

June 3, 2022



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

First Quarter 2022

Executive Summary

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Market Environment

Down Equity and Fixed Income Markets in 1Q22

Negative returns for stocks and bonds at the same time are unusual

Global equity markets are down sharply following the invasion of Ukraine:

- Similar impact across developed markets
- Greater impact on small cap and emerging markets

Fixed income down with sharply higher inflation and interest rates:

- Blmbg Aggregate: -5.9% (and much worse since, -9.5% through April)
- CPI-U: +8.5% for the year ended 1Q22

Number of times stocks and bonds have been down together:

- 37 quarters in almost 100 years, about 10% of the quarters
- But just twice on annual basis

Inflation spiked to the highest rate reported in decades.

Economic data show growth hit “pause” in the U.S.:

- GDP fell 1.4% in 1Q22, down from almost 7% GDP growth in 4Q21
- Forecasters are revising growth estimates for 2022 down to 3% or lower.

Returns for Periods ended 3/31/22

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	-5.28	11.92	15.40	14.28	9.53
S&P 500	-4.60	15.65	15.99	14.64	9.44
Russell 2000	-7.53	-5.79	9.74	11.04	8.88
Global ex-U.S. Equity					
MSCI World ex USA	-4.81	3.04	7.14	6.25	5.25
MSCI Emerging Markets	-6.97	-11.37	5.98	3.36	--
MSCI ACWI ex USA Small Cap	-6.52	0.03	7.89	7.28	6.70
Fixed Income					
Bloomberg Aggregate	-5.93	-4.15	2.14	2.24	4.71
90-day T-Bill	0.04	0.06	1.13	0.63	2.01
Bloomberg Long Gov/Credit	-10.95	-3.11	4.60	4.72	6.93
Bloomberg Global Agg ex-US	-6.15	-7.89	1.27	0.06	3.40
Real Estate					
NCREIF Property	5.33	21.87	8.54	9.61	9.50
FTSE Nareit Equity	-3.86	26.49	9.63	9.81	9.69
Alternatives					
CS Hedge Fund	2.13	7.47	5.48	4.71	6.61
Cambridge Private Equity*	5.01	48.84	21.29	17.11	15.64
Bloomberg Commodity	25.55	49.25	9.00	-0.70	1.90
Gold Spot Price	6.86	13.90	9.33	1.57	7.07
Inflation - CPI-U	3.12	8.54	3.35	2.28	2.37

*Cambridge PE data through 09/30/21.

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

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	1 Qtr. 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%	7.14%
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	Hedge Funds
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%	2.13%
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	Cash Equivalent
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%	0.04%
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	Large Cap
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%	-4.60%
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	Non-U.S. Equity
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%	-4.81%
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	High Yield
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%	-4.84%
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	U.S. Fixed
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%	-5.93%
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%	-6.15%
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%	-6.97%
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%	-7.53%

- 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

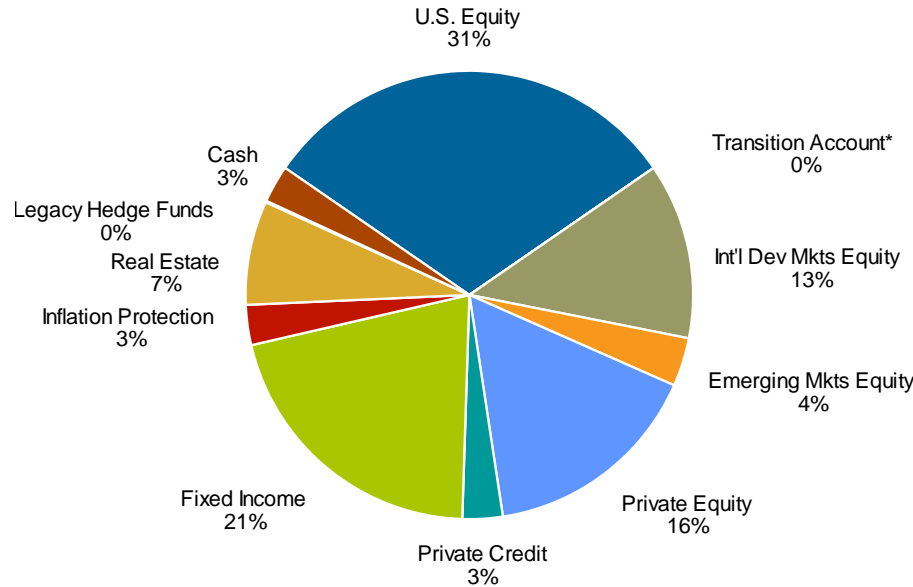
Callan

**PA SERS Defined Benefit Plan
Performance Review**

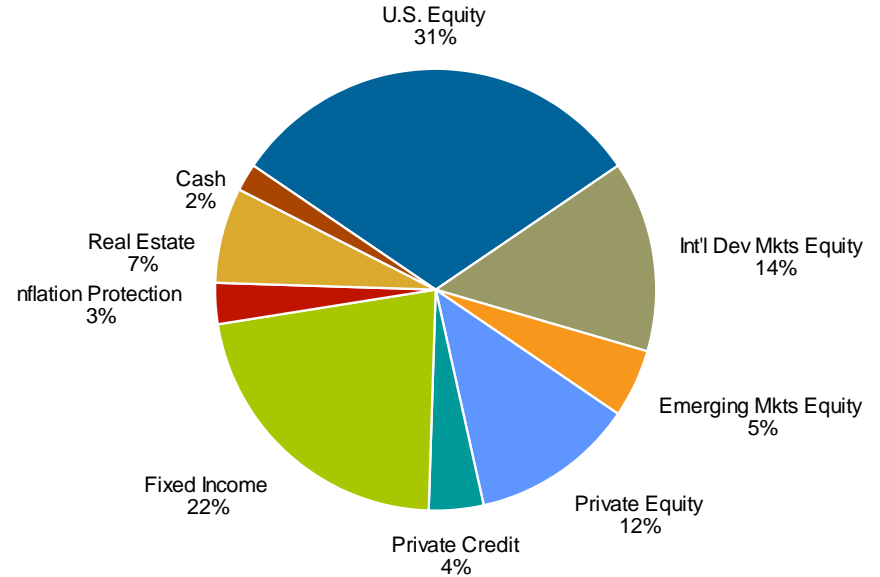
Total Fund

Actual Asset Allocation versus Target as of March 31, 2022

Actual Asset Allocation



Target Asset Allocation



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
U.S. Equity	11,751,308	30.8%	31.0%	(0.2%)	(89,568)
Transition Account*	1,106	0.0%	0.0%	0.0%	1,106
Int'l Dev Mkts Equity	4,851,443	12.7%	14.0%	(1.3%)	(496,049)
Emerging Mkts Equity	1,342,398	3.5%	5.0%	(1.5%)	(567,421)
Private Equity	6,117,368	16.0%	12.0%	4.0%	1,533,804
Private Credit	1,102,294	2.9%	4.0%	(1.1%)	(425,560)
Fixed Income	8,001,099	20.9%	22.0%	(1.1%)	(402,104)
Inflation Protection	1,121,105	2.9%	3.0%	(0.1%)	(24,787)
Real Estate	2,853,968	7.5%	7.0%	0.5%	180,222
Legacy Hedge Funds	21,129	0.1%	0.0%	0.1%	21,129
Cash	1,033,156	2.7%	2.0%	0.7%	269,228
Total	38,196,373	100.0%	100.0%		

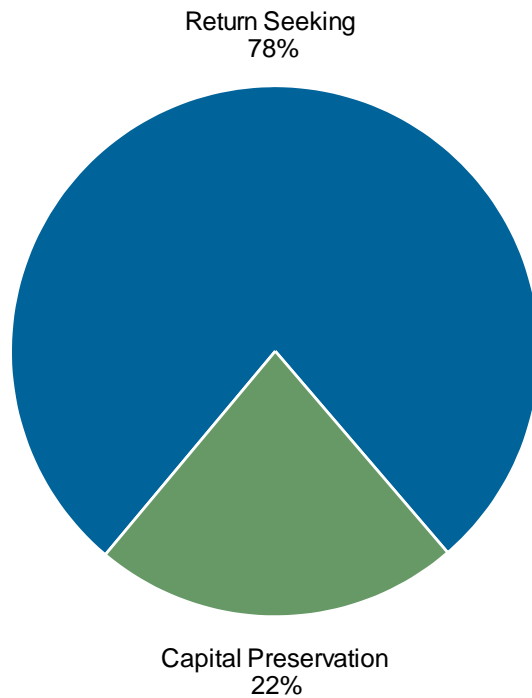
*Market values are shown net of accrued fees.

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

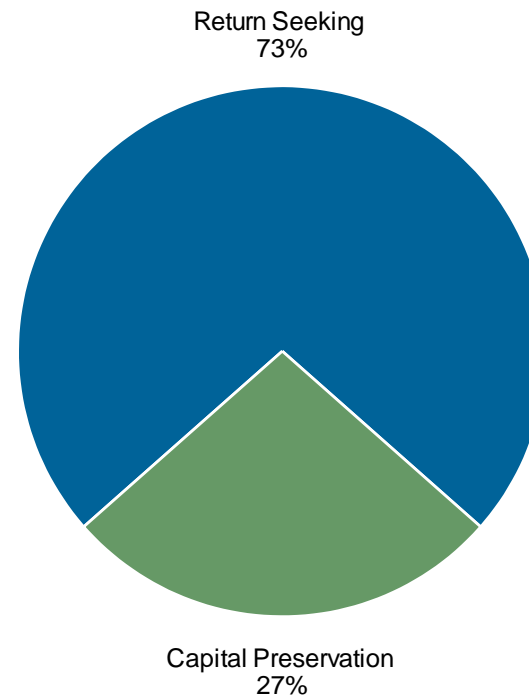
Return Seeking and Capital Preservation Assets

As of March 31, 2022

Actual Asset Allocation



Target Asset Allocation



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

*Capital Preservation Assets: Core FI, Nominal Treas, Inflation Protection (TIPS), Interm Treas, Long Duration, Securitized, Interm Credit 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	Private Credit	Real Estate	Private Equity
Policy Target Asset Allocation	2%	3%	22%	31%	14%	5%	4%	7%	12%
Projected Return* (Geometric)	1.20%	1.25%	1.75%	6.60%	6.50%	6.90%	5.50%	5.75%	8.00%
Projected Risk* (Standard Deviation)	0.90%	5.05%	3.75%	17.95%	19.90%	25.15%	14.60%	14.20%	27.60%
Liquidity	High	High	High	High	High	Medium	Low	Low	Low
Correlation to U.S. Equity*	-0.06	-0.08	-0.10	1.00	0.77	0.79	0.68	0.64	0.77
Months of Benefit Payments**	3.3	3.5	18.3 ^{^^}						
Months of Benefit Payments (Includes EE & ER Contributions)**	11.2	12.2	62.9 ^{^^}						
Cumulative Months of Benefit Payments (Includes EE & ER Contributions)**		86.3							

*Callan 2022 Capital Market Projections

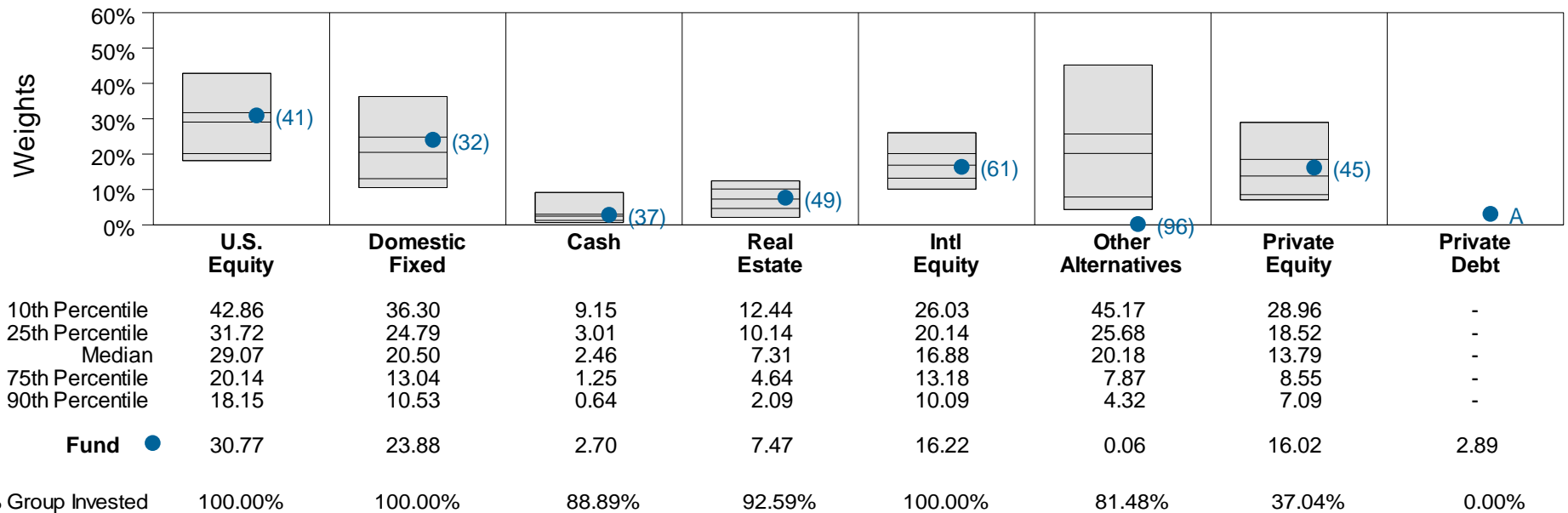
**SERS IO as of 3/31/2021. Benefit payment calculations for fixed income represent core fixed income & treasury allocations. ^^ Represents core fixed income and treasuries allocations.

[^]Core and Opportunistic fixed Income combined until new fixed income structure has been fully implemented.

Total Fund

Actual Asset Allocation versus Very Large Public DB Plan (>\$10B) Peers and Large Public DB Plan (>\$1B) Peers as of March 31, 2022

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



* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr 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 March 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 March 31, 2022

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return		
U.S. Equity	30%	31%	(5.45%)	(5.28%)	(0.06%)	(0.01%)	(0.07%)		
Int'l Dev. Mkts Equity	13%	14%	(5.72%)	(5.18%)	(0.07%)	0.02%	(0.05%)		
Emerging Markets	4%	5%	(9.71%)	(6.65%)	(0.12%)	0.05%	(0.07%)		
Private Equity	16%	12%	3.90%	3.90%	0.00%	0.24%	0.24%		
Private Credit	3%	4%	3.78%	0.99%	0.07%	(0.06%)	0.02%		
Fixed Income	22%	22%	(5.08%)	(5.93%)	0.19%	0.01%	0.19%		
Inflation Protection	3%	3%	(3.00%)	(3.02%)	0.00%	(0.00%)	(0.00%)		
Real Estate	7%	7%	4.27%	6.23%	(0.13%)	0.01%	(0.12%)		
Legacy Hedge Funds	0%	0%	(7.39%)	(7.39%)	0.00%	(0.00%)	(0.00%)		
Cash	3%	2%	0.03%	0.04%	(0.00%)	0.03%	0.03%		
Total			(2.99%)	(3.16%)	+	(0.12%)	+	0.29%	0.17%

• What helped relative attribution?

