**

ICON PLC	5.9%
CAPGEMINI SE	5.8%
SK HYNIX INC	5.3%
TOYOTA MOTOR CORP	4.9%
DAIKIN INDUSTRIES LTD	4.8%
ALIMENTATION COUCHE-TARD INC	4.6%
LIBERTY GLOBAL PLC	4.4%
SHIMANO INC	4.4%
FRANCO-NEVADA CORP	4.4%
NEXT PLC	4.2%
<b>Total</b>	<b>48.6%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
HGK Int'l Equity	5.3%	45.8%	41.0%	7.9%
MSCI EAFE	7.8%	25.3%	67.0%	0.0%
<i>Weight Over/Under</i>	<i>-2.5%</i>	<i>20.5%</i>	<i>-26.0%</i>	<i>7.9%</i>

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



**Region Allocation Summary**

Region	% of Total	% of Bench	% Diff
North America ex U.S.	8.6%	0.0%	8.6%
United States	3.6%	0.0%	3.6%
Europe Ex U.K.	40.2%	51.1%	-10.9%
United Kingdom	12.3%	14.6%	-2.3%
Pacific Basin Ex Japan	3.0%	11.1%	-8.1%
Japan	21.1%	22.5%	-1.4%
Emerging Markets	11.2%	0.0%	11.2%
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	1,236	1,413
Weighted Avg. Market Cap. (\$B)	134.9	139.7
Median Market Cap. (\$B)	8.0	7.2
Price To Earnings	12.5	12.3
Price To Book	2.8	2.8
Price To Sales	1.5	1.4
Return on Equity (%)	14.7	14.6
Yield (%)	2.4	2.4

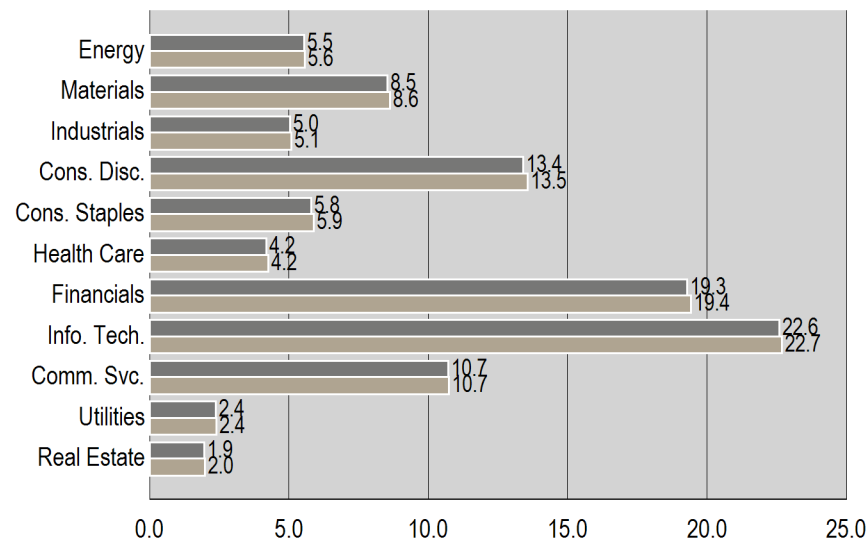
**Top Holdings**

TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	7.0%
TENCENT HOLDINGS LTD	4.3%
SAMSUNG ELECTRONICS CO LTD	4.0%
ALIBABA GROUP HOLDING LTD	2.9%
MEITUAN DIANPING USD0.00001 A B CLASS ISIN KYG596691041	1.5%
RELIANCE INDUSTRIES LTD	1.2%
INFOSYS LTD	1.1%
CHINA CONSTRUCTION BANK CORP	0.8%
MEDIATEK INCORPORATION	0.8%
JD.COM INC	0.8%
<b>Total</b>	<b>24.4%</b>

**Market Capitalization**

	Small Cap	Mid Cap	Large Cap	Unclassified
SSGA MSCI Emerging Markets Index	7.1%	23.1%	67.1%	2.6%
MSCI Emerging Markets	14.3%	21.8%	63.9%	0.0%
<i>Weight Over/Under</i>	-7.2%	1.3%	3.3%	2.6%

