

December 3, 2019



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

Third Quarter 2019

Executive Summary

Thomas H. Shingler
Senior Vice President

Bud Pellecchia
Senior Vice President

Britton M. Murdoch
Vice President

Callan

Market Environment

Does Strong 2019 Spell Problems for 2020 and Beyond?

U.S. equity market expanded modestly in Q3, while non-U.S. markets suffered losses:

- S&P up 1.7%, World ex USA down 0.9%, Emerging Markets lost 4.3%. One-year results were hindered by 4Q18, but all regions are still up sharply year-to-date.

Fed rate cuts, solid corporate fundamentals, and even lower unemployment propelled U.S. equity markets in Q3:

- Value caught up to growth in September
- Small cap declined and lagged large cap again
- Economic weakness, trade concerns hit developed non-U.S. and EM equities in Q3.
- Fixed income markets are having an “outlier” year:
- Investment grade is strongest performer in the U.S.
- Credit spreads continued rally in Q3
- Yield curve shifts lower across maturities; inverted from 3 month – 10 year in April, then from 2- to 10-year in August

Returns for Periods ended September 30, 2019

	1 Quarter	Year to Date	1 Year	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	1.16	20.09	2.92	10.44	13.08	9.81
S&P 500	1.70	20.55	4.25	10.84	13.24	9.83
Russell 2000	-2.40	14.18	-8.89	8.19	11.19	8.86
Non-U.S. Equity						
MSCI World ex USA	-0.93	13.57	-0.95	3.06	4.78	4.94
MSCI Emerging Markets	-4.25	5.90	-2.01	2.33	3.37	--
MSCI ACWI ex USA Small Cap	-1.19	10.28	-5.63	3.98	6.13	5.30
Fixed Income						
Bloomberg Barclays Aggregate	2.27	8.52	10.30	3.38	3.75	5.57
90-day T-Bill	0.56	1.81	2.39	0.98	0.54	2.50
Bloomberg Barclays Long Gov/Credit	6.58	20.93	21.88	6.81	7.42	8.02
Bloomberg Barclays Global Agg ex-US	-0.58	4.38	5.34	0.87	1.27	4.38
Real Estate						
NCREIF Property	1.41	4.80	6.24	8.57	9.77	9.36
FTSE Nareit Equity	7.80	26.96	18.42	10.26	13.04	10.67
Alternatives						
CS Hedge Fund	0.26	6.71	2.13	2.30	4.32	7.69
Cambridge Private Equity*	4.31	8.56	12.23	12.22	14.51	15.42
Bloomberg Commodity	-1.84	3.13	-6.57	-7.18	-4.32	1.66
Gold Spot Price	4.19	14.95	23.13	3.98	3.85	5.38
Inflation - CPI-U	0.24	2.20	1.71	1.53	1.75	2.19

*Cambridge PE data are available through June 30, 2019.

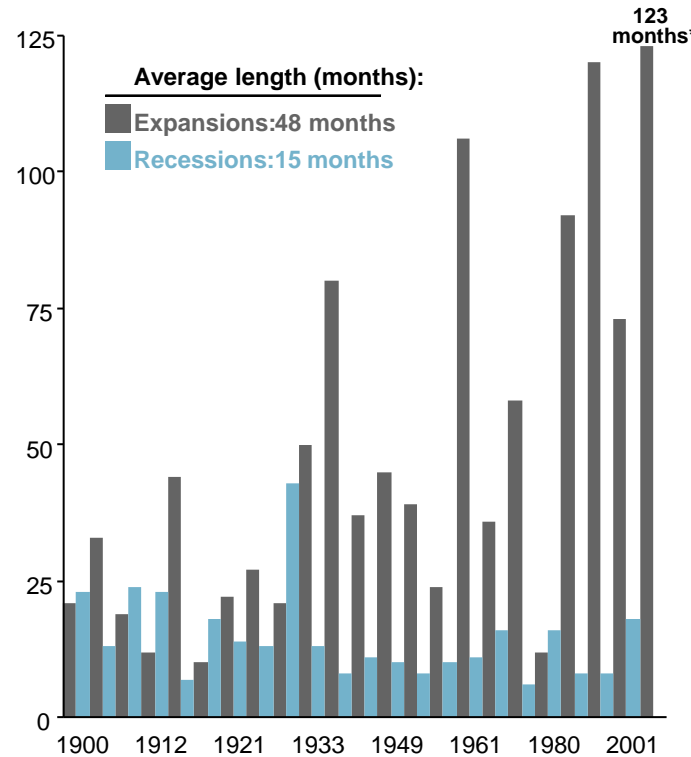
Source: Callan

Expansion Continues, but Not Without Raising Concerns

Expansions do not die of old age, but this one has become the longest

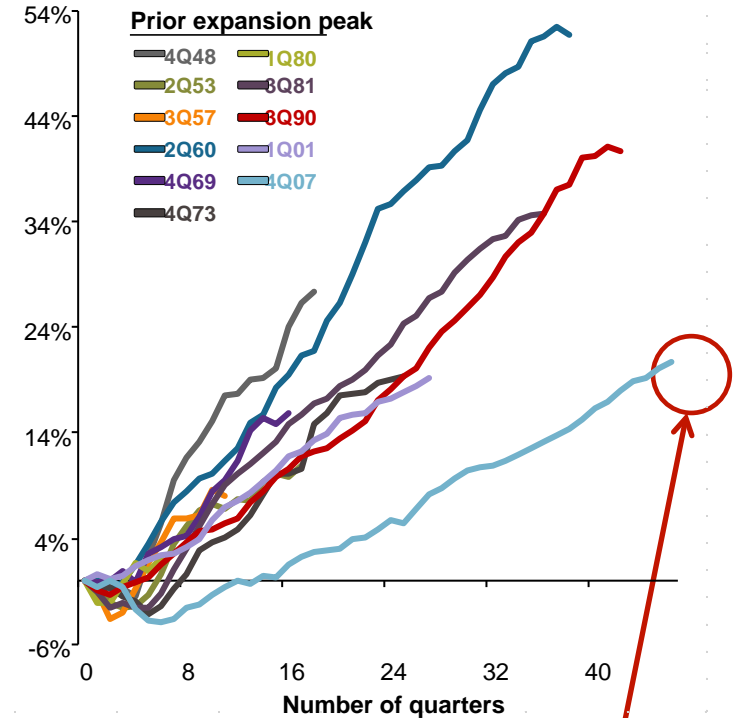
- The slow burn in the current expansion has enabled it to continue, at the risk of building back up asset price bubbles.
- Current recovery is now the longest, but also one of the slowest, averaging GDP growth in the U.S. of just 2.2%.
- The yield curve has inverted.
- The explanatory power of an inverted yield curve has lessened in the wake of the GFC and QE. Demand on the long end and limited supply are holding down the long end.
- Long rates did not budge as short rates rose during 2017-18; long rates have since dropped over 100 bps.

Length of economic expansions and recessions



Strength of economic expansions

Cumulative real GDP growth since prior peak, percent



Current Expansion

Source: J.P. Morgan Asset Management

Gradual Slowdown for Consumers, but Retreat in Interest Costs Will Be Beneficial

Consumption is 70% of GDP, and the sector typically leads growth (and contractions)

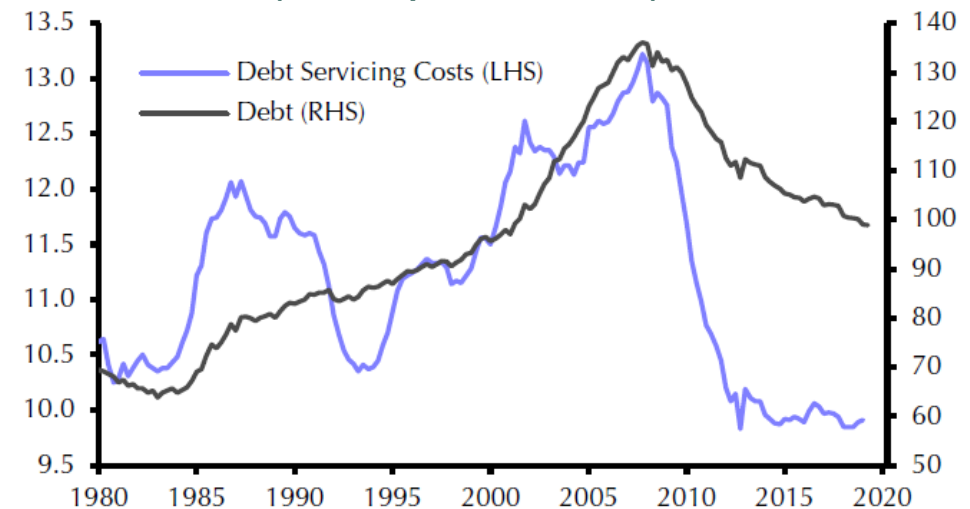
Overall consumption growth is solid, although durable goods spending slowed

- Spending reflects healthy job market and resilient consumer confidence, even in the face of escalating trade war and mounting economic uncertainty.
- Drop in household borrowing costs working its way back into spending, after 2+ years of interest rate hikes.
- Household debt servicing costs are near a record low and the savings rate is relatively high, which may limit the severity of a downturn.

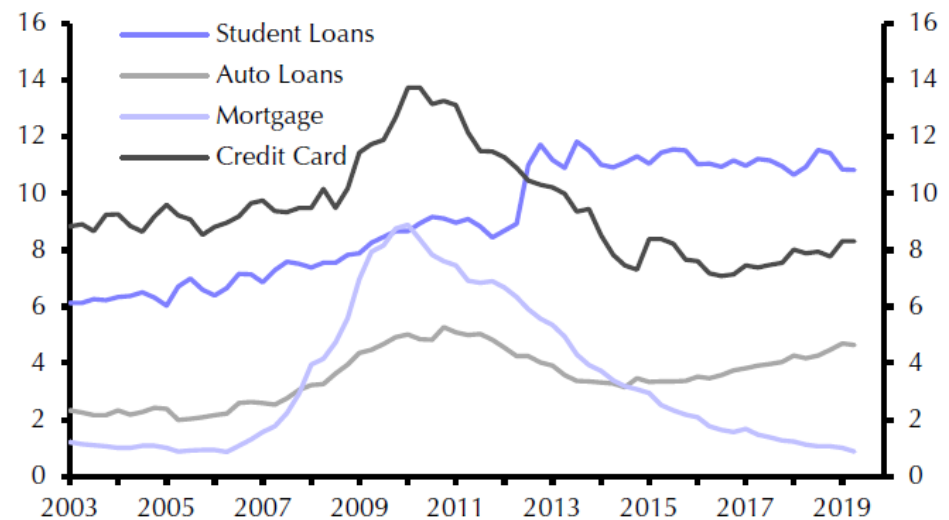
Delinquency rates for autos and credit cards have trended higher in recent years, but are levelling off with tighter standards

- Few signs of household financial stress
- Delinquency rates on borrowing besides credit cards are low. Mortgage debt, which accounts for 70% of consumer debt, has the lowest delinquency rate in 13 years.

Household Debt (% of Disposable Income)



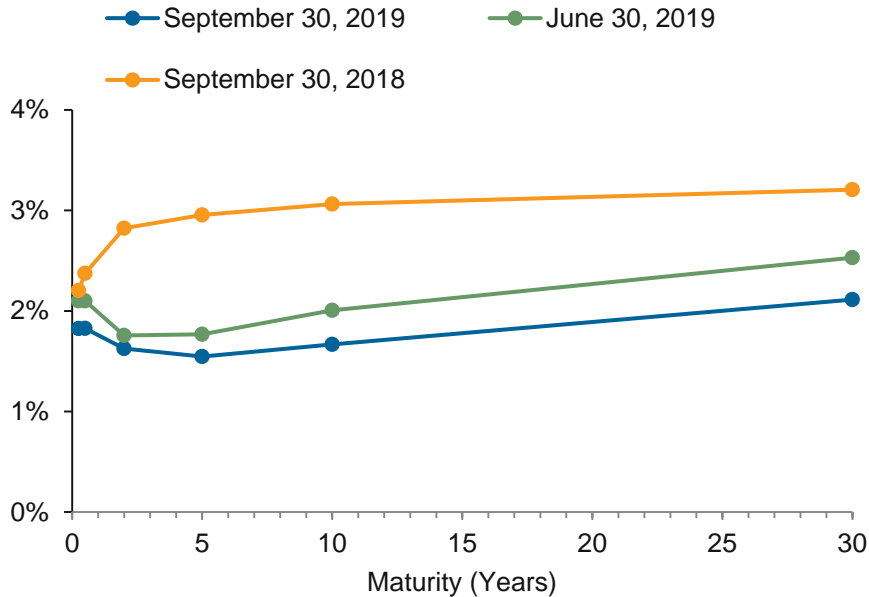
Newly Delinquent Loans (30+ Days, % of total)



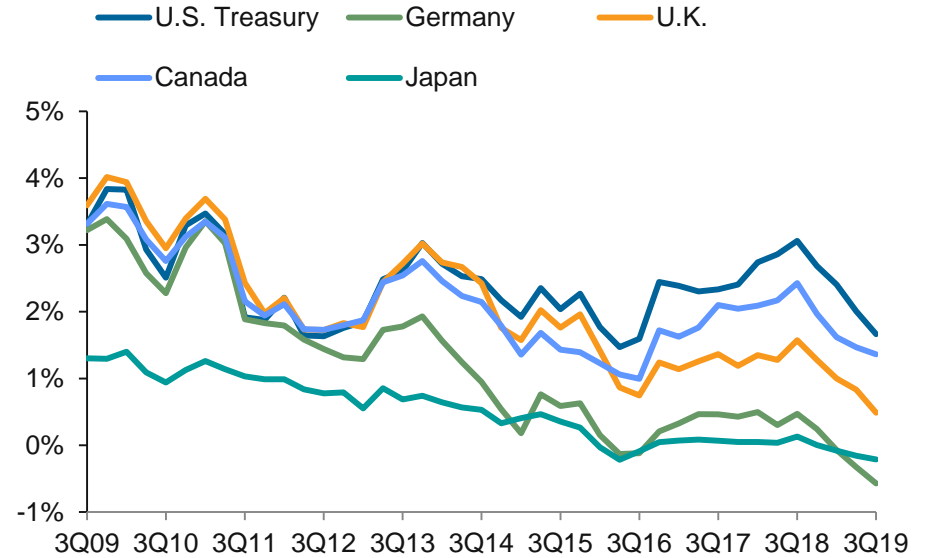
Sources: Capital Economics; BEA; NY Federal Reserve

Yield Curve Flattens While Global Rates Diverge

U.S. Treasury Yield Curves



10-Year Global Government Bond Yields



Treasury yield curve has inverted from 90-day T-bill through the 10-year T-note

- Yields have fallen more than 100 bps on the long end from one year ago.
- Inverted yield curve has presaged most recessions in past 70 years.
- Yield curve inverted from 2- to 10-year notes in August, but has wavered through the end of September.

