

February 21, 2023



**Pennsylvania State Employees'
Retirement System – Defined
Benefit Plan**

Fourth Quarter 2022

Executive Summary

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Market Environment

Equity and Fixed Income Markets Down Together in 2022

Declines for both stocks and bonds for three straight quarters are extremely unusual

Global equity markets down sharply in 2022 despite rebound in 4Q

- Similar impact across all equity market segments: developed, emerging, small cap

Fixed income down with sharply higher inflation and interest rates

- Bloomberg Aggregate: -13% for the year, worst year ever for the index by a wide margin
- CPI-U: +6.5% for the year ended Dec. 2022
- ▶ Number of times stocks and bonds have been down together
 - 38 quarters in almost 100 years, about 10% of the quarters
 - But just twice on annual basis
- ▶ Inflation at highest rate in decades
- ▶ Economic data show growth hit ‘pause’
 - GDP rose 2.9% in 4Q22, after a 3.2% rise in 3Q, a 0.6% drop in 2Q, and a 1.6% decline in 1Q.

Returns for Periods ended 12/31/22

	Quarter	Year to Date	1 Year	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	7.18	-19.21	-19.21	8.79	12.13	7.68
S&P 500	7.56	-18.11	-18.11	9.42	12.56	7.64
Russell 2000	6.23	-20.44	-20.44	4.13	9.01	7.13
Global ex-U.S. Equity						
MSCI World ex USA	16.18	-14.29	-14.29	1.79	4.59	4.65
MSCI Emerging Markets	9.70	-20.09	-20.09	-1.39	1.44	--
MSCI ACWI ex USA Small Cap	13.31	-19.97	-19.97	0.67	5.24	6.87
Fixed Income						
Bloomberg Aggregate	1.87	-13.01	-13.01	0.02	1.06	3.97
90-day T-Bill	0.84	1.46	1.46	1.26	0.76	1.91
Bloomberg Long Gov/Credit	2.61	-27.09	-27.09	-1.21	1.57	5.38
Bloomberg Global Agg ex-US	6.81	-18.70	-18.70	-3.07	-1.64	2.71
Real Estate						
NCREIF Property	-3.50	5.53	5.53	7.46	8.82	9.04
FTSE Nareit Equity	5.24	-24.37	-24.37	3.68	6.53	7.87
Alternatives						
CS Hedge Fund Index	0.92	1.06	1.06	4.25	4.24	5.81
Cambridge Private Equity*	-1.84	-3.77	-3.77	16.84	15.31	14.31
Bloomberg Commodity	2.22	16.09	16.09	6.44	-1.28	1.87
Gold Spot Price	9.22	-0.13	-0.13	6.88	0.86	7.64
Inflation - CPI-U	0.00	6.45	6.45	3.78	2.60	2.47

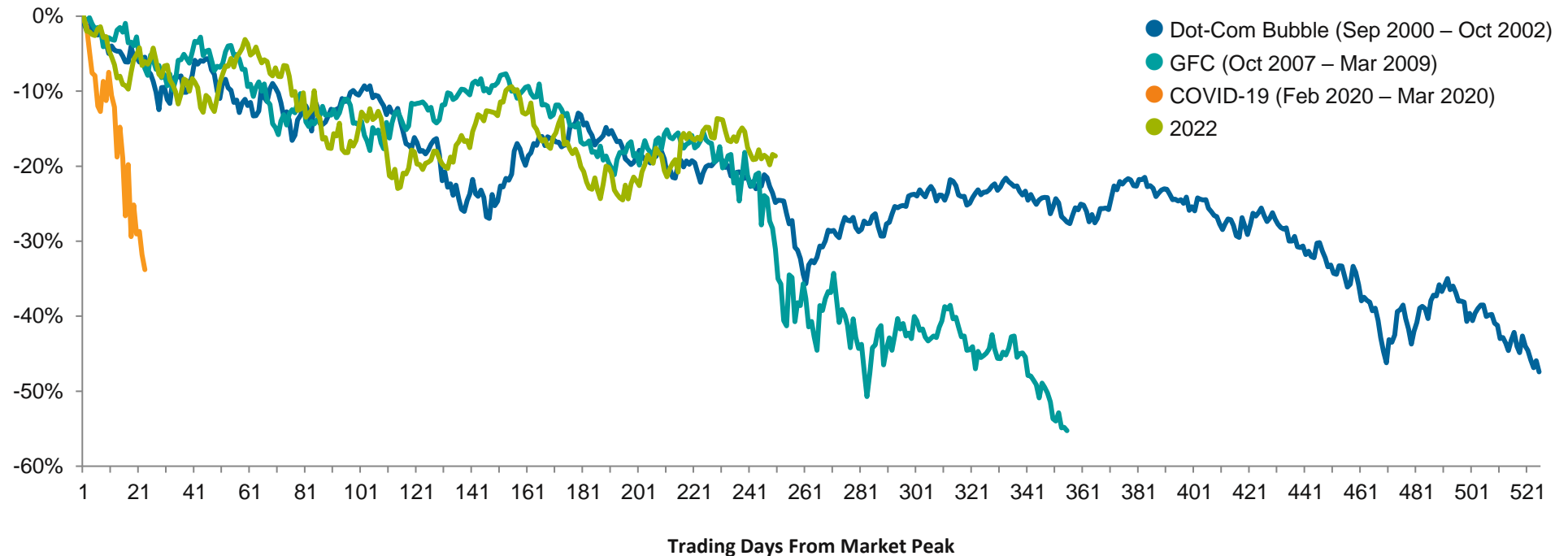
*Cambridge PE data through 09/30/22.

Sources: Bloomberg, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

2022 Equity Drawdown: A More 'Typical' Correction?

S&P 500 Cumulative Returns

Market Peak-to-Trough for Recent Corrections vs. 2022 Through 12/31/22



- ▶ While the COVID correction was swift and intense, the 2022 correction resembles the GFC and Dot-Com Bubble.
- ▶ The 2022 drawdown has been 250 trading days through December.
- ▶ It would take another 105 trading days to get to the bottom of the GFC and 275 trading days to get to the bottom of the Dot-Com Bubble.

Sources: Callan, S&P Dow Jones Indices

The Stock Market Is Not the Economy

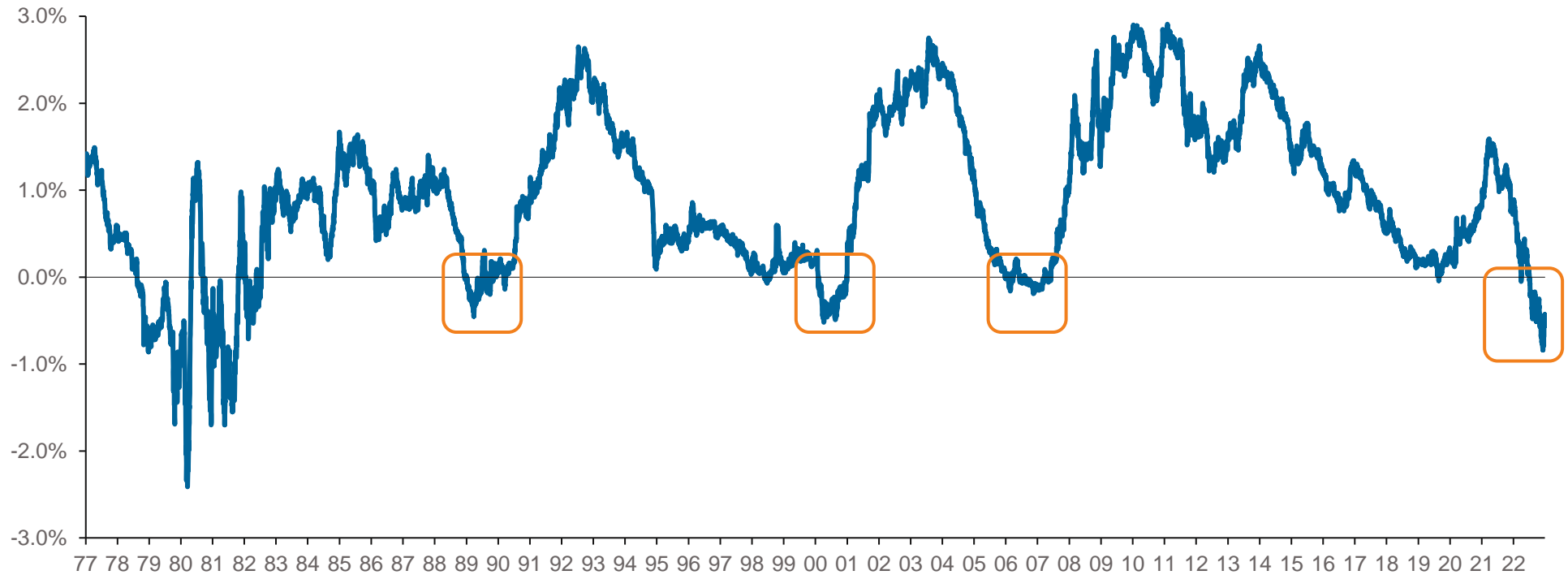


- ▶ The job market lost over 22 million jobs in the pandemic, and just regained the pre-pandemic high water mark in the summer of 2022.

Sources: Federal Reserve Bank of St. Louis, S&P Dow Jones Indices

Is the Bond Market Expecting a Recession?

10-Year Treasury vs. 2-Year Treasury Spread



- ▶ The 10-year to 2-year Treasury spread went negative two days in April and has been negative for most of 3Q and 4Q.
- ▶ Inversion in this spread does not always forecast a recession, but most recessions are preceded by a yield curve inversion.
 - Yield curve inversion means investors expect a recession will occur and that interest rates will be cut, and therefore increase their demand for securities with longer duration, and therefore a higher potential for capital gain when rates fall.

Source: Federal Reserve Bank of St. Louis

Diversification Remains Key Risk Control

Periodic Table of Investment Returns

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Emerging Markets	Emerging Markets	Emerging Markets	Emerging Markets	Emerging Markets	U.S. Fixed	Emerging Markets	Small Cap	Real Estate Funds	Emerging Markets	Small Cap	Large Cap	Real Estate Funds	Small Cap	Emerging Markets	Real Estate Funds	Large Cap	Small Cap	Large Cap	Real Estate Funds
55.82%	25.55%	34.00%	32.17%	39.38%	5.24%	78.51%	26.85%	14.96%	18.23%	38.82%	13.69%	13.95%	21.31%	37.28%	7.36%	31.49%	19.96%	28.71%	6.55%
Small Cap	Non-U.S. Equity	Real Estate Funds	Non-U.S. Equity	Real Estate Funds	Non-U.S. Fixed	High Yield	Emerging Markets	U.S. Fixed	Non-U.S. Equity	Large Cap	Real Estate Funds	Large Cap	High Yield	Non-U.S. Equity	Cash Equivalent	Small Cap	Large Cap	Real Estate Funds	Cash Equivalent
47.25%	20.38%	20.15%	25.71%	14.84%	4.39%	58.21%	18.88%	7.84%	16.41%	32.39%	11.46%	1.38%	17.13%	24.21%	1.87%	25.52%	18.40%	21.02%	1.46%
Non-U.S. Equity	Small Cap	Non-U.S. Equity	Small Cap	Hedge Funds	Cash Equivalent	Non-U.S. Equity	Real Estate Funds	High Yield	Small Cap	Non-U.S. Equity	U.S. Fixed	U.S. Fixed	Large Cap	Large Cap	U.S. Fixed	Non-U.S. Equity	Emerging Markets	Small Cap	Hedge Funds
39.42%	18.33%	14.47%	18.37%	12.56%	2.06%	33.67%	15.26%	4.98%	16.35%	21.02%	5.97%	0.55%	11.96%	21.83%	0.01%	22.49%	18.31%	14.82%	1.06%
High Yield	Non-U.S. Fixed	Hedge Funds	Large Cap	Non-U.S. Equity	Real Estate Funds	Small Cap	High Yield	Non-U.S. Fixed	Large Cap	Real Estate Funds	Small Cap	Cash Equivalent	Emerging Markets	Small Cap	High Yield	Emerging Markets	Non-U.S. Fixed	Non-U.S. Equity	High Yield
28.97%	12.54%	7.61%	15.79%	12.44%	-10.70%	27.17%	15.12%	4.36%	16.00%	12.90%	4.89%	0.05%	11.19%	14.65%	-2.08%	18.44%	10.11%	12.62%	-11.19%
Large Cap	Real Estate Funds	Large Cap	Real Estate Funds	Non-U.S. Fixed	Hedge Funds	Large Cap	Large Cap	Large Cap	High Yield	Hedge Funds	Hedge Funds	Hedge Funds	Real Estate Funds	Non-U.S. Fixed	Non-U.S. Fixed	High Yield	Non-U.S. Equity	Hedge Funds	U.S. Fixed
28.68%	12.00%	4.91%	15.27%	11.03%	-19.07%	26.47%	15.06%	2.11%	15.81%	9.73%	4.13%	-0.71%	7.79%	10.51%	-2.15%	14.32%	7.59%	8.23%	-13.01%
Non-U.S. Fixed	High Yield	Small Cap	Hedge Funds	U.S. Fixed	High Yield	Hedge Funds	Hedge Funds	Cash Equivalent	Real Estate Funds	High Yield	High Yield	Non-U.S. Equity	Non-U.S. Equity	High Yield	Hedge Funds	Hedge Funds	U.S. Fixed	High Yield	Non-U.S. Equity
19.36%	11.13%	4.55%	13.86%	6.97%	-26.16%	18.57%	10.95%	0.10%	9.79%	7.44%	2.45%	-3.04%	2.75%	7.50%	-3.19%	9.31%	7.51%	5.28%	-14.29%
Hedge Funds	Large Cap	Cash Equivalent	High Yield	Large Cap	Small Cap	Non-U.S. Fixed	Non-U.S. Equity	Hedge Funds	Hedge Funds	Cash Equivalent	Cash Equivalent	Small Cap	U.S. Fixed	Hedge Funds	Large Cap	U.S. Fixed	High Yield	Cash Equivalent	Large Cap
15.44%	10.88%	3.06%	11.85%	5.49%	-33.79%	7.53%	8.95%	-2.52%	7.67%	0.07%	0.04%	-4.41%	2.65%	7.12%	-4.38%	8.72%	7.11%	0.05%	-18.11%
Real Estate Funds	Hedge Funds	High Yield	Non-U.S. Fixed	Cash Equivalent	Large Cap	U.S. Fixed	U.S. Fixed	Small Cap	U.S. Fixed	U.S. Fixed	Emerging Markets	High Yield	Non-U.S. Fixed	Real Estate Funds	Small Cap	Non-U.S. Fixed	Hedge Funds	U.S. Fixed	Non-U.S. Fixed
8.28%	9.64%	2.74%	8.16%	5.00%	-37.00%	5.93%	6.54%	-4.18%	4.21%	-2.02%	-2.19%	-4.47%	1.49%	6.66%	-11.01%	5.09%	6.36%	-1.54%	-18.70%
U.S. Fixed	U.S. Fixed	U.S. Fixed	Cash Equivalent	High Yield	Non-U.S. Equity	Cash Equivalent	Non-U.S. Fixed	Non-U.S. Equity	Non-U.S. Fixed	Emerging Markets	Non-U.S. Fixed	Non-U.S. Fixed	Hedge Funds	U.S. Fixed	Non-U.S. Equity	Real Estate Funds	Cash Equivalent	Emerging Markets	Emerging Markets
4.10%	4.34%	2.43%	4.86%	1.87%	-43.56%	0.21%	4.95%	-12.21%	4.09%	-2.60%	-3.09%	-6.02%	1.25%	3.54%	-14.09%	4.39%	0.67%	-2.54%	-20.09%
Cash Equivalent	Cash Equivalent	Non-U.S. Fixed	U.S. Fixed	Small Cap	Emerging Markets	Real Estate Funds	Cash Equivalent	Emerging Markets	Cash Equivalent	Non-U.S. Fixed	Non-U.S. Equity	Emerging Markets	Cash Equivalent	Cash Equivalent	Emerging Markets	Cash Equivalent	Real Estate Funds	Non-U.S. Fixed	Small Cap
1.15%	1.33%	-8.65%	4.33%	-1.57%	-53.33%	-30.40%	0.13%	-18.42%	0.11%	-3.08%	-4.32%	-14.92%	0.33%	0.86%	-14.57%	2.28%	0.34%	-7.05%	-20.44%

