

September 28, 2021



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

Second Quarter 2021

Executive Summary

Thomas H. Shingler
Senior Vice President

Bud Pellecchia
Senior Vice President

Britton M. Murdoch
Vice President

Callan

Market Environment

Continued Surge in Global Equity Markets in 2Q21

Global equity continued to surge in 2Q:

- Year-over-year returns from June are eye-popping:
 - S&P 500: +41%
 - MSCI World ex-USA: +34%
 - Emerging Markets: +41%
 - U.S. Small Cap: +62% (!)
- The initial recovery was concentrated in a few stocks (FAANG) and U.S. mega cap.
- Market rotation to small cap and value with the flip from a “COVID trade” to a “GDP growth trade” in November, with the announcement of vaccines
- Economic recovery now looking very strong in 2021, into 2022. Fed projects GDP growth of 7.0% in 2021, although initial GDP estimate for 2Q is 6.5% and 1Q was revised down to 6.3%.
- Initial distribution challenges and resistance to vaccination have stalled the achievement of widespread inoculation in the U.S. Restricted availability of the vaccine outside the U.S. means inoculation rates have been held back in countries around the globe.

Returns for Periods ended 6/30/21

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	8.24	44.16	17.89	14.70	9.87
S&P 500	8.55	40.79	17.65	14.84	9.76
Russell 2000	4.29	62.03	16.47	12.34	9.33
Global ex-U.S. Equity					
MSCI World ex USA	5.65	33.60	10.36	5.70	5.37
MSCI Emerging Markets	5.05	40.90	13.03	4.29	--
MSCI ACWI ex USA Small Cap	6.35	47.04	11.97	7.02	6.60
Fixed Income					
Bloomberg Barclays Aggregate	1.83	-0.33	3.03	3.39	5.14
90-day T-Bill	0.00	0.09	1.17	0.63	2.17
Bloomberg Barclays Long Gov/Credit	6.44	-1.86	5.45	7.30	7.48
Bloomberg Barclays Global Agg ex-US	0.92	4.60	1.63	0.99	3.79
Real Estate					
NCREIF Property	1.72	5.42	5.74	8.59	9.04
FTSE Nareit Equity	12.02	38.02	6.31	9.41	10.23
Alternatives					
CS Hedge Fund	3.02	16.60	5.63	4.24	7.05
Cambridge Private Equity*	9.48	54.21	18.83	15.07	15.52
Bloomberg Commodity	13.30	45.61	2.40	-4.44	1.31
Gold Spot Price	3.26	-1.61	6.05	1.66	6.33
Inflation - CPI-U	2.57	5.39	2.43	1.87	2.22

*Cambridge PE data through 03/31/21

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

Market Environment: 2Q21

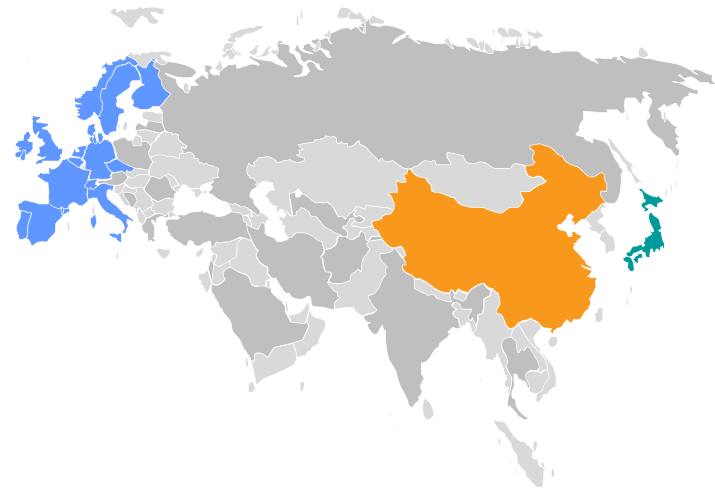
Strong growth worldwide, but continued uncertainty from uneven vaccine rollout

U.S.

- 2020 GDP loss of 3.4% for the year is the deepest recession in 75 years. GDP rose 6.5% in the second quarter, and the Fed still expects 7.0% growth for the year.
- Consumer spending, non-residential investment, and exports drove GDP gains. Consumers ramped up spending on food services, accommodations, and recreation services (gambling!), along with motor vehicles.
- Unemployment dropped to 6.0% in March but held steady at 5.9% through June, despite another large monthly gain of 850,000 jobs.
 - Considerable slack left in the job market, as measured by number of jobs still lost and the number unemployed compared to pre-pandemic levels.

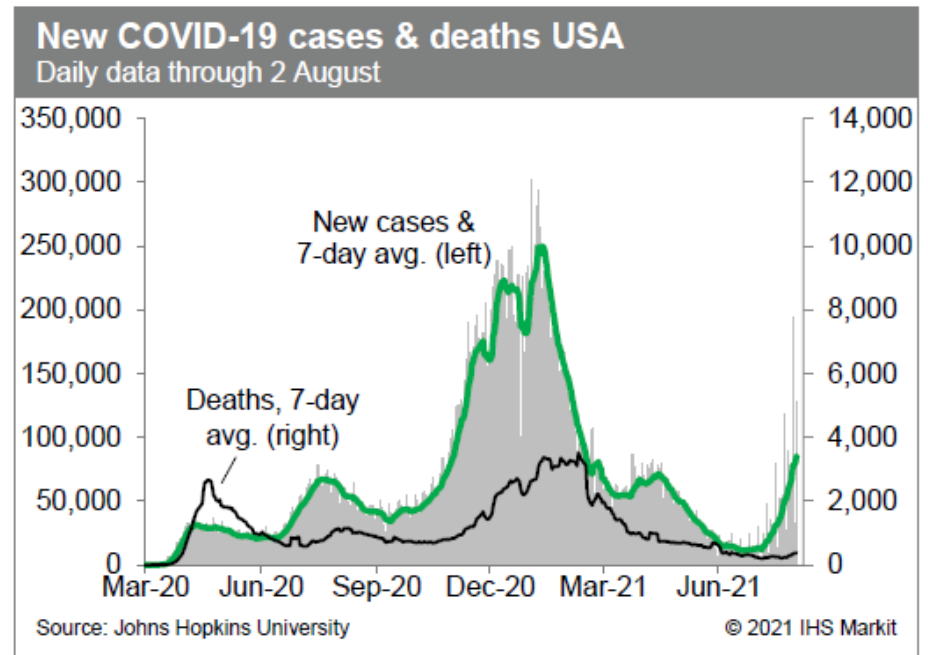
Global

- Euro zone GDP expanded 8.2% in 2Q21, after shrinking in 4Q20 and 1Q21.
- U.K. GDP on track for 7.2% growth in 2021, per OECD, although the organization warns the U.K. may face a longer road to recovery than the euro zone due to the double-whammy of the pandemic and Brexit.
- Japan's economy is expected to grow much more modestly than other developed nations in 2021; OECD expects 2.6% for the year.
- China's GDP grew 5.3% in 2Q21, after slowing to just 1.6% in 1Q21. China was one of the few economies to see growth in GDP during 2020.



Will the Delta Variant Derail U.S. and Global Growth?

- The Delta variant of the COVID-19 virus is driving a sharp upswing in cases and hospitalizations.
 - Trend is likely to worsen before it improves.
 - Delta variant now accounts for 83% of new cases, and represents a “new” pandemic among the unvaccinated.
 - Largest increases in cases occurring in areas with low vaccination rates
 - New case loads exceed those seen last summer by a substantial amount.
- New official containment measures may be unpopular and unlikely, but voluntary reductions in consumer and business activity (and spending) could slow growth in 2Q21.
 - Estimates of the impact on GDP range from -0.25% to -1%
 - Real risk of a more pronounced slowdown, depending on the shape of the surge in cases

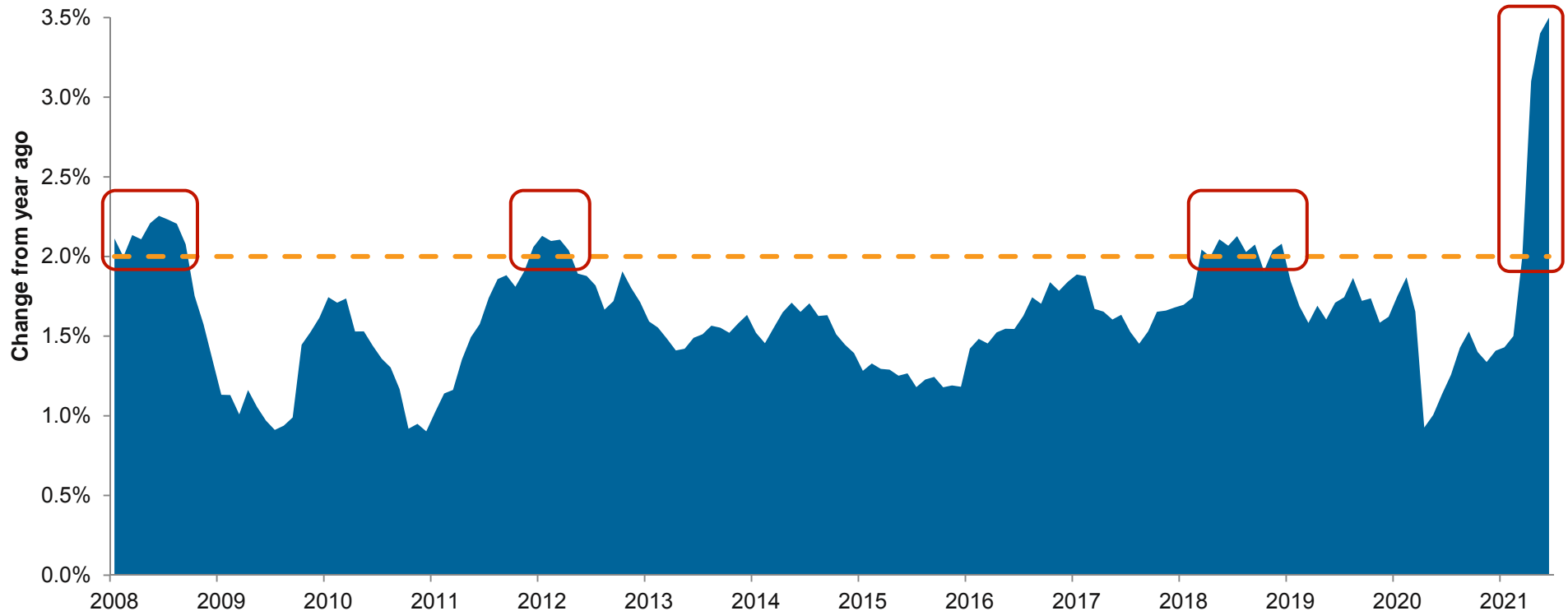


Source: Johns Hopkins University, IHS Markit

The Fed's New Inflation Framework

Targeting core personal consumption expenditures index

Personal Consumption Expenditures Excluding Food and Energy (Chain-Type Price Index)



- Inflation worries are in the headlines.
- Inflation has consistently undershot the Fed's 2% target, prompting a change in its inflation framework.
- Fed's aim is to achieve an average of 2% inflation over the medium term, not specifically defined.
- PCE is the Fed's target, different from and typically lower than CPI-U, which flashed a year-over-year change of 3.5% in June 2021.

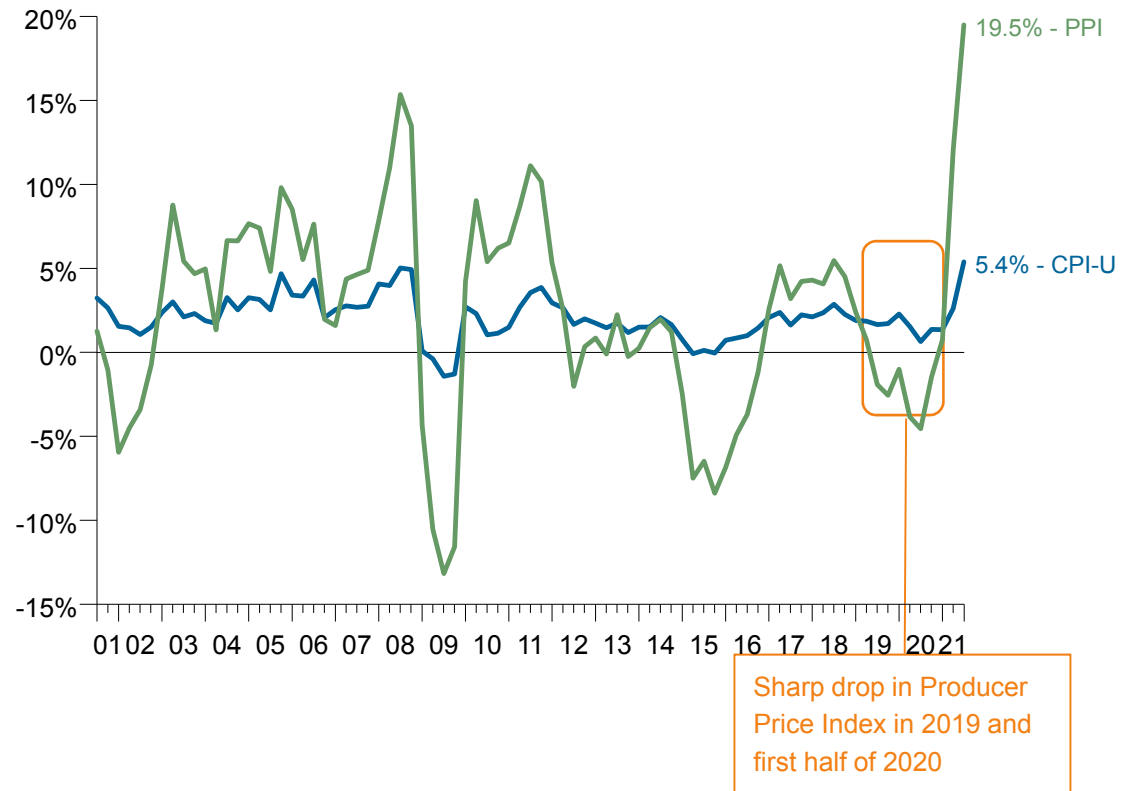
Sources: FRED, U.S. Bureau of Economic Analysis

Inflation Rebounds and Spurs Headline Concerns

CPI and PPI shoot up in 2Q21, but off a depressed base from one year ago

- Inflation fell sharply at the onset of the pandemic, starting in February 2020.
 - The recovery to pre-pandemic levels in the Consumer Price Index required a 2.6% year-over-year change
 - 5.4% jump in CPI-U represents kinks in supply chains and labor markets after a year of global economic disruption and shutdown; many markets cannot simply restart instantaneously
 - Producer prices had been tumbling for more than a year prior to the pandemic; recovery to 2018 price **levels** generates eye-popping year-over-year percent change that misrepresents whether we're seeing a "true" spike in inflation.

Consumer and Producer Price Indexes – Inflation Year-Over-Year



Diversification Remains Key Risk Control

Periodic Table of Investment Returns

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2 Qtrs. 2021
Non-U.S. Fixed	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	Small Cap
22.37%	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%	17.54%
U.S. Fixed	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	Large Cap
10.26%	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%	15.25%
Real Estate Funds	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	Non-U.S. Equity
4.57%	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%	9.92%
Hedge Funds	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	Emerging Markets
3.04%	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%	7.45%
Cash Equivalent	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
1.78%	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%	5.96%
High Yield	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	Real Estate Funds
-1.37%	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%	5.64%
Emerging Markets	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	High Yield
-6.16%	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%	3.62%
Non-U.S. Equity	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	Cash Equivalent
-15.80%	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%	0.02%
Small Cap	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	U.S. Fixed
-20.48%	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%	-1.60%
		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
		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%	-4.42%

- 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

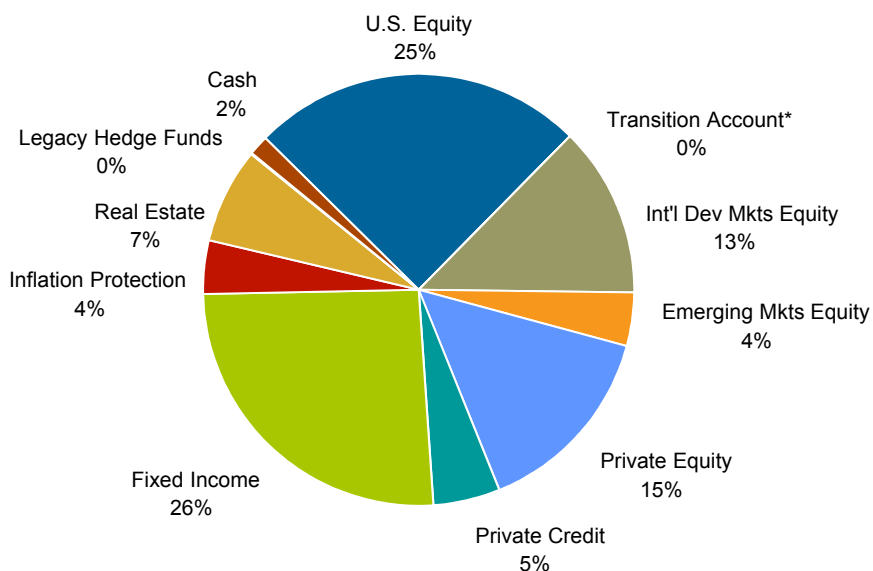
Callan

**PA SERS Defined Benefit Plan
Performance Review**

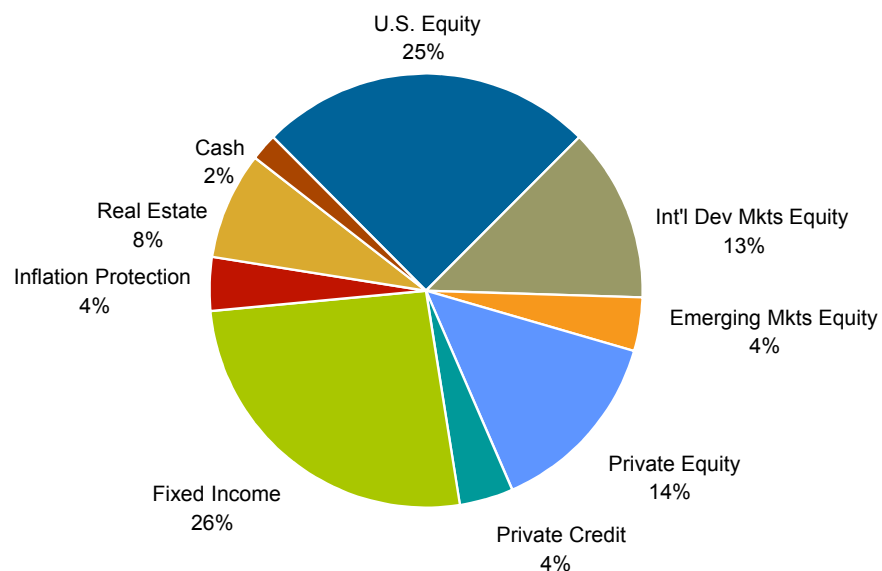
Total Fund

Actual Asset Allocation versus Target as of June 30, 2021

Actual Asset Allocation



Target Asset Allocation



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
U.S. Equity	9,514,075	25.0%	25.0%	0.0%	13,015
Transition Account*	1,176	0.0%	0.0%	0.0%	1,176
Int'l Dev Mkts Equity	4,858,394	12.8%	13.0%	(0.2%)	(82,157)
Emerging Mkts Equity	1,523,848	4.0%	4.0%	0.0%	3,679
Private Equity	5,595,870	14.7%	14.0%	0.7%	275,276
Private Credit	1,909,097	5.0%	4.0%	1.0%	388,928
Fixed Income	9,793,968	25.8%	26.0%	(0.2%)	(87,135)
Inflation Protection	1,508,842	4.0%	4.0%	(0.0%)	(11,328)
Real Estate	2,694,657	7.1%	8.0%	(0.9%)	(345,682)
Legacy Hedge Funds	23,713	0.1%	0.0%	0.1%	23,713
Cash	580,601	1.5%	2.0%	(0.5%)	(179,484)
Total	38,004,241	100.0%	100.0%		

