

June 13, 2019



**Pennsylvania State Employees'  
Retirement System – 457(b) Plan**

First Quarter 2019

Executive Summary

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**Thomas H. Shingler**  
Senior Vice President

**Bud Pellecchia**  
Senior Vice President

**Britton M. Murdoch**  
Vice President

Callan

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**Market Environment**

## Total Rebound in Q1 After a Severe Downtraft in Q4 2018

- The Fed raised rates four times in 2018, but placed further hikes on pause in 2019
- Market has since generated the strongest first quarter since 2009
- Wage pressures are building as the unemployment rate stays below 4%
- CPI fell back below 2% year-over-year in December and remained there through the first quarter
- Oil prices plummeted from \$84 to \$52 in Q4, seemingly altering the outlook for inflation. Prices rebounded to \$70+ in Q1, thanks to supply risks from Russia and Iran

### Returns for Periods ended March 31, 2019

	1 Quarter	1 Year	5 Years	10 Years	25 Years
<b>U.S. Equity</b>					
Russell 3000	14.04	8.77	10.36	16.00	9.78
S&P 500	13.65	9.50	10.91	15.92	9.80
Russell 2000	14.58	2.05	7.05	15.36	8.99
<b>Non-U.S. Equity</b>					
MSCI World ex USA	10.45	-3.14	2.20	8.82	5.04
MSCI Emerging Markets	9.93	-7.40	3.68	8.95	--
MSCI ACWI ex USA Small Cap	10.26	-9.48	3.26	11.86	--
<b>Fixed Income</b>					
Bloomberg Barclays Aggregate	2.94	4.48	2.74	3.77	5.33
3-Month T-Bill	0.60	2.12	0.74	0.43	2.54
Bloomberg Barclays Long Gov/Credit	6.45	5.24	5.35	7.23	7.34
Bloomberg Barclays Global Agg ex-US	1.52	-4.13	-0.26	2.46	4.40
<b>Real Estate</b>					
NCREIF Property	1.80	6.83	9.13	8.50	9.36
FTSE NAREIT Equity	16.33	20.86	9.12	18.28	10.27
<b>Alternatives</b>					
CS Hedge Fund	3.99	0.20	2.26	5.42	7.72
Cambridge Private Equity*	-0.53	10.61	11.94	13.76	15.20
Bloomberg Commodity	6.32	-5.25	-8.92	-2.56	2.15
Gold Spot Price	1.34	-2.17	0.23	3.45	4.88
<b>Inflation - CPI-U</b>	<b>1.18</b>	<b>1.86</b>	<b>1.47</b>	<b>1.80</b>	<b>2.21</b>

\*Cambridge PE data are available through December 31, 2018.

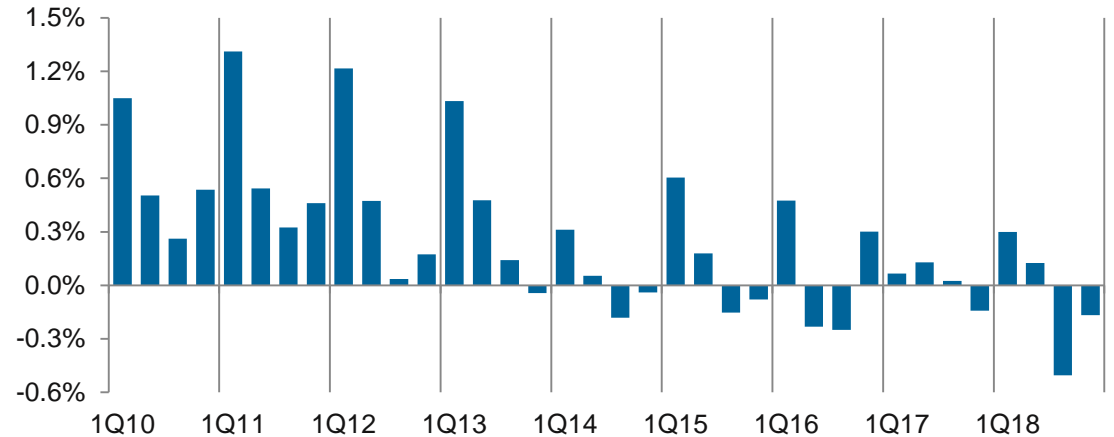
Source: Callan

# Defined Contribution / Deferred Compensation Trends

Will net outflows become the norm?