U.S. yields diverged further in 2017 as monetary policies fell out of sync

- U.S. tightened for two years while euro zone waited.
- U.S. has now paused and has reversed course with two rate cuts so far in 2019, one each in Q2 and Q3.
- Euro zone will skip tightening entirely in this cycle; U.S. spread remains very wide.

Source: Bloomberg

Investing in a Market Laden with Negative-Yielding Bonds

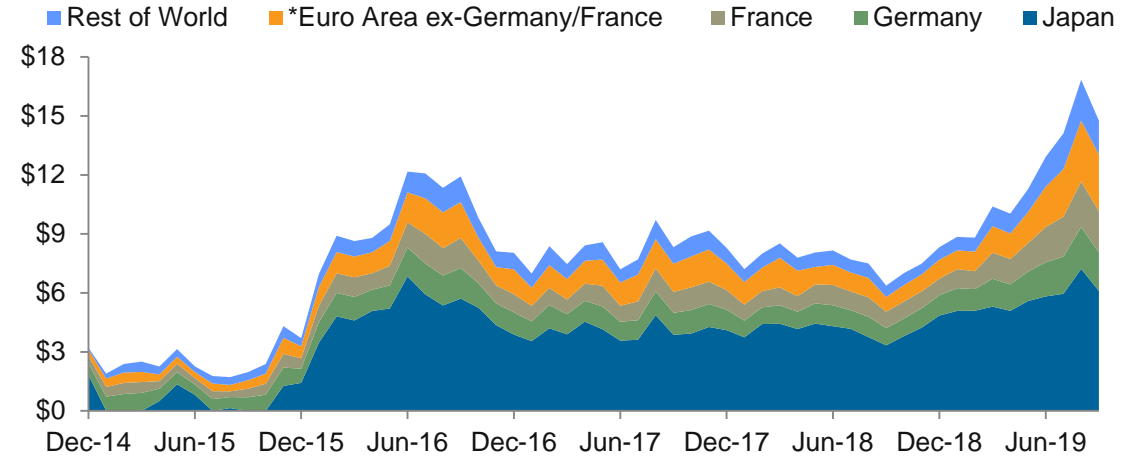
Negative-yielding debt rose to \$17 trillion globally as of August 2019

- 30% of debt within the Bloomberg Barclays Global Aggregate Index is negative yielding.
- France and Germany's yield curves are now negative out to 10 years or further.
- \$1 trillion of investment grade corporate debt is negative yielding.

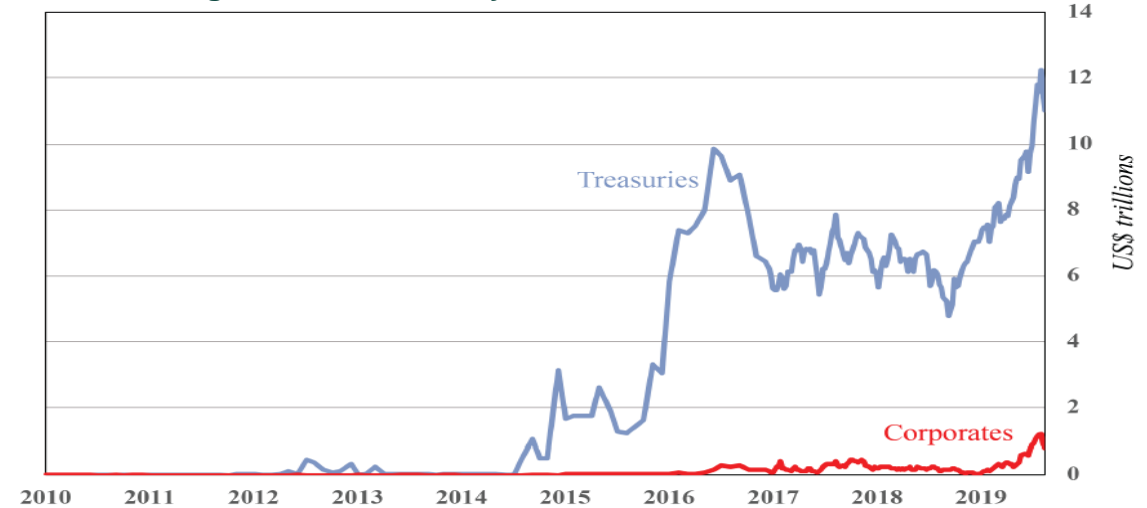
Investing in Negative Yield Bonds

- Negative yields imply that holding the bond to maturity would result in a loss.
- However, short-term returns can be positive as bond prices increase with the decline in yield.
- Investors could earn a positive real yield if inflation were more negative than the negative nominal yield on the bond.

Country Breakdown of Negative Yielding Debt (trillions)



Growth of Negative Yield Debt by Sector



Source: (Top) Bloomberg Barclays as of September 2019, (Bottom) Colchester Global Investors, Bloomberg Barclays Global Agg Treasuries Idx and Global Agg Corporate Idx as of August 2019

*Top 5 euro-area constituents ex-Germany/France by market value: Spain, Supranational (e.g., EU Investment Bank, European Financial Stability Facility), Italy, Netherlands, Belgium

The Callan Periodic Table of Investment Returns

Annual Returns for Key Indices Ranked in Order of Performance

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	3 Qtrs. 2019
Real Estate Funds	U.S. Fixed	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
13.19%	8.43%	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%	20.55%
U.S. Fixed	High Yield	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
11.63%	5.28%	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%	14.18%
Cash Equivalent	Real Estate Funds	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
6.19%	4.64%	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%	13.57%
Hedge Funds	Cash Equivalent	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	High Yield
4.85%	4.42%	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%	11.41%
Small Cap	Hedge Funds	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	U.S. Fixed
-3.02%	4.42%	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%	8.52%
Non-U.S. Fixed	Small Cap	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
-3.91%	2.49%	-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%	6.71%
High Yield	Emerging Markets	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	Emerging Markets
-5.86%	-2.61%	-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%	5.90%
Large Cap	Non-U.S. Fixed	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
-9.11%	-3.75%	-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%	4.38%
Non-U.S. Equity	Large Cap	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
-13.37%	-11.89%	-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%	3.08%
		Large Cap	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
		-22.10%	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%	1.81%

- 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

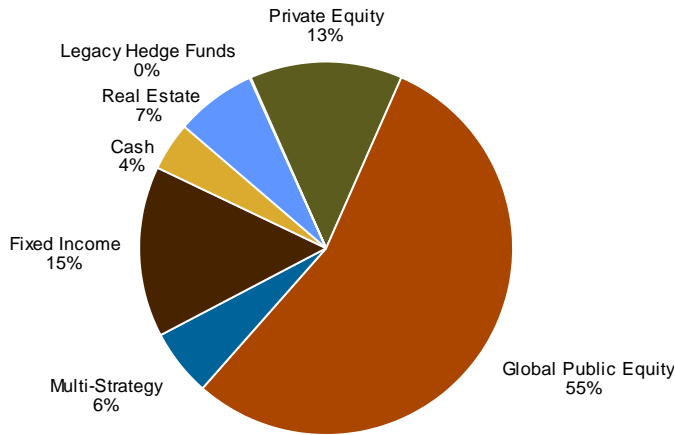
Callan

**PA SERS Defined Benefit Plan
Performance Review**

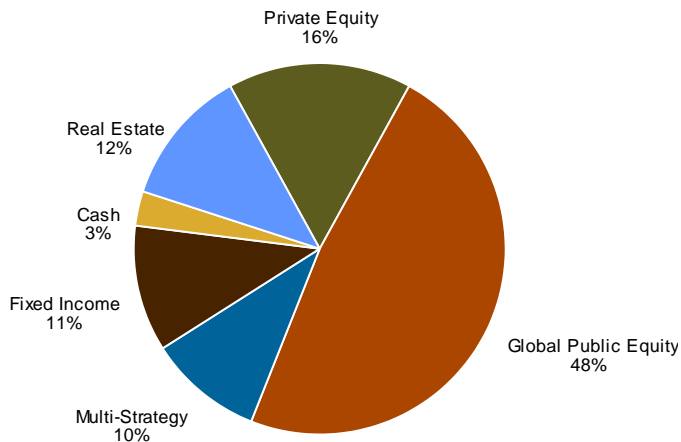
Total Fund

Actual Asset Allocation versus Target as of September 30, 2019

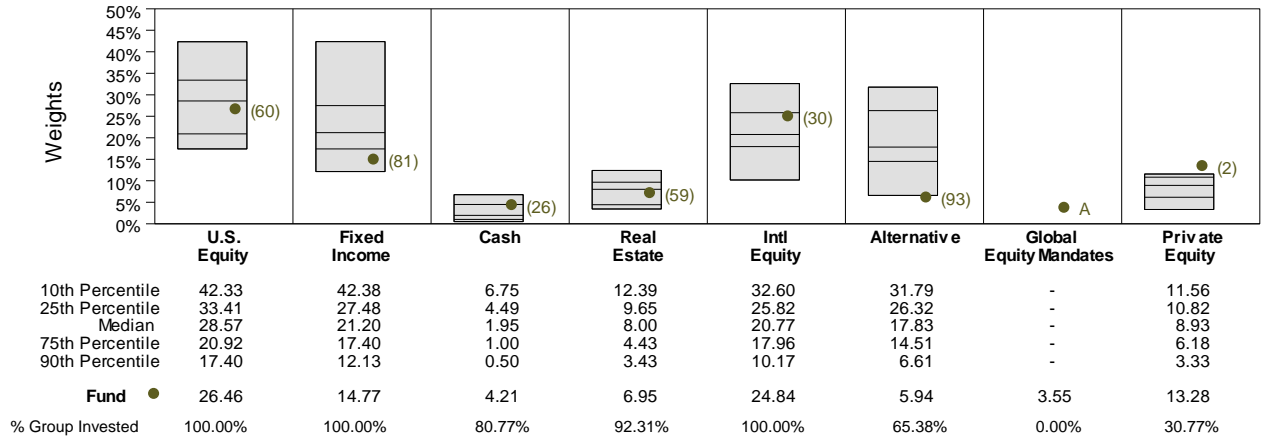
Actual Asset Allocation



Target Asset Allocation



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



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Private Equity	3,909,776	13.3%	16.0%	(2.7%)	(802,412)
Global Public Equity	16,154,037	54.9%	48.0%	6.9%	2,017,474
Multi-Strategy	1,714,470	5.8%	10.0%	(4.2%)	(1,230,648)
Fixed Income	4,350,899	14.8%	11.0%	3.8%	1,111,270
Cash	1,238,962	4.2%	3.0%	1.2%	355,426
Real Estate	2,047,329	7.0%	12.0%	(5.0%)	(1,486,812)
Legacy Hedge Funds	35,702	0.1%	0.0%	0.1%	35,702
Total	29,451,174	100.0%	100.0%		

- Following the adoption of the new SERS asset allocation, Callan recommends SERS conduct a fixed income structure review prior to implementation. The fixed income structure review would encompass core, opportunistic and TIPS fixed income.

* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

Attribution Analysis versus Target – Net of Fees as of September 30, 2019

Relative Attribution Effects for Quarter ended September 30, 2019

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Fixed Income	15%	11%	1.80%	2.27%	(0.07%)	0.05%	(0.02%)
Real Estate	7%	12%	2.06%	1.08%	0.07%	(0.03%)	0.04%
Multi-Strategy	6%	10%	0.57%	0.99%	(0.02%)	(0.02%)	(0.04%)
Global Public Equity	55%	48%	(0.47%)	(0.18%)	(0.16%)	(0.06%)	(0.22%)
Legacy Hedge Funds	0%	0%	(1.05%)	(0.82%)	(0.00%)	(0.00%)	(0.00%)
Private Equity	14%	16%	0.97%	0.97%	0.00%	(0.01%)	(0.01%)
Cash	4%	3%	0.57%	0.56%	0.00%	(0.00%)	(0.00%)
Total			0.32%	= 0.58%	+ (0.19%)	+ (0.07%)	(0.26%)

• What helped relative attribution?

