

December 3, 2019



**Pennsylvania State Employees'
Retirement System – 401(a) Plan**

Third Quarter 2019

Executive Summary

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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.

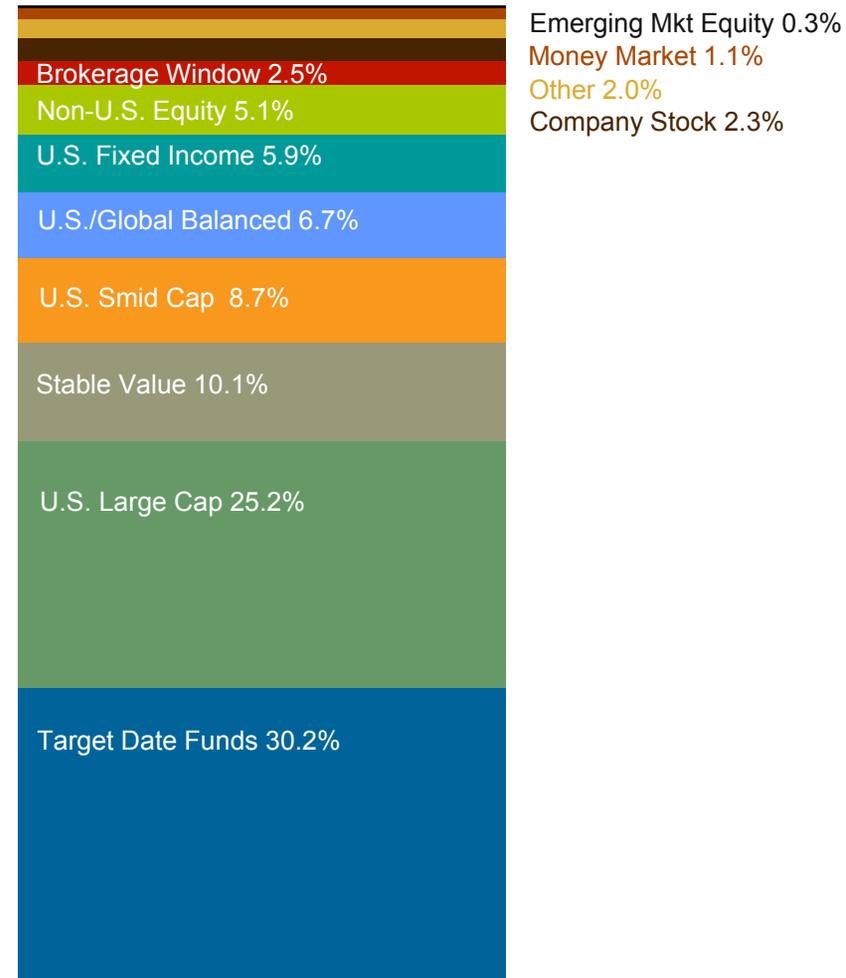
Source: Callan

Callan DC Index™

Net Cash Flow Analysis (as % of Total Net Flows)

Asset Class	2Q19
Alternatives/Other	-0.44%
Brokerage Window	-3.68%
Company Stock	-9.87%
Emerging Market Equity	-1.05%
Global Equity	0.27%
High Yield	0.17%
Money Market	3.59%
Non-U.S. Equity	2.29%
Non-U.S./Global Fixed Income	1.60%
Real Estate	1.48%
Real Return/TIPS	1.21%
Specialty Equity/Sector	-0.14%
Stable Value	-10.59%
Target Date Funds	62.56%
U.S. Fixed Income	26.82%
U.S. Large Cap	-45.95%
U.S. Smid Cap	-20.40%
U.S./Global Balanced	-7.58%
Total Turnover*	0.54%

Asset Allocation as of June 30, 2019



* Total Index "turnover" measures the percentage of total invested assets (transfers only, excluding contributions and withdrawals) that moved between asset classes.

Note: Data provided is the most recent available at time of publication.

