



**OREGON  
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# Oregon Investment Council

**September 18, 2019**

**Rukaiyah Adams**  
Chair

**John Skjervem**  
Chief Investment Officer

**Tobias Read**  
State Treasurer



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# OREGON INVESTMENT COUNCIL

## Agenda

September 18, 2019  
9:00 AM

Oregon State Treasury  
Investment Division  
16290 SW Upper Boones Ferry Road  
Tigard, OR 97224

<u>Time</u>	<u>A. Action Items</u>	<u>Presenter</u>	<u>Tab</u>
9:00-9:05	1. Review & Approval of Minutes June 5, 2019	Rukaiyah Adams <i>OIC Chair</i>	1
9:05-9:10	2. Committee Reports and CIO Remarks	John Skjervem <i>Chief Investment Officer</i>	2
<u>B. Information Items</u>			
9:10-10:00	3. Financial Markets and Macro Economic Update <i>Head of Macroeconomic and Investment Research, Guggenheim Partners, LLC</i>	Brian Smedley	3
10:00-10:20	4. Q2 2019 Performance & Risk Report <i>OPERF</i>	Karl Cheng <i>Senior Investment Officer, Portfolio Risk &amp; Research</i> Janet Becker-Wold <i>Senior Vice President, Callan LLC</i>	4
10:20-10:30	----- BREAK -----		
10:30-11:15	5. Annual Cost & Implementation Analysis <i>OPERF</i>	David Randall <i>Director of Investment Operations</i> Mike Heale <i>Principal, CEM Benchmarking</i>	5

**11:15-12:30 6. Oregon Savings Growth Plan** **Wil Hiles** **6**  
*Annual Review and Update* *Investment Officer, Public Equity*  
**Matt O'Hara**  
*Managing Director, Co-Head of LifePath, BlackRock*  
**Uvan Tseng**  
*Senior Vice President, Callan LLC*

**12:30-12:35 7. Asset Allocations & NAV Updates** **John Skjervem** **7**  
a. Oregon Public Employees Retirement Fund  
b. SAIF Corporation  
c. Common School Fund  
d. Southern Oregon University Endowment Fund

**8. Calendar — Future Agenda Items** **8**

**12:35 9. Open Discussion** **Council Members**  
**Staff**  
**Consultants**

**C. Public Comment Invited**  
10 Minutes

**TAB 1 – REVIEW & APPROVAL OF MINUTES**

*June 5, 2019 Regular Meeting*



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# State of Oregon

## Office of the State Treasurer

16290 SW Upper Boones Ferry Road  
Tigard, Oregon 97224

### OREGON INVESTMENT COUNCIL

June 5, 2019

#### Meeting Minutes

Members Present: Rukaiyah Adams, John Russell, Tobias Read, Rex Kim, Patricia Moss and Kevin Olineck

Staff Present: John Skjervem, Darren Bond, Perrin Lim, David Randall, Deena Bothello, Karl Cheng, Austin Carmichael, Paul Koch, David Elott, May Fanning, Angela Schaffers, Tony Breault, Jen Plett, Debra Day, Krystal Mclean, Sam Spencer, Ben Mahon, Tom Lofton, Lisa Pettinati, Geoff Nolan, Garrett Cudahey, Amanda Kingsbury, Michael Mueller, Aliese Jacobsen, Eric Messer, Kristel Flores, Steve Kruth, Joe Hutchinson, Michael Viteri, Jennifer Peet, Tyler Bernstein, Ricardo Lopez, Tiffany ZhuGe, Andy Coutu, James Sinks, Dmitri Palmateer, Amy Wojcicki, Kristi Jenkins, Ahman Dirks, Robin Kaukonen, Sommer May, Andrey Voloshinov, Chris Ebersole, Scott Robertson, Ian Huculak, Mark Selfridge and Kim Olson

Consultants Present: Tom Martin (TorreyCove); Allan Emkin, Christy Fields and Brandon Ross (Meketa Investment Group, Inc.); Janet Becker-Wold and Jim Callan (Callan LLC); Tom Marin (TorreyCove Capital Partners)

Legal Counsel Present: Steven Marlowe, Department of Justice

The June 5<sup>th</sup>, 2019 OIC meeting was called to order at 9:01 am by Rukaiyah Adams, OIC Chair.

#### I. **9:01 am Review and Approval of Minutes**

**MOTION:** Chair Adams asked for approval of the April 24, 2019 OIC regular meeting minutes. Member Russell moved the motion at 9:02 am, and Mr. Kim seconded the motion which then passed by a 5/0 vote.

#### II. **9:03 am Committee Reports and CIO Remarks**

**Committee Reports:** Mr. Skjervem gave an update on the following committee actions taken since the April 24<sup>th</sup>, 2019 OIC meeting:

##### **Private Equity Committee**

April 26, 2019	Permira VII, L.P.	€225M
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##### **Alternatives Portfolio Committee**

May 22, 2019	Silver Creek Aggregate Reserves Fund I	\$150M
	Taurus Mining Finance Fund No. 2, L.P.	\$150M



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**Opportunity Portfolio Committee**

None

**Real Estate Committee**

None

Mr. Skjervem then provided opening remarks which included a preview of the Annual Alternatives Review, Annual Overlay Review, Q1 2019 Performance & Risk Report and the Annual Operations Update. He also introduced new staff member, Ian Huculak, Investment Analyst, Operations, and announced the transfer of Ricardo Lopez from Investment Analyst in Operations to a similar role in Real Estate. Finally, Mr. Skjervem recognized Deputy Treasurer Darren Bond and his upcoming June 30 retirement, thanking him for his guidance and leadership at Treasury as well as his 30 years of dedicated service to the State of Oregon.

**III. 9:13 am Alternatives Portfolio Review – OPERF Alternatives Portfolio**

Ben Mahon, Senior Investment Officer, Alternatives along with Tom Martin, TorreyCove Capital Partners and Jim Callahan, Callan LLC, presented the Alternatives Portfolio 2018 Annual Review and 2019 Plan. This presentation included a discussion of the Alternatives Portfolio's background and objectives, and a review of the portfolio's 2018 performance and investment activity. Messrs. Mahon, Martin and Callahan also provided the Council with an update on the portfolio's current positioning as well as staff's 2019 investment plan.

**10:13 am Overlay Review – OPERF**

Karl Cheng, Senior Investment Officer, Portfolio Risk & Research, introduced Russell Investment's Greg Nordquist, Director, Overlay Strategies, and Philip Saucier, Portfolio Manager, Overlay Strategies, who presented Russell's annual report on the OPERF overlay program and that firm's management thereof.

**IV. 10:47 am Q1 2019 Performance & Risk Report – OPERF**

Karl Cheng, and Janet Becker-Wold, Senior Vice President, Callan LLC, presented the quarterly OPERF investment performance and risk report for the calendar year and cumulative period ended March 31, 2019.

**V. 11:13 am OST Investment Operations Update – OPERF & Other OST-managed Accounts**

David Randall, Director of Investment Operations, Debra Day, Investment Reporting Manager and Kristi Jenkins, Investment Operations Manager, provided the Council with an update on Investment Operations that included an executive summary of their group's various activities and accomplishments and an updated OST Investment Division Org Chart.

**VI. 11:26 am Asset Allocation & NAV Updates**

Mr. Skjervem reviewed asset allocations and NAVs across OST-managed accounts for the period ended April 30, 2019.

**VII. 11:26 am Calendar – Future Agenda Items**

A calendar listing of future OIC meetings and scheduled agenda topics was included in the Council's meeting material.

**VIII. 11:35 am Joint PERS Board/OIC Discussion**

Following the conclusion of the regular OIC meeting, Chair Adams invited members of the Public Employees Retirement System (PERS) Board to participate in a roundtable discussion regarding the Oregon Public Employees Retirement Fund (OPERF). That discussion started with a presentation from PERS actuary Matt Larrabee of Milliman, during which Mr. Larrabee reviewed the PERS Board's objectives as well as the pension



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plan's operating assumptions and governance structure. He also provided a comparison of peer fund's return expectations and shared his firm's projections of Oregon's unfunded pension liability. Following Mr. Larabee's remarks, the Council and PERS Board members engaged in a spirited discussion of future investment returns and the inherent trade-offs embedded in various investment strategies and asset allocation approaches.

**12:48 pm Public Comments**

None.

Ms. Adams adjourned the meeting at 12:49 pm.

Respectfully submitted,  
*May Fanning*  
May Fanning  
Executive Support Specialist

DRAFT

TAB 2 – Committee Reports and CIO Remarks



September 18, 2019

Oregon Investment Council

# Opening Remarks

John D. Skjervem, Chief Investment Officer



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## Macro Overview

- Negative interest rates

## Q2 2019 Performance & Risk Report

- Decidedly positive first half results

## Annual Cost & Implementation Analysis

- Well above peer group median performance at slightly below peer group median cost

## OSGP Annual Review and Update

- Minor changes in fund line-up necessitate a similarly minor benchmark change

## New Hires

- **Aaron Schaffer**, Office Assistant
- **Jeremy Knowles**, Investment Analyst I, Fixed Income
- **Mohammed Quraishi**, Investment Analyst II, Operations

## Promotions

- **Eric Messer**, from Investment Analyst III, Alternatives to Investment Officer I, Private Equity
- **Wil Hiles**, from Investment Analyst II, Public Equity to Investment Officer I, Public Equity
- **Krystal Mclean**, from Legal Assistant to Paralegal
- **Jen Plett**, from Senior Investment Analyst, Portfolio Risk & Research to Investment Officer I, Portfolio Risk & Research
- **Sommer May**, from Senior Compliance Analyst to Compliance Manager
- **Amanda Kingsbury**, from Senior Investment Analyst, Alternatives to Investment Officer I, Alternatives

## So Long and Thank You

- **Maryam Azeemi**

*Girls Who Invest Intern, Summer 2019*

- **Vivek Sharma**

*University of Oregon Intern, Summer 2019*

## Welcome

- **Bolivar Cardenas**

*Portland State University Straub Fellow, 2019-20*

TAB 3 – Financial Markets and Macro Economic Update

CONFIDENTIAL

TAB 4 – Q2 2019 Performance & Risk Report

*OPERF*

# Callan



September 18, 2019

**Oregon Investment Council**

Second Quarter 2019  
Performance Review

# Does Strong First Half Spell Problems for Second Half of 2019 and 2020?

Did we just “steal” the expected return for the next 18 months?