- Outperformance relative to target from Fixed Income and Private Credit managers
- An overweight to Private Equity (attribution based on target return)
- An underweight to Emerging Markets Equity (attribution based on target return)

• What hurt relative attribution?

- Underperformance relative to target from Real Estate, Emerging Markets, International Develop Equity and U.S. Equity (structural overweight to small cap) managers
- A slight underweight to Private Credit (attribution based on target return)

* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr 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 March 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	28%	28%	10.32%	11.92%	(0.46%)	(0.21%)	(0.67%)
Int'l Dev. Mkts Equity	13%	13%	3.78%	2.31%	0.20%	0.03%	0.24%
Emerging Markets	4%	4%	(12.34%)	(9.49%)	(0.13%)	0.13%	0.00%
Private Equity	15%	12%	50.63%	50.63%	0.00%	0.79%	0.79%
Private Credit	4%	4%	20.34%	6.20%	0.52%	(0.09%)	0.42%
Fixed Income	23%	24%	(2.16%)	(4.15%)	0.53%	0.05%	0.57%
Inflation Protection	3%	3%	3.90%	4.29%	(0.01%)	0.00%	(0.01%)
Real Estate	7%	7%	21.54%	22.36%	(0.06%)	0.03%	(0.03%)
Multi-Strategy	0%	0%	-	-	0.00%	0.00%	0.00%
Legacy Hedge Funds	0%	0%	13.46%	3.71%	0.01%	(0.00%)	0.00%
Cash	2%	2%	0.07%	0.06%	(0.00%)	0.03%	0.03%
Total			11.19%	= 9.84%	+ 0.59%	+ 0.76%	1.35%

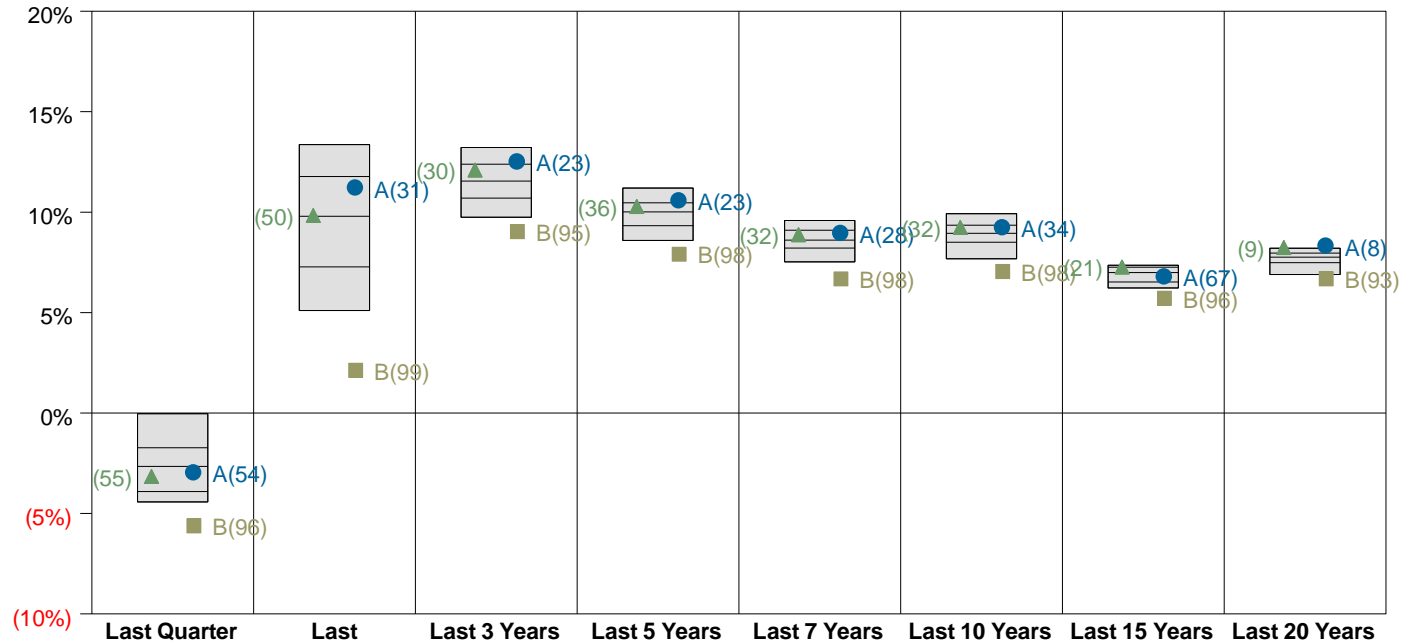
- **What helped relative attribution?**
 - Outperformance relative to target from Fixed Income, Private Credit and International Developed Markets Equity managers
 - An overweight to Private Equity (attribution based on target return)
 - A slight underweight to Emerging Markets Equity and Fixed Income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

* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr 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

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

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



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
10th Percentile	(0.03)	13.36	13.22	11.20	9.59	9.93	7.35	8.20
25th Percentile	(1.73)	11.78	12.39	10.47	9.10	9.35	7.26	7.96
Median	(2.66)	9.79	11.55	10.01	8.60	8.95	6.99	7.76
75th Percentile	(3.91)	7.28	10.70	9.33	8.21	8.51	6.52	7.48
90th Percentile	(4.43)	5.11	9.75	8.59	7.52	7.68	6.23	6.90
Total Fund	● A (2.99)	11.19	12.49	10.55	8.93	9.21	6.77	8.30
60% MSCI ACW V/40% Blmbg U.S. Agg	■ B (5.62)	2.13	9.03	7.91	6.68	7.04	5.71	6.68
Total Fund Custom Benchmark	▲ (3.16)	9.84	12.10	10.28	8.88	9.24	7.27	8.24

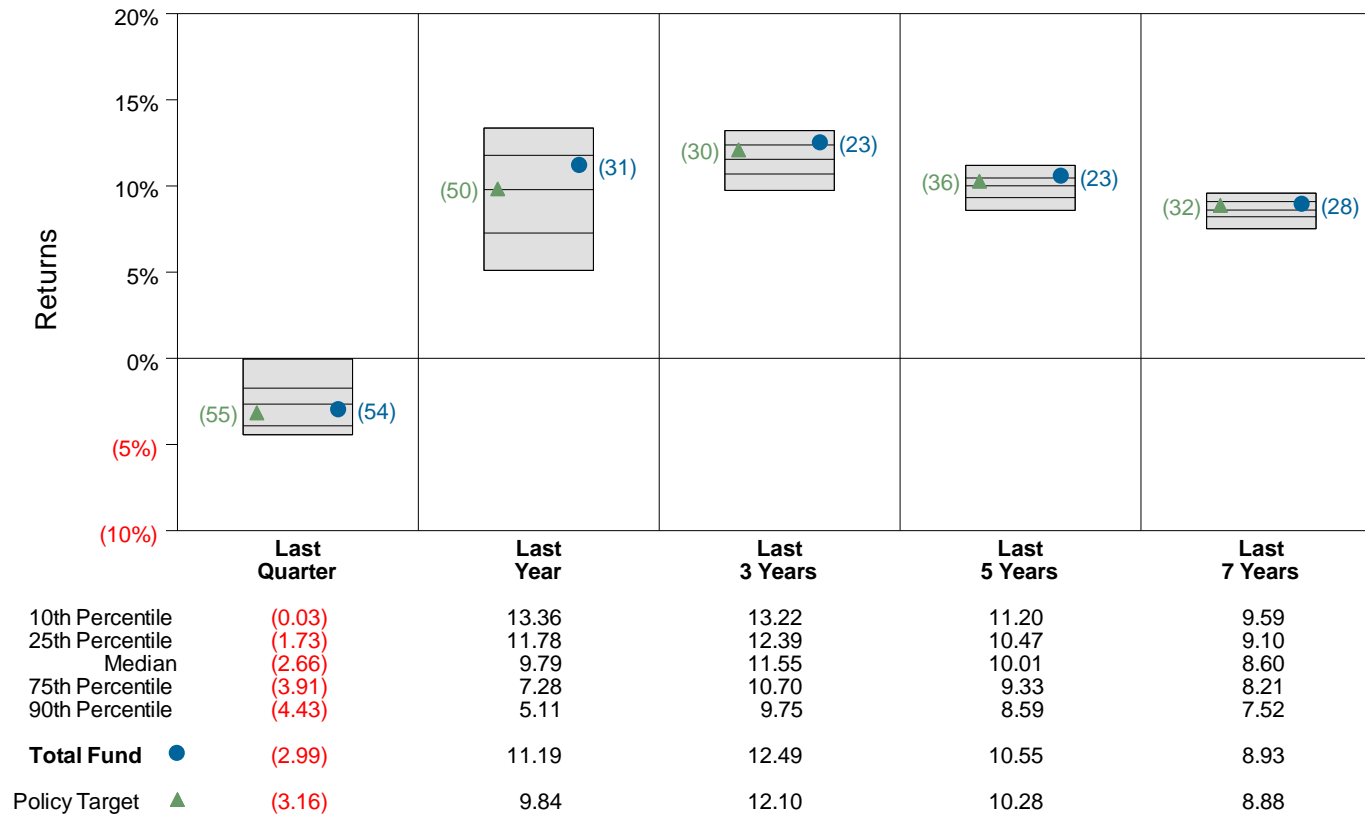
* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

Asset Allocation-Adjusted Gross of Fee Performance versus Very Large Public DB Plan (>\$10B) Peers as of March 31, 2022

- For this comparison, each fund in the Database is adjusted to have the same asset allocation as Pennsylvania SERS. This removes large asset allocation variances among plans and allows for a greater focus on manager performance.

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



* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

Risk vs. Return versus Very Large Public DB Plan (>\$10B) Peers as of March 31, 2022

Ten Year Annualized Risk vs Return



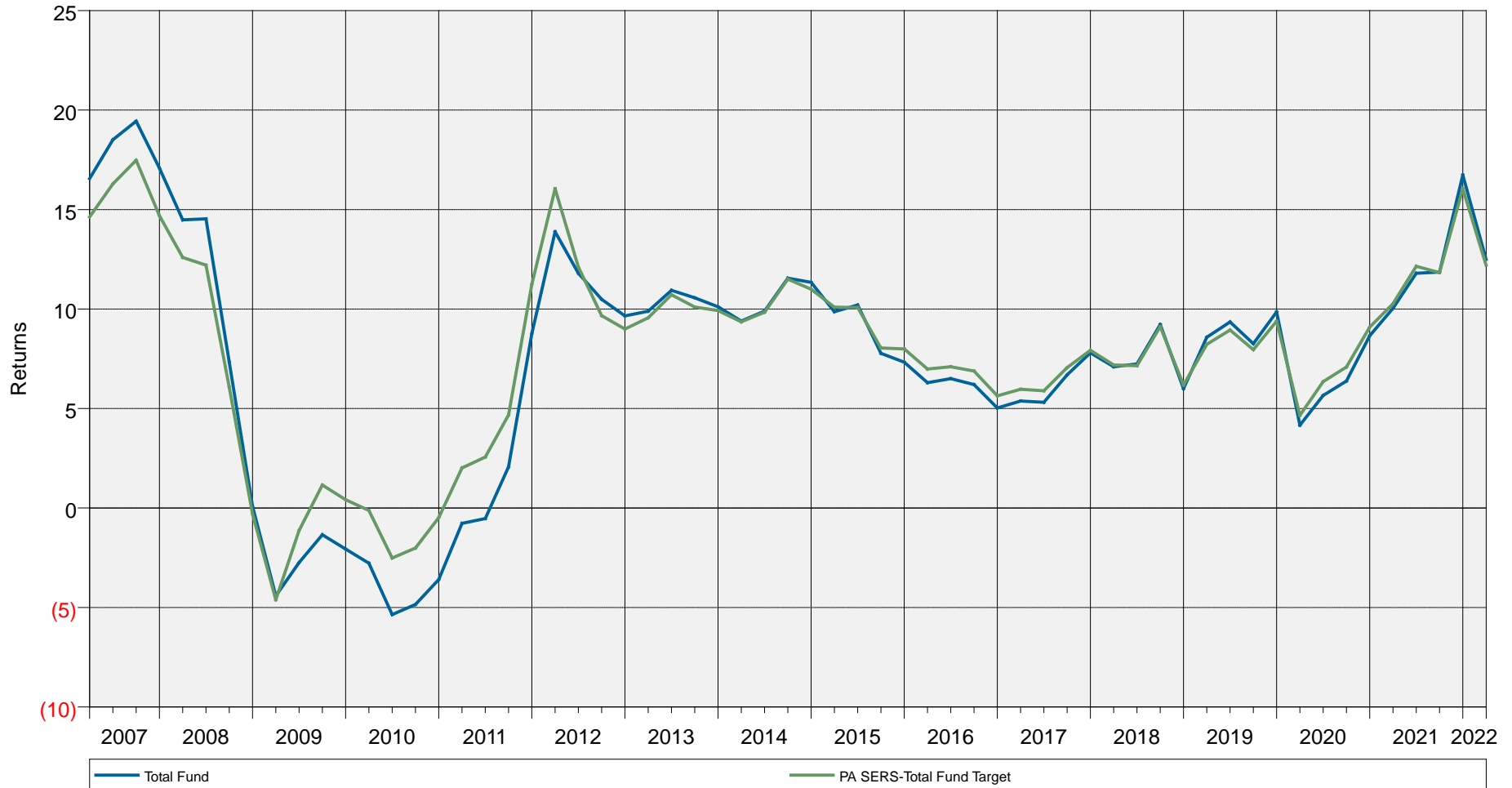
Squares represent membership of the Callan Public Fund Spons- V Lg DB (>10B)