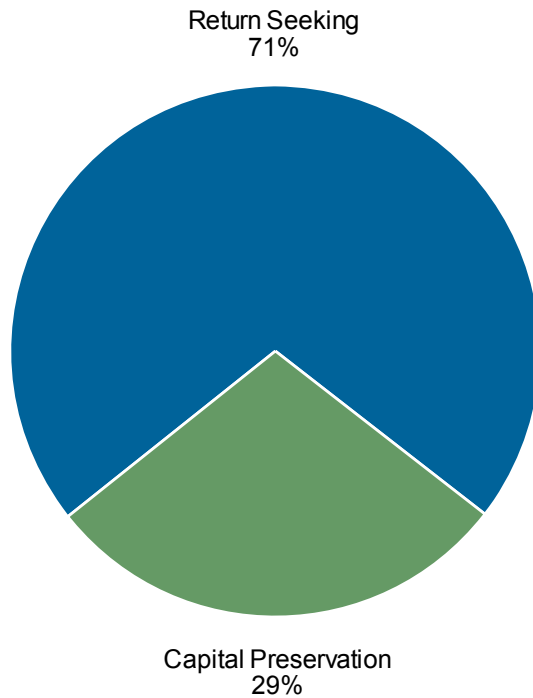
Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

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

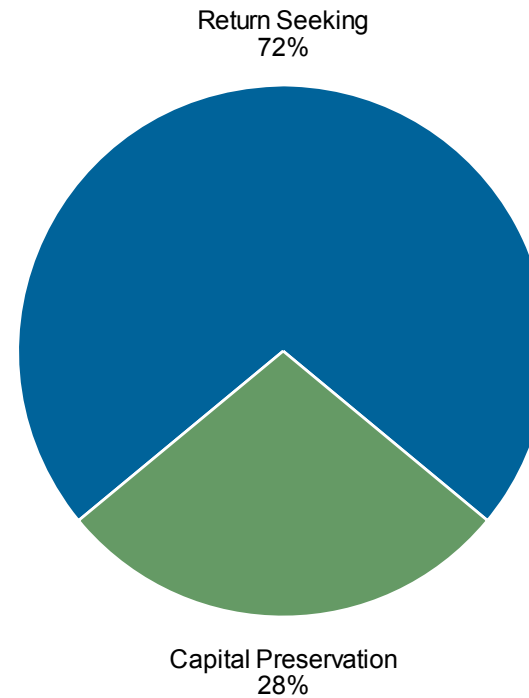
Return Seeking and Capital Preservation Assets

As of June 30, 2021

Actual Asset Allocation



Target Asset Allocation



Return Seeking Assets: U.S. Equity, Int'l Developed Markets Equity, Emerging Markets Equity, 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.

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

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%	4%	26%	25%	13%	4%	4%	8%	14%
Projected Return* (Geometric)	1.00%	1.70%	1.75%	6.60%	6.50%	6.90%	6.25%	5.75%	8.00%
Projected Risk* (Standard Deviation)	0.90%	5.05%	3.75%	17.95%	19.90%	25.15%	14.60%	14.10%	27.80%
Liquidity	High	High	High	High	High	Medium	Low	Low	Low
Correlation to U.S. Equity*	-0.06	-0.08	-0.10	1.00	0.78	0.80	0.74	0.71	0.80
Months of Benefit Payments**	1.9	4.9	28.8						
Months of Benefit Payments (Includes EE & ER Contributions)**	6.3	16.4	96.2						
Cumulative Months of Benefit Payments (Includes EE & ER Contributions)**		118.9							

*Callan 2021 Capital Market Projections

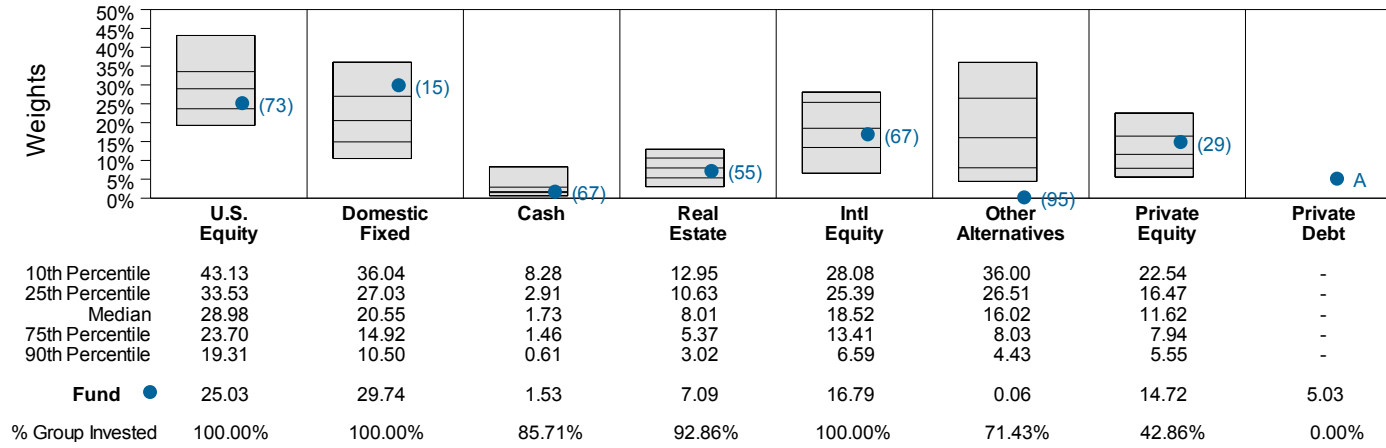
**SERS IO as of 6/30/2021. Benefit payment calculations for fixed income represent core fixed income & treasury allocations.

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

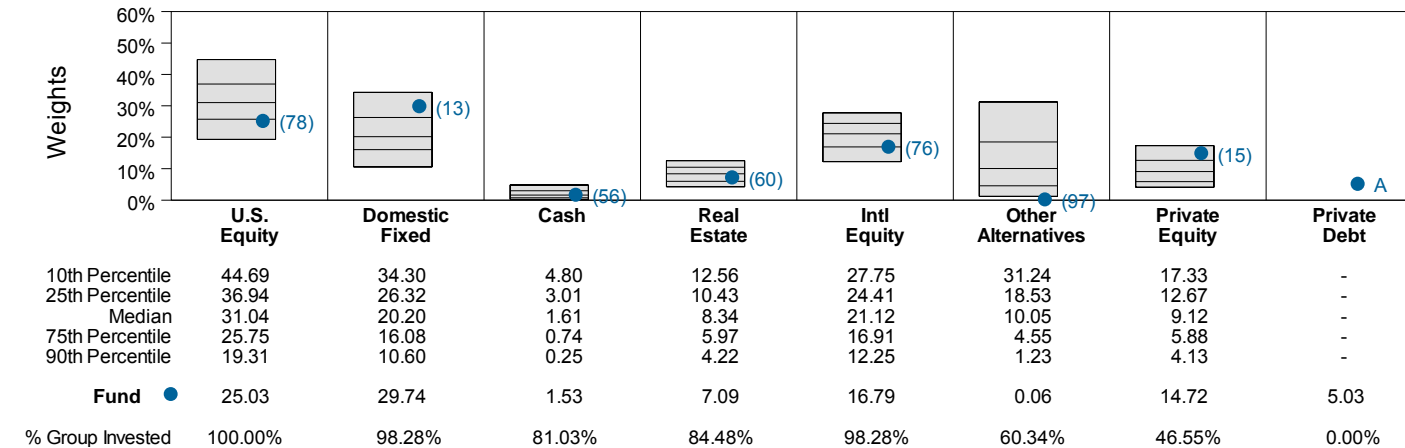
Total Fund

Actual Asset Allocation versus Very Large Public DB Plan (>\$10B) Peers and Large Public DB Plan (>\$1B) Peers as of June 30, 2021

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



Asset Class Weights vs Callan Public Fund Spons - Large (>1B)



Current Quarter Target = 26.0% BImbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% BImbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

One Quarter Attribution Analysis versus Target – Gross of Fees as of June 30, 2021

Note: Attribution is a snap shot 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 June 30, 2021

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return		
U.S. Equity	25%	25%	7.66%	8.24%	(0.14%)	(0.01%)	(0.15%)		
Int'l Dev. Mkts Equity	13%	13%	6.34%	5.52%	0.11%	(0.01%)	0.10%		
Emerging Markets	4%	4%	6.08%	5.73%	0.01%	(0.00%)	0.01%		
Private Equity	14%	14%	14.73%	14.73%	0.00%	(0.02%)	(0.02%)		
Private Credit	5%	4%	6.38%	2.02%	0.21%	(0.04%)	0.18%		
Fixed Income	26%	26%	2.55%	1.83%	0.19%	0.00%	0.19%		
Inflation Protection	4%	4%	3.28%	3.25%	0.00%	0.00%	0.00%		
Real Estate	7%	8%	4.52%	2.98%	0.11%	0.03%	0.14%		
Multi-Strategy	0%	0%	0.00%	1.47%	0.00%	0.00%	0.00%		
Legacy Hedge Funds	0%	0%	12.58%	2.89%	0.01%	(0.00%)	0.00%		
Cash	2%	2%	0.02%	(0.00%)	0.00%	(0.01%)	(0.01%)		
Total			6.43%	5.98%	+	0.50%	+	(0.05%)	0.45%

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

Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

One Year Attribution Analysis versus Target – Gross of Fees as of June 30, 2021

Note: Attribution is a snap shot 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 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	26%	25%	46.23%	44.16%	0.47%	0.09%	0.56%		
Int'l Dev. Mkts Equity	13%	13%	36.71%	34.82%	0.23%	(0.02%)	0.21%		
Emerging Markets	4%	4%	46.81%	43.21%	0.15%	0.07%	0.23%		
Private Equity	13%	14%	71.13%	71.13%	0.00%	(0.31%)	(0.31%)		
Private Credit	3%	4%	29.31%	21.72%	0.39%	(0.05%)	0.34%		
Fixed Income	27%	26%	2.99%	(0.33%)	1.14%	(0.42%)	0.72%		
Inflation Protection	4%	4%	6.54%	6.51%	0.00%	(0.00%)	0.00%		
Real Estate	7%	8%	12.37%	5.45%	0.56%	0.18%	0.74%		
Multi-Strategy	0%	0%	0.00%	7.90%	0.00%	0.00%	0.00%		
Legacy Hedge Funds	0%	0%	16.69%	18.34%	(0.00%)	(0.01%)	(0.01%)		
Cash	2%	2%	0.13%	0.09%	0.00%	0.08%	0.08%		
Total			29.49%	= 26.90%	+	2.97%	+	(0.38%)	2.59%

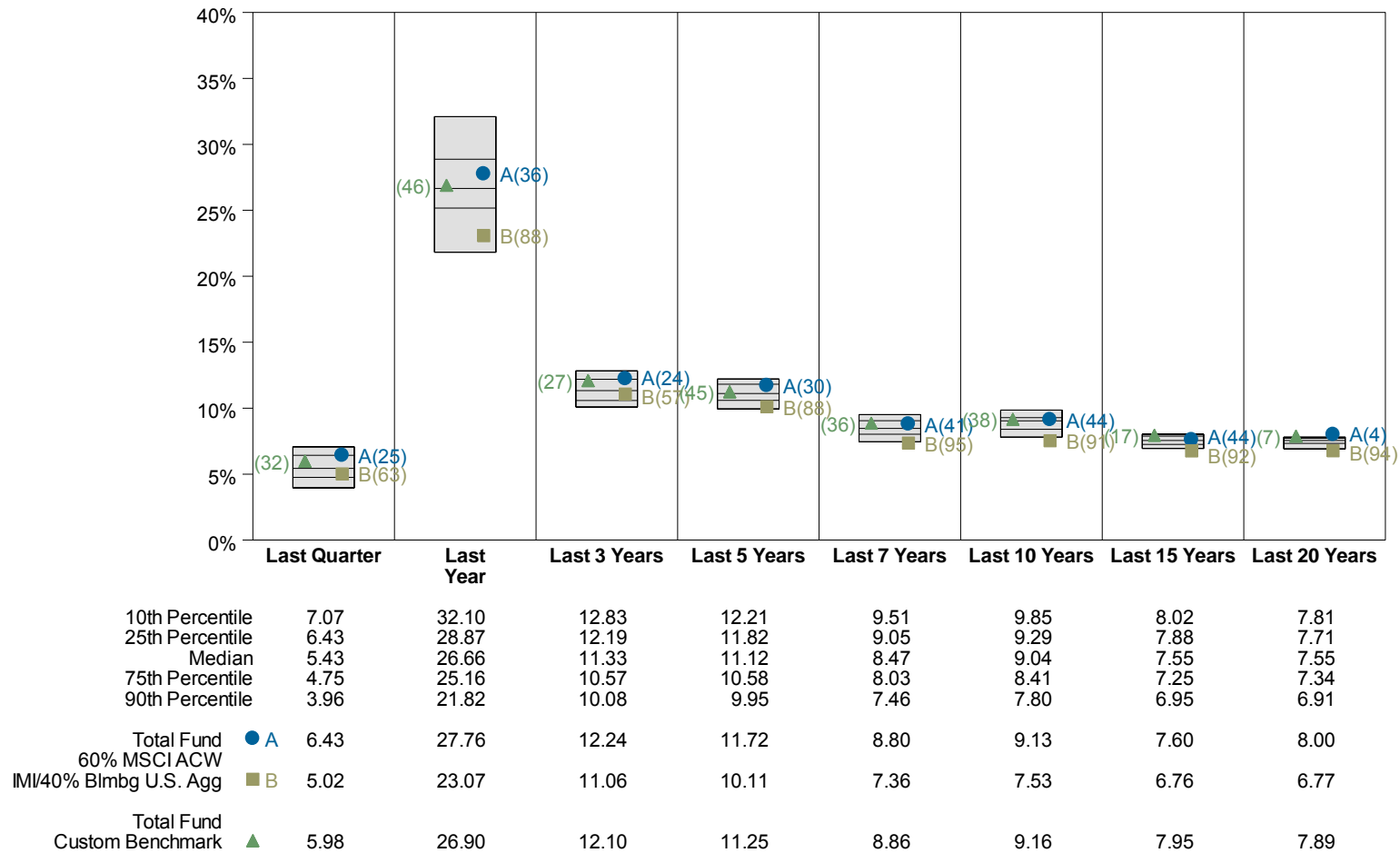
- **What helped relative attribution?**
 - Outperformance relative to target from Fixed Income, Real Estate, U.S. Equity, Private Credit, International Developed Equity and Emerging Markets Equity managers
 - An underweight to Real Estate (attribution based on target return)
 - A slight overweight to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

Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

Gross of Fee Performance versus Very Large Public DB Plan (>\$10B) Peers and Benchmark as of June 30, 2021

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

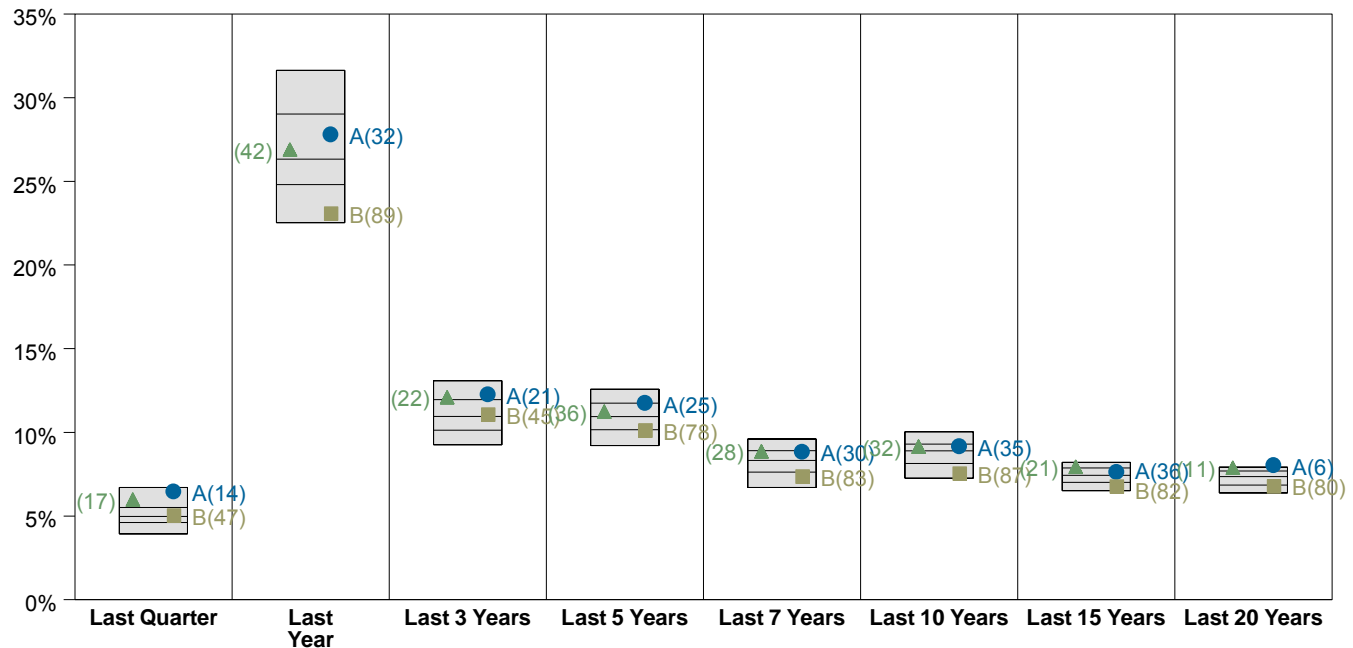


Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

Gross of Fee Performance versus Large Public DB Plan (>\$1B) Peers and Benchmark as of June 30, 2021

