Callan

June 9 , 2020

Pennsylvania State Employees' Retirement System – Defined Benefit Plan

First Quarter 2020

Executive Summary

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Callan

Market Environment

Sharp Drop in Global Equity Markets in 1Q 2020

No place to hide

- Equity markets around the globe collapsed starting in late February.
- S&P 500 Index was down 33% from peak (02/19/20) at worst point on 3/23/20; down -19.6% for the quarter. All countries and sectors were impacted.
- Fed cut interest rates to zero, commenced QE, instituted multiple facilities to backstop money markets, credit markets, and the economy.
- Congress passed fiscal stimulus (CARES) to carry the economy through the crisis.
- Fed's role is a backstop/facilitator/lender of last resort, but not a grantor; it expects to get paid back. Programs are designed to keep the Fed from losing money.
- Granting is the province of Congress, and fiscal policy.

Returns for Periods ended March 31, 2020

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	-20.90	-9.13	5.77	10.15	8.81
S&P 500	-19.60	-6.98	6.73	10.53	8.85
Russell 2000	-30.61	-23.99	-0.25	6.90	7.57
Global ex-U.S. Equity					
MSCI World ex USA	-23.26	-14.89	-0.76	2.43	4.12
MSCI Emerging Markets	-23.60	-17.69	-0.36	0.69	--
MSCI ACWI ex USA Small Cap	-29.01	-21.18	-0.81	2.79	4.57
Fixed Income					
Bloomberg Barclays Aggregate	3.15	8.93	3.36	3.88	5.49
90-day T-Bill	0.57	2.25	1.19	0.64	2.43
Bloomberg Barclays Long Gov/Credit	6.21	19.32	5.99	8.07	7.89
Bloomberg Barclays Global Agg ex-US	-2.68	0.74	2.04	1.39	3.77
Real Estate					
NCREIF Property	0.71	5.28	7.65	10.17	9.28
FTSE Nareit Equity	-27.30	-21.26	-0.35	7.40	9.24
Alternatives					
CS Hedge Fund	-8.98	-4.32	0.24	2.96	7.35
Cambridge Private Equity*	0.90	9.50	12.37	13.75	15.30
Bloomberg Commodity	-23.29	-22.31	-7.76	-6.74	0.56
Gold Spot Price	4.83	22.96	6.18	3.66	5.75
Inflation - CPI-U	0.44	1.54	1.80	1.72	2.15

*Cambridge PE data through September 30, 2019.
Source: Callan

Capital Markets

What just happened?

A “Global Hurricane” in the form of a pandemic; unprecedented economic impact from a global shutdown

– Dominant fear over last few years: an equity market downturn, which was realized at the end of February
– Breathtaking speed and depth of the three-week economic decline

Governments stepped in quickly with immediate monetary response, fiscal stimulus

– Fed Chairman Powell: “We’ll do whatever it takes.” Able to leverage policy playbook following GFC.
– Monetary response important, but not the solution to this crisis
– Massive fiscal policy required to address economic dislocation: companies, industries, individuals
– Tremendous uncertainty remains. Who gets rescued next?

Broad economic impact

– **Companies/Organizations:** Stresses to revenue, earnings, economic viability, access to capital, recovery
– **Individuals:** Unemployment, income, wealth, retirement savings
– **Governments:** Increasing service burden, declining tax revenues
– Need a new method of evaluating economic data: When do levels of GDP, income, employment, and unemployment return to normal?

Left us with a very uncertain future

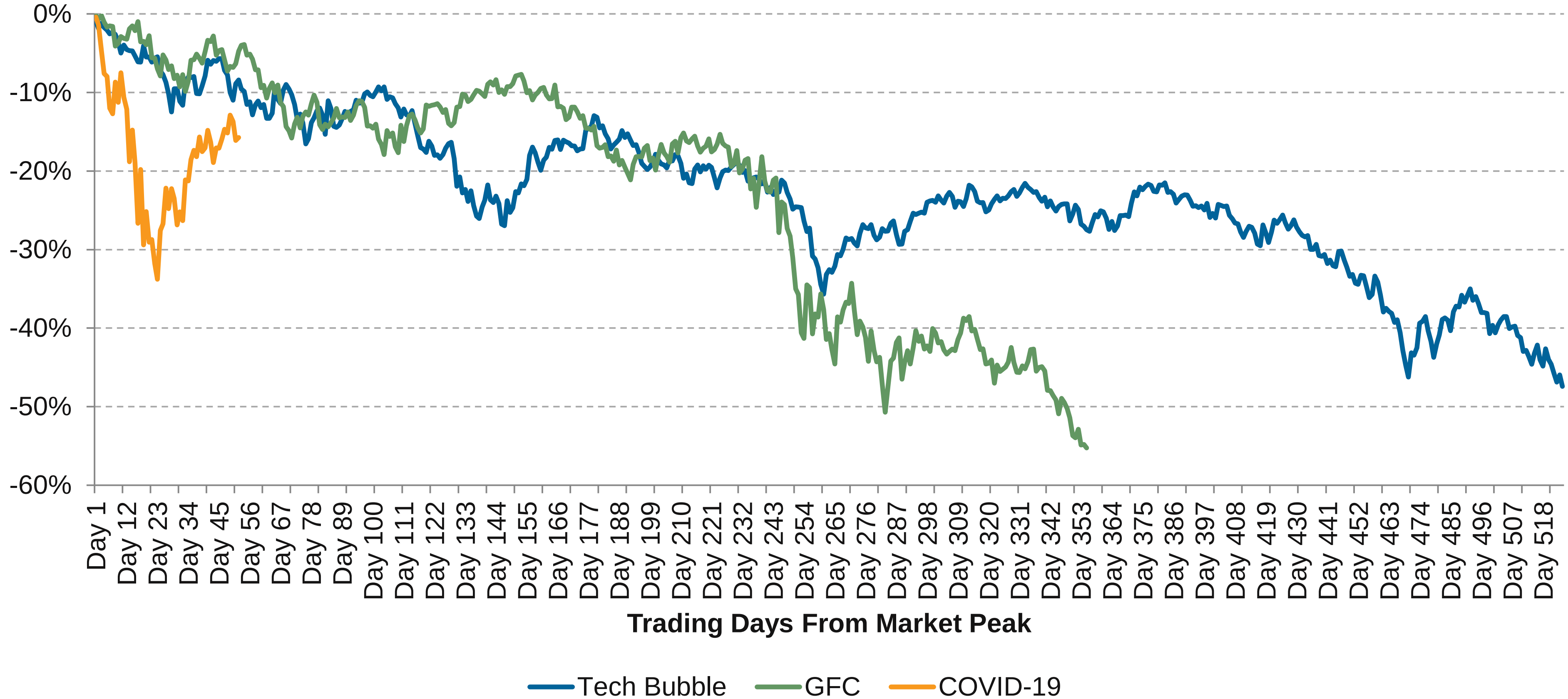
– Question we’re getting from clients: When will this uncertainty settle down?
– True recovery depends on containment and then a vaccine. Monetary and fiscal policy can only address the symptoms.

What Just Happened?

A 'Global Hurricane' in the form of a pandemic

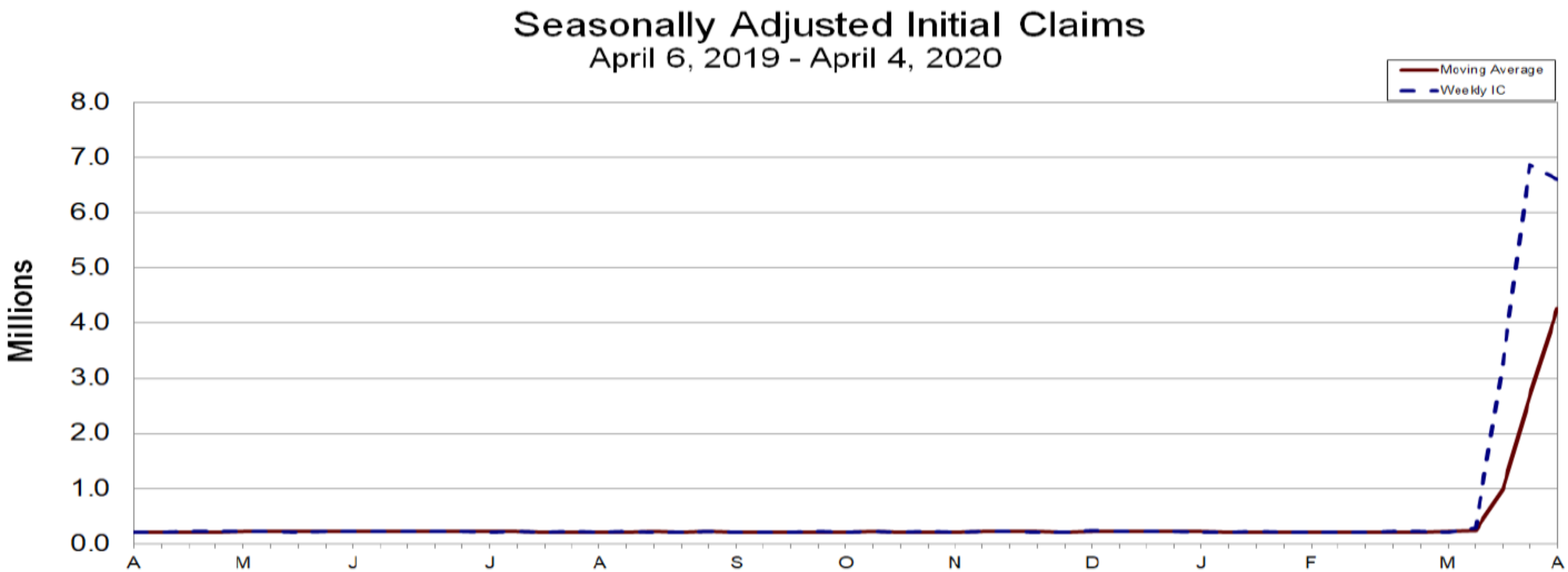
The sharpest and fastest equity market decline ever: 16 trading days to reach bear market; -33% after just 23 days

S&P 500 Index Cumulative Returns
Market Peak-to-Trough for Last Two Corrections vs.
Current Path of COVID-19 Correction Through 5/4/20



U.S. Economic Conditions

Initial unemployment claims



- Initial unemployment claims have spiked.
  - *6,606,000 for week ended April 4*
  - *6,648,000 for week ended March 28*
  - *Over 15 million jobs lost since March 1, 9% of the U.S. labor force*
- Insured unemployment rate now at 5.1%, likely headed into double-digits

Department of Labor, https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/ui-claims/20200551.pdf

Fed Providing Meaningful Support to Certain Markets…

…while excluding others

Program/Facility	Abbreviation	Targeted Sector	Purchases, direct lending, or SPV	Announced Treasury support ($Bn)	Capacity ($bn)	Authorization	Current Balance ($bn)
Commercial Paper Fund Facility	CPFF	Commercial Paper	SPV	$10	Not stated	13(3)	$1
Primary Dealer Credit Facility	PDCF	Primary Dealers/Liquidity	Direct Loans	$0	Not stated	13(3)	$33
Money Market Mutual Fund Liquidity Facility	MMLF	Money Market Mutual Funds	SPV	$10	Not stated	13(3)	$51
Term Asset-Backed Securities Loan Facility	TALF	Asset-Backed Securities	SPV	$10	Up to $100	13(3)	-
Corporate Credit Facilities	PMCCF, SMCCF	Corporate Debt	SPV	$75	Up to $750	13(3)	-
Main Street Loan Facilities	MSELF, MSNLF	Small- & Mid-Sized Businesses	SPV	$75	Up to $600	13(3)	-
Paycheck Protection Program Liquidity Facility	PPPLF	Small Businesses	Direct Loans	$0	Not stated	13(3)	-
Municipal Liquidity Facility	MLF	Municipal Debt	SPV	$35	Up to $500	13(3)	-
Discount Window	-	Banks	Direct Loans	$0	Not stated	10(B)	$36
Cenral Bank Swap Lines	-	Central Banks/Dollar Liquidity	Direct Loans	$0	Not stated	14	$378
FIMA Repo Facility	FIMA	Foreign Monetary/Treasury Liquidity	Direct Loans	$0	Not stated	FOMC	-
Asset Purchases	-	Treasuries, Agency MBS	Purchases	$0	Not stated	FOMC	$1,511
Repurchase Agreements	-	Financial Intermediaries	Direct Loans	$0	Not stated	FOMC	$181
Totals				**$215**	**> $1,950**		**$2,191**

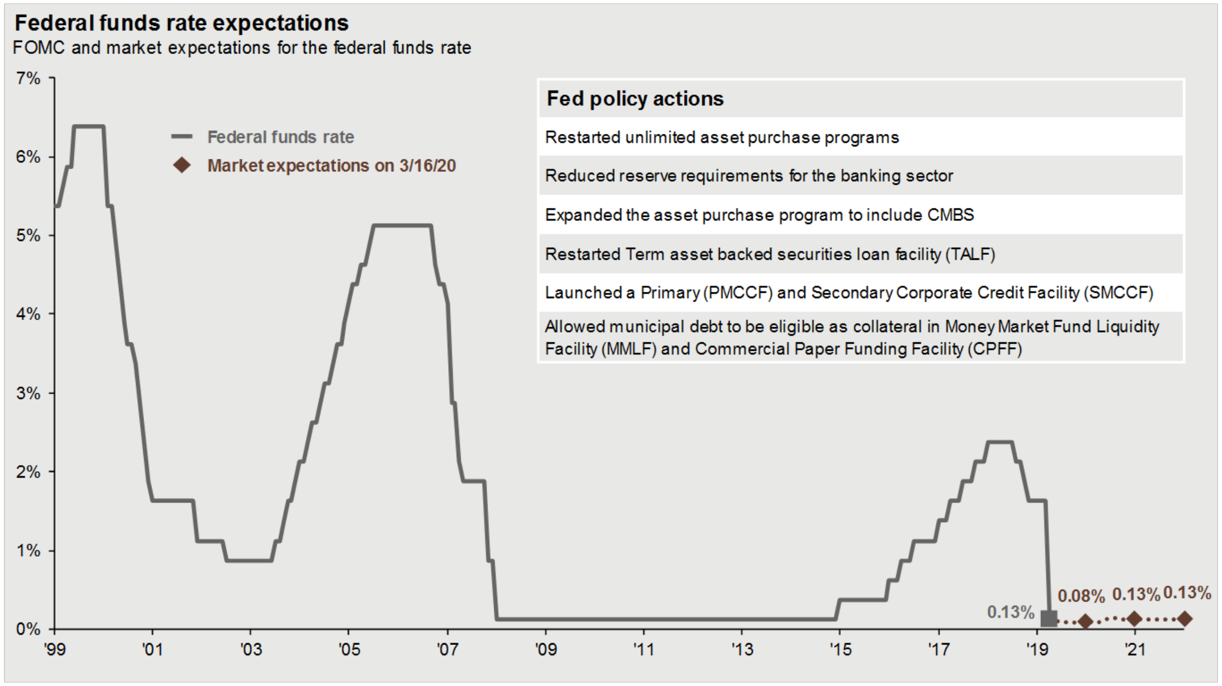
Asset Type	**Market Size ($bn)**	**Fed Facility Size ($bn)**	**Fed Eligible?**
HY Bonds	$1,300	None	N
HY ETF	$42	$8	N
Leveraged Loans	$1,400	None	N
Leveraged Loans ETF	$10	None	N
CLO AA-Unrated	$335	None	N
European HY Bonds and Loans	$700	None	N
Fallen Angels <BB	TBD	None	N
Middle Market Loans	$1,000	$200(E)	N
Total Ineligible Assets	**$4,787**		

The Fed and Treasury have been quick to provide solutions to certain parts of the market, primarily short-term and investment grade securities. However, the lack of support for leveraged credit markets and high yield bonds creates opportunities for distressed investors.

Source: Marathon Asset Management, LP, SIFMA. Note HY ETF assets have very limited eligibility.

Government Intervention

Fed funds rate



Source: Bloomberg, FactSet, Federal Reserve, J.P. Morgan Asset Management.
Market expectations are the federal funds rates priced into the fed futures market as of the following date of the March 15, 2020 emergency cut and are through December 2022.
Guide to the Markets – U.S. Data are as of April 7, 2020.