- Bloomberg Barclays Corp High Yield ● Bloomberg Barclays Global Aggregate ex US ● Bloomberg Barclays US Aggregate
- Credit Suisse Hedge Fund ● ICE BofAML US 3-Month Treasury Bill ● MSCI Emerging Markets ● MSCI World ex USA
- NFI-ODCE (value-weighted net) ● Russell 2000 ● S&P 500

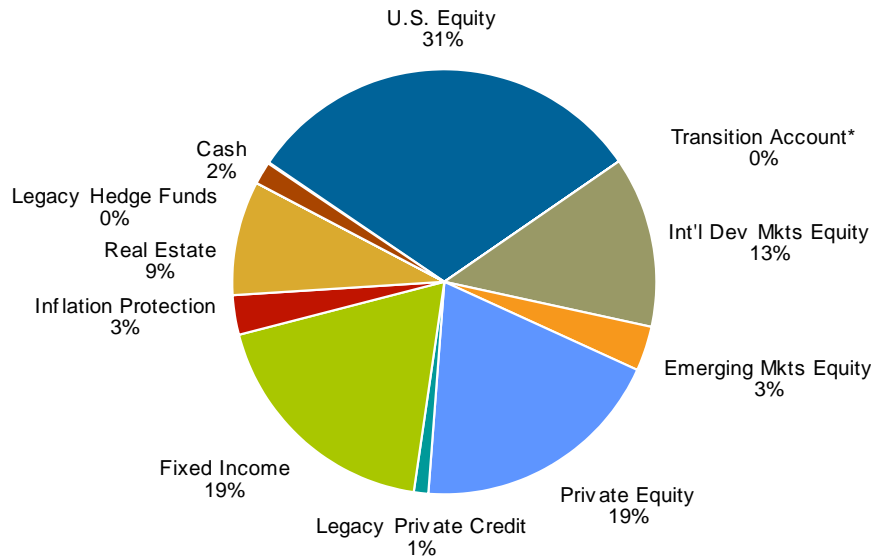
Callan

**PA SERS Defined Benefit Plan
Performance Review**

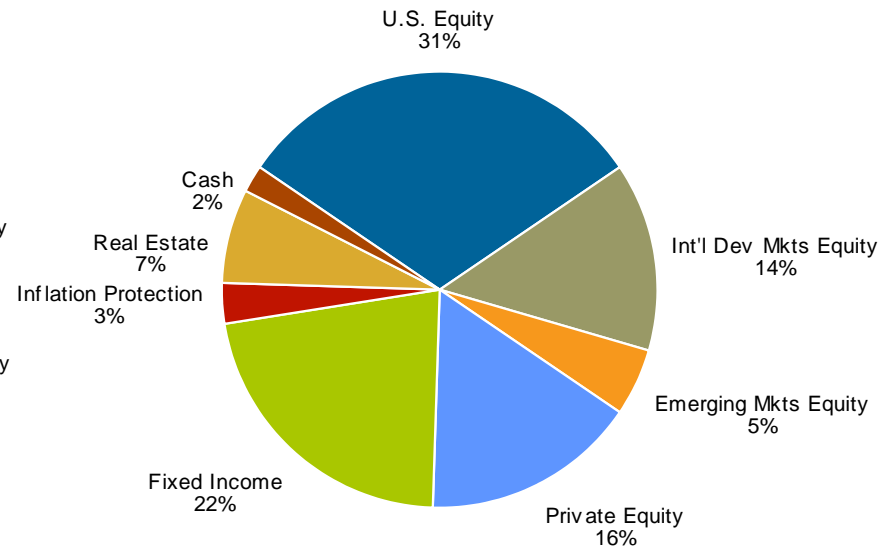
Total Fund

Actual Asset Allocation versus Target as of December 31, 2022

Actual Asset Allocation



Target Asset Allocation



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
U.S. Equity	10,413,291	30.9%	31.0%	(0.1%)	(33,547)
Transition Account*	1,051	0.0%	0.0%	0.0%	1,051
Int'l Dev Mkts Equity	4,366,514	13.0%	14.0%	(1.0%)	(351,413)
Emerging Mkts Equity	1,148,788	3.4%	5.0%	(1.6%)	(536,185)
Private Equity	6,537,196	19.4%	16.0%	3.4%	1,145,280
Legacy Private Credit	386,392	1.1%	0.0%	1.1%	386,392
Fixed Income	6,304,779	18.7%	22.0%	(3.3%)	(1,109,106)
Inflation Protection	1,005,859	3.0%	3.0%	(0.0%)	(5,125)
Real Estate	2,943,430	8.7%	7.0%	1.7%	584,467
Legacy Hedge Funds	16,698	0.0%	0.0%	0.0%	16,698
Cash	575,478	1.7%	2.0%	(0.3%)	(98,511)
Total	33,699,476	100.0%	100.0%		

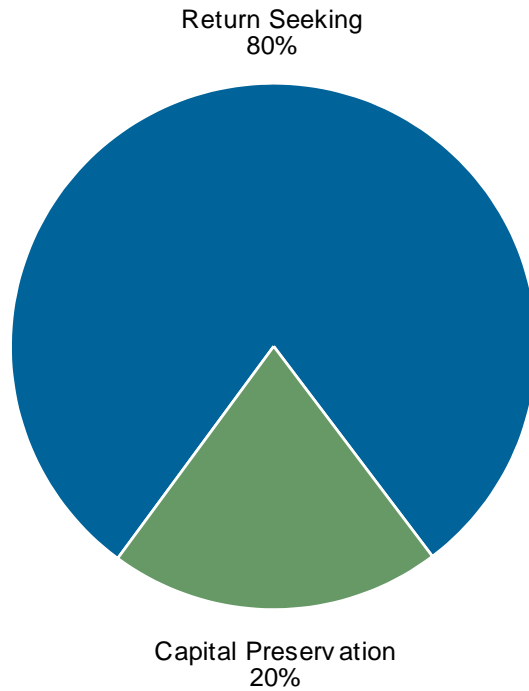
*Market values are shown net of accrued fees.

*Transition account market values are not included in any asset class and are excluded from these charts.

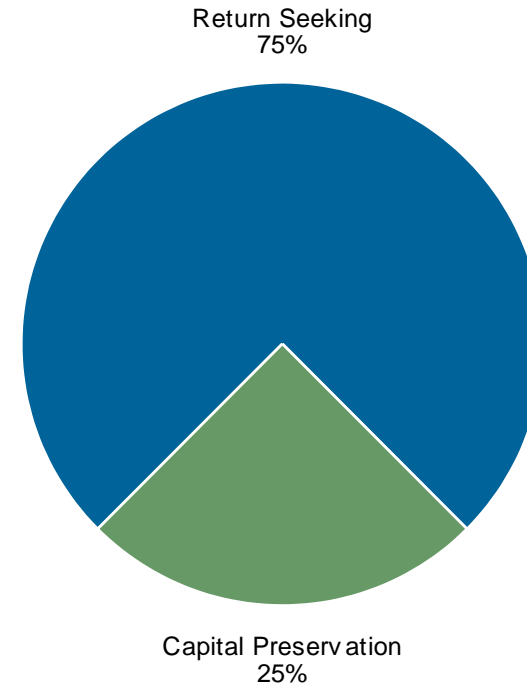
Return Seeking and Capital Preservation Assets

As of December 31, 2022

Actual Asset Allocation



Target Asset Allocation



*Return Seeking Assets: U.S. Equity, Int'l Developed Markets Equity, Emerging Markets Equity, Transition Account, Private Equity, Real Estate, Opportunistic Fixed Income, Legacy Hedge Funds and Legacy Private Credit.

*Capital Preservation Assets: Core Fixed Income, Nominal U.S. Treasuries, Inflation Protection (TIPS) and Cash.

*Market values are shown net of accrued fees.

Projected Risk, Liquidity and Correlation

	Capital Preservation Assets			Return Seeking Assets				
	Cash	Inflation Protection (TIPS)	Fixed Income [^]	U.S. Equity	Developed International Equity	Emerging Markets Equity	Real Estate	Private Equity
Policy Target Asset Allocation	2%	3%	22%	31%	14%	5%	7%	16%
Projected Return* (Geometric)	2.75%	4.00%	4.25%	7.35%	7.25%	7.45%	5.75%	8.50%
Projected Risk* (Standard Deviation)	0.90%	5.30%	4.10%	18.05%	20.15%	25.70%	14.20%	27.60%
Liquidity	High	High	High	High	High	Medium	Low	Low
Correlation to U.S. Equity*	-0.06	-0.07	0.02	1.00	0.73	0.79	0.44	0.79
Months of Benefit Payments**	1.8	3.2	16.4					
Months of Benefit Payments (Includes EE & ER Contributions)**	6.3	10.9	56.6					
Cumulative Months of Benefit Payments (Includes EE & ER Contributions)**		73.8						

*Callan 2023 Capital Market Projections

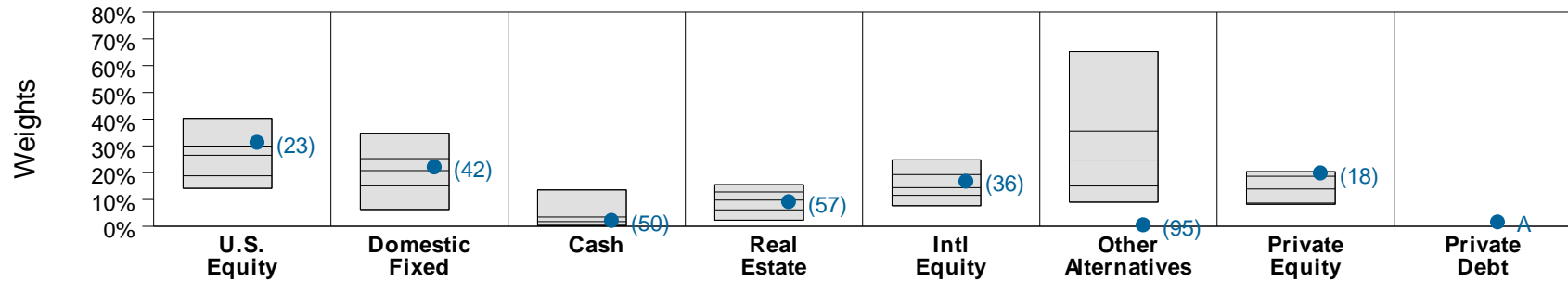
**Provided by SERS IO as of 12/31/2022. Benefit payment calculations for fixed income represent core fixed income , TIPS, treasury and cash allocations.

[^]Core and Opportunistic fixed Income combined

Total Fund

Actual Asset Allocation versus Very Large Public DB Plan (>\$10B) Peers as of December 31, 2022

Asset Class Weights vs Callan Public Fund Spons- V Lg DB (>10B)



10th Percentile	40.30	34.72	13.57	15.49	24.83	65.28	20.36	-
25th Percentile	29.92	25.28	3.49	12.83	19.32	35.64	18.63	-
Median	26.53	20.76	1.77	9.78	14.38	24.75	13.91	-
75th Percentile	18.82	15.09	0.65	6.12	11.54	15.05	8.64	-
90th Percentile	14.15	6.25	0.18	2.28	7.64	9.00	8.24	-
Fund	● 30.90	21.69	1.71	8.73	16.37	0.05	19.40	1.15
% Group Invested	100.00%	100.00%	83.33%	91.67%	100.00%	79.17%	25.00%	0.00%

* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

One Quarter Attribution Analysis versus Target – Gross of Fees as of December 31, 2022

Note: Attribution is a snapshot in time. Asset allocation effect utilizes monthly asset class weights to calculate the overall effect on attribution. Asset class weights fluctuate month to month and are combined to calculate a quarterly attribution effect.

Relative Attribution Effects for Quarter ended December 31, 2022

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
U.S. Equity	31%	31%	7.22%	7.18%	0.01%	(0.09%)	(0.08%)
Int'l Dev. Mkts Equity	12%	14%	15.89%	16.04%	(0.02%)	(0.21%)	(0.23%)
Emerging Markets	3%	5%	9.97%	9.50%	0.01%	(0.10%)	(0.08%)
Private Equity	19%	16%	(0.27%)	(0.27%)	0.00%	(0.23%)	(0.23%)
Legacy Private Credit	1%	0%	1.74%	1.74%	0.00%	(0.05%)	(0.05%)
Fixed Income	20%	22%	1.49%	1.87%	(0.08%)	0.03%	(0.05%)
Inflation Protection	3%	3%	2.20%	2.04%	0.00%	(0.00%)	0.00%
Real Estate	9%	7%	1.52%	0.77%	0.07%	(0.09%)	(0.02%)
Legacy Hedge Funds	0%	0%	(7.04%)	(7.04%)	0.00%	(0.01%)	(0.01%)
Cash	1%	2%	0.94%	0.84%	0.00%	0.03%	0.03%
Total			4.80%	= 5.51%	+ 0.00%	+ (0.72%)	(0.72%)

- **What helped relative attribution?**
 - Outperformance relative to target from Real Estate managers
 - An underweight to Fixed Income and Cash (attribution based on target return)
- **What hurt relative attribution?**
 - Underperformance relative to target from Fixed Income managers
 - An overweight to Private Equity and Real Estate (attribution based on target return)
 - An underweight to International Developed Markets and Emerging Markets (attribution based on target return)

* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.
Returns are shown gross of fees

Total Fund

One Year Attribution Analysis versus Target – Gross of Fees as of December 31, 2022

Note: Attribution is a snapshot in time. Asset allocation effect utilizes monthly asset class weights to calculate the overall effect on attribution. Asset class weights fluctuate month to month and are combined to calculate an annual attribution effect.