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Total Fund

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

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

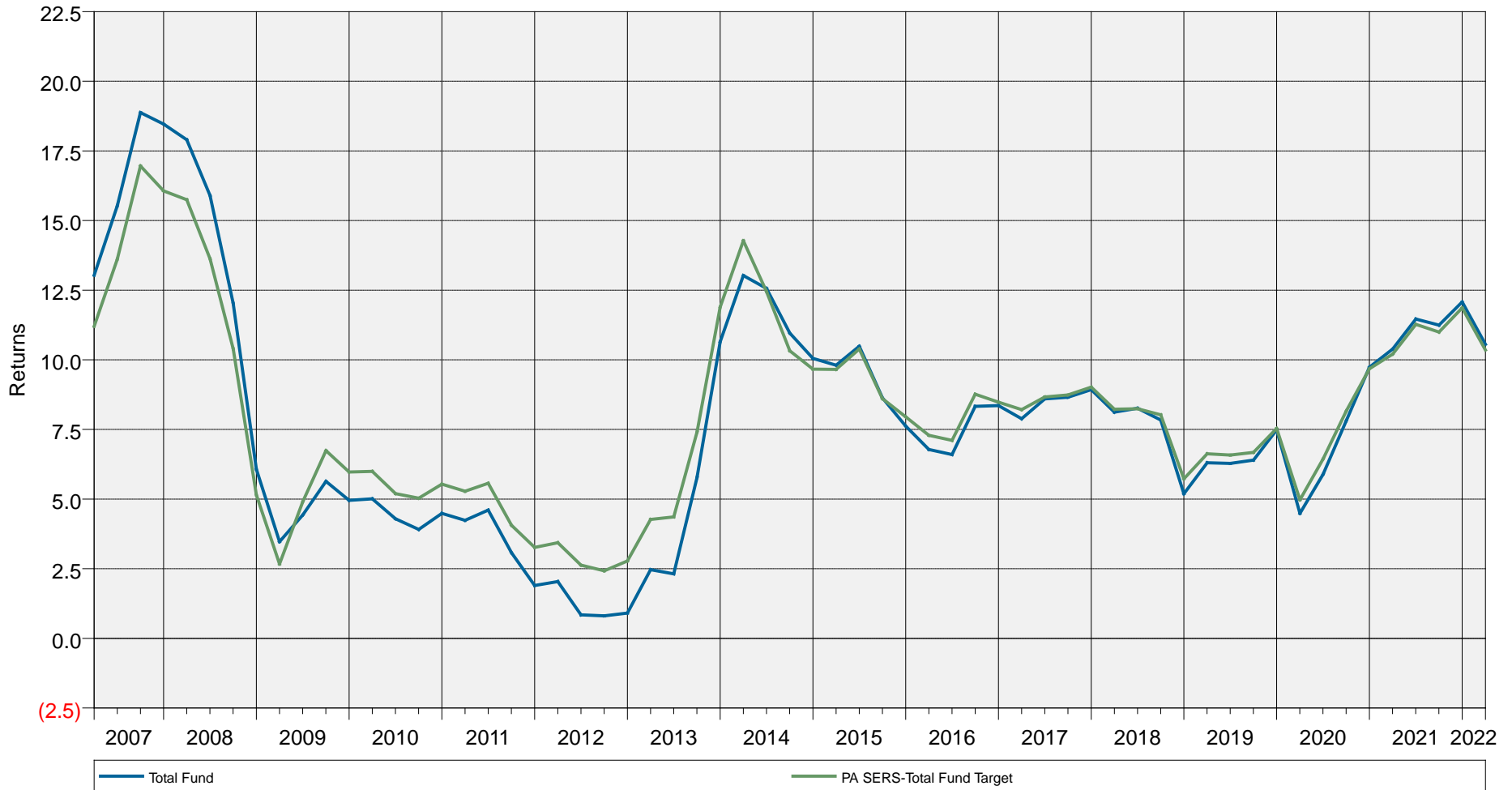


* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index.

Total Fund

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

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



* Current Quarter Target = 22% Bloomberg U.S. Agg Bond Index, 12% Private Equity, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr 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 March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance						
Total Fund	\$38,196	100.00%	(3.24%)	9.58%	11.39%	9.65%
Total Fund Custom Benchmark(1)	-	-	(3.16%)	9.84%	12.10%	10.28%
Public Market Equiv Benchmark(2)	-	-	(2.88%)	6.45%	11.65%	9.82%
60/40 Index(3)	-	-	(5.62%)	2.13%	9.03%	7.91%
U.S. Equity	\$11,751	30.77%	(5.46%)	10.28%	17.52%	14.52%
Russell 3000 Index	-	-	(5.28%)	11.92%	18.24%	15.40%
S&P 1500 Index	-	-	(4.64%)	14.57%	18.49%	15.53%
Int'l Developed Mkts Equity	\$4,851	12.70%	(5.75%)	3.65%	9.81%	8.43%
MSCI World ex US IMI	-	-	(5.18%)	2.31%	8.69%	7.22%
Emerging Mkts Equity	\$1,342	3.51%	(9.83%)	(12.82%)	6.99%	7.27%
MSCI EM IMI	-	-	(6.65%)	(9.49%)	5.74%	6.19%
Private Equity	\$6,117	16.02%	2.78%	39.82%	26.30%	20.64%
Burgiss Private Equity Index (Qtr lag)	-	-	4.27%	26.86%	20.83%	18.12%
Global Equity + 3% (Qtr lag)(4)	-	-	8.39%	25.52%	27.12%	20.17%
Private Credit	\$1,102	2.89%	3.00%	16.06%	12.76%	-
S&P Levered Loan Index + 1% (Qtr lag)	-	-	0.99%	6.20%	6.71%	5.32%
Fixed Income	\$8,001	20.95%	(5.12%)	(2.33%)	1.71%	2.09%
Blmbg U.S. Agg Bond Index	-	-	(5.93%)	(4.15%)	1.69%	2.14%
Inflation Protection (TIPS)	\$1,121	2.94%	(3.02%)	3.79%	5.91%	4.33%
Blmbg U.S. TIPS Index	-	-	(3.02%)	4.29%	6.22%	4.43%
Real Estate	\$2,854	7.47%	3.56%	19.20%	9.92%	6.66%
Real Estate Custom Bench (Qtr lag)(5)	-	-	6.23%	22.36%	9.23%	8.06%
CPI + 3% (Qtr lag)	-	-	2.34%	10.04%	6.53%	5.92%
Cash	\$1,033	2.70%	0.03%	0.06%	0.80%	1.28%
3-month Treasury Bill	-	-	0.04%	0.06%	0.81%	1.13%

(1) The current total fund benchmark consists of: 22% Bloomberg U.S. Agg Bond Index, 12% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% Real Estate Custom Benchmark, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index. See page 78 of Callan's performance report 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, 9% Russell 3000+ 3% (Qtr lag), 7% CPI+3% (Qtr Lag), 4% S&P/LSTA Levered Loan Index +1% (Qtr lag), 3% Bloomberg US TIPS Index, 5% MSCI EM IMI Index, 3% MSCI World ex US +3% (Qtr lag), 2% ICE BofAML 3 Mo US T-Bill Index. See page 78 for full benchmark history.

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

(4) 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.

(5) As of 03/31/2019 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.

Asset Class Returns

As of March 31, 2022

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance					
Total Fund	8.42%	5.93%	7.45%	7.82%	9.62% (1/81)
Total Fund Custom Benchmark(1)	9.24%	7.27%	8.24%	8.28%	-
Public Market Equiv Benchmark(2)	9.30%	7.26%	8.23%	8.27%	-
60/40 Index(3)	7.04%	5.71%	6.68%	6.56%	-
U.S. Equity	13.53%	8.57%	8.82%	9.11%	11.07% (1/81)
Russell 3000 Index	14.28%	10.10%	9.37%	9.50%	11.39% (1/81)
S&P 1500 Index	14.41%	10.22%	9.36%	9.63%	-
Int'l Developed Mkts Equity	7.20%	3.10%	6.55%	-	6.55% (1/02)
MSCI World ex US IMI	6.46%	3.29%	6.59%	5.51%	6.57% (1/02)
Emerging Mkts Equity	4.17%	2.36%	6.84%	-	7.25% (1/02)
MSCI EM IMI	3.59%	4.00%	8.71%	4.72%	9.19% (1/02)
Private Equity	14.95%	12.31%	12.29%	13.76%	12.10% (1/86)
Burgiss Private Equity Index (Qtr lag)	15.19%	12.17%	13.04%	14.37%	17.29% (1/86)
Global Equity + 3% (Qtr lag)(4)	19.01%	13.74%	12.92%	13.11%	15.18% (1/86)
Private Credit	-	-	-	-	11.38% (12/17)
S&P Levered Loan Index + 1% (Qtr lag)	5.72%	5.56%	5.86%	-	5.39% (12/17)
Fixed Income	2.65%	3.99%	5.10%	5.35%	7.91% (1/81)
Blmbg U.S. Agg Bond Index	2.24%	3.56%	4.00%	4.71%	7.19% (1/81)
Inflation Protection (TIPS)	2.46%	3.67%	-	-	3.54% (2/03)
Blmbg U.S. TIPS Index	2.69%	4.30%	5.07%	5.34%	4.50% (2/03)
Real Estate	7.80%	3.87%	7.02%	7.85%	8.50% (3/84)
Real Estate Custom Bench (Qtr lag)(5)	9.69%	5.83%	7.77%	8.35%	-
CPI + 3% (Qtr lag)	5.14%	5.18%	5.31%	5.28%	5.70% (3/84)
Cash	0.89%	1.14%	1.54%	2.34%	3.42% (1/87)
3-month Treasury Bill	0.63%	0.83%	1.27%	2.01%	3.15% (1/87)

(1) The current total fund benchmark consists of: 22% Bloomberg U.S. Agg Bond Index, 12% SERS Private Equity Composite, 31% Russell 3000 Index, 14% MSCI World ex US IMI Index, 7% Real Estate Custom Benchmark, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 5% MSCI Emerging Markets IMI Index, 3% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index. See page 78 of Callan' performance report 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, 9% Russell 3000+ 3% (Qtr lag), 7% CPI+3% (Qtr Lag), 4% S&P/LSTA Levered Loan Index +1% (Qtr lag), 3% Bloomberg US TIPS Index, 5% MSCI EM IMI Index, 3% MSCI World ex US +3% (Qtr lag), 2% ICE BofAML 3 Mo US T-Bill Index. See page 78 for full benchmark history.

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

(4) 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.

(5) As of 03/31/2019 benchmark consists of 90% NCREIF ODCE Index (Qtr lag) and 10% FTSE NAREIT Index (unlagged)

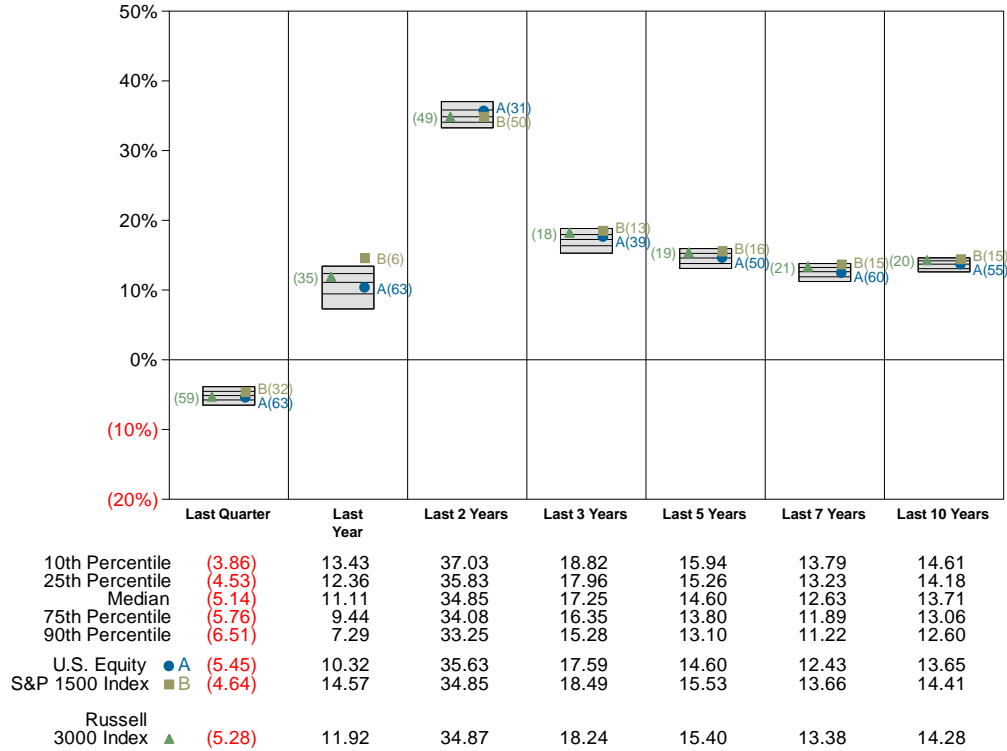
Prior to 03/31/2019, benchmark history was provided by RVK.

Callan

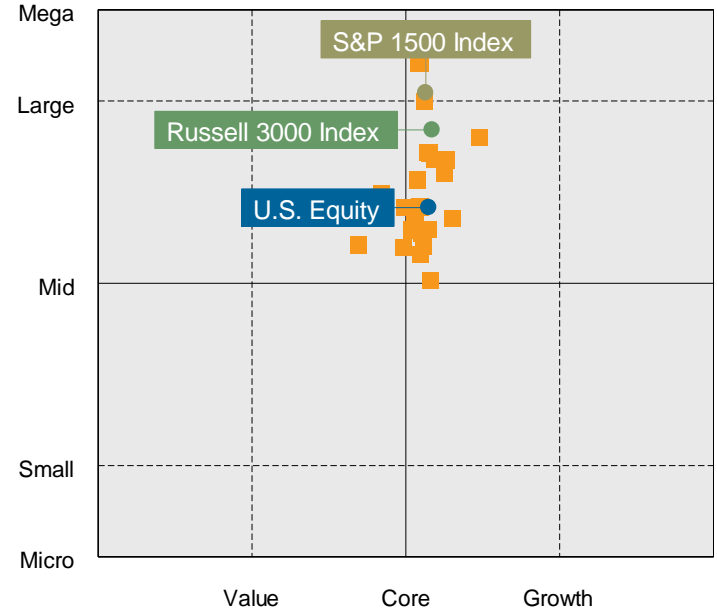
**Appendix I – Asset Class and Manager
Performance**

U.S. Equity as of March 31, 2022

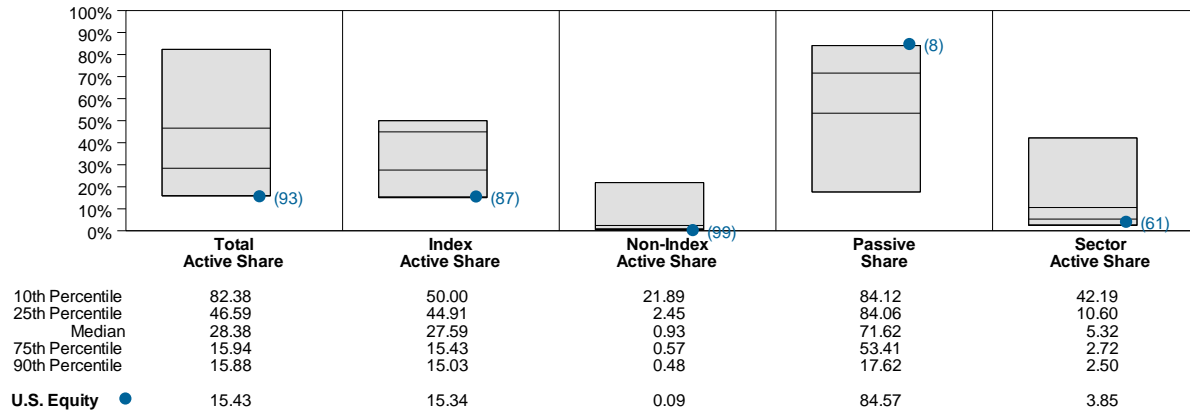
Performance vs Public Fund - Domestic Equity (Gross)