- In addition to supporting financial market liquidity, the Fed cut the Fed funds rate
  - *The Fed cut rates repeatedly and quickly; Fed funds now near zero*
  - *QE engaged to manage along the length of the yield curve*
  - *QE to be expanded to include intervention in the below-investment grade market*
- Markets do not expect the Fed to raise rates in the near future

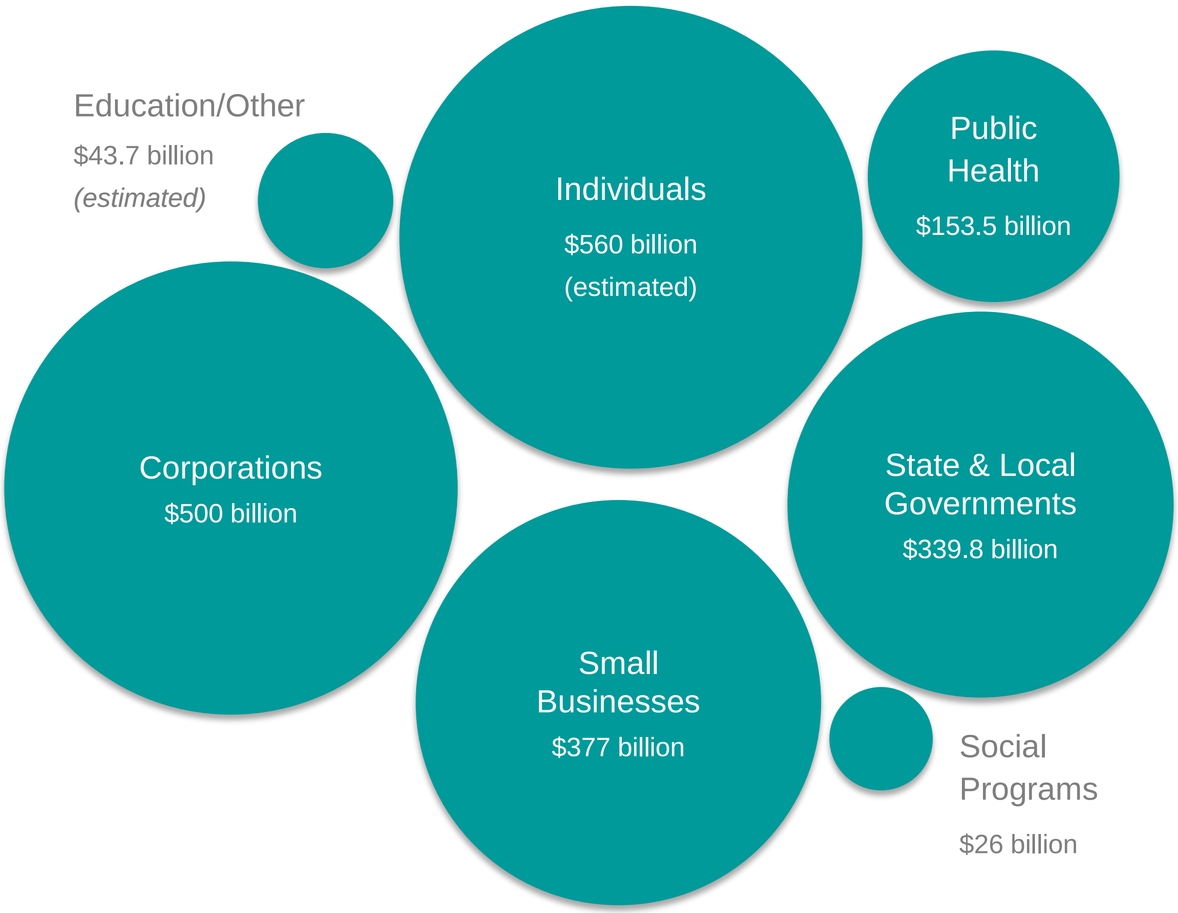
Source: Federal Reserve, J.P. Morgan

2020 CARES Act Injects $2 Trillion in Fiscal Stimulus

Equates to roughly 10% of GDP

- Expanded unemployment benefits
  - New benefits for those who exhausted eligibility
  - Additional $600/week for up to four months
  - Potential for 13 weeks of federal benefits after state benefits exhausted
- Cash distributions
  - Up to $1,200 for individuals, scaled by income level
  - Advance refundable tax credit against 2020 income taxes
- Student loan relief
  - Suspended payments and interest for some federal student loans
  - More flexibility for federal education grants
  - Tax-free employer loan payments
- Defined contribution plan liquidity
  - Relaxation of distribution taxes
  - Expansion of loan amounts
- $58 billion in airline industry relief
- $377 billion for small businesses
- Relaxed credit reporting
- Federally backed home loan forbearance

Distribution of the $2 Trillion from the CARES Act



Source: NPR.org

Diversification Remains Key Risk Control

Periodic Table of Investment Returns 2003 – 1Q2020

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	1 Qtr. 2020
MSCI Emerging Markets 55.82%	MSCI Emerging Markets 25.55%	MSCI Emerging Markets 34.00%	MSCI Emerging Markets 32.17%	MSCI Emerging Markets 39.38%	Bloomberg Barclays Agg 5.24%	MSCI Emerging Markets 78.51%	Russell 2000 Growth 29.09%	Bloomberg Barclays Agg 7.84%	MSCI Emerging Markets 18.23%	Russell 2000 Growth 43.30%	S&P 500 Growth 14.89%	S&P 500 Growth 5.52%	Russell 2000 Value 31.74%	MSCI Emerging Markets 37.28%	Bloomberg Barclays Agg 0.01%	S&P 500 Value 31.93%	Bloomberg Barclays Agg 3.15%
Russell 2000 Growth 48.54%	Russell 2000 Value 22.25%	MSCI World ex USA 14.47%	MSCI World ex USA 25.71%	MSCI World ex USA 12.44%	Bloomberg Barclays High Yield -26.16%	Bloomberg Barclays High Yield 58.21%	Russell 2000 26.85%	Bloomberg Barclays High Yield 4.98%	Russell 2000 Value 18.05%	Russell 2000 38.82%	S&P 500 13.69%	S&P 500 1.38%	Russell 2000 21.31%	S&P 500 Growth 27.44%	S&P 500 Growth -0.01%	S&P 500 31.49%	Bloomberg Barclays High Yield -12.68%
Russell 2000 47.25%	MSCI World ex USA 20.38%	S&P 500 Value 5.82%	Russell 2000 Value 23.48%	S&P 500 Growth 9.13%	Russell 2000 Value -28.92%	Russell 2000 Growth 34.47%	Russell 2000 Value 24.50%	S&P 500 Growth 4.65%	S&P 500 Value 17.68%	Russell 2000 Value 34.52%	S&P 500 Value 12.36%	Bloomberg Barclays Agg 0.55%	S&P 500 Value 17.40%	MSCI World ex USA 24.21%	Bloomberg Barclays High Yield -2.08%	S&P 500 Growth 31.13%	S&P 500 Growth -14.50%
Russell 2000 Value 46.03%	Russell 2000 18.33%	S&P 500 4.91%	S&P 500 Value 20.81%	Russell 2000 Growth 7.05%	Russell 2000 -33.79%	MSCI World ex USA 33.67%	MSCI Emerging Markets 18.88%	S&P 500 2.11%	MSCI World ex USA 16.41%	S&P 500 Growth 32.75%	Bloomberg Barclays Agg 5.97%	Russell 2000 Growth -1.38%	Bloomberg Barclays High Yield 17.13%	Russell 2000 Growth 22.17%	S&P 500 -4.38%	Russell 2000 Growth 28.48%	S&P 500 -19.60%
MSCI World ex USA 39.42%	S&P 500 Value 15.71%	Russell 2000 Value 4.71%	Russell 2000 18.37%	Bloomberg Barclays Agg 6.97%	S&P 500 Growth -34.92%	S&P 500 Growth 31.57%	Bloomberg Barclays High Yield 15.12%	S&P 500 Value -0.48%	Russell 2000 16.35%	S&P 500 32.39%	Russell 2000 Growth 5.60%	MSCI World ex USA -3.04%	S&P 500 11.96%	S&P 500 21.83%	S&P 500 Value -8.95%	Russell 2000 25.52%	MSCI World ex USA -23.26%
S&P 500 Value 31.79%	Russell 2000 Growth 14.31%	Russell 2000 4.55%	S&P 500 15.79%	S&P 500 5.49%	S&P 500 -37.00%	Russell 2000 27.17%	S&P 500 Value 15.10%	Russell 2000 Growth -2.91%	S&P 500 16.00%	S&P 500 Value 31.99%	Russell 2000 4.89%	S&P 500 Value -3.13%	Russell 2000 Growth 11.32%	S&P 500 Value 15.36%	Russell 2000 Growth -9.31%	MSCI World ex USA 22.49%	MSCI Emerging Markets -23.60%
Bloomberg Barclays High Yield 28.97%	Bloomberg Barclays High Yield 11.13%	Russell 2000 Growth 4.15%	Russell 2000 Growth 13.35%	S&P 500 Value 1.99%	Russell 2000 Growth -38.54%	S&P 500 26.47%	S&P 500 15.06%	Russell 2000 -4.18%	Bloomberg Barclays High Yield 15.81%	MSCI World ex USA 21.02%	Russell 2000 Value 4.22%	Russell 2000 -4.41%	MSCI Emerging Markets 11.19%	Russell 2000 14.65%	Russell 2000 -11.01%	Russell 2000 Value 22.39%	S&P 500 Value -25.34%
S&P 500 28.68%	S&P 500 10.88%	S&P 500 Growth 4.00%	Bloomberg Barclays High Yield 11.85%	Bloomberg Barclays High Yield 1.87%	S&P 500 Value -39.22%	S&P 500 Value 21.17%	S&P 500 Growth 15.05%	Russell 2000 Value -5.50%	S&P 500 Growth 14.61%	Bloomberg Barclays High Yield 7.44%	Bloomberg Barclays High Yield 2.45%	Bloomberg Barclays High Yield -4.47%	S&P 500 Growth 6.89%	Russell 2000 Value 7.84%	Russell 2000 Value -12.86%	MSCI Emerging Markets 18.44%	Russell 2000 Growth -25.76%
S&P 500 Growth 25.66%	S&P 500 Growth 6.13%	Bloomberg Barclays High Yield 2.74%	S&P 500 Growth 11.01%	Russell 2000 -1.57%	MSCI World ex USA -43.56%	Russell 2000 Value 20.58%	MSCI World ex USA 8.95%	MSCI World ex USA -12.21%	Russell 2000 Growth 14.59%	Bloomberg Barclays Agg -2.02%	MSCI Emerging Markets -2.19%	Russell 2000 Value -7.47%	MSCI World ex USA 2.75%	Bloomberg Barclays High Yield 7.50%	MSCI World ex USA -14.09%	Bloomberg Barclays High Yield 14.32%	Russell 2000 -30.61%
Bloomberg Barclays Agg 4.10%	Bloomberg Barclays Agg 4.34%	Bloomberg Barclays Agg 2.43%	Bloomberg Barclays Agg 4.33%	Russell 2000 Value -9.78%	MSCI Emerging Markets -53.33%	Bloomberg Barclays Agg 5.93%	Bloomberg Barclays Agg 6.54%	MSCI Emerging Markets -18.42%	Bloomberg Barclays Agg 4.21%	MSCI Emerging Markets -2.60%	MSCI World ex USA -4.32%	MSCI Emerging Markets -14.92%	Bloomberg Barclays Agg 2.65%	Bloomberg Barclays Agg 3.54%	MSCI Emerging Markets -14.57%	Bloomberg Barclays Agg 8.72%	Russell 2000 Value -35.66%

Source: Barclays, MSCI, Russell Investment Group, Standard & Poor's

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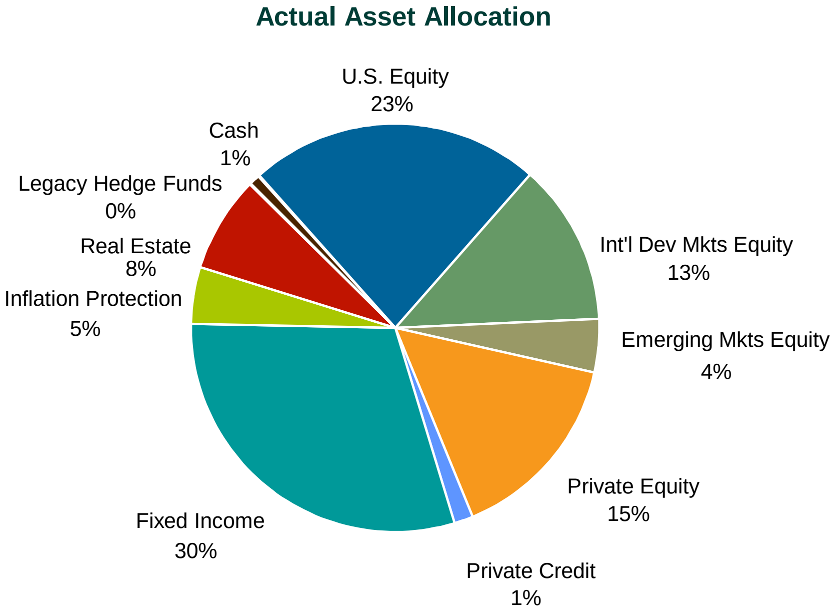
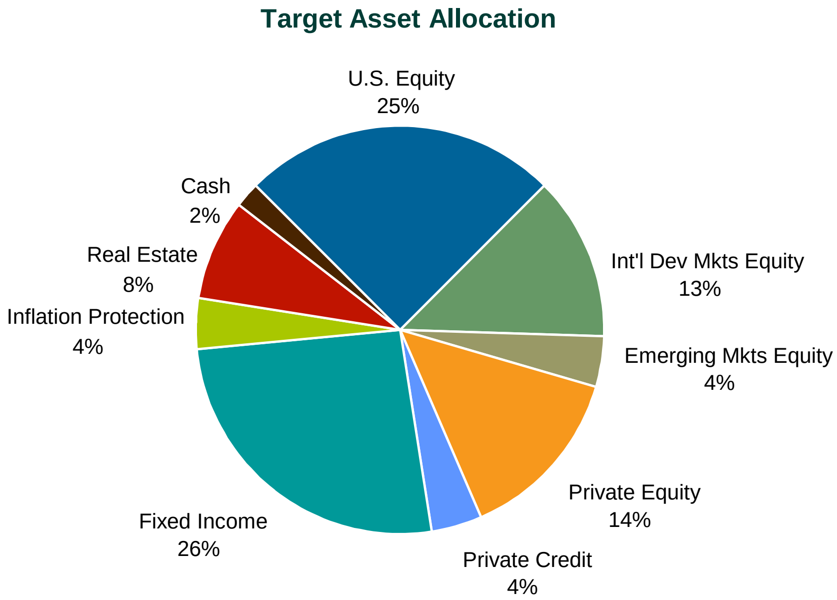
PA SERS Defined Benefit Plan Performance Review

Total Fund

Actual Asset Allocation versus Target as of March 31, 2020



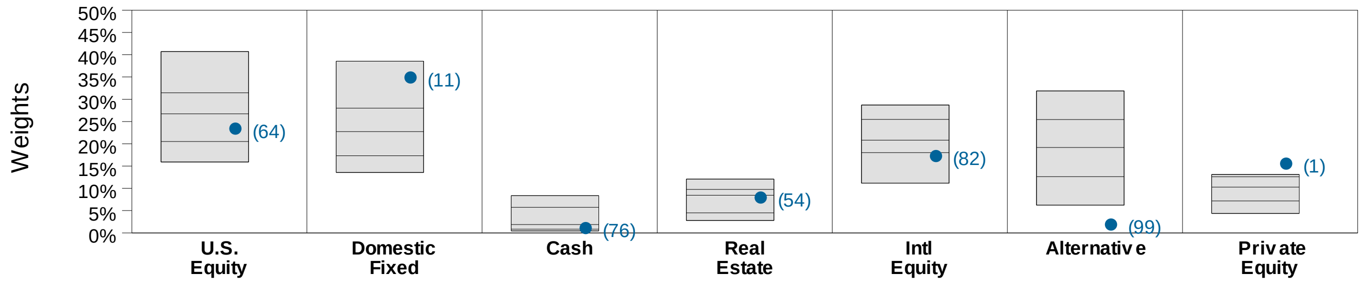


Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
U.S. Equity	6,232,203	23.1%	25.0%	(1.9%)	(514,841)
Int'l Dev Mkts Equity	3,463,065	12.8%	13.0%	(0.2%)	(45,398)
Emerging Mkts Equity	1,124,214	4.2%	4.0%	0.2%	44,686
Private Equity	4,124,190	15.3%	14.0%	1.3%	345,845
Private Credit	403,189	1.5%	4.0%	(2.5%)	(676,339)
Fixed Income	8,105,717	30.0%	26.0%	4.0%	1,088,790
Inflation Protection	1,226,904	4.5%	4.0%	0.5%	147,377
Real Estate	2,060,267	7.6%	8.0%	(0.4%)	(98,787)
Legacy Hedge Funds	30,415	0.1%	0.0%	0.1%	30,415
Cash	218,016	0.8%	2.0%	(1.2%)	(321,748)
Total	26,988,179	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.

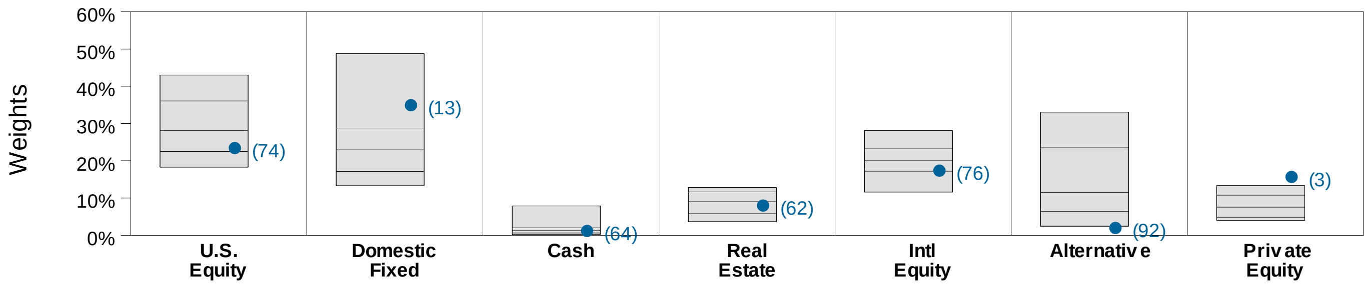
Actual Asset Allocation versus Very Large Public DB Plan (>$10B) Peers and Large Public DB Plan (>$1B) Peers as of March 31, 2020

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



	U.S. Equity	Domestic Fixed	Cash	Real Estate	Intl Equity	Alternative	Private Equity
10th Percentile	40.71	38.56	8.37	12.07	28.72	31.87	13.11
25th Percentile	31.47	28.01	5.76	9.76	25.47	25.46	12.61
Median	26.74	22.74	1.87	8.46	20.81	19.19	10.29
75th Percentile	20.52	17.32	0.84	4.50	18.02	12.62	7.17
90th Percentile	15.90	13.57	0.44	2.78	11.17	6.24	4.37
Fund ●	23.09	34.58	0.81	7.63	17.00	1.61	15.28
% Group Invested	100.00%	100.00%	81.48%	92.59%	96.30%	74.07%	29.63%

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



	U.S. Equity	Domestic Fixed	Cash	Real Estate	Intl Equity	Alternative	Private Equity
10th Percentile	42.99	48.80	7.87	12.82	28.08	33.05	13.31
25th Percentile	36.06	28.79	2.01	11.64	23.39	23.48	10.75
Median	28.08	22.93	1.27	9.02	20.02	11.55	7.55
75th Percentile	22.50	17.11	0.60	5.79	17.21	6.36	4.86
90th Percentile	18.29	13.27	0.15	3.66	11.61	2.43	4.01
Fund ●	23.09	34.58	0.81	7.63	17.00	1.61	15.28
% Group Invested	96.88%	96.88%	79.69%	85.94%	95.31%	64.06%	40.62%

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 Quarter Attribution Analysis versus Target – Net of Fees as of March 31, 2020

- During the first quarter, the Plan started the transition to the new asset allocation approved by the Board at the February 25, 2020 Investment Committee meeting. The transition is still in progress has caused attribution “noise” due to the underweight to Core Fixed Income and overweight to International Equity and Emerging Markets Equity.
- During the quarter, the overweights to equity and underweights to fixed income reflect the transition to the new asset class targets.
- Callan will provide longer attribution as more historical data becomes available under the new asset allocation policy.