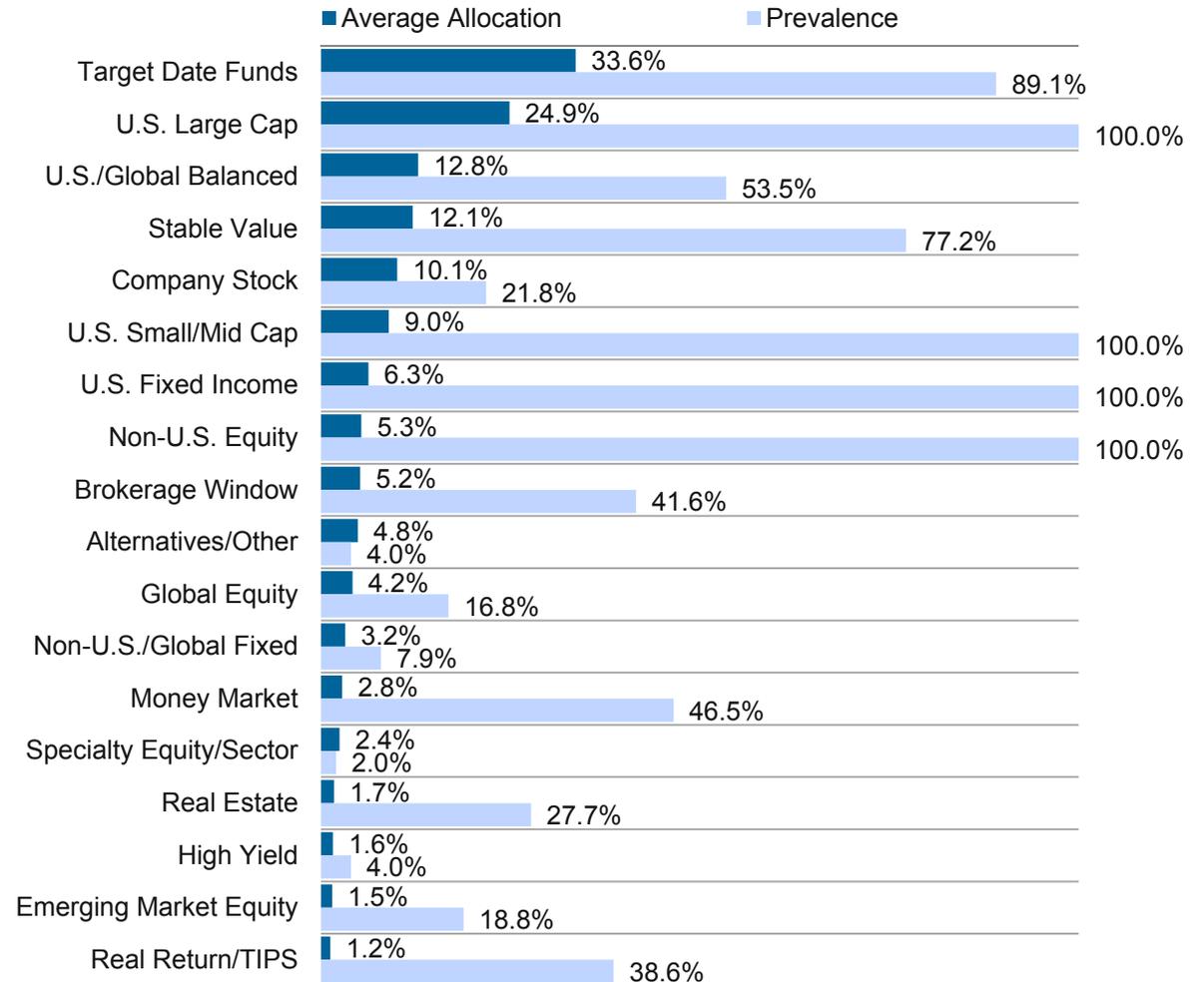
Source: Callan

Callan DC Index™

Prevalence of PA SERS 401a Funds versus Callan's DC Index:

- **The Target Date Funds** allocation of 85% is higher than the average of 34%. The Target Date Funds are the default investment for participants enrolled in the Plan.
- **Investments in Large Cap Stock Index Fund** represents approximately 6% of the Plan, a smaller percentage compared to the average allocation of 25%.
- It is important to note that the DC Index presents typical allocations. Asset allocation figures from the Index do not represent ideal allocations but rather demonstrate how the SERS plan differs from others.

Prevalence of Funds in DC Plans as of June 30, 2019



Source: Callan

Consultant Survey: Historical Analysis

DC: Significant Issues and Target Date Funds

Defined contribution (DC) plan sponsors continue to be intensely focused on fees and expenses, which has been the top concern in our surveys through time. Clients are telling our consultants:

“Fees and structures of multi-manager offerings are the hot-button topics.”

“Fees continue to be the area of focus. Looking at investment management and administrative fees.”

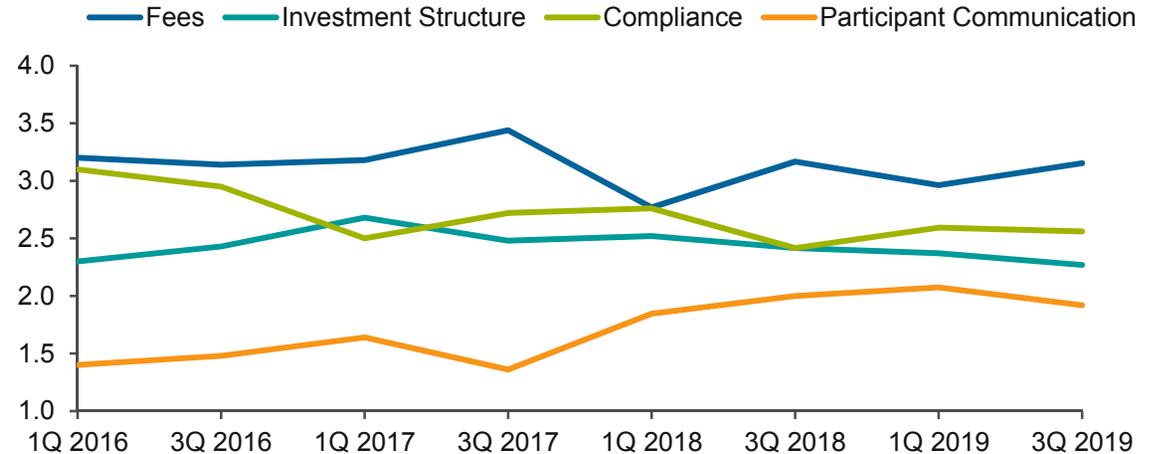
“Transparency of plan expenses and fund management costs remain a high area of focus.”

For some plans, lawsuits are spurring the focus on fees; as one consultant said, a client is:

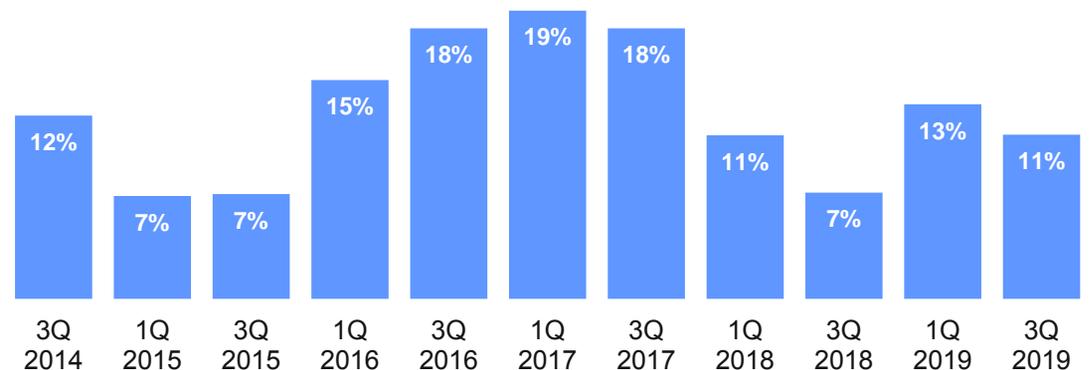
“Continuing to monitor fees to manage legal risk.”

Clients are also continuing to express an interest in streamlining lineups, which has been a consistent pattern in our surveys.