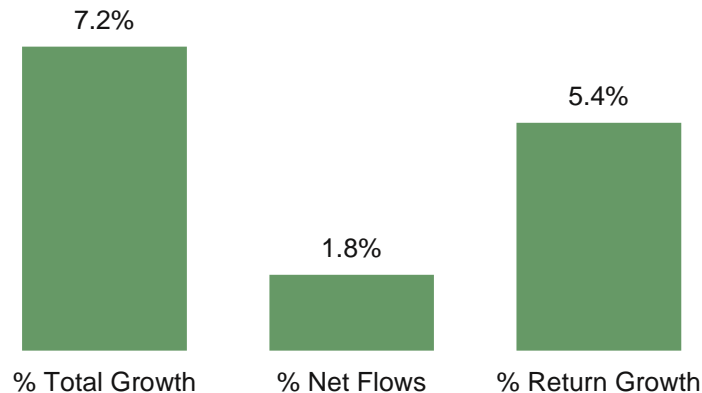
- Since the 2006 inception of the DC Index, inflows buoyed overall growth.
- Over past several years, outflows have increased; unclear if this is the new norm.
- Implications of continued outflows for DC system could be stark:
  - If plans shrink, costs may increase as scale erodes.
  - As more and more Baby Boomers retire, net flows will serve as a metric from which we judge how effective plans are at retaining retiree assets.

Net Quarterly Flows



Callan DC Index \$ Growth Sources

Annualized since inception (01/01/2006)



Source: Callan DC Index

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# Defined Contribution / Deferred Compensation Trends

## Impact of legislation

### Legislation could shake up industry

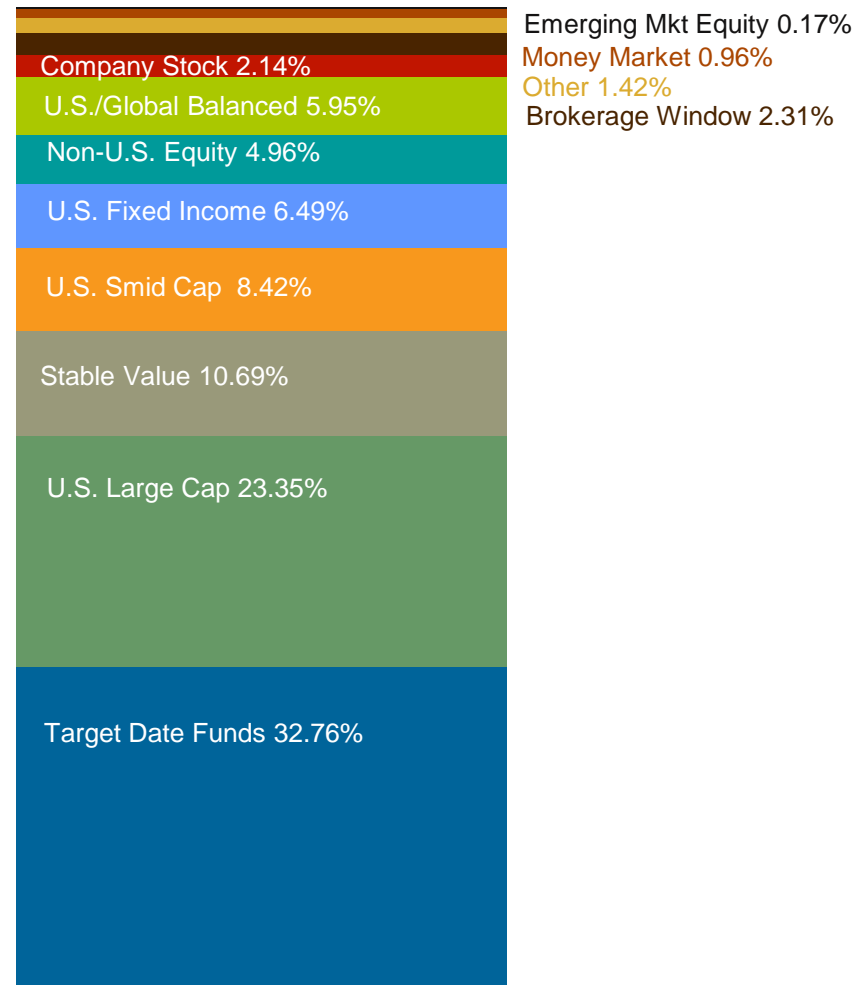
- Bills are making their way through Senate and Congress which, if passed, would alter retirement landscape.
- Retirement Enhancement and Savings Act of 2019 (Senate) and Setting Every Community Up for Retirement Enhancement Act of 2019 (Congress) strive for similar outcomes:
  - Further promotion of annuities within DC plans through an annuity safe harbor
  - Enhancing access to DC plans through easing rules around creation and eligibility for open multi-employer plans (MEP)
  - Loosening rules on required minimum distributions
- Although open MEPs are aimed at smaller employers, nothing precluding larger employers from joining.
- Given risks faced by plan sponsors, it's conceivable that open MEPs attract a larger swath of assets.