**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	0.9%	0.0%	0.9%
Europe Ex U.K.	0.5%	0.2%	0.3%
United Kingdom	0.2%	0.0%	0.2%
Pacific Basin Ex Japan	6.2%	0.0%	6.2%
Japan	0.0%	0.0%	0.0%
Emerging Markets	89.8%	99.2%	-9.4%
Other	2.5%	0.6%	1.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

**Characteristics**

Fund GAV (\$MM)	\$28,864.0
Fund NAV (\$MM)	\$22,809.0
Cash (% of NAV)	4.0%
# of Investments	267
% in Top 10 by NAV	18.1%
Leverage %	20.8%
Occupancy	91.2%
# of MSAs	42
1-Year Dividend Yield	3.4%
As of Date	30-Sep-21

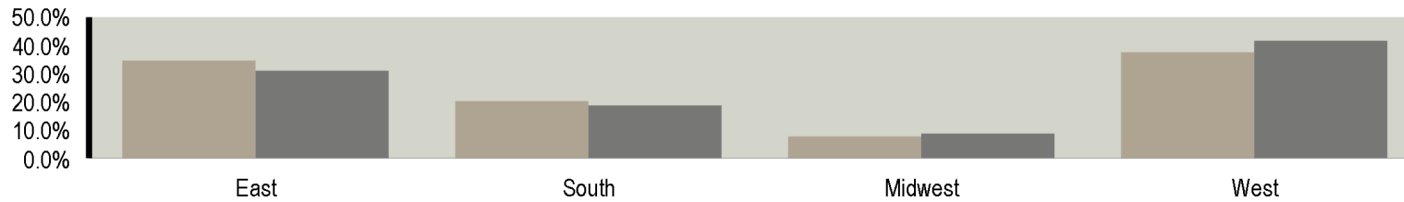
**Strategy Breakdown**

	% of Portfolio
Pre-Development	0.6%
Development	2.4%
Initial Leasing	1.3%
Operating	95.7%
Re-Development	
Other	
<u>Queue In:</u>	
Contribution Queue (\$MM)	\$2,038.00
Anticipated Drawdown (Months)	

Top Five Metro Areas	% of NAV
Los Angeles-Long Beach, CA	19.0%
New York-Newark, NY-NJ-CT-F	14.3%
Washington-Baltimore-Arlington	11.9%
San Jose-San Francisco-Oakland	8.5%
Boston-Worcester-Providence,	6.2%

<u>Queue Out:</u>
Redemption Queue (\$MM)
Anticipated Payout (Months)

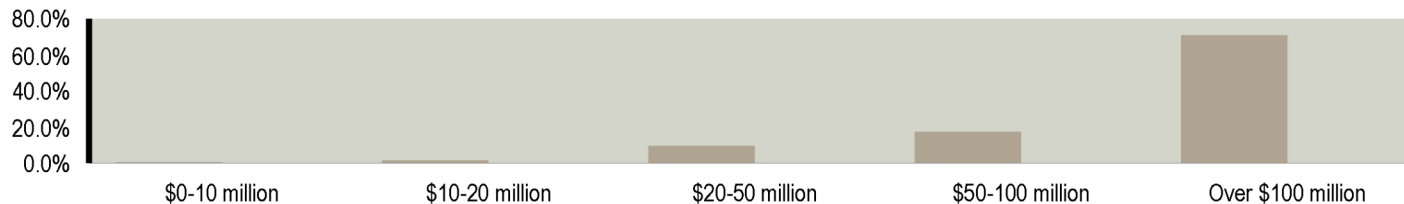
**Regional Breakdown by NAV (Excluding Cash & Debt)**