Most significant issues or concerns occupying the attention of DC clients



Percentage of DC clients decreasing total options



*Excluding REITs and TIPS

Consultant Survey: Historical Analysis

DC: Investment Structure Changes

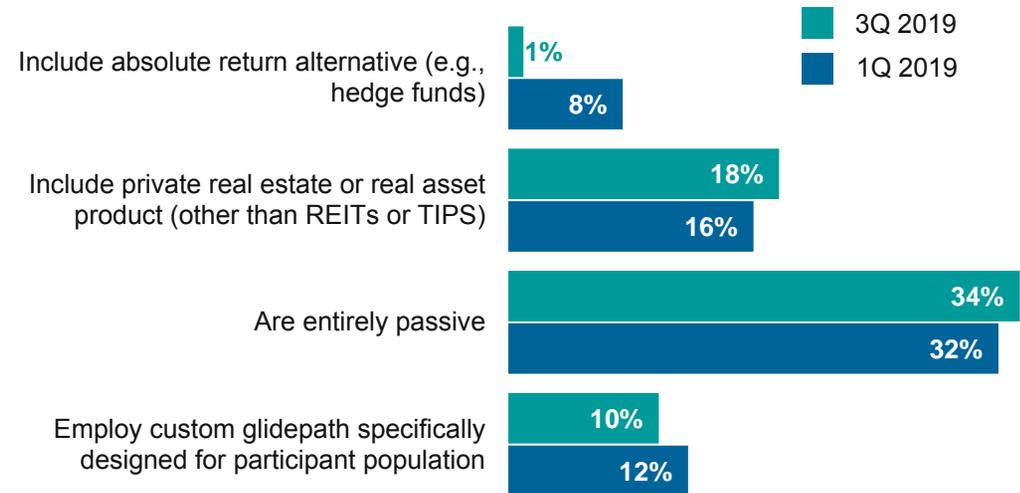
Callan DC clients reporting entirely passive target date funds increased to more than 30% in our recent survey, up from 16% in 2017. Additionally, nearly a fifth of DC clients now include private real estate or real assets in their target date funds.

While the number of plans that indicated they employ a custom glidepath declined slightly, it is still of interest to some clients. As one consultant noted,

“I have two clients with custom TDFs who went through the process of reaffirming that custom approach is still best for their plan.”

DC clients also reported a decline in their interest in introducing or increasing the number of passive options.

Percent of DC clients whose target date funds have the following characteristics



Percent of DC clients planning to introduce or increase the number of passive options



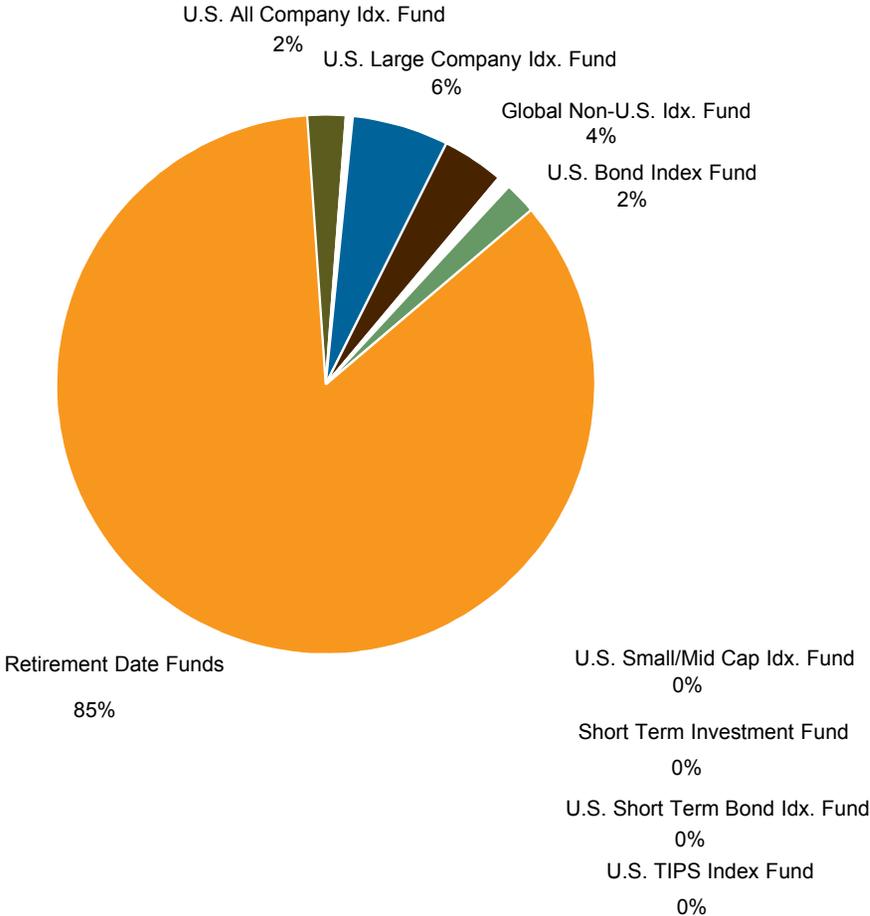
Callan

PA SERS 401(a) Plan Performance Review

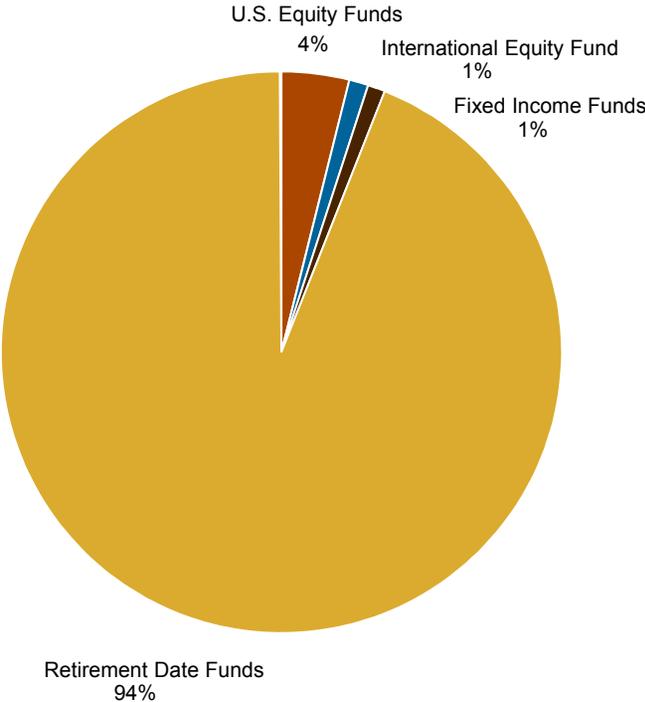
401(a) Plan Asset Allocation & Contributions