# Callan DC Index™ Net Cash Flow Analysis and Asset Allocation

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

Asset Class	4Q18
Alternatives / Other	-2.08%
Brokerage Window	10.93%
Company Stock	-7.33%
Emerging Market Equity	0.73%
Global Equity	-1.00%
High Yield	-0.01%
Money Market	11.27%
Non-U.S. Equity	-5.60%
Non-U.S. / Global Fixed Income	0.00%
Real Estate	-0.30%
Real Return / TIPS	2.11%
Specialty Equity / Sector	-0.03%
Stable Value	65.46%
Target Date Funds	9.50%
U.S. Fixed Income	-8.78%
U.S. Large Cap	-45.64%
U.S. Smid Cap	-21.49%
U.S. / Global Balanced	-7.36%
<b>Total Turnover*</b>	<b>0.41%</b>

## Asset Allocation as of December 31, 2018



\* 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

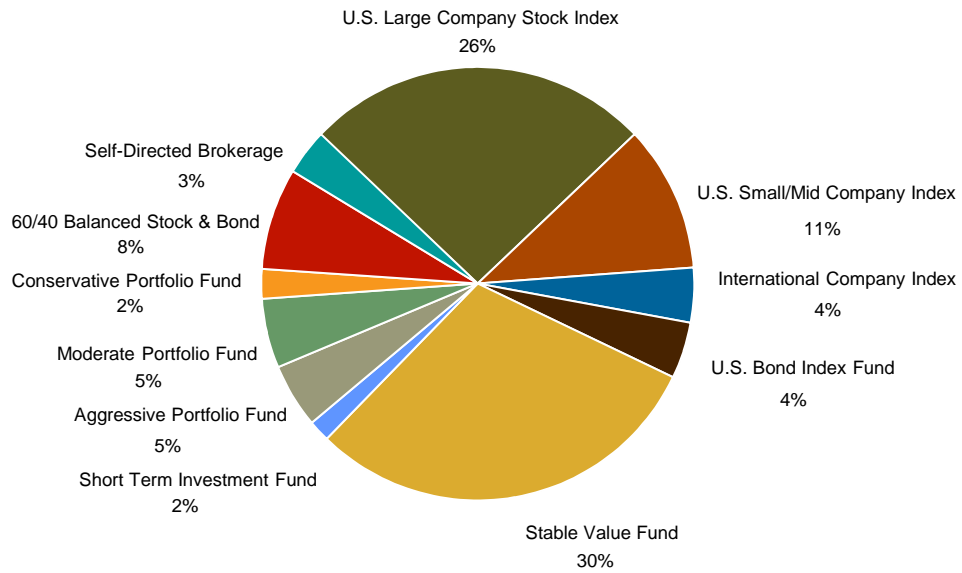
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**PA SERS 457(b) Plan Performance Review**

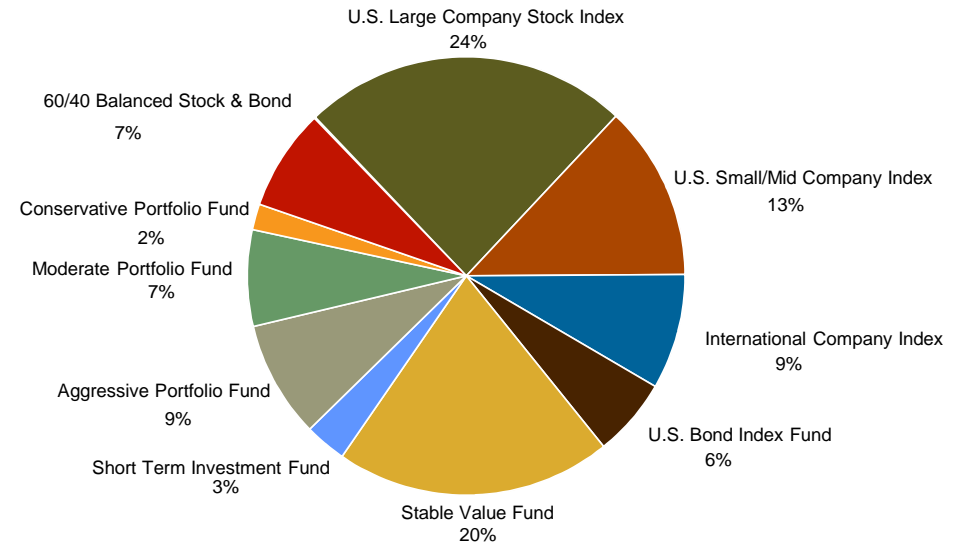
# 457(b) Plan Asset Allocation & Contributions