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
U.S. Equity	26%	25%	(22.27%)	(20.90%)	(0.37%)	(0.07%)	(0.44%)
International. Developed	19%	13%	(23.66%)	(24.00%)	0.08%	(0.79%)	(0.71%)
Emerging Mkts Equity	6%	4%	(23.00%)	(24.40%)	0.08%	(0.23%)	(0.15%)
Private Equity	13%	14%	2.40%	2.40%	0.00%	(0.04%)	(0.04%)
Private Credit	1%	4%	2.47%	1.97%	0.00%	(0.22%)	(0.21%)
Fixed Income	19%	26%	(1.49%)	3.15%	(0.99%)	(0.57%)	(1.56%)
Inflation Protection	3%	4%	1.43%	1.69%	(0.01%)	(0.05%)	(0.06%)
Real Estate	7%	8%	(2.26%)	1.08%	(0.22%)	(0.07%)	(0.29%)
Multi-Strategy	2%	0%	0.00%	(13.05%)	(0.03%)	0.02%	(0.01%)
Legacy Hedge Funds	0%	0%	0.05%	(8.79%)	0.01%	0.00%	0.01%
Cash	4%	2%	0.38%	0.57%	(0.01%)	0.15%	0.14%
Total			**(11.69%) =**	**(8.38%) +**	**(1.45%) +**	**(1.86%)**	**(3.31%)**

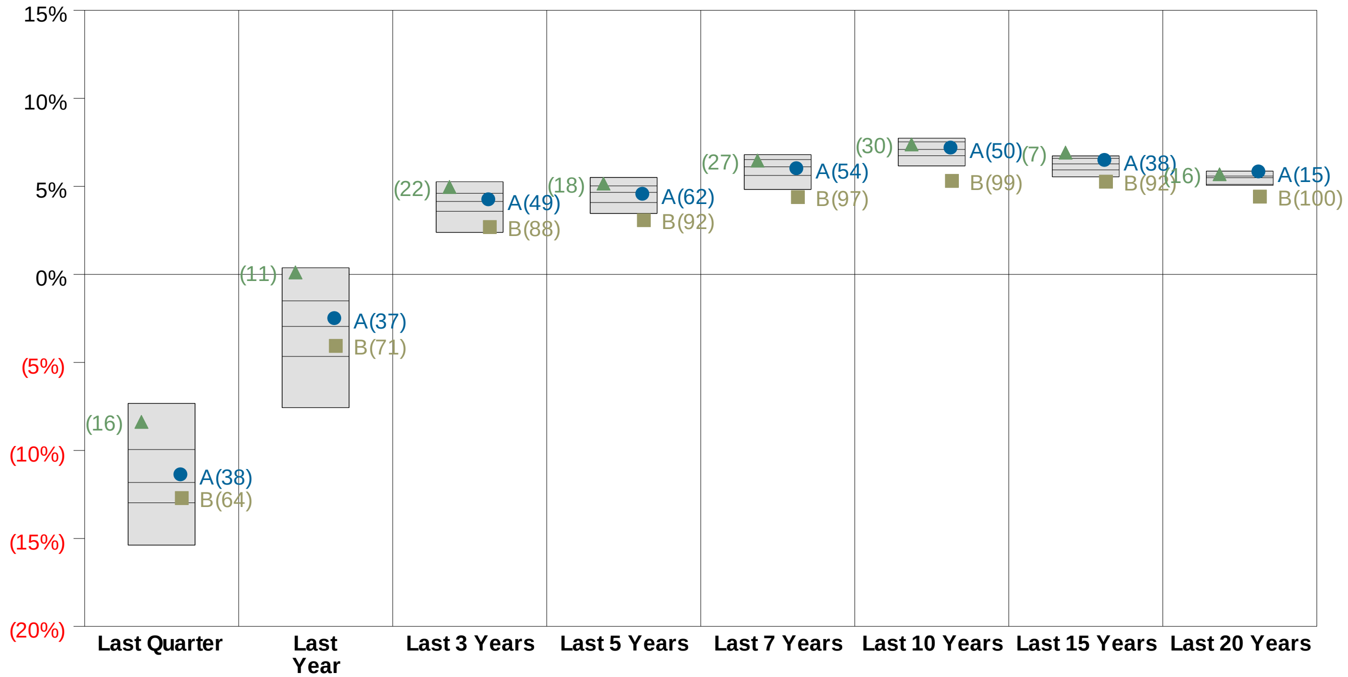
- **What helped relative attribution?**
  - An overweight to cash (attribution based on target return)
  - Outperformance relative to target from International Developed Equity and Emerging Markets Equity managers
- **What hurt relative attribution?**
  - Underperformance relative to target from Fixed Income and Real Estate managers.
  - Opportunistic Fixed Income benchmark mismatch using the Bloomberg Aggregate.
  - An overweight to International Developed Equity, Emerging Markets Equity, and U.S. Equity (attribution based on target return).
  - Structural overweight to small cap U.S. equity versus the benchmark.
  - An underweight to Fixed Income, Private Credit, and Real Estate (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 March 31, 2020)

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



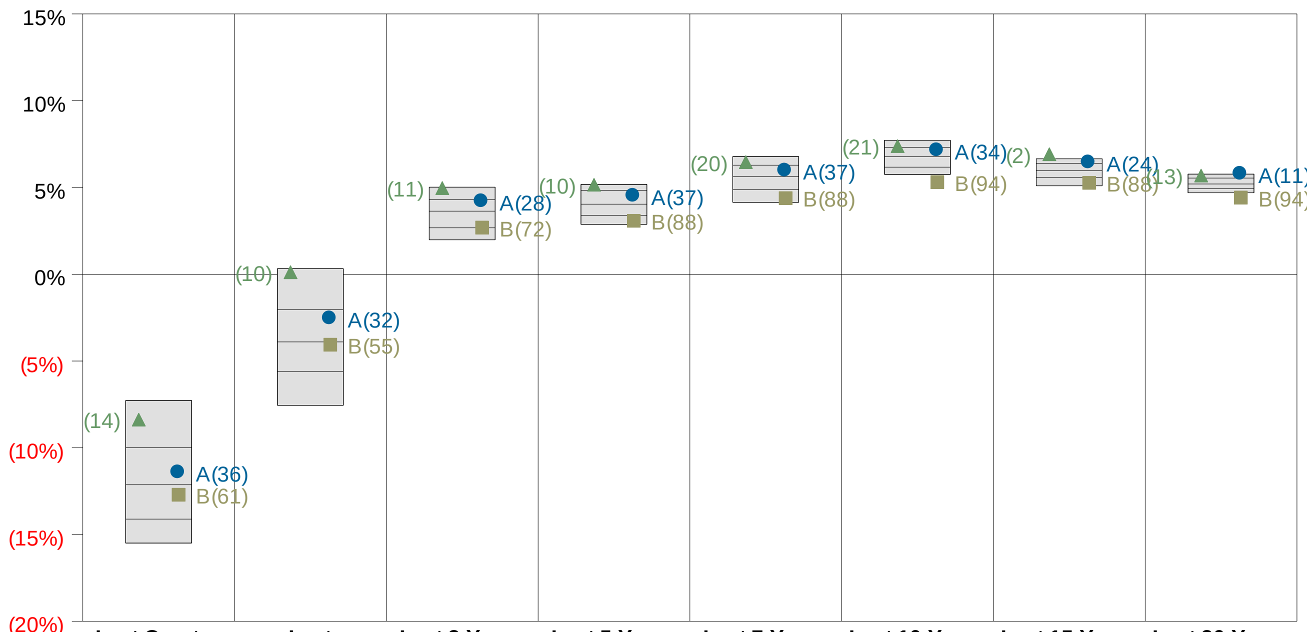
	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
10th Percentile	(7.33)	0.37	5.26	5.51	6.80	7.74	6.73	5.87
25th Percentile	(9.95)	(1.51)	4.60	5.02	6.52	7.53	6.59	5.58
Median	(11.82)	(2.95)	4.14	4.66	6.11	7.10	6.27	5.49
75th Percentile	(12.98)	(4.66)	3.58	4.08	5.62	6.74	5.93	5.11
90th Percentile	(15.38)	(7.57)	2.38	3.46	4.82	6.16	5.54	5.06
Total Fund ● A	(11.45)	(2.57)	4.17	4.49	5.95	7.11	6.41	5.76
60% MSCI ACW IMI/40% U.S. Agg Bond ■ B	(12.71)	(4.06)	2.69	3.08	4.39	5.31	5.27	4.42
Total Fund Custom Benchmark ▲	(8.38)	0.12	4.97	5.16	6.46	7.38	6.92	5.69

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 March 31, 2020)

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		(7.27)	0.32	5.02	5.17	6.78	7.71	6.65	5.77
25th Percentile		(10.00)	(2.04)	4.30	4.83	6.29	7.31	6.39	5.54
Median		(12.10)	(3.90)	3.64	4.03	5.63	6.77	5.97	5.20
75th Percentile		(14.11)	(5.61)	2.67	3.39	4.88	6.17	5.57	4.93
90th Percentile		(15.49)	(7.55)	1.98	2.88	4.14	5.75	5.10	4.69
Total Fund	● A	(11.45)	(2.57)	4.17	4.49	5.95	7.11	6.41	5.76
60% MSCI ACW IMI/40% U.S. Agg Bond	■ B	(12.71)	(4.06)	2.69	3.08	4.39	5.31	5.27	4.42
Total Fund Custom Benchmark	▲	(8.38)	0.12	4.97	5.16	6.46	7.38	6.92	5.69

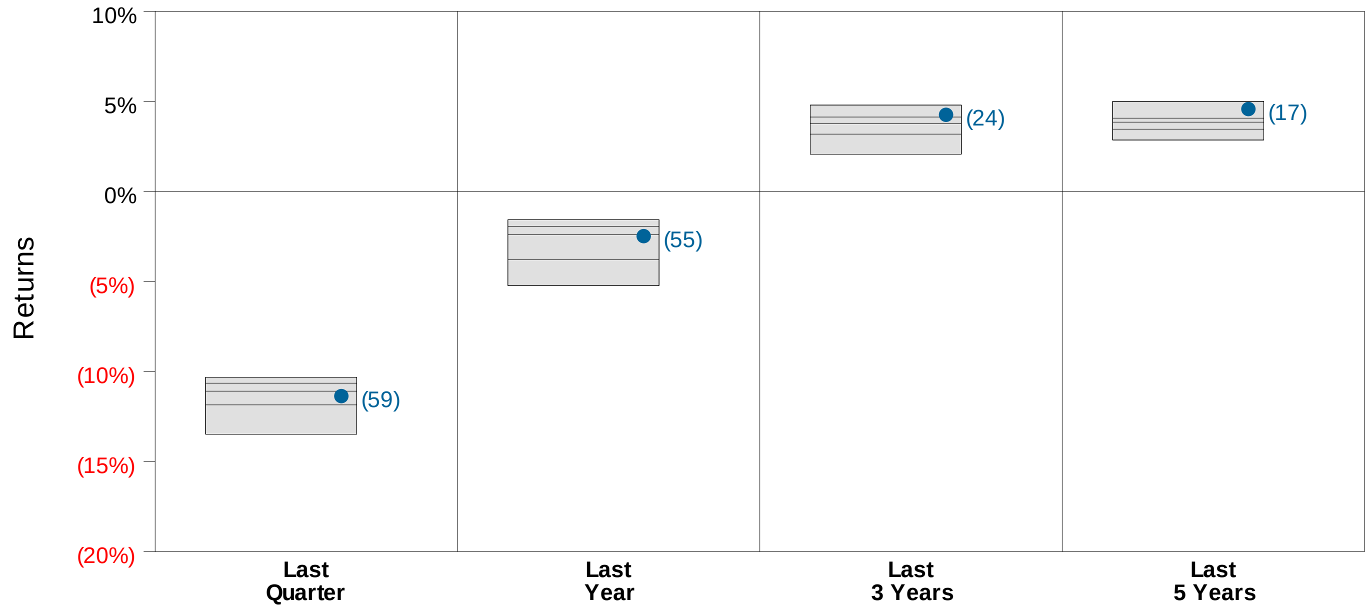
Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index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

Total Fund

Asset Allocation-Adjusted Gross of Fee Performance versus Very Large Public DB Plan (>$10B) Peers as of March 31, 2020

- 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



	Last Quarter	Last Year	Last 3 Years	Last 5 Years
10th Percentile	(10.31)	(1.57)	4.80	5.01
25th Percentile	(10.64)	(1.94)	4.13	4.08
Median	(11.09)	(2.40)	3.77	3.85
75th Percentile	(11.85)	(3.79)	3.19	3.46
90th Percentile	(13.48)	(5.23)	2.07	2.85
Total Fund ●	(11.45)	(2.57)	4.17	4.49

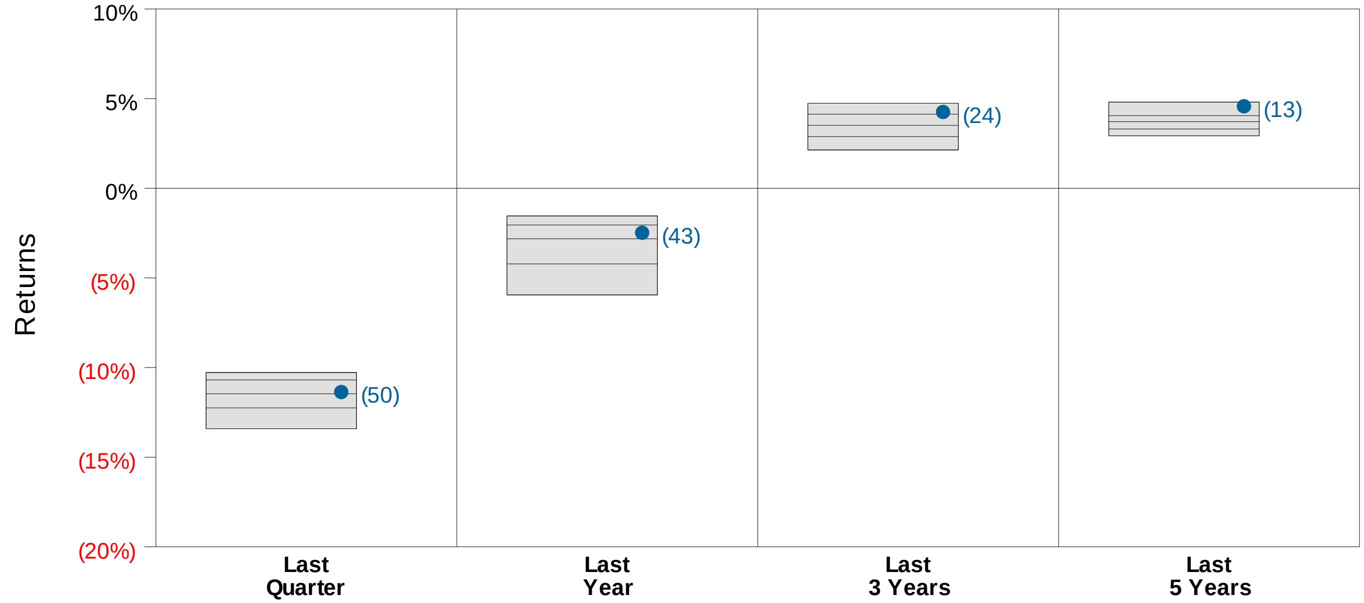
Current Quarter Target = 26.0% Blmbg Aggregate, 25.0% Russell 3000 Index, 14.0% Private Equity, 13.0% MSCI World ex US IMI, 7.2% NCREIF NFI-ODCE Eq Wt Net lagged 3 months, 4.0% MSCI EM IMI, 4.0% Blmbg:TIPS, 4.0% S&P:LSTA Lev Loan lagged 3 months+1.0%, 2.0% 3-month Treasury Bill, 0.8% FTSE EP/NA US Index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

Total Fund

Asset Allocation-Adjusted Gross of Fee Performance versus Large Public DB Plan (>$1B) Peers as of March 31, 2020