One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
U.S. Equity	31%	31%	(19.04%)	(19.21%)	0.05%	(0.13%)	(0.08%)
Int'l Dev. Mkts Equity	12%	14%	(15.06%)	(15.26%)	0.02%	0.01%	0.03%
Emerging Markets	3%	5%	(22.43%)	(19.83%)	(0.11%)	0.09%	(0.02%)
Private Equity	18%	14%	(4.38%)	(4.38%)	0.00%	0.34%	0.34%
Legacy Private Credit	2%	2%	9.78%	3.28%	0.16%	(0.16%)	(0.00%)
Fixed Income	21%	22%	(12.23%)	(13.01%)	0.17%	(0.03%)	0.14%
Inflation Protection	3%	3%	(12.90%)	(11.85%)	(0.03%)	(0.01%)	(0.04%)
Real Estate	8%	7%	8.27%	17.38%	(0.58%)	0.14%	(0.44%)
Legacy Hedge Funds	0%	0%	(19.43%)	(19.43%)	0.00%	(0.00%)	(0.00%)
Cash	2%	2%	1.65%	1.46%	0.00%	0.03%	0.03%
Total			(11.82%)	(11.78%)	+ (0.32%)	+ 0.28%	(0.04%)

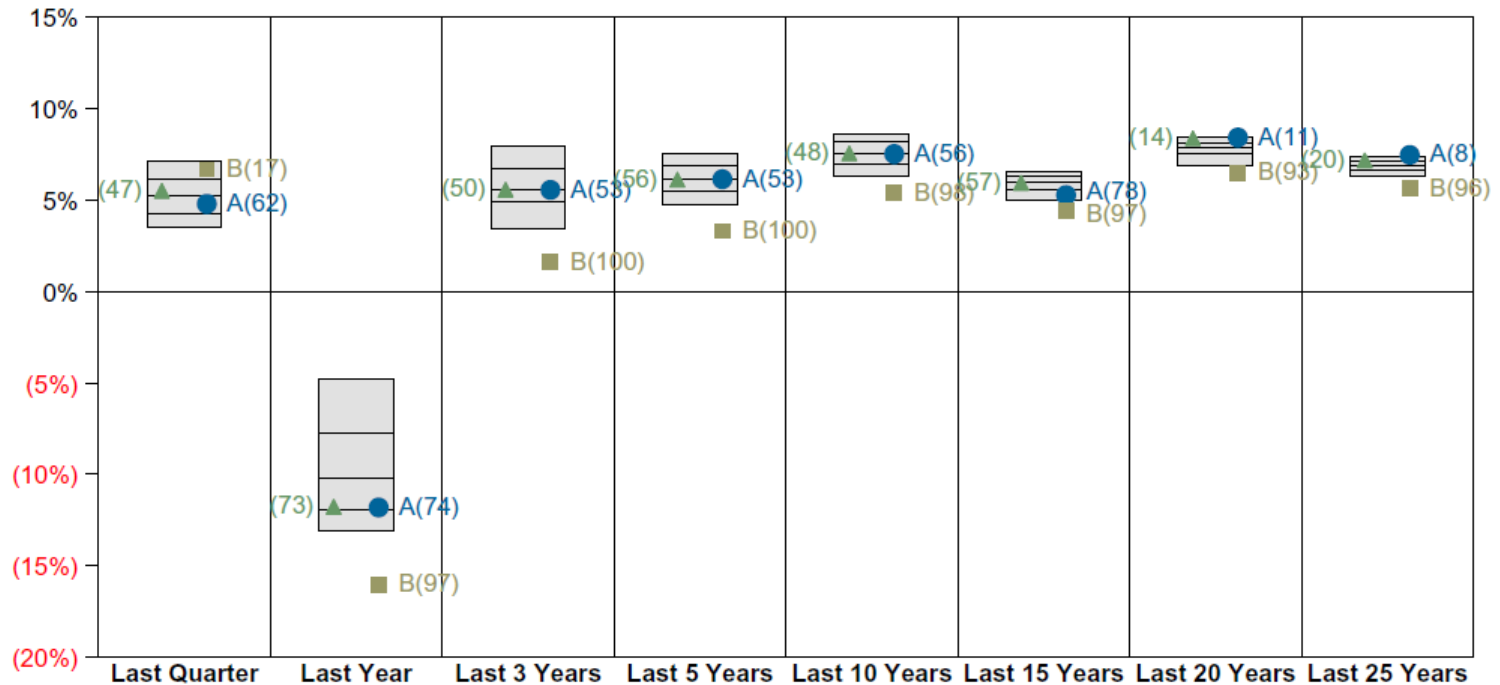
- **What helped relative attribution?**
 - Outperformance relative to target from Fixed Income and Legacy Private Credit managers
 - An overweight to Private Equity and Real Estate (attribution based on target return)
 - An underweight to Emerging Markets Equity and International Developed Equity (attribution based on target return)
- **What hurt relative attribution?**
 - Underperformance relative to target from Real Estate and Emerging Markets Equity managers
 - A slight underweight to U.S. Equity (attribution based on target return)

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Returns are shown gross of fees.

Total Fund

Gross of Fee Performance versus Very Large Public DB Plan (>\$10B) Peers and Benchmark as of December 31, 2022

Performance vs Callan Public Fund Spons- V Lg DB (>10B) (Gross)



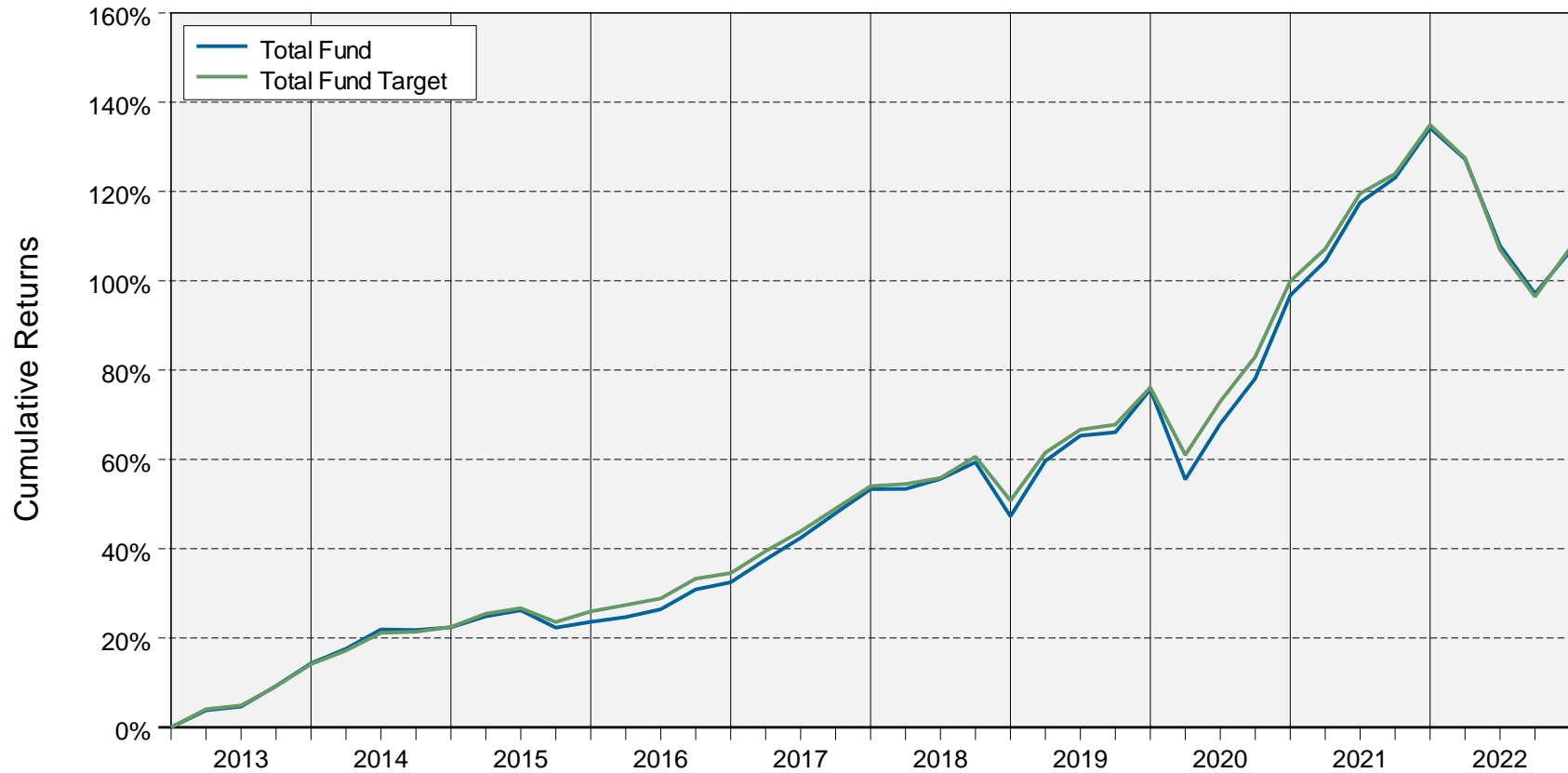
	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years
10th Percentile	7.16	(4.79)	7.93	7.56	8.57	6.54	8.43	7.40
25th Percentile	6.18	(7.71)	6.70	6.85	8.21	6.30	8.10	7.15
Median	5.24	(10.24)	5.57	6.15	7.54	5.99	7.90	6.92
75th Percentile	4.25	(11.93)	4.88	5.49	6.96	5.55	7.56	6.63
90th Percentile	3.49	(13.05)	3.47	4.75	6.30	4.96	6.90	6.29
Total Fund ● A	4.80	(11.82)	5.56	6.14	7.53	5.27	8.43	7.47
60% MSCI ACW IMI/40% Blmbg U.S. Agg ■ B	6.68	(16.04)	1.61	3.31	5.38	4.41	6.49	5.62
Total Fund Custom Benchmark ▲	5.51	(11.78)	5.57	6.12	7.56	5.94	8.39	7.18

* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

Cumulative 10-year Returns vs Target as of December 31, 2022

Cumulative Returns Actual vs Target

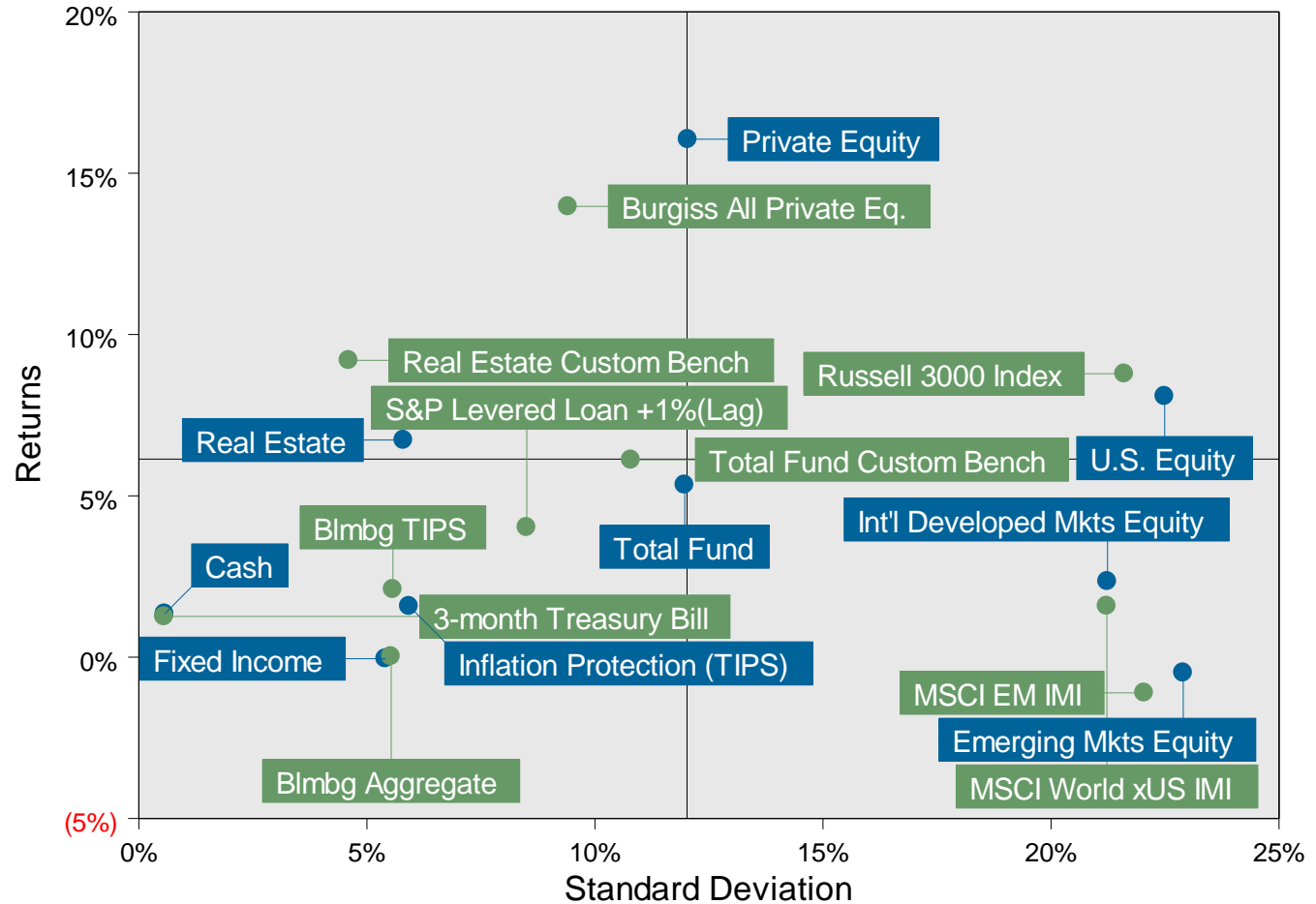


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Total Fund

Asset Class Risk and Return as of December 31, 2022

Five Year Annualized Risk vs Return
Asset Classes vs Benchmark Indices



* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

Rolling 3-year Gross of Fee Performance versus Benchmark as of December 31, 2022

Rolling 12 Quarter Gross of Fee Returns
for 15 Years Ended December 31, 2022



* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

Rolling 5-year Gross of Fee Performance versus Benchmark as of December 31, 2022

Rolling 20 Quarter Gross of Fee Returns
for 15 Years Ended December 31, 2022



* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Asset Class Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance						
Total Fund	\$33,699	100.00%	4.75%	(12.15%)	4.60%	5.34%
Total Fund Custom Benchmark(1)	-	-	5.51%	(11.78%)	5.57%	6.12%
Public Market Equiv Benchmark(2)	-	-	4.87%	(13.69%)	3.56%	5.03%
60/40 Index(3)	-	-	6.68%	(16.04%)	1.61%	3.31%
U.S. Equity	\$10,413	30.90%	7.22%	(19.06%)	6.95%	8.09%
Russell 3000 Index (4)	-	-	7.18%	(19.21%)	7.07%	8.79%
S&P 1500 Index	-	-	7.79%	(17.78%)	7.59%	9.15%
Int'l Developed Mkts Equity	\$4,367	12.96%	15.86%	(15.17%)	2.11%	2.35%
MSCI World ex US IMI	-	-	16.04%	(15.26%)	1.05%	1.59%
Emerging Mkts Equity	\$1,149	3.41%	9.83%	(22.84%)	(1.49%)	(0.48%)
MSCI EM IMI	-	-	9.50%	(19.83%)	(1.82%)	(1.10%)
Private Equity	\$6,537	19.40%	(0.33%)	(5.06%)	19.76%	16.06%
Burgiss Private Equity Index (Qtr lag)	-	-	(1.67%)	(1.84%)	15.43%	13.97%
Global Equity + 3% (Qtr lag)(5)	-	-	(4.46%)	(15.48%)	9.35%	10.97%
Legacy Private Credit Funds (6)	\$386	1.15%	1.34%	8.00%	10.58%	-
S&P Levered Loan Index + 1% (Qtr lag)	-	-	1.61%	(1.51%)	3.29%	4.03%
Fixed Income	\$6,305	18.71%	1.46%	(12.34%)	(2.73%)	(0.04%)
Blmbg U.S. Agg Bond Index	-	-	1.87%	(13.01%)	(2.71%)	0.02%
Inflation Protection (TIPS)	\$1,006	2.98%	2.18%	(12.99%)	0.53%	1.58%
Blmbg U.S. TIPS Index	-	-	2.04%	(11.85%)	1.21%	2.11%
Real Estate	\$2,943	8.73%	1.40%	6.02%	8.52%	6.73%
Real Estate Custom Bench (Qtr lag)(7)	-	-	0.77%	17.38%	11.40%	9.20%
CPI + 3% (Qtr lag)	-	-	0.91%	11.21%	7.95%	6.76%
Cash	\$575	1.71%	0.94%	1.65%	0.78%	1.35%
3-month Treasury Bill	-	-	0.84%	1.46%	0.72%	1.26%

* All returns on this report are shown with 2- decimal precision. This may differ from the decimal precision shown in BNY Mellon reports.