As of March 31, 2019

## Asset Allocation



## Contributions





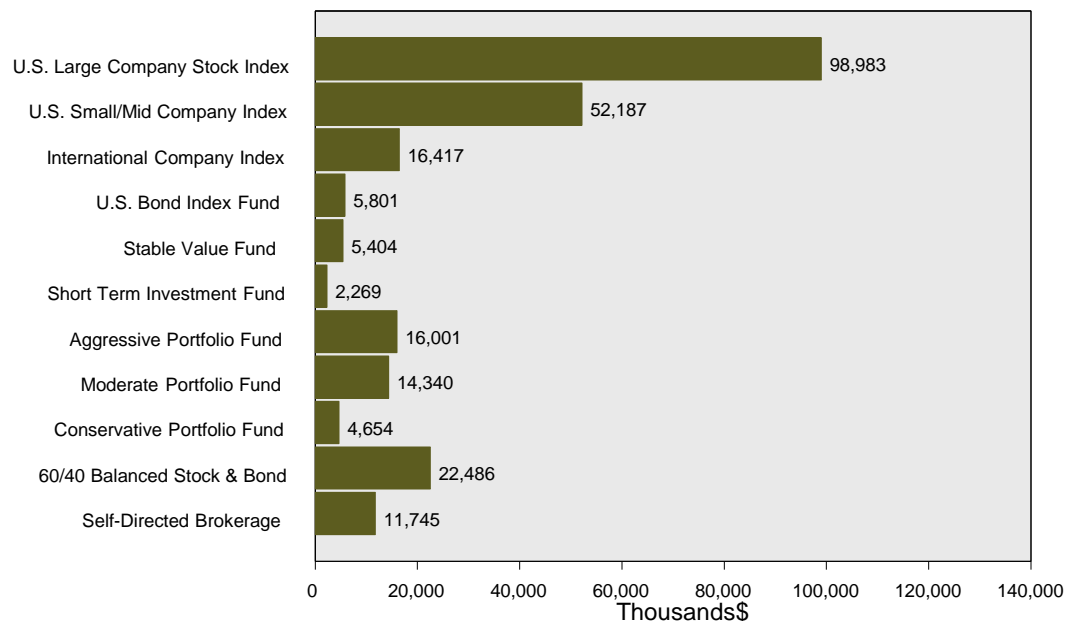
# Asset Allocation and Changes in Market Values

As of March 31, 2019

	March 31, 2019		Net New Inv. \$(000)	Inv. Return \$(000)	December 31, 2018	
	Market Value \$(000)	Weight			Market Value \$(000)	Weight
<b>Risk-Based Funds</b>						
60/40 Balanced Stock & Bond Fund	271,156	7.57%	(607)	23,093	248,670	7.46%
Conservative Portfolio Fund	77,280	2.16%	615	4,039	72,626	2.18%
Moderate Portfolio Fund	184,775	5.16%	(1,056)	15,396	170,435	5.11%
Aggressive Portfolio Fund	172,263	4.81%	(1,299)	17,301	156,262	4.69%
<b>Domestic Equity</b>						
U.S. Large Company Stock Index	928,176	25.90%	(13,601)	112,584	829,193	24.87%
U.S. Small/Mid Company Stock Index	390,014	10.88%	(1,938)	54,125	337,827	10.13%
<b>International Equity</b>						
International Company Stock Fund	147,841	4.13%	2,878	13,539	131,424	3.94%
<b>Domestic Fixed Income</b>						
Short Term Investment Fund	58,184	1.62%	1,953	316	55,914	1.68%
Stable Value Fund	1,082,208	30.20%	(512)	5,915	1,076,804	32.30%
U.S. Bond Index Fund	150,316	4.19%	1,649	4,152	144,515	4.34%
Self-Directed Brokerage Account	121,581	3.39%	(974)	12,718	109,837	3.29%
<b>Total Fund</b>	<b>\$3,583,793</b>	<b>100.0%</b>	<b>\$(12,891)</b>	<b>\$263,179</b>	<b>\$3,333,506</b>	<b>100.0%</b>

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:

1. Investment returns;
2. Participant contributions, company match, distributions, withdrawals; and
3. Transfers between funds by participants.