- 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



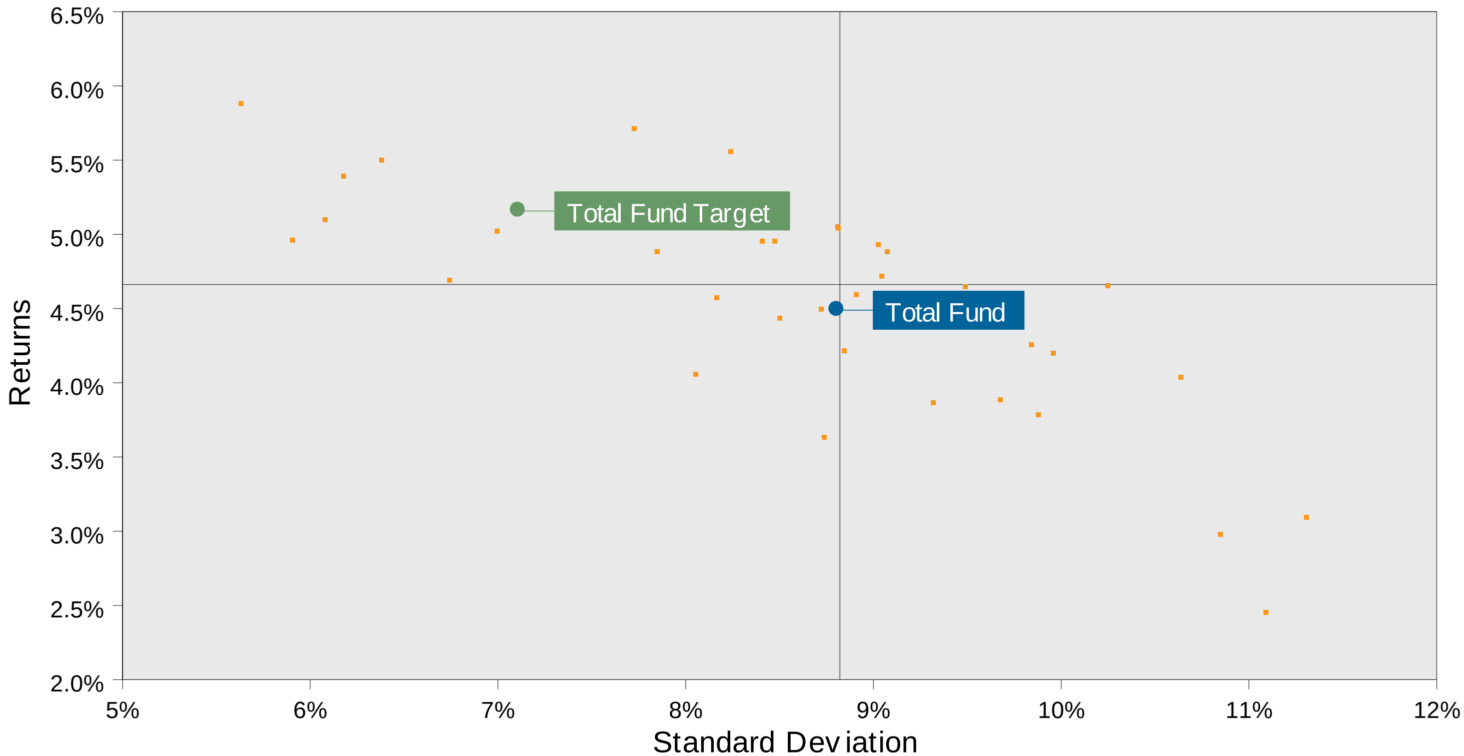
	Last Quarter	Last Year	Last 3 Years	Last 5 Years
10th Percentile	(10.27)	(1.54)	4.74	4.81
25th Percentile	(10.69)	(2.05)	4.13	4.06
Median	(11.46)	(2.81)	3.52	3.72
75th Percentile	(12.25)	(4.21)	2.88	3.31
90th Percentile	(13.41)	(5.94)	2.14	2.93
Total Fund ●	(11.45)	(2.57)	4.17	4.49

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 March 31, 2020)

Five Year Annualized Risk vs Return

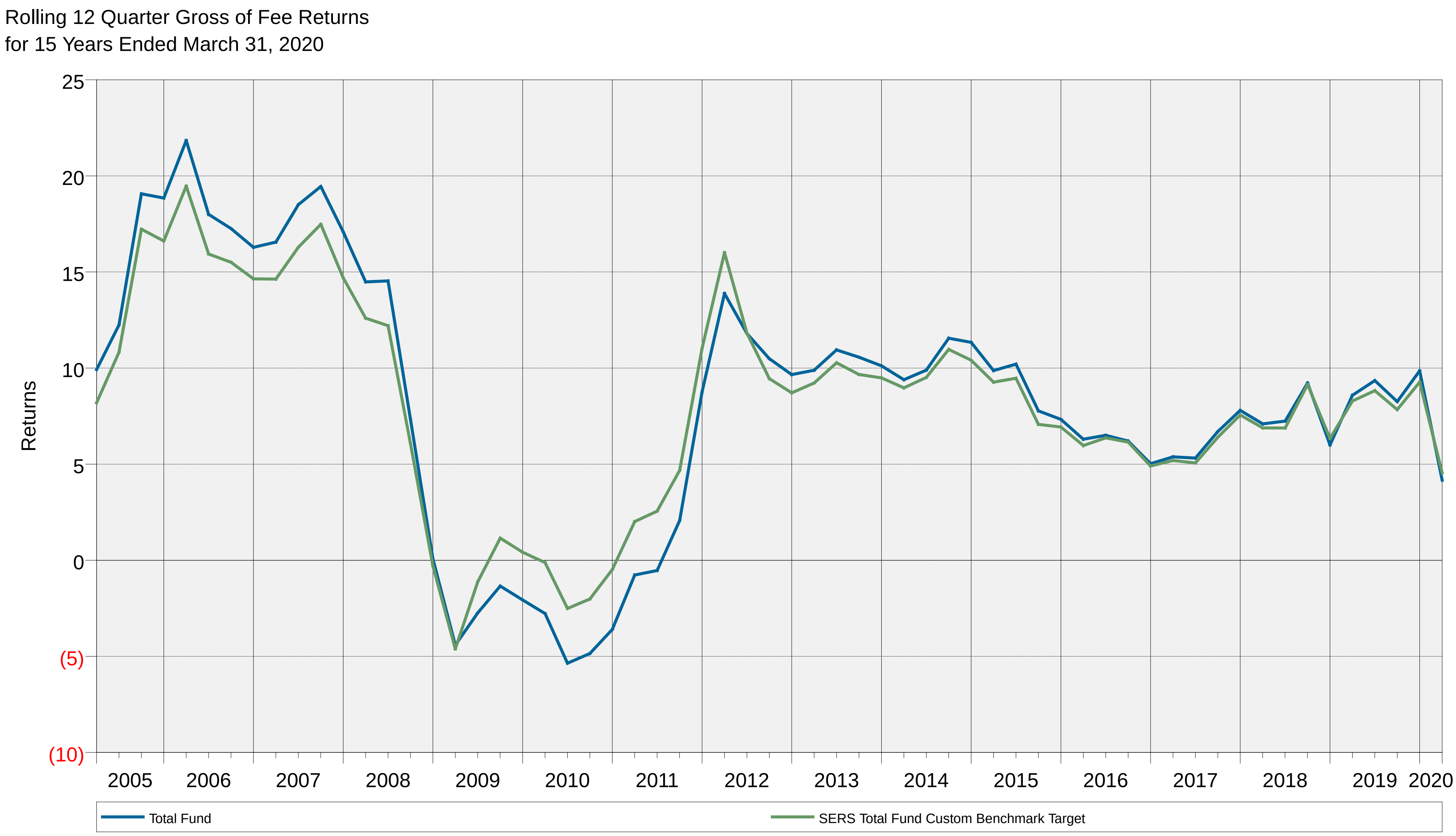


Squares represent membership of the Callan Public Fund Spons- V Lg DB (>10B)

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

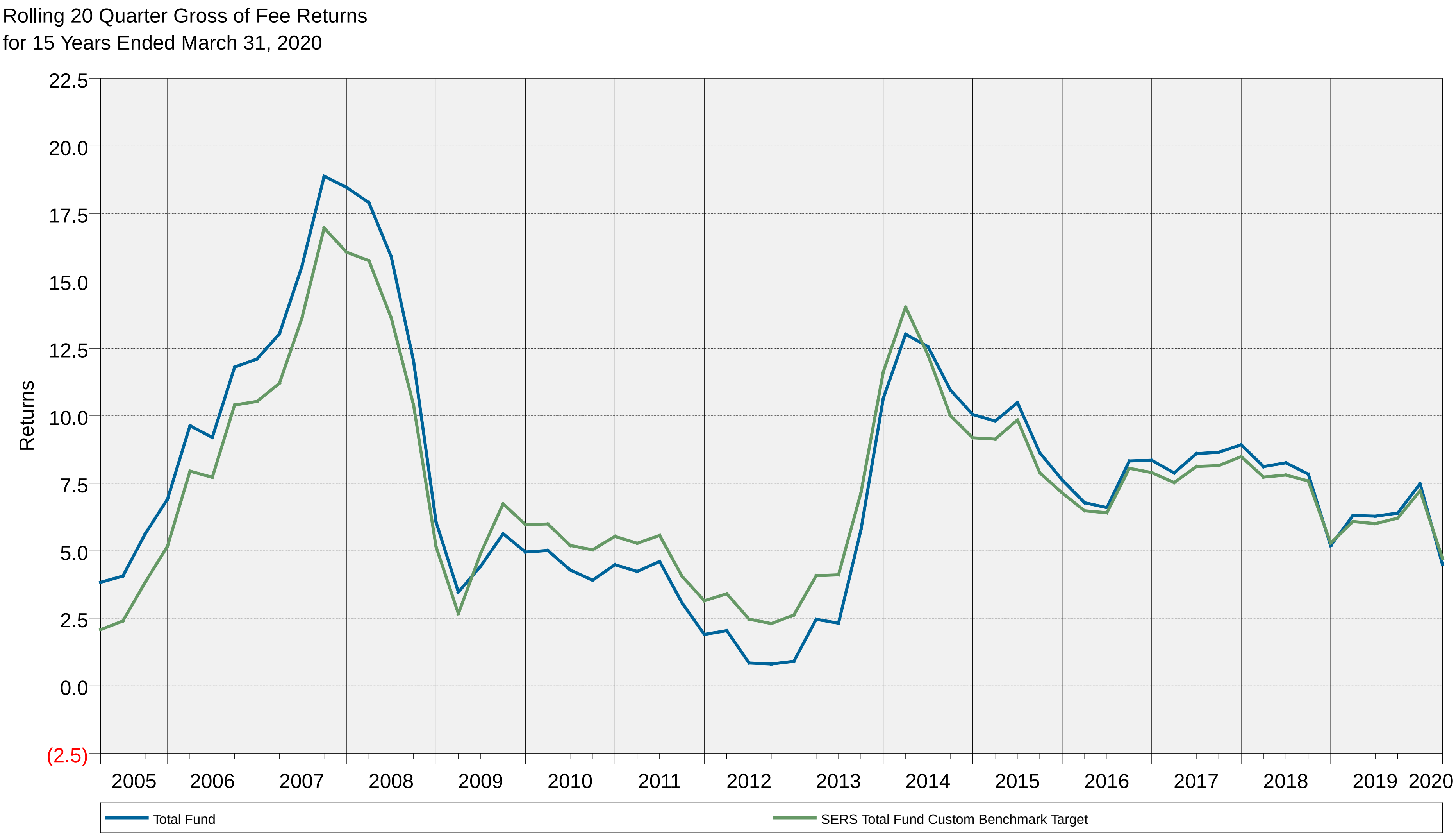
Rolling 3-year Gross of Fee Performance versus Peers and Benchmark (As of March 31, 2020)



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 Peers and Benchmark (As of March 31, 2020)



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 March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance						
Total Fund	**$26,988**	**100.00%**	**(11.69%)**	**(3.15%)**	**3.56%**	**3.88%**
Total Fund Custom Benchmark(1)	-	-	(8.38%)	0.12%	4.97%	5.16%
Public Market Equiv Benchmark(2)	-	-	(7.50%)	3.01%	5.75%	5.56%
60/40 Index(3)	-	-	(12.71%)	(4.06%)	2.69%	3.08%
U.S. Equity	**$6,232**	**23.09%**	**(22.27%)**	**(11.69%)**	**2.34%**	**4.18%**
Russell 3000 Index	-	-	(20.90%)	(9.13%)	4.00%	5.77%
International Developed Markets Equity	**$3,463**	**12.83%**	**(23.66%)**	**(14.54%)**	**(1.11%)**	**(0.16%)**
MSCI World Ex US IMI	-	-	(24.00%)	(15.48%)	(2.29%)	(0.62%)
Emerging Mkts Equity	**$1,124**	**4.17%**	**(23.00%)**	**(15.60%)**	**(0.71%)**	**1.09%**
MSCI EM IMI	-	-	(24.40%)	(18.91%)	(2.53%)	(0.90%)
Private Equity	**$4,124**	**15.28%**	**2.40%**	**10.97%**	**12.07%**	**9.65%**
Burgiss Private Equity Index (Qtr lag)	-	-	4.36%	12.70%	13.68%	11.64%
Global Equity +3% (Qtr lag)(4)	-	-	9.37%	33.99%	17.79%	14.48%
Private Credit	**$403**	**1.49%**	**2.47%**	**9.77%**	**-**	**-**
S&P Levered Loan Index +1% (Qtr lag)	-	-	1.97%	9.65%	5.35%	5.45%
Fixed Income	**$8,106**	**30.03%**	**(1.49%)**	**4.07%**	**3.12%**	**2.54%**
U.S. Agg Bond Index	-	-	3.15%	8.93%	4.82%	3.36%
Inflation Protection (TIPS)	**$1,227**	**4.55%**	**1.43%**	**6.41%**	**3.45%**	**2.65%**
U.S. TIPS Index	-	-	1.69%	6.85%	3.46%	2.67%
Real Estate	**$2,060**	**7.63%**	**(2.26%)**	**3.99%**	**2.62%**	**3.75%**
Real Estate Custom Bench (Qtr lag)(5)	-	-	1.08%	7.02%	6.56%	7.81%
CPI + 3% (Qtr lag)	-	-	0.82%	5.29%	5.10%	4.82%
Cash	**$218**	**0.81%**	**0.38%**	**2.07%**	**2.02%**	**1.49%**
3-month Treasury Bill	-	-	0.57%	2.25%	1.83%	1.19%

(1) Total Fund Custom Benchmark returns provided by RVK prior to 12/31/2018. As of 01/01/2020, benchmark consists of: 26% Bloomberg US 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% Russell 3000, 25% Bloomberg U.S. Agg Bond Index, 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 IM Index, 40% Bloomberg U.S. Agg Bond Index
(4) As of 01/01/2020 benchmark consists of 25% MSCI World ex US and 75% Russell 3000 + 3% with a 1 quarter 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 and 10% FTSE NAREIT Index with a one quarter lag. Prior to 03/31/2019, benchmark history was provided by RVK.

Asset Class Returns

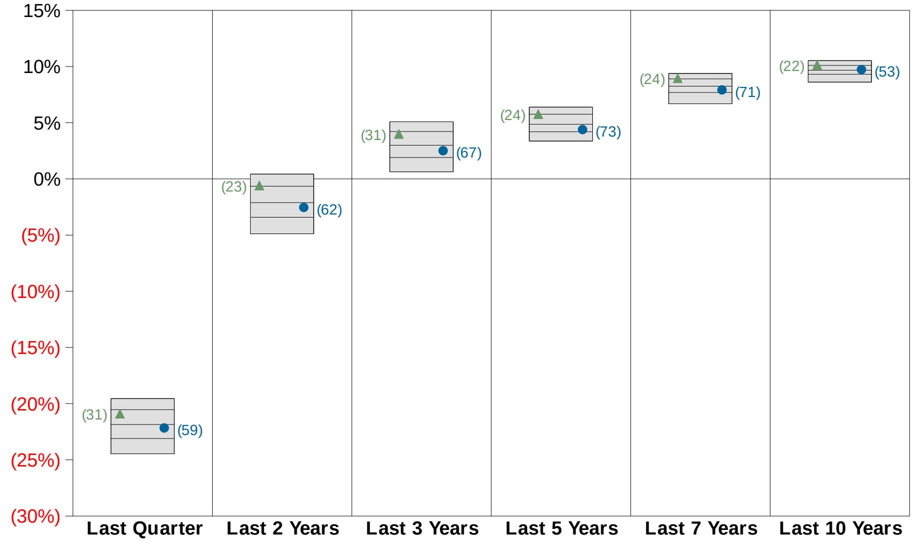
As of March 31, 2020

Net Performance	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Total Fund	**6.41%**	**5.62%**	**4.99%**	**7.65%**	**9.14%**	(1/81)
Total Fund Custom Benchmark(1)	7.38%	6.92%	5.69%	8.13%	-	
Public Market Equiv Benchmark(2)	7.83%	7.21%	5.91%	8.30%	-	
60/40 Index(3)	5.31%	5.27%	4.42%	6.15%	-	
U.S. Equity	**9.49%**	**6.27%**	**4.61%**	**8.31%**	**9.95%**	(1/81)
Russell 3000 Index	10.15%	7.50%	4.91%	8.81%	10.41%	(1/81)
International Developed Markets Equity	**3.64%**	**3.03%**	**-**	**-**	**4.75%**	(1/02)
MSCI World ex US IMI	2.61%	3.23%	2.16%	4.20%	4.89%	(1/02)
Emerging Mkts Equity	**0.53%**	**3.17%**	**-**	**-**	**5.90%**	(1/02)
MSCI EM IMI	0.48%	5.36%	4.84%	3.83%	7.99%	(1/02)
Private Equity	**10.95%**	**10.90%**	**7.88%**	**13.65%**	**10.90%**	(1/86)
Burgiss Private Equity Index (Qtr lag)	12.84%	12.31%	9.87%	15.25%	16.85%	(1/86)
Global Equity +3% (Qtr lag)(4)	16.71%	12.48%	9.86%	13.70%	14.69%	(1/86)
Private Credit	**-**	**-**	**-**	**-**	**8.95%**	(12/17)
S&P Levered Loan Index +1% (Qtr lag)	6.01%	5.78%	5.89%	-	5.49%	(12/17)
Fixed Income	**4.25%**	**4.96%**	**5.58%**	**6.13%**	**8.30%**	(1/81)
U.S. Agg Bond Index	3.88%	4.40%	5.08%	5.49%	7.67%	(1/81)
Inflation Protection (TIPS)	**2.54%**	**3.44%**	**-**	**-**	**3.30%**	(2/03)
U.S. TIPS Index	3.48%	3.92%	5.37%	-	4.33%	(2/03)
Real Estate	**7.30%**	**5.03%**	**6.53%**	**7.68%**	**8.26%**	(3/84)
Real Estate Custom Bench (Qtr lag)(5)	10.36%	6.91%	7.70%	-	-	
CPI +3% (Qtr lag)	4.76%	5.02%	5.14%	5.18%	5.62%	(3/84)
Cash	**0.90%**	**1.70%**	**2.24%**	**2.78%**	**3.61%**	(1/87)
3-month Treasury Bill	0.64%	1.39%	1.74%	2.43%	3.26%	(1/87)

(1) Total Fund Custom Benchmark returns provided by RVK prior to 12/31/2018. As of 01/01/2020, benchmark consists of: 26% Bloomberg US 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% Russell 3000, 25% Bloomberg U.S. Agg Bond Index, 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 IM Index, 40% Bloomberg U.S. Agg Bond Index
(4) As of 01/01/2020 benchmark consists of 25% MSCI World ex US and 75% Russell 3000 + 3% with a 1 quarter lag. Benchmark performance represents the historical benchmark linked to the current benchmark.
(5) As of 03/31/2019 benchmark consists of 90% NCREIF ODCE Index and 10% FTSE NAREIT Index with a one quarter lag. Prior to 03/31/2019, benchmark history was provided by RVK.