(1) Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Quarter lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index. See page 75 for full benchmark history.

(2) The current public equivalent benchmark consists of: 22% Bloomberg U.S. Agg Bond Index, 31% Russell 3000, 14% MSCI World ex US IMI Index, 12% Russell 3000+ 3% (Qtr lag), 7% CPI+3% (Qtr Lag), 3% Bloomberg US TIPS Index, 5% MSCI EM IMI Index, 4% MSCI World ex US +3% (Qtr lag), 2% ICE BofAML 3 Mo US T-Bill Index. See page 75 for full benchmark history.

(3) Benchmark consists of 60% MSCI ACW IMI Index and 40% Bloomberg U.S. Agg Bond Index.

(4) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

(5) As of 01/01/2020 benchmark consists of 25% MSCI World ex US +3% (Qtr lag) and 75% Russell 3000 + 3% (Qtr lag). Benchmark performance represents the historical benchmark (Russell 3000 +3% Qtr lag) linked to the current benchmark.

(6) Legacy Private Credit performance is included in the total fund starting at the composite's true inception date, 07/01/2022. The history is calculated and shown for informational purposes.

(7) As of 07/01/2022, the benchmark consists of 100% NCREIF NFI-ODCE (Qtr lag). From 03/31/2019 to 07/01/2022, the benchmark consists of 90% NCREIF ODCE Index (Qtr lag) and 10% FTSE NAREIT Index (unlagged).

Asset Class Returns

As of December 31, 2022

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance						
Total Fund	6.79%	4.49%	7.60%	6.70%	9.19%	(1/81)
Total Fund Custom Benchmark(1)	7.56%	5.94%	8.39%	7.18%	-	
Public Market Equiv Benchmark(2)	7.24%	5.75%	8.24%	7.06%	-	
60/40 Index(3)	5.38%	4.41%	6.49%	5.62%	-	
U.S. Equity	11.36%	6.94%	9.32%	7.33%	10.46%	(1/81)
Russell 3000 Index (4)	12.13%	8.66%	9.88%	7.65%	10.76%	(1/81)
S&P 1500 Index	12.38%	8.83%	9.92%	7.83%	-	
Int'l Developed Mkts Equity	5.50%	2.00%	6.98%	-	5.78%	(1/02)
MSCI World ex US IMI	4.73%	2.05%	6.85%	4.95%	5.76%	(1/02)
Emerging Mkts Equity	2.19%	(0.36%)	6.58%	-	6.20%	(1/02)
MSCI EM IMI	1.64%	0.86%	8.84%	5.36%	8.06%	(1/02)
Private Equity	13.15%	10.25%	12.56%	12.60%	11.60%	(1/86)
Burgiss Private Equity Index (Qtr lag)	13.51%	10.46%	13.32%	13.18%	16.72%	(1/86)
Global Equity + 3% (Qtr lag)(5)	14.14%	11.09%	13.10%	10.78%	14.08%	(1/86)
Legacy Private Credit Funds (6)	-	-	-	-	10.19%	(4/18)
S&P Levered Loan Index + 1% (Qtr lag)	-	-	-	-	3.95%	(4/18)
Fixed Income	1.18%	3.17%	4.32%	4.59%	7.56%	(1/81)
Blmbg U.S. Agg Bond Index	1.06%	2.66%	3.10%	3.97%	6.86%	(1/81)
Inflation Protection (TIPS)	0.99%	2.40%	-	-	2.84%	(2/03)
Blmbg U.S. TIPS Index	1.12%	3.05%	3.85%	4.79%	3.83%	(2/03)
Real Estate	7.30%	3.11%	6.88%	7.49%	8.40%	(3/84)
Real Estate Custom Bench (Qtr lag)(7)	9.80%	5.78%	8.15%	8.31%	-	
CPI + 3% (Qtr lag)	5.52%	5.39%	5.51%	5.47%	5.81%	(3/84)
Cash	1.02%	1.00%	1.54%	2.23%	3.39%	(1/87)
3-month Treasury Bill	0.76%	0.68%	1.27%	1.91%	3.12%	(1/87)

* All returns on this report are shown with 2- decimal precision. This may differ from the decimal precision shown in BNY Mellon reports.

(1)The current total fund benchmark consists of: 22% Bloomberg U.S. Agg Bond Index, 16% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE (Qtr lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index. See page 75 for full benchmark history.

(2) The current public equivalent benchmark consists of: 22% Bloomberg U.S. Agg Bond Index, 31% Russell 3000, 14% MSCI World ex US IMI Index, 12% Russell 3000+ 3% (Qtr lag), 7% CPI+3% (Qtr Lag), 3% Bloomberg US TIPS Index, 5% MSCI EM IMI Index, 4% MSCI World ex US +3% (Qtr lag), 2% ICE BofAML 3 Mo US T-Bill Index. See page 75 for full benchmark history.

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(4) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

(5) As of 01/01/2020 benchmark consists of 25% MSCI World ex US +3% (Qtr lag) and 75% Russell 3000 + 3% (Qtr lag). Benchmark performance represents the historical benchmark (Russell 3000 +3% Qtr lag) linked to the current benchmark.

(6) Legacy Private Credit performance is included in the total fund starting at the composite's true inception date, 07/01/2022. The history is calculated and shown for informational purposes.

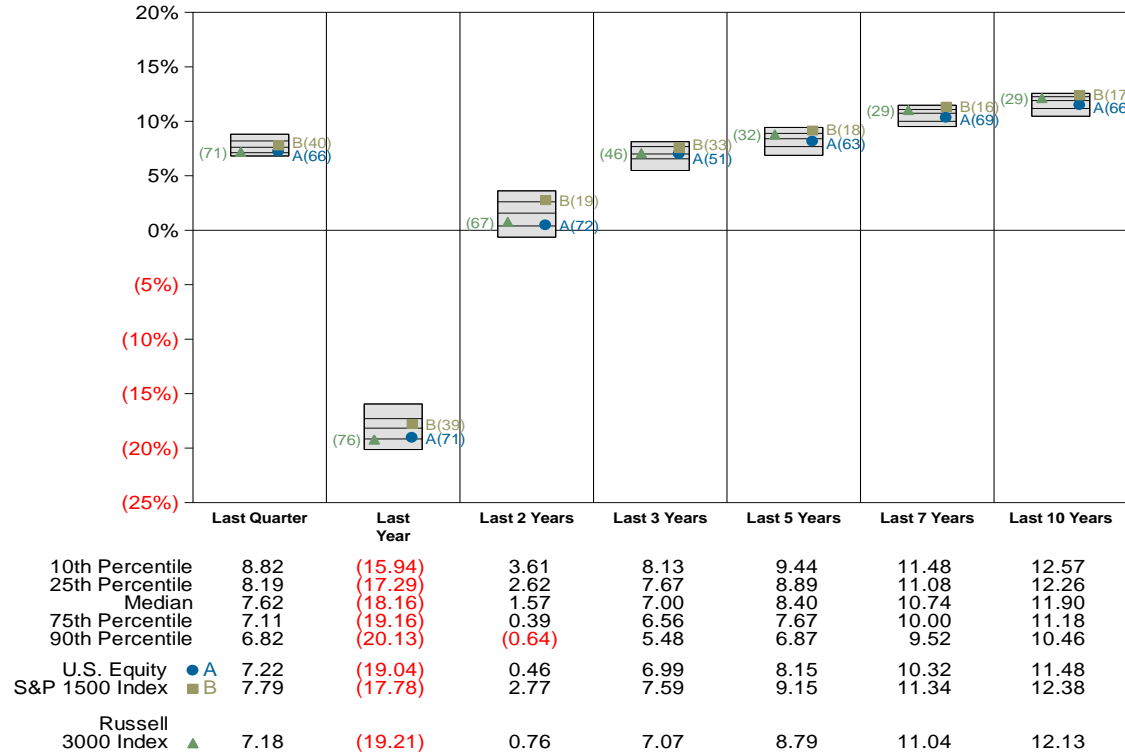
(7) As of 07/01/2022, the benchmark consists of 100% NCREIF NFI-ODCE (Qtr lag). From 03/31/2019 to 07/01/2022 the benchmark consists of 90% NCREIF ODCE Index (Qtr lag) and 10% FTSE NAREIT Index (unlagged).

Callan

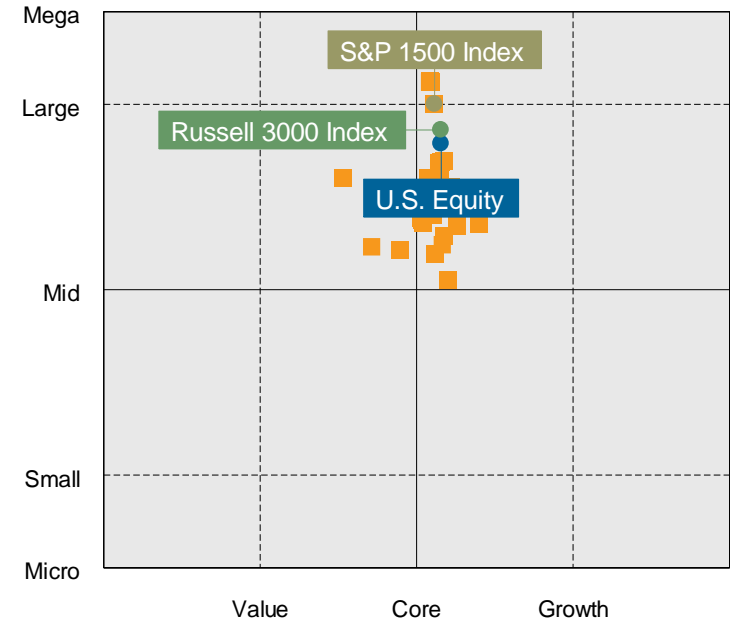
**Appendix I – Asset Class and Manager
Performance**

U.S. Equity as of December 31, 2022

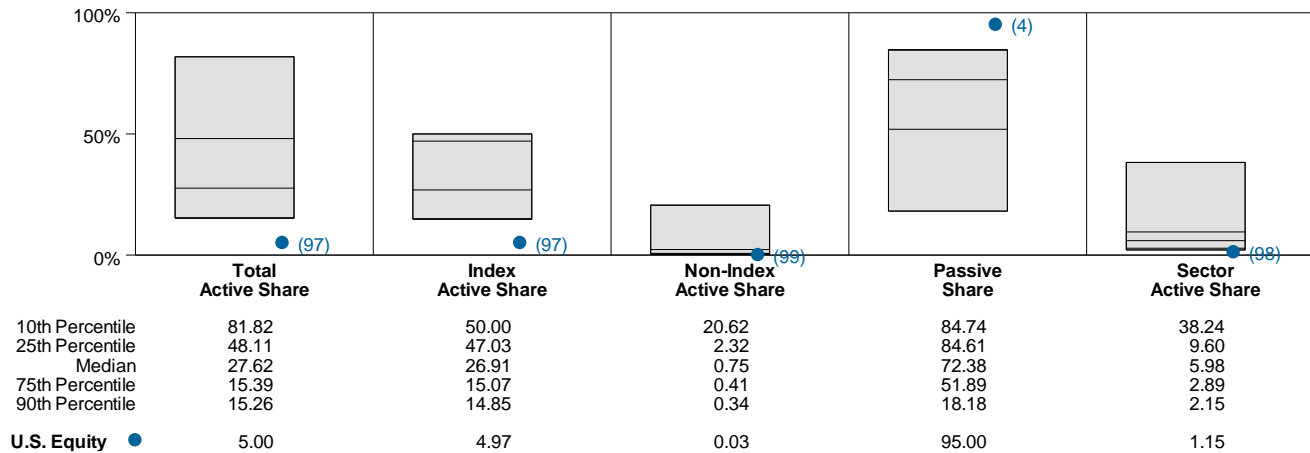
Performance vs Public Fund - Domestic Equity (Gross)