As of September 30, 2019

Asset Allocation



Contributions



Asset Allocation

As of September 30, 2019

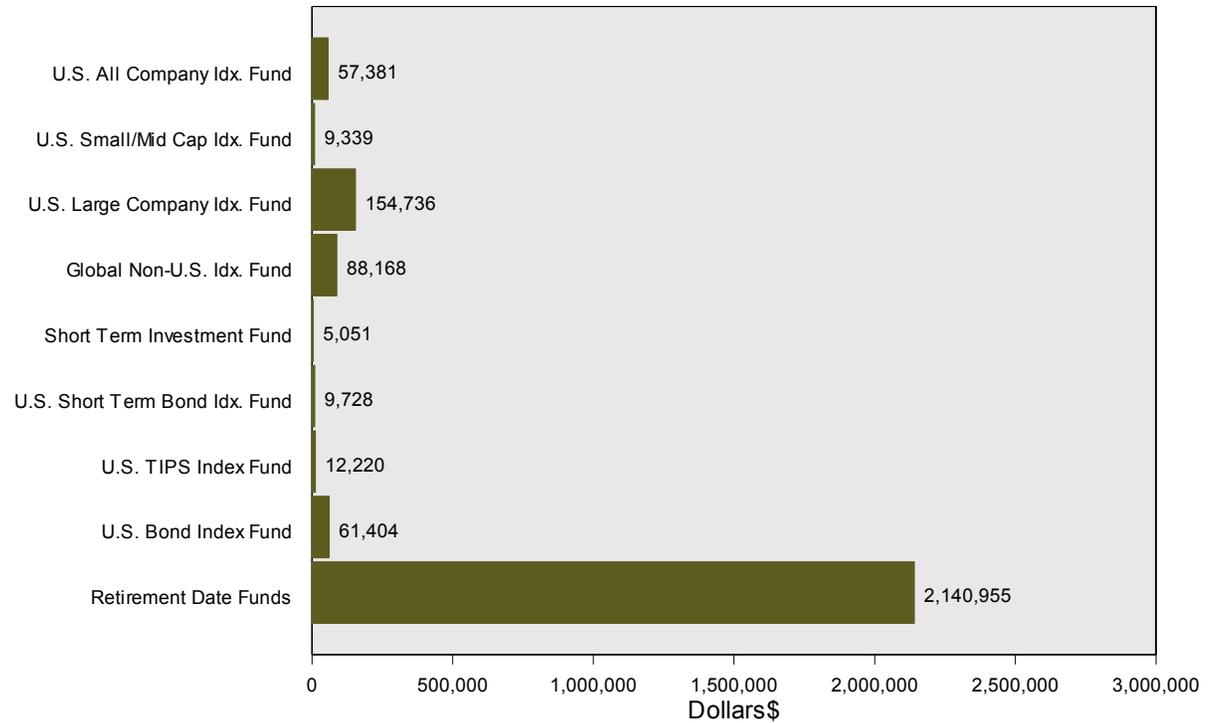
	September 30, 2019			June 30, 2019		
	Market Value	% of Total	Net New Inv.	Inv. Return	Market Value	% of Total
SERS Retirement Date Funds	\$3,586,127	85.09%	\$2,115,676	\$25,279	\$1,445,172	86.26%
SERS Post Retirement Fund	31,683	0.75%	20,333	289	11,061	0.66%
SERS 2020 Retirement Fund	44,115	1.05%	26,863	412	16,841	1.01%
SERS 2025 Retirement Fund	216,221	5.13%	105,675	1,987	108,559	6.48%
SERS 2030 Retirement Fund	291,592	6.92%	176,231	2,432	112,929	6.74%
SERS 2035 Retirement Fund	322,680	7.66%	195,252	2,393	125,035	7.46%
SERS 2040 Retirement Fund	383,227	9.09%	237,583	2,363	143,281	8.55%
SERS 2045 Retirement Fund	522,157	12.39%	260,998	4,020	257,140	15.35%
SERS 2050 Retirement Fund	491,254	11.66%	298,435	3,418	189,401	11.30%
SERS 2055 Retirement Fund	494,314	11.73%	303,491	3,173	187,650	11.20%
SERS 2060 Retirement Fund	788,882	18.72%	490,814	4,792	293,276	17.50%
SERS U.S. Equity	\$362,412	8.60%	\$215,854	\$5,600	\$140,958	8.41%
SERS U.S. Large Company Idx Fund	245,459	5.82%	150,142	4,593	90,723	5.41%
SERS U.S. All Company Idx Fund	100,691	2.39%	56,201	1,180	43,311	2.59%
SERS U.S. SMID Company Idx Fund	16,262	0.39%	9,511	(172)	6,924	0.41%
International Equity						
SERS Global Non-U.S. Index Fund	155,931	3.70%	87,515	653	67,763	4.04%
SERS Fixed Income	\$109,918	2.61%	\$87,506	\$897	\$21,515	1.28%
SERS Short Term Investment Fund	7,334	0.17%	5,024	27	2,283	0.14%
SERS U.S. Short Term Bond Idx Fund	10,972	0.26%	9,686	42	1,244	0.07%
SERS U.S. TIPS Index Fund	13,193	0.31%	12,227	(7)	973	0.06%
SERS U.S. Bond Index Fund	78,419	1.86%	60,568	836	17,014	1.02%
Total Fund	\$4,214,389	100.0%	\$2,506,551	\$32,430	\$1,675,407	100.0%