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



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



■ PRISA ■ NCREIF-ODCE

**Characteristics**

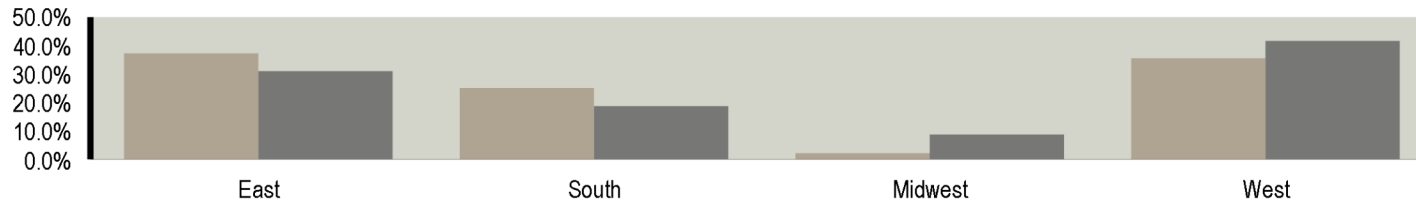
Fund GAV (\$MM)	\$15,117.0
Fund NAV (\$MM)	\$9,480.0
Cash (% of NAV)	1.6%
# of Investments	156
% in Top 10 by NAV	22.7%
Leverage %	33.4%
Occupancy	89.9%
# of MSAs	67
1-Year Dividend Yield	3.0%
As of Date	30-Sep-21

**Strategy Breakdown**

	% of Portfolio
Pre-Development	6.6%
Development	5.9%
Initial Leasing	11.5%
Operating	74.8%
Re-Development	
Other	1.3%
<u>Queue In:</u>	
Contribution Queue (\$MM)	\$0.00
Anticipated Drawdown (Months)	0

Top Five Metro Areas	% of NAV
Northern NJ	9.2%
San Francisco	7.8%
Boston	7.1%
San Jose	5.7%
Jersey City	5.4%
<u>Queue Out:</u>	
Redemption Queue (\$MM)	\$0.00
Anticipated Payout (Months)	0

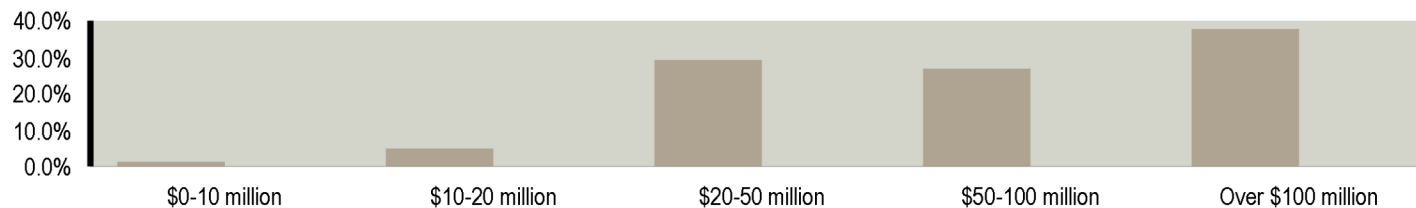
**Regional Breakdown by NAV (Excluding Cash & Debt)**



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



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



■ PRISA II ■ NCREIF-ODCE

As of December 31, 2021

**Characteristics**

Fund GAV (\$MM)	\$279.4
Fund NAV (\$MM)	\$259.7
Cash (% of NAV)	0.0%
# of Investments	8
Occupancy	67.0%
NOI	5.9%
Loan to Value	7.1%
As of Date	6/30/2021