Style Map vs Pub Pln- Dom Equity Holdings as of December 31, 2022



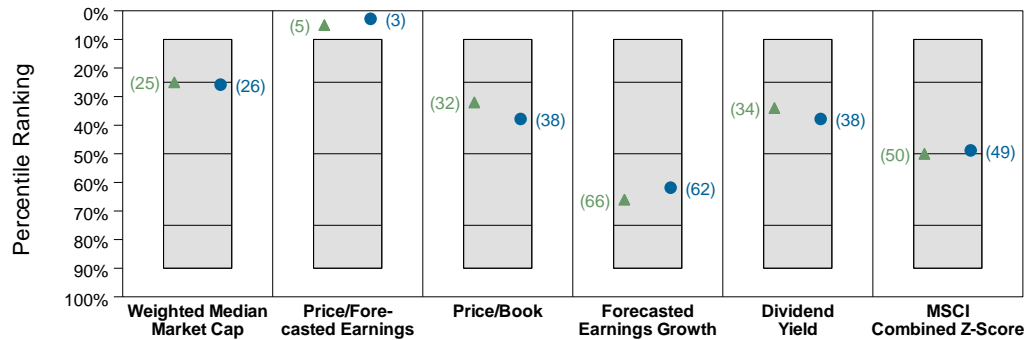
Active Share vs. Pub Pln- Dom Equity



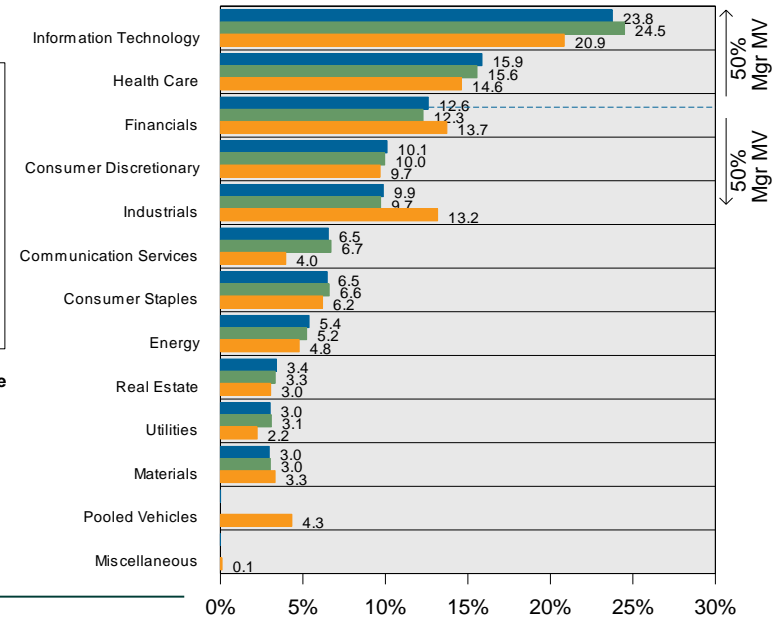
U.S. Equity

As of December 31, 2022

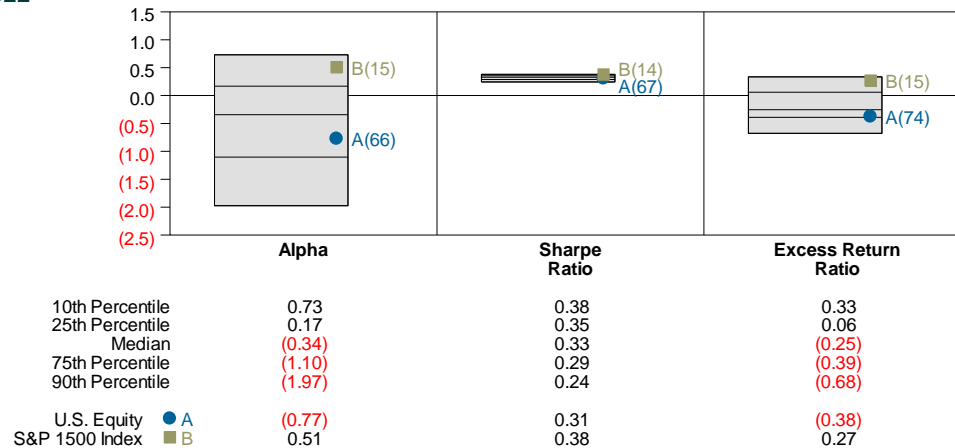
Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of December 31, 2022



Sector Allocation
December 31, 2022

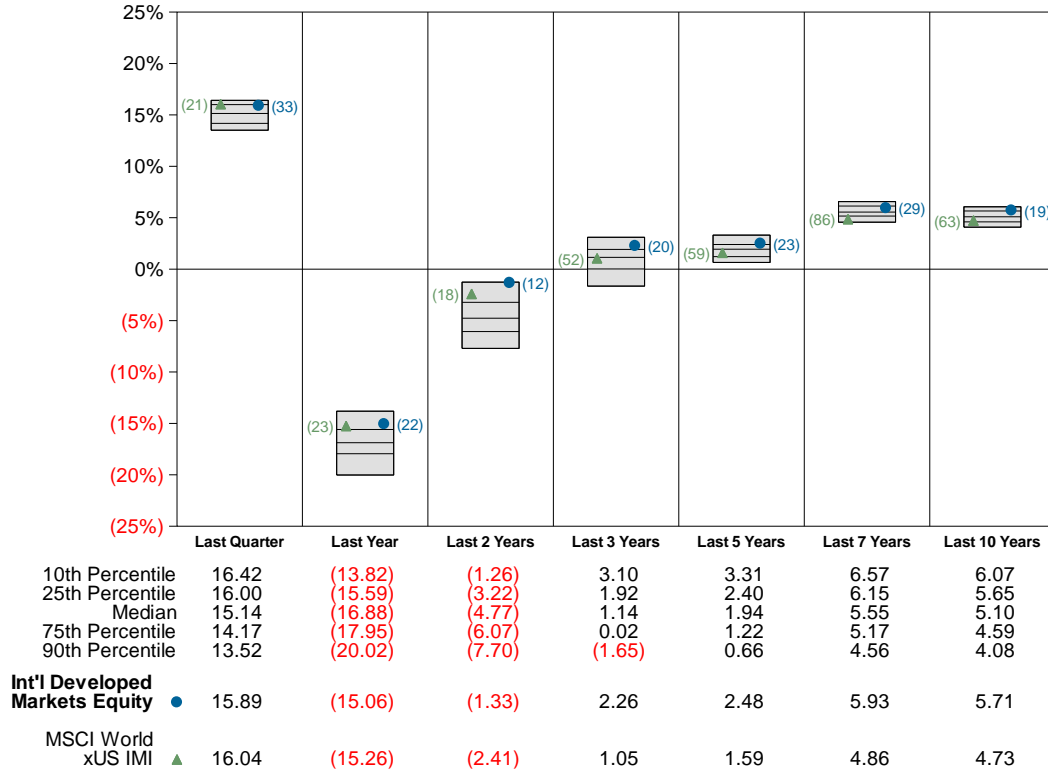


Risk Adjusted Return Measures vs Russell 3000 Index
Rankings Against Public Fund - Domestic Equity (Gross)
Five Years Ended December 31, 2022

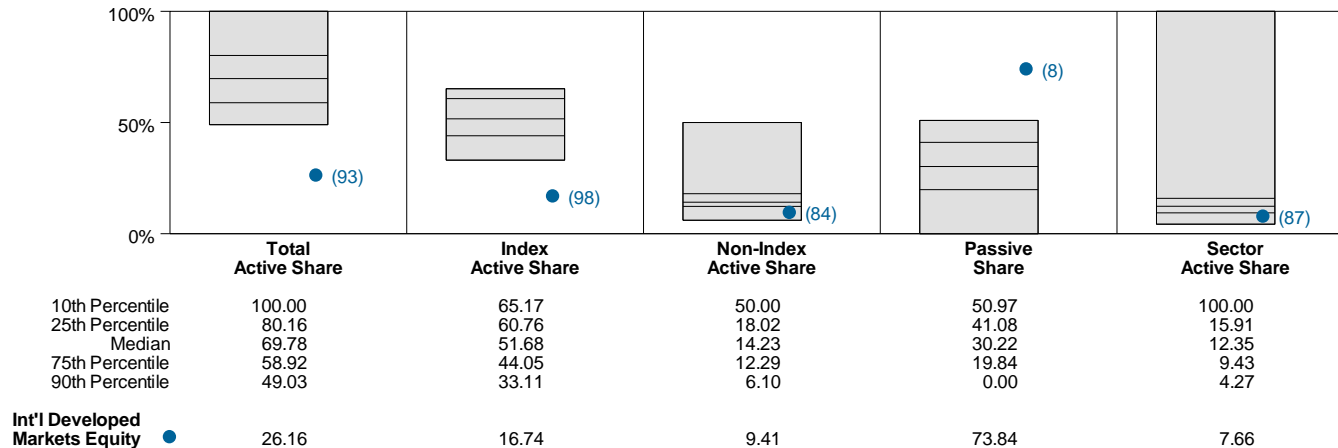


International Equity as of December 31, 2022

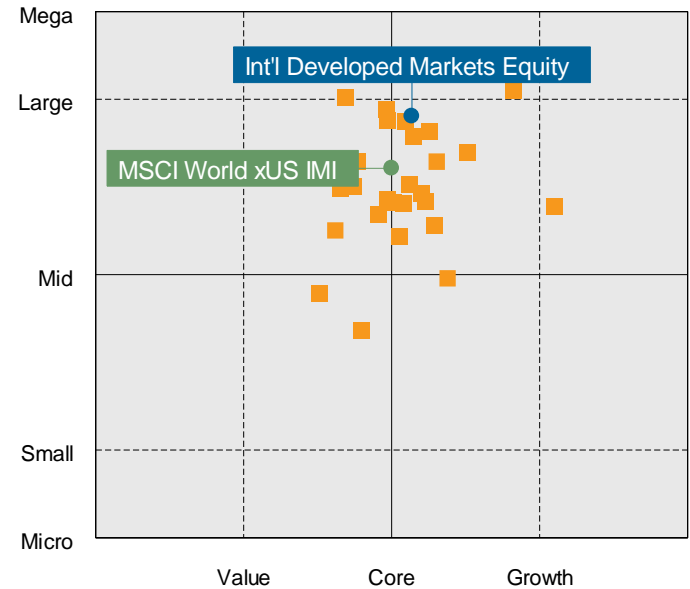
Performance vs Public Fund - International Equity (Gross)



Active Share vs. Pub Pln- Intl Equity



Style Map vs Pub Pln- Intl Equity Holdings as of December 31, 2022



International Equity

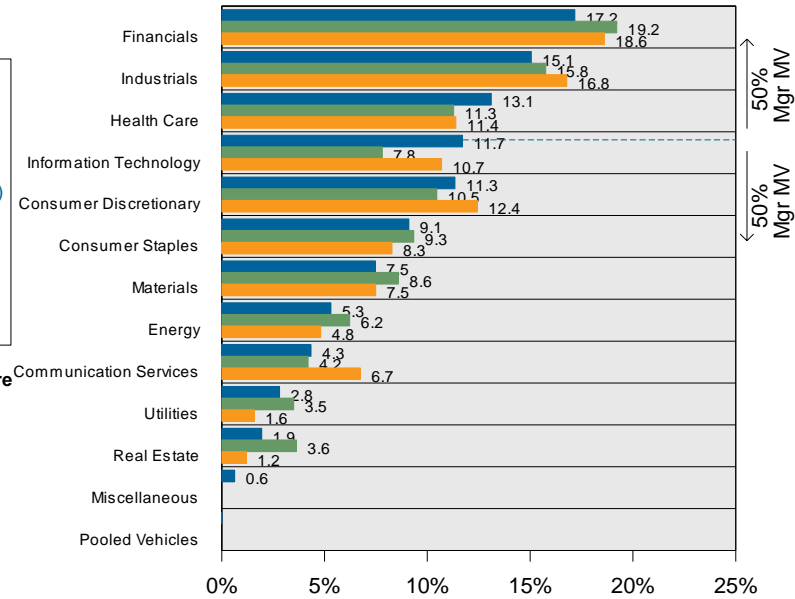
As of December 31, 2022

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - International Equity
as of December 31, 2022

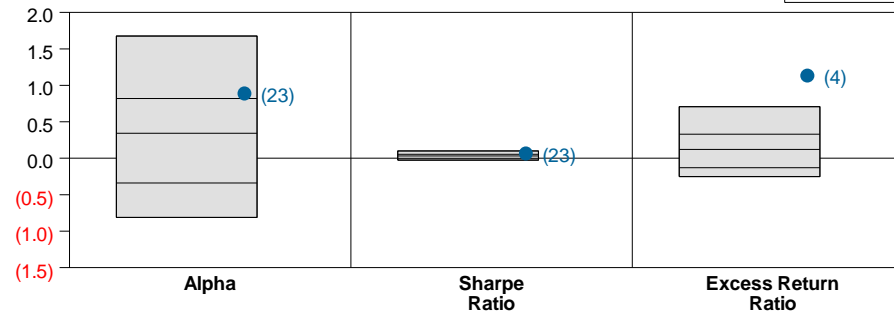


	Weighted Median Market Cap	Price/Forecasted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	40.85	15.46	2.57	15.92	3.96	0.59
25th Percentile	35.77	13.28	1.91	13.48	3.51	0.27
Median	26.85	12.20	1.61	12.26	2.97	0.09
75th Percentile	22.60	10.64	1.26	10.30	2.48	(0.17)
90th Percentile	13.01	9.77	1.12	9.40	2.18	(0.30)
Int'l Developed Markets Equity	38.90	13.03	1.79	10.77	2.75	0.11
MSCI World xUS IMI (Net)	30.57	12.36	1.54	10.06	3.17	(0.02)

Sector Allocation December 31, 2022



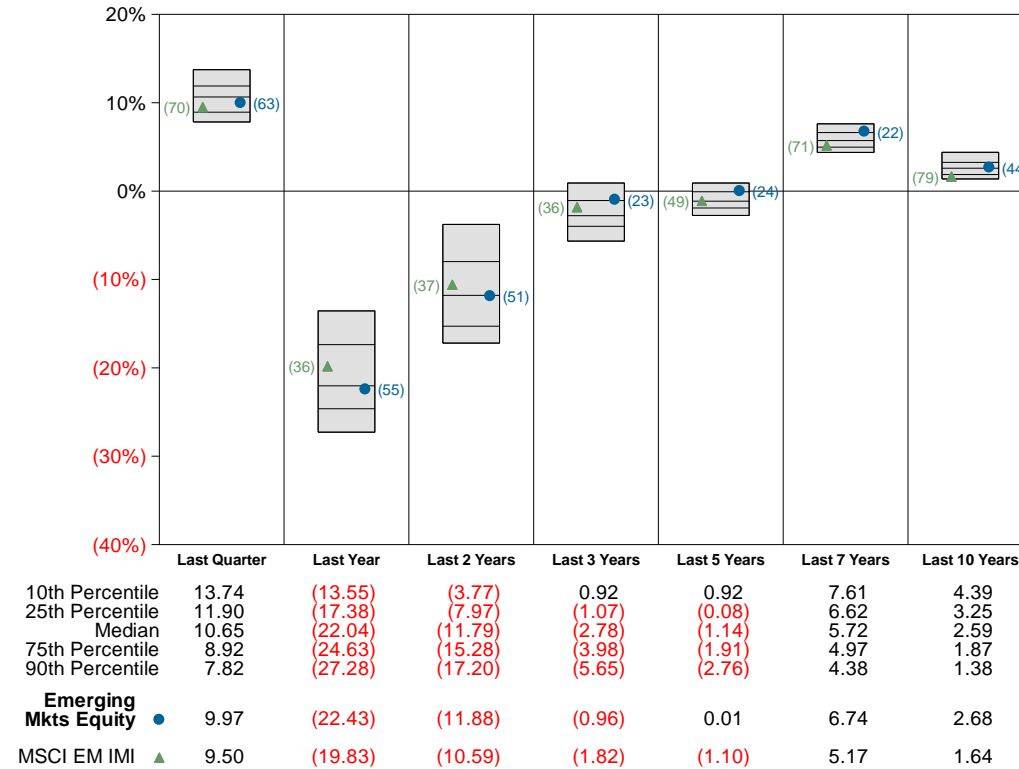
Risk Adjusted Return Measures vs MSCI World ex US IMI
Rankings Against Public Fund - International Equity (Gross)
Five Years Ended December 31, 2022