Changes in Market Values and Contributions

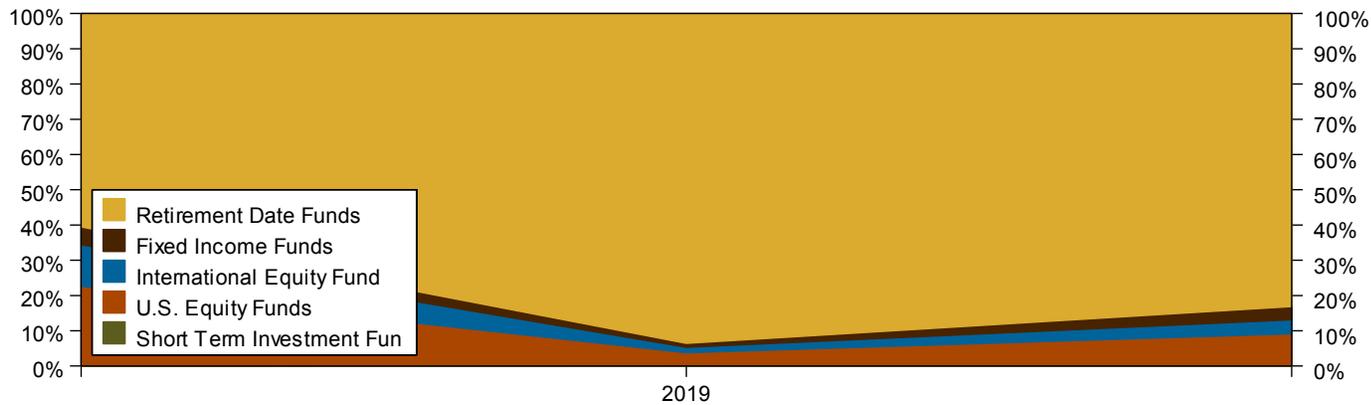
As of September 30, 2019

- The chart to the right shows the net change in fund values across the various investment options for the quarter. The change in value for each fund is the result of:

- Investment returns;
- Participant contributions, employer match, distributions, withdrawals; and
- Transfers between funds by participants.



Historical Allocation of Contributions



Cumulative Performance - Net of Fees

As of September 30, 2019

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years
Net Performance					
Target Date Funds					
SERS Post Retirement Fund	1.40%	6.38%	5.59%	4.76%	5.01%
BlackRock Post Retirement Index	1.40%	6.43%	5.58%	4.75%	4.99%
Callan Tgt Date 2000-2010	1.08%	5.60%	5.46%	4.71%	5.46%
SERS 2020 Retirement Fund	1.34%	5.97%	6.16%	5.14%	5.86%
BlackRock 2020 Index	1.35%	6.02%	6.14%	5.10%	5.81%
Callan Target Date 2020	1.06%	5.11%	6.32%	5.26%	6.46%
SERS 2025 Retirement Fund	1.12%	5.34%	6.96%	5.64%	6.55%
BlackRock 2025 Index	1.12%	5.32%	6.90%	5.58%	6.49%
Callan Target Date 2025	0.99%	4.56%	7.04%	5.70%	7.22%
SERS 2030 Retirement Fund	0.91%	4.71%	7.66%	6.08%	7.15%
BlackRock 2030 Index	0.90%	4.68%	7.56%	5.98%	7.06%
Callan Target Date 2030	0.80%	3.95%	7.83%	6.21%	7.85%
SERS 2035 Retirement Fund	0.71%	4.12%	8.32%	6.48%	7.71%
BlackRock 2035 Index	0.70%	4.05%	8.19%	6.36%	7.59%
Callan Target Date 2035	0.62%	3.23%	8.32%	6.57%	8.25%
SERS 2040 Retirement Fund	0.53%	3.55%	8.87%	6.81%	8.17%
BlackRock 2040 Index	0.54%	3.50%	8.73%	6.67%	8.05%
Callan Target Date 2040	0.43%	2.53%	8.71%	6.72%	8.66%
SERS 2045 Retirement Fund	0.40%	3.11%	9.19%	7.00%	8.54%
BlackRock 2045 Index	0.39%	2.99%	9.00%	6.84%	8.40%
Callan Target Date 2045	0.30%	2.11%	8.97%	6.91%	8.82%
SERS 2050 Retirement Fund	0.34%	2.94%	9.29%	7.07%	8.78%
BlackRock 2050 Index	0.34%	2.80%	9.10%	6.90%	8.64%
Callan Target Date 2050	0.28%	1.99%	9.06%	6.96%	8.95%
SERS 2055 Retirement Fund	0.34%	2.94%	9.28%	7.07%	8.95%
BlackRock 2055 Index	0.34%	2.81%	9.10%	6.91%	8.82%
Callan Target Date 2055	0.25%	1.94%	9.12%	7.05%	8.91%
SERS 2060 Retirement Fund	0.33%	2.91%	9.26%	-	-
BlackRock 2060 Index	0.34%	2.81%	9.10%	-	-
Callan Target Date 2060	0.28%	1.98%	9.24%	7.19%	9.42%

Note: SERS Funds are the top fund in each grouping followed by each fund's respective benchmark and median peer.

Cumulative Performance - Net of Fees

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years
Net Performance			
Target Date Funds			
SERS Post Retirement Fund	5.99%	-	-
BlackRock Post Retirement Index	5.99%	5.50%	5.59%
Callan Tgt Date 2000-2010	6.29%	4.92%	-
SERS 2020 Retirement Fund	6.79%	-	-
BlackRock 2020 Index	6.78%	5.89%	5.10%
Callan Target Date 2020	7.37%	5.56%	4.71%
SERS 2025 Retirement Fund	7.37%	-	-
BlackRock 2025 Index	7.33%	6.17%	5.16%
Callan Target Date 2025	8.05%	6.49%	-
SERS 2030 Retirement Fund	7.86%	-	-
BlackRock 2030 Index	7.80%	6.41%	5.18%
Callan Target Date 2030	8.50%	6.06%	4.84%
SERS 2035 Retirement Fund	8.32%	-	-
BlackRock 2035 Index	8.23%	6.61%	5.19%
Callan Target Date 2035	8.89%	6.94%	-
SERS 2040 Retirement Fund	8.69%	-	-
BlackRock 2040 Index	8.60%	6.77%	5.16%
Callan Target Date 2040	9.09%	6.42%	4.35%
SERS 2045 Retirement Fund	8.98%	-	-
BlackRock 2045 Index	8.88%	6.89%	5.12%
Callan Target Date 2045	9.10%	7.48%	-
SERS 2050 Retirement Fund	9.20%	-	-
BlackRock 2050 Index	9.10%	7.17%	6.27%
Callan Target Date 2050	9.21%	-	-

Note: SERS Funds are the top fund in each grouping followed by each fund's respective benchmark and median peer. Funds not listed do not have longer performance history.