# Cumulative Performance - Net of Fees

As of March 31, 2019

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years
<b>Net Performance</b>					
<b>Risk-Based Funds</b>					
60/40 Balanced Stock & Bond Fund	9.37%	8.09%	9.03%	7.76%	8.75%
60% S&P 500/ 40% Aggregate Bond	9.37%	8.01%	9.01%	7.75%	8.77%
Callan Dom Balanced MFs	9.24%	5.02%	8.30%	6.32%	8.12%
Conservative Portfolio Fund	5.54%	4.75%	4.99%	4.14%	4.68%
Conservative Portfolio Custom Index(3)	5.51%	4.65%	4.90%	4.07%	4.64%
Callan MA Tgt All Cons MF	5.90%	3.24%	5.04%	3.59%	4.75%
Moderate Portfolio Fund	9.09%	5.68%	8.19%	6.30%	7.65%
Moderate Portfolio Custom Index(2)	9.03%	5.57%	8.08%	6.22%	7.61%
Callan MA Tgt All Mod MF	8.36%	3.55%	7.17%	4.83%	6.41%
Aggressive Portfolio Fund	11.14%	5.71%	10.17%	7.40%	9.33%
Aggressive Portfolio Custom Index(1)	11.05%	5.59%	10.03%	7.29%	9.25%
Callan MA Tgt All AgGr MF	12.31%	2.25%	10.08%	6.35%	8.77%
<b>Domestic Equity</b>					
U.S. Large Company Stock Idx Fund	13.66%	9.51%	13.53%	10.92%	12.86%
S&P 500 Index	13.65%	9.50%	13.51%	10.91%	12.85%
Callan Lg Cap Broad MF	13.74%	8.42%	13.22%	9.88%	12.11%
U.S. Small/Mid Company Stock Idx Fd	16.04%	5.05%	13.34%	7.90%	11.53%
Dow Jones US Completion	15.99%	4.76%	13.12%	7.71%	11.33%
Callan SMID Broad MFs	16.11%	3.22%	11.59%	7.09%	10.90%
<b>International Equity</b>					
International Company Stock Fund	10.33%	(3.57%)	7.76%	2.66%	5.93%
MSCI EAFE	9.98%	(3.71%)	7.27%	2.33%	5.63%
Callan Intl Eq Dev Mkt MF	10.78%	(5.91%)	7.28%	2.26%	5.38%
<b>Domestic Fixed Income</b>					
Short Term Investment Fund	0.61%	2.31%	1.42%	0.93%	0.72%
3-month Treasury Bill	0.60%	2.12%	1.19%	0.74%	0.56%
Callan Cash Database	0.79%	2.49%	1.54%	1.08%	1.00%
Stable Value Fund	0.61%	2.62%	2.37%	2.45%	2.60%
3-month Treasury Bill	0.60%	2.12%	1.19%	0.74%	0.56%
Callan Stable Value	0.62%	2.36%	2.07%	1.91%	1.93%
U.S. Bond Index Fund	2.94%	4.49%	2.02%	2.73%	2.46%
Blmbg Aggregate	2.94%	4.48%	2.03%	2.74%	2.48%
Callan Core Bond MFs	3.23%	4.38%	2.33%	2.69%	2.61%

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

(1) Consists of: 48% S&P 500, 20% MSCI EAFE, 20% Bloomberg Agg., and 12% Dow Jones U.S. Market Completion Index

(2) Consists of: 40% Bloomberg Agg., 36% S&P 500, 15% MSCI EAFE, and 9% Dow Jones U.S. Market Completion Index

(3) Consists of: 50% Bloomberg Agg., 20% 3 Month T-Bill, 17% S&P 500, 8% MSCI EAFE, and 5% Dow Jones U.S. Mkt Completion

# Calendar Year Performance - Net of Fees

As of March 31, 2019

	12/2018- 3/2019	2018	2017	2016	2015
<b>Net Performance</b>					
<b>Risk-Based Funds</b>					
60/40 Balanced Stock & Bond Fund	9.37%	(2.19%)	14.25%	8.16%	1.20%
60% S&P 500/ 40% Aggregate Bond	9.37%	(2.26%)	14.26%	8.21%	1.20%
Callan Dom Balanced MFs	9.24%	(4.56%)	14.32%	7.30%	(0.54%)
Conservative Portfolio Fund	5.54%	(1.58%)	8.37%	4.35%	0.48%
Conservative Portfolio Custom Index(3)	5.51%	(1.72%)	8.31%	4.28%	0.44%
Callan MA Tgt All Cons MF	5.90%	(3.34%)	8.82%	5.48%	(1.12%)
Moderate Portfolio Fund	9.09%	(4.07%)	14.46%	7.00%	0.55%
Moderate Portfolio Custom Index(2)	9.03%	(4.21%)	14.40%	6.92%	0.47%
Callan MA Tgt All Mod MF	8.36%	(5.06%)	13.20%	6.59%	(1.38%)
Aggressive Portfolio Fund	11.14%	(5.66%)	18.29%	8.49%	0.45%
Aggressive Portfolio Custom Index(1)	11.05%	(5.82%)	18.19%	8.33%	0.34%
Callan MA Tgt All AgGr MF	12.31%	(8.91%)	20.65%	7.67%	(1.42%)
<b>Domestic Equity</b>					
U.S. Large Company Stock Idx Fund	13.66%	(4.38%)	21.84%	11.98%	1.39%
S&P 500 Index	13.65%	(4.38%)	21.83%	11.96%	1.38%
Callan Lg Cap Broad MF	13.74%	(4.54%)	23.56%	8.43%	1.50%
U.S. Small/Mid Company Stock Idx Fd	16.04%	(9.34%)	18.19%	16.05%	(3.32%)
Dow Jones US Completion	15.99%	(9.57%)	18.12%	15.75%	(3.42%)
Callan SMID Broad MFs	16.11%	(8.69%)	17.14%	13.80%	(2.80%)
<b>International Equity</b>					
International Company Stock Fund	10.33%	(13.39%)	25.53%	1.71%	(0.43%)
MSCI EAFE	9.98%	(13.79%)	25.03%	1.00%	(0.81%)
Callan Intl Eq Dev Mkt MF	10.78%	(15.06%)	26.64%	0.39%	(0.73%)
<b>Domestic Fixed Income</b>					
Short Term Investment Fund	0.61%	2.09%	1.08%	0.59%	0.19%
3-month Treasury Bill	0.60%	1.87%	0.86%	0.33%	0.05%
Callan Cash Database	0.79%	2.00%	1.19%	0.95%	0.40%
Stable Value Fund	0.61%	2.61%	2.16%	2.31%	2.51%
3-month Treasury Bill	0.60%	1.87%	0.86%	0.33%	0.05%
Callan Stable Value	0.62%	2.21%	1.97%	1.89%	1.77%
U.S. Bond Index Fund	2.94%	0.01%	3.54%	2.62%	0.53%
Blmbg Aggregate	2.94%	0.01%	3.54%	2.65%	0.55%
Callan Core Bond MFs	3.23%	(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.