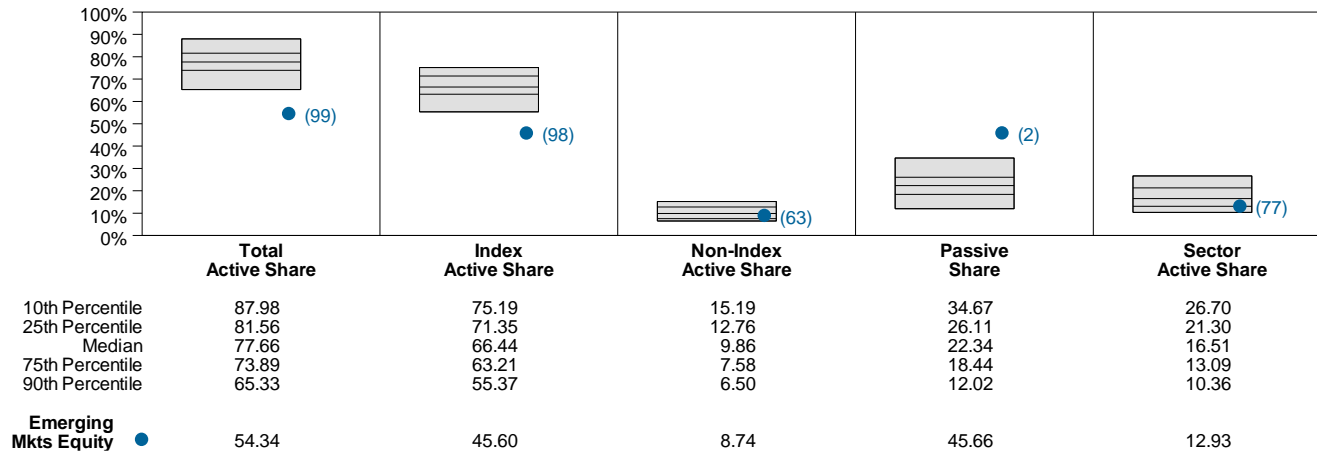
	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	1.68	0.10	0.71
25th Percentile	0.82	0.05	0.33
Median	0.34	0.03	0.12
75th Percentile	(0.34)	(0.00)	(0.13)
90th Percentile	(0.81)	(0.03)	(0.25)
Int'l Developed Markets Equity	0.88	0.06	1.13

Emerging Markets Equity as of December 31, 2022

Performance vs Callan Emerging Broad (Gross)



Active Share vs. Callan Emerging Broad



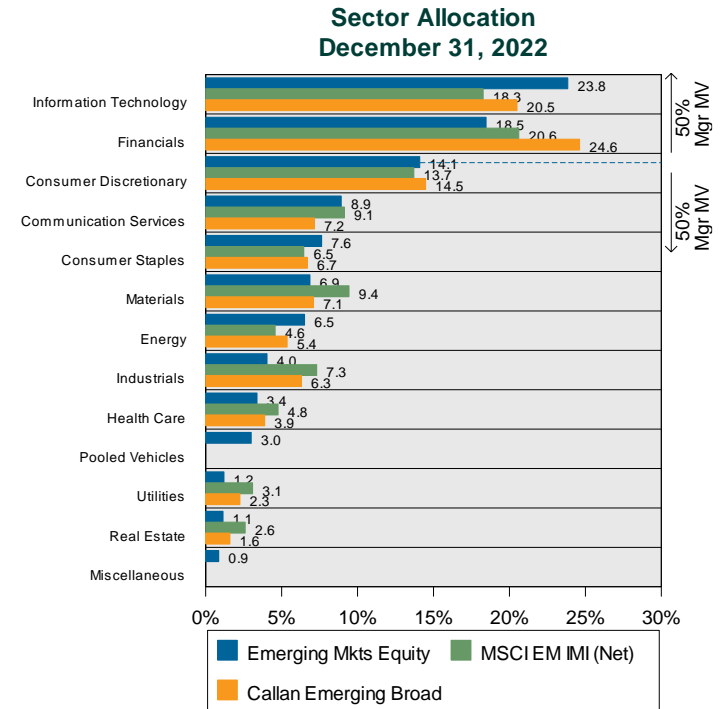
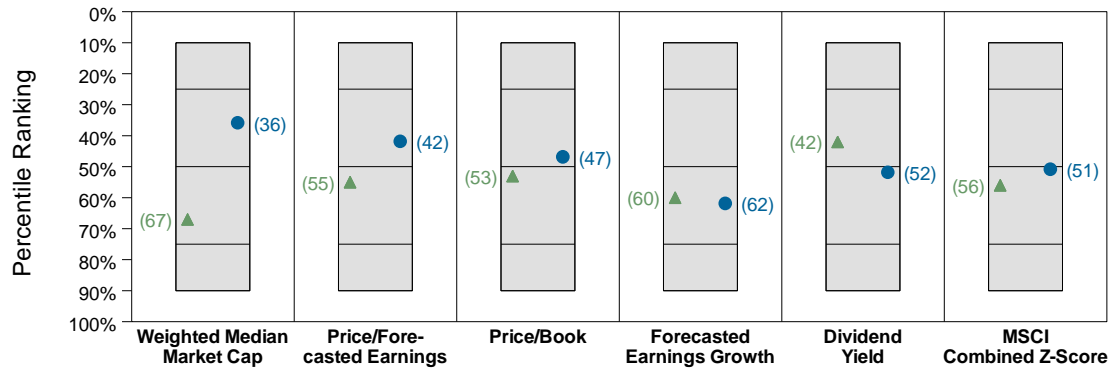
Style Map vs Callan Emerging Broad Holdings as of December 31, 2022



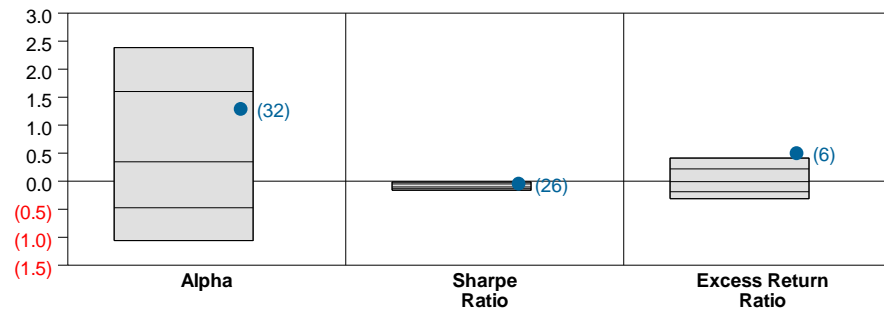
Emerging Markets Equity

As of December 31, 2022

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Emerging Broad
as of December 31, 2022

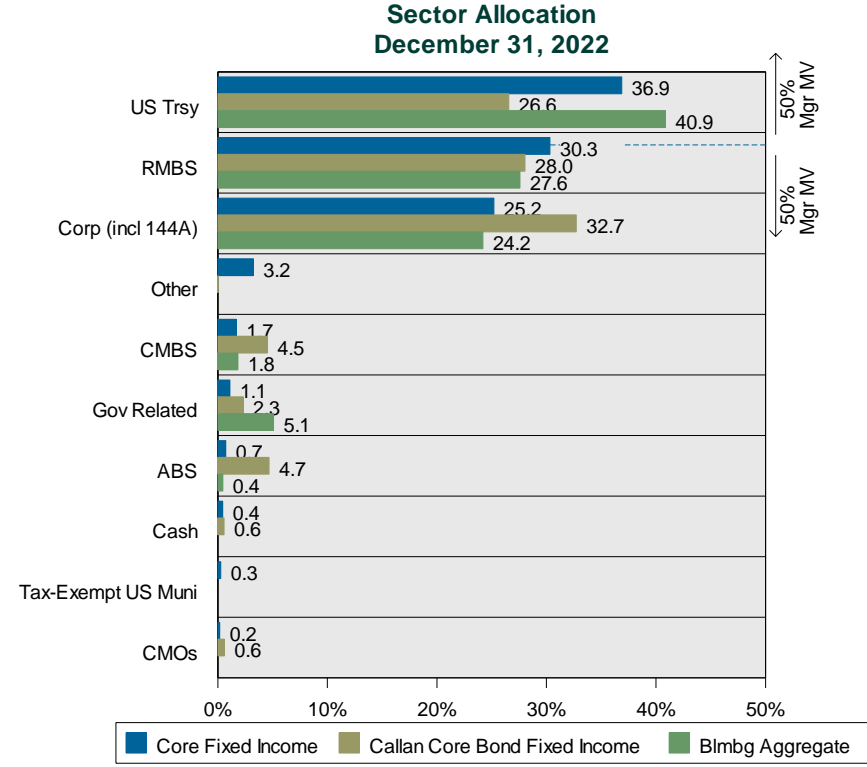
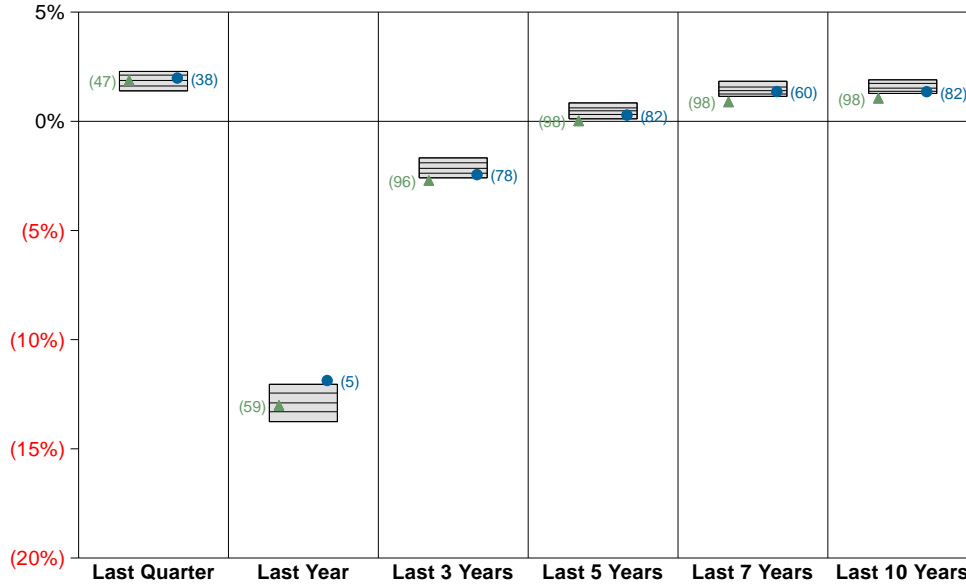


Risk Adjusted Return Measures vs MSCI EM IMI
Rankings Against Callan Emerging Broad (Gross)
Five Years Ended December 31, 2022

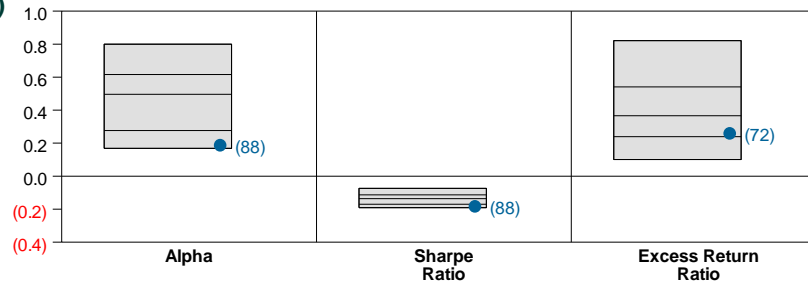


Core Fixed Income As of December 31, 2022

Performance vs Callan Core Bond Fixed Income (Gross)



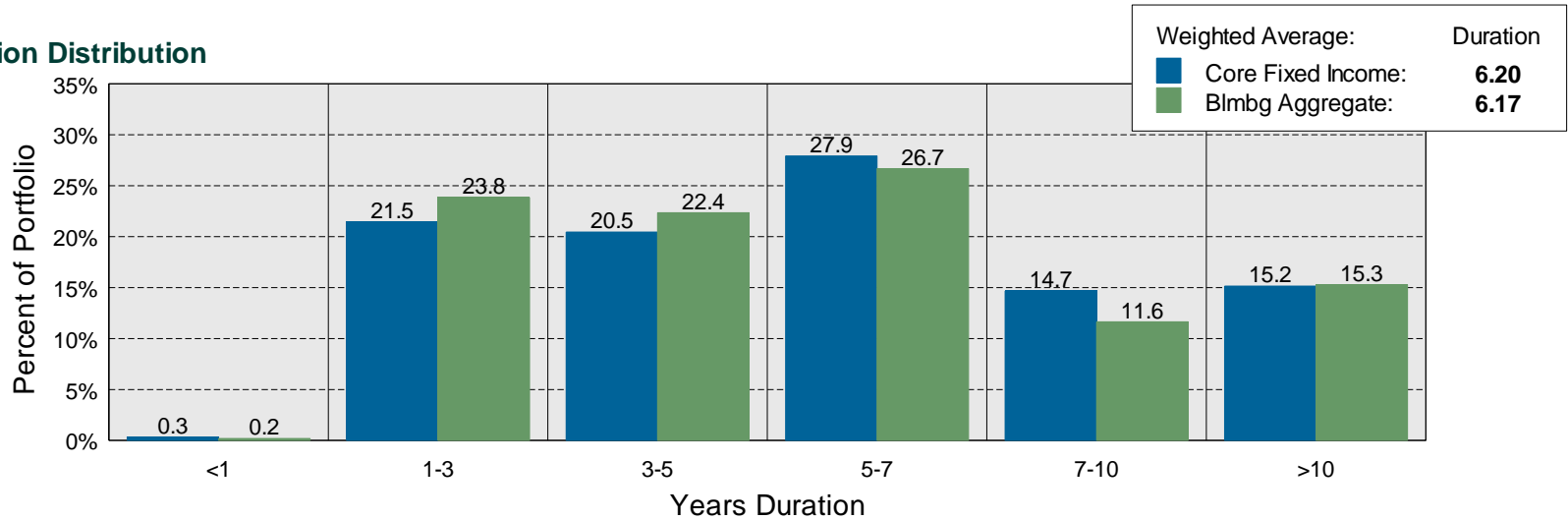
Risk Adjusted Return Measures vs Blimbg Aggregate Rankings Against Public Fund - Domestic Fixed (Gross) Five Years Ended December 31, 2022