- Outperformance relative to target from Real Estate managers
- An overweight to Fixed Income (attribution based on target return)

• What hurt relative attribution?

- Underperformance relative to target from Global Public Equity and Fixed Income Managers
- An overweight to Global Public Equity (attribution based on target return)
- An underweight to Real Estate (attribution based on target return)

* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

Attribution Analysis versus Target – Net of Fees as of September 30, 2019

Year to Date Relative Attribution Effects for Period ended September 30, 2019

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return		
Fixed Income	15%	11%	8.90%	8.52%	0.05%	(0.13%)	(0.08%)		
Real Estate	7%	12%	8.76%	4.70%	0.28%	0.29%	0.57%		
Multi-Strategy	7%	10%	11.70%	6.79%	0.39%	0.08%	0.47%		
Global Public Equity	54%	48%	16.27%	15.87%	0.21%	0.12%	0.33%		
Legacy Hedge Funds	0%	0%	(4.44%)	5.29%	(0.02%)	(0.01%)	(0.03%)		
Private Equity	14%	16%	7.16%	7.16%	0.00%	0.04%	0.04%		
Cash	4%	3%	1.82%	1.81%	(0.00%)	(0.02%)	(0.02%)		
Total			12.39%	= 11.11%	+	0.91%	+	0.37%	1.28%

• What helped relative attribution?

- Outperformance relative to target from Multi-Strategy, Real Estate, Global Public Equity and Fixed Income managers
- An underweight to Real Estate, Multi-Strategy and Private Equity (attribution based on target return)
- An overweight to Global Public Equity (attribution based on target return)

• What hurt relative attribution?

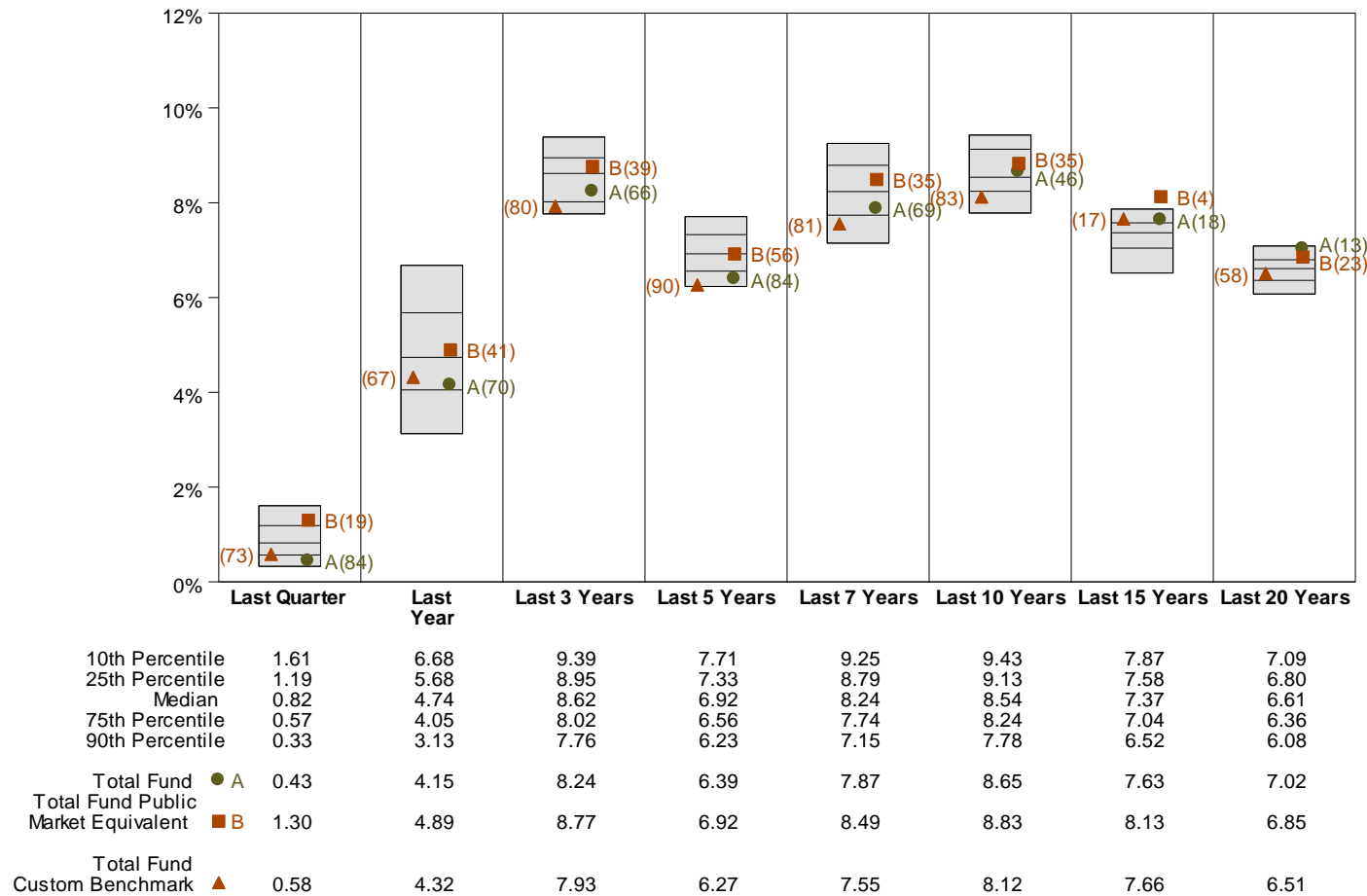
- An overweight to Fixed Income (attribution based on target return)

* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

Gross of Fee Performance versus Peers and Benchmark (As of September 30, 2019)

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



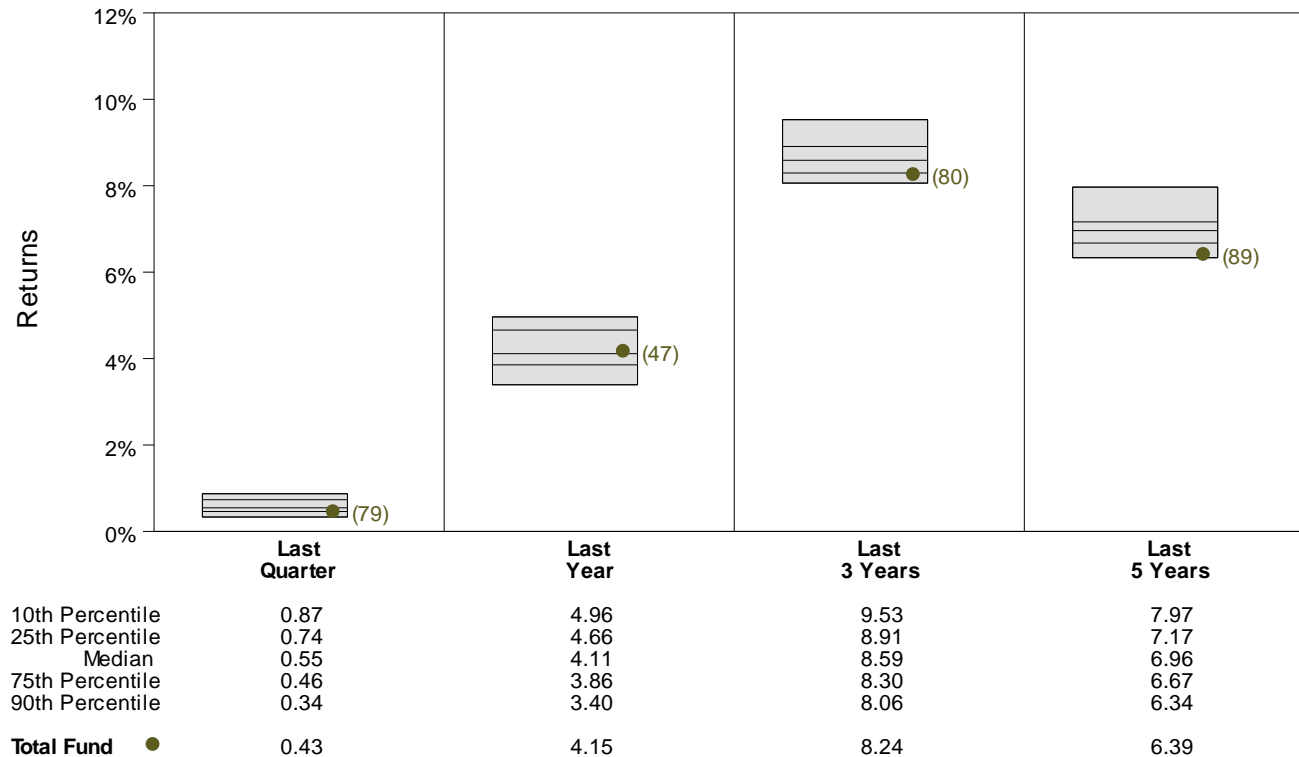
* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

Asset Allocation-Adjusted Gross of Fee Peer Performance Comparison as of September 30, 2019

- 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



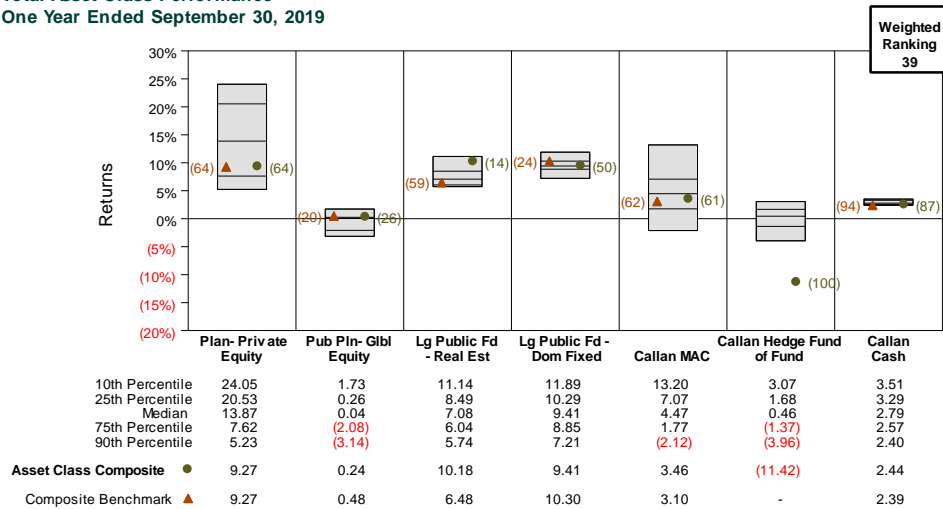
* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

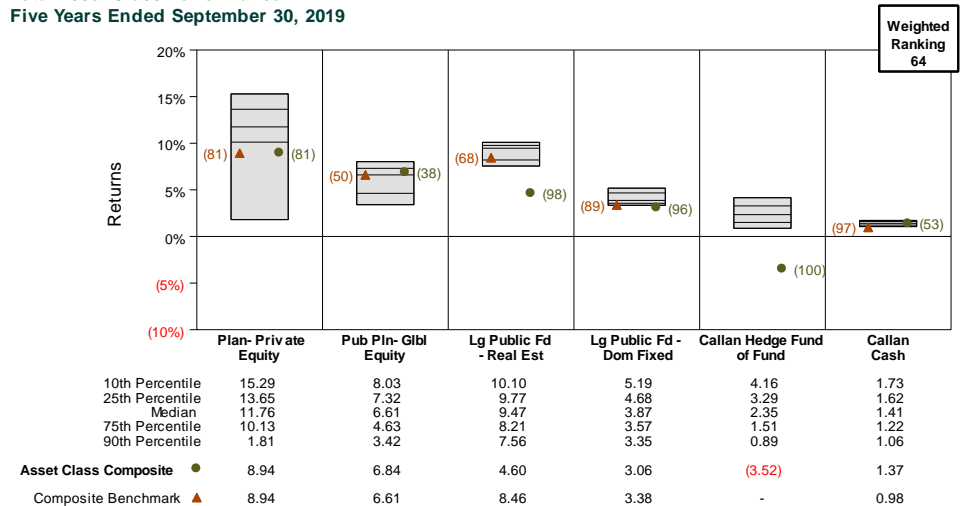
Asset Class Rankings – Net of Fee Peer Performance Comparison as of September 30, 2019

- For this comparison, each asset class component of peers is compared to the asset class returns of the Pennsylvania SERS Plan. In the upper right corner of each graph is the weighted average of the rankings across the different asset classes. The weights of the Plan's actual asset allocation are used to make this calculation. The weighted average ranking can be viewed as a measure of the Plan's overall success in picking managers and structuring asset classes.