Performance vs Callan Public Fund Spons - Large (>1B) (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		6.70	31.63	13.08	12.58	9.61	10.03	8.21	7.91
25th Percentile		5.52	29.02	11.96	11.74	8.91	9.30	7.87	7.69
Median		4.98	26.33	10.95	10.94	8.32	8.89	7.44	7.35
75th Percentile		4.61	24.81	10.13	10.16	7.62	8.14	7.02	6.86
90th Percentile		3.93	22.53	9.25	9.21	6.70	7.26	6.52	6.38
Total Fund	● A	6.43	27.76	12.24	11.72	8.80	9.13	7.60	8.00
60% MSCI ACW									
IMI/40% Blmbg U.S. Agg	■ B	5.02	23.07	11.06	10.11	7.36	7.53	6.76	6.77
Total Fund									
Custom Benchmark	▲	5.98	26.90	12.10	11.25	8.86	9.16	7.95	7.89

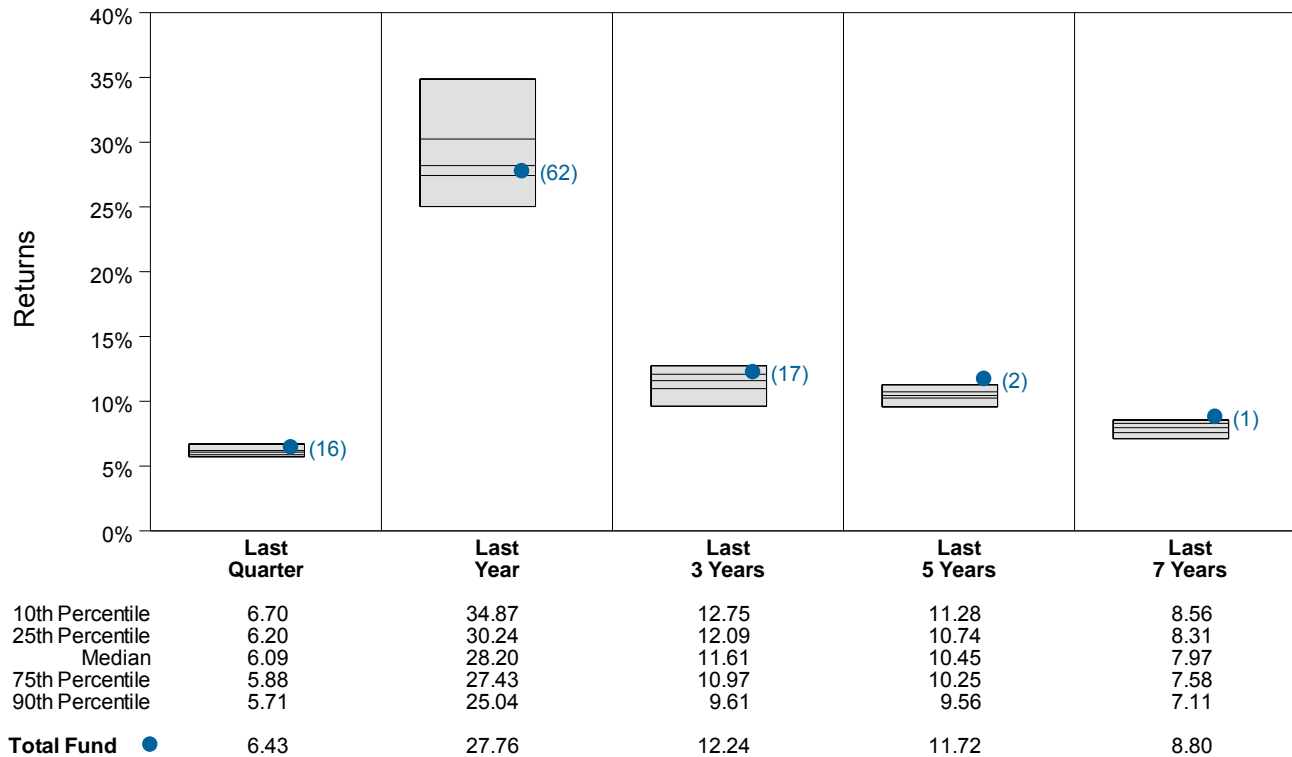
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Total Fund

Asset Allocation-Adjusted Gross of Fee Performance versus Very Large Public DB Plan (>\$10B) Peers as of June 30, 2021

- 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.

Asset Allocation Adjusted Ranking



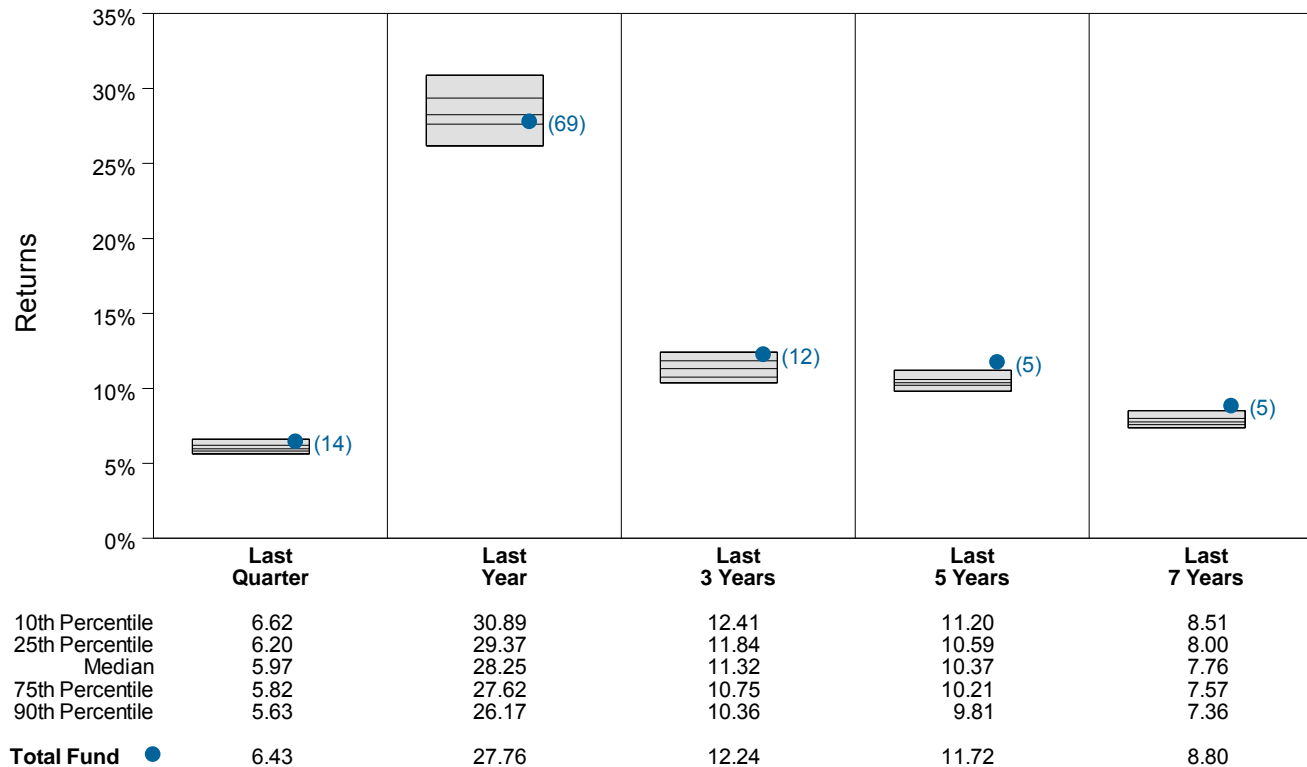
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Total Fund

Asset Allocation-Adjusted Gross of Fee Performance versus Large Public DB Plan (>\$1B) Peers as of June 30, 2021

- 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.

Asset Allocation Adjusted Ranking

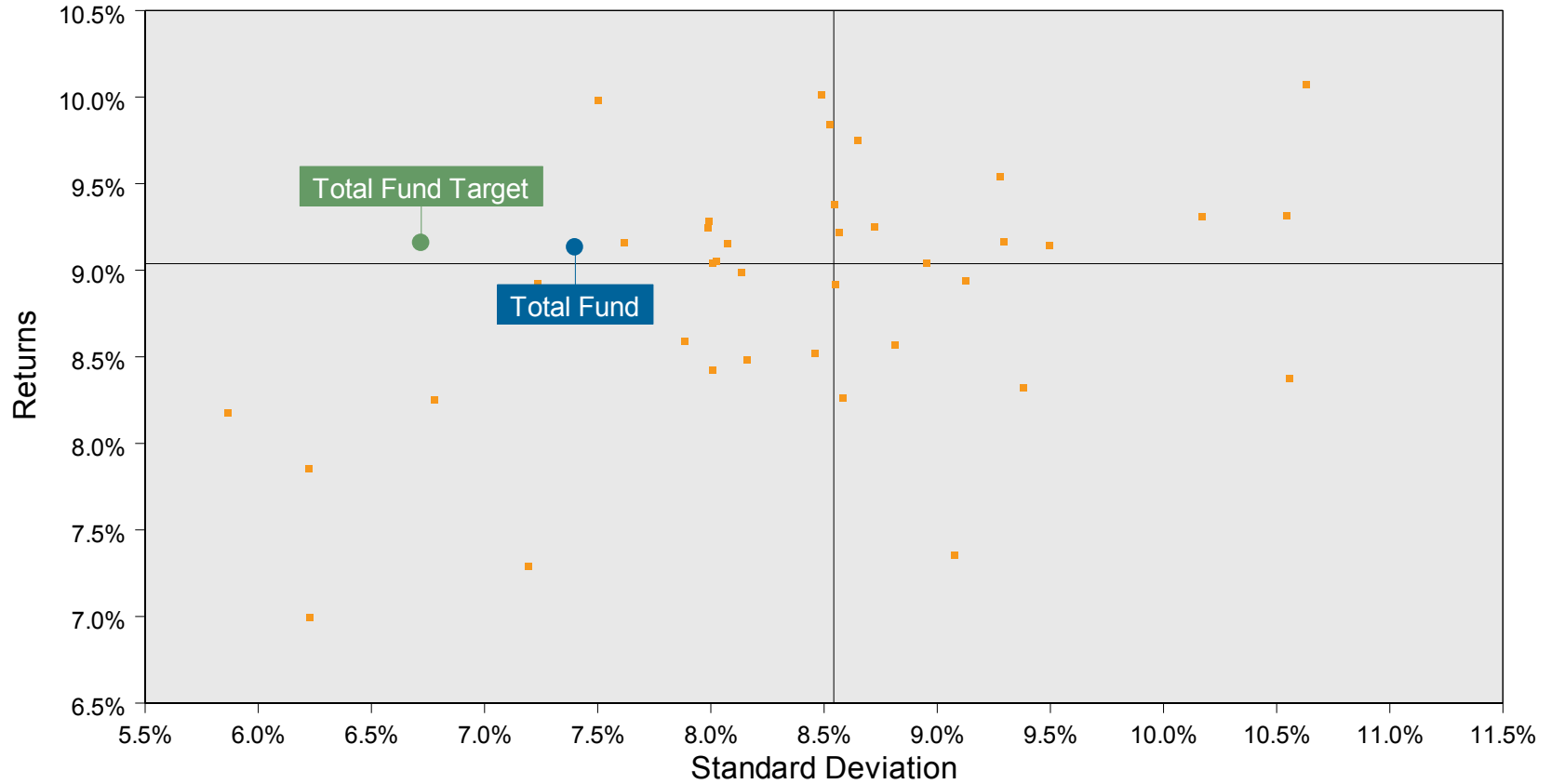


Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

Risk vs. Return versus Very Large Public DB Plan (>\$10B) Peers as of June 30, 2021

Ten Year Annualized Risk vs Return



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

Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

Rolling 3-year Gross of Fee Performance versus Benchmark as of June 30, 2021

Rolling 12 Quarter Gross of Fee Returns
for 15 Years Ended June 30, 2021



Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Total Fund

Rolling 5-year Gross of Fee Performance versus Benchmark as of June 30, 2021

Rolling 20 Quarter Gross of Fee Returns
for 15 Years Ended June 30, 2021



Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index lagged 3 months, 0.0% HFRI Fund of Funds Compos and 0.0% S&P:LSTA Lev Loan.

Asset Class Returns

As of June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance							
Total Fund	\$38,004	100.00%	6.01%	9.75%	27.79%	10.95%	10.69%
Total Fund Custom Benchmark(1)	-	-	5.98%	9.81%	26.90%	12.10%	11.25%
Public Market Equiv Benchmark(2)	-	-	4.79%	8.64%	25.99%	11.74%	11.45%
60/40 Index(3)	-	-	5.02%	6.79%	23.07%	11.06%	10.11%
U.S. Equity	\$9,514	25.03%	7.65%	15.00%	46.17%	17.64%	16.99%
Russell 3000 Index	-	-	8.24%	15.11%	44.16%	18.73%	17.89%
Int'l Developed Mkts Equity	\$4,858	12.78%	6.31%	10.66%	36.54%	9.52%	11.75%
MSCI World ex US IMI	-	-	5.52%	9.92%	34.82%	8.62%	10.58%
Emerging Mkts Equity	\$1,524	4.01%	5.93%	9.07%	46.00%	14.16%	15.53%
MSCI EM IMI	-	-	5.73%	8.75%	43.21%	11.38%	12.86%
Private Equity	\$5,596	14.72%	12.11%	25.94%	57.89%	20.19%	16.85%
Burgiss Private Equity Index (Qtr lag)	-	-	7.58%	22.45%	42.36%	16.91%	16.28%
Global Equity + 3% (Qtr lag)(4)	-	-	6.41%	23.02%	61.74%	19.53%	19.32%
Private Credit	\$1,909	5.02%	5.50%	11.52%	24.59%	13.17%	-
S&P Levered Loan Index + 1% (Qtr lag)	-	-	2.02%	6.14%	21.72%	5.21%	6.33%
Fixed Income	\$9,794	25.77%	2.53%	(1.15%)	2.84%	4.81%	3.42%
Blmbg U.S. Agg Bond Index	-	-	1.83%	(1.60%)	(0.33%)	5.34%	3.03%
Inflation Protection (TIPS)	\$1,509	3.97%	3.25%	1.45%	6.44%	6.35%	4.15%
Blmbg U.S. TIPS Index	-	-	3.25%	1.73%	6.51%	6.53%	4.17%
Real Estate	\$2,695	7.09%	4.29%	6.96%	11.81%	4.43%	3.92%
Real Estate Custom Bench (Qtr lag)(5)	-	-	2.98%	5.04%	5.45%	4.76%	5.35%
CPI + 3% (Qtr lag)	-	-	2.40%	3.23%	5.62%	5.01%	5.15%
Cash	\$581	1.53%	0.02%	0.04%	0.13%	1.39%	1.38%
3-month Treasury Bill	-	-	(0.00%)	0.02%	0.09%	1.34%	1.17%

(1) Total Fund Custom Benchmark returns provided by RVK prior to 12/31/2018. Starting 01/01/2020, benchmark consists of: 26% Bloomberg U.S. Agg Bond Index, 14% SERS Private Equity Composite, 25% Russell 3000 Index, 13% MSCI World ex US IMI Index, 8% Real Estate Custom Benchmark, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 4% MSCI Emerging Markets IMI Index, 4% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index,

(2) Public Market Equivalent Benchmark returns provided by RVK prior to 12/31/2018. As of 01/01/2020, benchmark consists of: 26% Bloomberg U.S. Agg Bond Index, 25% Russell 3000, 13% MSCI World ex US Index, 10.5% Russell 3000+ 3% (Qtr lag), 8% CPI+3% (Qtr Lag), 4% S&P/LSTA Levered Loan Index +1% (Qtr lag), 4% Bloomberg US TIPS Index, 4% MSCI Emerging Markets Index, 3.5% MSCI World ex US +3% (Qtr lag), 2% ICE BofAML 3 Mo US T-Bill Index.