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(3) Consists of: 50% Bloomberg Agg., 20% 3 Month T-Bill, 17% S&P 500, 8% MSCI EAFE, and 5% Dow Jones U.S. Mkt Completion

# Performance Summary & Expense Ratios

As of March 31, 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
<b>Gross of Fee Performance</b>									
<b>Risk-Based Funds</b>									
<b>60/40 Balanced Stock &amp; Bond Fund</b> Callan Dom Balanced MFs 60% S&P 500/ 40% Aggregate Bond	9.4 47	8.1 13	9.0 31	7.8 8	8.8 24	11.2 28			0.01 98
<b>Conservative Portfolio Fund</b> Callan MA Tgt All Cons MF Conservative Portfolio Custom Index	5.5 69	4.8 14	5.0 52	4.2 28	4.7 54	6.4 68			0.01 100
<b>Moderate Portfolio Fund</b> Callan MA Tgt All Mod MF Moderate Portfolio Custom Index	9.1 29	5.7 21	8.2 19	6.3 12	7.7 17	10.4 20			0.02 100
<b>Aggressive Portfolio Fund</b> Callan MA Tgt All AgGr MF Aggressive Portfolio Custom Index	11.1 84	5.7 6	10.2 46	7.4 20	9.3 23	12.5 43			0.02 100
<b>Domestic Equity</b>									
<b>U.S. Large Company Stock Index</b> Callan Lg Cap Broad MF S&P 500 Index	13.7 51	9.5 41	13.5 44	10.9 41	12.9 34	16.0 32			0.01 99
<b>U.S. Small/Mid Company Stock Index</b> Callan SMID Broad MFs Dow Jones US Completion	16.0 51	5.1 47	13.4 44	7.9 42	11.6 32	16.6 30			0.02 100
<b>International Equity</b>									
<b>International Company Stock Fund</b> Callan Intl Eq Dev Mkt MF MSCI EAFE	10.3 61	-3.6 26	7.8 34	2.7 39	6.0 32	9.3 51			0.02 99
<b>Domestic Fixed Income</b>									
<b>Short Term Investment Fund</b> Callan Cash Database 3-month Treasury Bill	0.6 93	2.3 75	1.4 76	0.9 81	0.7 82	0.6 84			0.00 100

Returns:  
■ above median  
■ third quartile  
■ fourth quartile

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

Risk Quadrant:  


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

- The SERS 457(b) Plan per participant administrative fee of \$2 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 March 31, 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
<b>Stable Value Fund</b> Callan Stable Value	0.7 2	2.7 1	2.4 1	2.5 1	2.6 1	3.0 1			
3-month Treasury Bill	0.6 59	2.1 89	1.2 98	0.7 100	0.6 100	0.4 100			
<b>U.S. Bond Index Fund</b> Callan Core Bond MFs	2.9 72	4.5 42	2.0 84	2.8 37	2.5 74	3.8 90			0.02 96
Blmbg Aggregate	2.9 71	4.5 44	2.0 85	2.7 38	2.5 74	3.8 91			

Returns:  
■ above median  
■ third quartile  
■ fourth quartile

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

Risk Quadrant:  