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



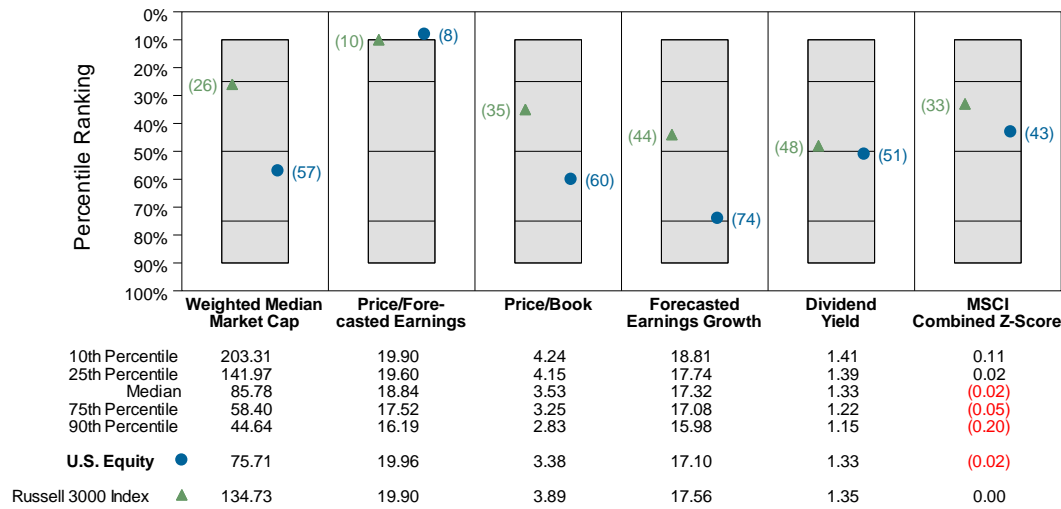
Active Share vs. Pub Pln- Dom Equity



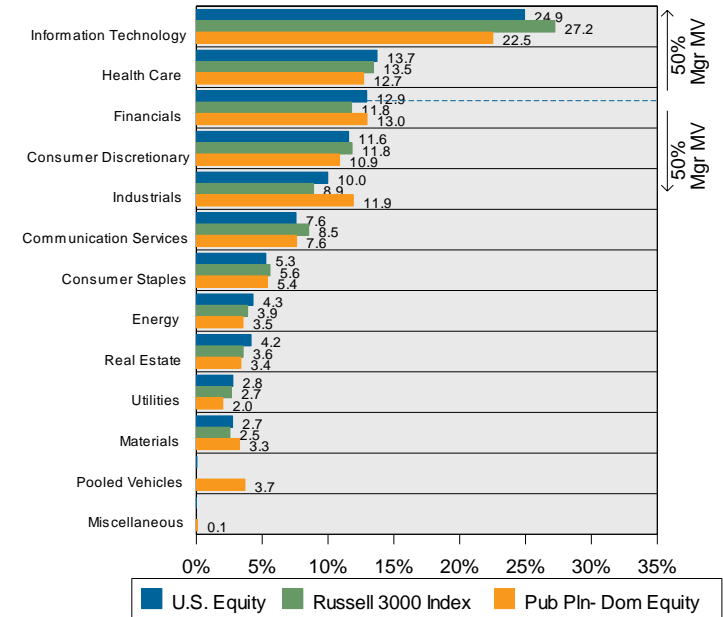
U.S. Equity

As of March 31, 2022

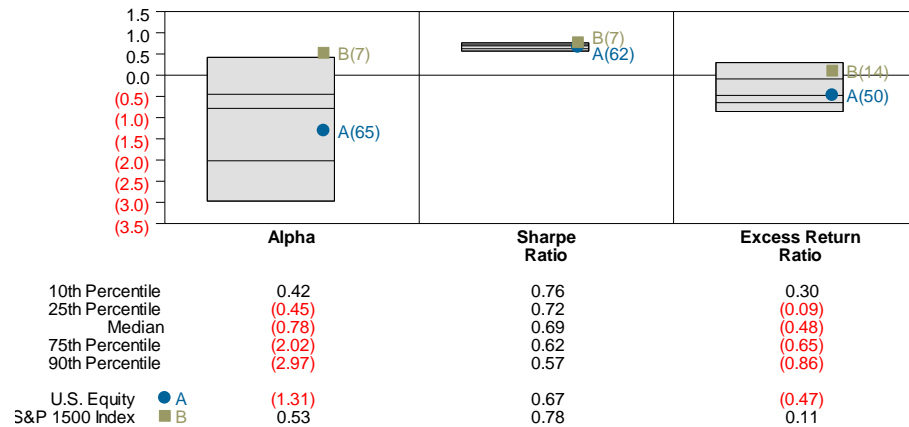
Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of March 31, 2022



Sector Allocation
March 31, 2022

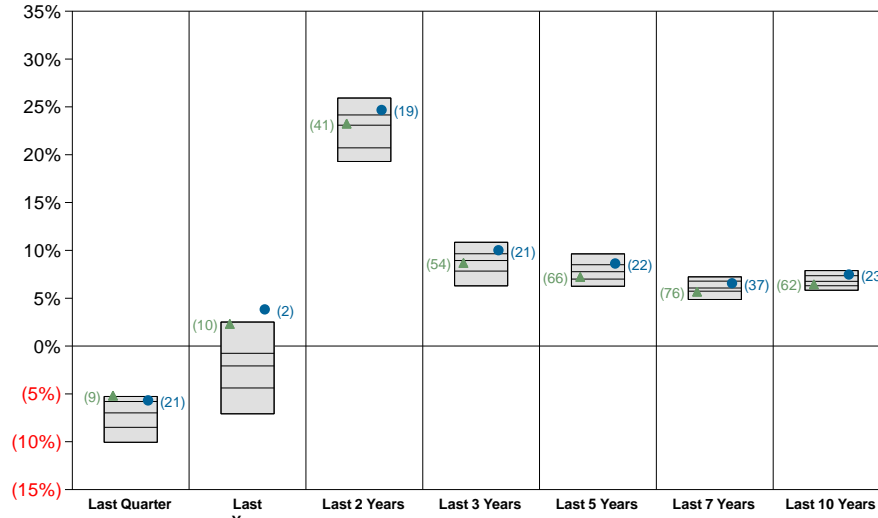


Risk Adjusted Return Measures vs Russell 3000 Index
Rankings Against Public Fund - Domestic Equity (Gross)
Five Years Ended March 31 2022

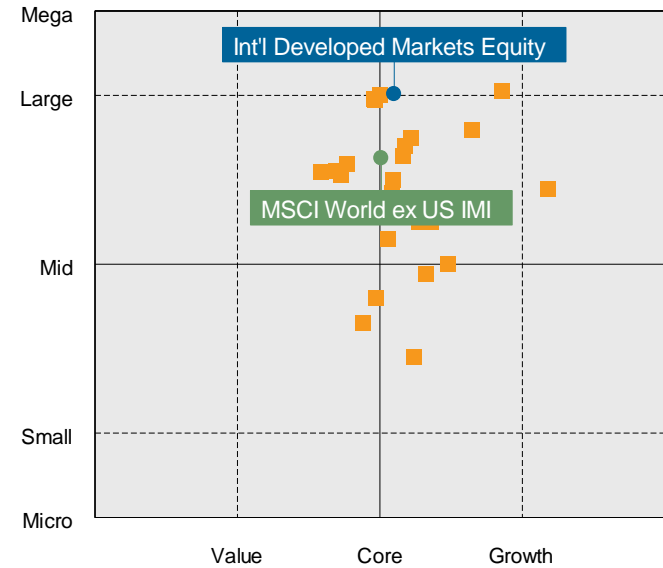


International Equity as of March 31, 2022

Performance vs Public Fund - International Equity (Gross)

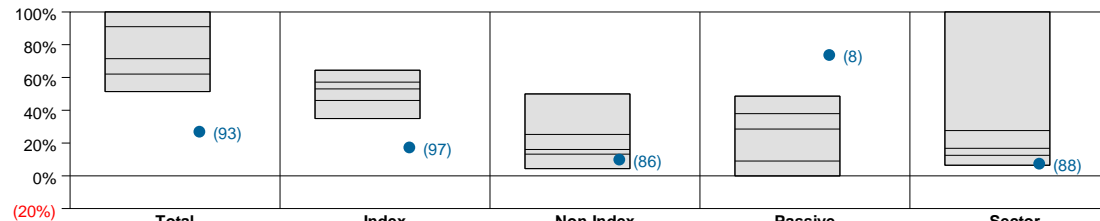


Style Map vs Pub Pln- Intl Equity Holdings as of March 31, 2022



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	(5.28)	2.51	25.93	10.84	9.64	7.24	7.89
25th Percentile	(5.79)	(0.76)	24.15	9.65	8.50	6.79	7.36
Median	(6.98)	(2.08)	23.09	8.94	7.77	6.07	6.77
75th Percentile	(8.50)	(4.38)	20.72	7.83	7.00	5.73	6.31
90th Percentile	(10.07)	(7.08)	19.29	6.29	6.25	4.86	5.83
Int'l Developed Markets Equity ●	(5.72)	3.78	24.63	9.97	8.59	6.52	7.42
MSCI World ex US IMI ▲	(5.18)	2.31	23.25	8.69	7.22	5.69	6.46

Active Share vs. Pub Pln- Intl Equity

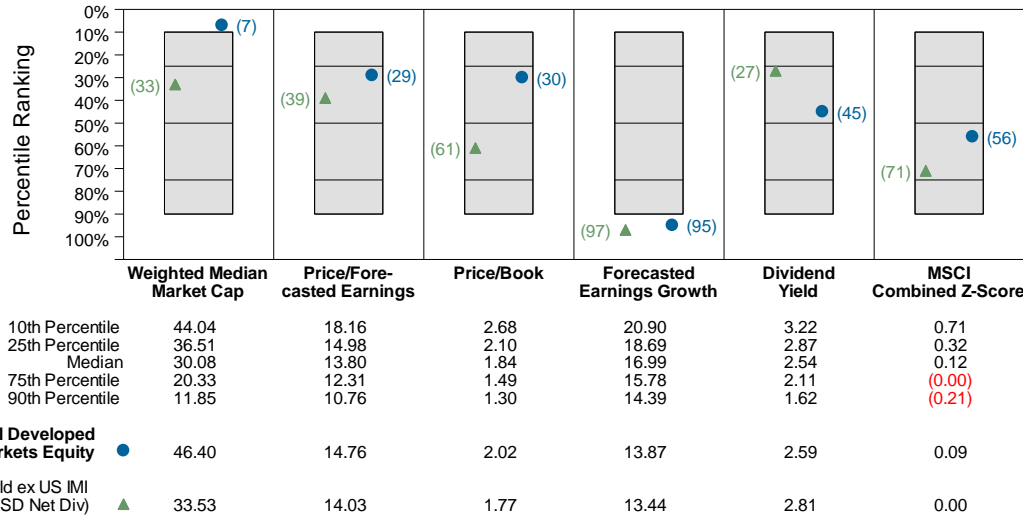


	Total Active Share	Index Active Share	Non-Index Active Share	Passive Share	Sector Active Share
10th Percentile	100.00	64.46	50.00	48.64	100.00
25th Percentile	91.01	57.17	25.28	37.92	27.60
Median	71.50	53.03	16.05	28.50	16.75
75th Percentile	62.08	46.01	13.24	8.99	12.53
90th Percentile	51.36	34.96	4.40	0.00	6.46
Int'l Developed Markets Equity ●	26.59	17.00	9.58	73.41	7.11

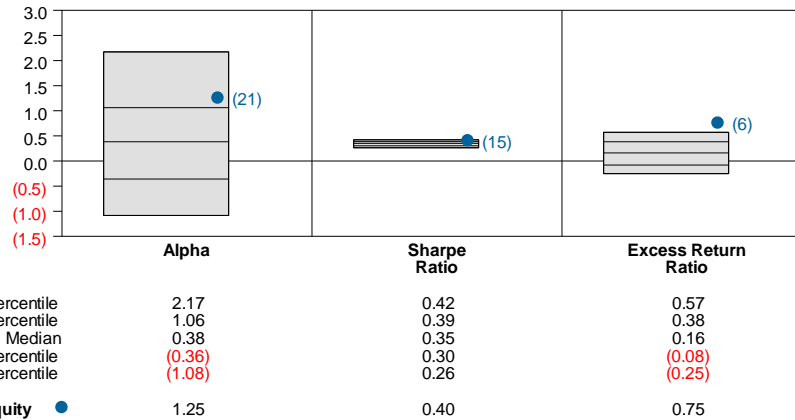
International Equity

As of March 31, 2022

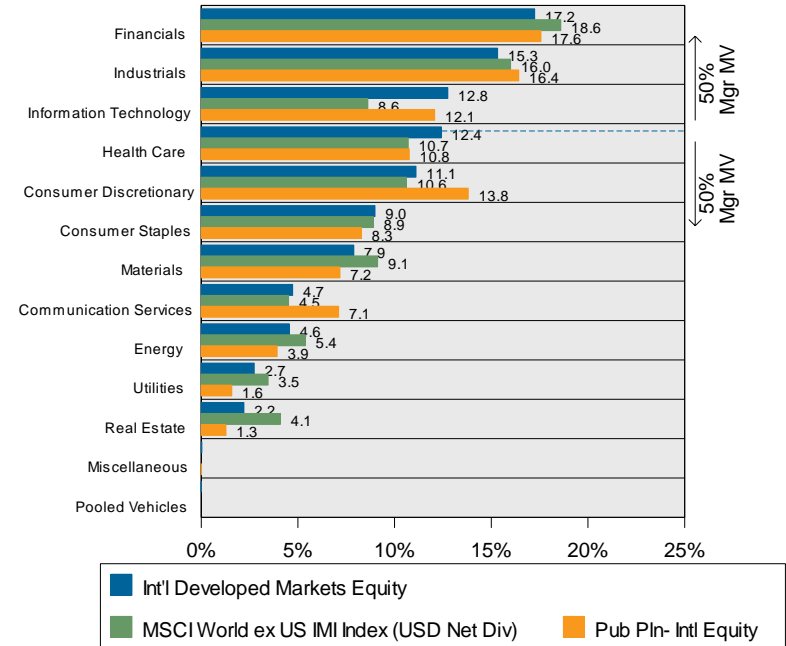
Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - International Equity
as of March 31, 2022