(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 June 30, 2021

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance					
Total Fund	8.27%	6.70%	7.12%	8.02%	9.72% (1/81)
Total Fund Custom Benchmark(1)	9.16%	7.95%	7.89%	8.47%	-
Public Market Equiv Benchmark(2)	9.35%	8.08%	7.99%	8.55%	-
60/40 Index(3)	7.53%	6.76%	6.77%	6.84%	-
U.S. Equity	14.18%	9.48%	8.48%	9.42%	11.22% (1/81)
Russell 3000 Index	14.70%	10.78%	8.92%	9.87%	11.62% (1/81)
Int'l Developed Mkts Equity	7.06%	4.71%	-	-	6.95% (1/02)
MSCI World ex US IMI	5.96%	4.71%	6.30%	5.52%	7.01% (1/02)
Emerging Mkts Equity	4.91%	5.10%	-	-	8.62% (1/02)
MSCI EM IMI	4.31%	6.78%	10.14%	5.51%	10.44% (1/02)
Private Equity	12.92%	11.96%	10.14%	13.52%	11.67% (1/86)
Burgiss Private Equity Index (Qtr lag)	13.55%	12.56%	11.34%	14.57%	17.14% (1/86)
Global Equity + 3% (Qtr lag)(4)	16.78%	13.36%	12.18%	13.10%	14.99% (1/86)
Private Credit	-	-	-	-	10.93% (12/17)
S&P Levered Loan Index + 1% (Qtr lag)	5.28%	5.65%	5.79%	-	5.36% (12/17)
Fixed Income	3.49%	4.94%	5.49%	5.80%	8.19% (1/81)
Blmbg U.S. Agg Bond Index	3.39%	4.43%	4.56%	5.14%	7.49% (1/81)
Inflation Protection (TIPS)	2.74%	4.00%	-	-	3.66% (2/03)
Blmbg U.S. TIPS Index	3.40%	4.56%	5.16%	-	4.63% (2/03)
Real Estate	6.86%	3.90%	6.47%	7.69%	8.29% (3/84)
Real Estate Custom Bench (Qtr lag)(5)	8.65%	5.48%	7.03%	8.06%	-
CPI + 3% (Qtr lag)	4.72%	4.90%	5.06%	5.15%	5.61% (3/84)
Cash	0.90%	1.39%	1.76%	2.51%	3.49% (1/87)
3-month Treasury Bill	0.63%	1.08%	1.37%	2.17%	3.21% (1/87)

(1) Total Fund Custom Benchmark returns provided by RVK prior to 12/31/2018. Starting 01/01/2020, benchmark consists of: 26% Bloomberg U.S. Agg Bond Index, 14% SERS Private Equity Composite, 25% Russell 3000 Index, 13% MSCI World ex US IMI Index, 8% Real Estate Custom Benchmark, 4% S&P/LSTA Leveraged Loan Index + 1% (Qtr lag), 4% MSCI Emerging Markets IMI Index, 4% Bloomberg US TIPS Index, 2% ICE BofAML 3 Mo US T-Bill Index,

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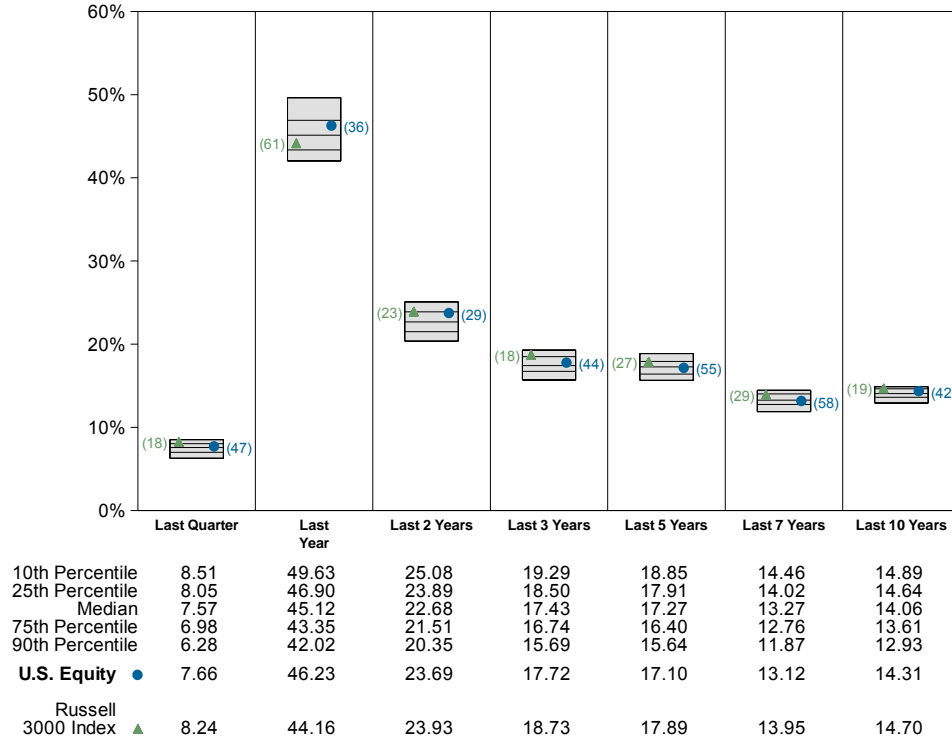
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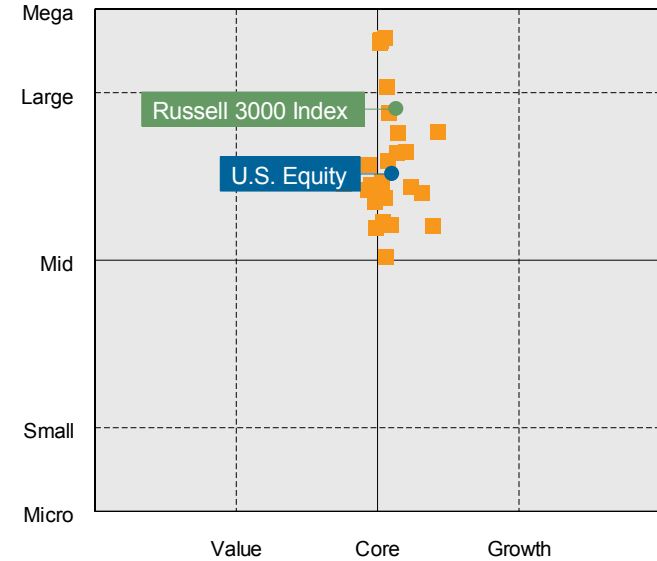
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U.S. Equity as of June 30, 2021

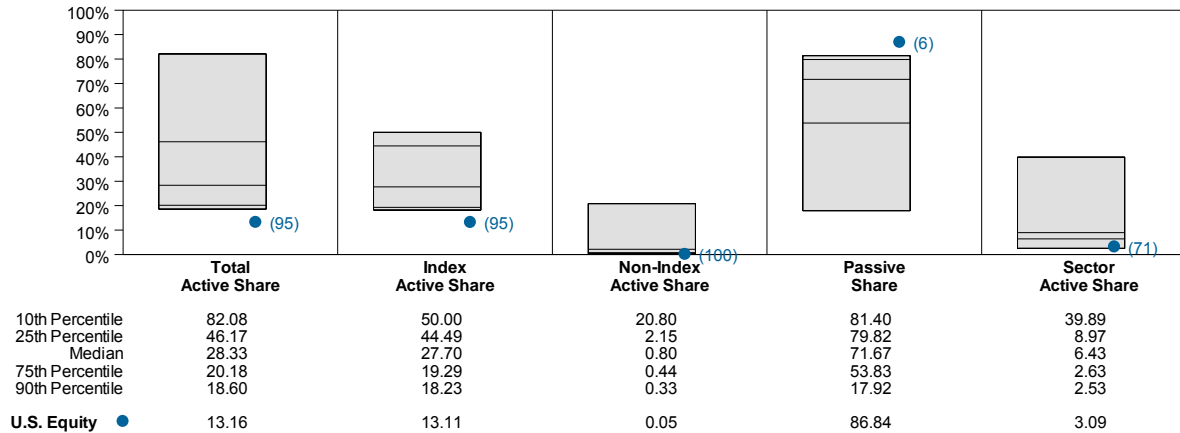
Performance vs Public Fund - Domestic Equity (Gross)



Style Map vs Pub Pln- Dom Equity Holdings as of June 30, 2021



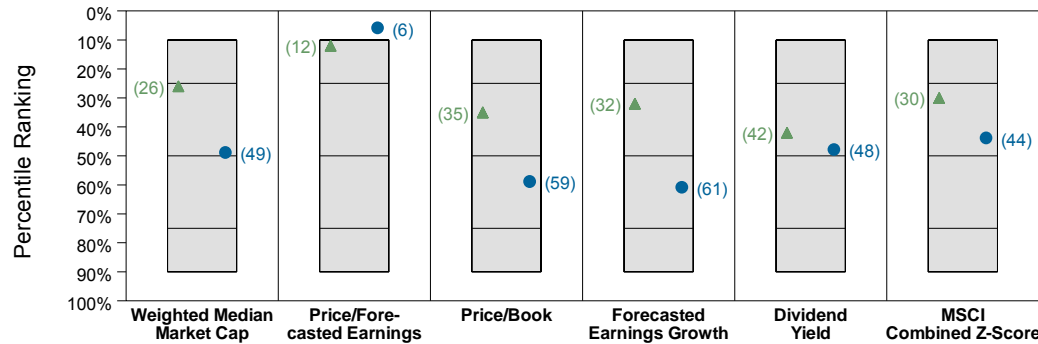
Active Share vs. Pub Pln- Dom Equity



U.S. Equity

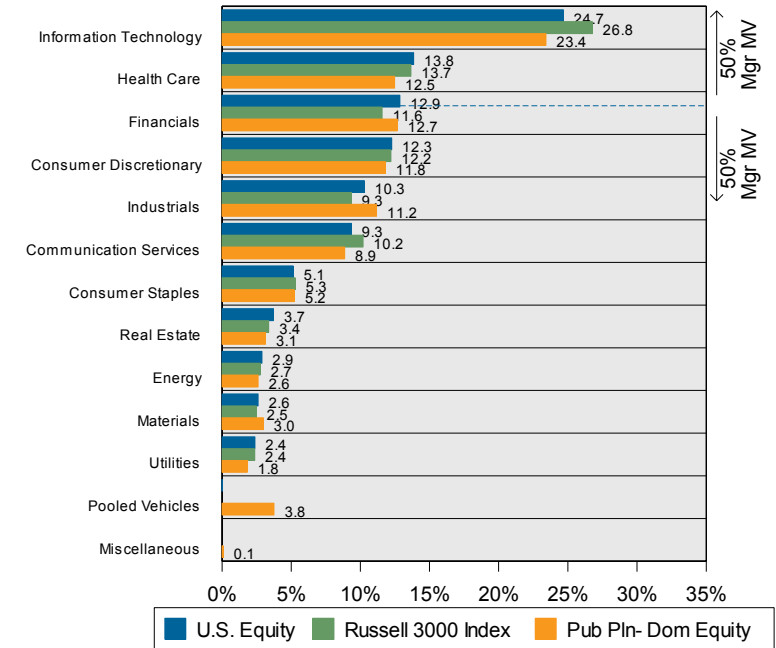
As of June 30, 2021

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of June 30, 2021

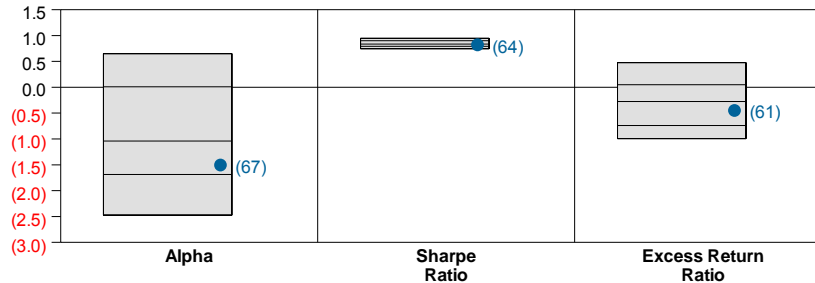


	Weighted Median Market Cap	Price/Forecasted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	193.89	22.97	4.38	20.09	1.37	0.18
25th Percentile	134.74	22.13	4.31	19.34	1.35	0.04
Median	76.57	21.53	3.80	19.10	1.25	(0.02)
75th Percentile	64.38	20.25	3.41	18.48	1.13	(0.05)
90th Percentile	42.28	19.21	3.23	17.48	1.03	(0.10)
U.S. Equity	80.70	23.39	3.64	18.88	1.25	(0.01)
Russell 3000 Index	128.18	22.71	4.08	19.18	1.28	0.01

Sector Allocation
June 30, 2021



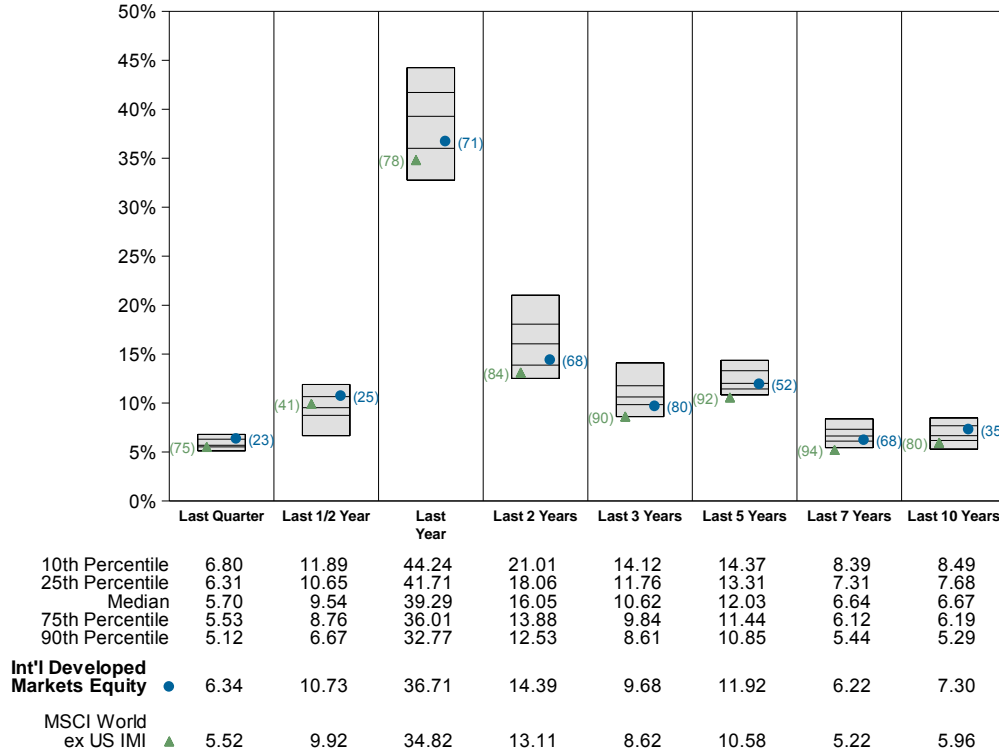
Risk Adjusted Return Measures vs Russell 3000 Index
Rankings Against Public Fund - Domestic Equity (Gross)
Five Years Ended June 30 2021



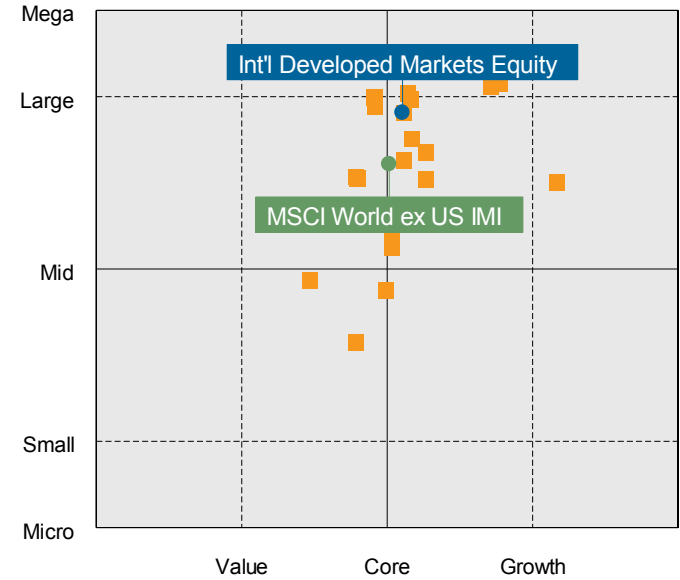
	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.65	0.95	0.48
25th Percentile	0.01	0.90	0.05
Median	(1.04)	0.84	(0.28)
75th Percentile	(1.69)	0.79	(0.74)
90th Percentile	(2.47)	0.74	(1.00)
U.S. Equity	(1.51)	0.81	(0.46)

International Equity as of June 30, 2021

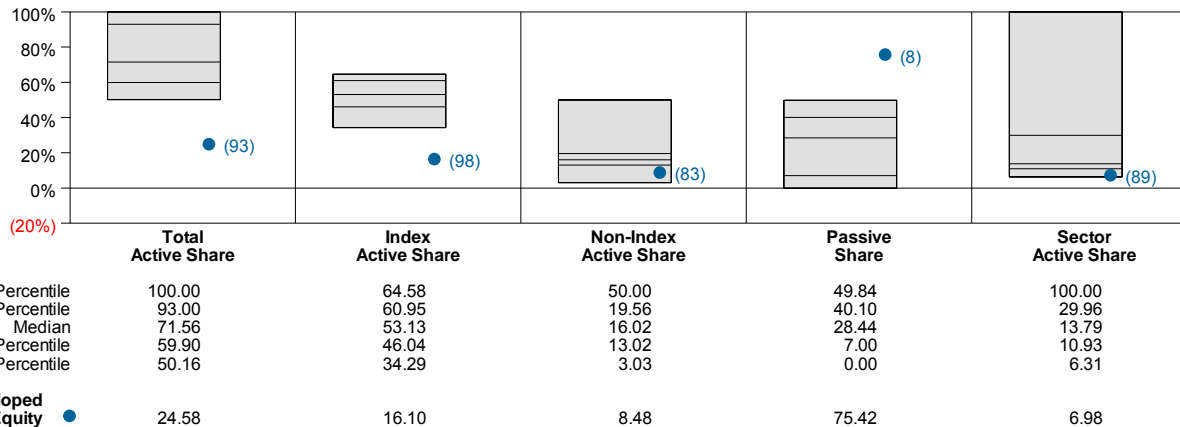
Performance vs Public Fund - International Equity (Gross)