Total Asset Class Performance
One Year Ended September 30, 2019



Total Asset Class Performance
Five Years Ended September 30, 2019

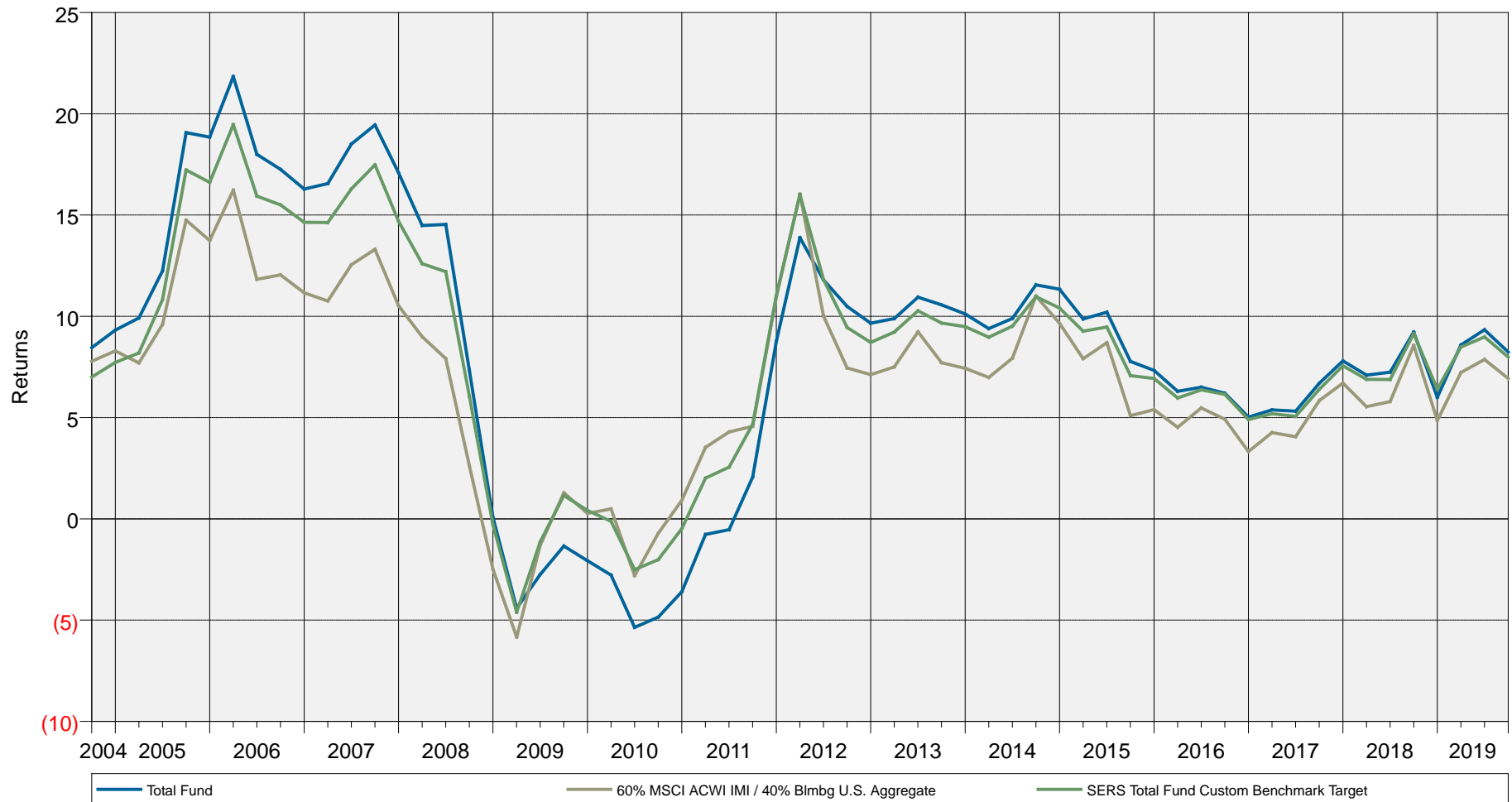


* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

Rolling 3-year Gross of Fee Performance versus Peers and Benchmark (As of September 30, 2019)

Rolling 12 Quarter Gross of Fee Returns
for 15 Years Ended September 30, 2019

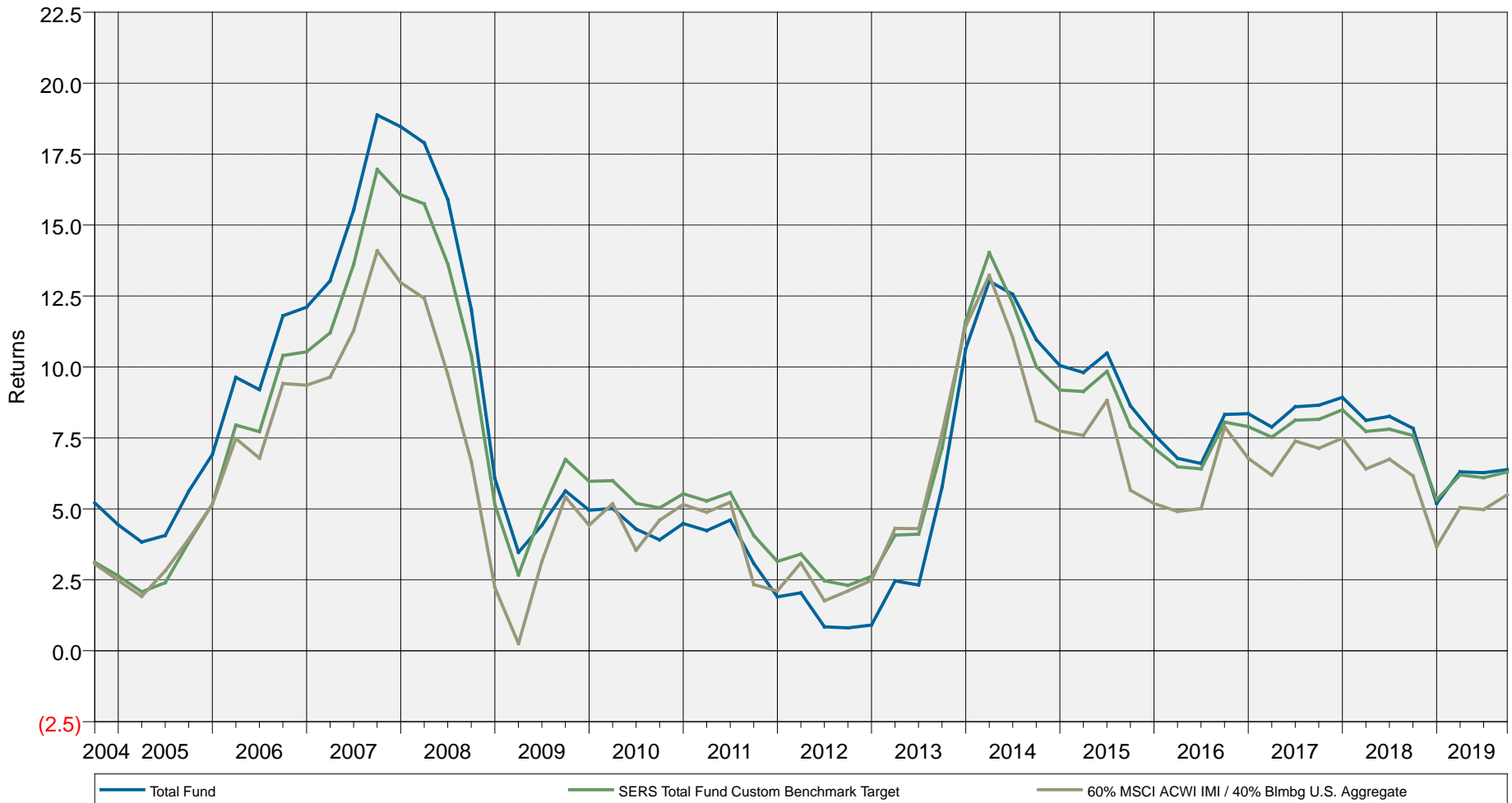


* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Total Fund

Rolling 5-year Gross of Fee Performance versus Peers and Benchmark (As of September 30, 2019)

Rolling 20 Quarter Gross of Fee Returns
for 15 Years Ended September 30, 2019



* Current Target = 48.0% MSCI ACWI IMI, 16.0% Private Equity, 12.0% Real Estate Custom Benchmark, 11.0% Blmbg Aggregate, 10.0% S&P/LSTA, Leveraged Loan, 3.0% 3-month Treasury Bill and 0.0% Hedge Fund Custom Benchmark.

Asset Class Returns

As of September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance							
Total Fund	\$29,451	100.00%	0.32%	12.39%	3.69%	7.65%	5.78%
Total Fund Custom Benchmark(1)	-	-	0.58%	11.11%	4.32%	7.93%	6.27%
Public Market Equiv Benchmark(2)	-	-	1.30%	10.82%	4.89%	8.77%	6.92%
60/40 Index(3)	-	-	0.83%	13.12%	4.71%	6.93%	5.50%
Global Public Equity	\$16,154	54.85%	(0.47%)	16.27%	0.24%	9.56%	6.84%
MSCI ACWI IMI	-	-	(0.18%)	15.87%	0.48%	9.36%	6.61%
Fixed Income	\$4,351	14.77%	1.80%	8.90%	9.41%	3.38%	3.06%
Bimbg Aggregate	-	-	2.27%	8.52%	10.30%	2.92%	3.38%
Multi-Strategy	\$1,714	5.82%	0.57%	11.70%	3.46%	-	-
S&P/LSTA Leveraged Loan	-	-	0.99%	6.79%	3.10%	4.53%	3.98%
Russell 3000 Index	-	-	1.16%	20.09%	2.92%	12.83%	10.44%
Real Estate	\$2,047	6.95%	2.06%	8.76%	10.18%	2.04%	4.60%
Real Estate Custom Benchmark	-	-	1.08%	4.70%	6.54%	6.46%	8.47%
CPI +3% (Qtr lag)	-	-	1.49%	3.70%	4.65%	5.05%	4.45%
Private Equity	\$3,910	13.28%	0.97%	7.16%	9.27%	11.87%	8.94%
Burgiss Private Equity Custom Index	-	-	3.33%	6.30%	9.78%	14.17%	11.14%
Russell 3000 +3% (Qtr lag)	-	-	4.94%	4.66%	12.76%	17.35%	13.49%
Cash	\$1,239	4.21%	0.57%	1.82%	2.44%	1.87%	1.37%
3-month Treasury Bill	-	-	0.56%	1.81%	2.39%	1.54%	0.98%

(1) Total Fund Custom Benchmark returns provided by RVK. Benchmark consists of: 16% SERS Private Equity Composite, 48% MSCI ACW IM Index, 12% Real Estate Custom Benchmark, 10% S&P/LSTA Leveraged Loan Index, 11% Bloomberg US Agg Bond Index, 3% ICE BofAML 3 Mo US T-Bill Index

(2) Public Market Equivalent Benchmark returns provided by RVK. Benchmark consists of: 16% Russell 3000+3% (Qtr Lag), 48% MSCI ACW IM Index, 12% CPI+3% (Qtr Lag), 10% S&P/LSTA Leveraged Loan Index, 11% Bloomberg US Agg Bond Index, 3% ICE BofAML 3 Mo US T-Bill Index

(3) Benchmark consists of 60% MSCI ACWI IMI Index, 40% Bloomberg U.S. Aggregate Index.

Asset Class Returns

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance					
Total Fund	7.93%	6.84%	6.26%	8.18%	9.46% (1/81)
Total Fund Custom Benchmark(1)	8.12%	7.66%	6.51%	8.41%	-
Public Market Equiv Benchmark(2)	8.83%	8.13%	6.85%	8.69%	-
60/40 Index(3)	6.80%	6.33%	5.51%	6.62%	-
Global Public Equity	9.06%	6.95%	-	-	6.64% (1/02)
MSCI ACWI IMI	8.45%	7.25%	5.28%	6.79%	6.96% (1/02)
Fixed Income	5.21%	5.20%	5.74%	6.41%	8.44% (1/81)
Bimbg Aggregate	3.75%	4.21%	5.01%	5.57%	7.68% (1/81)
Multi-Strategy	-	-	-	-	6.94% (10/17)
S&P/LSTA Leveraged Loan	5.21%	4.72%	4.85%	-	4.14% (10/17)
Russell 3000 Index	13.08%	9.10%	6.72%	9.81%	10.00% (10/17)
Real Estate	6.65%	5.93%	6.90%	7.75%	8.39% (3/84)
Real Estate Custom Benchmark	9.32%	7.36%	7.76%	-	-
CPI +3% (Qtr lag)	4.73%	5.02%	5.19%	5.22%	5.64% (3/84)
Private Equity	11.92%	11.58%	9.92%	13.70%	10.92% (1/86)
Burgiss Private Equity Custom Index	13.71%	13.11%	11.77%	15.15%	16.94% (1/86)
Russell 3000 +3% (Qtr lag)	18.00%	12.35%	9.80%	13.49%	14.56% (1/86)
Cash	0.84%	1.68%	2.31%	2.86%	3.64% (1/87)
3-month Treasury Bill	0.54%	1.39%	1.82%	2.50%	3.28% (1/87)