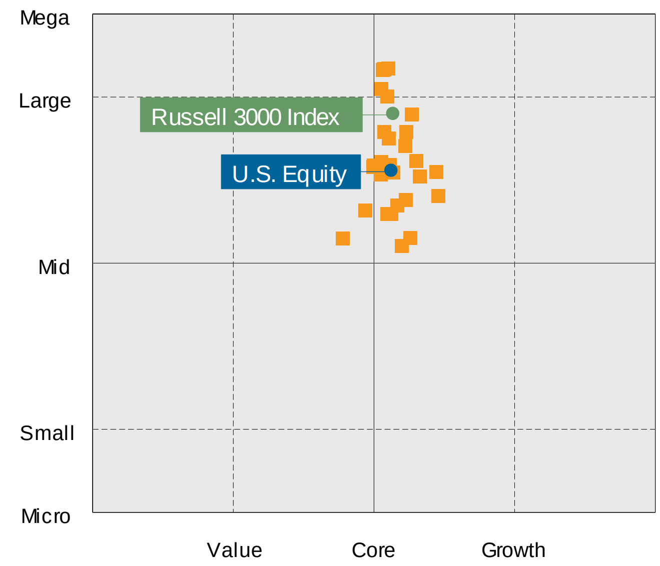
U.S. Equity as of March 31, 2020

Performance vs Public Fund - Domestic Equity (Gross)

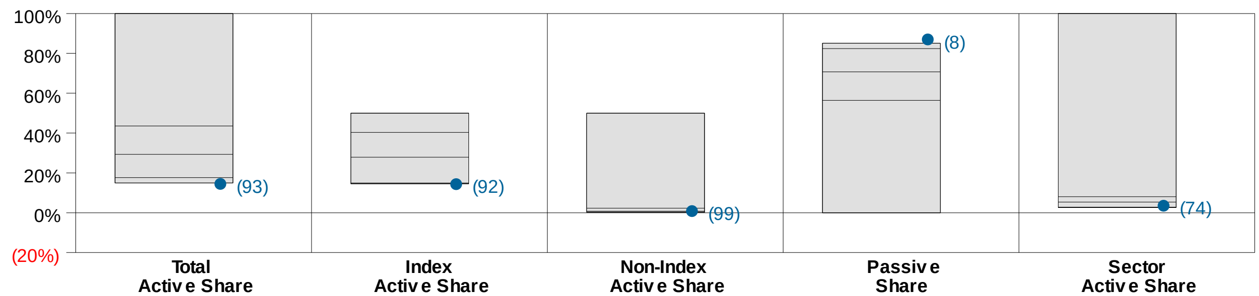


	Last Quarter	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	(19.55)	0.43	5.08	6.39	9.38	10.53
25th Percentile	(20.53)	(0.65)	4.21	5.75	8.90	10.10
Median	(21.86)	(2.11)	2.99	4.86	8.25	9.68
75th Percentile	(23.10)	(3.41)	1.91	4.20	7.70	9.31
90th Percentile	(24.46)	(4.88)	0.63	3.37	6.68	8.61
U.S. Equity ●	(22.25)	(2.62)	2.42	4.31	7.83	9.63
Russell 3000 Index ▲	(20.90)	(0.58)	4.00	5.77	8.96	10.15

Style Map vs Pub Pln- Dom Equity
Holdings as of March 31, 2020



Active Share vs. Pub Pln- Dom Equity

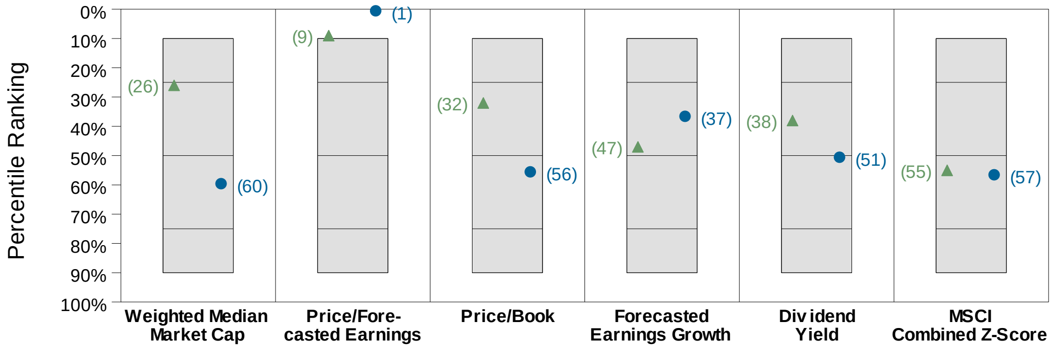


	Total Active Share	Index Active Share	Non-Index Active Share	Passive Share	Sector Active Share
10th Percentile	100.00	50.00	50.00	85.06	100.00
25th Percentile	43.57	40.36	2.25	82.39	8.07
Median	29.29	27.86	0.73	70.71	5.36
75th Percentile	17.61	14.92	0.35	56.43	2.80
90th Percentile	14.94	14.54	0.20	0.00	2.60
U.S. Equity ●	13.75	13.67	0.08	86.25	2.86

U.S. Equity

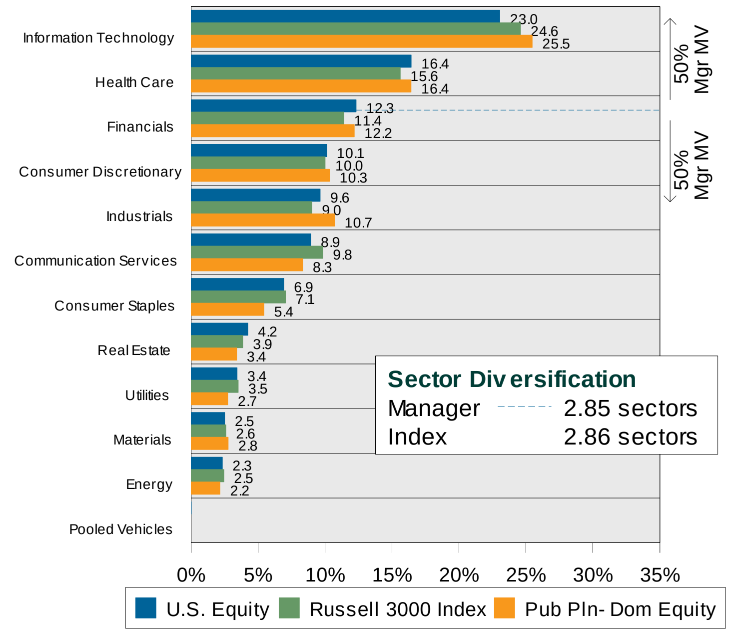
As of March 31, 2020

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of March 31, 2020

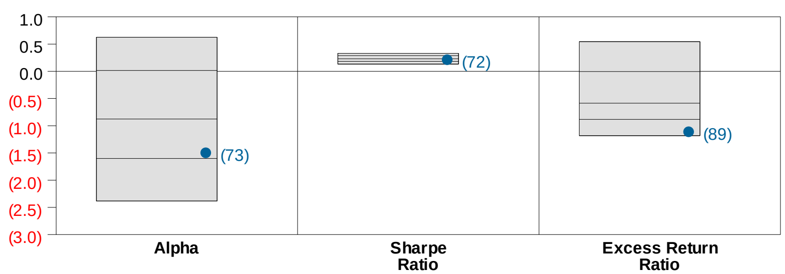


	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	116.81	16.02	2.66	13.00	2.42	0.19
25th Percentile	88.89	15.83	2.60	12.24	2.33	0.12
Median	60.32	15.56	2.36	11.56	2.21	0.03
75th Percentile	43.48	14.84	2.07	11.06	2.04	(0.00)
90th Percentile	28.42	13.66	1.95	10.63	1.88	(0.14)
U.S. Equity ●	57.48	16.47	2.25	11.97	2.18	0.02
Russell 3000 Index ▲	87.19	16.04	2.46	11.66	2.27	0.02

Sector Allocation
March 31, 2020



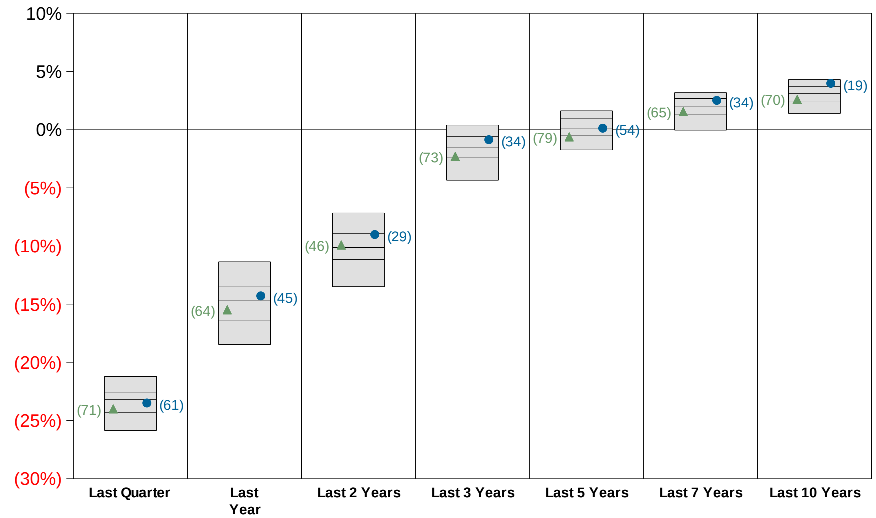
Risk Adjusted Return Measures vs Russell 3000 Index
Rankings Against Public Fund - Domestic Equity (Gross)
Five Years Ended March 31, 2020



	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.62	0.33	0.54
25th Percentile	0.02	0.29	(0.00)
Median	(0.88)	0.23	(0.59)
75th Percentile	(1.60)	0.18	(0.88)
90th Percentile	(2.38)	0.13	(1.18)
U.S. Equity ●	(1.52)	0.19	(1.14)

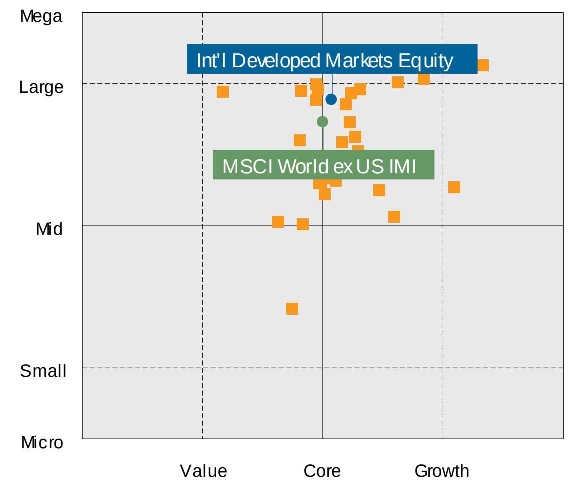
International Equity as of March 31, 2020

Performance vs Public Fund - International Equity (Gross)

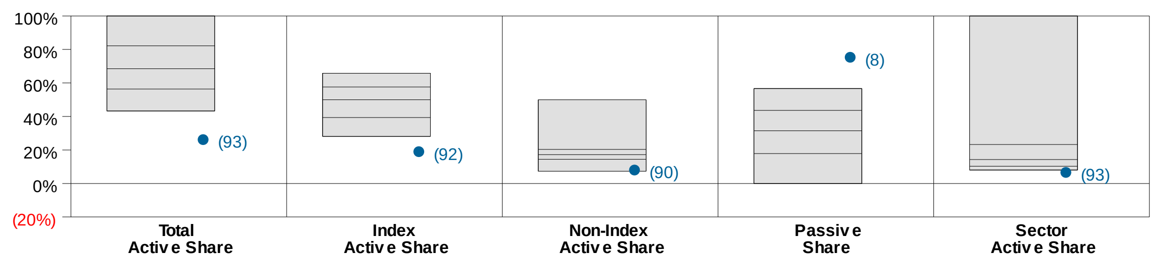


	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	(21.22)	(11.36)	(7.16)	0.40	1.62	3.18	4.30
25th Percentile	(22.56)	(13.45)	(8.94)	(0.58)	0.98	2.68	3.70
Median	(23.20)	(14.66)	(10.13)	(1.50)	0.13	1.96	3.12
75th Percentile	(24.33)	(16.37)	(11.15)	(2.36)	(0.47)	1.27	2.38
90th Percentile	(25.85)	(18.46)	(13.50)	(4.34)	(1.74)	(0.04)	1.40
Int'l Developed Markets Equity ●	(23.58)	(14.38)	(9.10)	(0.94)	0.04	2.43	3.90
MSCI World ex US IMI ▲	(24.00)	(15.48)	(9.91)	(2.29)	(0.62)	1.55	2.61

Style Map vs Pub Pln- Intl Equity
Holdings as of March 31, 2020



Active Share vs. Pub Pln- Intl Equity

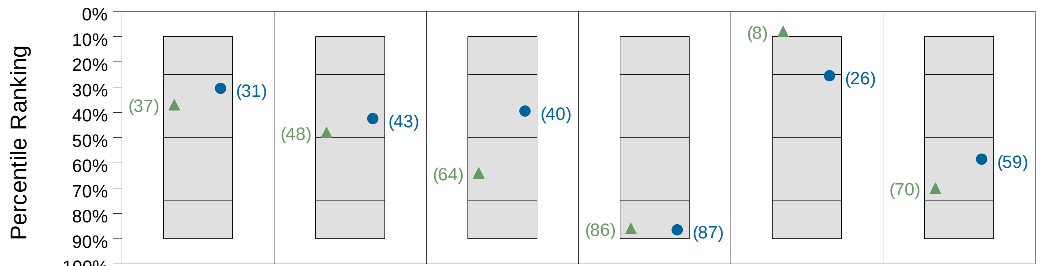


	Total Active Share	Index Active Share	Non-Index Active Share	Passive Share	Sector Active Share
10th Percentile	100.00	65.78	50.00	56.69	100.00
25th Percentile	82.17	57.61	20.38	43.63	23.24
Median	68.52	50.00	17.23	31.48	14.29
75th Percentile	56.37	39.36	14.42	17.83	10.29
90th Percentile	43.31	28.14	7.33	0.00	7.98
Int'l Developed Markets Equity ●	25.46	18.17	7.29	74.54	5.80

International Equity

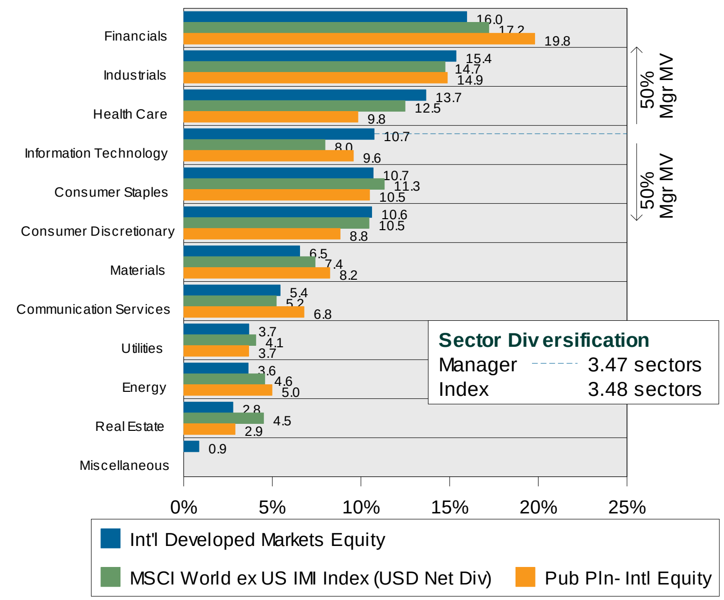
As of March 31, 2020

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - International Equity
as of March 31, 2020

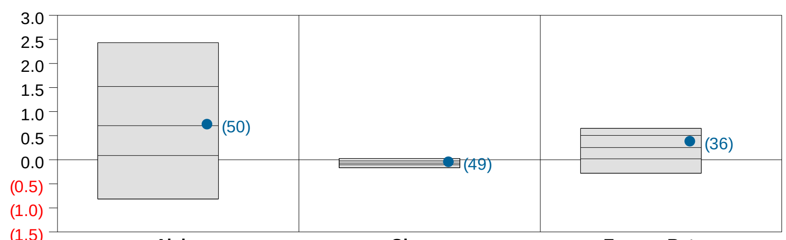


	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	29.08	16.23	2.03	14.77	3.69	0.71
25th Percentile	27.63	13.43	1.58	10.93	3.44	0.32
Median	19.99	12.38	1.37	10.16	3.07	0.15
75th Percentile	15.86	11.71	1.22	9.28	2.68	0.02
90th Percentile	11.06	10.74	1.01	8.09	1.89	(0.16)
Int'l Developed Markets Equity ●	26.65	12.60	1.42	8.37	3.43	0.08
MSCI World ex US IMI Index (USD Net Div) ▲	23.78	12.44	1.29	8.52	3.74	0.02

Sector Allocation
March 31, 2020



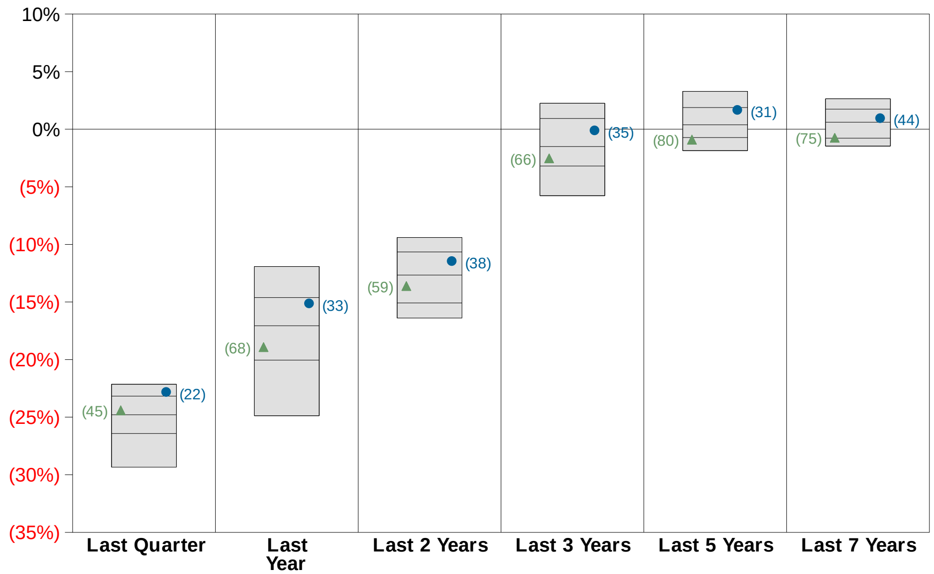
Risk Adjusted Return Measures vs MSCI World ex US IMI
Rankings Against Public Fund - International Equity (Gross)
Five Years Ended March 31, 2020