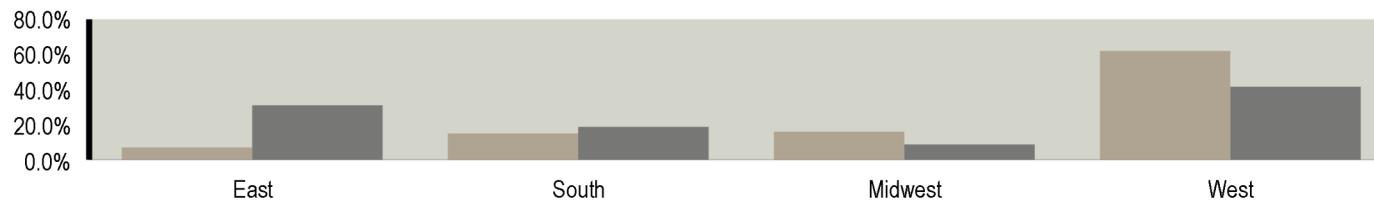
**Asset Summary**

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

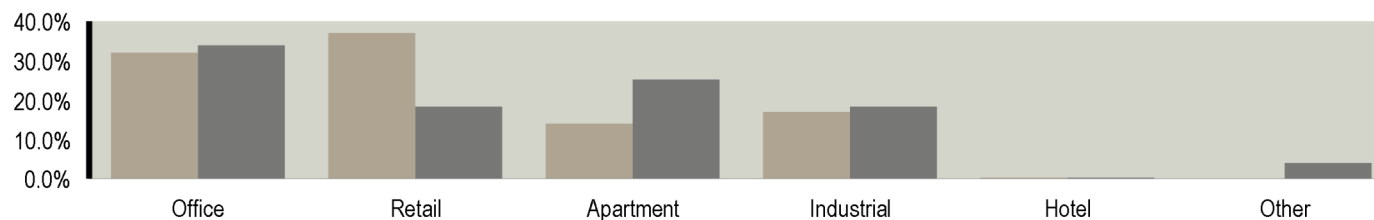
**Portfolio Allocation**

#	Property	Type	Location	% of Fund NAV
1	Copley Corporate Center	Office	San Diego, CA	18.2%
2	SR Ranch	Retail	San Diego, CA	16.1%
3	Des Peres Corners	Retail	Des Peres, MO	15.8%
4	708 Uptown	Apartment	Seattle, WA	14.6%
5	Fairway Center II	Office	Brea, CA	13.0%
6	Republic Distribution Center	Industrial	Houston, TX	10.3%
7	526 Route 46	Industrial	Teterboro, NJ	6.9%
8	Shoppes at Monarch Lakes	Retail	Miramar, FL	5.0%
<b>Total</b>				<b>100.0%</b>

**Regional Breakdown by NAV**



**Property Type Breakdown by NAV**



Net Assets (\$MM) 134.1

**Portfolio Allocation**

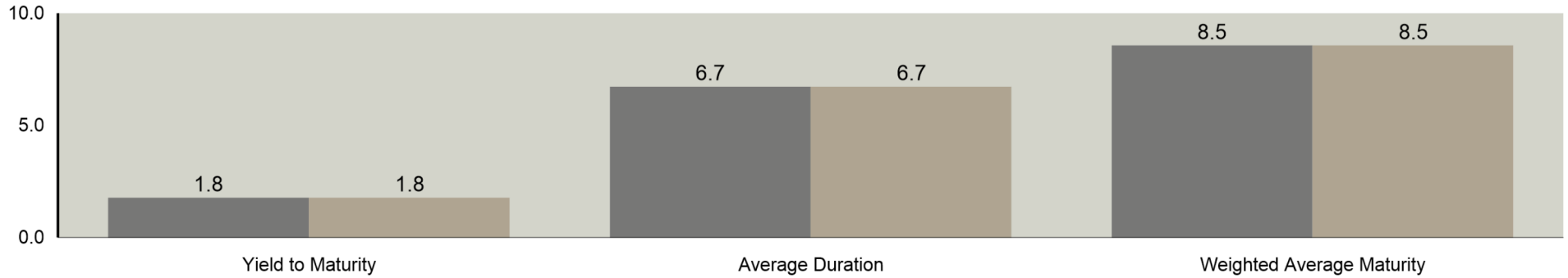
#	Property	Type	Location	% of Fund NAV
1	Dupont	Pine	Georgia	17.3%
2	Black River	Pine	South Carolina	16.3%
3	Coquille	Douglas Fir/Cedar	Oregon	17.6%
4	North River	Douglas Fir/Hemlock	Washington	13.1%
5	Bucktails	Maple/Oak/Cherry	Pennsylvania	13.3%
6	Carter Pasture	Pine	Texas	7.2%
7	Bennetts Creek	Pine	North Carolina	6.2%
8	Bear Island	Pine	Virginia	5.2%
9	Fitz-Weller	Maple/Oak	New York	3.8%
<b>Total</b>				<b>100.0%</b>