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

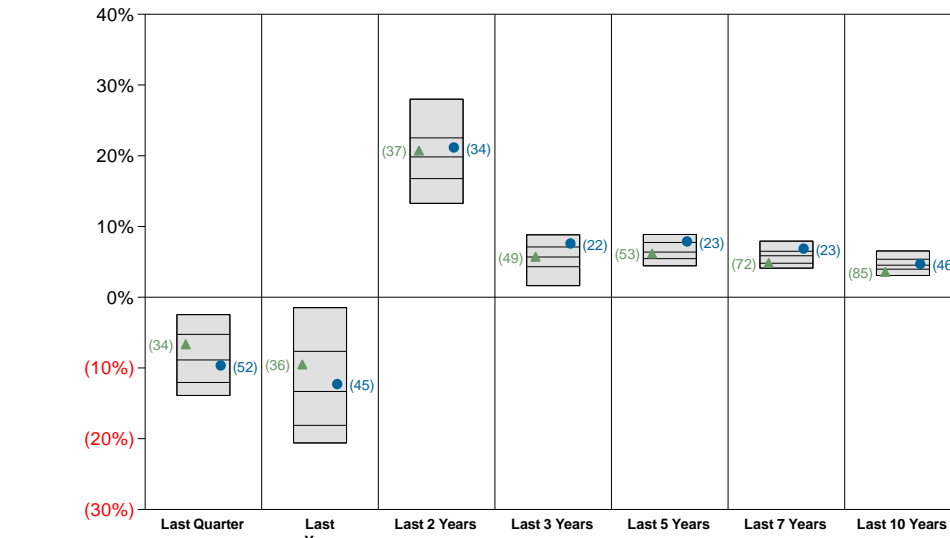


Sector Allocation
March 31, 2022



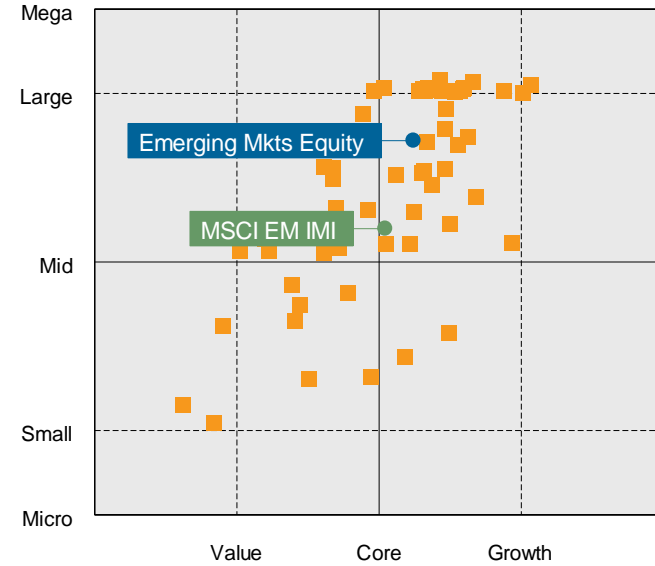
Emerging Markets Equity as of March 31, 2022

Performance vs Callan Emerging Broad (Gross)

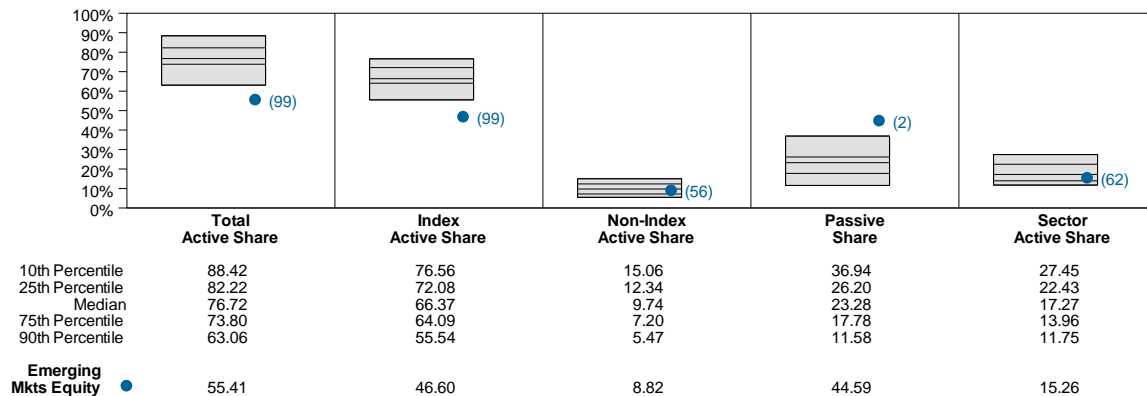


10th Percentile	(2.47)	(1.47)	27.99	8.82	8.86	7.92	6.55
25th Percentile	(5.25)	(7.65)	22.52	7.11	7.73	6.50	5.36
Median	(8.86)	(13.32)	19.83	5.68	6.38	5.85	4.53
75th Percentile	(12.05)	(18.11)	16.76	4.32	5.45	4.80	3.96
90th Percentile	(13.89)	(20.60)	13.26	1.63	4.45	4.11	3.07
Emerging Mkts Equity	(9.71)	(12.34)	21.10	7.53	7.83	6.82	4.65
MSCI EM IMI	(6.65)	(9.49)	20.75	5.74	6.19	4.85	3.59

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



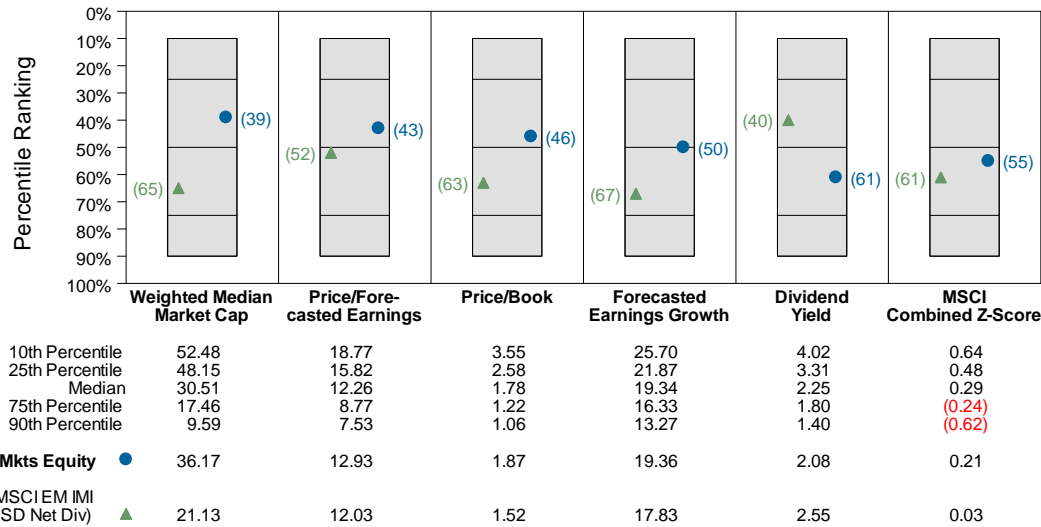
Active Share vs. Callan Emerging Broad



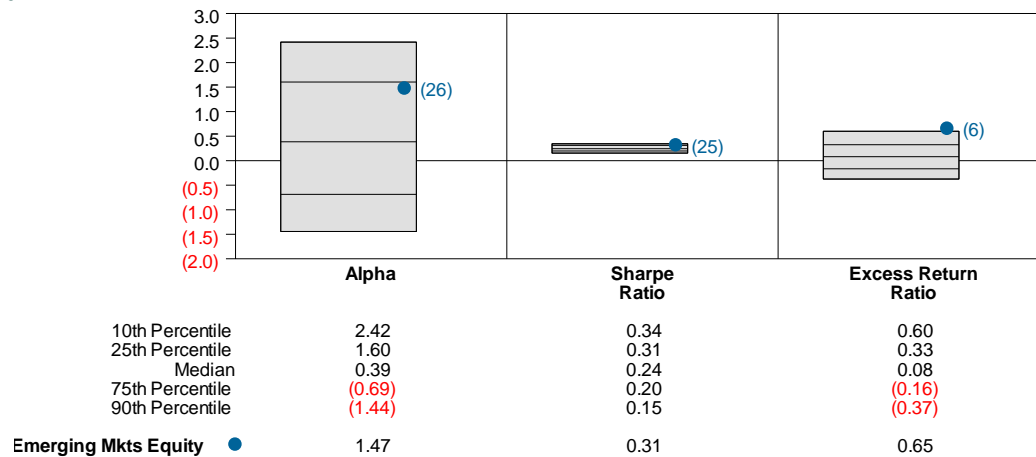
Emerging Markets Equity

As of March 31, 2022

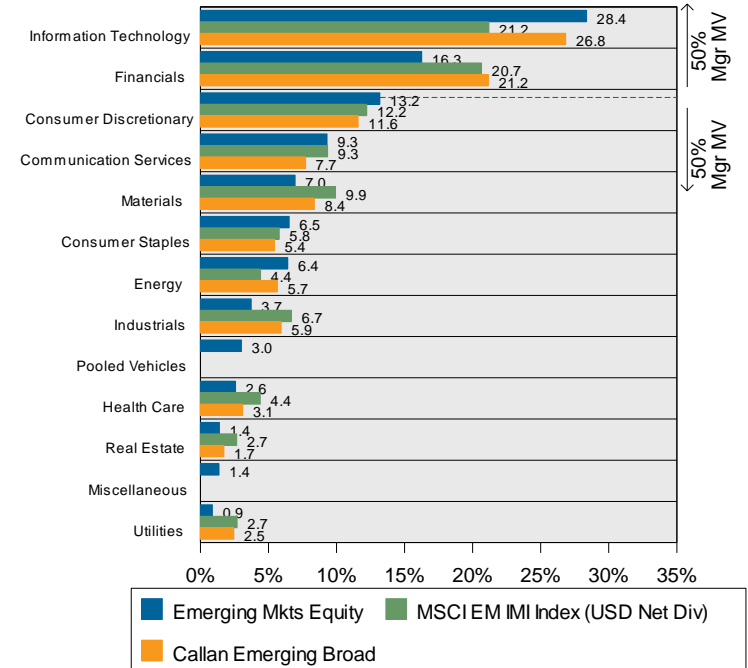
**Portfolio Characteristics Percentile Rankings
Rankings Against Callan Emerging Broad
as of March 31, 2022**



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

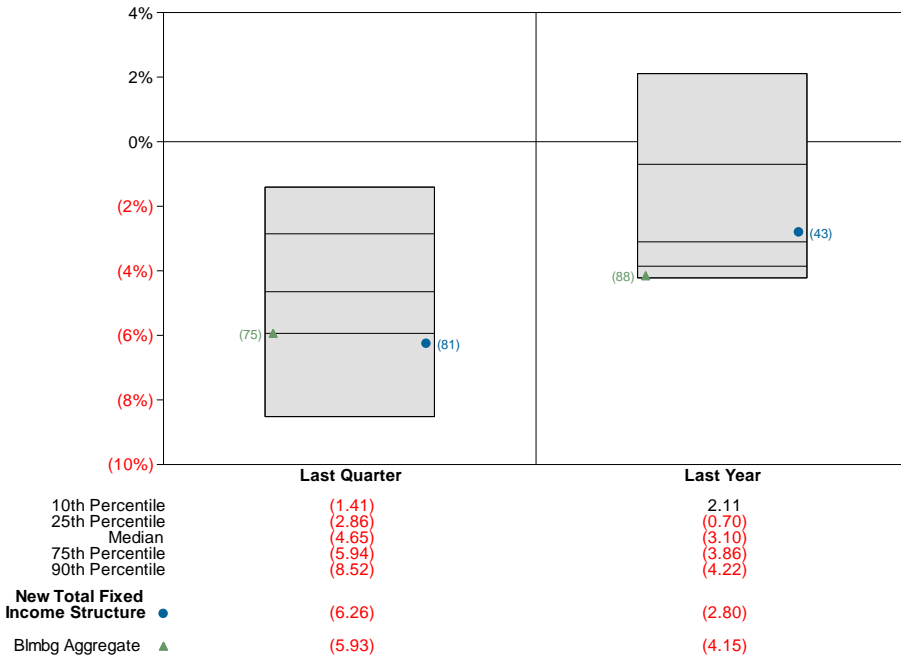


**Sector Allocation
March 31, 2022**

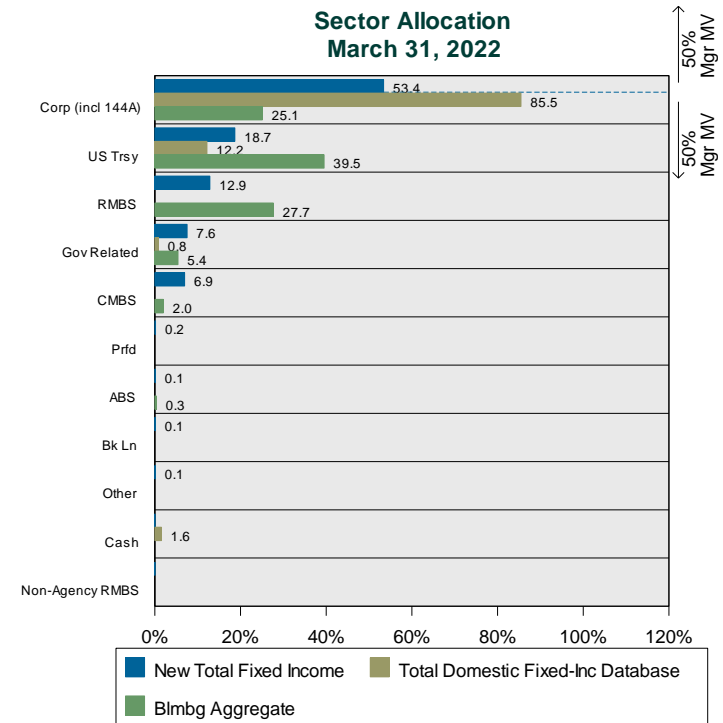


New Fixed Income Structure As of March 31, 2022

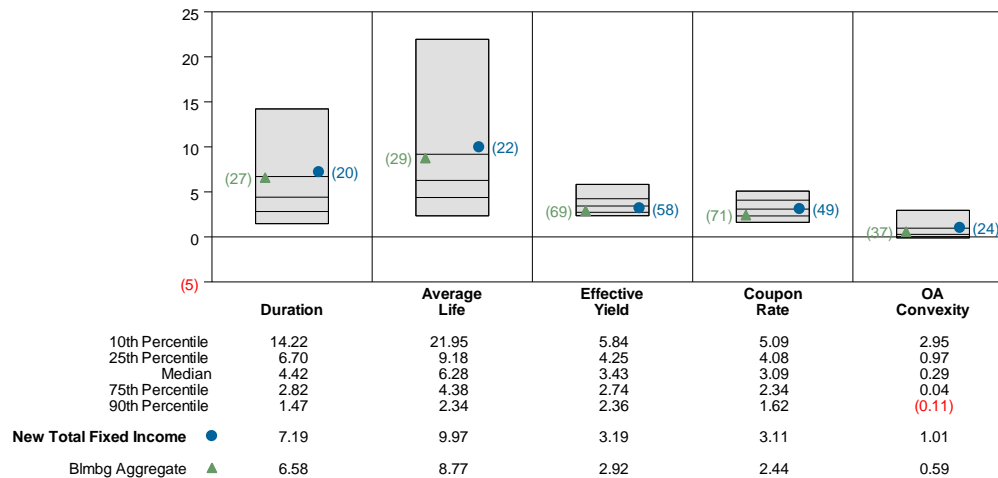
Performance vs Total Domestic Fixed-Inc Database (Gross)