	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	2.43	0.03	0.65
25th Percentile	1.52	(0.02)	0.51
Median	0.71	(0.07)	0.25
75th Percentile	0.09	(0.10)	0.02
90th Percentile	(0.82)	(0.16)	(0.28)
Int'l Developed Markets Equity ●	0.71	(0.07)	0.36

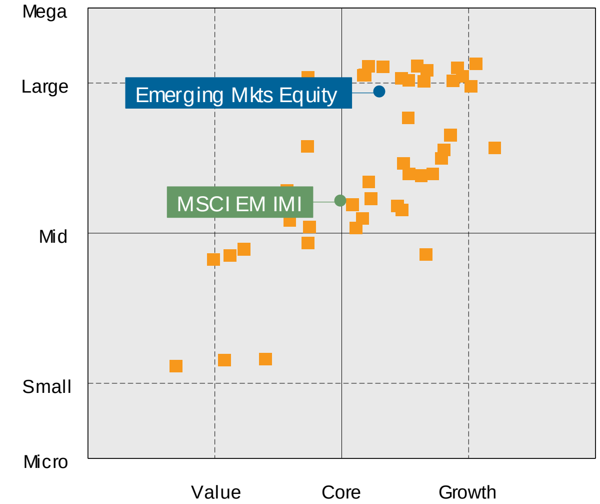
Emerging Markets Equity as of March 31, 2020

Performance vs Callan Emerging Broad (Gross)

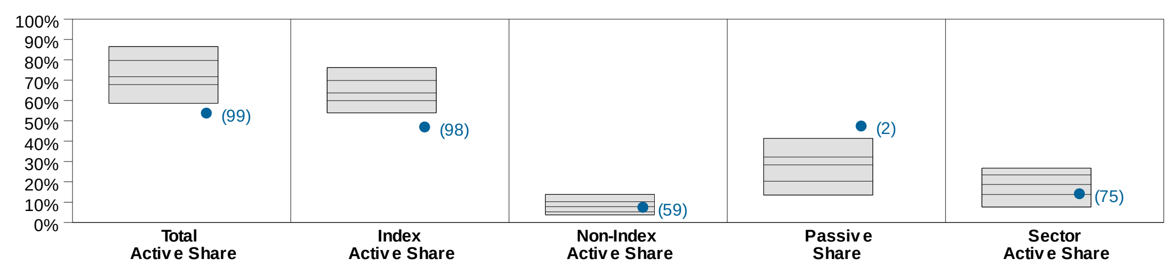


	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years
10th Percentile	(22.15)	(11.92)	(9.40)	2.25	3.29	2.65
25th Percentile	(23.17)	(14.61)	(10.66)	0.93	1.88	1.74
Median	(24.79)	(17.07)	(12.67)	(1.50)	0.38	0.61
75th Percentile	(26.42)	(20.05)	(15.08)	(3.20)	(0.72)	(0.78)
90th Percentile	(29.34)	(24.88)	(16.39)	(5.77)	(1.85)	(1.46)
Emerging Mkts Equity ●	(22.90)	(15.21)	(11.54)	(0.19)	1.59	0.87
MSCI EM IMI ▲	(24.40)	(18.91)	(13.61)	(2.53)	(0.90)	(0.74)

Style Map vs Callan Emerging Broad Holdings as of March 31, 2020



Active Share vs. Callan Emerging Broad

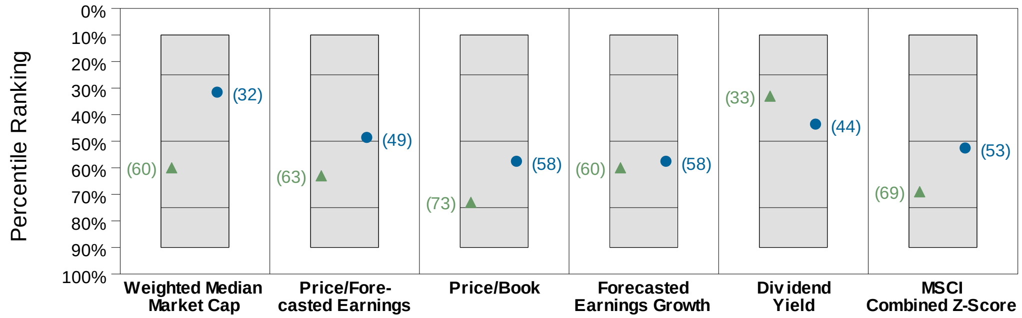


	Total Active Share	Index Active Share	Non-Index Active Share	Passive Share	Sector Active Share
10th Percentile	86.53	76.15	13.86	41.39	26.76
25th Percentile	79.67	69.83	10.22	32.22	23.44
Median	71.68	63.71	7.80	28.32	18.74
75th Percentile	67.78	59.90	5.22	20.33	13.78
90th Percentile	58.61	53.93	3.74	13.47	7.61
Emerging Mkts Equity ●	53.16	46.29	6.87	46.84	13.50

Emerging Markets Equity

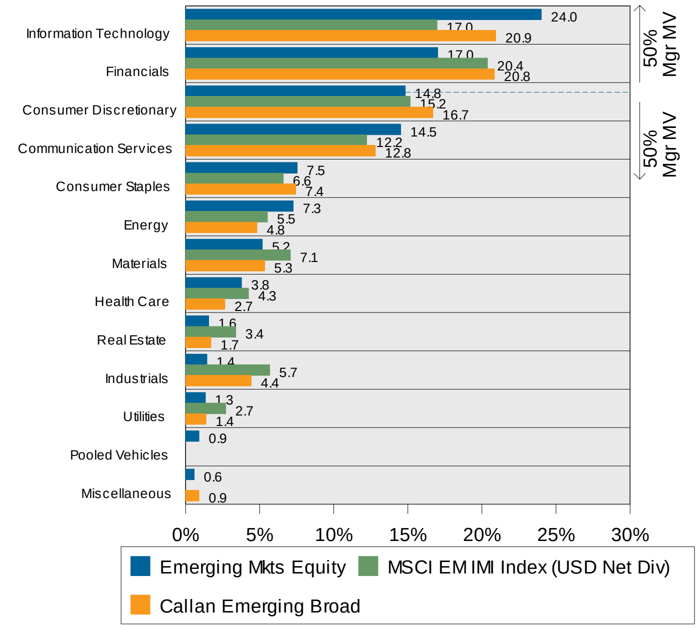
As of March 31, 2020

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Emerging Broad
as of March 31, 2020

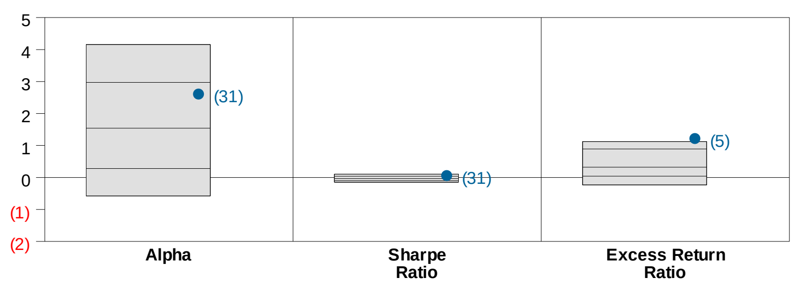


	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	45.34	17.57	2.93	17.63	4.51	0.82
25th Percentile	31.00	15.74	2.14	16.05	3.36	0.61
Median	17.62	12.55	1.54	13.57	2.40	0.37
75th Percentile	11.76	9.38	1.08	11.57	1.91	(0.18)
90th Percentile	9.12	7.83	0.79	10.12	1.71	(0.69)
Emerging Mkts Equity ●	27.63	12.81	1.37	13.22	2.57	0.27
MSCI EM IMI Index (USD Net Div) ▲	14.35	11.06	1.13	13.03	2.89	0.02

Sector Allocation
March 31, 2020



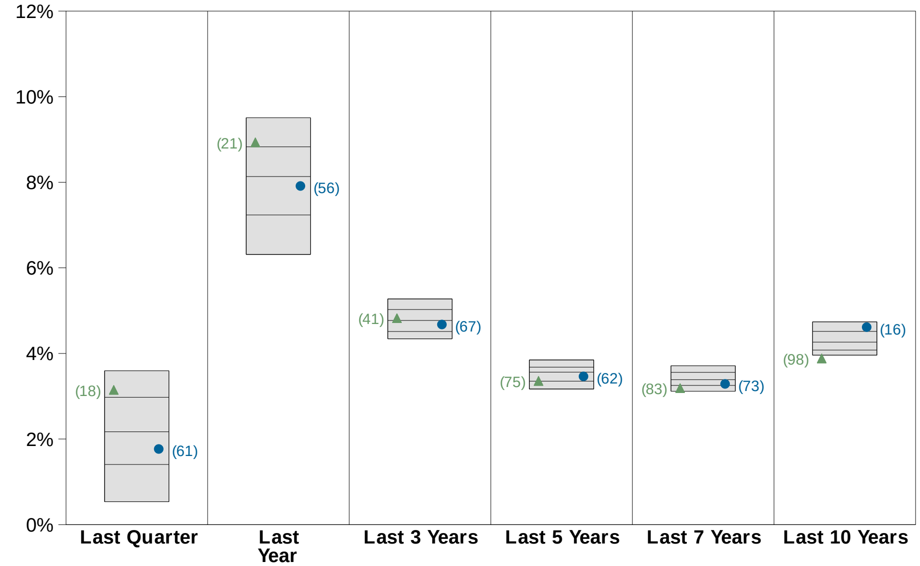
Risk Adjusted Return Measures vs MSCI EM IMI
Rankings Against Callan Emerging Broad (Gross)
Five Years Ended March 31, 2020



	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	4.16	0.11	1.12
25th Percentile	2.97	0.04	0.89
Median	1.54	(0.04)	0.32
75th Percentile	0.28	(0.10)	0.04
90th Percentile	(0.58)	(0.15)	(0.23)
Emerging Mkts Equity ●	2.57	0.02	1.18

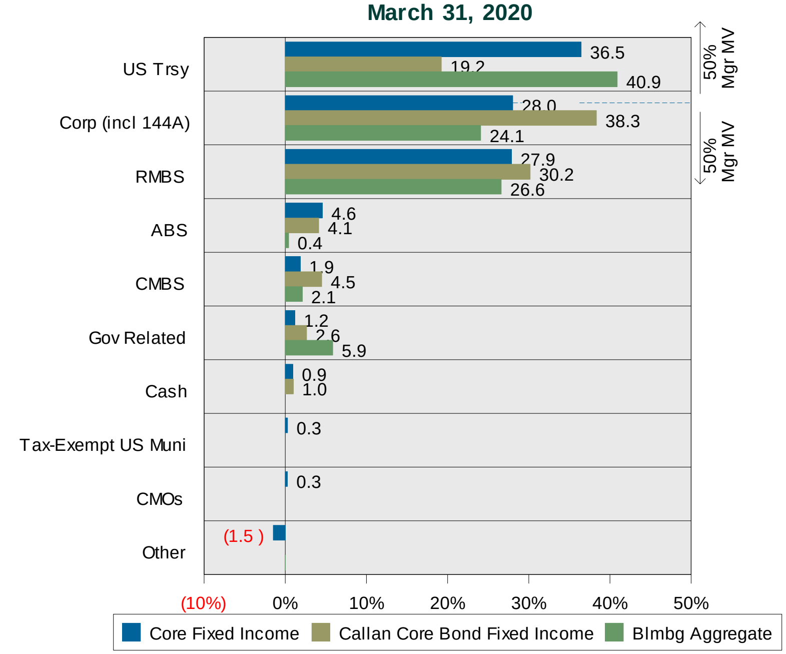
Core Fixed Income As of March 31, 2020

Performance vs Callan Core Bond Fixed Income (Gross)

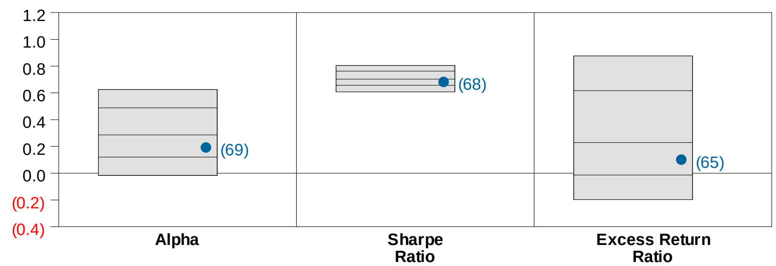


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	3.59	9.51	5.27	3.85	3.71	4.74
25th Percentile	2.98	8.83	5.03	3.68	3.56	4.51
Median	2.17	8.13	4.77	3.56	3.39	4.26
75th Percentile	1.41	7.24	4.51	3.35	3.25	4.08
90th Percentile	0.53	6.31	4.34	3.17	3.12	3.96
Core Fixed Income ●	1.74	7.89	4.65	3.44	3.26	4.59
Blmbg Aggregate ▲	3.15	8.93	4.82	3.36	3.19	3.88

Sector Allocation
March 31, 2020



Risk Adjusted Return Measures vs Blmbg Aggregate
Rankings Against Public Fund - Domestic Fixed (Gross)
Five Years Ended March 31, 2020

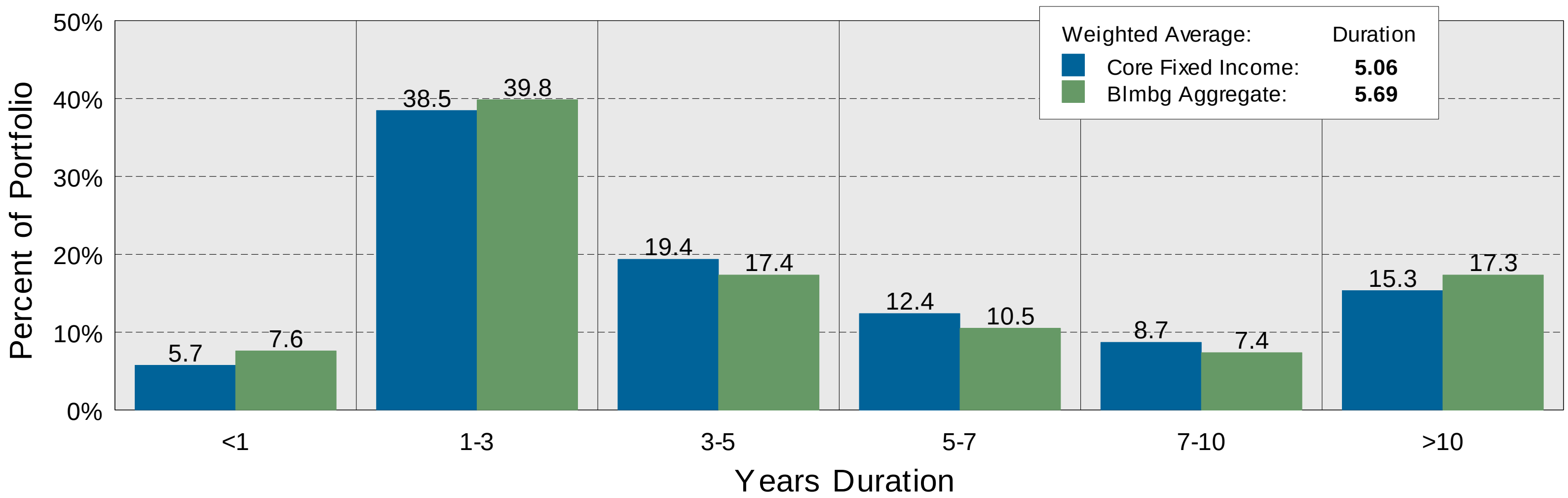


	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.63	0.80	0.88
25th Percentile	0.49	0.76	0.62
Median	0.29	0.70	0.23
75th Percentile	0.12	0.66	(0.01)
90th Percentile	(0.02)	0.61	(0.20)
Core Fixed Income ●	0.18	0.67	0.09