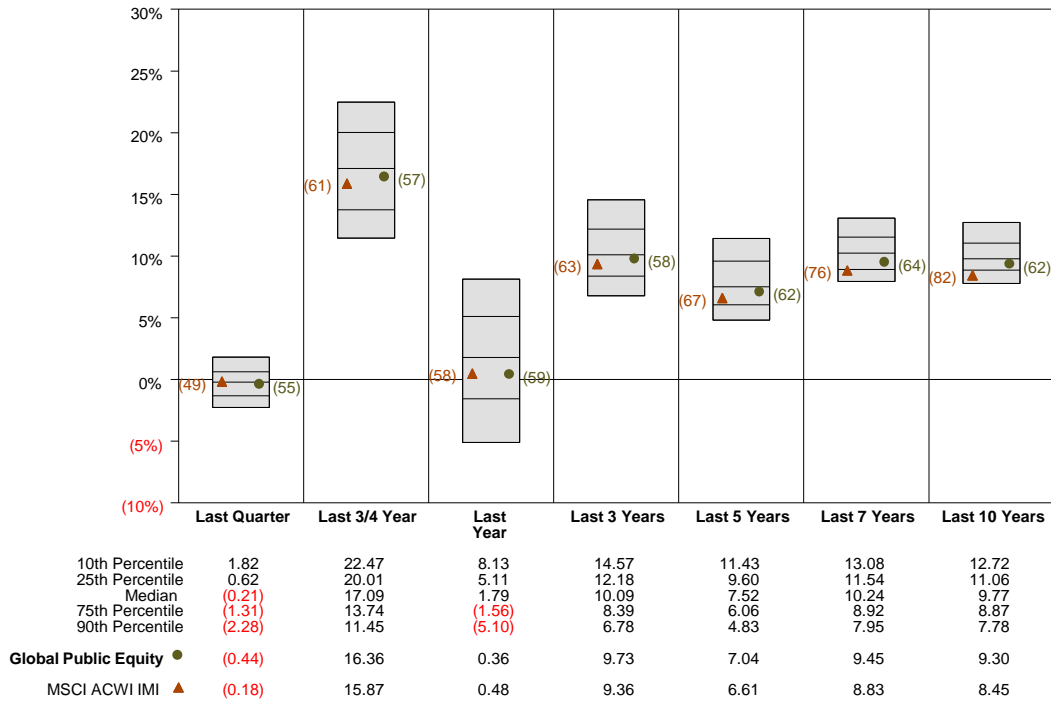
(1) Total Fund Custom Benchmark returns provided by RVK. Benchmark consists of: 16% SERS Private Equity Composite, 48% MSCI ACW IM Index, 12% Real Estate Custom Benchmark, 10% S&P/LSTA Leveraged Loan Index, 11% Bloomberg US Agg Bond Index, 3% ICE BofAML 3 Mo US T-Bill Index

(2) Public Market Equivalent Benchmark returns provided by RVK. Benchmark consists of: 16% Russell 3000+3% (Qtr Lag), 48% MSCI ACW IM Index, 12% CPI+3% (Qtr Lag), 10% S&P/LSTA Leveraged Loan Index, 11% Bloomberg US Agg Bond Index, 3% ICE BofAML 3 Mo US T-Bill Index

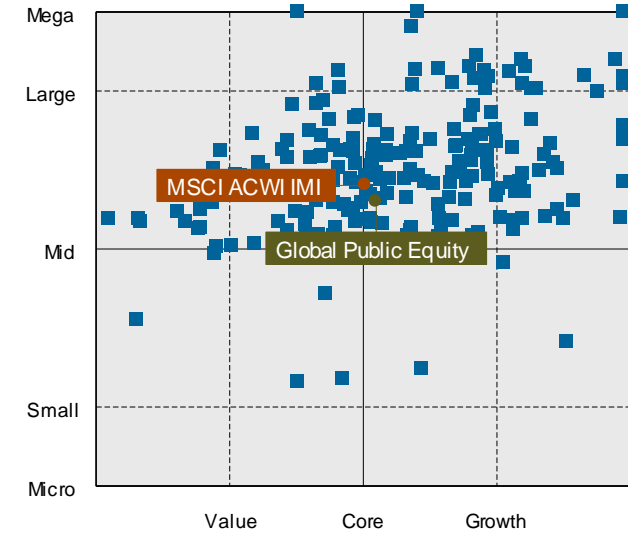
(3) Benchmark consists of 60% MSCI ACWI IMI Index, 40% Bloomberg U.S. Aggregate Index.

Global Equity as of September 30, 2019

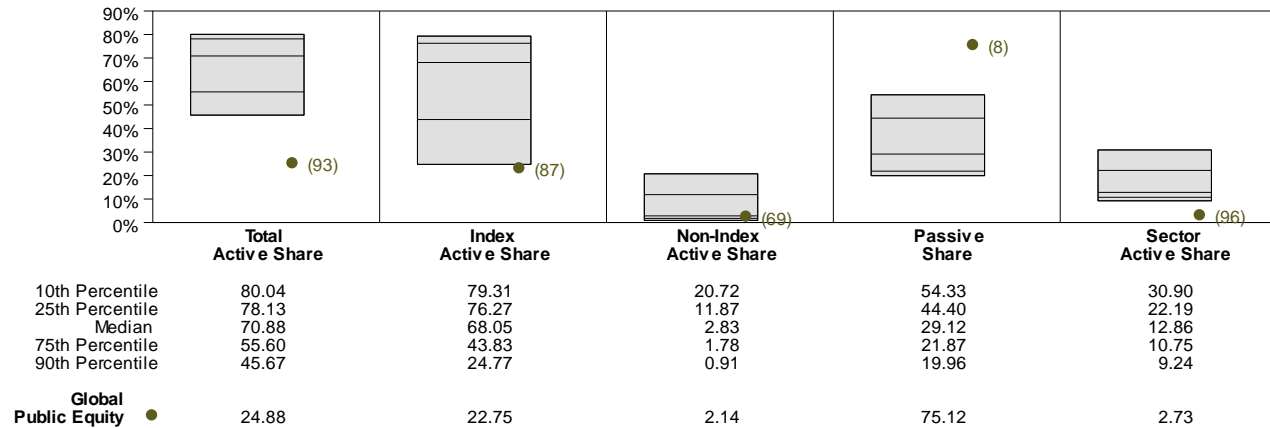
Performance vs Callan Global Equity (Gross)



Style Map vs Callan Global Equity Holdings as of September 30, 2019



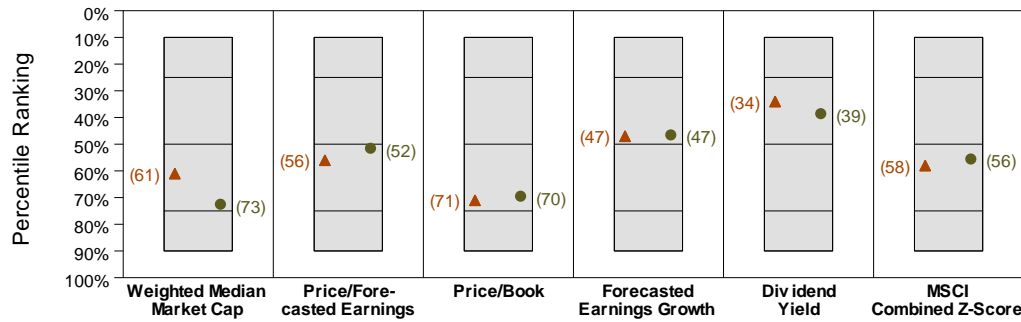
Active Share vs. Pub Pln- GIBI Equity



Global Equity

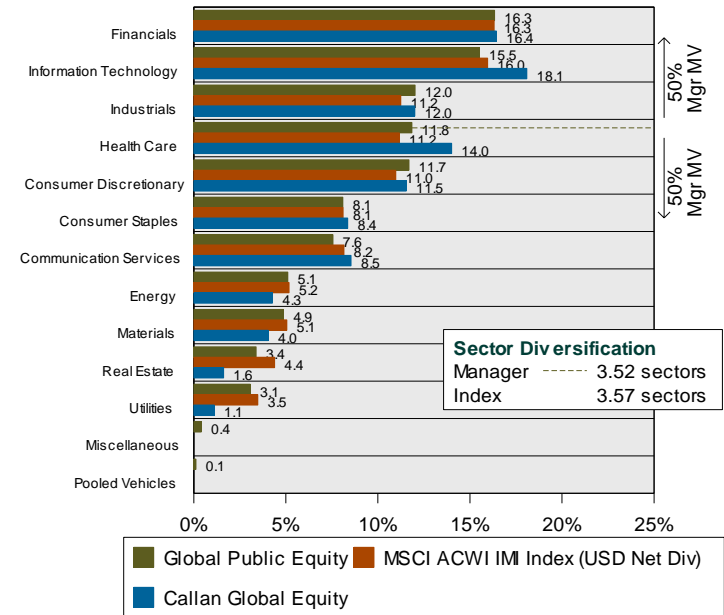
As of September 30, 2019

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Global Equity
as of September 30, 2019

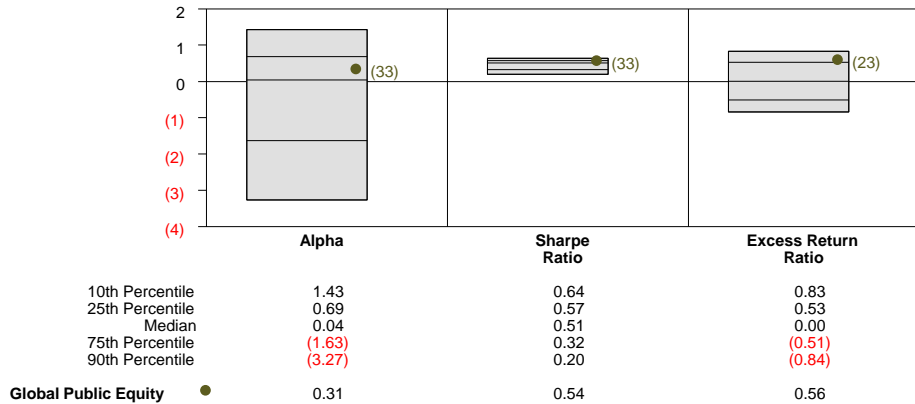


	Weighted Median Market Cap	Price/Forecasted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	99.91	23.18	4.91	16.86	3.36	1.01
25th Percentile	66.62	20.55	3.75	13.72	2.71	0.70
Median	48.61	16.00	2.60	11.15	2.09	0.13
75th Percentile	34.11	13.73	1.97	8.92	1.49	(0.29)
90th Percentile	21.28	11.69	1.49	7.26	1.06	(0.72)
Global Public Equity ●	36.11	15.77	2.12	11.28	2.31	0.04
MSCI ACWI IMI Index (USD Net Div) ▲	44.50	15.44	2.10	11.27	2.45	(0.02)

Sector Allocation September 30, 2019



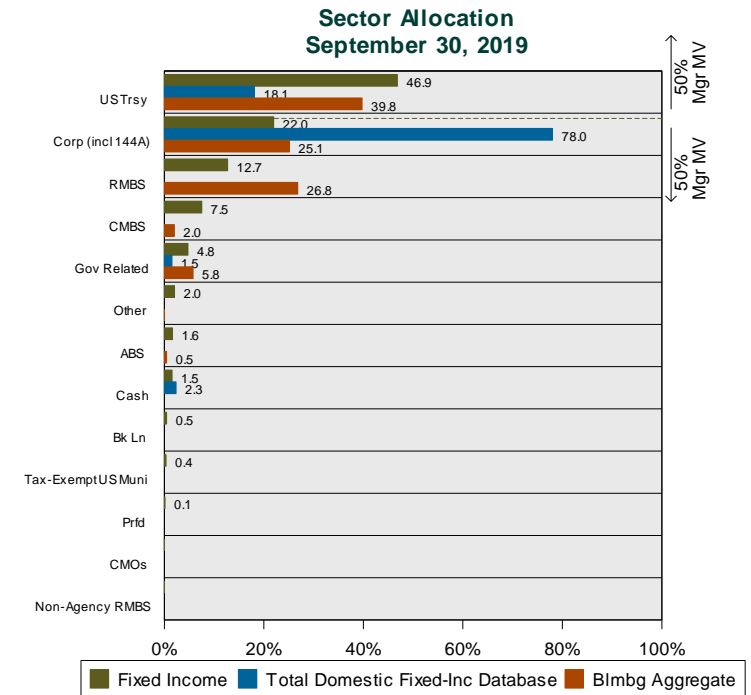
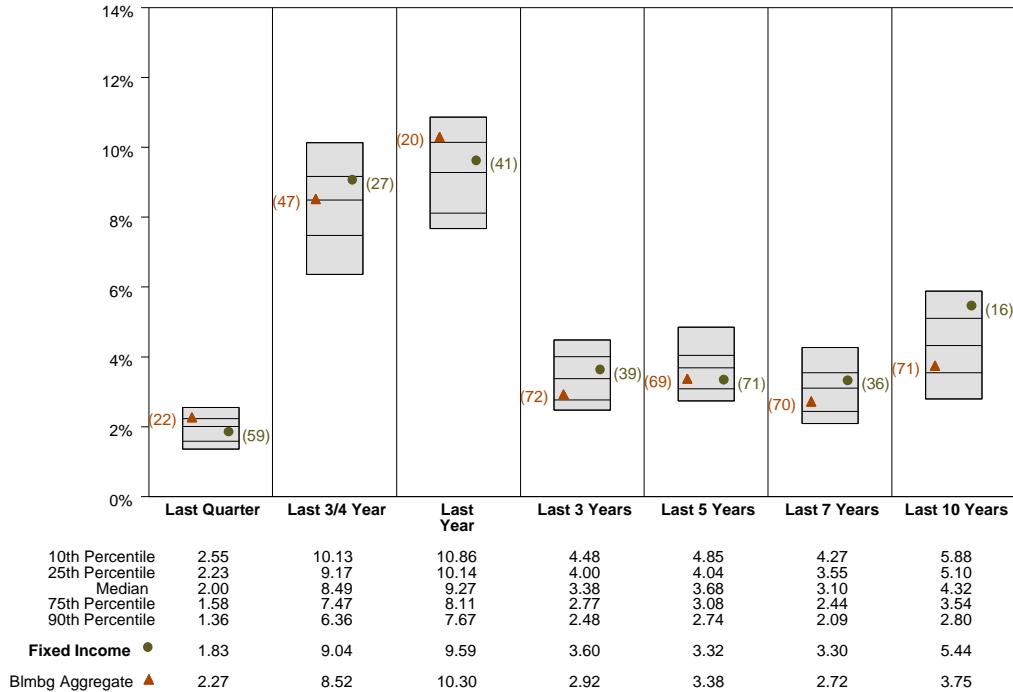
Risk Adjusted Return Measures vs MSCI ACWI IMI Rankings Against Public Fund - Global Equity (Gross) Five Years Ended September 30, 2019