Cumulative Performance - Net of Fees

As of September 30, 2019

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years
Net Performance					
Domestic Equity					
SERS U.S. Large Company Index Fund	1.69%	4.26%	13.39%	10.84%	13.26%
S&P 500 Index	1.70%	4.25%	13.39%	10.84%	13.26%
Callan Lg Cap Broad MF	0.76%	2.27%	12.67%	9.74%	12.54%
SERS U.S. All Company Index Fund	0.78%	2.52%	12.64%	10.34%	12.91%
Russell 3000 Index	1.16%	2.92%	12.83%	10.44%	13.00%
Callan Multi Cap Brd MF	0.50%	0.96%	11.08%	8.64%	11.79%
SERS U.S. SMID Company Idx Fund	(1.52%)	(3.63%)	10.07%	8.56%	11.71%
Dow Jones US Completion	(1.64%)	(3.95%)	9.84%	8.36%	11.50%
Callan SMID Broad MFs	(1.77%)	(4.42%)	10.81%	8.51%	10.97%
International Equity					
SERS Global Non-U.S. Index Fund	(1.77%)	(0.89%)	6.53%	3.14%	5.20%
MSCI ACWI ex US	(1.80%)	(1.23%)	6.33%	2.90%	5.01%
Callan Non US Equity MFs	(1.29%)	(2.22%)	5.94%	3.16%	5.85%
Domestic Fixed Income					
SERS Short Term Investment Fund	0.59%	2.43%	1.73%	1.16%	0.88%
3-month Treasury Bill	0.56%	2.39%	1.54%	0.98%	0.72%
Callan Cash Database(1)	0.64%	2.79%	1.89%	1.41%	1.16%
SERS U.S. Short Term Bond Idx Fund	0.68%	4.59%	-	-	-
Blmbg Gov/Cred 1-3 Yr	0.69%	4.64%	1.82%	1.59%	1.33%
Callan Short US Govt MFs	0.64%	4.19%	1.33%	1.31%	0.95%
SERS U.S. TIPS Index Fund	1.31%	7.08%	-	-	-
Blmbg US TIPS	1.35%	7.13%	2.21%	2.45%	1.06%
Callan TIPS MFs	1.10%	6.16%	2.14%	1.99%	0.84%
SERS U.S. Bond Index Fund	2.24%	10.27%	2.88%	3.32%	2.65%
Blmbg Aggregate	2.27%	10.30%	2.92%	3.38%	2.72%
Callan Core Bond MFs	2.25%	10.14%	3.12%	3.36%	2.73%

Note: SERS Funds are the top fund in each grouping followed by each fund's respective benchmark and median peer.

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

Cumulative Performance - Net of Fees

As of September 30, 2019

	Last 10 Years	Last 15 Years	Last 20 Years
Net Performance			
Domestic Equity			
SERS U.S. Large Company Index Fund	13.25%	9.04%	6.38%
S&P 500 Index	13.24%	9.01%	6.33%
Callan Lg Cap Broad MF	12.43%	8.83%	6.37%
Russell 3000 Index	13.08%	9.10%	6.72%
Callan Multi Cap Brd MF	11.69%	8.43%	7.12%
SERS U.S. SMID Company Idx Fund	12.51%	9.64%	8.38%
Dow Jones US Completion	12.31%	9.45%	8.06%
Callan SMID Broad MFs	12.13%	9.31%	8.88%
International Equity			
SERS Global Non-U.S. Index Fund	4.60%	-	-
MSCI ACWI ex US	4.46%	5.66%	-
Callan Non US Equity MFs	5.18%	5.65%	4.48%
Domestic Fixed Income			
SERS Short Term Investment Fund	0.69%	1.56%	-
3-month Treasury Bill	0.54%	1.39%	1.82%
Callan Cash Database(1)	1.02%	1.87%	2.36%
Blmbg Gov/Cred 1-3 Yr	1.52%	2.43%	3.19%
Callan Short US Govt MFs	1.34%	2.31%	3.13%
Blmbg US TIPS	3.46%	3.90%	5.47%
Callan TIPS MFs	3.17%	3.63%	4.67%
SERS U.S. Bond Index Fund	3.67%	4.14%	4.96%
Blmbg Aggregate	3.75%	4.21%	5.01%
Callan Core Bond MFs	4.01%	4.46%	5.07%

Note: SERS Funds are the top fund in each grouping followed by each fund's respective benchmark and median peer.

Funds not listed do not have longer performance history.

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

Calendar Year Performance - Net of Fees

As of September 30, 2019

	12/2018- 9/2019	2018	2017	2016	2015
Net Performance					
Target Date Funds					
SERS Post Retirement Fund	11.64%	(3.49%)	10.17%	6.09%	(1.14%)
BlackRock Post Retirement Index	11.64%	(3.48%)	10.10%	6.01%	(1.07%)
Callan Tgt Date 2000-2010	10.68%	(3.15%)	10.16%	5.79%	(0.48%)
SERS 2020 Retirement Fund	11.97%	(3.89%)	11.77%	6.64%	(1.27%)
BlackRock 2020 Index	11.96%	(3.88%)	11.67%	6.51%	(1.28%)
Callan Target Date 2020	11.93%	(4.29%)	12.61%	6.51%	(1.03%)
SERS 2025 Retirement Fund	13.13%	(4.88%)	13.90%	7.28%	(1.43%)
BlackRock 2025 Index	13.09%	(4.90%)	13.75%	7.10%	(1.45%)
Callan Target Date 2025	13.07%	(5.19%)	15.03%	7.08%	(1.19%)
SERS 2030 Retirement Fund	14.05%	(5.71%)	15.82%	7.87%	(1.61%)
BlackRock 2030 Index	14.00%	(5.76%)	15.64%	7.61%	(1.66%)
Callan Target Date 2030	13.95%	(6.12%)	16.81%	7.58%	(1.31%)
SERS 2035 Retirement Fund	14.94%	(6.50%)	17.68%	8.41%	(1.80%)
BlackRock 2035 Index	14.84%	(6.58%)	17.48%	8.08%	(1.86%)
Callan Target Date 2035	14.79%	(7.03%)	18.54%	8.20%	(1.46%)
SERS 2040 Retirement Fund	15.71%	(7.24%)	19.35%	8.86%	(2.00%)
BlackRock 2040 Index	15.63%	(7.33%)	19.09%	8.51%	(2.08%)
Callan Target Date 2040	15.30%	(7.89%)	19.84%	8.48%	(1.55%)
SERS 2045 Retirement Fund	16.27%	(7.85%)	20.44%	9.16%	(2.15%)
BlackRock 2045 Index	16.17%	(7.99%)	20.15%	8.77%	(2.22%)
Callan Target Date 2045	15.69%	(8.21%)	20.63%	8.63%	(1.58%)
SERS 2050 Retirement Fund	16.51%	(8.12%)	20.83%	9.24%	(2.20%)
BlackRock 2050 Index	16.41%	(8.26%)	20.55%	8.82%	(2.26%)
Callan Target Date 2050	15.76%	(8.44%)	20.74%	8.61%	(1.56%)
SERS 2055 Retirement Fund	16.55%	(8.15%)	20.81%	9.21%	(2.18%)
BlackRock 2055 Index	16.45%	(8.28%)	20.55%	8.82%	(2.26%)
Callan Target Date 2055	15.83%	(8.44%)	21.12%	8.65%	(1.69%)
SERS 2060 Retirement Fund	16.52%	(8.15%)	20.76%	9.23%	(2.15%)
BlackRock 2060 Index	16.45%	(8.28%)	20.55%	8.82%	(2.16%)
Callan Target Date 2060	15.81%	(8.35%)	21.14%	8.80%	(1.57%)