**Strong equity markets continue in Q2, adding to sharp rebound in Q1**

– S&P up 18.5%, ACWI ex USA up 13.6% y-t-d

Dovish Fed comments, solid corporate fundamentals, and even lower unemployment propel equity markets in Q2:

- low quality stocks outperform
- growth over value
- small cap lags large cap once again
- Developed non-U.S. equities continue rebound, EM stalls in Q2

Trade uncertainty slowed markets in May, hope of deal rebounded in June

**Fixed income markets participate, too**

- Investment grade is strongest performer in the U.S.
- Credit spreads continued rally in Q2.
- Yield curve shifts lower across maturities, inverts from 3 months – 10 years; upward sloping from 1 year

## Returns for Periods ended June 30, 2019

	1 Quarter	1 Year	5 Years	10 Years	25 Years
<b>U.S. Equity</b>					
Russell 3000	4.10	8.98	10.19	14.67	9.98
S&P 500	4.30	10.42	10.71	14.70	9.97
Russell 2000	2.10	-3.31	7.06	13.45	9.26
<b>Non-U.S. Equity</b>					
MSCI World ex USA	3.79	1.29	2.04	6.75	5.01
MSCI Emerging Markets	0.61	1.22	2.49	5.81	--
MSCI ACWI ex USA Small Cap	1.21	-5.94	2.77	8.48	5.32
<b>Fixed Income</b>					
Bloomberg Barclays Aggregate	3.08	7.87	2.95	3.90	5.50
3-Month T-Bill	0.64	2.31	0.87	0.49	2.52
Bloomberg Barclays Long Gov/Credit	6.59	13.82	5.68	7.62	7.73
Bloomberg Barclays Global Agg ex-US	3.42	4.10	-0.12	2.10	4.49
<b>Real Estate</b>					
NCREIF Property	1.51	6.51	8.83	9.25	9.36
FTSE NAREIT Equity	1.24	11.21	7.92	15.46	10.25
<b>Alternatives</b>					
CS Hedge Fund	2.35	2.46	2.36	5.03	7.84
Cambridge Private Equity*	4.86	12.71	12.30	14.83	15.32
Bloomberg Commodity	-1.19	-6.75	-9.15	-3.74	1.69
Gold Spot Price	8.87	12.69	1.35	4.31	5.32
<b>Inflation - CPI-U</b>	0.76	1.65	1.45	1.73	2.22

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

Source: Callan



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# Global Economic Update 2019

## The Big Picture

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### Central bank policy front and center

- The Fed was alone on a path to normalize interest rates, with nine rate hikes in two years; euro zone sat out. U.S. rates have been substantially higher than developed markets globally for an extended period.
- Fed adopted dovish tone in January, a sharp reversal in stance. Rates held constant through Q2; rate cuts now expected in Q3 or Q4 2019.

### However, U.S. economy remains strong, labor market very tight, reaching the limits of full employment

- Solid Q1 GDP growth (3.2%) moderated in Q2 (2.1%), will soften further in face of slowing global economy, trade uncertainty
- Slower growth inevitable after impact of 2018 fiscal stimulus fades and full impact of nine rate hikes feeds through the economy.
- Switch to dovish Fed policy boosted consumer and business confidence, and juiced stock market; drop back in borrowing costs expected to sustain growth, or at least soften slowdown
- Policy reversal simultaneously stoked fears of coming slowdown and fed a rally in bonds.

### The slowdown in Europe and China weighing on global growth

- Euro zone unemployment has dropped, but economic growth stalled (GDP below 1.5%).
- China suffering dramatic slowdown in growth: industrial output, retail sales, implied GDP
- Resolution of trade uncertainty crucial to resumption of growth, far more important to China than the U.S.

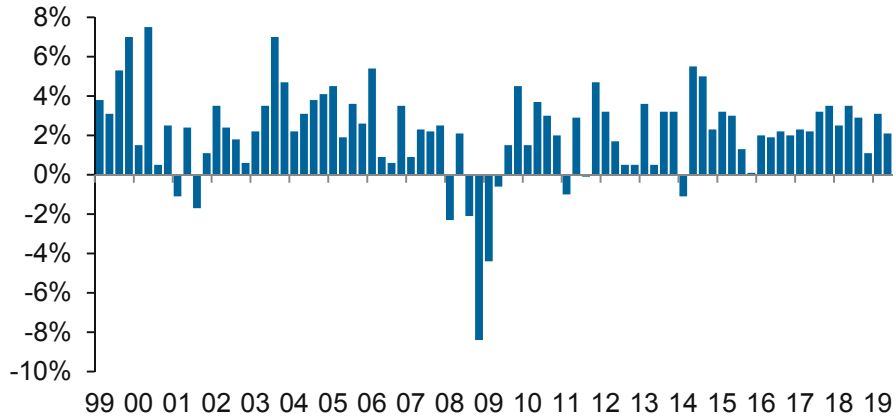
### Inflation remains stuck below 2% in U.S., weaker overseas

- Wage pressures building in U.S. have yet to translate into headline inflation.
- Weakening global growth, softer inflation give Fed cover to reverse policy and cut rates