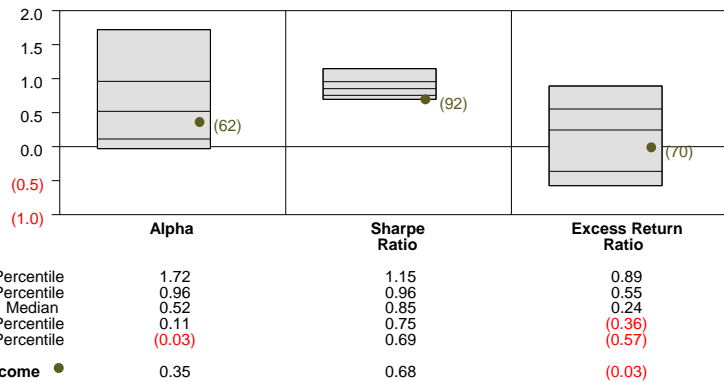
Fixed Income

As of September 30, 2019

Performance vs Public Fund - Domestic Fixed (Gross)



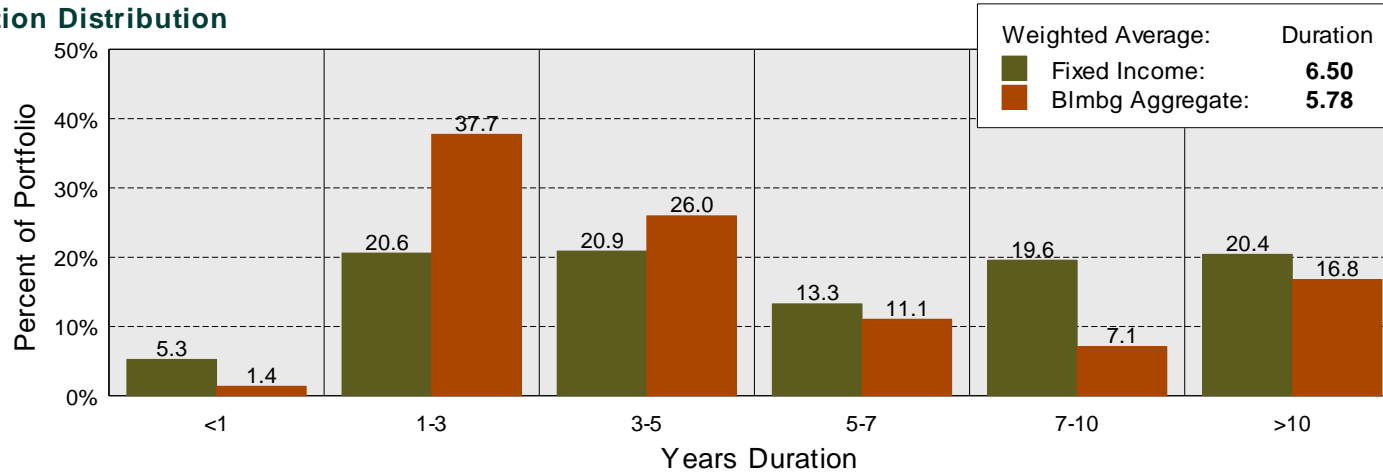
Risk Adjusted Return Measures vs Blmbg Aggregate Rankings Against Public Fund - Domestic Fixed (Gross) Five Years Ended September 30, 2019



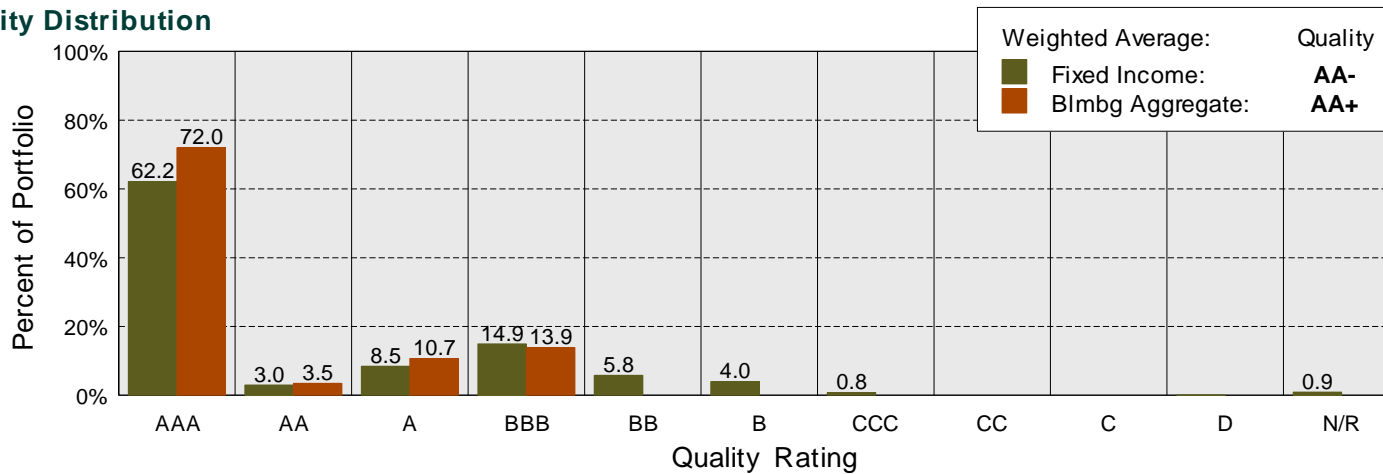
Fixed Income

As of September 30, 2019

Duration Distribution



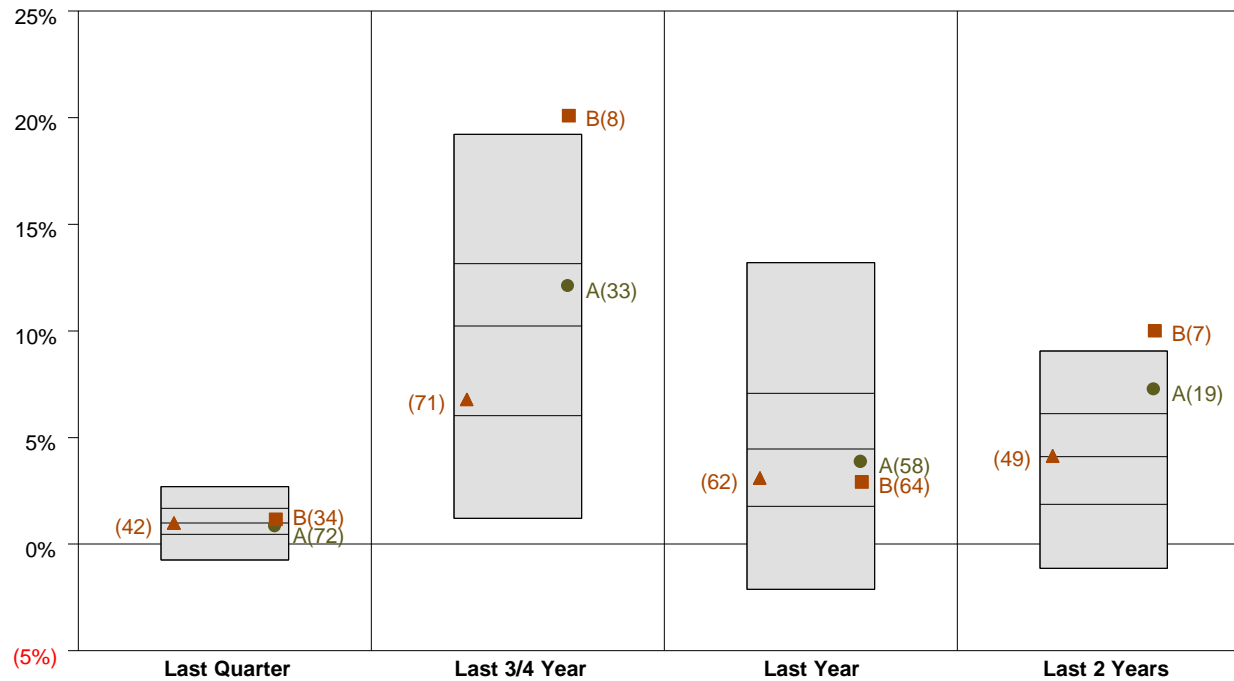
Quality Distribution



Multi-Strategy

As of September 30, 2019

Performance vs Callan Multi-Asset Database (Gross)



	Last Quarter	Last 3/4 Year	Last Year	Last 2 Years
10th Percentile	2.70	19.23	13.20	9.06
25th Percentile	1.69	13.16	7.07	6.12
Median	0.99	10.22	4.47	4.10
75th Percentile	0.45	6.03	1.77	1.87
90th Percentile	(0.73)	1.21	(2.12)	(1.13)
Multi-Strategy ● A	0.81	12.06	3.82	7.21
Russell 3000 Index ■ B	1.16	20.09	2.92	10.00
S&P:LSTA Lev Loan ▲	0.99	6.79	3.10	4.14

Callan

Appendix I – Investment Manager Returns

Investment Manager Returns

As of September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance- Equity							
Global Public Equity	\$16,154	100.00%	(0.47%)	16.27%	0.24%	9.56%	6.84%
MSCI ACWI IMI	-	-	(0.18%)	15.87%	0.48%	9.36%	6.61%
Global Mandates	\$1,046	6.48%	0.53%	20.84%	6.38%	14.52%	10.96%
MSCI World	-	-	0.53%	17.61%	1.83%	10.21%	7.18%
Walter Scott & Prtnrs Gbl Gr Eq	1,046	6.48%	0.53%	20.84%	6.38%	14.52%	10.96%
MSCI World	-	-	0.53%	17.61%	1.83%	10.21%	7.18%
U.S. Equity	\$7,792	48.23%	0.33%	19.39%	0.72%	11.10%	9.20%
Russell 3000 Index(1)	-	-	1.16%	20.09%	2.92%	12.83%	10.44%
U.S. Mid/Large Cap Equity	\$6,242	38.64%	1.38%	20.57%	3.34%	12.44%	9.99%
Russell 1000 Index	-	-	1.42%	20.53%	3.87%	13.19%	10.62%
MCM Russell 1000 Index	5,790	35.84%	1.43%	20.51%	3.91%	13.22%	10.66%
Russell 1000 Index	-	-	1.42%	20.53%	3.87%	13.19%	10.62%
Iridian Asset Mgmt MCV	453	2.80%	1.03%	21.78%	(3.26%)	4.33%	3.70%
Russell MidCap Index	-	-	0.48%	21.93%	3.19%	10.69%	9.10%
Russell MidCap Value Idx	-	-	1.22%	19.47%	1.60%	7.82%	7.55%
U.S. Small Cap Equity	\$1,549	9.59%	(3.75%)	14.77%	(8.76%)	5.46%	5.86%
Russell 2000 Index(1)	-	-	(2.40%)	14.18%	(8.89%)	7.32%	7.26%
S&P 600 Small Cap Index	-	-	(0.20%)	13.46%	(9.34%)	9.33%	9.89%
MCM Russell 2000 Core Index	317	1.96%	(2.39%)	14.13%	(8.88%)	-	-
Russell 2000 Index	-	-	(2.40%)	14.18%	(8.89%)	8.23%	8.19%
MCM Russell 2000 Val Index	573	3.55%	(0.56%)	12.77%	(8.23%)	-	-
Russell 2000 Value Index	-	-	(0.57%)	12.82%	(8.24%)	6.54%	7.17%
Emerald Adv Div Sm Cap Grth	660	4.08%	(6.96%)	16.86%	(9.17%)	-	-
Russell 2000 Growth Index	-	-	(4.17%)	15.34%	(9.63%)	9.79%	9.08%

*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 provided by RVK.