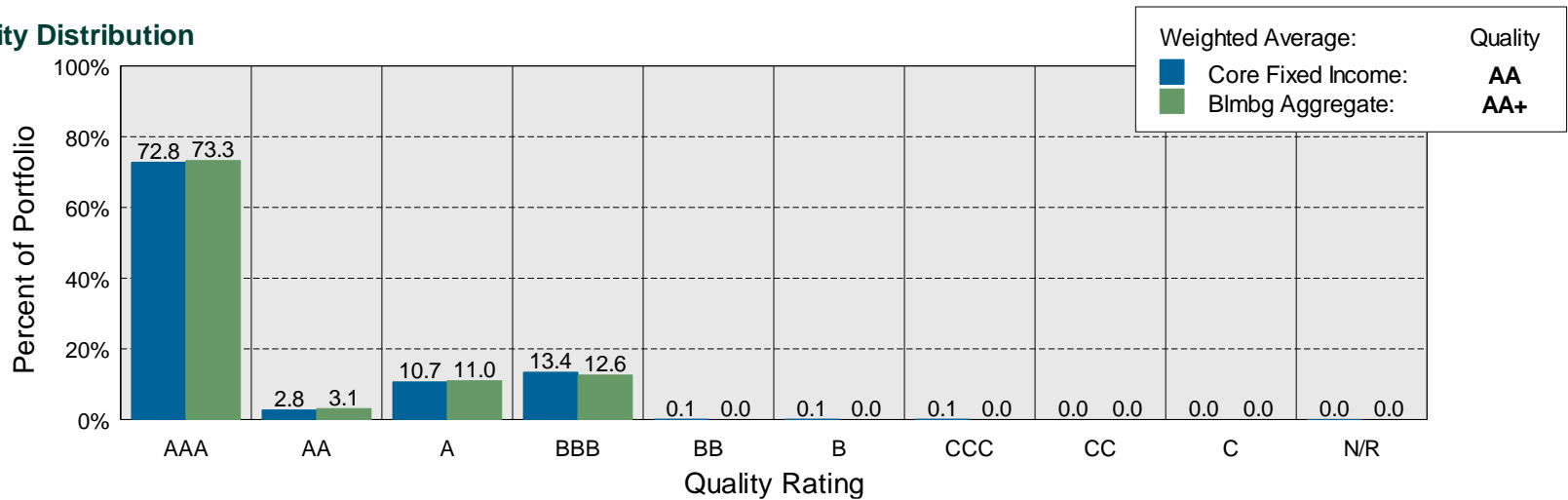
Core Fixed Income

As of December 31, 2022

Duration Distribution

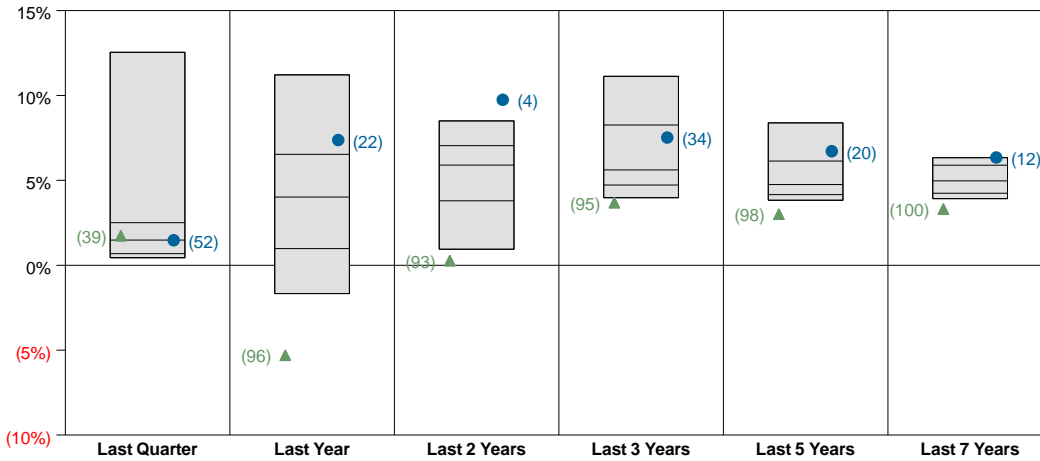


Quality Distribution



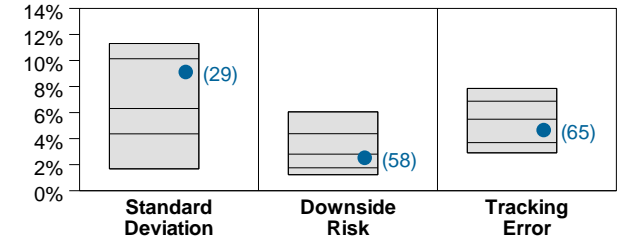
Opportunistic Fixed Income As of December 31, 2022

Performance vs Callan Absolute Rtn Hedge Fund of Funds (Net)



10th Percentile	12.54	11.22	8.50	11.13	8.38	6.34
25th Percentile	2.50	6.53	7.04	8.26	6.14	5.89
Median	1.49	4.02	5.90	5.62	4.75	4.97
75th Percentile	0.68	0.98	3.80	4.72	4.17	4.24
90th Percentile	0.44	(1.67)	0.94	3.98	3.82	3.92
Blackstone Keystone	1.44	7.34	9.71	7.48	6.68	6.32
HFRI Fund of Funds Composite Index	1.74	(5.30)	0.27	3.69	3.01	3.31

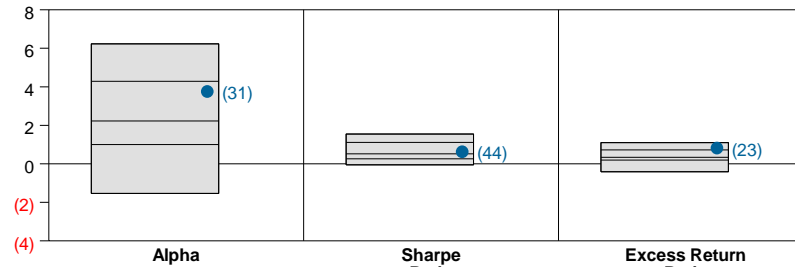
Risk Statistics Rankings vs HFRI FOF Comp Index Rankings Against Callan Absolute Rtn Hedge Fund of Funds (Net) Five Years Ended December 31, 2022



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	11.31	6.06	7.86
25th Percentile	10.14	4.37	6.88
Median	6.31	2.81	5.49
75th Percentile	4.37	1.77	3.70
90th Percentile	1.68	1.23	2.91

Blackstone Keystone ● 9.07 2.49 4.61

Risk Adjusted Return Measures vs HFRI FOF Comp Index Rankings Against Callan Absolute Rtn Hedge Fund of Funds (Net) Five Years Ended December 31, 2022



	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	6.23	1.55	1.10
25th Percentile	4.28	1.11	0.72
Median	2.23	0.52	0.34
75th Percentile	1.00	0.26	0.19
90th Percentile	(1.54)	(0.05)	(0.41)
Blackstone Keystone	3.73	0.60	0.80

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance- Domestic Equity						
U.S. Equity	\$10,413	100.00%	7.22%	(19.06%)	6.95%	8.09%
Russell 3000 Index (1)	-	-	7.18%	(19.21%)	7.07%	8.79%
S&P 1500 Index	-	-	7.79%	(17.78%)	7.59%	9.15%
MCM Russell 1000 Index	9,349	89.78%	7.23%	(18.88%)	7.49%	9.24%
Russell 1000 Index	-	-	7.24%	(19.13%)	7.35%	9.13%
S&P 500 Index	-	-	7.56%	(18.11%)	7.66%	9.42%
MCM Russell 2000 Core Index	407	3.91%	6.26%	(20.33%)	3.58%	4.41%
Russell 2000 Index	-	-	6.23%	(20.44%)	3.10%	4.13%
S&P 600 Index	-	-	9.19%	(16.10%)	5.80%	5.88%
MCM Russell 2000 Val Index	322	3.09%	8.46%	(14.32%)	4.79%	4.17%
Russell 2000 Value Index	-	-	8.42%	(14.48%)	4.70%	4.13%
S&P 600 Value Index	-	-	11.18%	(11.04%)	6.10%	5.38%
Emerald Asset Management	335	3.22%	6.70%	(24.10%)	2.28%	4.36%
Russell 2000 Growth Index	-	-	4.13%	(26.36%)	0.65%	3.51%
S&P 600 Growth Index	-	-	6.98%	(21.08%)	4.99%	6.11%
	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	

Net Performance- Domestic Equity

U.S. Equity	11.36%	6.94%	9.32%	7.33%	10.46% (1/81)
Russell 3000 Index (1)	12.13%	8.66%	9.88%	7.65%	10.76% (1/81)
S&P 1500 Index	12.38%	8.83%	9.92%	7.83%	-
MCM Russell 1000 Index	12.43%	-	-	-	12.75% (1/12)
Russell 1000 Index	12.37%	8.77%	9.92%	7.74%	12.74% (1/12)
S&P 500 Index	12.56%	8.81%	9.80%	7.64%	12.87% (1/12)
MCM Russell 2000 Core Index	-	-	-	-	6.44% (12/16)
Russell 2000 Index	9.01%	7.16%	9.36%	7.13%	6.21% (12/16)
S&P 600 Index	10.82%	8.89%	10.64%	8.95%	7.55% (12/16)
MCM Russell 2000 Val Index	-	-	-	-	5.39% (12/16)
Russell 2000 Value Index	8.48%	6.81%	8.99%	7.70%	5.37% (12/16)
S&P 600 Value Index	10.33%	8.43%	10.19%	8.66%	6.84% (12/16)
Emerald Asset Management	-	-	-	-	7.83% (12/16)
Russell 2000 Growth Index	9.20%	7.26%	9.50%	6.07%	6.55% (12/16)
S&P 600 Growth Index	11.13%	9.23%	10.97%	8.81%	8.01% (12/16)

* All returns on this report are shown with 2- decimal precision. This may differ from the decimal precision shown in BNY Mellon reports.

** Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation. The market values and performance of such accounts are included within their relevant composites.

(1) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance- International Equity						
Int'l Developed Mkts Equity	\$4,367	100.00%	15.86%	(15.17%)	2.11%	2.35%
MSCI World ex US IMI	-	-	16.04%	(15.26%)	1.05%	1.59%
Walter Scott & Partners(1) MSCI World	663 -	15.18% -	12.97% 9.77%	(19.26%) (18.14%)	5.52% 4.94%	8.88% 6.14%
BlackRock MSCI World Ex US Index MSCI World ex US	3,372 -	77.21% -	16.23% 16.18%	(13.85%) (14.29%)	1.72% 1.27%	2.22% 1.79%
Xpance Non-U.S. Small Cap MSCI ACWI ex US Small Cap	202 -	4.64% -	13.43% 13.31%	(22.67%) (19.97%)	(1.85%) 1.07%	- 0.67%
Harris Assoc Int'l SCV MSCI World ex US Sm Cap MSCI World ex US Sm Value	126 - -	2.89% - -	26.44% 15.21% 16.80%	(14.34%) (20.59%) (14.00%)	3.05% (0.15%) (0.02%)	2.13% 0.45% 0.04%
	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance- International Equity						
Int'l Developed Mkts Equity	5.50%	2.00%	6.98%	-	5.78% (1/02)	
MSCI World ex US IMI	4.73%	2.05%	6.85%	4.95%	5.76% (1/02)	
Walter Scott & Partners(1) MSCI World	10.39% 8.85%	8.31% 5.40%	- 8.18%	- 6.04%	8.78% (10/06) 6.06% (10/06)	
BlackRock MSCI World Ex US Index MSCI World ex US	- 4.59%	- 1.84%	- 6.57%	- 4.65%	3.84% (6/17) 3.39% (6/17)	
Xpance Non-U.S. Small Cap MSCI ACWI ex US Small Cap	- 5.24%	- 3.33%	- 9.13%	- 6.87%	0.24% (10/18) 1.86% (10/18)	
Harris Assoc Int'l SCV MSCI World ex US Sm Cap MSCI World ex US Sm Value	6.50% 5.77% 5.32%	5.69% 3.57% 3.44%	- 8.86% 8.95%	- - 7.67%	9.74% (7/03) 8.01% (7/03) 8.10% (7/03)	

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(1) Walter Scott since inception returns were contained in the Global Mandates composite prior to 12/31/2019.

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance- Emerging Mkts Equity						
Emerging Mkts Equity	\$1,149	100.00%	9.83%	(22.84%)	(1.49%)	(0.48%)
MSCIEM IMI	-	-	9.50%	(19.83%)	(1.82%)	(1.10%)
Macquarie Emg Mkts Equity	308	26.84%	8.19%	(25.89%)	(3.74%)	(1.38%)
MSCIEM	-	-	9.70%	(20.09%)	(2.69%)	(1.39%)
Martin Currie Emg Mkts Equity	336	29.28%	11.24%	(26.34%)	(3.17%)	(1.04%)
MSCIEM	-	-	9.70%	(20.09%)	(2.69%)	(1.39%)
BlackRock Emg Mkts Index	168	14.62%	9.67%	(20.20%)	(2.94%)	(1.63%)
MSCIEM	-	-	9.70%	(20.09%)	(2.69%)	(1.39%)
Leading Edge Emg Mkts Fund	215	18.70%	9.95%	(20.01%)	(3.15%)	-
MSCIEM	-	-	9.70%	(20.09%)	(2.69%)	(1.39%)
GlobeFlex Emerging Small Cap	121	10.57%	10.16%	(11.50%)	8.50%	3.76%
MSCIEM Small Cap	-	-	8.20%	(18.02%)	5.11%	1.06%
		Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception

Net Performance- Emerging Mkts Equity						
Emerging Mkts Equity	2.19%	(0.36%)	6.58%	-	6.20%	(1/02)
MSCIEM IMI	1.64%	0.86%	8.84%	5.36%	8.06%	(1/02)
Macquarie Emg Mkts Equity	-	-	-	-	2.32%	(5/13)
MSCIEM	1.44%	0.65%	8.72%	-	1.58%	(5/13)
Martin Currie Emg Mkts Equity	-	-	-	-	2.93%	(1/14)
MSCIEM	1.44%	0.65%	8.72%	-	1.90%	(1/14)
BlackRock Emg Mkts Index	-	-	-	-	1.18%	(7/17)
MSCIEM	1.44%	0.65%	8.72%	-	1.42%	(7/17)
Leading Edge Emg Mkts Fund	-	-	-	-	2.14%	(11/18)
MSCIEM	1.44%	0.65%	8.72%	-	2.45%	(11/18)
GlobeFlex Emerging Small Cap	-	-	-	-	5.64%	(8/13)
MSCIEM Small Cap	3.21%	2.20%	10.12%	6.83%	3.76%	(8/13)

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** Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation. The market values and performance of such accounts are included within their relevant composites.