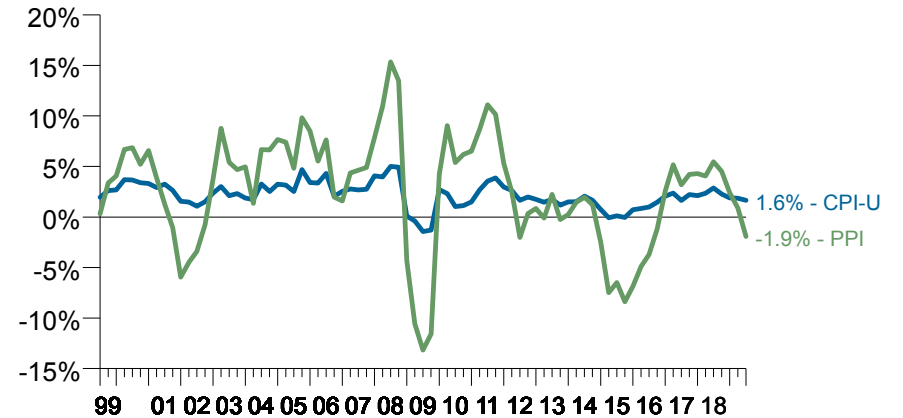
# U.S. Economy—Summary

For periods ended June 30, 2019

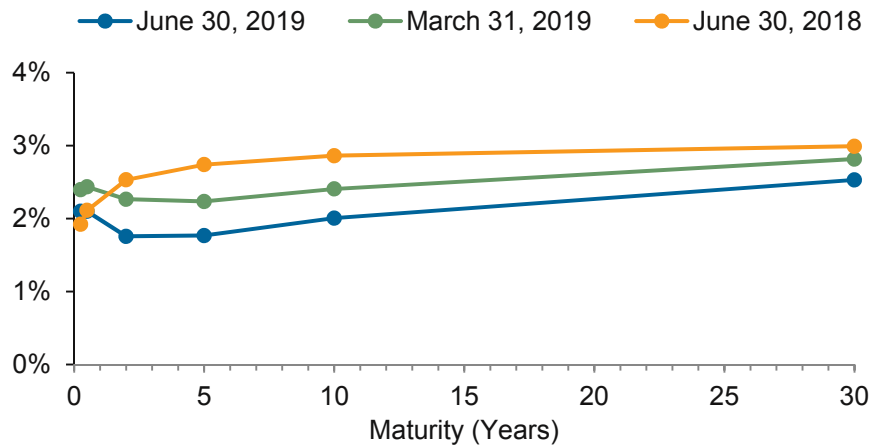
## Quarterly Real GDP Growth



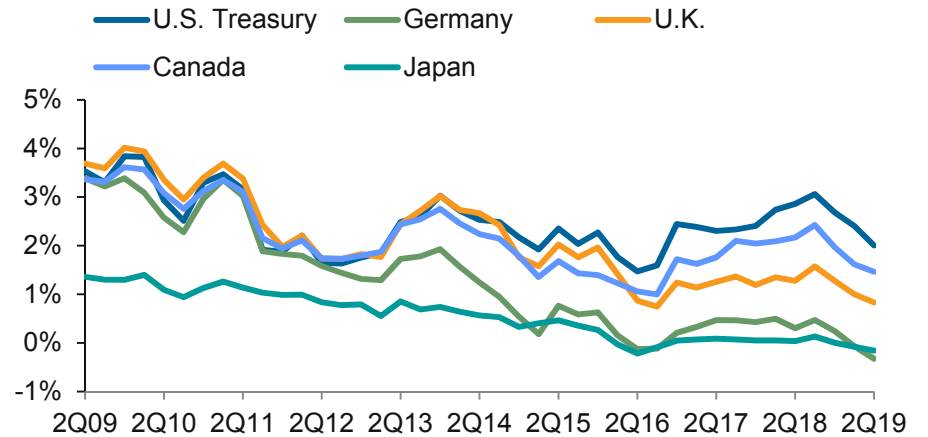
## Inflation Year-Over-Year



## U.S. Treasury Yield Curves



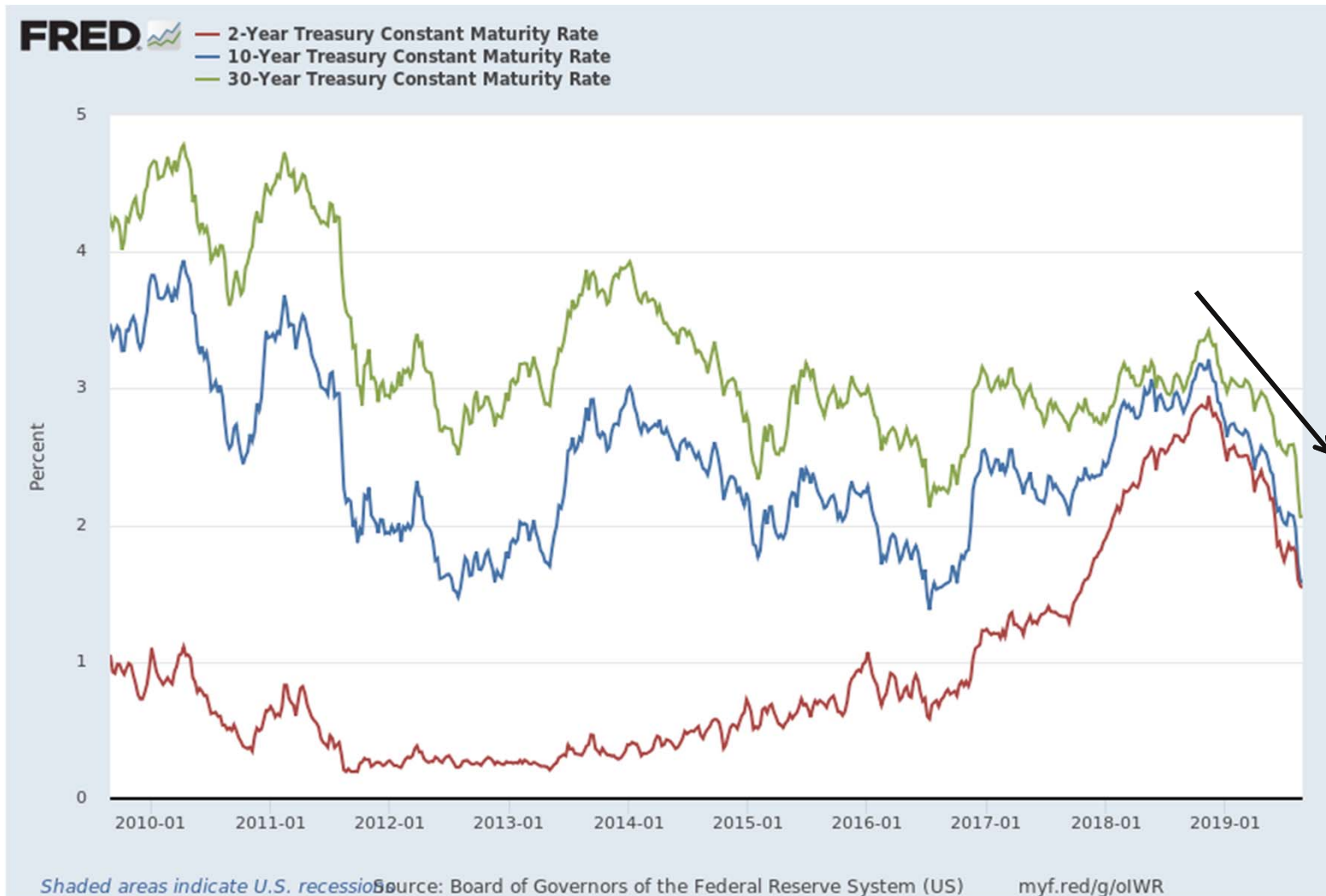
## 10-Year Global Government Bond Yields



Sources: Bureau of Labor Statistics, Bloomberg, Callan

# Treasury Yield Curve

August 23, 2009– August 23, 2019



# Q2 Rebound Continues, Global Stock Markets Surge Through First Half of 2019

## New record for the S&P 500 reached in Q2 2019

- 4.3% gain in Q2, on top of strongest first quarter (13.7%) since 2009

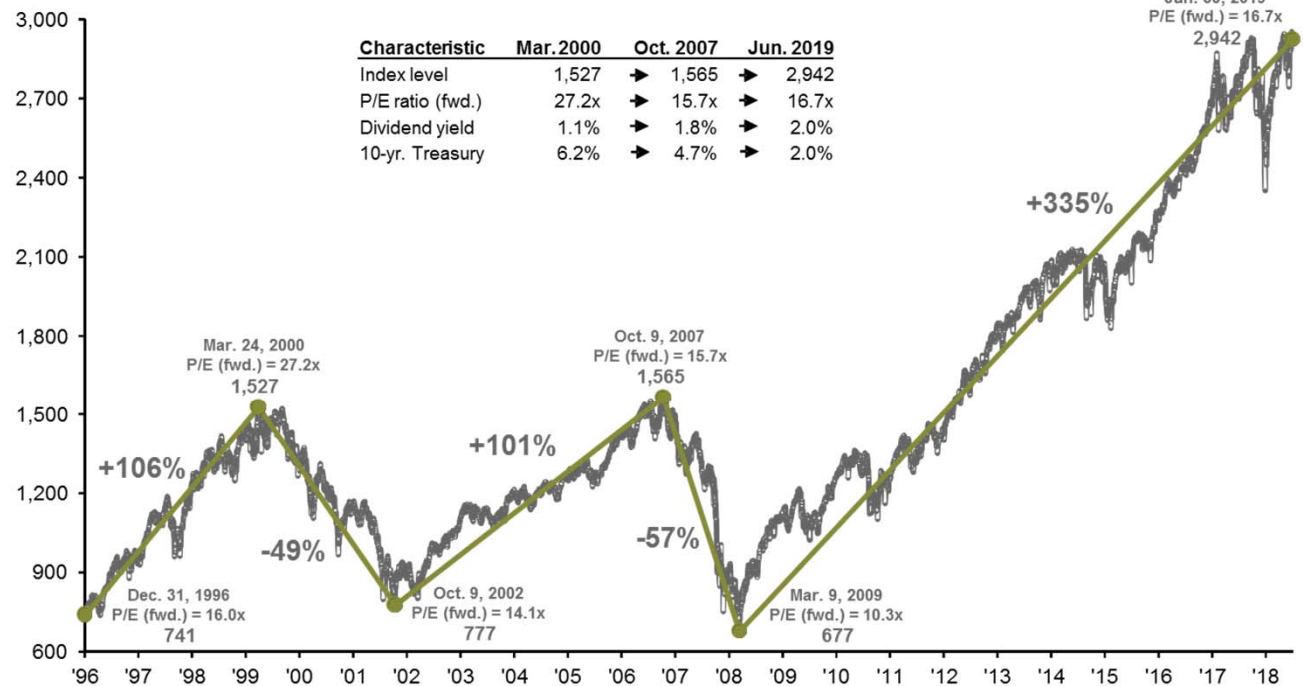
## Forward valuation rose back to 17.1 in Q2, above its 25-year average (16.2)

- Still nowhere near the peak set in 2000

## Yield on 10-year Treasury fell back to the level of the dividend yield on stocks

- Prior to GFC, Treasury yield typically exceeded that of the stock dividend; two yields were very close for eight years following GFC.
- Gap began to widen with Fed tightening in 2017, but narrowed again in Q2 with reversal of Fed policy.
- Vastly different relationship between stock and bond yields in 2000 and 2007

S&P 500 Price Index



Source: Compustat, FactSet, Federal Reserve, Standard & Poor's, J.P. Morgan Asset Management. Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price to earnings ratio is a bottom-up calculation based on the most recent S&P 500 Index price, divided by consensus estimates for earnings in the next 12 months (NTM), and is provided by FactSet Market Aggregates. Returns are cumulative and based on S&P 500 Index price movement only, and do not include the reinvestment of dividends. Past performance is not indicative of future returns. Guide to the Markets – U.S. Data are as of June 30, 2019.

Source: J.P. Morgan Asset Management.

# Callan Periodic Table of Investment Returns

## Returns for Key Indices

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2 Qtrs. 2019
Emerging Market Equity 34.00%	Real Estate 42.12%	Emerging Market Equity 39.38%	U.S. Fixed Income 5.24%	Emerging Market Equity 78.51%	Small Cap Equity 26.85%	U.S. Fixed Income 7.84%	Real Estate 27.73%	Small Cap Equity 38.82%	Real Estate 15.02%	Large Cap Equity 1.38%	Small Cap Equity 21.31%	Emerging Market Equity 37.28%	Cash Equivalent 1.87%	Large Cap Equity 18.54%
Real Estate 15.35%	Emerging Market Equity 32.17%	Non-U.S. Equity 12.44%	Non-U.S. Fixed Income 4.39%	High Yield 58.21%	Real Estate 19.63%	High Yield 4.98%	Emerging Market Equity 18.23%	Large Cap Equity 32.39%	Large Cap Equity 13.69%	U.S. Fixed Income 0.55%	High Yield 17.13%	Non-U.S. Equity 24.21%	U.S. Fixed Income 0.01%	Small Cap Equity 16.98%
Non-U.S. Equity 14.47%	Non-U.S. Equity 25.71%	Non-U.S. Fixed Income 11.03%	Cash Equivalent 2.06%	Real Estate 37.13%	Emerging Market Equity 18.88%	Non-U.S. Fixed Income 4.36%	Non-U.S. Equity 16.41%	Non-U.S. Equity 21.02%	U.S. Fixed Income 5.97%	Cash Equivalent 0.05%	Large Cap Equity 11.96%	Large Cap Equity 21.83%	High Yield -2.08%	Non-U.S. Equity 14.64%
Large Cap Equity 4.91%	Small Cap Equity 18.37%	U.S. Fixed Income 6.97%	High Yield -26.16%	Non-U.S. Equity 33.67%	High Yield 15.12%	Large Cap Equity 2.11%	Small Cap Equity 16.35%	High Yield 7.44%	Small Cap Equity 4.89%	Real Estate -0.79%	Emerging Market Equity 11.19%	Small Cap Equity 14.65%	Non-U.S. Fixed Income -2.15%	Real Estate 14.51%
Small Cap Equity 4.55%	Large Cap Equity 15.79%	Large Cap Equity 5.49%	Small Cap Equity -33.79%	Small Cap Equity 27.17%	Large Cap Equity 15.06%	Cash Equivalent 0.10%	Large Cap Equity 16.00%	Real Estate 3.67%	High Yield 2.45%	Non-U.S. Equity -3.04%	Real Estate 4.06%	Non-U.S. Fixed Income 10.51%	Large Cap Equity -4.38%	Emerging Market Equity 10.59%
Cash Equivalent 3.07%	High Yield 11.85%	Cash Equivalent 5.00%	Large Cap Equity -37.00%	Large Cap Equity 26.47%	Non-U.S. Equity 8.95%	Small Cap Equity -4.18%	High Yield 15.81%	Cash Equivalent 0.07%	Cash Equivalent 0.03%	Small Cap Equity -4.41%	Non-U.S. Equity 2.75%	Real Estate 10.36%	Real Estate -5.63%	High Yield 9.94%
High Yield 2.74%	Non-U.S. Fixed Income 8.16%	High Yield 1.87%	Non-U.S. Equity -43.56%	Non-U.S. Fixed Income 7.53%	U.S. Fixed Income 6.54%	Real Estate -6.46%	U.S. Fixed Income 4.21%	U.S. Fixed Income -2.02%	Emerging Market Equity -2.19%	High Yield -4.47%	U.S. Fixed Income 2.65%	High Yield 7.50%	Small Cap Equity -11.01%	U.S. Fixed Income 6.11%
U.S. Fixed Income 2.43%	Cash Equivalent 4.85%	Small Cap Equity -1.57%	Real Estate -48.21%	U.S. Fixed Income 5.93%	Non-U.S. Fixed Income 4.95%	Non-U.S. Equity -12.21%	Non-U.S. Fixed Income 4.09%	Emerging Market Equity -2.60%	Non-U.S. Fixed Income -3.09%	Non-U.S. Fixed Income -6.02%	Non-U.S. Fixed Income 1.49%	U.S. Fixed Income 3.54%	Non-U.S. Equity -14.09%	Non-U.S. Fixed Income 4.99%
Non-U.S. Fixed Income -8.65%	U.S. Fixed Income 4.33%	Real Estate -7.39%	Emerging Market Equity -53.33%	Cash Equivalent 0.21%	Cash Equivalent 0.13%	Emerging Market Equity -18.42%	Cash Equivalent 0.11%	Non-U.S. Fixed Income -3.08%	Non-U.S. Equity -4.32%	Emerging Market Equity -14.92%	Cash Equivalent 0.33%	Cash Equivalent 0.86%	Emerging Market Equity -14.57%	Cash Equivalent 1.24%