**Regional Breakdown by NAV**

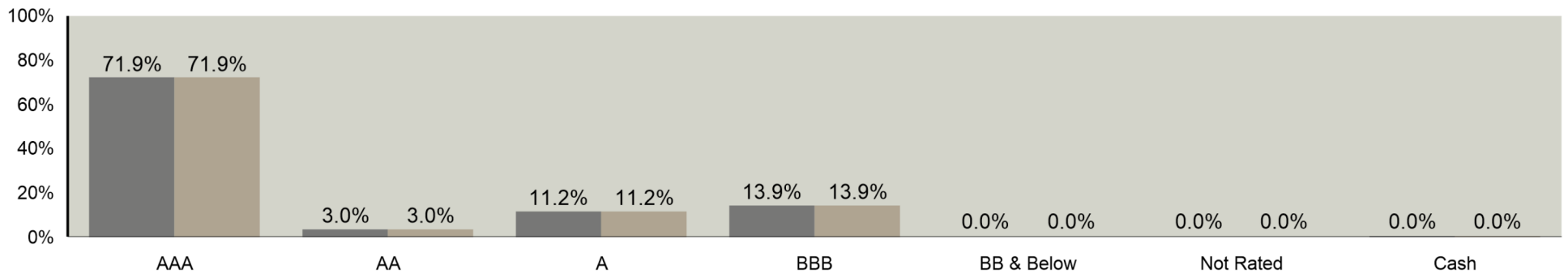




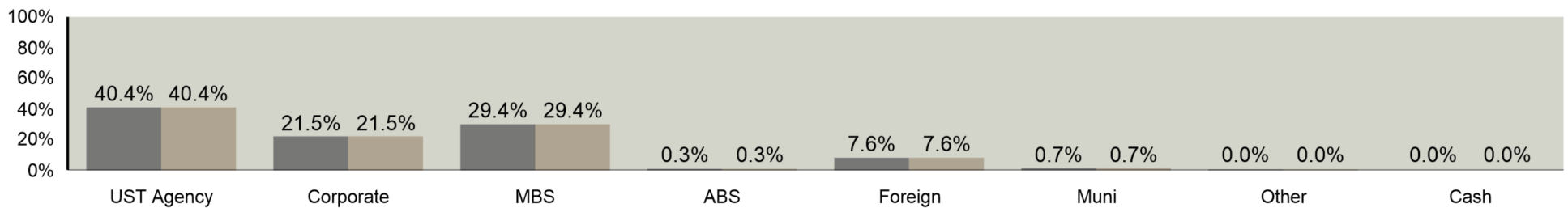
Summary Characteristics



Credibility Quality Allocation



US Sector Allocation



Fixed Income Composite

BbgBarc U.S. Aggregate Bond

## VI. Appendix



**Policy Index History**

<b>Total Fund Composite</b>		
1/1/2022	Present	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>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>		
1/1/2022	Present	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>		

# Pennsylvania Municipal Retirement System

## Fee Summary

As of December 31, 2021

Account	Fee Schedule	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
LSV Large Cap Value	0.60% of First 25.0 Mil, 0.50% of Next 25.0 Mil, 0.40% of Next 50.0 Mil, 0.30% of Next 100.0 Mil, 0.30% Thereafter	4.3%	\$631,225	0.42%
Xponance S&P 500	0.02% of Assets	8.1%	\$57,126	0.02%
Northern Trust S&P 500	0.00% of Assets	8.5%	\$12,045	0.00%
Polen Focus Growth	0.40% of Assets	3.8%	\$540,937	0.40%
Northern Trust Dow Jones Completion Index	0.02% of Assets	3.5%	\$18,342	0.02%
Smith, Graham & Co Small Cap Value	0.75% of First 50.0 Mil, 0.60% Thereafter	1.5%	\$390,806	0.74%
Copeland Small Cap Dividend Growth	0.50% of Assets	1.5%	\$268,646	0.50%
Emerald Small Cap Growth	0.60% of First 10.0 Mil, 0.55% of Next 5.0 Mil, 0.50% Thereafter	1.4%	\$258,289	0.53%
LSV Small Cap Value	0.75% of First 25.0 Mil, 0.65% of Next 25.0 Mil, 0.55% Thereafter	0.0%	\$97	0.75%
AMI Small Cap Growth	0.90% of First 10.0 Mil, 0.80% of Next 15.0 Mil, 0.70% of Next 25.0 Mil, 0.60% Thereafter	0.0%	\$0	0.90%
Rhumblin Global Min. Volatility	0.07% of Assets	4.9%	\$113,665	0.06%
iShares MSCI ACWI	0.32% of Assets	5.2%	\$592,639	0.32%
SSGA MSCI World ex US	0.04% of Assets	8.1%	\$114,934	0.04%
Hardman Johnston Int'l Equity	0.75% of First 25.0 Mil, 0.60% Thereafter	3.5%	\$783,874	0.63%