Investment Manager Returns

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance- Equity					
Global Public Equity	9.06%	6.95%	-	-	6.64% ^(1/02)
MSCI ACWI IMI	8.45%	7.25%	5.28%	6.79%	6.96% ^(1/02)
Global Mandates	11.41%	-	-	-	8.48% ^(11/06)
MSCI World	9.01%	7.14%	4.89%	7.00%	5.51% ^(11/06)
Walter Scott & Prtnrs Gbl Gr Eq	11.12%	-	-	-	9.04% ^(10/06)
MSCI World	9.01%	7.14%	4.89%	7.00%	5.77% ^(10/06)
U.S. Equity	12.64%	8.12%	6.44%	9.36%	10.55% ^(1/81)
Russell 3000 Index(1)	13.08%	9.10%	6.72%	9.72%	10.87% ^(1/81)
U.S. Mid/Large Cap Equity	13.20%	8.74%	6.43%	9.68%	9.45% ^(1/94)
Russell 1000 Index	13.23%	9.17%	6.63%	9.93%	9.66% ^(1/94)
MCM Russell 1000 Index	-	-	-	-	14.03% ^(1/12)
Russell 1000 Index	13.23%	9.17%	6.63%	9.93%	14.06% ^(1/12)
Iridian Asset Mgmt MCV	12.01%	10.29%	10.05%	-	12.51% ^(3/95)
Russell MidCap Index	13.07%	9.92%	9.50%	11.05%	11.04% ^(3/95)
Russell MidCap Value Idx	12.29%	9.29%	9.83%	11.11%	11.11% ^(3/95)
U.S. Small Cap Equity	10.01%	7.07%	7.53%	9.37%	8.91% ^(1/94)
Russell 2000 Index(1)	11.54%	8.72%	8.88%	10.39%	10.07% ^(1/94)
S&P 600 Small Cap Index	13.02%	9.52%	10.01%	10.75%	10.32% ^(1/94)
MCM Russell 2000 Core Index	-	-	-	-	6.53% ^(12/16)
Russell 2000 Index	11.19%	8.19%	7.99%	8.86%	6.57% ^(12/16)
MCM Russell 2000 Val Index	-	-	-	-	3.49% ^(12/16)
Russell 2000 Value Index	10.06%	7.23%	9.05%	9.66%	3.55% ^(12/16)
Emerald Adv Div Sm Cap Grth	-	-	-	-	10.51% ^(12/16)
Russell 2000 Growth Index	12.25%	9.04%	6.53%	7.63%	9.56% ^(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 provided by RVK.

Investment Manager Returns

As of September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance- Equity							
Non-U.S. Equity	\$7,315	36.31%	(1.45%)	12.54%	(1.08%)	7.17%	3.57%
MSCI ACWI ex US IMI(1)	-	-	(1.72%)	11.39%	(1.84%)	6.10%	3.05%
Non-U.S. Developed Markets Equity	\$5,515	27.38%	(0.93%)	14.20%	(0.93%)	7.60%	4.02%
MSCI ACWI ex US IMI	-	-	(1.72%)	11.39%	(1.84%)	6.10%	3.05%
MSCI World ex US	-	-	(0.93%)	13.57%	(0.95%)	6.49%	3.06%
Non-U.S. Dev Mid/Large Cap Equity	\$4,757	23.61%	(0.89%)	13.92%	(0.64%)	8.58%	4.36%
MSCI World ex US	-	-	(0.93%)	13.57%	(0.95%)	6.49%	3.06%
BlackRock MSCI World Ex US Index	4,748	23.57%	(0.89%)	13.96%	(0.62%)	-	-
MSCI World ex US	-	-	(0.93%)	13.57%	(0.95%)	6.49%	3.06%
Non-U.S. Dev Small Cap Equity	\$758	3.76%	(1.15%)	16.01%	(2.82%)	5.33%	4.09%
MSCI World ex US Sm Cap	-	-	(0.27%)	12.58%	(5.62%)	5.54%	5.14%
FIS Group Non-U.S. Small Cap	190	0.95%	(2.24%)	9.21%	(4.98%)	-	-
MSCI ACWI ex US Small Cap	-	-	(1.19%)	10.28%	(5.63%)	4.64%	3.98%
Harris Assoc Int'l SCV	568	2.82%	(0.78%)	18.48%	(2.08%)	5.43%	4.15%
MSCI World ex US Sm Cap	-	-	(0.27%)	12.58%	(5.62%)	5.54%	5.14%
Emerging Mkts Equity	\$1,799	8.93%	(3.00%)	7.75%	(0.91%)	7.11%	3.05%
MSCI EM	-	-	(4.25%)	5.90%	(2.01%)	5.98%	2.33%
BlackRock Emg Mkts Index	660	3.27%	(4.26%)	5.72%	(2.19%)	-	-
MSCI EM	-	-	(4.25%)	5.90%	(2.01%)	5.98%	2.33%
Leading Edge Emg Mkts Fund	212	1.05%	(3.38%)	9.44%	-	-	-
MSCI EM	-	-	(4.25%)	5.90%	(2.01%)	5.98%	2.33%
Macquarie Emg Mkts Equity	409	2.03%	(1.68%)	6.12%	(1.98%)	7.35%	2.34%
MSCI EM	-	-	(4.25%)	5.90%	(2.01%)	5.98%	2.33%
Martin Currie Emg Mkts Equity	431	2.14%	(1.14%)	11.92%	2.47%	9.71%	5.38%
MSCI EM	-	-	(4.25%)	5.90%	(2.01%)	5.98%	2.33%
GlobeFlex Emerging Small Cap	88	0.44%	(7.37%)	4.44%	(7.79%)	4.28%	0.95%
MSCI EM Small Cap	-	-	(4.58%)	1.82%	(5.48%)	1.32%	(0.13%)
Northern Trust Equity Transition	1	0.01%	0.53%	0.69%	(15.28%)	-	-

*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 provided by RVK.

Investment Manager Returns

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance- Equity					
Non-U.S. Equity	5.26%	5.31%	4.83%	-	6.10% (11/95)
MSCI ACWI ex US IMI(1)	4.64%	6.03%	4.81%	5.18%	5.45% (11/95)
Non-U.S. Developed Markets Equity	6.06%	5.44%	-	-	6.01% (1/02)
MSCI ACWI ex US IMI	4.66%	5.88%	4.41%	4.85%	6.55% (1/02)
MSCI World ex US	4.78%	5.36%	3.89%	4.94%	5.72% (1/02)
Non-U.S. Dev Mid/Large Cap Equity	6.17%	5.01%	-	-	5.50% (1/02)
MSCI World ex US	4.78%	5.36%	3.89%	4.94%	5.72% (1/02)
BlackRock MSCI World Ex US Index	-	-	-	-	3.62% (6/17)
MSCI World ex US	4.78%	5.36%	3.89%	4.94%	3.15% (6/17)
Non-U.S. Dev Small Cap Equity	6.52%	7.40%	6.59%	6.63%	6.74% (10/93)
MSCI World ex US Sm Cap	6.93%	7.00%	-	-	-
FIS Group Non-U.S. Small Cap	-	-	-	-	(4.98%) (10/18)
MSCI ACWI ex US Small Cap	6.13%	7.30%	6.44%	5.30%	(5.63%) (10/18)
Harris Assoc Int'l SCV	7.08%	8.37%	-	-	10.40% (7/03)
MSCI World ex US Sm Cap	6.93%	7.00%	-	-	8.99% (7/03)
Emerging Mkts Equity	2.89%	5.36%	-	-	6.93% (1/02)
MSCI EM	3.37%	7.82%	-	-	9.30% (1/02)
BlackRock Emg Mkts Index	-	-	-	-	1.94% (7/17)
MSCI EM	3.37%	7.82%	-	-	2.14% (7/17)
Leading Edge Emg Mkts Fund	-	-	-	-	7.97% (11/18)
MSCI EM	3.37%	7.82%	-	-	7.34% (11/18)
Macquarie Emg Mkts Equity	-	-	-	-	3.22% (5/13)
MSCI EM	3.37%	7.82%	-	-	1.91% (5/13)
Martin Currie Emg Mkts Equity	-	-	-	-	4.08% (1/14)
MSCI EM	3.37%	7.82%	-	-	2.45% (1/14)
GlobeFlex Emerging Small Cap	-	-	-	-	2.87% (8/13)
MSCI EM Small Cap	3.21%	8.17%	7.22%	3.35%	1.75% (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.

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

Investment Manager Returns

As of September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income							
Fixed Income	\$4,351	100.00%	1.80%	8.90%	9.41%	3.38%	3.06%
Blmbg Aggregate	-	-	2.27%	8.52%	10.30%	2.92%	3.38%
Core Fixed Income	\$1,983	45.58%	2.19%	9.05%	10.16%	3.21%	3.54%
Blmbg Aggregate	-	-	2.27%	8.52%	10.30%	2.92%	3.38%
MCM Bond Index	1,117	25.66%	2.22%	8.47%	10.23%	2.88%	3.33%
Blmbg Aggregate(1)	-	-	2.27%	8.52%	10.30%	2.92%	3.38%
PIMCO Core Bond Fund	665	15.29%	1.90%	8.85%	9.64%	3.27%	3.62%
Blmbg Agg ex Treasury	-	-	2.18%	9.03%	10.19%	3.32%	3.65%
Taplin, Canida & Habacht Corp FI	202	4.64%	3.00%	13.02%	11.48%	4.66%	4.24%
Blmbg Credit	-	-	2.98%	12.61%	12.63%	4.33%	4.54%
Core-Plus Fixed Income	\$893	20.53%	0.31%	8.66%	6.73%	4.30%	2.44%
Brandywine Global Opp	196	4.51%	(1.64%)	5.03%	3.68%	1.79%	1.60%
FTSE WGBI	-	-	0.85%	6.27%	8.13%	1.19%	1.80%
Pyramis Gbl Adv HY CMBS	340	7.81%	1.85%	7.80%	8.35%	5.24%	5.15%
Blmbg US Univ CMBS ex Aaa	-	-	2.61%	11.13%	11.75%	5.32%	4.92%
Stone Harbor Gbl HY	193	4.44%	0.85%	11.69%	6.27%	5.32%	4.21%
FTSE US High Yield	-	-	0.96%	10.95%	5.72%	5.81%	4.99%
Stone Harbor EMD	164	3.77%	(1.07%)	11.40%	7.38%	3.07%	4.41%
JPM EMBI Global	-	-	1.34%	12.08%	10.74%	3.84%	5.10%
Global TIPS	\$868	19.95%	1.42%	7.69%	7.13%	2.19%	2.49%
Blmbg US TIPS	-	-	1.35%	7.58%	7.13%	2.21%	2.45%
Brown Brothers TIPS	230	5.29%	1.50%	7.74%	7.30%	2.23%	2.58%
Blmbg US TIPS	-	-	1.35%	7.58%	7.13%	2.21%	2.45%
NISA Inv Adv TIPS	517	11.88%	1.28%	7.48%	6.98%	2.16%	2.44%
Blmbg US TIPS(1)	-	-	1.35%	7.58%	7.13%	2.21%	2.45%
New Century Global TIPS	121	2.77%	1.95%	8.59%	7.57%	2.27%	2.55%
Blmbg Wld Gov I-L Undhdg	-	-	1.77%	8.19%	7.31%	2.17%	2.29%
Nominal U.S. Treasuries	\$607	13.94%	3.33%	10.53%	14.53%	2.13%	3.68%
Blmbg US Treas Bell 10Y	-	-	3.19%	10.86%	15.15%	1.81%	3.39%
PIMCO US Treasuries	607	13.94%	3.33%	10.53%	14.53%	2.42%	3.94%
Blmbg US Treas Bell 10Y	-	-	3.19%	10.86%	15.15%	1.81%	3.39%

*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 provided by RVK.

Investment Manager Returns

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Fixed Income					
Fixed Income	5.21%	5.20%	5.74%	6.41%	8.44% (1/81)
Blmbg Aggregate	3.75%	4.21%	5.01%	5.57%	7.68% (1/81)
Core Fixed Income	4.54%	4.60%	-	-	4.90% (1/02)
Blmbg Aggregate	3.75%	4.21%	5.01%	5.57%	4.54% (1/02)
MCM Bond Index	3.63%	4.09%	4.99%	5.69%	7.17% (4/84)
Blmbg Aggregate(1)	3.75%	4.21%	5.10%	5.76%	7.45% (4/84)
PIMCO Core Bond Fund	-	-	-	-	2.86% (1/13)
Blmbg Agg ex Treasury	4.10%	-	-	-	3.14% (1/13)
Taplin, Canida & Habacht Corp FI	5.53%	5.22%	-	-	5.91% (11/00)
Blmbg Credit	5.32%	5.12%	5.92%	6.39%	5.95% (11/00)
Core-Plus Fixed Income	-	-	-	-	4.44% (10/12)
Brandywine Global Opp	-	-	-	-	3.65% (2/11)
FTSE WGBI	1.69%	3.31%	4.16%	4.69%	1.59% (2/11)
Pyramis Gbl Adv HY CMBS	12.01%	6.86%	8.45%	-	8.65% (4/97)
Blmbg US Univ CMBS ex Aaa	9.20%	0.98%	-	-	-
Stone Harbor Gbl HY	6.89%	6.62%	-	-	7.54% (7/00)
FTSE US High Yield	7.61%	6.97%	6.88%	7.37%	7.14% (7/00)
Stone Harbor EMD	6.49%	-	-	-	7.40% (4/05)
JPM EMBI Global	6.51%	7.27%	8.99%	9.50%	7.28% (4/05)
Global TIPS	2.67%	3.27%	-	-	3.27% (2/03)
Blmbg US TIPS	3.46%	3.90%	5.47%	-	4.31% (2/03)
Brown Brothers TIPS	-	-	-	-	1.66% (2/12)
Blmbg US TIPS	3.46%	3.90%	5.47%	-	1.47% (2/12)
NISA Inv Adv TIPS	2.45%	-	-	-	3.15% (4/07)
Blmbg US TIPS(1)	2.45%	3.18%	4.92%	-	3.15% (4/07)
New Century Global TIPS	-	-	-	-	2.28% (2/12)
Blmbg Wld Gov I-L Undhdg	3.22%	4.05%	5.46%	-	1.88% (2/12)
Nominal U.S. Treasuries	-	-	-	-	2.88% (9/11)
Blmbg US Treas Bell 10Y	4.00%	4.35%	5.03%	5.60%	2.92% (9/11)
PIMCO US Treasuries	-	-	-	-	3.09% (9/11)
Blmbg US Treas Bell 10Y	4.00%	4.35%	5.03%	5.60%	2.92% (9/11)

*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 provided by RVK.