- S&P 500 Index
- Russell 2000 Index
- MSCI World ex USA
- MSCI Emerging Markets
- Bloomberg Barclays US Aggregate Bond
- Bloomberg Barclays High Yield Bond Index
- Bloomberg Barclays Global Aggregate ex US Bond Index
- FTSE EPRA/NAREIT Developed REIT Index
- 3-month Treasury Bill

Sources: Bloomberg Barclays, FTSE Russell, MSCI, Standard & Poor's

# OPERF Total Regular Account

## Performance Summary for the Second Quarter 2019

### Total Fund:

For the quarter ended June 30, 2019, the Total Regular Account rose 3.27% (+3.16% net of fees), lagging behind the 5.05% return of the Policy Benchmark, and ranked in the second quartile of Callan's \$10B+ public fund peer group. For the twelve months ended June, the Total Regular Account gained 7.00% (+6.54% net of fees), falling just short of the 7.2% return for the Policy Target, and ranked in the top third of Callan's \$10B+ public fund peer group. Longer term results against the Policy Target are mixed; however, absolute returns are strong and peer group rankings are in the top quartile.

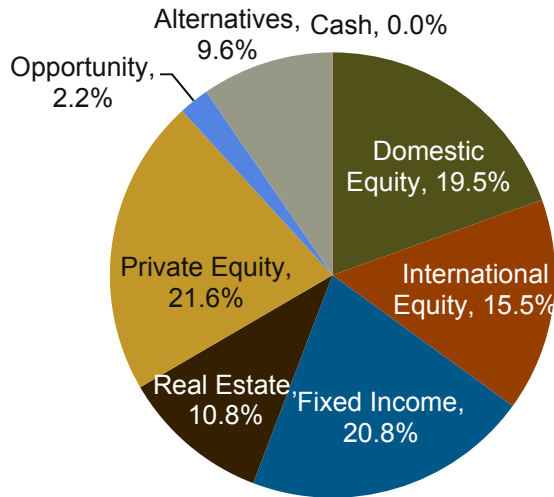
### Asset Classes:

- **Total Fixed Income:** The Fixed Income Portfolio added 3.03% (+3.00% net of fees) for the quarter versus a gain of 2.86% for the Custom Fixed Income Benchmark, and ranked in the 59th percentile of Callan's Public Funds \$10B+ US Fixed income (Gross) peer group. For the trailing year, the Portfolio rose 7.39% (+7.24% net of fees), coming in ahead of the 7.15% return of the benchmark, and ranked in the 63th percentile of the peer group. 10 year results were ahead of the benchmark and ranked in the top quartile of the peer group.
- **Total Public Equity:** Total Public Equity portfolio returned 3.33% (+3.27% net of fees) for the quarter versus 3.37% increase in the MSCI ACWI IMI Net benchmark, and ranked in the 65th percentile of its peer group. For the trailing year, the portfolio rose 3.88% (+3.63% net of fees), trailing the 4.56% return of the benchmark and ranked in the 66th percentile of peer group. 10 year returns remain well ahead of the benchmark though they trail the peer group median.
  - **U.S. Equity:** The U.S. Equity Portfolio increased 3.77% (+3.75% net of fees) for the quarter, lagging the Russell 3000 Index return of 4.10%, and ranked in the 57th percentile of Callan's Public Fund: \$10B+ Domestic Equity (gross) peer group. On a trailing 12 month basis, the Portfolio gained 5.38% (+5.30% net of fees) versus a return of 8.98% for the benchmark and ranked in the 81th percentile of the peer group. 10 year results of 14.34% (+14.12% net of fees) trail the benchmark return of 14.67% and ranked in the 74th percentile of the peer group.
  - **International Equity:** The International Equity Portfolio registered returns of 2.72% (+2.60% net of fees) for the quarter, essentially matching the 2.74% return of the MSCI ACWI ex-U.S. IMI Index, and ranked in the 63th percentile of Callan's Public Fund: \$10B+ International Equity (gross) peer group. For the trailing year, the Portfolio returned 0.80% (+0.39% net of fees) beating the benchmark return of 0.26%, and ranked in the 70th percentile in the peer group. 10 year results remained comfortably ahead of the benchmark (+7.98% net of fees versus +6.78%) and continued to rank in the top quartile of the peer group.
- **Total Real Estate:** The Real Estate Portfolio continued to show competitive absolute results over the last decade with an annualized return of 10.03% net of fees.
- **Opportunity Portfolio:** The Opportunity Portfolio's results over the last 10 years continue to be favorable with an annualized return of 10.60% net of fees.
- **Alternative Portfolio:** The Alternative Portfolio returned 1.88% per annum net of fees over the last five years.
- **Total Private Equity:** The Private Equity Portfolio's returns remained strong with an annualized return of 14.54% net of fees over the last ten years.

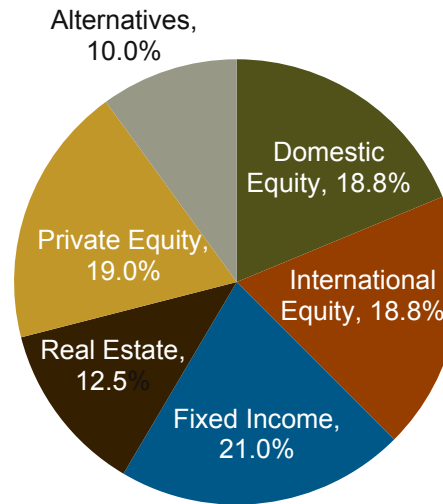
# OPERF Total Regular Account

## Asset Allocation

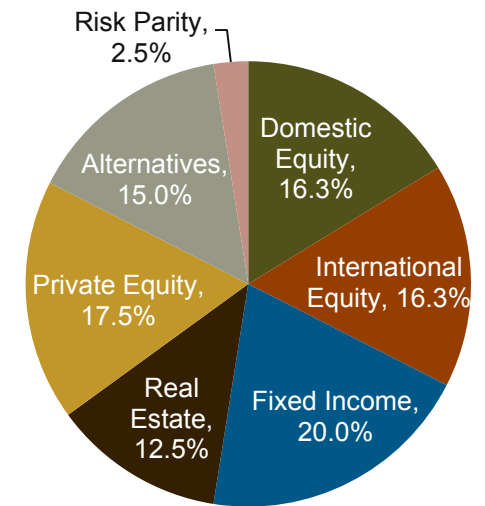
Actual Allocation as of 06/30/2019



Interim Policy Target\*



Strategic Policy Target\*\*



Asset Class	\$000s Actual	Weight*** Actual	Target	Percent Difference	\$000s Difference
Total Fixed Income	15,962,777	20.8%	21.0%	(0.2%)	(125,789)
U.S. Equity Portfolio	14,916,106	19.5%	18.8%	0.7%	551,314
Non-U.S. Equity Portfolio	11,867,444	15.5%	18.8%	(3.3%)	(2,497,348)
Total Real Estate	8,291,318	10.8%	12.5%	(1.7%)	(1,285,210)
Opportunity Portfolio	1,705,836	2.2%	0.0%	2.2%	1,705,836
Alternative Portfolio	7,329,823	9.6%	10.0%	(0.4%)	(331,400)
Total Private Equity	16,516,650	21.6%	19.0%	2.6%	1,960,328
Cash	22,270	0.0%	0.0%	0.0%	22,270
Total	76,612,224	100.0%	100.0%		

\*Interim policy target adopted January 1, 2019

\*\*Strategic policy target adopted April 24, 2019

\*\*\*Totals provided by OST Staff



# OPERF Total Regular Account

## Net Cumulative Performance by Asset Class as of June 30, 2019

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
<b>Total Regular Account</b>	<b>3.16%</b>	<b>6.54%</b>	<b>9.34%</b>	<b>6.65%</b>	<b>10.17%</b>
Total Regular Account ex-Overlay	3.12%	6.27%	9.20%	6.53%	9.99%
OPERF Policy Benchmark*	5.05%	7.21%	9.78%	7.23%	10.33%
<b>Total Fixed Income</b>	<b>3.00%</b>	<b>7.24%</b>	<b>2.97%</b>	<b>2.80%</b>	<b>5.69%</b>
Custom FI Benchmark	2.86%	7.15%	2.55%	2.54%	4.05%
Callan Public Fund > \$10bn U.S. Fixed	3.08%	7.67%	3.23%	3.28%	4.72%
<b>Total Public Equity</b>	<b>3.27%</b>	<b>3.63%</b>	<b>11.70%</b>	<b>6.28%</b>	<b>10.88%</b>
MSCI ACWI IMI Net	3.37%	4.56%	11.42%	6.03%	10.32%
<b>U.S. Equity Portfolio</b>	<b>3.75%</b>	<b>5.30%</b>	<b>13.19%</b>	<b>9.09%</b>	<b>14.12%</b>
Russell 3000 Index	4.10%	8.98%	14.02%	10.19%	14.67%
Callan Large Public > \$10bn U.S. Equity	3.98%	7.61%	13.93%	9.94%	14.64%
<b>Non-U.S. Equity Portfolio</b>	<b>2.60%</b>	<b>0.39%</b>	<b>9.79%</b>	<b>3.34%</b>	<b>7.98%</b>
MSCI ACWI ex-US IMI Index**	2.74%	0.26%	9.17%	2.25%	6.78%
Callan Large Public > \$10bn Non-U.S. Equity	2.97%	1.18%	9.81%	3.31%	7.82%
<b>Total Real Estate</b>	<b>1.04%</b>	<b>5.85%</b>	<b>7.59%</b>	<b>9.12%</b>	<b>10.03%</b>
Total Real Estate ex REITs	1.52%	5.99%	8.99%	10.39%	9.23%
Oregon Custom Real Estate Benchmark	1.20%	6.55%	7.01%	9.03%	8.46%
Callan Public Plan - Real Estate	1.65%	7.10%	7.71%	9.32%	10.48%
<b>Opportunity Portfolio</b>	<b>0.55%</b>	<b>3.55%</b>	<b>6.65%</b>	<b>4.49%</b>	<b>10.60%</b>
Russell 3000 Index	4.10%	8.98%	14.02%	10.19%	14.67%
CPI + 5%	2.00%	6.45%	7.01%	6.25%	6.71%
<b>Alternative Portfolio</b>	<b>-0.08%</b>	<b>-2.65%</b>	<b>4.13%</b>	<b>1.88%</b>	<b>-</b>
CPI + 4%	1.75%	5.71%	6.12%	5.51%	-
<b>Total Private Equity</b>	<b>5.89%</b>	<b>15.03%</b>	<b>15.11%</b>	<b>11.80%</b>	<b>14.54%</b>
OIC - Russell 3000 + 300 BPS Qtr Lag	14.85%	12.01%	16.86%	13.64%	19.38%