# Pennsylvania Municipal Retirement System

## Fee Summary

As of December 31, 2021

Account	Fee Schedule	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
HGK Int'l Equity	0.65% of Assets	3.7%	\$838,392	0.65%
SSGA MSCI Emerging Markets Index	0.05% of Assets	2.4%	\$41,961	0.05%
Forest Investment Associates	0.75% of Assets	3.8%	\$1,011,611	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%	\$600,635	0.95%
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%	\$1,380,595	1.08%
PennMuni-Nuveen U.S. Real Estate Fund	0.85% of Assets	6.2%	\$1,876,536	0.85%
N. Front Street (Nuveen)	0.85% of Assets	0.1%	\$18,059	0.85%
SSGA US Aggregate Bond Index	0.02% of First 100.0 Mil, 0.01% of Next 300.0 Mil, 0.01% Thereafter	23.4%	\$81,883	0.01%
Cash Management	No Fee	0.4%	--	--
Abel Noser Transition Account	No Fee	0.2%	--	--
<b>Investment Management Fee</b>		<b>100.0%</b>	<b>\$9,632,296</b>	<b>0.27%</b>

# Pennsylvania Municipal Retirement System

Monthly Performance Report  
As of February 28, 2022

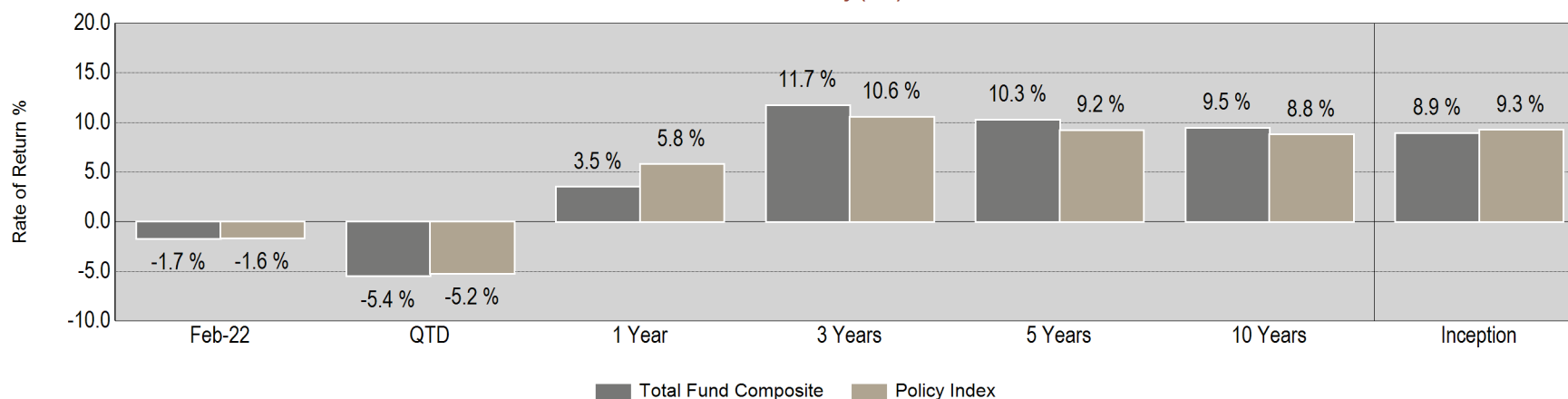


As of February 28, 2022

Summary of Cash Flows

	Last Month	Quarter-To-Date	One Year	Three Years	Five Years	Ten Years
<b>Beginning Market Value</b>	<b>\$3,392,270,449</b>	<b>\$3,533,386,110</b>	<b>\$3,274,101,020</b>	<b>\$2,559,663,988</b>	<b>\$2,226,523,650</b>	<b>\$1,602,194,016</b>
Net Cash Flow	-\$2,634,884	-\$7,842,496	-\$57,209,740	-\$131,051,715	-\$212,067,009	-\$341,152,581
Net Investment Change	-\$56,611,236	-\$192,519,285	\$116,133,050	\$904,412,056	\$1,318,567,688	\$2,071,982,894
<b>Ending Market Value</b>	<b>\$3,333,024,329</b>	<b>\$3,333,024,329</b>	<b>\$3,333,024,329</b>	<b>\$3,333,024,329</b>	<b>\$3,333,024,329</b>	<b>\$3,333,024,329</b>