Note: SERS Funds are the top fund in each grouping followed by each fund's respective benchmark and median peer return.

Calendar Year Performance - Net of Fees

As of September 30, 2019

	12/2018- 9/2019	2018	2017	2016	2015
Net Performance					
Domestic Equity					
SERS U.S. Large Company Index Fund	20.55%	(4.40%)	21.83%	11.97%	1.39%
S&P 500 Index	20.55%	(4.38%)	21.83%	11.96%	1.38%
Callan Lg Cap Broad MF	19.76%	(4.54%)	23.56%	8.43%	1.50%
SERS U.S. All Company Index Fund	19.63%	(5.30%)	21.05%	12.69%	0.45%
Russell 3000 Index	20.09%	(5.24%)	21.13%	12.74%	0.48%
Callan Multi Cap Brd MF	19.21%	(6.82%)	20.75%	9.05%	(1.26%)
SERS U.S. SMID Company Idx Fund	17.76%	(9.34%)	18.18%	16.05%	(3.32%)
Dow Jones US Completion	17.54%	(9.57%)	18.12%	15.75%	(3.42%)
Callan SMID Broad MFs	18.99%	(8.69%)	17.14%	13.80%	(2.80%)
International Equity					
SERS Global Non-U.S. Index Fund	11.95%	(13.91%)	27.57%	5.00%	(5.63%)
MSCI ACWI ex US	11.56%	(14.20%)	27.19%	4.50%	(5.66%)
Callan Non US Equity MFs	13.22%	(15.04%)	26.90%	0.23%	0.02%
Domestic Fixed Income					
SERS Short Term Investment Fund	1.82%	2.09%	1.08%	0.59%	0.19%
3-month Treasury Bill	1.81%	1.87%	0.86%	0.33%	0.05%
Callan Cash Database(1)	2.19%	2.00%	1.19%	0.95%	0.40%
SERS U.S. Short Term Bond Idx Fund	3.39%	1.55%	-	-	-
Blmbg Gov/Cred 1-3 Yr	3.42%	1.60%	0.84%	1.28%	0.65%
Callan Short US Govt MFs	3.21%	1.15%	0.59%	0.64%	0.35%
SERS U.S. TIPS Index Fund	7.52%	(1.27%)	-	-	-
Blmbg US TIPS	7.58%	(1.26%)	3.01%	4.68%	(1.44%)
Callan TIPS MFs	7.40%	(1.53%)	3.12%	4.63%	(1.76%)
SERS U.S. Bond Index Fund	8.48%	0.00%	3.50%	2.56%	0.46%
Blmbg Aggregate	8.52%	0.01%	3.54%	2.65%	0.55%
Callan Core Bond MFs	8.80%	(0.35%)	3.71%	3.03%	0.10%

Note: SERS Funds are the top fund in each grouping followed by each fund's respective benchmark and median peer return.

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

Performance Summary & Expense Ratios as of September 30, 2019

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	10 Year Return	5 Year Return Consistency	5 Year Risk Quadrant	Expense Ratio
Gross of Fee Performance									
Target Date Funds									
SERS Post Retirement Fund Callan Tgt Date 2000-2010	1.4 14	6.5 20	5.7 45	4.8 43	5.1 68	6.1 68			0.08 100
BlackRock Post Retirement Index	1.4 17	6.4 21	5.6 46	4.8 46	5.0 73	6.0 70			
SERS 2020 Retirement Fund Callan Target Date 2020	1.4 19	6.1 19	6.2 56	5.2 53	5.9 66	6.9 61			0.08 97
BlackRock 2020 Index	1.3 19	6.0 19	6.1 63	5.1 64	5.8 68	6.8 63			
SERS 2025 Retirement Fund Callan Target Date 2025	1.1 25	5.4 19	7.0 48	5.7 48	6.6 70	7.5 72			0.08 96
BlackRock 2025 Index	1.1 30	5.3 23	6.9 61	5.6 64	6.5 72	7.3 75			
SERS 2030 Retirement Fund Callan Target Date 2030	0.9 32	4.8 16	7.7 56	6.2 55	7.2 70	7.9 65			0.08 97
BlackRock 2030 Index	0.9 33	4.7 21	7.6 65	6.0 66	7.1 75	7.8 72			
SERS 2035 Retirement Fund Callan Target Date 2035	0.7 35	4.2 14	8.4 44	6.6 51	7.8 72	8.4 69			0.08 97
BlackRock 2035 Index	0.7 40	4.1 16	8.2 58	6.4 64	7.6 78	8.2 72			
SERS 2040 Retirement Fund Callan Target Date 2040	0.5 37	3.6 13	9.0 38	6.9 41	8.3 69	8.8 60			0.08 98
BlackRock 2040 Index	0.5 37	3.5 17	8.7 49	6.7 53	8.1 77	8.6 64			
SERS 2045 Retirement Fund Callan Target Date 2045	0.4 36	3.2 17	9.3 35	7.1 38	8.6 64	9.1 52			0.08 97
BlackRock 2045 Index	0.4 39	3.0 22	9.0 47	6.8 54	8.4 75	8.9 62			
SERS 2050 Retirement Fund Callan Target Date 2050	0.4 36	3.0 19	9.4 34	7.2 40	8.9 53	9.3 44			0.08 97
BlackRock 2050 Index	0.3 38	2.8 25	9.1 47	6.9 53	8.6 73	9.1 58			
SERS 2055 Retirement Fund Callan Target Date 2055	0.3 35	3.0 16	9.4 36	7.2 47	9.0 43				0.08 97
BlackRock 2055 Index	0.3 36	2.8 24	9.1 53	6.9 53	8.8 53				