\*Current Policy Benchmark = 37.5%, MSCI ACWI IMI, 21.0% OPERF Custom Total FI Benchmark, 19.0% Russell 3000 + 300 bps Qtr Lag, 12.5% Oregon Custom Real Estate Benchmark and 10.0% CPI + 400 bps Target 12/18= 39.0%, MSCI ACWI IMI, 22.0% OPERF Custom Total FI Benchmark, 19.0% Russell 3000 + 300 bps Qtr Lag, 12.5% Oregon Custom Real Estate Benchmark and 7.5% CPI + 400 bps



# OPERF Total Regular Account

## Net Calendar Year Performance by Asset Class

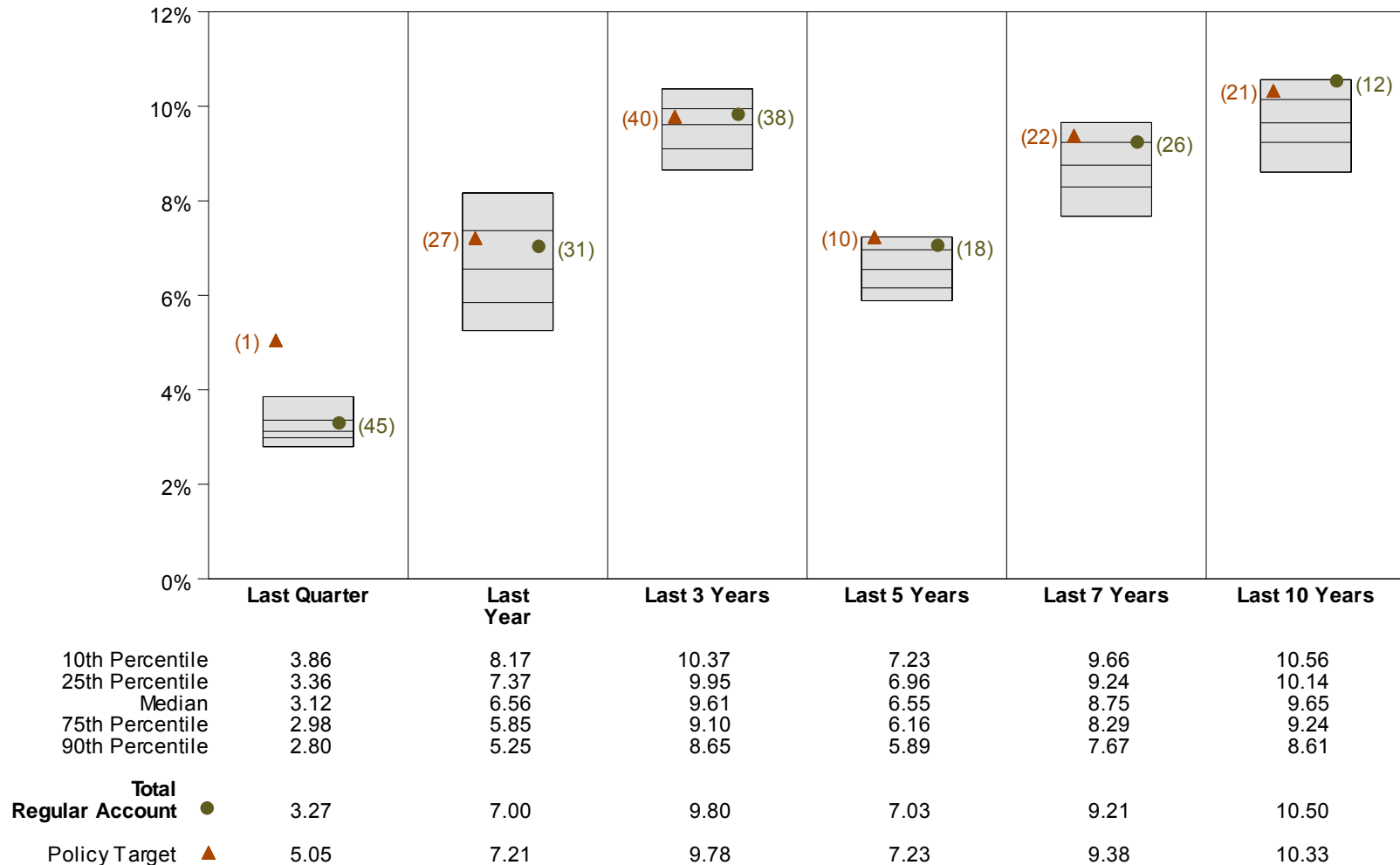
	2 Qtrs. 2019	2018	2017	2016	2015
<b>Total Regular Account</b>	<b>7.88%</b>	<b>0.48%</b>	<b>15.39%</b>	<b>7.11%</b>	<b>2.01%</b>
Total Regular Account ex-Overlay	7.70%	0.45%	15.38%	6.73%	2.02%
OPERF Policy Benchmark*	7.98%	1.22%	15.64%	8.95%	1.57%
<b>Total Fixed Income</b>	<b>6.18%</b>	<b>0.25%</b>	<b>3.70%</b>	<b>3.06%</b>	<b>0.54%</b>
Custom FI Benchmark	5.90%	0.31%	3.32%	2.52%	0.16%
Callan Public Fund > \$10bn U.S. Fixed	6.76%	-0.58%	4.61%	4.82%	-0.06%
<b>Total Public Equity</b>	<b>15.38%</b>	<b>-10.47%</b>	<b>24.41%</b>	<b>9.89%</b>	<b>-1.75%</b>
MSCI ACWI IMI Net	16.08%	-10.08%	23.95%	8.36%	-2.19%
<b>U.S. Equity Portfolio</b>	<b>17.25%</b>	<b>-7.87%</b>	<b>20.40%</b>	<b>14.90%</b>	<b>-0.87%</b>
Russell 3000 Index	18.71%	-5.24%	21.13%	12.74%	0.48%
Callan Large Public > \$10bn U.S. Equity	18.58%	-5.89%	21.28%	12.60%	0.40%
<b>Non-U.S. Equity Portfolio</b>	<b>13.76%</b>	<b>-14.88%</b>	<b>30.23%</b>	<b>4.67%</b>	<b>-2.59%</b>
MSCI ACWI ex-US IMI Index**	13.33%	-14.76%	27.81%	4.41%	-4.60%
Callan Large Public > \$10bn Non-U.S. Equity	14.12%	-14.03%	29.70%	5.16%	-3.22%
<b>Total Real Estate</b>	<b>2.92%</b>	<b>8.03%</b>	<b>10.05%</b>	<b>7.88%</b>	<b>9.90%</b>
Total Real Estate ex REITs	2.66%	8.87%	11.19%	10.01%	12.67%
Oregon Custom Real Estate Benchmark	2.74%	7.71%	6.70%	8.88%	13.48%
Callan Public Plan - Real Estate	3.74%	7.98%	7.70%	8.50%	12.31%
<b>Opportunity Portfolio</b>	<b>1.54%</b>	<b>5.85%</b>	<b>10.47%</b>	<b>6.12%</b>	<b>2.14%</b>
Russell 3000 Index	18.71%	-5.24%	21.13%	12.74%	0.48%
CPI + 5%	4.45%	6.77%	7.18%	6.99%	5.39%
<b>Alternative Portfolio</b>	<b>-0.50%</b>	<b>-2.44%</b>	<b>8.30%</b>	<b>6.61%</b>	<b>-0.0432</b>
CPI + 4%	3.97%	5.98%	6.19%	6.16%	4.76%
<b>Total Private Equity</b>	<b>4.63%</b>	<b>18.15%</b>	<b>17.32%</b>	<b>6.26%</b>	<b>7.79%</b>
OIC - Russell 3000 + 300 BPS Qtr Lag	-0.80%	21.06%	22.22%	18.37%	2.49%

\*Current Policy Benchmark = 37.5%, MSCI ACWI IMI, 21.0% OPERF Custom Total FI Benchmark, 19.0% Russell 3000 + 300 bps Qtr Lag, 12.5% Oregon Custom Real Estate Benchmark and 10.0% CPI + 400 bps Target 12/18= 39.0%, MSCI ACWI IMI, 22.0% OPERF Custom Total FI Benchmark, 19.0% Russell 3000 + 300 bps Qtr Lag, 12.5% Oregon Custom Real Estate Benchmark and 7.5% CPI + 400 bps