Style Map vs Pub Pln- Intl Equity Holdings as of June 30, 2021



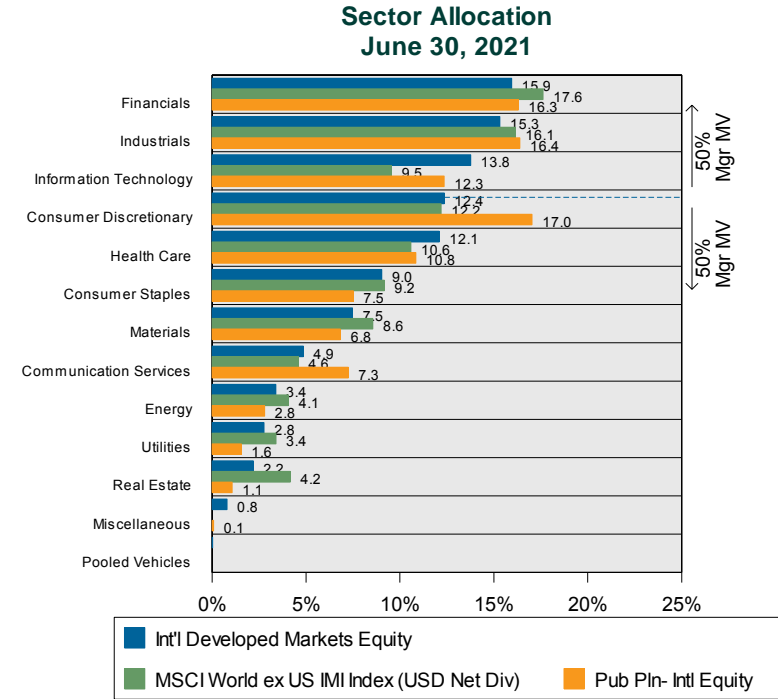
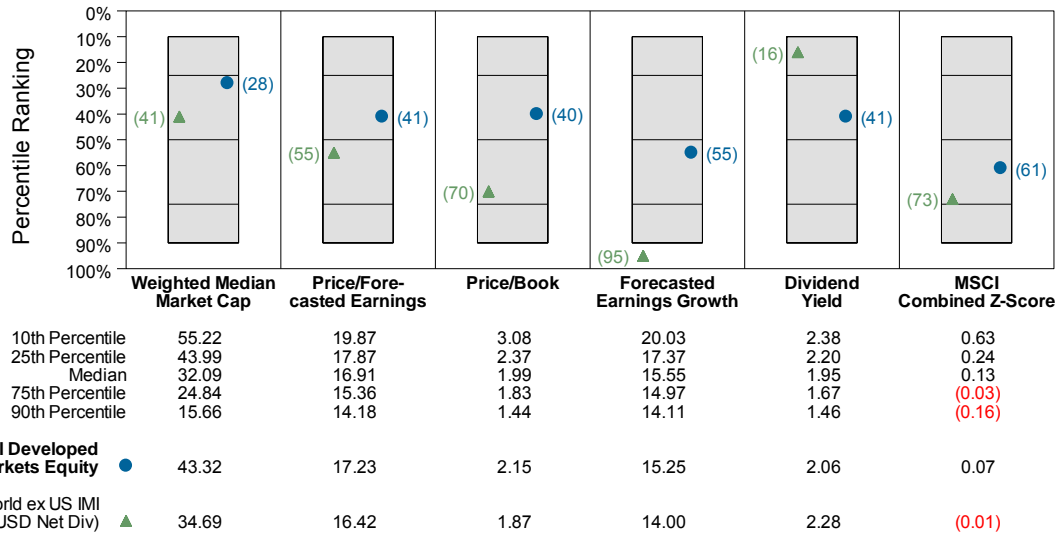
Active Share vs. Pub Pln- Intl Equity



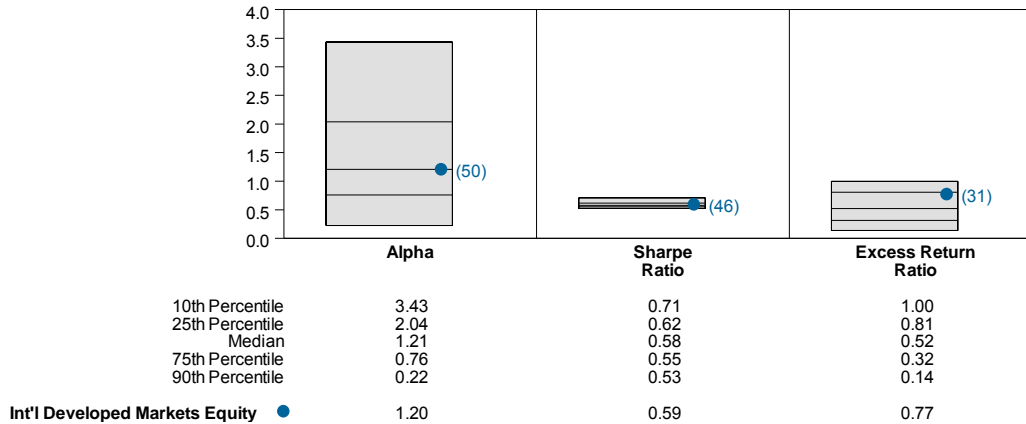
International Equity

As of June 30, 2021

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - International Equity
as of June 30, 2021

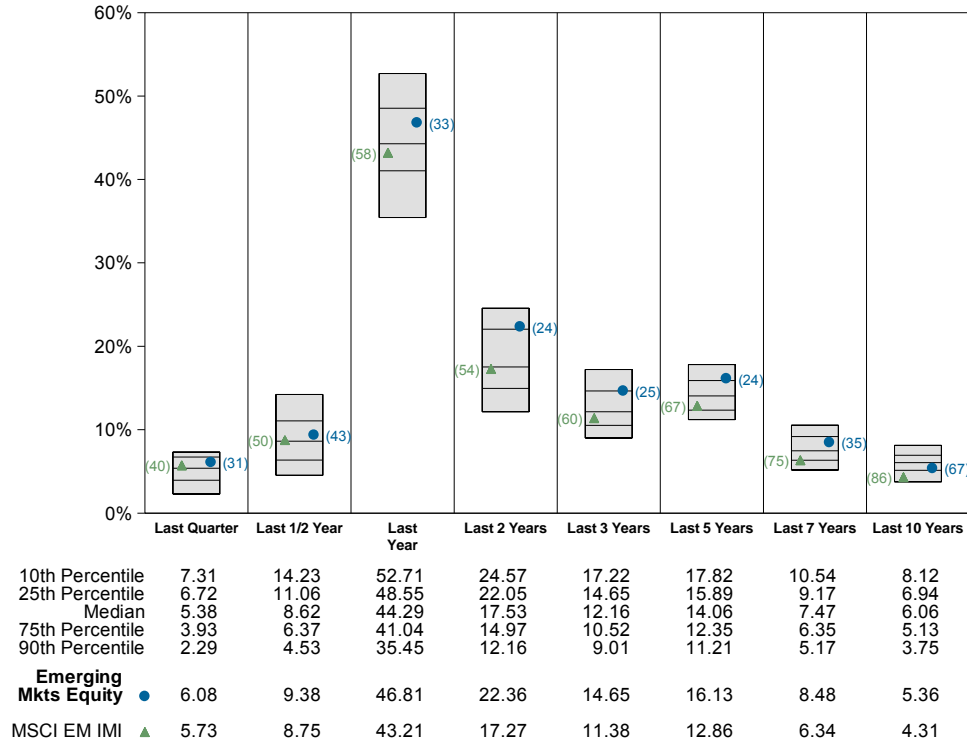


Risk Adjusted Return Measures vs MSCI World ex US IMI
Rankings Against Public Fund - International Equity (Gross)
Five Years Ended June 30, 2021

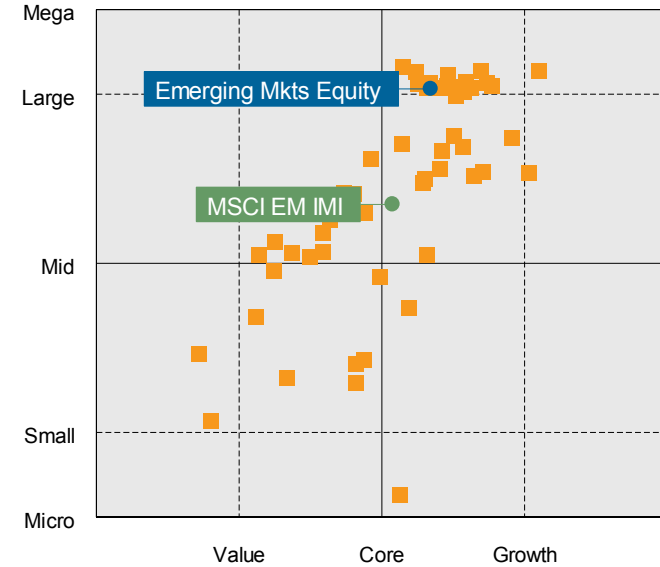


Emerging Markets Equity as of June 30, 2021

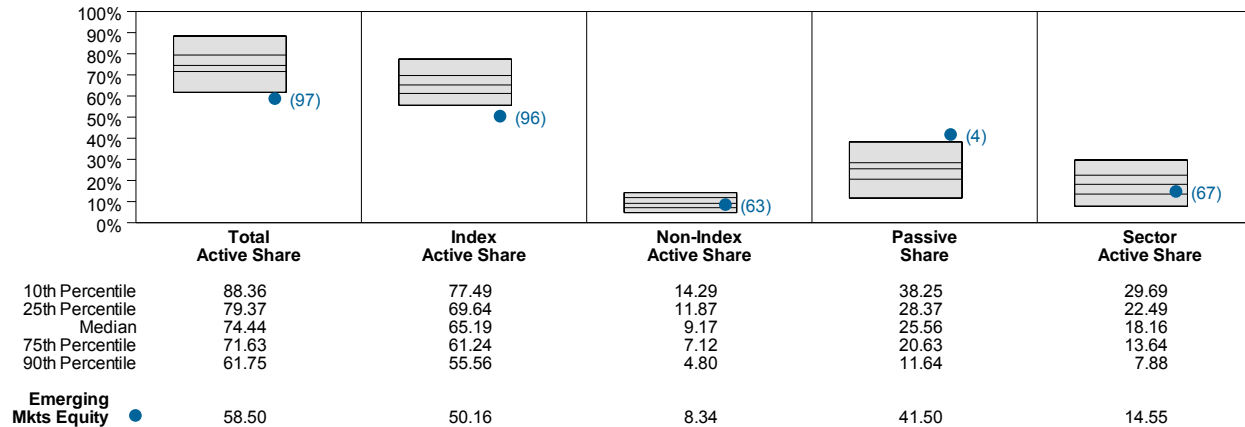
Performance vs Callan Emerging Broad (Gross)



Style Map vs Callan Emerging Broad Holdings as of June 30, 2021



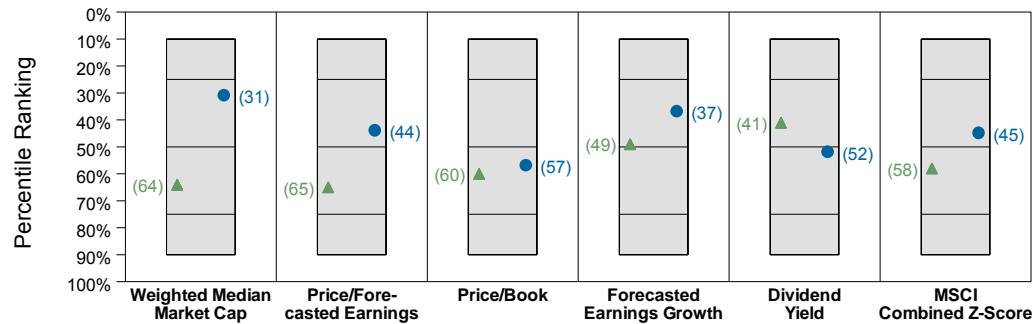
Active Share vs. Callan Emerging Broad



Emerging Markets Equity

As of June 30, 2021

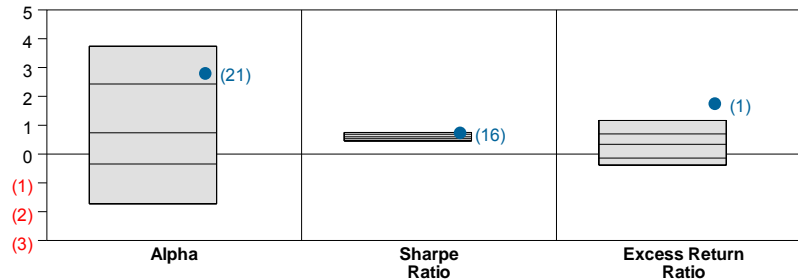
Portfolio Characteristics Percentile Rankings
Rankings Against Callan Emerging Broad
as of June 30, 2021



Emerging Mkts Equity ● 55.11 16.13 2.01 19.34 1.66 0.26

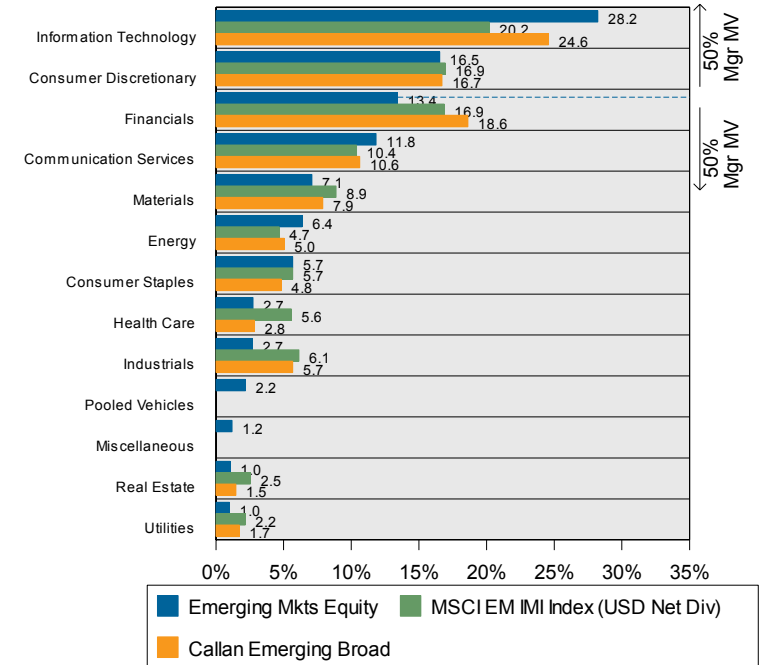
MSCI EM IMI Index (USD Net Div) ▲ 27.14 11.90 1.79 18.67 1.96 0.04

Risk Adjusted Return Measures vs MSCI EM IMI
Rankings Against Callan Emerging Broad (Gross)
Five Years Ended June 30, 2021



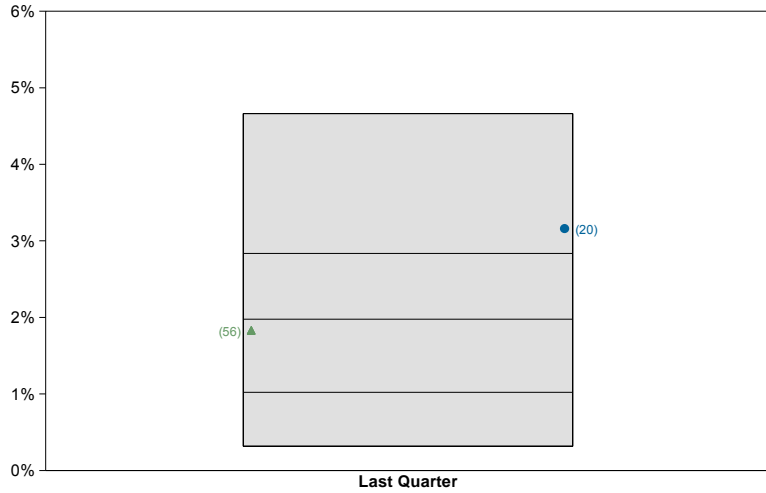
Emerging Mkts Equity ● 2.78 0.71 1.73

Sector Allocation June 30, 2021



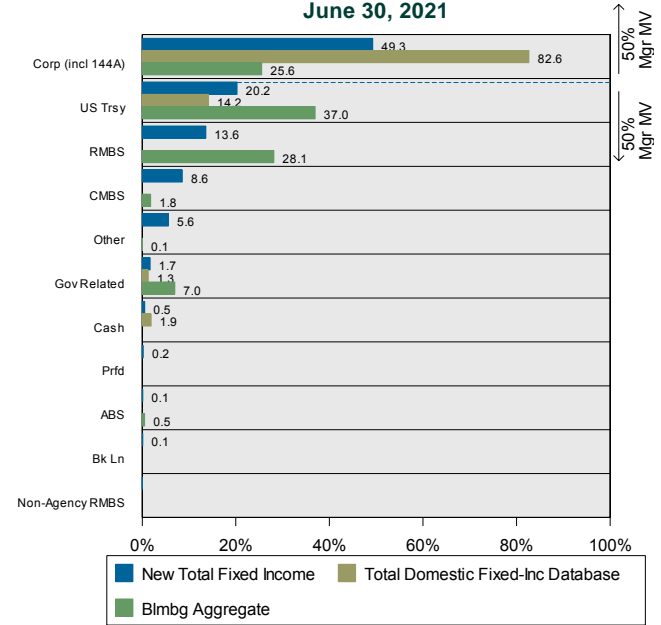
New Fixed Income Structure As of June 30, 2021

Performance vs Total Domestic Fixed-Inc Database (Gross)

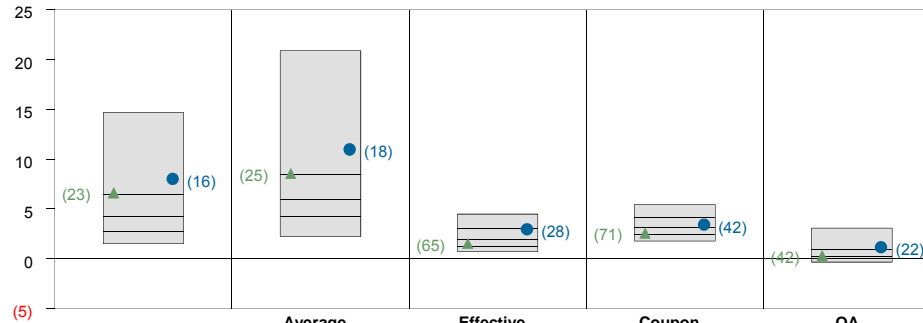


10th Percentile	4.66
25th Percentile	2.84
Median	1.98
75th Percentile	1.02
90th Percentile	0.32
New Total Fixed Income Structure ●	3.15
Bimbg Aggregate ▲	1.83

Sector Allocation
June 30, 2021



Fixed Income Portfolio Characteristics
Rankings Against Total Fixed Income Database