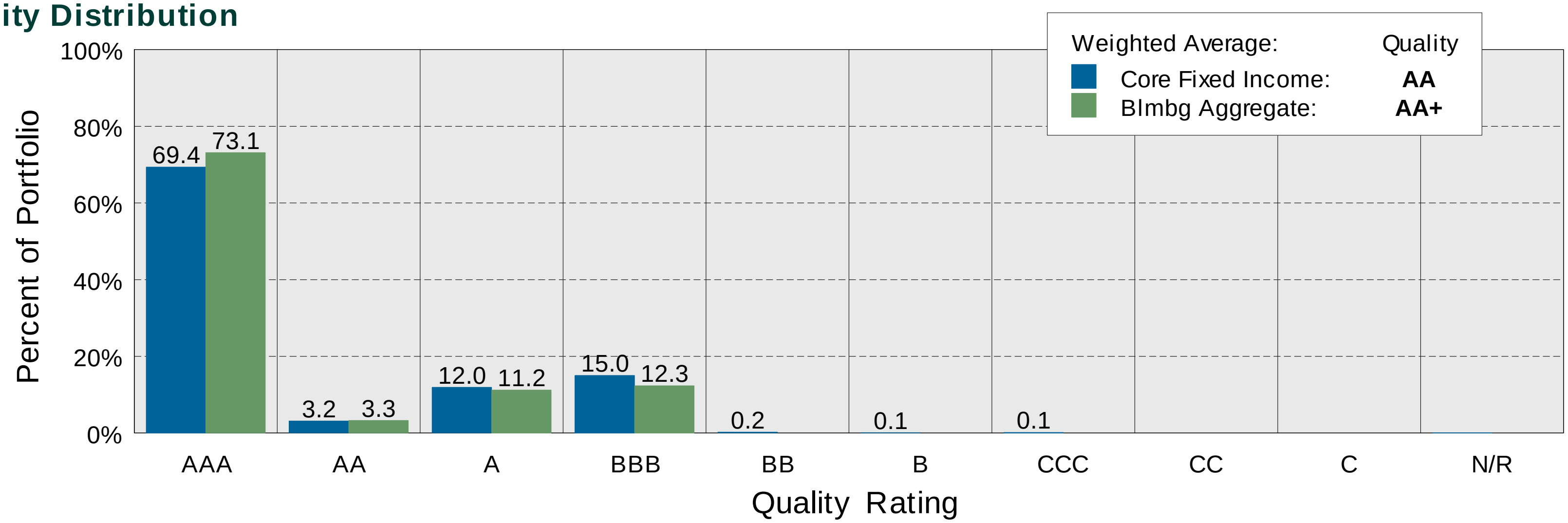
Core Fixed Income

As of March 31, 2020

Duration Distribution

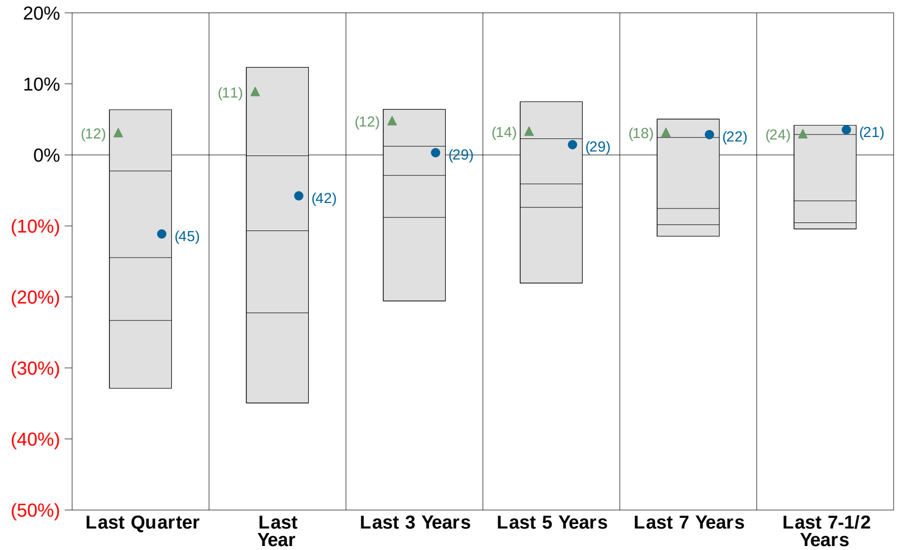


Quality Distribution



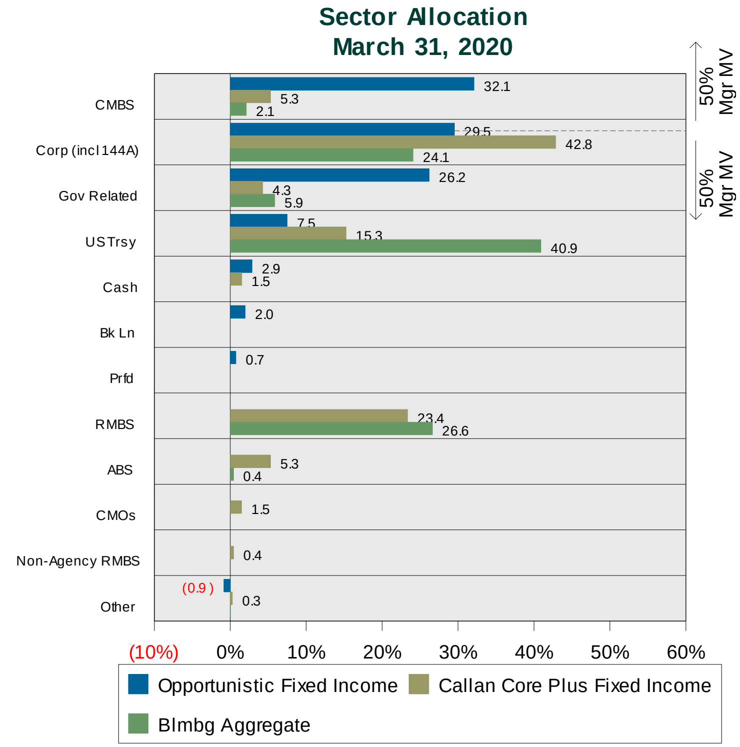
Opportunistic Fixed Income As of March 31, 2020

Performance vs Callan Alternative Investments DB (Gross)

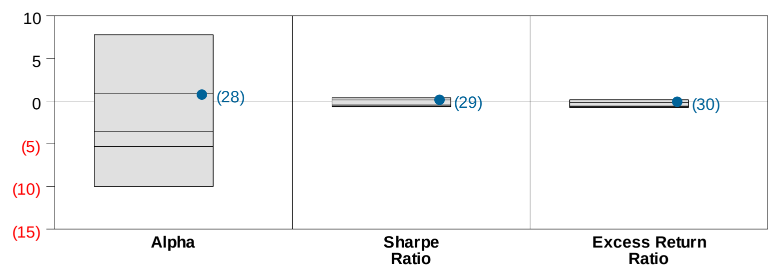


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 7-1/2 Years
10th Percentile	6.35	12.34	6.42	7.48	5.04	4.18
25th Percentile	(2.26)	(0.12)	1.22	2.28	2.46	2.87
Median	(14.46)	(10.69)	(2.89)	(4.08)	(7.54)	(6.47)
75th Percentile	(23.31)	(22.25)	(8.81)	(7.39)	(9.84)	(9.55)
90th Percentile	(32.86)	(34.94)	(20.56)	(18.05)	(11.45)	(10.43)
Opportunistic Fixed Income ●	(11.28)	(5.91)	0.17	1.28	2.72	3.39
Blmbg Aggregate ▲	3.15	8.93	4.82	3.36	3.19	2.99

Sector Allocation
March 31, 2020



Risk Adjusted Return Measures vs Blmbg Aggregate
Rankings Against Callan Alternative Investments DB (Gross)
Five Years Ended March 31, 2020

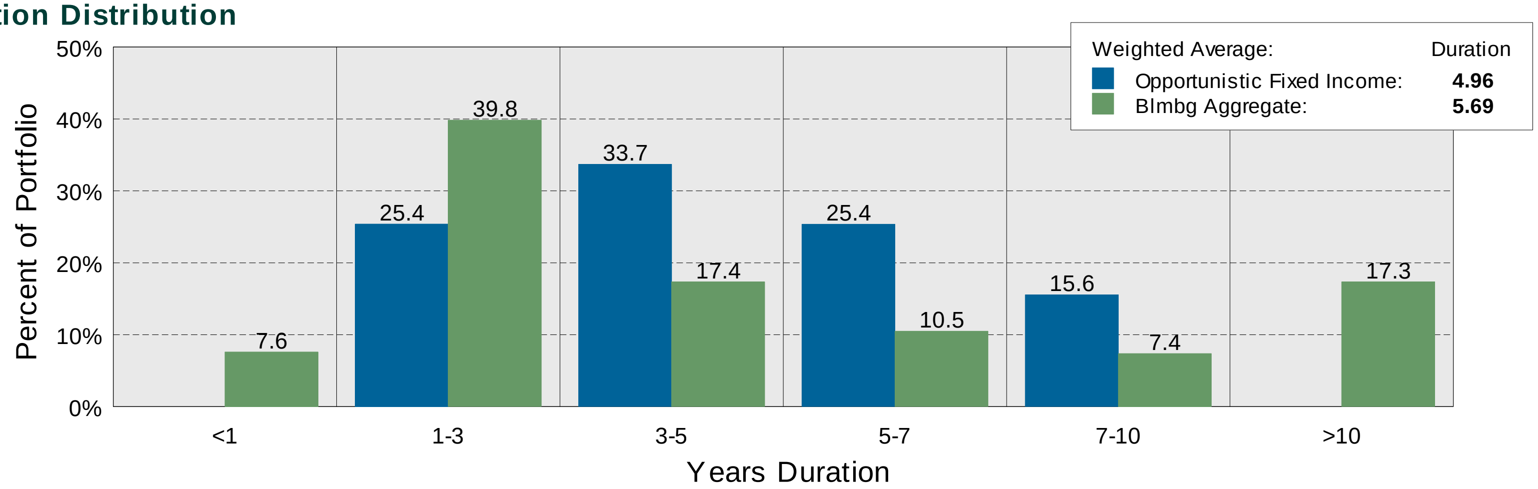


	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	7.78	0.38	0.16
25th Percentile	0.91	0.14	(0.15)
Median	(3.54)	(0.44)	(0.57)
75th Percentile	(5.31)	(0.55)	(0.65)
90th Percentile	(10.00)	(0.65)	(0.74)
Opportunistic Fixed Income ●	0.61	0.01	(0.23)

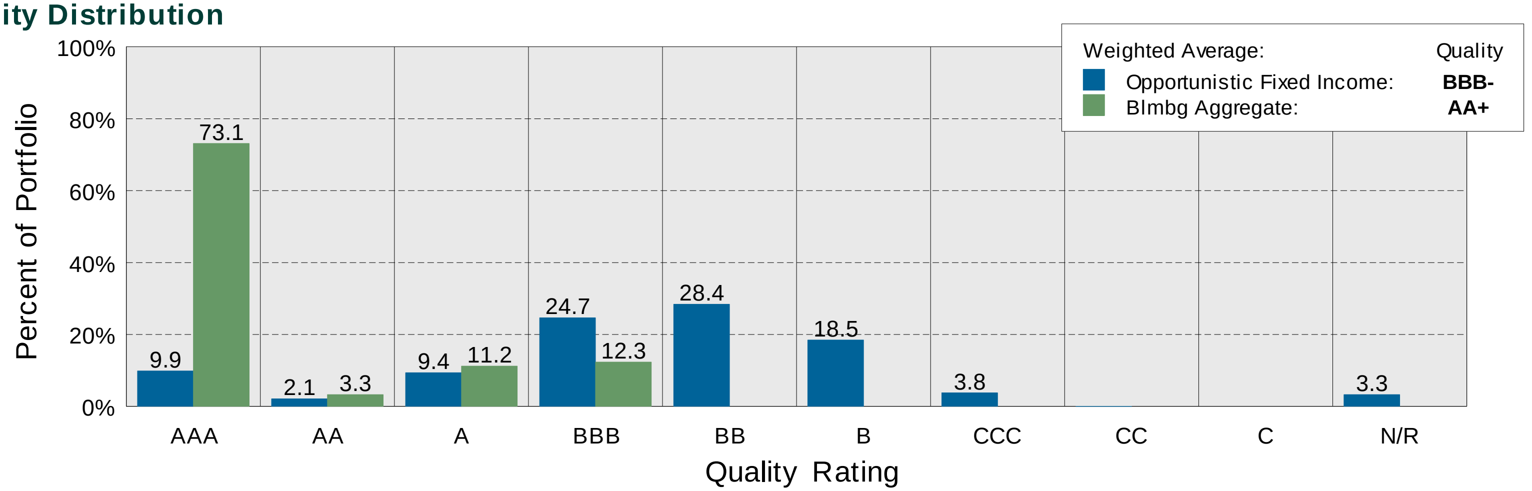
Opportunistic Fixed Income

As of March 31, 2020

Duration Distribution



Quality Distribution



Appendix I – Investment Manager Returns

Investment Manager Returns

As of March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance- Domestic Equity						
U.S. Equity	**$6,232**	**100.00%**	**(22.27%)**	**(11.69%)**	**2.34%**	**4.18%**
Russell 3000 Index (1)	-	-	(20.90%)	(9.13%)	4.00%	5.77%
MCM Russell 1000 Index	5,036	80.80%	(20.22%)	(8.05%)	4.66%	6.26%
Russell 1000 Index	-	-	(20.22%)	(8.03%)	4.64%	6.22%
MCM Russell 2000 Core Index	242	3.88%	(30.62%)	(23.99%)	(4.66%)	-
Russell 2000 Index	-	-	(30.61%)	(23.99%)	(4.64%)	(0.25%)
MCM Russell 2000 Val Index	400	6.42%	(35.61%)	(29.58%)	(9.53%)	-
Russell 2000 Value Index	-	-	(35.66%)	(29.64%)	(9.51%)	(2.42%)
Emerald Asset Management	555	8.90%	(24.58%)	(18.76%)	1.60%	-
Russell 2000 Growth Index	-	-	(25.76%)	(18.58%)	0.10%	1.70%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance- Domestic Equity						
U.S. Equity	**9.49%**	**6.27%**	**4.61%**	**8.31%**	**9.95%**	(1/81)
Russell 3000 Index (1)	10.15%	7.50%	4.91%	8.73%	10.31%	(1/81)
MCM Russell 1000 Index	-	-	-	-	11.23%	(1/12)
Russell 1000 Index	10.39%	7.63%	4.88%	8.94%	11.26%	(1/12)
MCM Russell 2000 Core Index	-	-	-	-	(2.70%)	(12/16)
Russell 2000 Index	6.90%	5.71%	5.28%	7.57%	(2.68%)	(12/16)
MCM Russell 2000 Val Index	-	-	-	-	(7.54%)	(12/16)
Russell 2000 Value Index	4.79%	4.11%	6.83%	8.06%	(7.52%)	(12/16)
Emerald Asset Management	-	-	-	-	3.32%	(12/16)
Russell 2000 Growth Index	8.89%	7.17%	3.55%	6.62%	2.08%	(12/16)

*Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation. The market values and performance of such accounts are included within their relevant composites.
(1) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

Investment Manager Returns

As of March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance- International Equity						
International Dev Mkts Equity	**$3,463**	**75.49%**	**(23.66%)**	**(14.54%)**	**(1.11%)**	**(0.16%)**
MSCI World ex US IMI	-	-	(24.00%)	(15.48%)	(2.29%)	(0.62%)
Walter Scott & Partners(1)	476	10.38%	(16.41%)	(5.13%)	8.43%	8.12%
MSCI World	-	-	(21.05%)	(10.39%)	1.92%	3.25%
BlackRock MSCI World Ex US Index	2,576	56.16%	(23.21%)	(14.55%)	-	-
MSCI World ex US	-	-	(23.26%)	(14.89%)	(2.07%)	(0.76%)
FIS Group Non-U.S. Small Cap	154	3.35%	(28.26%)	(18.96%)	-	-
MSCI ACWI ex US Small Cap	-	-	(29.01%)	(21.18%)	(4.89%)	(0.81%)
Harris Assoc Int'l SCV	248	5.41%	(36.99%)	(26.06%)	(9.42%)	(4.15%)
MSCI World ex US Sm Cap	-	-	(28.39%)	(19.04%)	(3.60%)	0.39%
MSCI World ex US Sm Value	-	-	(31.70%)	(23.16%)	(6.39%)	(1.63%)
Emerging Mkts Equity	**$1,124**	**24.51%**	**(23.00%)**	**(15.60%)**	**(0.71%)**	**1.09%**
MSCI EM IMI	-	-	(24.40%)	(18.91%)	(2.53%)	(0.90%)
Macquarie Emg Mkts Equity	350	7.63%	(25.16%)	(17.05%)	(0.85%)	1.52%
MSCI EM	-	-	(23.60%)	(17.69%)	(1.62%)	(0.36%)
Martin Currie Emg Mkts Equity	380	8.28%	(22.31%)	(11.93%)	2.30%	3.07%
MSCI EM	-	-	(23.60%)	(17.69%)	(1.62%)	(0.36%)
BlackRock Emg Mkts Index	151	3.29%	(23.66%)	(17.90%)	-	-
MSCI EM	-	-	(23.60%)	(17.69%)	(1.62%)	(0.36%)
Leading Edge Emg Mkts Fund	174	3.80%	(26.31%)	(19.42%)	-	-
MSCI EM	-	-	(23.60%)	(17.69%)	(1.62%)	(0.36%)
GlobeFlex Emerging Small Cap	69	1.51%	(28.34%)	(25.07%)	(6.88%)	(4.05%)
MSCI EM Small Cap	-	-	(31.37%)	(28.98%)	(9.64%)	(5.17%)

(1) Walter Scott since inception returns were contained in the Global Mandates composite prior to 12/31/2019.
*Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation. The market values and performance of such accounts are included within their relevant composites.

Investment Manager Returns

As of March 31, 2020

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance- International Equity						
International Dev Mkts Equity	**3.64%**	**3.03%**	**-**	**-**	**4.75%**	(1/02)
MSCI World ex US IMI	2.61%	3.23%	2.16%	4.20%	4.89%	(1/02)
Walter Scott & Partners(1)	8.99%	-	-	-	7.90%	(10/06)
MSCI World	6.57%	5.33%	3.22%	6.18%	4.35%	(10/06)
BlackRock MSCI World Ex US Index	-	-	-	-	(3.63%)	(6/17)
MSCI World ex US	2.43%	3.06%	2.07%	4.12%	(4.03%)	(6/17)
FIS Group Non-U.S. Small Cap	-	-	-	-	(16.24%)	(10/18)
MSCI ACWI ex US Small Cap	2.79%	4.28%	4.70%	4.57%	(17.91%)	(10/18)
Harris Assoc Int'l SCV	2.43%	4.49%	-	-	7.82%	(7/03)
MSCI World ex US Sm Cap	3.95%	4.01%	-	-	7.26%	(7/03)
MSCI World ex US Sm Value	2.74%	3.64%	6.26%	5.42%	7.03%	(7/03)
Emerging Mkts Equity	**0.53%**	**3.17%**	**-**	**-**	**5.90%**	(1/02)
MSCI EM IMI	0.48%	5.36%	4.84%	3.83%	7.99%	(1/02)
Macquarie Emg Mkts Equity	-	-	-	-	0.67%	(5/13)
MSCI EM	0.69%	5.45%	-	-	(0.52%)	(5/13)
Martin Currie Emg Mkts Equity	-	-	-	-	1.68%	(1/14)
MSCI EM	0.69%	5.45%	-	-	(0.29%)	(1/14)
BlackRock Emg Mkts Index	-	-	-	-	(4.13%)	(7/17)
MSCI EM	0.69%	5.45%	-	-	(3.91%)	(7/17)
Leading Edge Emg Mkts Fund	-	-	-	-	(8.20%)	(11/18)
MSCI EM	0.69%	5.45%	-	-	(5.92%)	(11/18)
GlobeFlex Emerging Small Cap	-	-	-	-	(0.91%)	(8/13)
MSCI EM Small Cap	(1.34%)	4.68%	4.67%	2.77%	(2.65%)	(8/13)

(1) Walter Scott since inception returns were contained in the Global Mandates composite prior to 12/31/2019.
*Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation. The market values and performance of such accounts are included within their relevant composites.