# OPERF Total Regular Account

Gross Performance and Peer Group Rankings\* as of June 30, 2019

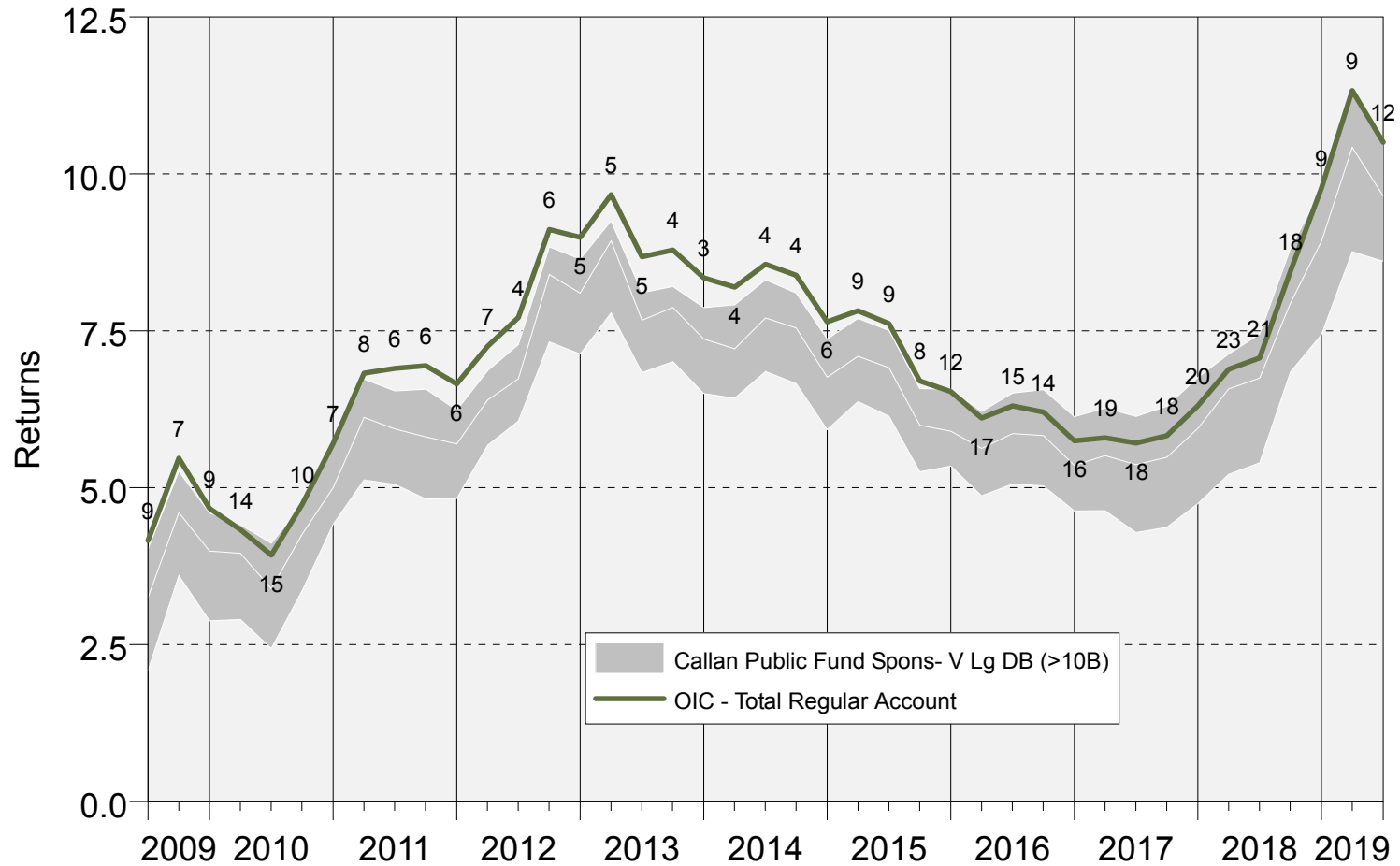
Performance vs Callan Public Fund Spons- V Lg DB (>10B) (Gross)



\*Versus Callan's Very Large Public Funds (> \$10 billion) Peer Group (35 funds)

# OPERF Rolling 10 Year Returns and Rankings

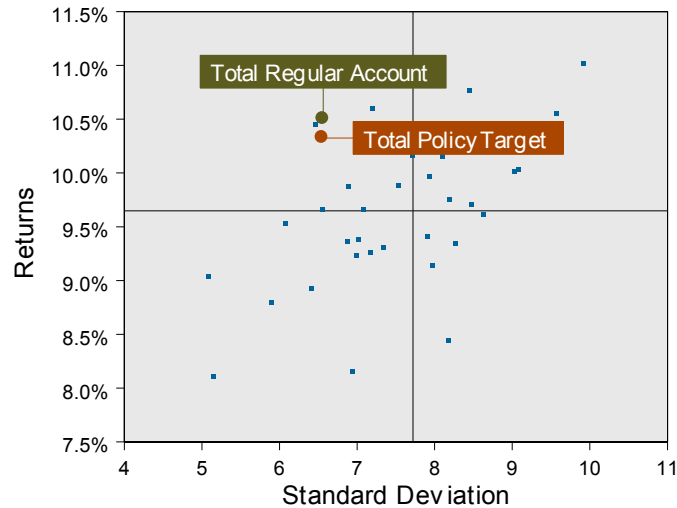
Rolling 40 Quarter Gross of Fee Returns  
for 10 Years Ended June 30, 2019



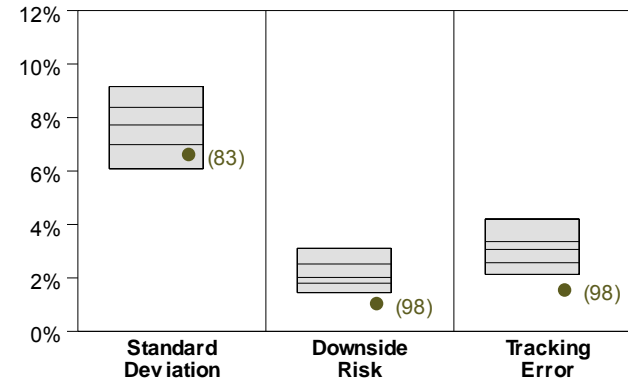
# OPERF Total Regular Account

## Risk vs Return

Callan Public Fund Spons- V Lg DB (>10B) (Gross)  
Annualized Ten Year Risk vs Return



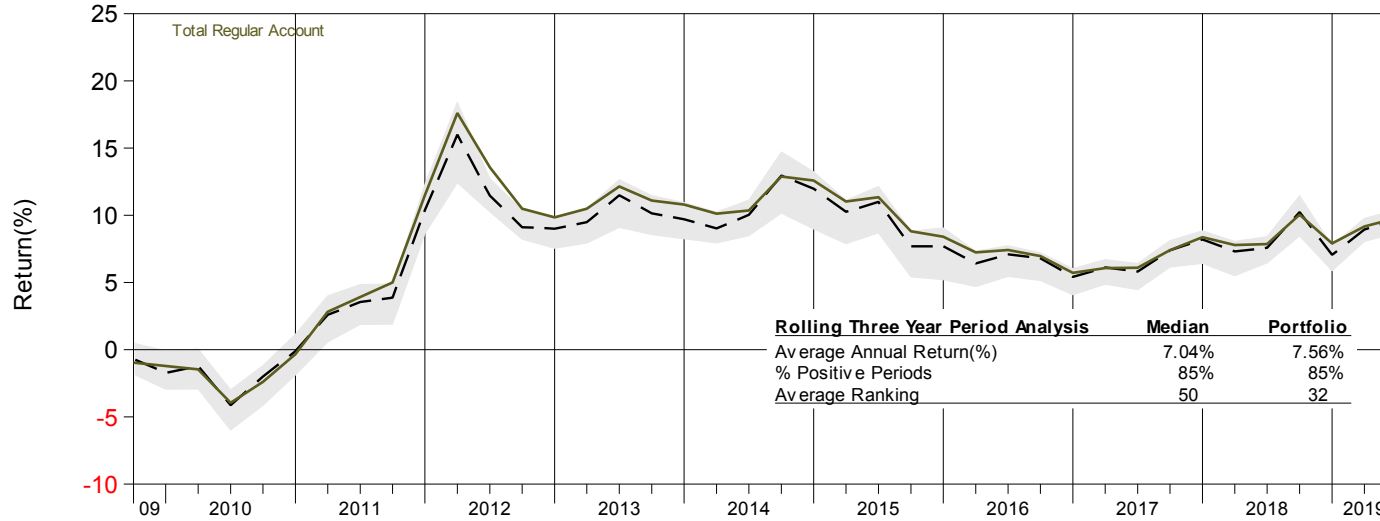
Risk Statistics Rankings vs Policy Target  
Rankings Against Callan Public Fund Spons- V Lg DB (>10B) (Gross)  
Ten Years Ended June 30, 2019



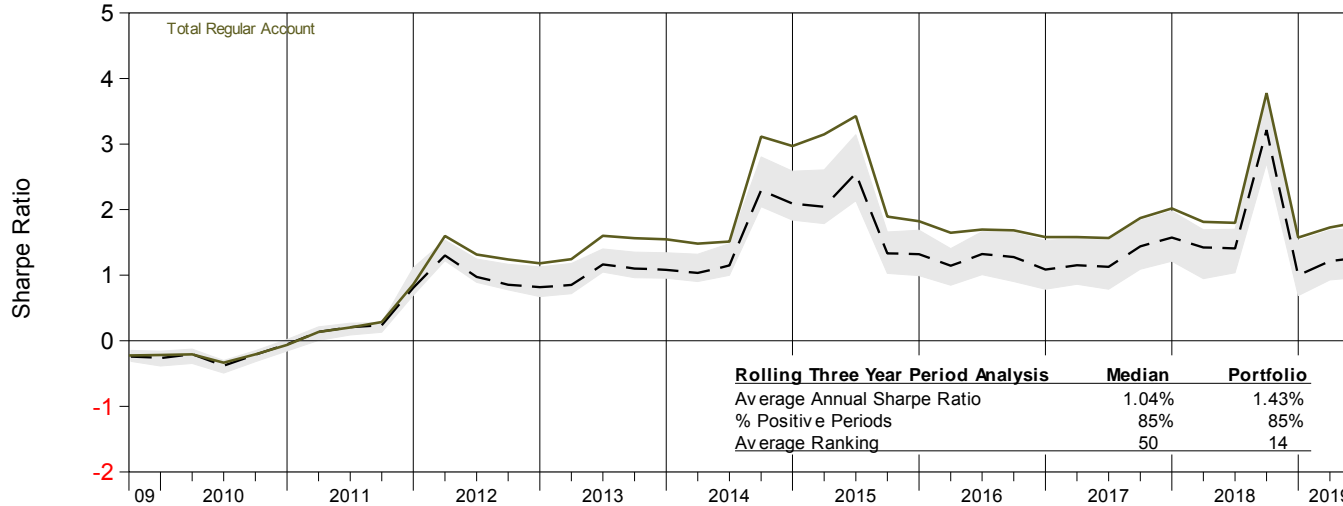
	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	9.16	3.11	4.20
25th Percentile	8.38	2.52	3.36
Median	7.72	2.02	3.06
75th Percentile	6.99	1.81	2.57
90th Percentile	6.08	1.45	2.13
<b>Total Regular Account</b>	<b>6.56</b>	<b>0.99</b>	<b>1.49</b>