Sector Allocation
March 31, 2022



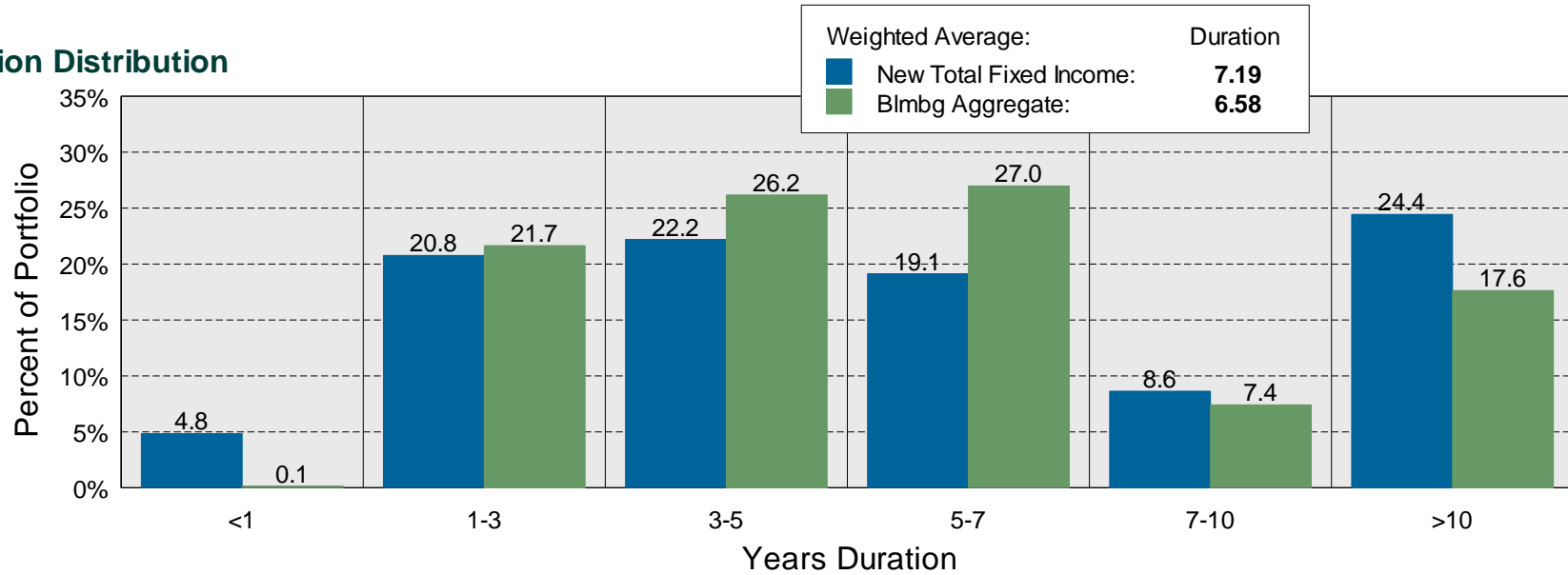
Fixed Income Portfolio Characteristics
Rankings Against Total Domestic Fixed-Inc Database
as of March 31, 2022



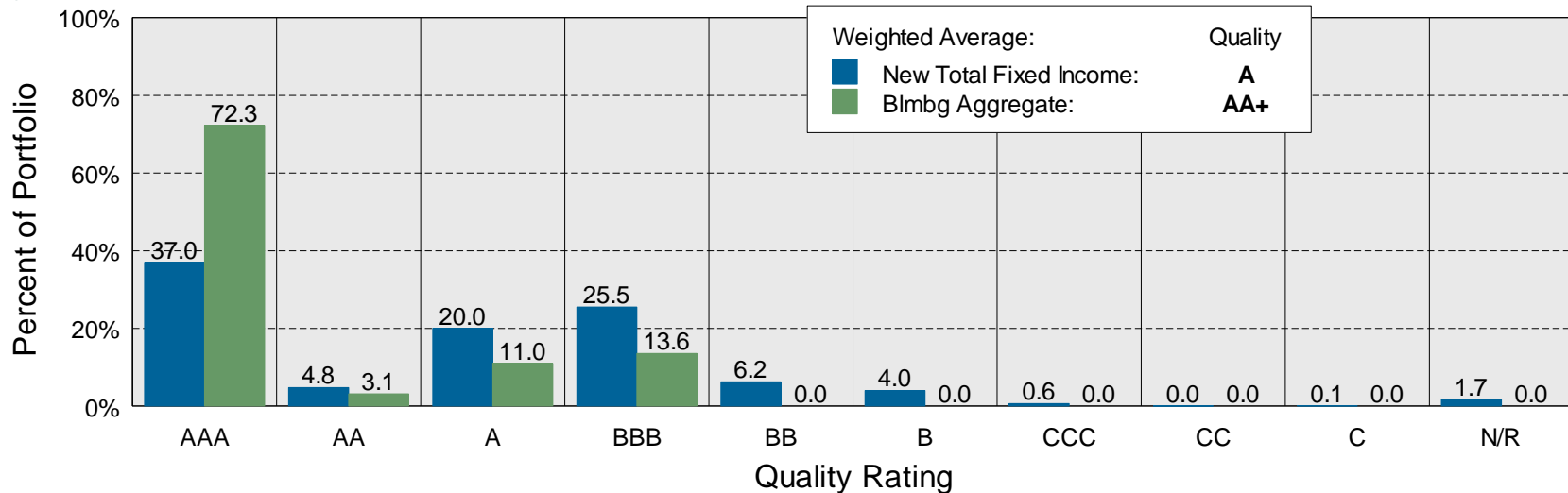
New Fixed Income Structure

As of March 31, 2022

Duration Distribution

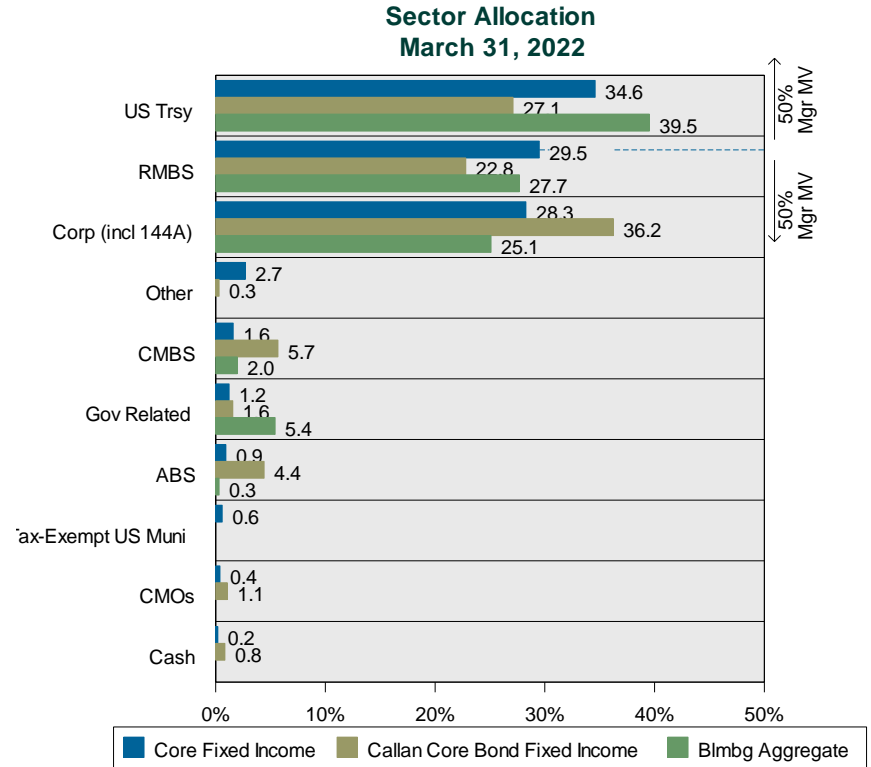
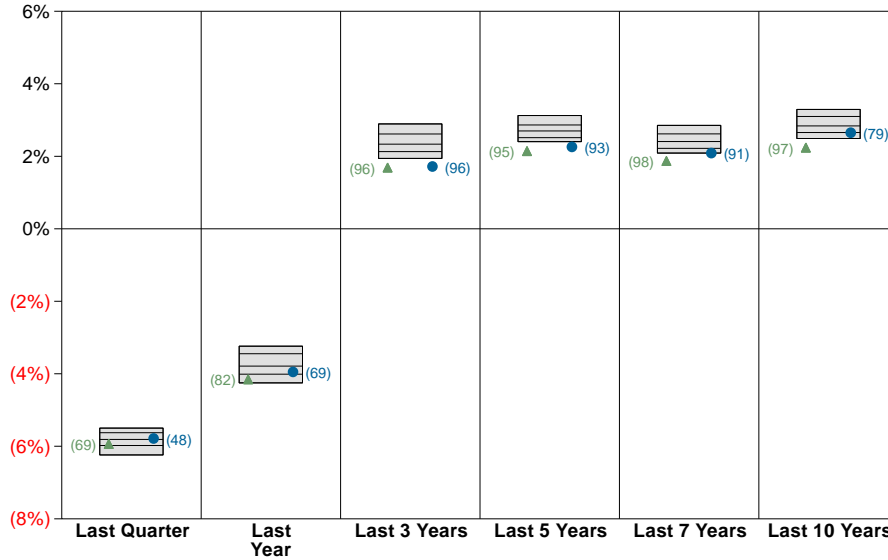


Quality Distribution

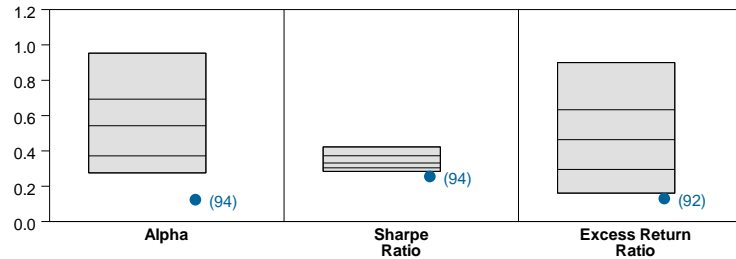


Core Fixed Income As of March 31, 2022

Performance vs Callan Core Bond Fixed Income (Gross)



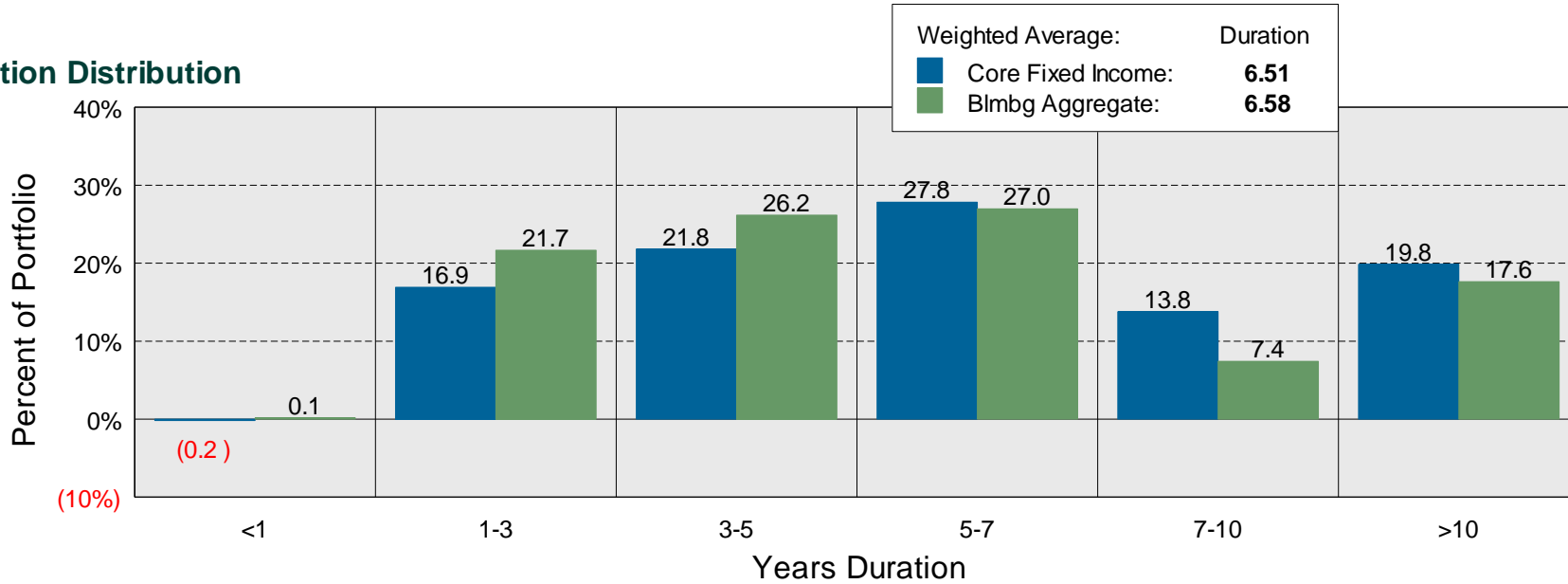
Risk Adjusted Return Measures vs Blmbg Aggregate Rankings Against Public Fund - Domestic Fixed (Gross) Five Years Ended March 31, 2022