Investment Manager Returns

As of September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Multi-Strategy							
Multi-Strategy	\$1,714	100.00%	0.57%	11.70%	3.46%	-	-
S&P/LSTA Leveraged Loan	-	-	0.99%	6.79%	3.10%	4.53%	3.98%
Russell 3000 Index	-	-	1.16%	20.09%	2.92%	12.83%	10.44%
Credit Focused Strategies	\$934	54.47%	0.83%	7.07%	2.94%	-	-
Blackstone Keystone(1)	934	54.47%	0.83%	7.07%	2.94%	5.78%	4.22%
HFRI Fund of Funds Compos	-	-	(0.82%)	5.29%	0.08%	3.18%	1.96%
Opp. Equity & Fixed Income	\$547	31.93%	0.26%	15.44%	4.11%	-	-
SEI Str. Credit: HY Bank Loans(2)	343	20.02%	(1.22%)	2.66%	2.26%	9.02%	6.76%
FTSE US High Yield	-	-	0.96%	10.95%	5.72%	5.81%	4.99%
Eaton Vance GMARA	204	11.92%	2.86%	7.90%	5.39%	-	-
3 month LIBOR + 6%	-	-	2.00%	6.30%	8.56%	7.90%	7.31%
Private Credit(3)	\$233	13.59%	0.14%	5.89%	7.38%	-	-

(1) Blackstone Keystone since inception returns are included in the Legacy Hedge Fund composite through 9/30/2017.

(2) SEI HY Bank Loans since inception returns are included in the Fixed Income composite through 9/30/2017.

(3) Russell 3000 Index since inception returns are included in the Global Public Equity composite through 9/30/2017.

(4) Private Credit performance has a 1 Qtr lag.

Investment Manager Returns

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Multi-Strategy					
Multi-Strategy	-	-	-	-	6.94% ^(10/17)
S&P/LSTA Leveraged Loan	5.21%	4.72%	4.85%	-	4.14% ^(10/17)
Russell 3000 Index	13.08%	9.10%	6.72%	9.81%	10.00% ^(10/17)
Credit Focused Strategies	-	-	-	-	4.03% ^(10/17)
Blackstone Keystone(1)	-	-	-	-	7.31% ^(7/12)
HFRI Fund of Funds Compos	2.68%	2.94%	3.91%	4.87%	3.42% ^(7/12)
Opp. Equity & Fixed Income	-	-	-	-	9.18% ^(10/17)
SEI Str. Credit: HY Bank Loans(2)	14.99%	-	-	-	12.27% ^(5/08)
FTSE US High Yield	7.61%	6.97%	6.88%	7.37%	7.26% ^(5/08)
Eaton Vance GMARA	-	-	-	-	1.60% ^(6/18)
3 month LIBOR + 6%	6.82%	7.79%	8.13%	8.83%	8.52% ^(6/18)
Private Credit(3)	-	-	-	-	7.82% ^(12/17)

(1) Blackstone Keystone since inception returns are included in the Legacy Hedge Fund composite through 9/30/2017.

(2) SEI HY Bank Loans since inception returns are included in the Fixed Income composite through 9/30/2017.

(3) Russell 3000 Index since inception returns are included in the Global Public Equity composite through 9/30/2017.

(4) Private Credit performance has a 1 Qtr lag.

Investment Manager Returns

As of September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Real Estate							
Real Estate	\$2,047	100.00%	2.06%	8.76%	10.18%	2.04%	4.60%
Real Estate Custom Benchmark	-	-	1.08%	4.70%	6.54%	6.46%	8.47%
CPI +3% (Qtr lag)	-	-	1.49%	3.70%	4.65%	5.05%	4.45%
Core/Core Plus Real Estate Funds	\$700	34.18%	(1.48%)	0.51%	3.53%	5.68%	8.01%
NCREIF ODCE Index (Qtr lag)	-	-	1.12%	4.04%	5.99%	6.97%	9.12%
Value Add/Opp. Real Estate	\$1,056	51.57%	2.83%	9.53%	11.74%	0.98%	4.10%
NCREIF ODCE Index (Qtr lag)	-	-	1.12%	4.04%	5.99%	6.97%	9.12%
Real Estate Separate Accounts	616	30.09%	3.26%	12.66%	15.21%	(1.85%)	2.56%
NCREIF ODCE Index (Qtr lag)	-	-	1.12%	4.04%	5.99%	6.97%	9.12%
Non-Core Closed End Funds	440	21.48%	2.20%	4.81%	6.21%	7.67%	7.80%
NCREIF ODCE Index (Qtr lag)	-	-	1.12%	4.04%	5.99%	6.97%	9.12%
Natural Resources/Infrastructure	\$5	0.27%	2.77%	0.51%	0.55%	(4.11%)	(2.24%)
CPI +3% (Qtr lag)	-	-	1.49%	3.70%	4.65%	5.05%	4.45%
REITS	\$286	13.98%	8.04%	28.00%	19.77%	5.74%	5.99%
FTSE NAREIT US Index (Qtr lag)	-	-	0.70%	9.70%	10.34%	3.72%	7.42%

*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 September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Real Estate					
Real Estate	6.65%	5.93%	6.90%	7.75%	8.39% (3/84)
Real Estate Custom Benchmark	9.32%	7.36%	7.76%	-	-
CPI +3% (Qtr lag)	4.73%	5.02%	5.19%	5.22%	5.64% (3/84)
Core/Core Plus Real Estate Funds	9.42%	7.52%	7.71%	8.83%	7.04% (9/86)
NCREIF ODCE Index (Qtr lag)	8.80%	6.87%	7.16%	7.83%	6.01% (9/86)
Value Add/Opp. Real Estate	5.85%	5.23%	6.28%	7.26%	6.70% (3/84)
NCREIF ODCE Index (Qtr lag)	8.80%	6.87%	7.16%	7.83%	6.28% (3/84)
Real Estate Separate Accounts	3.78%	4.08%	5.15%	6.13%	5.13% (6/88)
NCREIF ODCE Index (Qtr lag)	8.80%	6.87%	7.16%	7.83%	6.06% (6/88)
Non-Core Closed End Funds	9.66%	6.90%	7.84%	8.86%	7.88% (3/84)
NCREIF ODCE Index (Qtr lag)	8.80%	6.87%	7.16%	7.83%	6.28% (3/84)
Natural Resources/Infrastructure	(1.79%)	1.89%	2.85%	3.82%	4.11% (3/93)
CPI +3% (Qtr lag)	4.73%	5.02%	5.19%	5.22%	5.24% (3/93)
REITS	12.15%	8.95%	10.11%	-	10.15% (4/96)
FTSE NAREIT US Index (Qtr lag)	15.24%	8.75%	10.07%	10.77%	10.52% (4/96)

*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 September 30, 2019

	Market Value \$(mm)	Ending Weight	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
Net Performance - Private Equity							
Private Equity	\$3,910	100.00%	0.97%	7.16%	9.27%	11.87%	8.94%
Burgiss Private Eqty Idx (Qtr Lag)	-	-	3.33%	6.30%	9.78%	14.17%	11.14%
Russell 3000 + 3% (Qtr Lag)	-	-	4.94%	4.66%	12.76%	17.35%	13.49%
Buyouts	\$1,780	45.52%	2.20%	5.96%	9.03%	12.88%	10.43%
Burgiss Buyout Index (Qtr Lag)	-	-	2.76%	4.59%	7.65%	14.38%	11.00%
Special Situations	\$559	14.30%	3.89%	11.70%	15.50%	12.57%	8.24%
Burgiss Special Sits Idx (Qtr Lag)	-	-	1.22%	2.03%	3.83%	8.24%	6.29%
Venture Capital	\$747	19.11%	(3.48%)	16.58%	26.98%	15.88%	9.79%
Burgiss Venture Cap Idx (Qtr Lag)	-	-	5.27%	13.27%	19.70%	17.06%	14.92%
Keystone Legacy (Qtr Lag) (1)	\$824	21.06%	0.70%	1.05%	(2.49%)	-	-

(1) As of 7/31/2018, Keystone Legacy SPV consists of 163 non-core funds, prior performance in previous sub-asset classes

Investment Manager Returns

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception
Net Performance - Private Equity					
Private Equity	11.92%	11.58%	9.92%	13.70%	10.92% (1/86)
Burgiss Private Eqty Idx (Qtr Lag)	13.71%	13.11%	11.77%	15.15%	16.94% (1/86)
Russell 3000 + 3% (Qtr Lag)	18.00%	12.35%	9.80%	13.49%	14.56% (1/86)
Buyouts	13.96%	14.12%	11.85%	16.54%	13.13% (4/86)
Burgiss Buyout Index (Qtr Lag)	13.88%	13.97%	11.94%	13.58%	19.63% (4/86)
Special Situations	12.32%	11.98%	12.00%	-	12.31% (1/95)
Burgiss Special Sits Idx (Qtr Lag)	10.48%	9.01%	10.00%	-	10.51% (1/95)
Venture Capital	9.96%	6.94%	3.88%	8.00%	7.00% (1/86)
Burgiss Venture Cap Idx (Qtr Lag)	15.06%	11.78%	9.19%	16.02%	13.70% (1/86)
Keystone Legacy (Qtr Lag) (1)	-	-	-	-	(2.00%) (7/18)

(1) As of 7/31/2018, Keystone Legacy SPV consists of 163 non-core funds, prior performance in previous sub-asset classes

Callan

Appendix II – Callan Update

Published Research Highlights from 3Q19

Callan's 2019 ESG Survey



The Callan DC Index™ in Detail



The Keys to Unlocking Private Equity Portfolio Assessment



DC Plan Hacks: Tips for an Efficient Design

Saving in the DC Plan

You don't pay taxes on the earnings each year as you would if you saved outside the plan.

Pre-Tax	Roth	After-Tax
Save before paying taxes	Save after you have paid taxes and avoid taxes on the earnings	Save after you have paid taxes and pay taxes on the earnings
<ul style="list-style-type: none">Your income for the purposes of determining your taxes is the amount you're required to pay each year.You will pay taxes on both the original contribution and earnings when you take the money out.You can save up to \$19,000 between pre-tax and Roth, or up to \$27,000 if you are over 50.	<ul style="list-style-type: none">Your Roth deferral won't lower your income for tax purposes in the current year.You pay no taxes on either the original contribution or the earnings when you take the money out, assuming you are over 59½ and you haven't touched the money for 5 years.You can save up to \$19,000 between pre-tax and Roth, or up to \$27,000 if you are over 50.	<ul style="list-style-type: none">Your deferral won't lower your income for tax purposes in the current year.You will be responsible for taxes on the earnings when you take the money out or convert it to a Roth account.You can save up to \$19,000 between pre-tax and Roth, or up to \$27,000 if you are over 50.

Note: All savings limits are for 2019.

Recent Blog Posts

For Corporate DB Plans, We Have Good News and Bad News

William Emmett

What Fixed Income Managers Are Thinking Now

David Zee

Tips for Emerging and Diverse Managers

Anne Maloney

Additional Reading

Private Equity Trends quarterly newsletter

Active vs. Passive quarterly charts

Capital Market Review quarterly newsletter

Monthly Updates to the Periodic Table

Market Pulse Flipbook quarterly markets update

Callan Institute Events

Upcoming Conferences, Workshops, and Webinars

Save the Date! Callan's 40th National Conference

January 27–29, 2020 | The Palace Hotel, San Francisco

This year's lineup of speakers will include:



Frank W. Abagnale

- Renowned cybersecurity and fraud prevention expert
- Best-selling author and subject of *Catch Me If You Can*



Dr. Joseph F. Coughlin

- Director of the Massachusetts Institute of Technology AgeLab
- Professor of MIT's Department of Urban Studies & Planning and the Sloan School's Advanced Management Program



Dr. Doris Kearns Goodwin

- World-renowned presidential historian and public speaker
- Pulitzer Prize-winning and New York Times #1 best-selling author



Dr. Dambisa Mayo

- Global economist and investor in the future
- Author of four New York Times best-selling books

On-Demand Webinars

Visit our website for On-Demand webinar options at <https://www.callan.com/ondemandwebinar/>

“Callan College” Introduction to Investments

San Francisco, April 21-22, 2020

Chicago, July 21-22, 2020

Callan Updates

Firm updates by the numbers, as of September 30, 2019

Total Associates: 194

Ownership

- 100% employees
- Broadly distributed across 94 shareholders

Leadership Changes

- No executive additions or departures
- No leadership changes this quarter

Total General and Fund Sponsor Consultants: more than 45

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 \$2.4 trillion

“The Callan culture that we have all built together over the years is the reason we like coming to work each day ... Our culture of supporting and caring about each other, of appreciating and respecting each other while still having some fun and good humor has been the key to our longevity and success. We never want to diminish it.”

— Ron Peyton, Executive Chairman