# Total Fund Consistency

**Rolling Three Year Return(%) Relative to Policy Target  
Ten Years Ended June 30, 2019**



**Rolling Three Year Sharpe Ratio Relative to Policy Target  
Ten Years Ended June 30, 2019**



# Callan



Appendix

# U.S. Equity Performance: Reaching for Record Highs

## Markets rebounded, continue to march upward

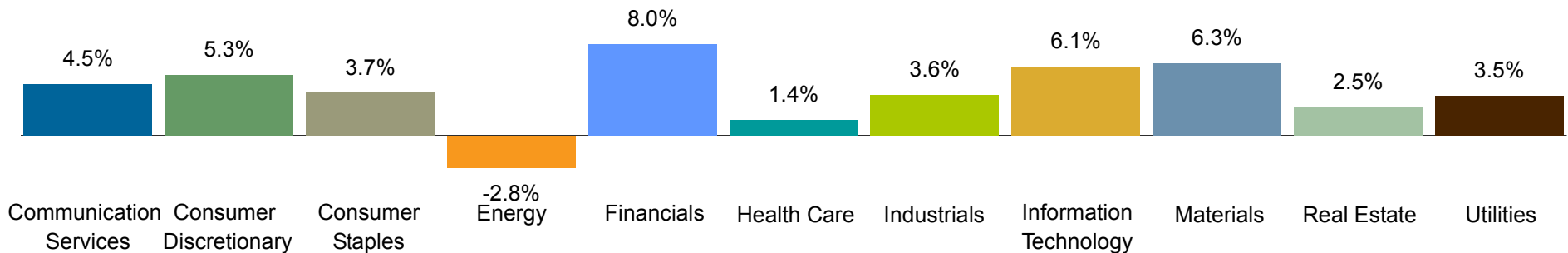
- U.S. equity markets neared record highs as market participants anticipated another round of Fed easing.
- Cyclical outperformed while Financials was the best-performing sector; Energy was the only sector to experience negative returns over the quarter.
- Trade rhetoric weighed on U.S. stocks in May followed by a rebound.
- Given the increase in risk appetite, defensive sectors including Utilities underperformed.

## Growth outpaced value

- Growth continued to outpace value.
- Increasingly dovish Fed a headwind for the valuation sensitive stocks.

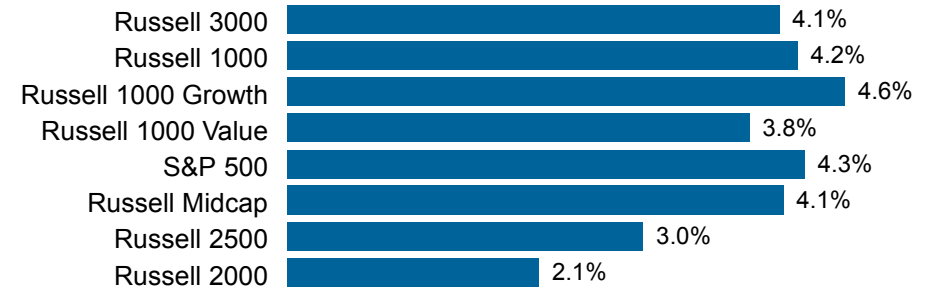
## Small cap stocks lagged large caps

## Economic Sector Quarterly Performance (S&P 500)

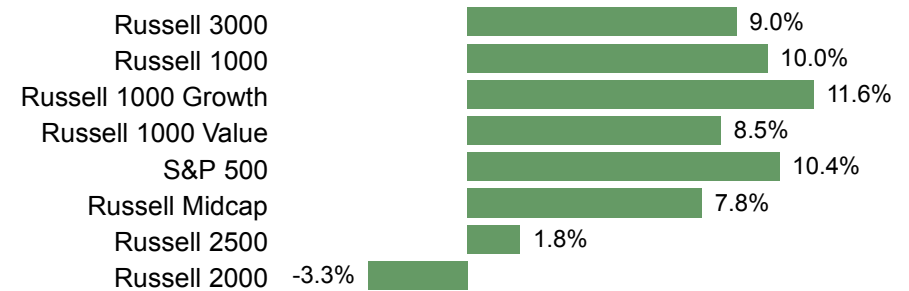


Sources: FTSE Russell, Standard & Poor's

## U.S. Equity: Quarterly Returns



## U.S. Equity: One-Year Returns



# Non-U.S. Equity Performance

## Positive global equity returns despite muted sentiment

- U.S./China tariff fatigue and Brexit uncertainty continued
- European markets strong on declining bond yields
- Yen/euro strengthened vs. the dollar on negative interest rate policies; British pound weakened on growing no-deal Brexit concerns
- Cyclical performance drove returns, benefitting from declining U.S. interest rates (non-U.S./U.S. cyclicals highly correlated)
- Factor performance favored growth, specifically quality and profitability reflecting investors' cautious sentiment

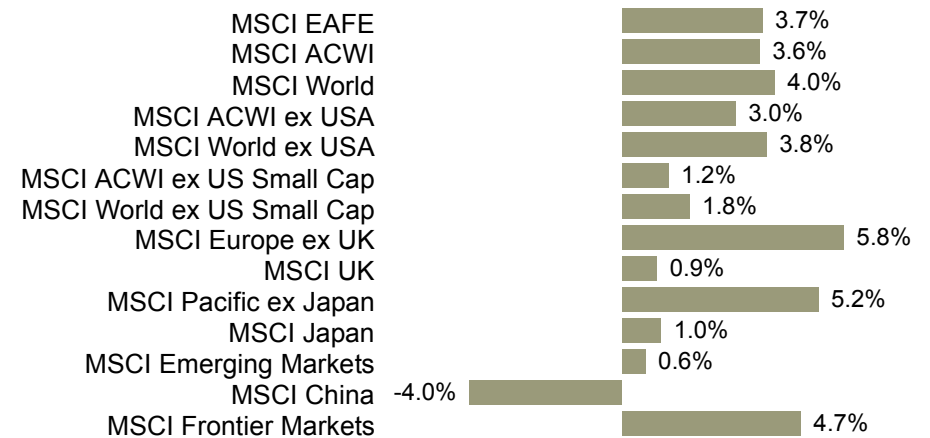
## China reversal hurt emerging market results

- China (-4.02%) faltered on renewed tariff concerns

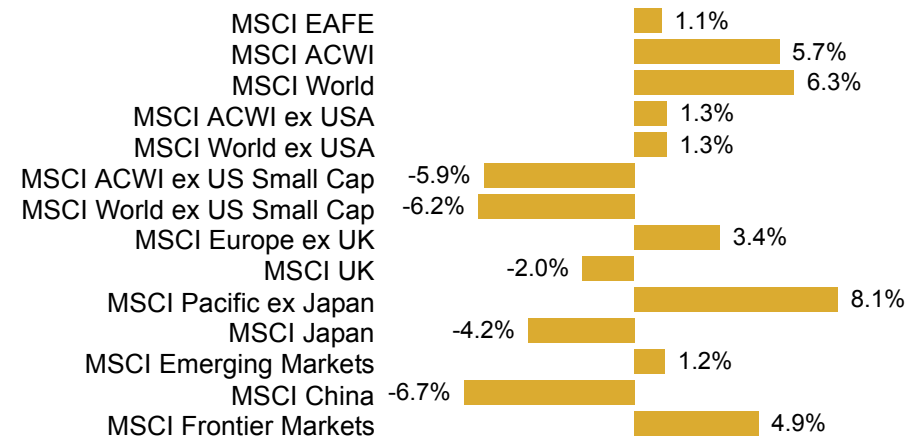
## Non-U.S. small cap lagged large cap

- Investors favored lower earnings risk

## Global Equity: Quarterly Returns



## Global Equity: Annual Returns



Source: MSCI



# Trade War With China

Substantial impact on trade, but small impact on U.S. GDP

Exports to China have fallen by 20%, imports are down by more than 10% (top chart)

- However, decline in exports subtracted less than 0.1% from U.S. GDP in Q1 2019.

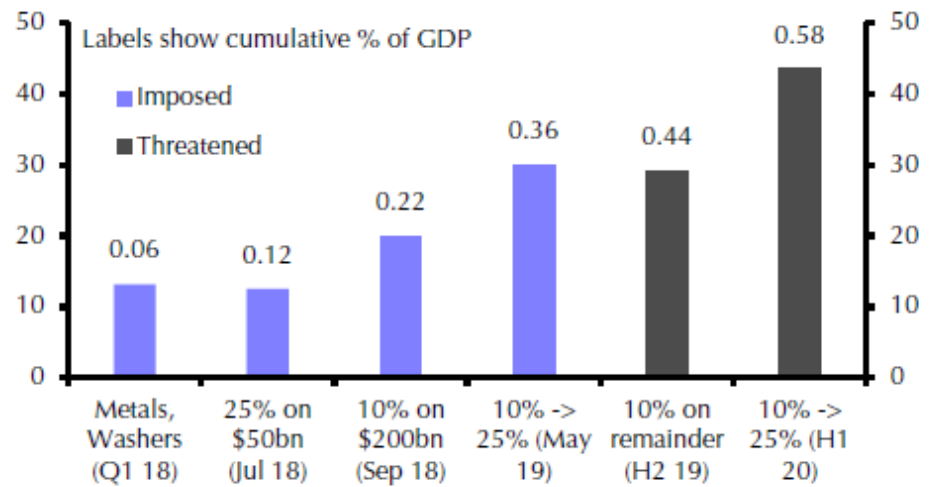
U.S. Bilateral Trade With China (3 month average, % change y/y)



Threatened tariffs could reduce GDP by 0.2% in second half of 2019 and another 0.2% in first half of 2020

- Analysis assumes 10% tariff in 2019, rising to 25% in 2020.
- Chart depicts cumulative impact on GDP growth through Q2 2020 is less than 1%.
- Larger impact is on business confidence and investor sentiment.

U.S. Tariffs on China (\$B and % of GDP)



Sources: Capital Economics; IHS Markit

# Trade Matters, but More to U.S. Trading Partners

## Exports, imports, and trade-to-GDP ratio in 2017

**Trade and trade policy dominate headlines in 2019, but impact of trade in the U.S. is far lower than in Europe and many other developed markets**

- Trade-to-GDP ratio is the sum of exports and imports as a % of GDP. Exports and imports include both goods and services.
- Trade has become a larger component of U.S. GDP over time.
  - U.S. exports have gradually risen from 7% in 1985 to 11.9% in 2017, while imports rose from 9% to 14.7%.
  - Trade activity now involves 26.6% of U.S. GDP.
- By comparison, trade accounts for 37.8% of China GDP, and well over half of GDP in Europe and Mexico.