Return Summary (Net)



Asset Allocation vs. Target

	Current	Policy	Difference*
U.S. Equity	31.7%	32.5%	-\$28,310,168
Global Equity	10.0%	10.0%	\$1,592,914
Non-U.S. Equity	15.1%	15.0%	\$1,850,538
Emerging Markets	2.4%	2.5%	-\$3,625,465
Real Assets	16.4%	15.0%	\$47,880,296
U.S. Fixed Income	24.0%	24.0%	-\$1,434,454
Cash Equivalent	0.5%	1.0%	-\$17,953,661
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	

The above is an interim policy allocation until Opp. Credit is funded (5% from Global Equity)

# Pennsylvania Municipal Retirement System

## Annualized Performance (Net)

As of February 28, 2022

	1 Mo	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	Inception	Inception Date
<b>Total Fund Composite</b>	<b>-1.7</b>	<b>-5.4</b>	<b>3.5</b>	<b>11.7</b>	<b>10.3</b>	<b>9.5</b>	<b>8.9</b>	<b>Jan-86</b>
<i>Policy Index</i>	-1.6	-5.2	5.8	10.6	9.2	8.8	9.3	Jan-86
<b>Total Equity Composite</b>	<b>-2.4</b>	<b>-7.8</b>	<b>2.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>19.5</b>	<b>Oct-20</b>
<i>MSCI ACWI IMI Net USD</i>	-2.3	-7.4	6.9	--	--	--	18.2	Oct-20
<b>U.S. Equity Composite</b>	<b>-2.3</b>	<b>-8.4</b>	<b>6.2</b>	<b>17.8</b>	<b>14.6</b>	<b>13.8</b>	<b>9.5</b>	<b>Jan-06</b>
<i>Russell 3000</i>	-2.5	-8.3	12.3	17.6	14.7	14.3	10.2	Jan-06
LSV Large Cap Value	-0.8	-2.5	14.4	12.0	9.7	12.0	8.8	Apr-04
<i>Russell 1000 Value</i>	-1.2	-3.5	15.0	12.2	9.5	11.7	8.4	Apr-04
Xponance S&P 500	-3.0	-8.0	--	--	--	--	-8.0	Dec-21
<i>S&amp;P 500</i>	-3.0	-8.0	--	--	--	--	-8.0	Dec-21
Northern Trust S&P 500	-3.0	-8.0	--	--	--	--	-8.0	Dec-21
<i>S&amp;P 500</i>	-3.0	-8.0	--	--	--	--	-8.0	Dec-21
Polen Focus Growth	-7.1	-15.9	4.5	20.1	20.3	16.5	17.1	Oct-10
<i>Russell 1000 Growth</i>	-4.2	-12.5	12.5	23.2	20.2	17.0	17.2	Oct-10
Northern Trust Dow Jones Completion Index	0.0	-10.0	--	--	--	--	-10.0	Dec-21
<i>Dow Jones U.S. Completion Total Stock Market</i>	0.0	-10.1	--	--	--	--	-10.1	Dec-21
Smith, Graham & Co Small Cap Value	0.2	-5.8	0.6	13.9	8.6	--	8.9	Dec-16
<i>Russell 2000 Value</i>	1.7	-4.3	6.6	10.9	8.0	--	8.6	Dec-16
Copeland Small Cap Dividend Growth	0.6	-6.1	8.4	12.7	--	--	11.8	Sep-17
<i>Russell 2000</i>	1.1	-8.7	-6.0	10.5	--	--	8.8	Sep-17
Emerald Small Cap Growth	1.9	-12.3	-13.7	10.5	12.7	13.3	10.9	Oct-98
<i>Russell 2000 Growth</i>	0.4	-13.0	-17.4	9.2	10.5	11.4	8.2	Oct-98
<b>Global Equity Composite</b>	<b>-2.4</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-7.0</b>	<b>Dec-21</b>
<i>Global Equity Policy Index</i>	-2.1	-6.9	--	--	--	--	-6.9	Dec-21
Rhumblin Global Min. Volatility	-1.7	-6.5	--	--	--	--	-6.5	Dec-21
<i>MSCI ACWI Minimum Volatility Index</i>	-1.6	-6.4	--	--	--	--	-6.4	Dec-21
iShares MSCI ACWI	-3.1	-7.5	--	--	--	--	-7.5	Dec-21
<i>MSCI ACWI</i>	-2.6	-7.4	--	--	--	--	-7.4	Dec-21