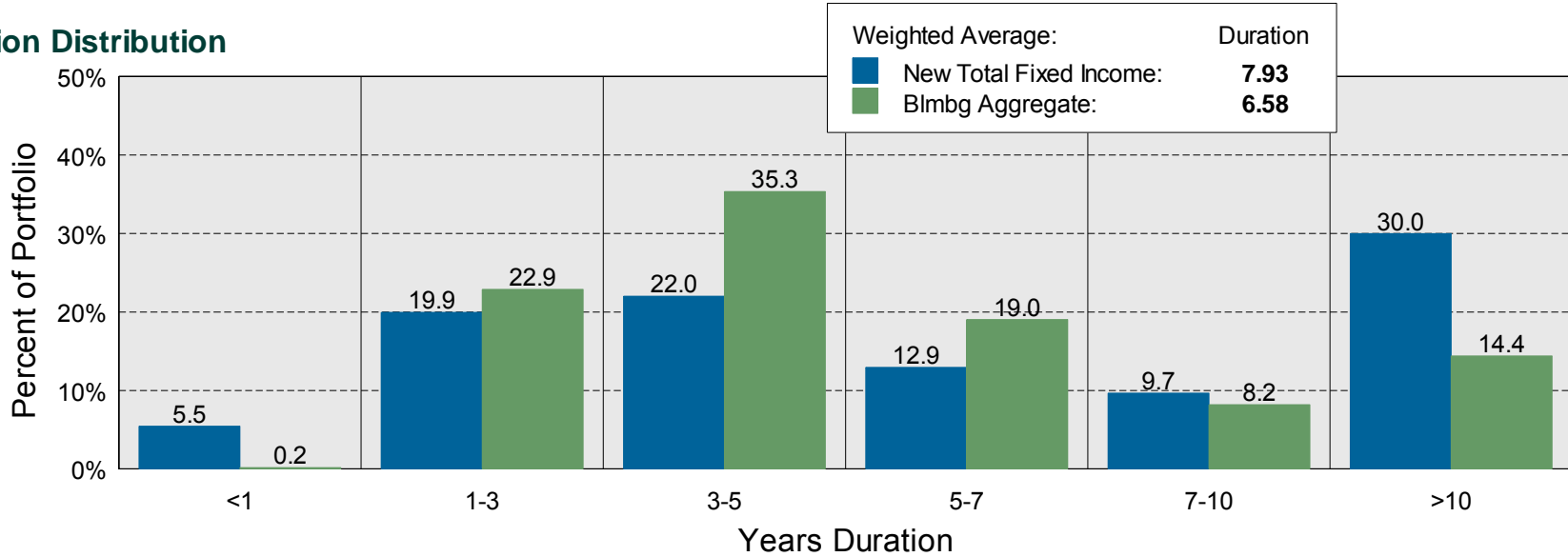


	Duration	Average Life	Effective Yield	Coupon Rate	OA Convexity
10th Percentile	14.67	20.86	4.45	5.42	3.06
25th Percentile	6.47	8.46	3.06	4.13	0.90
Median	4.19	5.91	1.93	3.11	0.22
75th Percentile	2.74	4.19	1.17	2.41	0.00
90th Percentile	1.48	2.22	0.71	1.74	(0.34)
New Total Fixed Income ●	7.93	10.91	2.90	3.35	1.08
Bimbg Aggregate ▲	6.58	8.53	1.50	2.55	0.28

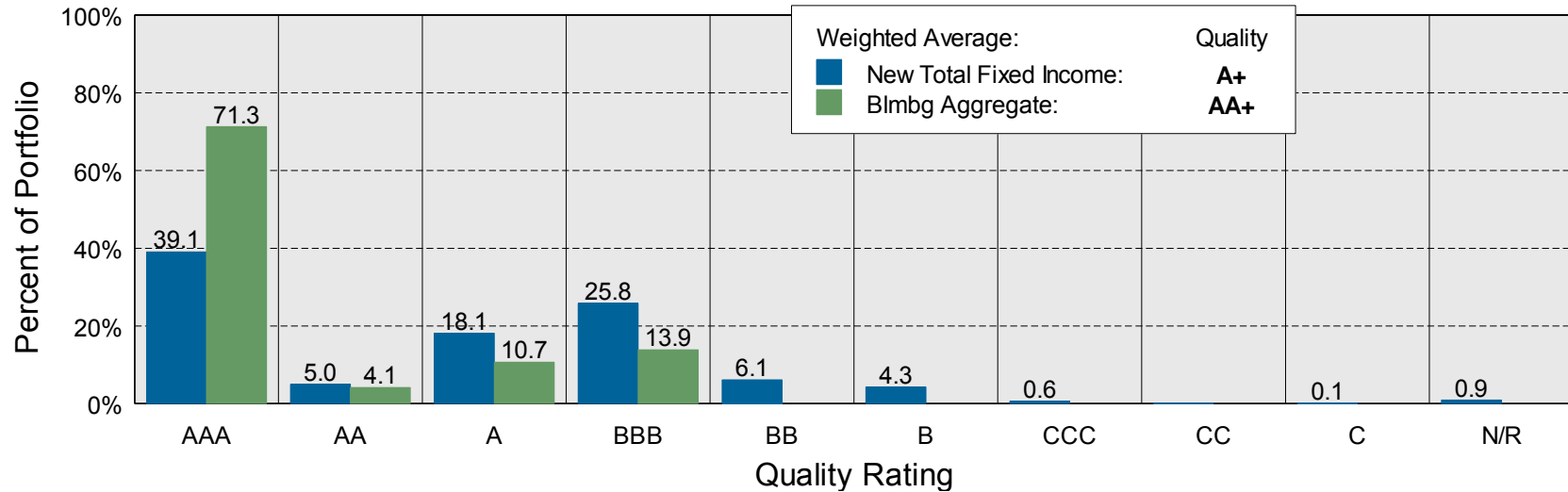
New Fixed Income Structure

As of June 30, 2021

Duration Distribution

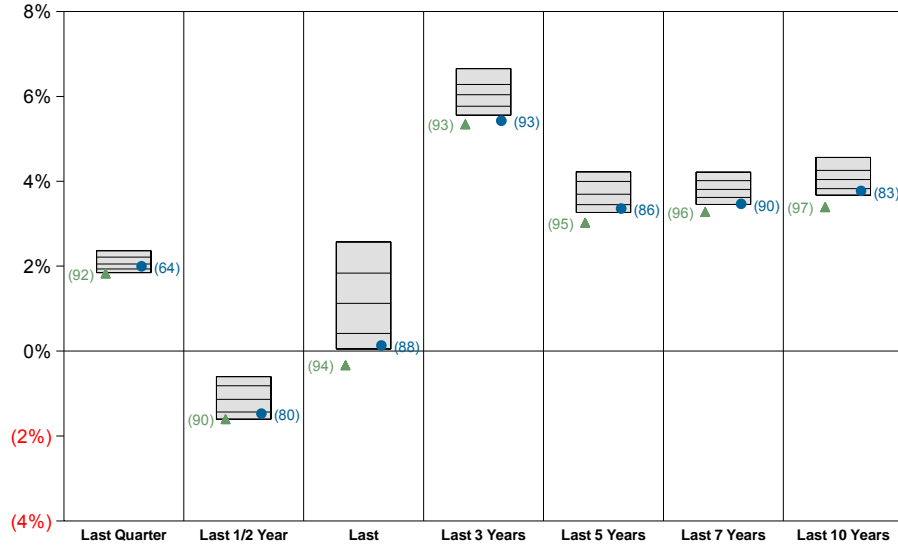


Quality Distribution



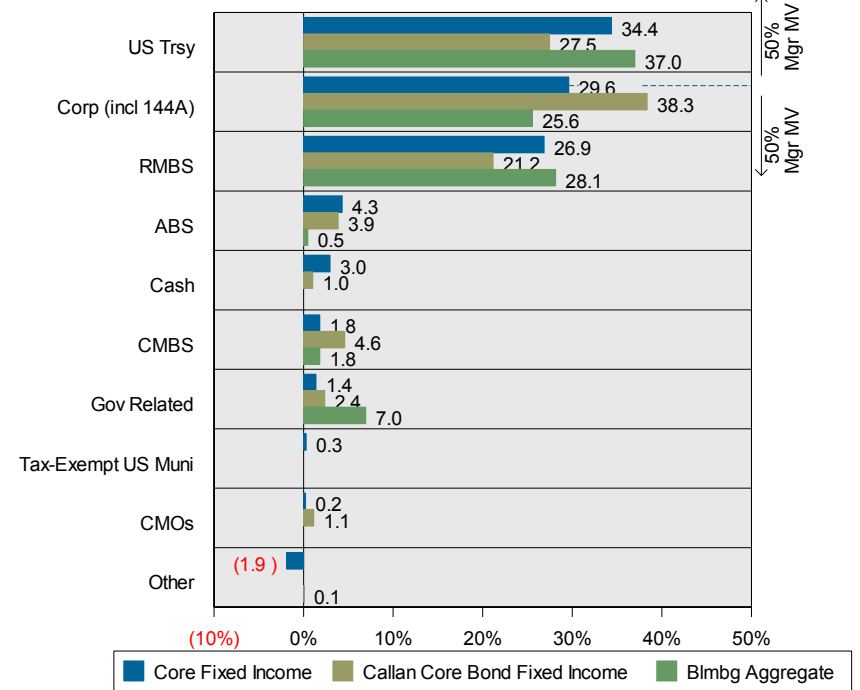
Core Fixed Income As of June 30, 2021

Performance vs Callan Core Bond Fixed Income (Gross)

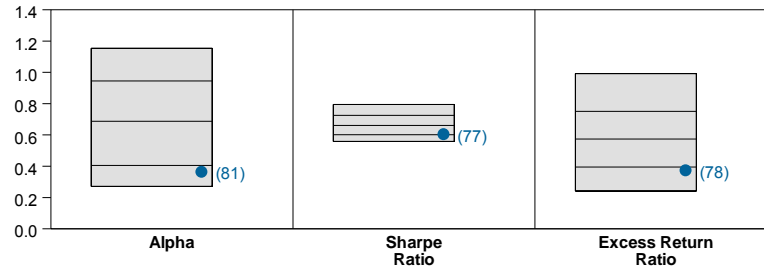


10th Percentile	2.37	(0.60)	2.57	6.65	4.22	4.21	4.56
25th Percentile	2.21	(0.82)	1.84	6.28	3.99	4.01	4.26
Median	2.05	(1.14)	1.13	6.04	3.69	3.81	4.04
75th Percentile	1.93	(1.43)	0.42	5.77	3.45	3.62	3.83
90th Percentile	1.85	(1.61)	0.05	5.56	3.26	3.45	3.67
Core Fixed Income ●	1.99	(1.48)	0.12	5.42	3.35	3.46	3.76
Blmbg Aggregate ▲	1.83	(1.60)	(0.33)	5.34	3.03	3.28	3.39

Sector Allocation June 30, 2021



Risk Adjusted Return Measures vs Blmbg Aggregate Rankings Against Public Fund - Domestic Fixed (Gross) Five Years Ended June 30, 2021

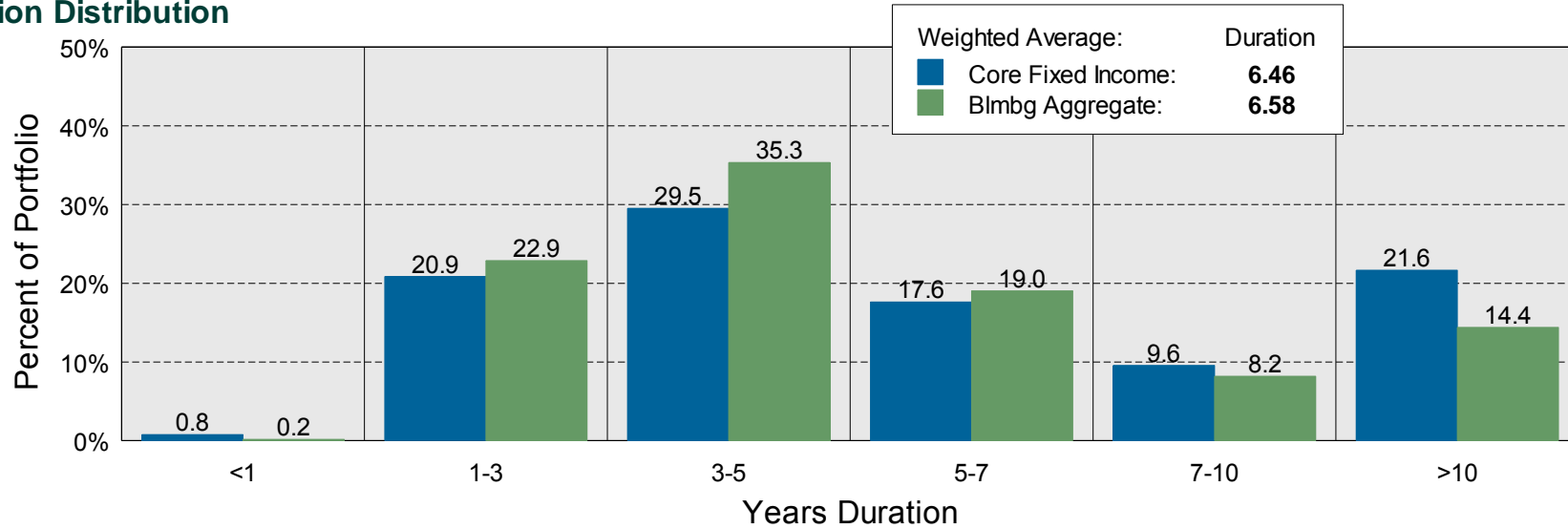


10th Percentile	1.15	0.79	0.99
25th Percentile	0.95	0.72	0.75
Median	0.69	0.66	0.57
75th Percentile	0.41	0.60	0.39
90th Percentile	0.27	0.56	0.24
Core Fixed Income ●	0.36	0.60	0.37

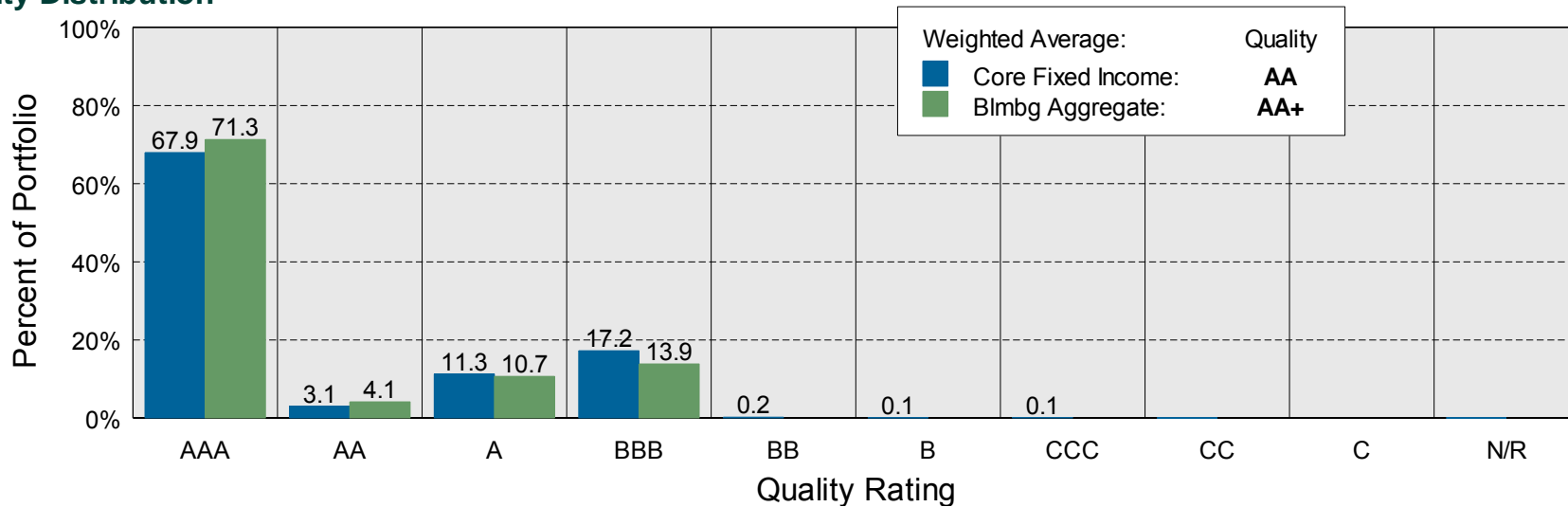
Core Fixed Income

As of June 30, 2021

Duration Distribution

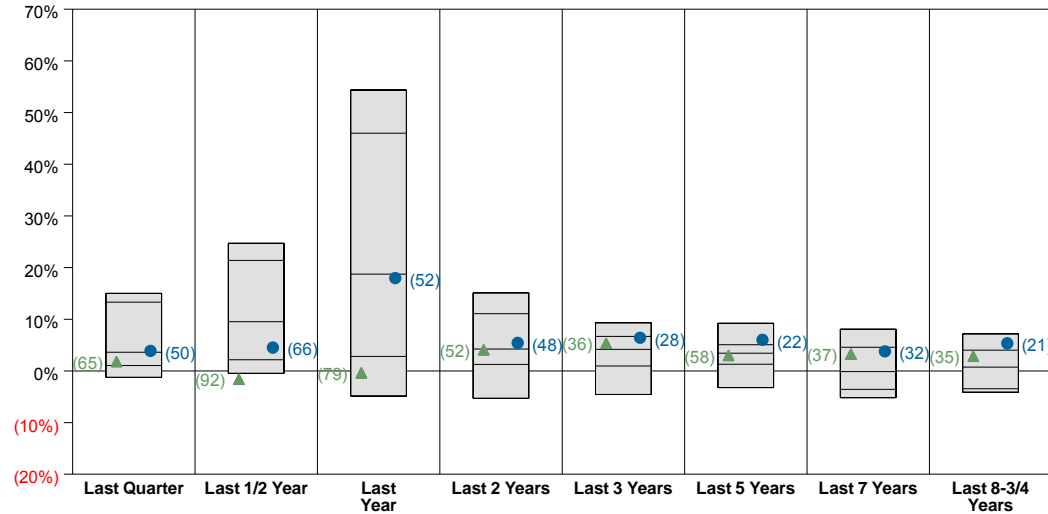


Quality Distribution



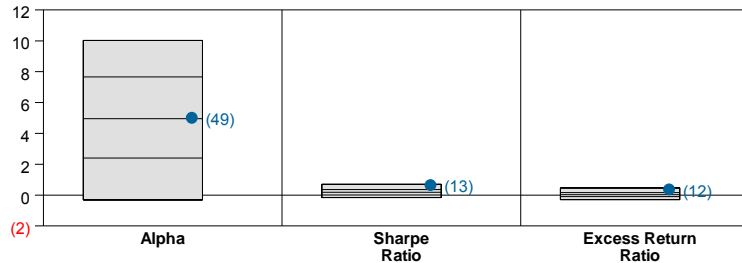
Opportunistic Fixed Income As of June 30, 2021

Performance vs Callan Alternative Investments DB (Gross)