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

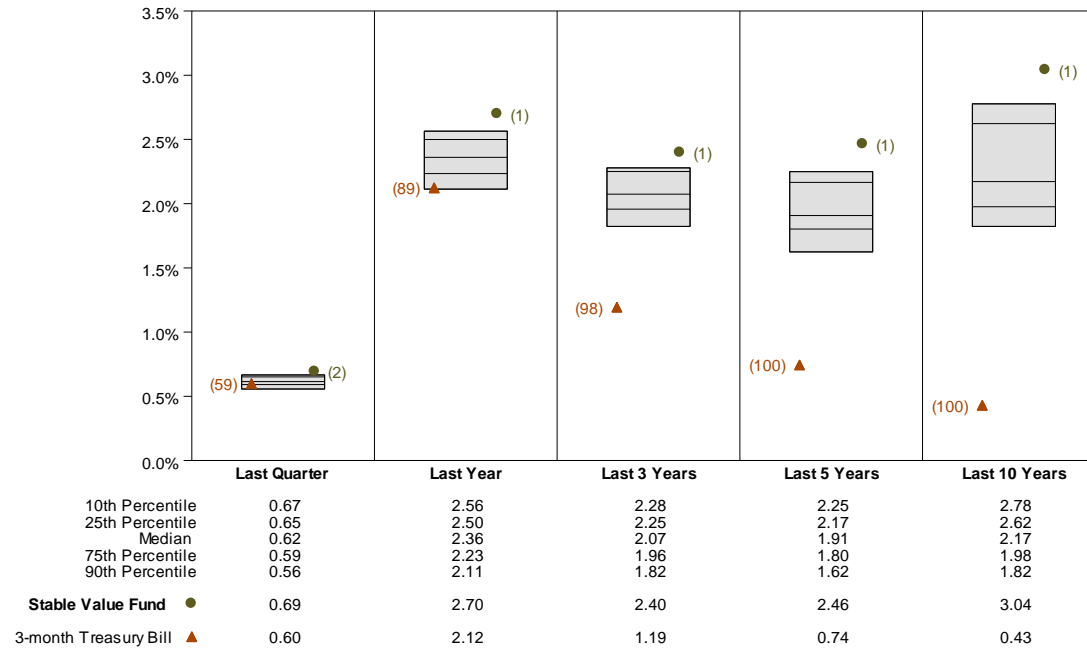
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Note: For returns, each SERS Fund and corresponding benchmark return are shown with their respective peer group rankings. For returns, lower peer group rankings are more desirable (e.g. 25th percentile equates to top quartile performance). Expense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

# Stable Value Fund

As of March 31, 2019

Performance vs Callan Stable Value (Gross)