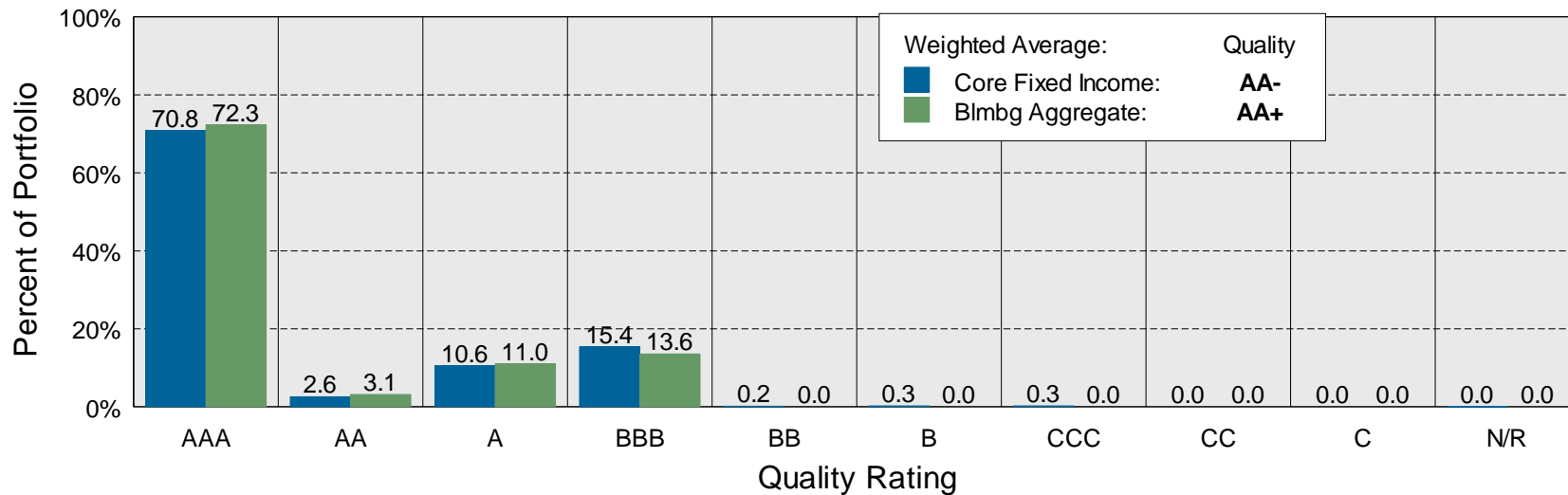
Core Fixed Income

As of March 31, 2022

Duration Distribution

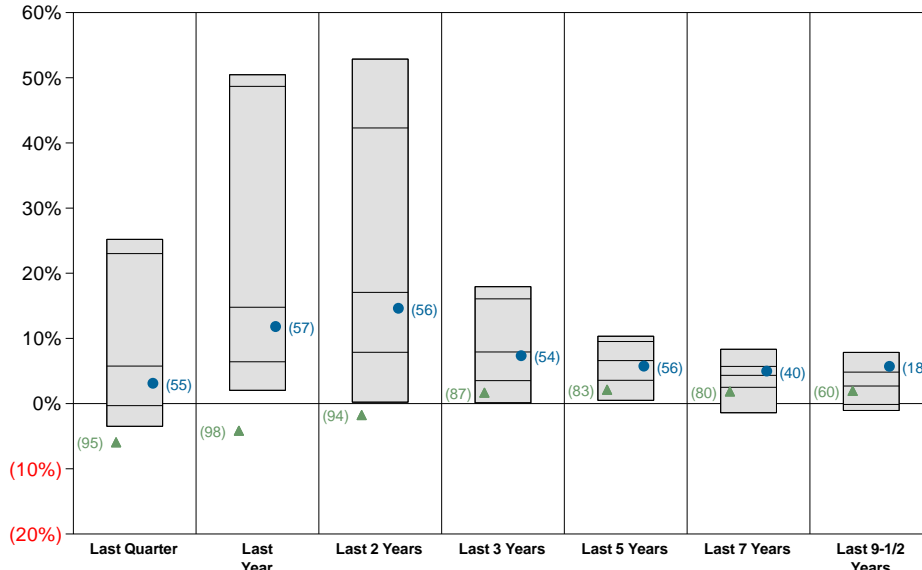


Quality Distribution



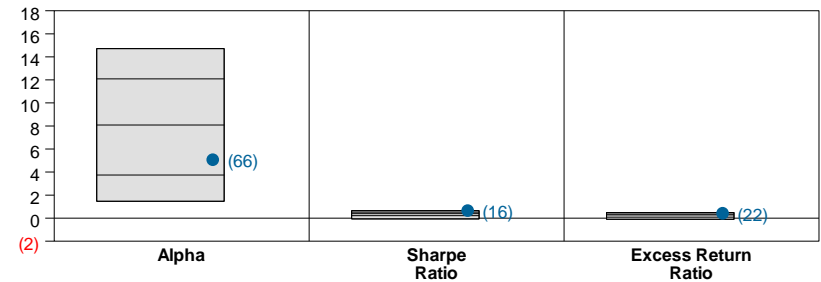
Opportunistic Fixed Income As of March 31, 2022

Performance vs Callan Alternative Investments DB (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years	Last 9-1/2 Years
10th Percentile	25.19	50.47	52.86	17.93	10.34	8.33	7.85
25th Percentile	23.02	48.67	42.29	16.07	9.52	5.71	4.83
Median	5.76	14.79	17.07	7.92	6.60	4.34	2.69
75th Percentile	(0.32)	6.41	7.87	3.53	3.57	2.50	(0.12)
90th Percentile	(3.49)	2.03	0.22	0.11	0.49	(1.40)	(1.05)
Opportunistic Fixed Income ●	3.05	11.76	14.54	7.27	5.69	4.91	5.64
Blmbg Aggregate ▲	(5.93)	(4.15)	(1.75)	1.69	2.14	1.87	1.97

Risk Adjusted Return Measures vs Blmbg Aggregate Rankings Against Callan Alternative Investments DB (Gross) Five Years Ended March 31, 2022



	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	14.71	0.65	0.49
25th Percentile	12.09	0.52	0.36
Median	8.09	0.39	0.28
75th Percentile	3.75	0.22	0.09
90th Percentile	1.46	(0.06)	(0.09)
Opportunistic Fixed Income ●	5.03	0.60	0.38

Investment Manager Returns

As of March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance- Domestic Equity						
U.S. Equity	\$11,751	100.00%	(5.46%)	10.28%	17.52%	14.52%
Russell 3000 Index (1)	-	-	(5.28%)	11.92%	18.24%	15.40%
S&P 1500 Index	-	-	(4.64%)	14.57%	18.49%	15.53%
MCM Russell 1000 Index	9,217	78.43%	(5.11%)	13.46%	18.74%	15.86%
Russell 1000 Index	-	-	(5.13%)	13.27%	18.71%	15.82%
S&P 500 Index	-	-	(4.60%)	15.65%	18.92%	15.99%
MCM Russell 2000 Core Index	1,200	10.21%	(7.52%)	(3.91%)	12.21%	10.01%
Russell 2000 Index	-	-	(7.53%)	(5.79%)	11.74%	9.74%
S&P 600 Index	-	-	(5.62%)	1.23%	13.58%	10.89%
MCM Russell 2000 Val Index	759	6.46%	(2.40%)	3.42%	12.76%	8.56%
Russell 2000 Value Index	-	-	(2.40%)	3.32%	12.73%	8.57%
S&P 600 Value Index	-	-	(1.64%)	3.73%	13.51%	9.98%
Emerald Asset Management	575	4.89%	(10.40%)	(8.42%)	10.81%	11.93%
Russell 2000 Growth Index	-	-	(12.63%)	(14.33%)	9.88%	10.33%
S&P 600 Growth Index	-	-	(9.51%)	(1.17%)	13.19%	11.57%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance- Domestic Equity					
U.S. Equity	13.53%	8.57%	8.82%	9.11%	11.07% (1/81)
Russell 3000 Index (1)	14.28%	10.10%	9.37%	9.50%	11.39% (1/81)
S&P 1500 Index	14.41%	10.22%	9.36%	9.63%	-
MCM Russell 1000 Index	14.53%	-	-	-	15.50% (1/12)
Russell 1000 Index	14.53%	10.26%	9.42%	9.60%	15.51% (1/12)
S&P 500 Index	14.64%	10.26%	9.25%	9.44%	15.58% (1/12)
MCM Russell 2000 Core Index	-	-	-	-	10.43% (12/16)
Russell 2000 Index	11.04%	7.99%	8.72%	8.88%	10.18% (12/16)
S&P 600 Index	12.56%	9.50%	10.04%	10.71%	11.09% (12/16)
MCM Russell 2000 Val Index	-	-	-	-	8.80% (12/16)
Russell 2000 Value Index	10.54%	6.91%	8.55%	9.49%	8.81% (12/16)
S&P 600 Value Index	11.97%	8.59%	9.35%	10.44%	9.89% (12/16)
Emerald Asset Management	-	-	-	-	12.42% (12/16)
Russell 2000 Growth Index	11.21%	8.81%	8.57%	7.80%	11.01% (12/16)
S&P 600 Growth Index	13.00%	10.32%	10.61%	10.58%	12.03% (12/16)

*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 March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance- International Equity						
Int'l Developed Mkts Equity	\$4,851	100.00%	(5.75%)	3.65%	9.81%	8.43%
MSCI World ex US IMI	-	-	(5.18%)	2.31%	8.69%	7.22%
Walter Scott & Partners(1) MSCI World	748	15.41%	(8.93%) (5.15%)	8.31% 10.12%	14.57% 14.98%	15.11% 12.42%
BlackRock MSCI World Ex US Index MSCI World ex US	3,730	76.89%	(4.68%) (4.81%)	3.47% 3.04%	9.02% 8.55%	- 7.14%
Xponance Non-U.S. Small Cap MSCI ACWI ex US Small Cap	238	4.91%	(9.06%) (6.52%)	(3.36%) 0.03%	7.89% 10.22%	- 7.89%
Harris Assoc Int'l SCV MSCI World ex US Sm Cap MSCI World ex US Sm Value	132	2.71%	(10.47%) (7.23%) (2.92%)	(4.09%) (1.69%) 2.15%	10.30% 9.55% 8.27%	6.17% 7.79% 6.26%
		Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception

Net Performance- International Equity						
Int'l Developed Mkts Equity	7.20%	3.10%	6.55%	-	6.55%	(1/02)
MSCI World ex US IMI	6.46%	3.29%	6.59%	5.51%	6.57%	(1/02)
Walter Scott & Partners(1) MSCI World	12.40% 10.88%	9.89% 6.88%	- 7.76%	- 7.28%	10.07% 7.38%	(10/06) (10/06)
BlackRock MSCI World Ex US Index MSCI World ex US	- 6.25%	- 3.09%	- 6.19%	- 5.25%	6.66% 6.20%	(6/17) (6/17)
Xponance Non-U.S. Small Cap MSCI ACWI ex US Small Cap	- 7.28%	- 4.64%	- 9.32%	- 6.70%	5.05% 6.91%	(10/18) (10/18)
Harris Assoc Int'l SCV MSCI World ex US Sm Cap MSCI World ex US Sm Value	6.89% 7.78% 7.01%	5.04% 4.38% 3.93%	- 8.96% 9.38%	- - 7.61%	10.41% 9.25% 9.14%	(7/03) (7/03) (7/03)

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

Investment Manager Returns

As of March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance- Emerging Mkts Equity						
Emerging Mkts Equity	\$1,342	100.00%	(9.83%)	(12.82%)	6.99%	7.27%
MSCI EM IMI	-	-	(6.65%)	(9.49%)	5.74%	6.19%
Macquarie Emg Mkts Equity	366	27.26%	(12.07%)	(14.88%)	5.46%	6.63%
MSCI EM	-	-	(6.97%)	(11.37%)	4.94%	5.98%
Martin Currie Emg Mkts Equity	398	29.66%	(12.79%)	(17.66%)	6.80%	8.17%
MSCI EM	-	-	(6.97%)	(11.37%)	4.94%	5.98%
BlackRock Emg Mkts Index	195	14.56%	(7.09%)	(11.60%)	4.62%	-
MSCI EM	-	-	(6.97%)	(11.37%)	4.94%	5.98%
Leading Edge Emg Mkts Fund	244	18.17%	(9.16%)	(14.86%)	4.09%	-
MSCI EM	-	-	(6.97%)	(11.37%)	4.94%	5.98%
GlobeFlex Emerging Small Cap	139	10.35%	1.29%	14.96%	15.19%	10.50%
MSCI EM Small Cap	-	-	(4.33%)	5.52%	11.93%	7.82%
	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	

Net Performance- Emerging Mkts Equity

Emerging Mkts Equity	4.17%	2.36%	6.84%	-	7.25% (1/02)
MSCI EM IMI	3.59%	4.00%	8.71%	4.72%	9.19% (1/02)
Macquarie Emg Mkts Equity	-	-	-	-	4.51% (5/13)
MSCI EM	3.36%	3.79%	8.61%	-	3.46% (5/13)
Martin Currie Emg Mkts Equity	-	-	-	-	5.33% (1/14)
MSCI EM	3.36%	3.79%	8.61%	-	3.97% (1/14)
BlackRock Emg Mkts Index	-	-	-	-	4.67% (7/17)
MSCI EM	3.36%	3.79%	8.61%	-	4.95% (7/17)
Leading Edge Emg Mkts Fund	-	-	-	-	6.50% (11/18)
MSCI EM	3.36%	3.79%	8.61%	-	7.68% (11/18)
GlobeFlex Emerging Small Cap	-	-	-	-	7.81% (8/13)
MSCI EM Small Cap	5.31%	5.20%	10.13%	5.16%	5.96% (8/13)

*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 March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income						
Fixed Income (1)	\$8,001	40.31%	(5.12%)	(2.33%)	1.71%	2.09%
Blmbg U.S. Agg Bond Index	-	-	(5.93%)	(4.15%)	1.69%	2.14%
Core Fixed Income	\$2,209	11.13%	(5.81%)	(4.02%)	1.62%	2.16%
Blmbg U.S. Agg Bond Index	-	-	(5.93%)	(4.15%)	1.69%	2.14%
PIMCO Core Bond Fund	554	2.79%	(5.86%)	(3.91%)	2.03%	2.54%
Blmbg Agg ex Treasury	-	-	(6.16%)	(4.46%)	1.76%	2.31%
Mellon Bond Index	1,654	8.33%	(5.81%)	(4.10%)	1.61%	2.09%
Blmbg U.S. Agg Bond Index (2)	-	-	(5.93%)	(4.15%)	1.69%	2.14%
Nominal U.S. Treasuries	\$95	0.48%	(6.27%)	(3.03%)	1.25%	1.76%
Blmbg US Treas Bell 10Y	-	-	(6.86%)	(3.44%)	1.62%	1.85%
PIMCO US Treasuries	95	0.48%	(6.27%)	(3.03%)	1.85%	2.21%
Blmbg US Treas Bell 10Y	-	-	(6.86%)	(3.44%)	1.62%	1.85%
New Total Fixed Income Structure (1)	\$4,772	24.04%	(6.27%)	(2.86%)	-	-
Intermediate Treasury	\$274	1.38%	(4.16%)	(4.13%)	-	-
Mellon Intermediate Treasury Index	274	1.38%	(4.16%)	(4.13%)	-	-
Blmbg Intmtd Treasury	-	-	(4.21%)	(4.17%)	1.04%	1.34%
Long Duration	\$1,220	6.15%	(10.55%)	(2.45%)	-	-
Mellon Long Duration Index	618	3.12%	(10.17%)	(0.91%)	-	-
Blmbg Long Treasury	-	-	(10.58%)	(1.42%)	3.26%	3.90%
Mellon Long Term Credit Bond Index	601	3.03%	(10.92%)	(4.11%)	-	-
Blmbg Long Credit	-	-	(11.23%)	(4.24%)	4.37%	4.77%
Securitized	\$668	3.37%	(4.95%)	(5.03%)	-	-
Mellon Securitized Index	668	3.37%	(4.95%)	(5.03%)	-	-
Blmbg Securitized	-	-	(4.99%)	(4.86%)	0.66%	1.44%
Intermediate Credit	\$1,922	9.68%	(5.00%)	(4.12%)	-	-
Mellon Intermediate Credit	1,922	9.68%	(5.00%)	(4.12%)	-	-
Blmbg Intmtd Credit	-	-	(5.07%)	(4.05%)	2.10%	2.47%
High Yield	\$688	3.47%	(3.87%)	0.83%	-	-
Fidelity HY CMBS (3)	329	1.66%	(2.96%)	2.09%	1.45%	2.88%
Blmbg US CMBS Ex AAA Index (4)	-	-	(5.78%)	(3.42%)	2.20%	3.42%
BlackRock US High Yield Index	118	0.59%	(4.59%)	(0.46%)	-	-
ICE BofA US HY Constrained Index	-	-	(4.53%)	(0.33%)	4.36%	4.48%
Mellon High Yield Beta Fund	241	1.21%	(4.75%)	-	-	-
Blmbg HY Corp	-	-	(4.84%)	(0.66%)	4.58%	4.69%

*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 also includes the new fixed income sub-composite which was funded in 03/01/2021.