# Pennsylvania Municipal Retirement System

## Annualized Performance (Net)

As of February 28, 2022

	1 Mo	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	Inception	Inception Date
<b>Non-U.S Equity Composite</b>	<b>-2.4</b>	<b>-7.0</b>	<b>-4.6</b>	<b>8.8</b>	<b>9.0</b>	<b>--</b>	<b>8.0</b>	<b>May-12</b>
<i>MSCI ACWI ex USA IMI</i>	-1.9	-5.9	-0.2	8.0	7.4	--	7.4	May-12
SSGA MSCI World ex US	-1.6	-5.9	4.7	8.7	7.8	--	6.5	Apr-12
<i>MSCI World ex USA</i>	-1.6	-5.9	4.5	8.3	7.4	--	6.2	Apr-12
Hardman Johnston Int'l Equity	-4.1	-13.0	-12.2	12.1	12.1	--	9.4	Apr-12
<i>MSCI EAFE</i>	-1.8	-6.5	2.8	7.8	7.2	--	6.3	Apr-12
HGK Int'l Equity	-1.1	-4.8	5.7	11.0	10.7	9.5	9.6	Feb-12
<i>MSCI EAFE</i>	-1.8	-6.5	2.8	7.8	7.2	6.2	6.7	Feb-12
SSGA MSCI Emerging Markets Index	-4.5	-5.1	-10.9	5.9	6.9	3.1	7.8	Nov-08
<i>MSCI Emerging Markets</i>	-3.0	-4.8	-10.7	6.0	7.0	3.2	8.0	Nov-08
<b>Real Assets Composite</b>	<b>0.0</b>	<b>0.0</b>	<b>13.1</b>	<b>5.5</b>	<b>6.0</b>	<b>7.5</b>	<b>7.6</b>	<b>Apr-93</b>
<i>Real Assets Policy Index</i>	0.0	0.0	21.1	8.2	7.7	9.4	7.8	Apr-93
Forest Investment Associates	0.0	0.0	6.5	0.7	2.3	4.4	3.7	Mar-99
<i>NCREIF Timberland Property Index</i>	0.0	0.0	9.2	3.7	3.6	5.3	6.0	Mar-99
PRISA LP	0.0	0.0	20.6	8.9	8.1	9.7	6.6	Jan-86
<i>NFI-ODCE</i>	0.0	0.0	19.6	8.0	7.5	9.3	6.4	Jan-86
PRISA II	0.0	0.0	21.9	9.0	8.4	10.8	4.6	Jul-07
<i>NFI-ODCE</i>	0.0	0.0	19.6	8.0	7.5	9.3	5.3	Jul-07
PennMuni-Nuveen U.S. Real Estate Fund	0.0	0.0	10.8	7.9	8.1	9.2	6.4	Dec-08
<i>NFI-ODCE</i>	0.0	0.0	19.6	8.0	7.5	9.3	6.4	Dec-08
N. Front Street (Nuveen)	0.0	0.0	3.1	0.8	-3.9	--	-4.8	Sep-16
<i>Consumer Price Index</i>	0.9	1.8	7.9	3.9	3.1	--	3.0	Sep-16
<b>Total Fixed Income Composite</b>								
SSGA US Aggregate Bond Index	-1.1	-3.2	-2.6	3.3	2.7	2.5	4.9	Apr-97
<i>Bloomberg US Aggregate TR</i>	-1.1	-3.2	-2.6	3.3	2.7	2.5	4.8	Apr-97
<b>Cash Composite</b>								
Cash Management								
Abel Noser Transition Account								

\*Policy Index: 32.5% Russell 3000 / 5% MSCI ACWI Min Vol Index / 5% MSCI ACWI / 17.5% MSCI ACWIexUS IMI / 10% NCREIF ODCE / 5% NCREIF Timberland / 24% BBgBarc AGG / 1% BofAML 90 Day T-Bill)

\*N. Front St. as of 9/30/21. Nuveen US Real Estate Fund estimated as of 12/31/21. PRISA LP, PRISA II, and Forest are final as of 12/31/21

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