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance - Fixed Income						
Fixed Income (1)	\$6,305	50.00%	1.46%	(12.34%)	(2.73%)	(0.04%)
Blmbg U.S. Agg Bond Index	-	-	1.87%	(13.01%)	(2.71%)	0.02%
Core Fixed Income	\$4,370	34.66%	1.94%	(11.94%)	(2.53%)	0.18%
Blmbg U.S. Agg Bond Index	-	-	1.87%	(13.01%)	(2.71%)	0.02%
PIMCO Core Bond Fund	511	4.05%	2.30%	(13.21%)	(2.52%)	0.18%
Blmbg Agg ex Treasury	-	-	2.67%	(13.35%)	(2.89%)	0.03%
Mellon Bond Index	3,859	30.60%	1.90%	(13.00%)	(2.81%)	(0.05%)
Blmbg U.S. Agg Bond Index (2)	-	-	1.87%	(13.01%)	(2.71%)	0.02%
Opportunistic Fixed Income	\$854	6.78%	1.29%	6.46%	5.76%	5.12%
BAAM Keystone (3)	854	6.78%	1.29%	6.67%	6.68%	6.11%
HFRI FOF Comp Index	-	-	1.79%	(5.25%)	3.71%	3.02%
Nominal U.S. Treasuries	\$834	6.62%	(0.49%)	(17.68%)	(4.81%)	(1.15%)
Blmbg US Treas Bell 10Y	-	-	0.62%	(16.33%)	(3.73%)	(0.57%)
PIMCO US Treasuries	86	0.68%	0.57%	(15.40%)	(3.36%)	(0.25%)
Blmbg US Treas Bell 10Y	-	-	0.62%	(16.33%)	(3.73%)	(0.57%)
Mellon Intermediate Treasury Index	263	2.09%	0.89%	(7.84%)	-	-
Blmbg Intrmtd Treasury	-	-	1.02%	(7.77%)	(1.39%)	0.46%
Mellon Long Duration Index	485	3.85%	(1.40%)	(29.53%)	-	-
Blmbg Long Treasury	-	-	(0.59%)	(29.26%)	(7.40%)	(2.20%)
Legacy Fixed Income	\$246	1.95%	(0.49%)	-	-	-
Fidelity HY CMBS (4)	245	1.94%	(0.38%)	(7.37%)	(1.82%)	1.14%
Blmbg US CMBS Ex AAA Index (5)	-	-	(0.88%)	(13.65%)	(2.57%)	0.82%
SEI Str. Credit: HY Bank Loans (6)	0	0.00%	(1.83%)	(3.93%)	8.63%	6.58%
FTSE HY Corp (1 month lag)	-	-	0.32%	(8.66%)	0.80%	2.37%

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** Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation.
The market values and performance of such accounts are included within their relevant composites.

(1) Fixed Income included the new fixed income sub-composite from 03/01/2021 to 06/30/2022. On 07/01/2022, the sub-composites of the new fixed income structure was liquidated and the managers reorganized under Core Fixed Income,

Opportunistic Fixed Income, Nominal US Treasuries and Legacy Fixed Income sub-composites.

(2) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

(3) Blackstone Keystone since inception returns were included in the Legacy Hedge Fund composite through 9/30/2017, included in the Multi-Strategy composite from 10/01/2017 through 12/31/2019, included in the Opportunistic Fixed composite from 01/01/2020 through 12/31/2020, included in the Private Credit from 01/01/2021 through 09/30/2021 and Opportunistic Fixed composite, thereafter.

(4) Fidelity was included in the Opportunistic Fixed composite prior to 03/01/2021, included in the High Yield under the new fixed income structure from 03/01/2021 through 06/30/2022, and Legacy Fixed Income Structure, thereafter.

(5) Fidelity's blended benchmark consists of FTSE High Yield Market Index prior to 12/31/2009 and Blmbg US CMBS Ex AAA Index, thereafter.

(6) SEI HY Bank Loans has a 1 month lag in valuation. On this chart, SEI's market value of \$483K has been rounded to \$0MM.

Investment Manager Returns

As of December 31, 2022

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Fixed Income						
Fixed Income (1)	1.18%	3.17%	4.32%	4.59%	7.56%	
Blmbg U.S. Agg Bond Index	1.06%	2.66%	3.10%	3.97%	6.86%	(1/81) (1/81)
Core Fixed Income	1.24%	3.09%	3.46%	-	3.77%	(1/02) (1/02)
Blmbg U.S. Agg Bond Index	1.06%	2.66%	3.10%	3.97%	3.43%	(1/02) (1/02)
PIMCO Core Bond Fund	1.23%	-	-	-	1.23%	(1/13) (1/13)
Blmbg Agg ex Treasury	1.30%	2.93%	-	-	1.30%	(1/13) (1/13)
Mellon Bond Index	0.98%	2.53%	2.97%	3.92%	6.32%	(4/84) (4/84)
Blmbg U.S. Agg Bond Index (2)	1.06%	2.66%	3.10%	4.03%	-	(4/84) (4/84)
Opportunistic Fixed Income	4.68%	-	-	-	4.92%	(10/12) (10/12)
BAAM Keystone (3)	6.84%	-	-	-	7.33%	(7/12) (7/12)
HFRI FOF Comp Index	3.51%	1.73%	3.57%	3.92%	3.71%	(7/12) (7/12)
Nominal U.S. Treasuries	0.04%	-	-	-	0.58%	(9/11) (9/11)
Blmbg US Treas Bell 10Y	0.21%	2.54%	2.86%	3.70%	0.89%	(9/11) (9/11)
PIMCO US Treasuries	0.64%	-	-	-	1.13%	(9/11) (9/11)
Blmbg US Treas Bell 10Y	0.21%	2.54%	2.86%	3.70%	0.89%	(9/11) (9/11)
Mellon Intermediate Treasury Index	-	-	-	-	(4.72%)	(3/21) (3/21)
Blmbg Intrmtd Treasury	0.69%	1.98%	2.37%	3.34%	(4.66%)	(3/21) (3/21)
Mellon Long Duration Index	-	-	-	-	(18.24%)	(1/21) (1/21)
Blmbg Long Treasury	0.60%	3.55%	4.07%	4.97%	(17.87%)	(1/21) (1/21)
Legacy Fixed Income	-	-	-	-	(1.72%)	(7/22) (7/22)
Fidelity HY CMBS (4)	3.89%	5.18%	6.01%	6.87%	7.30%	(4/97) (4/97)
Blmbg US CMBS Ex AAA Index (5)	1.99%	0.18%	1.08%	2.94%	3.29%	(4/97) (4/97)
SEI Str. Credit: HY Bank Loans (6)	6.87%	-	-	-	11.11%	(5/08) (5/08)
FTSE HY Corp (1 month lag)	4.00%	5.82%	7.13%	5.79%	6.15%	(5/08) (5/08)

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** Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation.

(1/81) The market values and performance of such accounts are included within their relevant composites.

(1/02) (1) Fixed Income included the new fixed income sub-composite from 03/01/2021 to 06/30/2022. On 07/01/2022, the sub-composites of the new fixed income structure was liquidated and the managers reorganized under Core Fixed Income,

(4/84) Opportunistic Fixed Income, Nominal US Treasuries and Legacy Fixed Income sub-composites.

(10/12) (2) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

(7/12) (3) Blackstone Keystone since inception returns were included in the Legacy Hedge Fund composite through 9/30/2017, included in the Multi-Strategy composite from 10/01/2017 through 12/31/2019, included in the Opportunistic Fixed composite from 01/01/2020 through 12/31/2020, included in the Private Credit from 01/01/2021 through 09/30/2021 and Opportunistic Fixed composite, thereafter.

(3/21) (4) Fidelity was included in the Opportunistic Fixed composite prior to 03/01/2021, included in the High Yield under the new fixed income structure from 03/01/2021 through 06/30/2022, and Legacy Fixed Income Structure, thereafter.

(7/22) (5) Fidelity's blended benchmark consists of FTSE High Yield Market Index prior to 12/31/2009 and Blmbg US CMBS Ex AAA Index, thereafter.

(5/08) (6) SEI HY Bank Loans has a 1 month lag in valuation. On this chart, SEI's market value of \$483K has been rounded to \$0MM.

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance - Inflation Protection						
Inflation Protection (TIPS)	\$1,006	100.00%	2.18%	(12.99%)	0.53%	1.58%
Blmbg U.S. TIPS Index	-	-	2.04%	(11.85%)	1.21%	2.11%
NISA Inv Adv TIPS	438	43.53%	1.93%	(11.90%)	1.15%	2.05%
Blmbg U.S. TIPS Index (1)	-	-	2.04%	(11.85%)	1.21%	2.11%
Brown Brothers TIPS	460	45.72%	1.95%	(11.67%)	1.12%	2.03%
Blmbg U.S. TIPS Index	-	-	2.04%	(11.85%)	1.21%	2.11%
New Century Global TIPS	108	10.75%	4.21%	(21.90%)	(3.28%)	(1.27%)
Blmbg Wrld Inflation Linked Unhdg	-	-	3.83%	(21.86%)	(3.21%)	(1.20%)

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Inflation Protection					
Inflation Protection (TIPS)	0.99%	2.40%	-	-	2.84% (2/03)
Blmbg U.S. TIPS Index	1.12%	3.05%	3.85%	4.79%	3.83% (2/03)
NISA Inv Adv TIPS	1.09%	2.38%	-	-	2.77% (4/07)
Blmbg U.S. TIPS Index (1)	1.12%	2.40%	3.31%	4.36%	2.78% (4/07)
Brown Brothers TIPS	1.16%	-	-	-	1.53% (2/12)
Blmbg U.S. TIPS Index	1.12%	3.05%	3.85%	4.79%	1.44% (2/12)
New Century Global TIPS	0.18%	-	-	-	0.65% (2/12)
Blmbg Wrld Inflation Linked Unhdg	0.03%	1.74%	3.63%	4.45%	0.41% (2/12)

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(1) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance - Private Equity						
Private Equity	\$6,537	100.00%	(0.33%)	(5.06%)	19.76%	16.06%
Burgiss Private Equity Index (Qtr lag)	-	-	(1.67%)	(1.84%)	15.43%	13.97%
Global Equity + 3% (Qtr lag)(1)	-	-	(4.46%)	(15.48%)	9.35%	10.97%
Buyouts	3,566	54.55%	(0.37%)	(0.41%)	19.45%	15.93%
Burgiss Buyout Index (Qtr lag)	-	-	(1.84%)	0.38%	14.32%	12.80%
Special Situations	1,558	23.84%	1.50%	10.74%	21.58%	17.78%
Burgiss Special Situations Idx (Qtr lag)	-	-	0.00%	1.86%	6.01%	5.73%
Growth Equity	1,194	18.27%	(0.84%)	(15.66%)	28.10%	26.03%
Burgiss Venture Capital Index (Qtr lag)	-	-	(2.47%)	(7.58%)	23.49%	21.84%
Keystone Legacy (2)	219	3.34%	(8.65%)	(41.45%)	(4.71%)	-
	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	

Net Performance - Private Equity

Private Equity	13.15%	10.25%	12.56%	12.60%	11.60% (1/86)
Burgiss Private Equity Index (Qtr lag)	13.51%	10.46%	13.32%	13.18%	16.72% (1/86)
Global Equity + 3% (Qtr lag)(1)	14.14%	11.09%	13.10%	10.78%	14.08% (1/86)
Buyouts	14.23%	11.53%	14.90%	14.59%	13.62% (4/86)
Burgiss Buyout Index (Qtr lag)	13.09%	10.06%	14.32%	12.89%	19.07% (4/86)
Special Situations	13.30%	10.71%	14.36%	13.20%	13.35% (1/95)
Burgiss Special Situations Idx (Qtr lag)	7.39%	6.57%	9.39%	9.56%	9.93% (1/95)
Growth Equity	15.31%	10.95%	8.09%	8.47%	8.67% (1/86)
Burgiss Venture Capital Index (Qtr lag)	18.41%	13.57%	11.46%	13.71%	14.40% (1/86)
Keystone Legacy (2)	-	-	-	-	(4.35%) (7/18)

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(1) As of 01/01/2020 benchmark consists of 25% MSCI World ex US and 75% Russell 3000 + 3% with a 1 quarter lag.

(2) As of 09/30/2022, Keystone Legacy SPV consists of 53 non-core funds, prior performance is reflected in previous sub-asset classes.

Investment Manager Returns

As of December 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last 3 Years	Last 5 Years
Net Performance - Real Estate						
Real Estate	\$2,943	100.00%	1.40%	6.02%	8.52%	6.73%
Real Estate Custom Bench (Qtr lag) (1)	-	-	0.77%	17.38%	11.40%	9.20%
CPI+3% (Qtr lag)	-	-	0.91%	11.21%	7.95%	6.76%
Core/Core Plus Real Estate Funds	1,301	44.21%	2.57%	14.63%	9.74%	8.38%
NCREIF ODCE Index (Qtr lag)	-	-	0.77%	21.68%	12.13%	9.87%
Value Add/Oppportunistic SMA	560	19.03%	(1.80%)	0.88%	7.15%	4.56%
NCREIF ODCE Index (Qtr lag)	-	-	0.77%	21.68%	12.13%	9.87%
Value Add/Oppportunistic Funds	791	26.87%	0.58%	12.11%	10.74%	9.34%
NCREIF ODCE Index (Qtr lag)	-	-	0.77%	21.68%	12.13%	9.87%
REITS	291	9.87%	4.72%	(23.73%)	1.35%	4.96%
FTSE NAREIT US Index	-	-	5.06%	(24.87%)	(1.01%)	3.21%
	Last 10 Years		Last 15 Years	Last 20 Years	Last 25 Years	Since Inception

Net Performance - Real Estate						
Real Estate	7.30%	3.11%	6.88%	7.49%	8.40%	(3/84)
Real Estate Custom Bench (Qtr lag) (1)	9.80%	5.78%	8.15%	8.31%	-	
CPI+3% (Qtr lag)	5.52%	5.39%	5.51%	5.47%	5.81%	(3/84)
Core/Core Plus Real Estate Funds	9.37%	6.52%	7.95%	8.45%	7.32%	(9/86)
NCREIF ODCE Index (Qtr lag)	10.26%	5.89%	7.75%	8.17%	6.50%	(9/86)
Value Add/Oppportunistic SMA	5.65%	1.23%	4.85%	5.73%	5.34%	(6/88)
NCREIF ODCE Index (Qtr lag)	10.26%	5.89%	7.75%	8.17%	6.56%	(6/88)
Value Add/Oppportunistic Funds	10.15%	3.72%	7.91%	9.12%	8.07%	(3/84)
NCREIF ODCE Index (Qtr lag)	10.26%	5.89%	7.75%	8.17%	6.71%	(3/84)
REITS	5.80%	4.06%	8.78%	7.60%	8.99%	(4/96)
FTSE NAREIT US Index	6.17%	4.57%	8.71%	7.55%	9.30%	(4/96)

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 (1) As of 07/01/2022, the benchmark consists of 100% NCREIF NFI-ODCE (Qtr lag). From 03/31/2019 to 07/01/2022, the benchmark consists of 90% NCREIF ODCE Index (Qtr lag) and 10% FTSE NAREIT Index (unlagged). Prior to 03/31/2019, benchmark history was provided by RVK.

Callan

Appendix II – Callan Update

Published Research Highlights from 4Q22

Webinar: Rebalancing During this Unusual Market Environment



Considering Currency: A Guide for Institutional Investors



2022 Nuclear Decommissioning Funding Study



2022 ESG Survey



Recent Blog Posts

Unlocking the Secrets of the 'Data Vault'

Bo Abesamis

Index Selection Within TDF Benchmarks Can Make a Big Difference

Mark Andersen

Emerging Managers in Private Equity: A Guide for Success

David Smith

Additional Reading

Alternatives Focus quarterly newsletter

Active vs. Passive quarterly charts

Capital Markets Review quarterly newsletter

Monthly Updates to the Periodic Table

Market Pulse Flipbook quarterly markets update

Real Estate Indicators market outlook

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