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

(3) On 03/01/2021, the Fidelity HY CMBS account switched from the Opportunistic Fixed composite to the High Yield composite under the new fixed income structure.

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

Investment Manager Returns

As of March 31, 2022

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Fixed Income					
Fixed Income (1)	2.65%	3.99%	5.10%	5.35%	7.91% (1/81)
Blmbg U.S. Agg Bond Index	2.24%	3.56%	4.00%	4.71%	7.19% (1/81)
Core Fixed Income	2.53%	3.92%	4.33%	-	4.26% (1/02)
Blmbg U.S. Agg Bond Index	2.24%	3.56%	4.00%	4.71%	3.96% (1/02)
PIMCO Core Bond Fund	-	-	-	-	2.22% (1/13)
Blmbg Agg ex Treasury	2.53%	3.80%	-	-	2.28% (1/13)
Mellon Bond-Index	2.14%	3.44%	3.99%	4.75%	6.67% (4/84)
Blmbg U.S. Agg Bond Index (2)	2.24%	3.56%	4.11%	4.85%	-
Nominal U.S. Treasuries	1.98%	-	-	-	1.86% (9/11)
Blmbg US Treas Bell 10Y	1.93%	3.82%	4.23%	4.68%	1.99% (9/11)
PIMCO US Treasuries	2.30%	-	-	-	2.20% (9/11)
Blmbg US Treas Bell 10Y	1.93%	3.82%	4.23%	4.68%	1.99% (9/11)
New Total Fixed Income Structure (1)	-	-	-	-	(4.11%) (3/21)
Intermediate Treasury	-	-	-	-	(4.46%) (3/21)
Mellon Intermediate Treasury Index	-	-	-	-	(4.46%) (3/21)
Blmbg Intmtd Treasury	1.29%	2.71%	3.05%	3.80%	(4.46%) (3/21)
Long Duration	-	-	-	-	(5.26%) (3/21)
Mellon Long Duration Index	-	-	-	-	(12.03%) (1/21)
Blmbg Long Treasury	3.97%	5.77%	6.20%	6.70%	(11.97%) (1/21)
Mellon Long Term Credit Index	-	-	-	-	(6.04%) (3/21)
Blmbg Long Credit	5.07%	6.21%	6.67%	6.88%	(6.35%) (3/21)
Securitized	-	-	-	-	(5.52%) (3/21)
Mellon Securitized Index	-	-	-	-	(5.52%) (3/21)
Blmbg Securitized	1.76%	3.22%	3.66%	4.46%	(4.98%) (3/21)
Intermediate Credit	-	-	-	-	(4.94%) (3/21)
Mellon Intermediate Credit	-	-	-	-	(4.94%) (3/21)
Blmbg Intmtd Credit	2.74%	3.94%	4.39%	4.95%	(4.58%) (3/21)
High Yield	-	-	-	-	1.13% (3/21)
Fidelity HY CMBS (3)	6.00%	5.29%	6.92%	7.73%	7.73% (4/97)
Blmbg US CMBS Ex AAA Index (4)	3.82%	0.35%	2.36%	3.75%	3.75% (4/97)
BlackRock US High Yield Bond Index	-	-	-	-	(0.46%) (4/21)
ICE BofA US HY Constrained Index	-	-	-	-	(0.33%) (4/21)
Mellon High Yield Beta Fund	-	-	-	-	(2.08%) (5/21)
Blmbg HY Corp	5.75%	6.53%	7.48%	6.62%	(1.73%) (5/21)

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The market values and performance of such accounts are included within their relevant composites.

(1) Fixed Income also includes the new fixed income sub-composite which was funded in 03/01/2021.

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

(3) On 03/01/2021, the Fidelity HY CMBS account switched from the Opportunistic Fixed composite to the High Yield composite under the new fixed income structure.

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

Investment Manager Returns

As of March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income						
Fixed Income (1)	\$8,001	100.00%	(5.12%)	(2.33%)	1.71%	2.09%
Blmbg U.S. Agg Bond Index	-	-	(5.93%)	(4.15%)	1.69%	2.14%
Opportunistic Fixed Income	\$925	11.57%	2.78%	10.47%	6.47%	4.97%
SEI Str. Credit: HY Bank Loans (2)(3)	32	0.41%	(0.46%)	12.08%	9.97%	8.99%
FTSE HY Corp (1 month lag)	-	-	(1.72%)	0.91%	5.02%	4.68%
BAAM Keystone (4)	892	11.15%	2.91%	9.89%	7.63%	6.43%
HFRI FOF Comp Index	-	-	(2.89%)	1.07%	5.81%	4.60%

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The market values and performance of such accounts are included within their relevant composites.

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Fixed Income					
Fixed Income (1)	2.65%	3.99%	5.10%	5.35%	7.91% (1/81)
Blmbg Aggregate	2.24%	3.56%	4.00%	4.71%	7.19% (1/81)
Opportunistic Fixed Income	-	-	-	-	4.93% (10/12)
SEI Str. Credit: HY Bank Loans (2)(3)	8.87%	-	-	-	12.02% (5/08)
FTSE HY Corp (1 month lag)	5.55%	6.28%	7.41%	6.48%	7.05% (5/08)
BAAM Keystone (4)	-	-	-	-	7.52% (7/12)
HFRI FOF Comp Index	3.91%	2.34%	3.70%	4.47%	4.26% (7/12)

(1) Fixed Income also includes the new fixed income sub-composite which was funded in 03/01/2021.

(2) SEI HY Bank Loans since inception returns were included in the Fixed Income composite through 9/30/2017 and in the Multi-Strategy composite through 12/31/2019.

(3) SEI HY Bank Loans has a 1 month lag in valuation.

(4) 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.

Investment Manager Returns

As of March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Private Equity						
Private Equity	\$6,117	100.00%	2.78%	39.82%	26.30%	20.64%
Burgiss Private Equity Index (Qtr lag)	-	-	4.27%	26.86%	20.83%	18.12%
Global Equity + 3% (Qtr lag)(1)	-	-	8.39%	25.52%	27.12%	20.17%
Buyouts	3,611	59.03%	3.37%	34.85%	24.61%	19.83%
Burgiss Buyout Index (Qtr lag)	-	-	4.57%	26.64%	18.65%	16.86%
Special Situations	676	11.04%	12.23%	49.60%	26.59%	21.60%
Burgiss Special Situations ldx (Qtr lag)	-	-	2.47%	11.29%	7.41%	7.54%
Growth Equity	1,543	25.22%	6.50%	59.69%	44.36%	33.69%
Burgiss Venture Capital Index (Qtr lag)	-	-	4.55%	35.60%	33.67%	27.23%
Keystone Legacy (2)	288	4.71%	(29.34%)	(2.47%)	1.50%	-

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Private Equity					
Private Equity	14.95%	12.31%	12.29%	13.76%	12.10% (1/86)
Burgiss Private Equity Index (Qtr lag)	15.19%	12.17%	13.04%	14.37%	17.29% (1/86)
Global Equity + 3% (Qtr lag)(1)	19.01%	13.74%	12.92%	13.11%	15.18% (1/86)
Buyouts	16.40%	13.34%	14.60%	15.74%	14.04% (4/86)
Burgiss Buyout Index (Qtr lag)	14.57%	11.78%	14.33%	13.87%	19.64% (4/86)
Special Situations	14.40%	13.42%	14.45%	13.93%	13.80% (1/95)
Burgiss Special Situations ldx (Qtr lag)	8.78%	7.33%	9.38%	9.88%	10.24% (1/95)
Growth Equity	18.53%	13.24%	7.79%	10.09%	9.56% (1/86)
Burgiss Venture Capital Index (Qtr lag)	20.43%	15.29%	10.46%	15.54%	15.11% (1/86)
Keystone Legacy (2)	-	-	-	-	(0.33%) (7/18)

*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) 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 12/31/2020, Keystone Legacy SPV consists of 119 non-core funds.

Investment Manager Returns

As of March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Private Credit						
Private Credit	\$1,102	100.00%	3.00%	16.06%	12.76%	-
S&P Levered Loan Index +1% (Qtr lag)	-	-	0.99%	6.20%	6.71%	5.32%
Direct Lending	362	32.84%	3.08%	13.62%	-	-
Distressed Debt	303	27.48%	2.59%	29.21%	-	-
Diversified Credit	437	39.67%	3.20%	15.26%	-	-

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Private Credit					
Private Credit	-	-	-	-	11.38% (12/17)
S&P Levered Loan Index +1% (Qtr lag)	5.72%	5.56%	5.86%	-	5.39% (12/17)
Direct Lending	-	-	-	-	10.04% (1/20)
Distressed Debt	-	-	-	-	24.38% (1/20)
Diversified Credit	-	-	-	-	15.83% (1/20)

*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 March 31, 2022

	Market Value \$(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years	
Net Performance - Real Estate							
Real Estate	\$2,854	100.00%	3.56%	19.20%	9.92%	6.66%	
Real Estate Custom Bench (Qtr lag) (1)	-	-	6.23%	22.36%	9.23%	8.06%	
CPI +3% (Qtr lag)	-	-	2.34%	10.04%	6.53%	5.92%	
Core/Core Plus Real Estate Funds	1,241	43.50%	5.81%	17.71%	7.87%	7.46%	
NCREIF ODCE Index (Qtr lag)	-	-	7.38%	21.88%	8.90%	8.18%	
Value Add/Oppportunistic SMA	549	19.25%	0.36%	13.86%	10.57%	4.46%	
NCREIF ODCE Index (Qtr lag)	-	-	7.38%	21.88%	8.90%	8.18%	
Value Add/Oppportunistic Funds	694	24.31%	5.88%	22.85%	10.16%	9.53%	
NCREIF ODCE Index (Qtr lag)	-	-	7.38%	21.88%	8.90%	8.18%	
REITS	369	12.94%	(3.03%)	27.26%	12.98%	10.73%	
FTSE NAREIT US Index	-	-	(4.16%)	24.90%	9.92%	8.85%	
			Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Real Estate							
Real Estate			7.80%	3.87%	7.02%	7.85%	8.50% (3/84)
Real Estate Custom Bench (Qtr lag) (1)			9.69%	5.83%	7.77%	8.35%	-
CPI +3% (Qtr lag)			5.14%	5.18%	5.31%	5.28%	5.70% (3/84)
Core/Core Plus Real Estate Funds			9.53%	6.57%	7.81%	8.56%	7.23% (9/86)
NCREIF ODCE Index (Qtr lag)			9.70%	5.85%	7.24%	7.99%	6.27% (9/86)
Value Add/Oppportunistic SMA			5.84%	2.51%	5.18%	6.23%	5.45% (6/88)
NCREIF ODCE Index (Qtr lag)			9.70%	5.85%	7.24%	7.99%	6.32% (6/88)
Value Add/Oppportunistic Funds			10.53%	4.11%	7.82%	9.23%	8.07% (3/84)
NCREIF ODCE Index (Qtr lag)			9.70%	5.85%	7.24%	7.99%	6.50% (3/84)
REITS			10.20%	6.09%	10.26%	9.36%	10.27% (4/96)
FTSE NAREIT US Index			10.32%	6.00%	10.12%	9.49%	10.61% (4/96)

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 (1) As of 03/31/2019 benchmark consists of 90% NCREIF ODCE Index (1 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 1Q22

Alternatives Focus, a new quarterly publication



Callan 2022-2031 Capital Markets Assumptions



2022 Defined Contribution Trends Survey



Periodic Table Collection: Year-End 2021

2017	2018	2019	2020	2021
Emerging Markets	Real Estate Funds	Large Cap	Small Cap	Large Cap
37.28%	7.36%	31.49%	19.96%	28.71%
Dev ex-U.S. Equity	Cash Equivalent	Small Cap	Large Cap	Real Estate Funds
24.21%	1.87%	25.52%	18.40%	21.02%
Large Cap	U.S. Fixed	Dev ex-U.S. Equity	Emerging Markets	Small Cap
21.83%	0.01%	22.49%	18.31%	14.82%
Small Cap	High Yield	Emerging Markets	Global ex-U.S. Fixed	Dev ex-U.S. Equity
14.65%	-2.08%	18.44%	10.11%	12.62%

Recent Blog Posts

Hedge Funds and Ukraine: A Guide for Institutional Investors

Joe McGuane

Why It Was a Tough 4Q21 for Large Cap Growth Managers

David Wang

DOL Shifts Tone on Private Equity in DC Plans

Patrick Wisdom

Additional Reading

Private Equity Trends 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

Callan Institute Events

Upcoming conferences, workshops, and webinars

Callan College

Intro to Investments – Learn the Fundamentals

This course is for institutional investors, including trustees and staff members of public plans, corporate plans, and nonprofits. This session familiarizes trustees and staff with basic investment theory, terminology, and practices.

Join our next LIVE session in San Francisco (1½-day session):
July 26–27, 2022

Join our next VIRTUAL session via Zoom (3 sessions, 2–3 hours each):
September 20–22, 2022

Mark Your Calendar

2022 June Regional Workshops

June 7, 2022 – Atlanta
June 9, 2022 – Portland

2022 October Regional Workshops

October 18, 2022 – Denver
October 20, 2022 – San Francisco

Watch your email for further details and an invitation.

Webinars & Research Café Sessions

Research Café: Private Equity Fee Study

May 11, 2022 – 9:30am (PT)

Webinar: Pension Risk Transfer

May 18, 2022 – 9:30am (PT)

Market Intelligence

July 15, 2022 – 9:30am (PT)

Callan Updates

Firm updates by the numbers, as of March 31, 2022

Total Associates: ~200

Ownership

- 100% employees
- All shareholders own less than 10% of the firm
- 67% of employees are equity owners
- 55% of shareholders identify as women or minority

Leadership Changes

- Greg Allen, CEO & Chief Research Officer, is now also Callan's Diversity, Equity & Belonging Executive Sponsor
- Lauren Mathias, SVP, non-U.S. equities consultant and head of the Callan Connects program, is now also Callan's DEB Champion

Total General and Investment Consultants: more than 55

Total Specialty and Research Consultants: more than 60

Total CFA/CAIA/FRMs: ~55

Total Institutional Investor Clients: more than 400

AUA: more than \$3 trillion

"Our focus is to build on all of the diversity work we've done over the years to bring change to our firm and our industry. Like many firms, we know we have a ways to go, and we're confident that the strategy we've developed will help us make meaningful, lasting change now and in the future."

- Lauren Mathias, senior vice president and DEB Champion, on Callan's new Diversity, Equity & Belonging program



Disclaimers

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Past performance is no guarantee of future results.

The statements made herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties such that actual results may differ materially from these statements. There is no obligation to update or alter any forward-looking statement, whether as a result of new information, future events or otherwise. Undue reliance should not be placed on forward-looking statements.