Returns:
■ above median
■ third quartile
■ fourth quartile

Return Consistency:
■ above median
■ third quartile
■ fourth quartile

Risk Quadrant:

 Return
 Risk

Expense Ratio:
■ below median
■ second quartile
■ first quartile

- The SERS 401(a) Plan per participant administrative fee of \$4.95 ranks in the bottom decile (Cheaper than 90% of peers) of comparably sized plans in Callan's database.

Note: For returns, each SERS Fund and corresponding benchmark return are shown with their respective peer group rankings. For returns, lower peer group rankings are more desirable (e.g. 25th percentile equates to top quartile performance). Expense Ratio: Higher peer group rankings are more desirable (e.g. 75th percentile equates to bottom quartile/cheapest fees).

Performance Summary & Expense Ratios as of September 30, 2019

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	10 Year Return	5 Year Return Consistency	5 Year Risk Quadrant	Expense Ratio
SERS 2060 Retirement Fund Callan Target Date 2060 BlackRock 2060 Index	0.3 36	3.0 15	9.3 44						0.08 96
Domestic Equity									
SERS U.S. Large Company Stock Index Fund Callan Lg Cap Broad MF S&P 500 Index	1.7 24	4.3 29	13.4 43	10.9 38	13.3 36	13.3 35			0.01 99
SERS U.S. All Company Index Fund Callan Multi Cap Brd MF Russell 3000 Index	0.8 43	2.5 37	12.7 34	10.4 27	12.9 28				0.03 99
U.S. Small/Mid Company Stock Index Fund Callan SMID Broad MFs Dow Jones US Completion	-1.5 49	-3.6 44	10.1 55	8.6 50	11.7 36	12.5 41			0.03 100
International Equity									
SERS Global Non-U.S. Index Fund Callan Non US Equity MFs MSCI ACWI ex US	-1.8 64	-0.8 35	6.6 40	3.2 49	5.3 70	4.7 62			0.06 100
Domestic Fixed Income									
SERS Short Term Investment Fund Callan Cash Database 3-month Treasury Bill	0.6 78	2.4 88	1.7 80	1.2 85	0.9 86	0.7 86			0.00 100
Comments: Callan Cash Database includes STIF, enhanced cash, and money market funds.									
SERS U.S. Short Term Bond Idx Fund Callan Short US Govt MFs Blmbg Gov/Cred 1-3 Yr	0.7 46	4.6 45							0.03 99
SERS U.S. TIPS Index Fund Callan TIPS MFs Blmbg US TIPS	1.3 30	7.1 18							0.03 99

Returns:
■ above median
■ third quartile
■ fourth quartile

Return Consistency:
■ above median
■ third quartile
■ fourth quartile

Risk Quadrant:

 Return
 Risk

Expense Ratio:
■ below median
■ second quartile
■ first quartile

- The SERS 401(a) Plan per participant administrative fee of \$4.95 ranks in the bottom decile (Cheaper than 90% of peers) of comparably sized plans in Callan's database.

Note: For returns, each SERS Fund and corresponding benchmark return are shown with their respective peer group rankings. For returns, lower peer group rankings are more desirable (e.g. 25th percentile equates to top quartile performance). Expense Ratio: Higher peer group rankings are more desirable (e.g. 75th percentile equates to bottom quartile/cheapest fees).

Performance Summary & Expense Ratios

As of September 30, 2019

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	10 Year Return	5 Year Return Consistency	5 Year Risk Quadrant	Expense Ratio
SERS U.S. Bond Index Fund Callan Core Bond MFs	2.3 49	10.3 43	2.9 70	3.3 52	2.7 58	3.7 86			0.03 96
BImbg Aggregate	2.3 44	10.3 43	2.9 70	3.4 47	2.7 51	3.7 83			

Returns:
 above median
 third quartile
 fourth quartile

Return Consistency:
 above median
 third quartile
 fourth quartile

Risk Quadrant:
 above median
 third quartile
 fourth quartile
 Return
 Risk

Expense Ratio:
 below median
 second quartile
 first quartile

- The SERS 401(a) Plan per participant administrative fee of \$4.95 ranks in the bottom decile (Cheaper than 90% of peers) of comparably sized plans in Callan's database.

Note: For returns, each SERS Fund and corresponding benchmark return are shown with their respective peer group rankings. For returns, lower peer group rankings are more desirable (e.g. 25th percentile equates to top quartile performance). Expense Ratio: Higher peer group rankings are more desirable (e.g. 75th percentile equates to bottom quartile/cheapest fees).

401(a) Plan Investment Structure

Lineup Mapped to Callan's Clean Sheet



Defined Contribution and Deferred Compensation Projects for 2020

- Plan Administration and Investment Management Fee Evaluation Study
- Target Date Fund Suitability Analysis
- Investment Policy Statement Review

Callan

Appendix – 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 in the current year is reduced by how much you saveYou will pay taxes on both the original contribution and the earnings when you take the money outYou can save up to \$19,000, between pre-tax and Roth, or up to \$25,000 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 yearYou 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 yearsYou can save up to \$19,000, between pre-tax and Roth, or up to \$25,000 if you are over 50	<ul style="list-style-type: none">Your deferral won't lower your income for tax purposes in the current yearYou will be responsible for taxes on the earnings when you take the money out or convert it to a Roth accountYou can save up to \$56,000, MINUS your pre-tax and Roth deferrals, matching and profit-sharing contributions

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