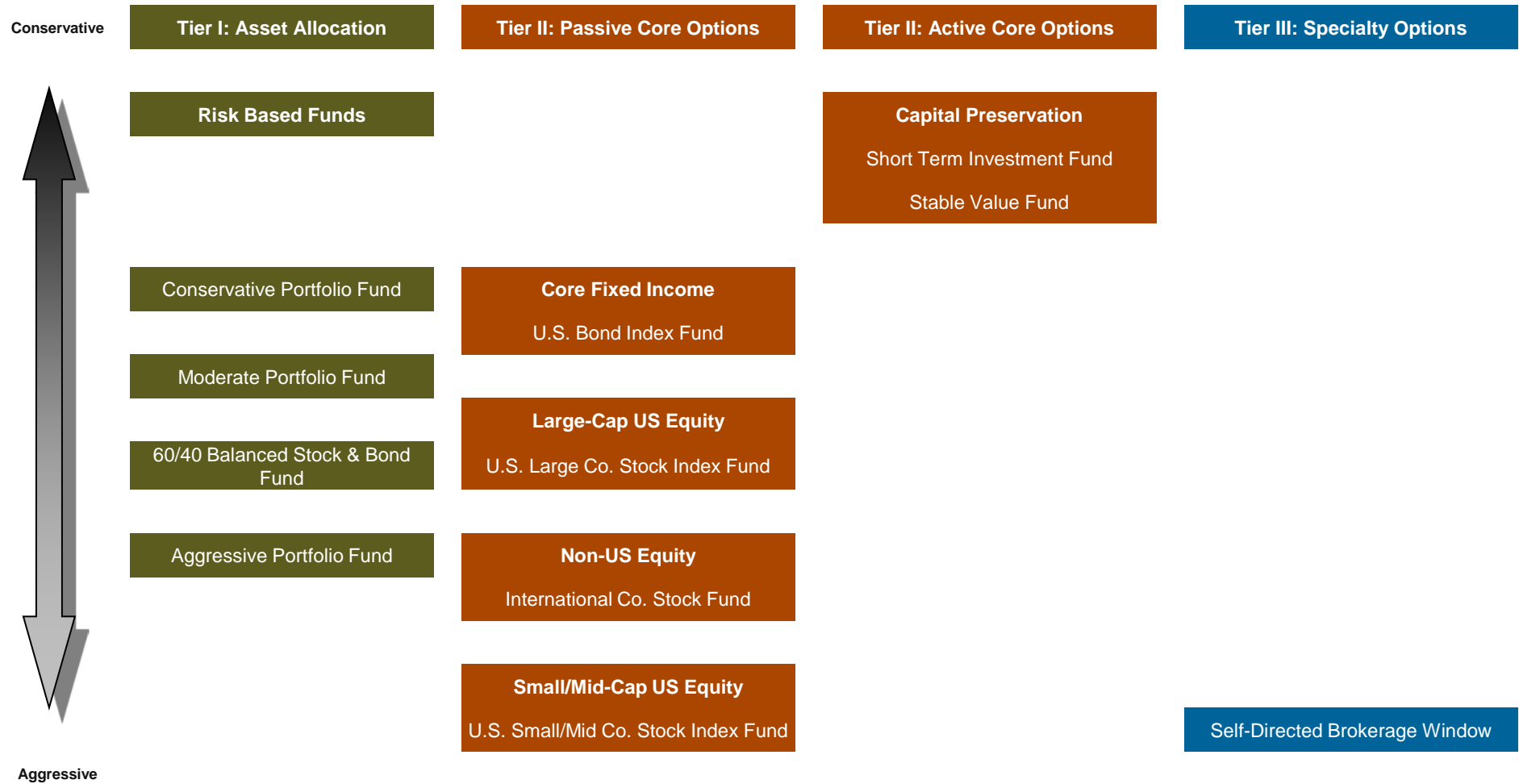
## Wrap Provider Exposure\*

Contract Issuer	Portfolio	Average Fee	Moody's Rating	S&P Rating	Fitch Rating
Nationwide Life Insurance	20.25%	0.18%	A1	A+	NR
Transamerica	20.14%	0.18%	A1	AA-	A+
Prudential Insurance Co.	15.20%	0.18%	A1	AA-	AA-
RGA	15.19%	0.18%	A1	AA-	A
Pacific Life Insurance Co.	12.66%	0.18%	A1	AA-	A+
State Street Bank	12.65%	0.18%	Aa3	AA-	AA+
	96.10%	0.17%			

\*Source: Invesco

# 457(b) Plan Investment Structure

## Lineup Mapped to Callan's Clean Sheet



Callan

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**Appendix – Callan Update**



# Published Research Highlights from 1Q19

## Callan's 2019–2028 Capital Market Projections



## 2019 DC Trends Survey



## The Callan Periodic Table Collection: Year-End 2018

Large Funds	Real Estate Funds	Non-U.S.
2.13%	13.95%	2.7%
High Yield	Large Cap Equity	U.S.
2.45%	1.38%	2.5%
2014: 0.76%	2015: 0.73%	2016:
Equivalent	U.S. Fixed	Non-U.S.
0.04%	0.55%	1.4%
Emerging Markets	Cash Equivalent	Hedge
2.19%	0.05%	1.2%
U.S. Fixed	Hedge Funds	Cash E
0.00%	0.71%	0.0%

## Two Questions to Help DC Plans Save on Litigation Costs



## Popular Blog Posts

**How DTS Helps Us Evaluate Bonds**

Kevin Machiz

**Securities Lending 101**

Kyle Fekete and Mark Kinoshita

**A Look at the New Communication Services Sector**

Irina Sushch

## 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

### 2019 June Regional Workshops

- Atlanta, June 4, 2019
- San Francisco, June 5, 2019

### 2019 October Regional Workshops

- Denver, October 22, 2019
- Chicago, October 24, 2019

### “Callan College”—Ongoing fiduciary education

#### Introduction to Investments sessions

- San Francisco, July 16–17, 2019
- Chicago, October 22–23, 2019
- Atlanta, TBD

#### Alternative Investments session

- Chicago, October TBD

### Upcoming Webinar:

- Cobbler’s Shoes Webinar, June 18, 2019, 11am PST

**Webinars: On-Demand now available at**  
<https://www.callan.com/ondemandwebinar/>

### Our library of pre-recorded webinars on specific investment-related topics, such as:

- ESG Adoption and Implementation Trends
- Infrastructure: Real Perspectives on an Evolving Asset Class
- Investigating Private Equity Implementation

**“Research is the foundation of all we do at Callan, and sharing our best thinking with the investment community is our way of helping to foster dialogue to raise the bar across the industry.”**

— *Greg Allen, CEO, Chief Research Officer*



# Callan Updates

Firm updates by the numbers, as of March 31, 2019

**Total Associates: 191**

## Ownership

- 100% employees
- Broadly distributed across more than 95 shareholders

## Leadership Changes

- No executive additions or departures
- Added Pete Keliuotis, head of Alternatives Consulting
- Executive Chairman Ron Peyton completes his 45th year at Callan

**Total General and Fund Sponsor Consultants: more than 45**

**Total Specialty and Research Consultants: more than 60**

**Total CFA/CAIA/FRMs: more than 50**

**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*