Investment Manager Returns

As of March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income						
Fixed Income	**$8,106**	**57.67%**	**(1.49%)**	**4.07%**	**3.12%**	**2.54%**
Blmbg Aggregate	-	-	3.15%	8.93%	4.82%	3.36%
Core Fixed Income	**$5,283**	**37.58%**	**1.70%**	**7.75%**	**4.54%**	**3.32%**
Blmbg Aggregate	-	-	3.15%	8.93%	4.82%	3.36%
PIMCO Core Bond Fund	667	4.75%	(0.62%)	5.07%	3.89%	2.92%
Blmbg Agg ex Treasury	-	-	(0.19%)	6.04%	4.10%	3.10%
Mellon Bond-Index	4,421	31.45%	3.15%	8.84%	4.79%	3.31%
Blmbg Aggregate (1)	-	-	3.15%	8.93%	4.82%	3.36%
BMO (TCH) Corp FI	195	1.39%	(4.83%)	3.84%	3.52%	2.94%
Blmbg Credit	-	-	(3.14%)	5.10%	4.19%	3.28%
Nominal U.S. Treasuries	**$667**	**4.75%**	**11.77%**	**18.11%**	**7.48%**	**4.41%**
Blmbg US Treas Bell 10Y	-	-	11.93%	18.26%	7.30%	4.10%
PIMCO US Treasuries	667	4.75%	11.77%	18.11%	7.63%	4.71%
Blmbg US Treas Bell 10Y	-	-	11.93%	18.26%	7.30%	4.10%

*Market values may not sum as a result of accounts funded within the quarter or accounts in the process of liquidation. The market values and performance of such accounts are included within their relevant composites.
(1) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

Investment Manager Returns

As of March 31, 2020

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Fixed Income						
Fixed Income	**4.25%**	**4.96%**	**5.58%**	**6.13%**	**8.30%**	(1/81)
Blmbg Aggregate	3.88%	4.40%	5.08%	5.49%	7.67%	(1/81)
Core Fixed Income	**4.42%**	**4.71%**	**-**	**-**	**4.89%**	(1/02)
Blmbg Aggregate	3.88%	4.40%	5.08%	5.49%	4.60%	(1/02)
PIMCO Core Bond Fund	-	-	-	-	2.69%	(1/13)
Blmbg Agg ex Treasury	3.88%	4.46%	-	-	3.01%	(1/13)
Mellon Bond-Index	3.79%	4.29%	5.00%	5.57%	7.17%	(4/84)
Blmbg Aggregate (1)	3.88%	4.40%	5.13%	5.64%	7.44%	(4/84)
BMO (TCH) Corp FI	4.73%	4.87%	-	-	5.57%	(11/00)
Blmbg Credit	4.75%	4.95%	5.73%	6.03%	5.67%	(11/00)
Nominal U.S. Treasuries	**-**	**-**	**-**	**-**	**3.85%**	(9/11)
Blmbg US Treas Bell 10Y	5.27%	5.07%	5.46%	5.74%	3.89%	(9/11)
PIMCO US Treasuries	-	-	-	-	4.06%	(9/11)
Blmbg US Treas Bell 10Y	5.27%	5.07%	5.46%	5.74%	3.89%	(9/11)

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The market values and performance of such accounts are included within their relevant composites.
(1) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

Investment Manager Returns

As of March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Fixed Income						
Opportunistic Fixed Income	**$2,154**	**100.00%**	**(11.45%)**	**(6.43%)**	**(0.39%)**	**0.65%**
BAAM Keystone(1)	830	38.56%	(14.37%)	(8.86%)	(0.05%)	0.88%
HFRI FOF Comp Index	-	-	(8.79%)	(5.48%)	(0.04%)	0.00%
Brandywine Global Opp FI	183	8.48%	(10.74%)	(5.27%)	(0.14%)	0.24%
FTSE Wrld Gov't Bond Index	-	-	2.00%	6.17%	4.27%	2.96%
Eaton Vance GMARA(2)	196	9.10%	(8.08%)	1.43%	-	-
3 Mo LIBOR Index +6%	-	-	1.85%	8.09%	8.04%	7.47%
Fidelity HY CMBS	286	13.29%	(16.13%)	(11.68%)	(0.85%)	0.55%
Bloomberg US CMBS Ex AAA Index	-	-	(7.45%)	(2.11%)	2.75%	2.63%
SEI Str. Credit: HY Bank Loans(3)(4)	344	15.99%	2.16%	2.31%	5.76%	6.61%
FTSE:HY Corp (1 month lag)	-	-	0.36%	5.49%	4.61%	4.88%
Stone Harbor Glbl HY	183	8.51%	(11.99%)	(6.73%)	0.29%	1.79%
FTSE High Yield Market Index	-	-	(13.09%)	(7.64%)	0.47%	2.46%
Stone Harbor EMD	131	6.07%	(17.65%)	(13.11%)	(2.61%)	1.55%
JPM Emg Mkts Bond Global Index	-	-	(11.76%)	(5.28%)	0.44%	2.85%

(1) Blackstone Keystone since inception returns were included in the Legacy Hedge Fund composite through 9/30/2017 and in the Multi strategy composite through 12/31/2019.
(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 March 31, 2020

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Fixed Income						
Opportunistic Fixed Income	**-**	**-**	**-**	**-**	**2.73%**	(10/12)
BAAM Keystone(1)	-	-	-	-	5.21%	(7/12)
HFRI FOF Comp Index	1.75%	2.13%	2.58%	4.71%	2.36%	(7/12)
Brandywine Global Opp FI	-	-	-	-	2.63%	(2/11)
FTSE Wrld Gov't Bond Index	2.19%	3.04%	4.31%	4.30%	1.68%	(2/11)
Eaton Vance GMARA(2)	-	-	-	-	(1.10%)	(6/18)
3 Mo LIBOR Index +6%	6.90%	7.77%	8.02%	8.74%	8.32%	(6/18)
Fidelity HY CMBS	7.92%	5.36%	7.16%	-	7.64%	(4/97)
Bloomberg US CMBS Ex AAA Index	6.15%	0.41%	-	-	-	
SEI Str. Credit: HY Bank Loans(3)(4)	9.98%	-	-	-	11.69%	(5/08)
FTSE:HY Corp (1 month lag)	6.98%	6.62%	6.88%	7.21%	7.44%	(5/08)
Stone Harbor Glbl HY	4.74%	5.60%	-	-	6.76%	(7/00)
FTSE High Yield Market Index	5.36%	5.95%	6.33%	6.64%	6.34%	(7/00)
Stone Harbor EMD	3.86%	5.97%	-	-	5.97%	(4/05)
JPM Emg Mkts Bond Global Index	4.82%	6.28%	7.51%	9.93%	6.28%	(4/05)

(1) Blackstone Keystone since inception returns were included in the Legacy Hedge Fund composite through 9/30/2017 and in the Multi-Strategy composite through 12/31/2019.
(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 March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Inflation Protection						
Inflation Protection (TIPS)	**$1,227**	**100.00%**	**1.43%**	**6.41%**	**3.45%**	**2.65%**
Blmbg US TIPS	-	-	1.69%	6.85%	3.46%	2.67%
NISA Inv Adv TIPS	530	43.22%	1.71%	6.74%	3.45%	2.67%
Blmbg US TIPS (1)	-	-	1.69%	6.85%	3.46%	2.67%
Brown Brothers TIPS	578	47.12%	1.98%	7.25%	3.49%	2.78%
Blmbg US TIPS	-	-	1.69%	6.85%	3.46%	2.67%
New Century Global TIPS	118	9.66%	(1.48%)	2.66%	3.13%	2.18%
Blmbg Wld Gov I-L Undhdg	-	-	(2.40%)	1.61%	2.74%	1.97%

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Inflation Protection						
Inflation Protection (TIPS)	**2.54%**	**3.44%**	**-**	**-**	**3.30%**	(2/03)
Blmbg US TIPS	3.48%	3.92%	5.37%	-	4.33%	(2/03)
NISA Inv Adv TIPS	2.36%	-	-	-	3.22%	(4/07)
Blmbg US TIPS (1)	2.36%	3.20%	4.82%	-	3.22%	(4/07)
Brown Brothers TIPS	-	-	-	-	1.88%	(2/12)
Blmbg US TIPS	3.48%	3.92%	5.37%	-	1.68%	(2/12)
New Century Global TIPS	-	-	-	-	1.92%	(2/12)
Blmbg Wld Gov I-L Undhdg	3.04%	3.49%	5.21%	-	1.46%	(2/12)

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The market values and performance of such accounts are included within their relevant composites.
(1) Benchmark history is a blend of current and past benchmark indices. History prior to 12/31/2018 is provided by RVK.

Investment Manager Returns

As of March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Private Equity						
Private Equity	**$4,124**	**100.00%**	**2.40%**	**10.97%**	**12.07%**	**9.65%**
Burgiss Private Equity Custom Index	-	-	4.36%	12.70%	13.68%	11.64%
Global Equity +3% (Qtr lag)(1)	-	-	9.37%	33.99%	17.79%	14.48%
Buyouts	**$2,087**	**50.59%**	**3.18%**	**12.85%**	**12.95%**	**11.49%**
Burgiss Buyout Custom Index	-	-	4.41%	12.04%	13.50%	12.07%
Special Situations	**$435**	**10.54%**	**5.42%**	**17.41%**	**15.44%**	**9.65%**
Burgiss Special Situations Custom Index	-	-	2.24%	5.70%	7.05%	6.35%
Growth Equity	**$896**	**21.72%**	**1.67%**	**15.22%**	**17.82%**	**11.04%**
Burgiss Venture Capital Custom Index	-	-	5.67%	18.45%	18.25%	13.69%
Keystone Legacy(2)	**$707**	**17.15%**	**(0.29%)**	**(0.16%)**	**-**	**-**
Private Credit	**$403**	**9.78%**	**2.47%**	**9.77%**	**-**	**-**
S&P Levered Loan Index +1% (Qtr lag)	-	-	1.97%	9.65%	5.35%	5.45%

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

Investment Manager Returns

As of March 31, 2020

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Private Equity						
Private Equity	**10.95%**	**10.90%**	**7.88%**	**13.65%**	**10.90%**	(1/86)
Burgiss Private Equity Custom Index	12.84%	12.31%	9.87%	15.25%	16.85%	(1/86)
Global Equity + 3% (Qtr lag)(1)	16.71%	12.48%	9.86%	13.70%	14.69%	(1/86)
Buyouts	**13.01%**	**13.24%**	**10.61%**	**16.31%**	**13.12%**	(4/86)
Burgiss Buyout Custom Index	12.88%	13.02%	11.49%	13.84%	19.53%	(9/86)
Special Situations	**10.97%**	**11.75%**	**12.15%**	**12.47%**	**12.50%**	(1/95)
Burgiss Special Situations Custom Index	8.97%	8.25%	9.55%	10.51%	10.51%	(6/95)
Growth Equity	**10.31%**	**7.10%**	**0.68%**	**8.18%**	**7.10%**	(1/86)
Burgiss Venture Capital Custom Index	15.19%	11.39%	5.01%	15.86%	13.71%	(1/86)
Keystone Legacy(2)	**-**	**-**	**-**	**-**	**(3.28%)**	(7/18)
Private Credit	**-**	**-**	**-**	**-**	**8.95%**	(12/17)
S&P Levered Loan Index +1% (Qtr lag)	6.01%	5.78%	5.89%	-	5.49%	(12/17)

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

Investment Manager Returns

As of March 31, 2020

	Market Value $(mm)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Net Performance - Real Estate						
Real Estate	**$2,060**	**100.00%**	**(2.26%)**	**3.99%**	**2.62%**	**3.75%**
Real Estate Custom Benchmark (1)	-	-	1.08%	7.02%	6.56%	7.81%
CPI +3% (Qtr lag)	-	-	0.82%	5.29%	5.10%	4.82%
Core/Core Plus Real Estate Funds	**$741**	**35.98%**	**1.08%**	**4.03%**	**5.90%**	**7.92%**
NCREIF ODCE Index (Qtr lag)	-	-	1.30%	5.18%	6.46%	8.34%
Value Add/Opportunistic SMA	**$639**	**31.01%**	**0.54%**	**11.06%**	**0.73%**	**2.53%**
NCREIF ODCE Index (Qtr lag)	-	-	1.30%	5.18%	6.46%	8.34%
Value Add/Opportunistic Funds	**$460**	**22.34%**	**2.62%**	**6.93%**	**8.04%**	**7.33%**
NCREIF ODCE Index (Qtr lag)	-	-	1.30%	5.18%	6.46%	8.34%
Legacy Real Assets	**$6**	**0.28%**	**(0.86%)**	**10.98%**	**(0.77%)**	**(0.40%)**
CPI +3% (Qtr lag)	-	-	0.82%	5.29%	5.10%	4.82%
REITS	**$214**	**10.39%**	**(24.63%)**	**(17.86%)**	**(1.77%)**	**(0.75%)**
FTSE NAREIT US Index (Qtr lag)	-	-	(0.96%)	24.34%	7.49%	6.60%

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

Investment Manager Returns

As of March 31, 2020

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Since Inception	
Net Performance - Real Estate						
Real Estate	**7.30%**	**5.03%**	**6.53%**	**7.68%**	**8.26%**	(3/84)
Real Estate Custom Benchmark (1)	10.36%	6.91%	7.70%	-	-	
CPI +3% (Qtr lag)	4.76%	5.02%	5.14%	5.18%	5.62%	(3/84)
Core/Core Plus Real Estate Funds	**10.68%**	**7.28%**	**7.65%**	**8.77%**	**7.08%**	(9/86)
NCREIF ODCE Index (Qtr lag)	10.52%	6.63%	7.01%	7.80%	6.00%	(9/86)
Value Add/Opportunistic SMA	**5.86%**	**3.87%**	**4.81%**	**6.31%**	**5.15%**	(6/88)
NCREIF ODCE Index (Qtr lag)	10.52%	6.63%	7.01%	7.80%	6.04%	(6/88)
Value Add/Opportunistic Funds	**11.09%**	**6.11%**	**7.70%**	**8.83%**	**7.86%**	(3/84)
NCREIF ODCE Index (Qtr lag)	10.52%	6.63%	7.01%	7.80%	6.26%	(3/84)
Legacy Real Assets	**(0.31%)**	**1.72%**	**2.13%**	**4.02%**	**4.37%**	(3/93)
CPI +3% (Qtr lag)	4.76%	5.02%	5.14%	5.18%	5.21%	(3/93)
REITS	**5.72%**	**5.28%**	**9.03%**	**-**	**8.60%**	(4/96)
FTSE NAREIT US Index (Qtr lag)	11.60%	7.58%	10.98%	11.03%	10.59%	(4/96)

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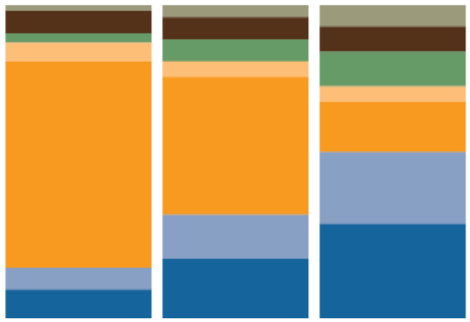
(1) As of 03/31/2019 benchmark consists of 90% NCREIF ODCE Index and 10% FTSE NAREIT Index with a one quarter lag. Prior to 03/31/2019, benchmark history was provided by RVK.

Appendix II – Callan Update

Published Research Highlights from 1Q20

2020 DC Trends Survey

Callan’s 2020-2029 Capital Market Assumptions



How DC Plans Can Harness DC Plan Data for Better Outcomes

An Introduction to Our New Hedge Fund Peer Group

Recent Blog Posts

Local Presence for Multinational Managers in China

Fanglue Zhou

Trigger Funds: Here’s What You Need to Know

Catherine Beard

Plus our blog contains a wide array of posts related to the pandemic

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

Real Assets Reporter quarterly newsletter

Callan Institute Events

Upcoming Conferences, Workshops, and Webinars

Upcoming Webinars

Hedge Fund Overview
May 21, 2020

China Update
July 8, 2020

Register at callan.com/callan-institute-events

"Research, education, and dialogue are more important than ever in these extraordinary times, which is why I'm pleased to announce that we are adding more webinars, and we plan to expand our events to include roundtables and other interactive digital offerings."

Barb Gerraty
Director, Callan Institute

On-Demand Webinars

Visit our website for On-Demand webinar options at https://www.callan.com/on-demand-webinars/

Our most recent webinar covered strategies in alternatives.

"Callan College"

Introduction to Investments for Institutional Investors

This program familiarizes institutional investor trustees and staff and asset management advisers with basic investment theory, terminology, and practices. It lasts one-and-a-half days and is designed for individuals with less than two years of experience with asset-management oversight and/or support responsibilities.

Alternative Investments for Institutional Investors

Alternative investments like private equity, hedge funds, and real estate can play a key role in any portfolio. In this one-day session, Callan experts will provide instruction about the importance of allocations to alternatives, and how to integrate, evaluate, and monitor them.

Program dates and registration can be found at callan.com/callan-institute-events

Callan Updates

Firm updates by the numbers, as of March 31, 2020

Total Associates: 193

Ownership
- 100% employees
- Broadly distributed across more than 95 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 $2.5 trillion

"We've been taking precautions to combat the spread of the virus and to safeguard the health of our employees, our clients, and the community at large. Our hearts go out to those directly affected by the virus, and to those whose lives are being disrupted by the downstream social and economic effects."

- CEO & Chief Research Officer Greg Allen on Callan's COVID-19 Response