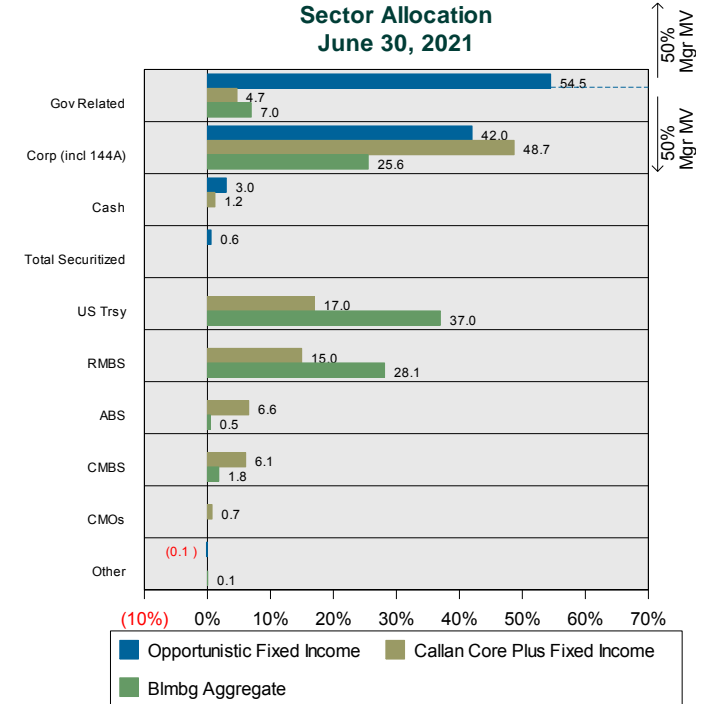
10th Percentile	15.01	24.71	54.37	15.11	9.30	9.24	8.08	7.16
25th Percentile	13.32	21.38	46.00	11.08	6.66	5.09	4.58	4.04
Median	3.60	9.54	18.76	4.23	4.17	3.44	(0.12)	0.73
75th Percentile	1.04	2.16	2.80	1.26	0.94	1.29	(3.58)	(3.46)
90th Percentile	(1.23)	(0.47)	(4.89)	(5.30)	(4.55)	(3.21)	(5.19)	(4.11)
Opportunistic Fixed Income	● 3.77	4.41	17.86	5.31	6.33	5.91	3.67	5.24
Blmbg Aggregate	▲ 1.83	(1.60)	(0.33)	4.10	5.34	3.03	3.28	2.85

Risk Adjusted Return Measures vs Blmbg Aggregate Rankings Against Callan Alternative Investments DB (Gross) Five Years Ended June 30, 2021



10th Percentile	10.02	0.70	0.47
25th Percentile	7.66	0.36	0.16
Median	4.96	0.18	0.03
75th Percentile	2.40	0.01	(0.10)
90th Percentile	(0.31)	(0.16)	(0.29)
Opportunistic Fixed Income	● 4.99	0.61	0.33

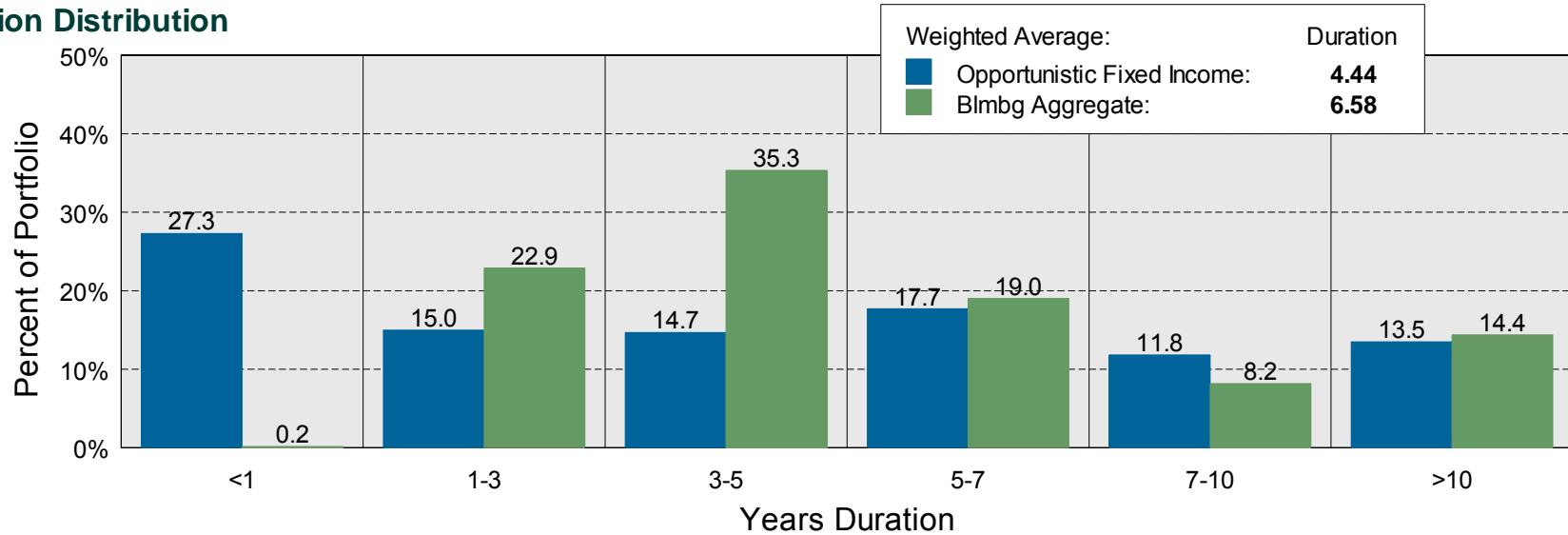
Sector Allocation June 30, 2021



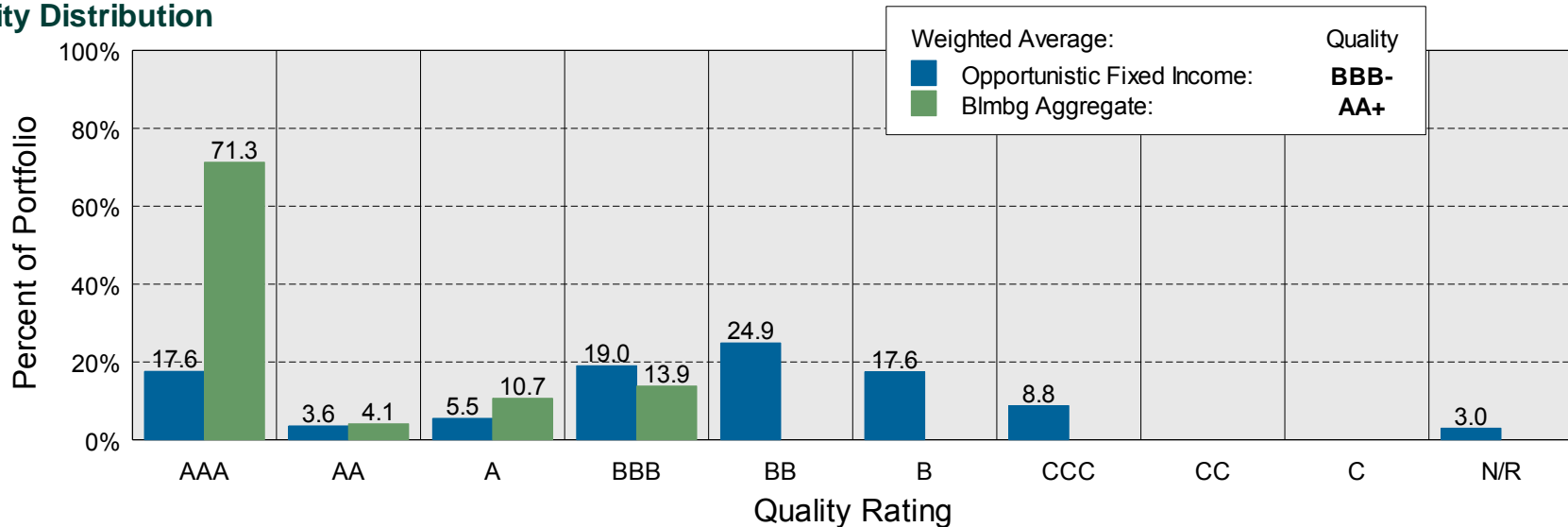
Opportunistic Fixed Income

As of June 30, 2021

Duration Distribution



Quality Distribution



Callan

Appendix I – Investment Manager Returns

Investment Manager Returns

As of June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance- Domestic Equity							
U.S. Equity	\$9,514	100.00%	7.65%	15.00%	46.17%	17.64%	16.99%
Russell 3000 Index (1)	-	-	8.24%	15.11%	44.16%	18.73%	17.89%
MCM Russell 1000 Index	7,694	80.87%	8.52%	14.95%	43.04%	19.12%	17.98%
Russell 1000 Index	-	-	8.54%	14.95%	43.07%	19.16%	17.99%
MCM Russell 2000 Core Index	397	4.17%	3.82%	17.07%	60.52%	13.08%	-
Russell 2000 Index	-	-	4.29%	17.54%	62.03%	13.52%	16.47%
MCM Russell 2000 Val Index	773	8.12%	4.67%	26.76%	73.31%	10.30%	-
Russell 2000 Value Index	-	-	4.56%	26.69%	73.28%	10.27%	13.62%
Emerald Asset Management	650	6.83%	3.47%	4.58%	43.46%	15.54%	-
Russell 2000 Growth Index	-	-	3.92%	8.98%	51.36%	15.94%	18.76%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance- Domestic Equity					
U.S. Equity	14.18%	9.48%	8.48%	9.42%	11.22% ^(1/81)
Russell 3000 Index (1)	14.70%	10.78%	8.92%	9.79%	11.52% ^(1/81)
MCM Russell 1000 Index	-	-	-	-	16.28% ^(1/12)
Russell 1000 Index	14.90%	10.89%	8.90%	9.96%	16.31% ^(1/12)
MCM Russell 2000 Core Index	-	-	-	-	14.14% ^(12/16)
Russell 2000 Index	12.34%	9.51%	9.26%	9.33%	14.45% ^(12/16)
MCM Russell 2000 Val Index	-	-	-	-	10.60% ^(12/16)
Russell 2000 Value Index	10.85%	7.90%	9.17%	10.01%	10.61% ^(12/16)
Emerald Asset Management	-	-	-	-	17.69% ^(12/16)
Russell 2000 Growth Index	13.52%	10.89%	8.99%	8.13%	17.78% ^(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 June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance- International Equity							
Int'l Developed Mkts Equity	\$4,858	100.00%	6.31%	10.66%	36.54%	9.52%	11.75%
MSCI World ex US IMI	-	-	5.52%	9.92%	34.82%	8.62%	10.58%
Walter Scott & Partners(1) MSCI World	752	15.47%	8.46%	9.54%	36.54%	18.14%	17.46%
	-	-	7.74%	13.05%	39.04%	14.99%	14.83%
BlackRock MSCI World Ex US Index MSCI World ex US	3,688	75.90%	5.80%	10.23%	34.20%	8.98%	-
	-	-	5.65%	9.92%	33.60%	8.57%	10.36%
Xpance Non-U.S. Small Cap MSCI ACWI ex US Small Cap	263	5.41%	6.58%	12.10%	46.23%	-	-
	-	-	6.35%	12.24%	47.04%	9.78%	11.97%
Harris Assoc Int'l SCV MSCI World ex US Sm Cap	150	3.08%	8.07%	20.07%	64.48%	10.71%	13.15%
	-	-	4.81%	9.92%	42.28%	8.92%	11.88%
MSCI World ex US Sm Value	-	-	4.34%	12.32%	44.91%	6.33%	9.93%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance- International Equity					
Int'l Developed Mkts Equity	7.06%	4.71%	-	-	6.95% (1/02)
MSCI World ex US IMI	5.96%	4.71%	6.30%	5.52%	7.01% (1/02)
Walter Scott & Partners(1) MSCI World	12.83%	-	-	-	10.62% (10/06)
	10.65%	7.79%	7.27%	7.45%	7.61% (10/06)
BlackRock MSCI World Ex US Index MSCI World ex US	-	-	-	-	8.52% (6/17)
	5.70%	4.46%	5.91%	5.37%	8.04% (6/17)
Xpance Non-U.S. Small Cap MSCI ACWI ex US Small Cap	-	-	-	-	10.33% (10/18)
	7.02%	6.65%	9.52%	6.60%	11.33% (10/18)
Harris Assoc Int'l SCV MSCI World ex US Sm Cap	8.18%	7.64%	-	-	11.60% (7/03)
	7.66%	6.11%	9.09%	-	10.04% (7/03)
MSCI World ex US Sm Value	6.43%	5.60%	9.36%	7.18%	9.67% (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 June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance- Emerging Mkts Equity							
Emerging Mkts Equity	\$1,524	100.00%	5.93%	9.07%	46.00%	14.16%	15.53%
MSCI EM IMI	-	-	5.73%	8.75%	43.21%	11.38%	12.86%
Macquarie Emg Mkts Equity	448	29.43%	4.32%	7.60%	40.06%	13.33%	15.33%
MSCI EM	-	-	5.05%	7.45%	40.90%	11.28%	13.03%
Martin Currie Emg Mkts Equity	509	33.37%	5.17%	7.36%	49.63%	15.11%	17.59%
MSCI EM	-	-	5.05%	7.45%	40.90%	11.28%	13.03%
BlackRock Emg Mkts Index	123	8.09%	5.03%	7.34%	40.41%	10.98%	-
MSCI EM	-	-	5.05%	7.45%	40.90%	11.28%	13.03%
Leading Edge Emg Mkts Fund	299	19.61%	4.31%	6.83%	41.15%	-	-
MSCI EM	-	-	5.05%	7.45%	40.90%	11.28%	13.03%
GlobeFlex Emerging Small Cap	145	9.50%	18.34%	29.12%	69.14%	13.80%	15.67%
MSCI EM Small Cap	-	-	11.25%	19.78%	63.75%	12.31%	11.86%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance- Emerging Mkts Equity					
Emerging Mkts Equity	4.91%	5.10%	-	-	8.62% ^(1/02)
MSCI EM IMI	4.31%	6.78%	10.14%	5.51%	10.44% ^(1/02)
Macquarie Emg Mkts Equity	-	-	-	-	7.58% ^(5/13)
MSCI EM	4.29%	6.61%	10.08%	-	5.97% ^(5/13)
Martin Currie Emg Mkts Equity	-	-	-	-	9.39% ^(1/14)
MSCI EM	4.29%	6.61%	10.08%	-	6.76% ^(1/14)
BlackRock Emg Mkts Index	-	-	-	-	10.22% ^(7/17)
MSCI EM	4.29%	6.61%	10.08%	-	10.50% ^(7/17)
Leading Edge Emg Mkts Fund	-	-	-	-	16.98% ^(11/18)
MSCI EM	4.29%	6.61%	10.08%	-	17.18% ^(11/18)
GlobeFlex Emerging Small Cap	-	-	-	-	8.98% ^(8/13)
MSCI EM Small Cap	4.55%	7.90%	11.15%	5.59%	7.26% ^(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 June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income							
Fixed Income (1)	\$9,794	42.18%	2.53%	(1.15%)	2.84%	4.81%	3.42%
Blmbg U.S. Agg Bond Index	-	-	1.83%	(1.60%)	(0.33%)	5.34%	3.03%
Core Fixed Income	\$4,804	20.69%	1.98%	(1.50%)	0.06%	5.32%	3.25%
Blmbg U.S. Agg Bond Index	-	-	1.83%	(1.60%)	(0.33%)	5.34%	3.03%
PIMCO Core Bond Fund	712	3.07%	2.06%	(0.88%)	1.71%	5.79%	3.67%
Blmbg Agg ex Treasury	-	-	1.88%	(1.02%)	1.41%	5.66%	3.48%
Mellon Bond Index	3,943	16.98%	1.90%	(1.68%)	(0.43%)	5.27%	2.95%
Blmbg U.S. Agg Bond Index (2)	-	-	1.83%	(1.60%)	(0.33%)	5.34%	3.03%
BMO (TCH) Corp FI	148	0.64%	3.64%	(1.21%)	4.59%	7.71%	5.41%
Blmbg Credit	-	-	3.32%	(1.28%)	2.99%	7.42%	4.63%
Nominal U.S. Treasuries	\$664	2.86%	3.16%	(5.99%)	(7.38%)	5.30%	1.71%
Blmbg US Treas Bell 10Y	-	-	3.06%	(4.17%)	(5.94%)	5.85%	1.75%
PIMCO US Treasuries	664	2.86%	3.16%	(4.13%)	(5.70%)	5.93%	2.28%
Blmbg US Treas Bell 10Y	-	-	3.06%	(4.17%)	(5.94%)	5.85%	1.75%
New Total Fixed Income Structure	\$3,978	17.13%	3.14%	-	-	-	-
Intermediate Treasury	\$194	0.84%	0.66%	-	-	-	-
Mellon Intermediate Treasury Index	194	0.84%	0.66%	-	-	-	-
Blmbg Intrmtd Treasury	-	-	0.62%	(1.14%)	(1.18%)	3.96%	1.93%
Long Duration	\$1,223	5.27%	6.92%	-	-	-	-
Mellon Long Duration Index	611	2.63%	7.00%	(7.99%)	-	-	-
Blmbg Long Treasury	-	-	6.46%	(7.92%)	(10.58%)	7.99%	3.13%
Mellon Long Term Credit Bond Index	612	2.63%	6.69%	-	-	-	-
Blmbg Long Credit	-	-	6.45%	(2.49%)	4.32%	10.73%	6.65%
Securitized	\$589	2.54%	0.37%	-	-	-	-
Mellon Securitized Index	589	2.54%	0.37%	-	-	-	-
Blmbg Securitized	-	-	0.44%	(0.74%)	(0.20%)	3.93%	2.35%
Intermediate Credit	\$1,381	5.95%	1.54%	-	-	-	-
Mellon Intermediate Credit	1,381	5.95%	1.54%	-	-	-	-
Blmbg Intrmtd Credit	-	-	1.56%	(0.54%)	2.25%	5.78%	3.64%
High Yield	\$591	2.55%	3.19%	-	-	-	-
Fidelity HY CMBS (3)	338	1.46%	3.32%	6.16%	17.22%	3.58%	3.73%
Blmbg US CMBS Ex AAA Index (4)	-	-	3.14%	3.50%	14.06%	6.64%	5.07%
BlackRock US High Yield Index	102	0.44%	2.76%	-	-	-	-
ICE BofA US HY Constrained Index	-	-	2.76%	3.71%	15.61%	7.12%	7.11%
Mellon High Yield Beta Fund	151	0.65%	-	-	-	-	-
Blmbg HY Corp	-	-	2.74%	3.62%	15.37%	7.45%	7.48%

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(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 June 30, 2021

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Fixed Income					
Fixed Income (1)	3.49%	4.94%	5.49%	5.80%	8.19% (1/81)
Bimbg U.S. Agg Bond Index	3.39%	4.43%	4.56%	5.14%	7.49% (1/81)
Core Fixed Income	3.63%	4.77%	-	-	4.75% (1/02)
Bimbg U.S. Agg Bond Index	3.39%	4.43%	4.56%	5.14%	4.44% (1/02)
PIMCO Core Bond Fund	-	-	-	-	3.15% (1/13)
Bimbg Agg ex Treasury	3.70%	4.71%	-	-	3.26% (1/13)
Mellon Bond-Index	3.29%	4.31%	4.51%	5.17%	6.98% (4/84)
Bimbg U.S. Agg Bond Index (2)	3.39%	4.43%	4.62%	5.27%	-
BMO (TCH) Corp FI	5.13%	5.78%	5.82%	-	5.95% (12/00)
Bimbg Credit	4.92%	5.61%	5.63%	5.98%	5.83% (12/00)
Nominal U.S. Treasuries	-	-	-	-	2.65% (9/11)
Bimbg US Treas Bell 10Y	3.67%	4.74%	4.69%	5.08%	2.82% (9/11)
PIMCO US Treasuries	-	-	-	-	3.01% (9/11)
Bimbg US Treas Bell 10Y	3.67%	4.74%	4.69%	5.08%	2.82% (9/11)
New Total Fixed Income Structure	-	-	-	-	1.46% (3/21)
Intermediate Treasury	-	-	-	-	(0.07%) (3/21)
Mellon Intermediate Treasury Index	-	-	-	-	(0.07%) (3/21)
Bimbg Intmdt Treasury	2.16%	3.40%	3.51%	4.17%	(0.07%) (3/21)
Long Duration	-	-	-	-	3.37% (3/21)
Mellon Long Duration Index	-	-	-	-	(7.99%) (1/21)
Bimbg Long Treasury	6.66%	6.86%	6.76%	7.15%	(7.92%) (1/21)
Mellon Long Term Credit Index	-	-	-	-	4.01% (3/21)
Bimbg Long Credit	7.55%	7.64%	7.49%	7.52%	3.53% (3/21)
Securitized	-	-	-	-	(0.61%) (3/21)
Mellon Securitized Index	-	-	-	-	(0.61%) (3/21)
Bimbg Securitized	2.71%	4.05%	4.22%	-	(0.11%) (3/21)
Intermediate Credit	-	-	-	-	0.25% (3/21)
Mellon Intermediate Credit	-	-	-	-	0.25% (3/21)
Bimbg Intmdt Credit	3.80%	4.79%	4.91%	5.37%	0.61% (3/21)
High Yield	-	-	-	-	3.60% (3/21)
Fidelity HY CMBS (3)	6.85%	5.86%	7.24%	-	8.03% (4/97)
Bimbg US CMBS Ex AAA Index (4)	5.20%	1.23%	3.07%	-	4.16% (4/97)
BlackRock US High Yield Bond Index	-	-	-	-	2.76% (3/21)
ICE BofA US HY Constrained Index	6.44%	-	-	-	7.01% (3/10)
Mellon High Yield Beta Fund	-	-	-	-	1.41% (5/21)
Bimbg HY Corp	6.66%	7.53%	7.82%	7.12%	1.64% (5/21)

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(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 Bimbg US CMBS Ex AAA Index, thereafter.

Investment Manager Returns

As of June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income							
Fixed Income (1)	\$9,794	100.00%	2.53%	(1.15%)	2.84%	4.81%	3.42%
Blmbg U.S. Agg Bond Index	-	-	1.83%	(1.60%)	(0.33%)	5.34%	3.03%
Opportunistic Fixed Income	\$348	3.55%	3.64%	4.15%	17.24%	5.73%	5.31%
Brandywine Global Opp FI	58	0.59%	2.79%	(2.00%)	11.00%	4.79%	3.74%
FTSE Wrld Gov't Bond Index	-	-	0.98%	(4.75%)	0.76%	3.59%	1.66%
Eaton Vance GMARA (2)	87	0.89%	4.15%	3.94%	9.33%	5.81%	-
3 Month LIBOR Index + 6%	-	-	1.50%	3.04%	6.21%	7.46%	7.42%
SEI Str. Credit: HY Bank Loans (3)(4)	99	1.01%	4.83%	18.79%	52.74%	7.79%	11.66%
FTSE HY Corp (1 month lag)	-	-	1.64%	4.30%	15.20%	6.69%	7.15%
Stone Harbor Gbl HY	56	0.57%	2.84%	3.45%	16.37%	7.71%	7.00%
FTSE HY Market Index	-	-	2.68%	3.64%	15.69%	7.03%	7.20%
Stone Harbor EMD	48	0.49%	3.86%	(1.22%)	9.24%	5.84%	4.51%
JPM Emg Mkts Bond Global Index	-	-	3.93%	(1.00%)	6.81%	6.48%	4.44%

*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) Eaton Vance since inception returns were included in the Multi-Strategy composite through 12/31/2019.

(3) 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.

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

Investment Manager Returns

As of June 30, 2021

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Fixed Income					
Fixed Income (1)	3.49%	4.94%	5.49%	5.80%	8.19% (1/81)
Blmbg Aggregate	3.39%	4.43%	4.56%	5.14%	7.49% (1/81)
Opportunistic Fixed Income	-	-	-	-	4.59% (10/12)
Brandywine Global Opp FI	3.87%	-	-	-	4.17% (2/11)
FTSE Wrld Govt Bond Index	1.42%	3.36%	4.62%	4.18%	1.75% (2/11)
Eaton Vance GMARA (1)	-	-	-	-	5.21% (6/18)
3 Month LIBOR Index + 6%	6.89%	7.43%	7.68%	-	7.48% (6/18)
SEI Str. Credit: HY Bank Loans (2)(3)	8.19%	-	-	-	12.18% (5/08)
FTSE HY Corp (1 month lag)	6.12%	7.06%	7.38%	6.98%	7.52% (5/08)
Stone Harbor Gbl HY	5.93%	6.74%	7.60%	-	7.59% (7/00)
FTSE HY Market Index	6.36%	7.18%	7.60%	7.00%	7.16% (7/00)
Stone Harbor EMD	4.75%	6.91%	-	-	7.12% (4/05)
JPM Emg Mkts Bond Global Index	5.34%	6.74%	7.75%	8.57%	6.91% (4/05)

*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) Eaton Vance since inception returns were included in the Multi-Strategy composite through 12/31/2019.

(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.

Investment Manager Returns

As of June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Inflation Protection							
Inflation Protection (TIPS)	\$1,509	100.00%	3.25%	1.45%	6.44%	6.35%	4.15%
Blmbg U.S. TIPS Index	-	-	3.25%	1.73%	6.51%	6.53%	4.17%
NISA Inv Adv TIPS	787	52.16%	3.37%	1.76%	6.49%	6.46%	4.14%
Blmbg U.S. TIPS Index (1)	-	-	3.25%	1.73%	6.51%	6.53%	4.17%
Brown Brothers TIPS	586	38.86%	3.18%	1.89%	6.23%	6.47%	4.12%
Blmbg U.S. TIPS Index	-	-	3.25%	1.73%	6.51%	6.53%	4.17%
New Century Global TIPS	135	8.98%	2.99%	(1.25%)	7.64%	6.06%	4.50%
Blmbg Wrld Inflation Linked Unhdg	-	-	3.02%	(0.42%)	7.81%	5.76%	4.26%
		Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Inflation Protection							
Inflation Protection (TIPS)		2.74%	4.00%	-	-	3.66%	(2/03)
Blmbg U.S. TIPS Index		3.40%	4.56%	5.16%	-	4.63%	(2/03)
NISA Inv Adv TIPS		2.55%	-	-	-	3.69%	(4/07)
Blmbg U.S. TIPS Index (1)		2.55%	3.83%	4.61%	-	3.70%	(4/07)
Brown Brothers TIPS		-	-	-	-	2.71%	(2/12)
Blmbg U.S. TIPS Index		3.40%	4.56%	5.16%	-	2.59%	(2/12)
New Century Global TIPS		-	-	-	-	3.16%	(2/12)
Blmbg Wrld Inflation Linked Unhdg		3.14%	4.28%	5.87%	-	2.76%	(2/12)

*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 June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Private Equity							
Private Equity	\$5,596	100.00%	12.11%	25.94%	57.89%	20.19%	16.85%
Burgiss Private Equity Index (Qtr lag)	-	-	7.58%	22.45%	42.36%	16.91%	16.28%
Global Equity + 3% (Qtr lag)(1)	-	-	6.41%	23.02%	61.74%	19.53%	19.32%
Buyouts	3,099	55.38%	10.71%	20.26%	52.79%	18.86%	17.18%
Burgiss Buyout Index (Qtr lag)	-	-	6.50%	18.53%	37.57%	13.81%	15.29%
Special Situations	521	9.30%	11.34%	24.01%	39.11%	19.19%	15.12%
Burgiss Special Situations Idx (Qtr lag)	-	-	3.14%	8.54%	16.99%	5.47%	7.61%
Growth Equity	1,387	24.79%	17.64%	42.24%	96.15%	40.95%	26.50%
Burgiss Venture Capital Index (Qtr lag)	-	-	12.62%	41.17%	71.45%	31.85%	23.53%
Keystone Legacy (2)	589	10.53%	7.29%	22.59%	35.91%	2.81%	-
		Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	

Net Performance - Private Equity

Private Equity	12.92%	11.96%	10.14%	13.52%	11.67%	(1/86)
Burgiss Private Equity Index (Qtr lag)	13.55%	12.56%	11.34%	14.57%	17.14%	(1/86)
Global Equity + 3% (Qtr lag)(1)	16.78%	13.36%	12.18%	13.10%	14.99%	(1/86)
Buyouts	14.35%	13.42%	12.67%	15.82%	13.72%	(4/86)
Burgiss Buyout Index (Qtr lag)	12.85%	12.47%	13.01%	13.72%	19.51%	(4/86)
Special Situations	12.19%	12.57%	12.88%	13.08%	12.95%	(1/95)
Burgiss Special Situations Idx (Qtr lag)	7.75%	7.71%	9.18%	10.13%	10.33%	(6/95)
Growth Equity	15.70%	11.49%	4.58%	9.32%	8.83%	(1/86)
Burgiss Venture Capital Index (Qtr lag)	18.95%	14.67%	7.57%	15.97%	14.85%	(1/86)
Keystone Legacy (2)	-	-	-	-	2.81%	(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 June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Private Credit							
Private Credit	\$1,909	100.00%	5.50%	11.52%	24.59%	13.17%	-
S&P Levered Loan Index +1% (Qtr lag)	-	-	2.02%	6.14%	21.72%	5.21%	6.33%
Direct Lending	251	13.14%	3.46%	12.70%	18.81%	-	-
Distressed Debt	218	11.39%	9.85%	24.36%	46.66%	-	-
Diversified Credit	1,441	75.47%	5.26%	9.92%	24.66%	-	-
			Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Private Credit							
Private Credit			-	-	-	-	10.93% (12/17)
S&P Levered Loan Index +1% (Qtr lag)			5.28%	5.65%	5.79%	-	5.36% (12/17)
Direct Lending			-	-	-	-	8.45% (1/20)
Distressed Debt			-	-	-	-	24.49% (1/20)
Diversified Credit			-	-	-	-	17.34% (1/20)

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Investment Manager Returns

As of June 30, 2021

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Real Estate							
Real Estate	\$2,695	100.00%	4.29%	6.96%	11.81%	4.43%	3.92%
Real Estate Custom Bench (Qtr lag) (1)	-	-	2.98%	5.04%	5.45%	4.76%	5.35%
CPI +3% (Qtr lag)	-	-	2.40%	3.23%	5.62%	5.01%	5.15%
Core/Core Plus Real Estate Funds	1,086	40.30%	3.42%	4.96%	8.27%	5.28%	5.97%
NCREIF ODCE Index (Qtr lag)	-	-	2.07%	3.26%	2.12%	4.41%	5.64%
Value Add/Oppportunistic SMA	713	26.46%	0.65%	(0.04%)	5.68%	1.07%	1.48%
NCREIF ODCE Index (Qtr lag)	-	-	2.07%	3.26%	2.12%	4.41%	5.64%
Value Add/Oppportunistic Funds	562	20.86%	6.53%	12.98%	14.00%	6.83%	7.48%
NCREIF ODCE Index (Qtr lag)	-	-	2.07%	3.26%	2.12%	4.41%	5.64%
Legacy Real Assets	5	0.18%	(2.59%)	(3.22%)	(10.75%)	(1.68%)	(3.23%)
CPI +3% (Qtr lag)	-	-	2.40%	3.23%	5.62%	5.01%	5.15%
REITS	329	12.20%	12.32%	21.94%	38.26%	14.55%	7.12%
FTSE NAREIT US Index	-	-	11.29%	21.98%	39.06%	12.43%	6.76%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Real Estate					
Real Estate	6.86%	3.90%	6.47%	7.69%	8.29% (3/84)
Real Estate Custom Bench (Qtr lag) (1)	8.65%	5.48%	7.03%	8.06%	-
CPI +3% (Qtr lag)	4.72%	4.90%	5.06%	5.15%	5.61% (3/84)
Core/Core Plus Real Estate Funds	9.33%	6.33%	7.23%	8.45%	7.00% (9/86)
NCREIF ODCE Index (Qtr lag)	8.88%	5.33%	6.42%	7.51%	5.86% (9/86)
Value Add/Oppportunistic SMA	5.29%	2.30%	4.61%	6.10%	5.18% (6/88)
NCREIF ODCE Index (Qtr lag)	8.88%	5.33%	6.42%	7.51%	5.90% (6/88)
Value Add/Oppportunistic Funds	9.53%	4.48%	7.29%	8.93%	7.82% (3/84)
NCREIF ODCE Index (Qtr lag)	8.88%	5.33%	6.42%	7.51%	6.13% (3/84)
Legacy Real Assets	(0.93%)	0.60%	1.93%	2.97%	3.72% (3/93)
CPI +3% (Qtr lag)	4.72%	4.90%	5.06%	5.15%	5.23% (3/93)
REITS	8.24%	6.59%	10.10%	10.19%	10.05% (4/96)
FTSE NAREIT US Index	9.21%	6.42%	10.05%	10.38%	10.44% (4/96)

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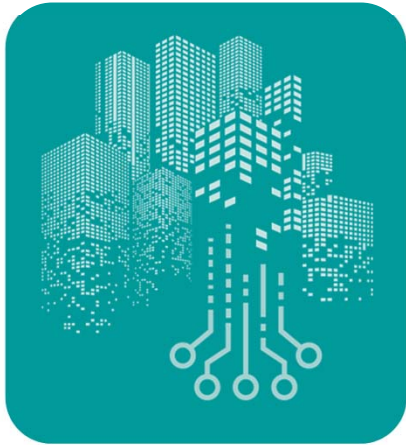
(1) As of 03/31/2019 benchmark consists of 90% NCREIF ODCE Index (1 Qtr lag) and 10% FTSE NAREIT Index (unlagged) Prior to 03/31/2019, benchmark history was provided by RVK.

Callan

Appendix II – Callan Update

Published Research Highlights from 2Q21

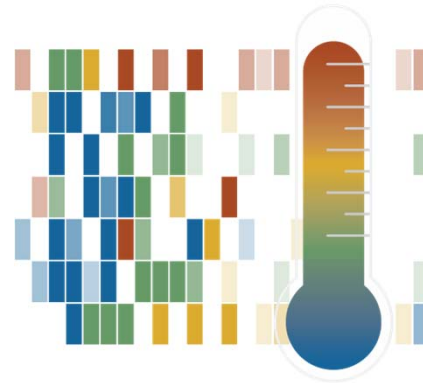
'Proptech' and Commercial Real Estate



A Guide to Implementing a China A-Shares Allocation



Real Estate Indicators, 1Q21 Update



Webinar on Inflation and Institutional Investors



Recent Blog Posts

Capital Markets Assumptions and the Future

Greg Allen

When the Passive Index Is an Active Decision

Weston Lewis

Putting Values into Action: A Practical Guide for Institutional Investors

Brad Penter and
Lauren Mathias

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

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 nonprofits, and public and corporate funds. This session familiarizes trustees and staff with basic investment theory, terminology, and practices.

Join our next virtual sessions (2-3 hour sessions over 3 days):

Aug. 17, 2021 – Aug. 19, 2021

Oct. 26, 2021 – Oct. 28, 2021

Join our next LIVE session in Chicago (1.5-day session):

Oct. 6, 2021 – Oct. 7, 2021

Alternative Investments

Alternative investments like private equity, hedge funds, and real estate can play a key role in any portfolio. You will learn about the importance of allocations to alternatives, and how to consider integrating, evaluating, and monitoring them.

Join our next virtual session (2-3 hour sessions over 2 days):

Oct. 19, 2021 – Oct. 20, 2021

Fall Regional Workshops

Join us in person!

Our regional workshops will be covering ESG topics this Fall. Watch your email for further details and an invitation.

November 2, 2021, in Atlanta

St. Regis Hotel

Eighty-Eight West Paces Ferry Road, Atlanta, GA 30305

November 5, 2021, in San Francisco

Palace Hotel

2 New Montgomery St, San Francisco, CA 94105

Agenda

8:30am - Breakfast

9:30am - Workshop

Webinars

Research Café: Property Technology

Aug. 30, 2021 – 9:30am (PT)

Market Intelligence

Oct. 15, 2021 – 9:30am (PT)

Callan Updates

Firm updates by the numbers, as of June 30, 2021

Total Associates: ~200

Ownership

- 100% employees
- Broadly distributed across 99 shareholders

Leadership Changes

- No changes to leadership this quarter

Total General and Fund Sponsor Consultants: more than 55

Total Specialty and Research Consultants: more than 60

Total CFA/CAIA/FRMs: more than 55

Total Fund Sponsor Clients: more than 400

AUA: more than \$3 trillion

“With Callan at the forefront of ESG research and education, we are thrilled to be part of this working group of our peers to bring further transparency and insights to the rapidly changing ESG landscape. There is growing interest from institutional investors to incorporate financially material ESG factors into their investment processes, and we believe the move toward more ESG incorporation is consistent with a long-term investment approach.”

— Tom Shingler, leader of Callan’s ESG team, on the formation of the Investment Consultants Sustainability Working Group – US.



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