	Exports (% of GDP)	Imports (% of GDP)	Trade-to-GDP Ratio
Germany	47.2%	39.7%	86.9%
Mexico	37.9%	39.7%	77.6%
Canada	30.9%	33.2%	64.1%
France	30.9%	32.0%	62.9%
U.K.	30.5%	31.9%	62.4%
Italy	31.3%	28.2%	59.5%
Russia	26.0%	20.7%	46.7%
China	19.8%	18.0%	37.8%
Japan	16.1%	15.1%	31.2%
U.S.	11.9%	14.7%	26.6%

Source: World Bank

# U.S. Fixed Income Performance

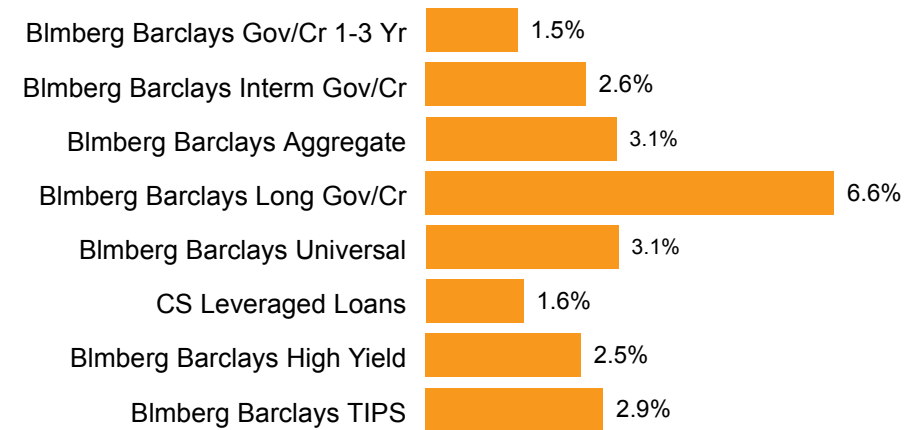
## Bonds rally on dovish Fed comments

- Fed policy and comments to “sustain the expansion” caused risk assets and U.S. Treasuries to rally.
- Treasuries rose +3.01% as yield curve shifted lower across maturities given expectations for Fed to ease.
- The overall shape of the yield curve did not materially change during the quarter.
- High yield corporates posted positive results but underperformed investment grade corporates, primarily due to the longer duration of the investment grade sector.

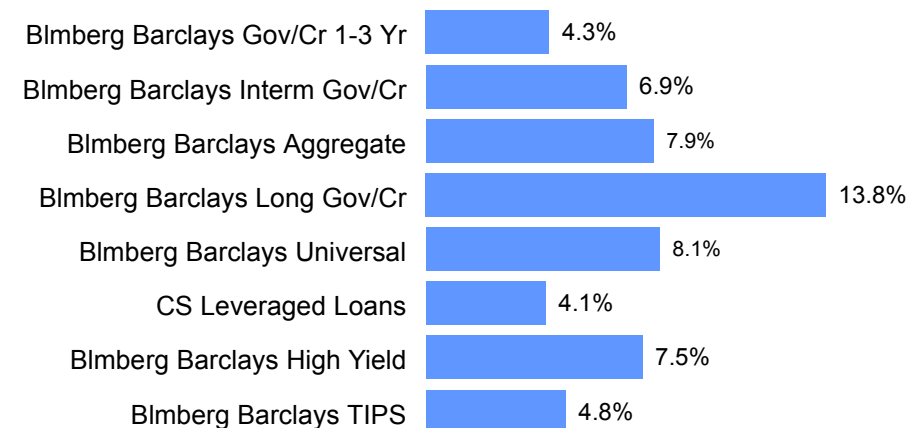
## Bank Loans participated but to lesser degree

- Bank loans participated in rally, but lagged IG and HY corporates as interest rates declined.
- Bank loans have less sensitivity to interest rates, but may have a spread duration profile similar to that of high yield bonds.
- Retail outflows remain unabated as the Fed’s dovish tone dampened enthusiasm for floating rate assets.

## U.S. Fixed Income: Quarterly Returns



## U.S. Fixed Income: Annual Returns



Sources: Bloomberg Barclays, Credit Suisse

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September 18, 2019

# OPERF Risk Dashboard

2019 Q2

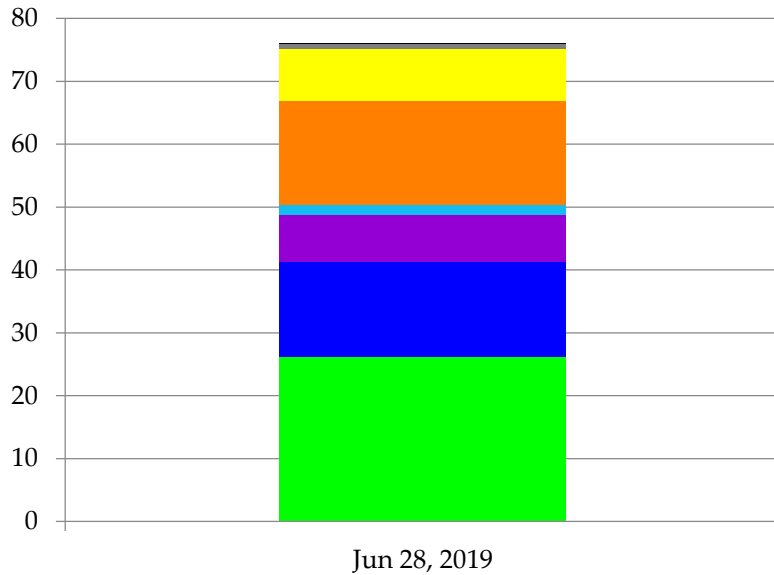


OREGON  
STATE  
TREASURY

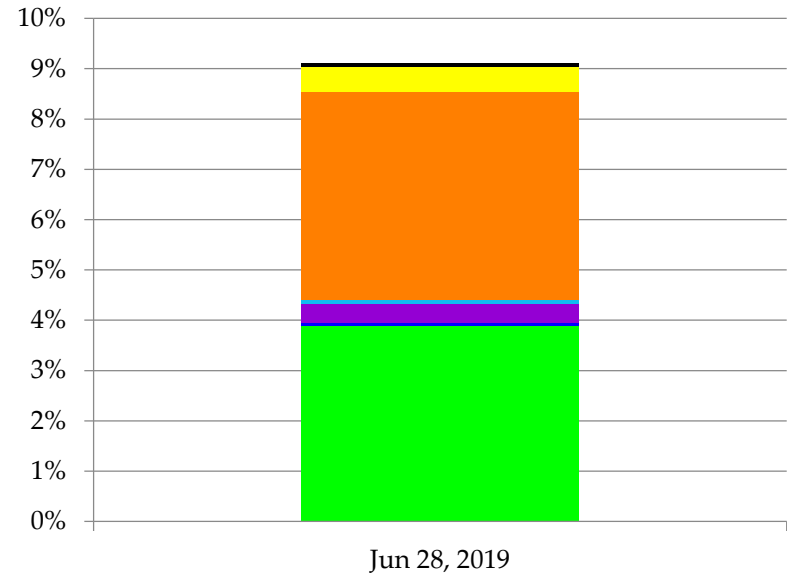


# Allocation & Risk Contribution by Asset Class

## Allocation in \$B



## Risk Contribution

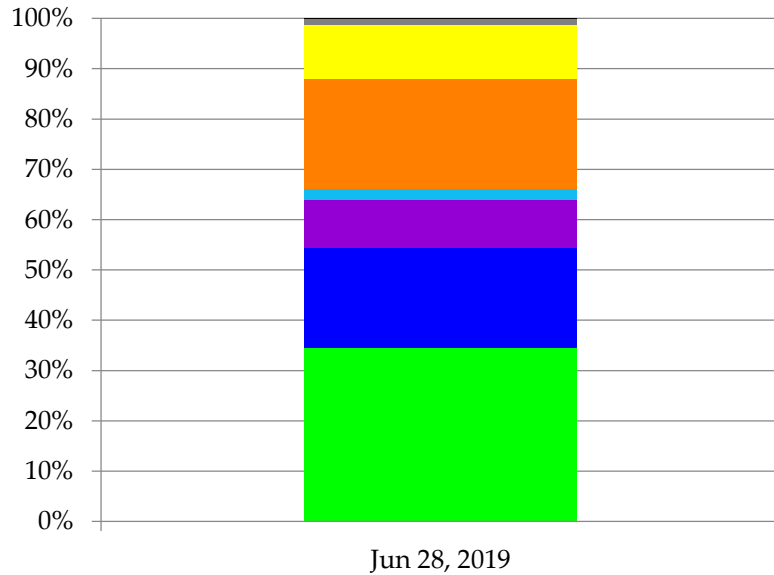


- Equity
- Fixed Income
- Alternatives Portfolio
- Opportunity Portfolio
- Private Equity
- Real Estate
- Cash
- Overlay

- Equity
- Fixed Income
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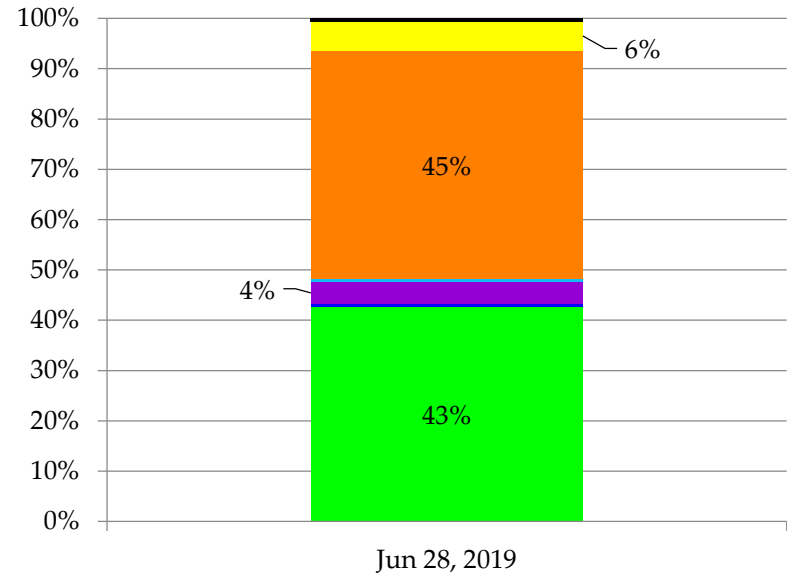
# Allocation & Risk Contribution by Asset Class

## Allocation % of Total



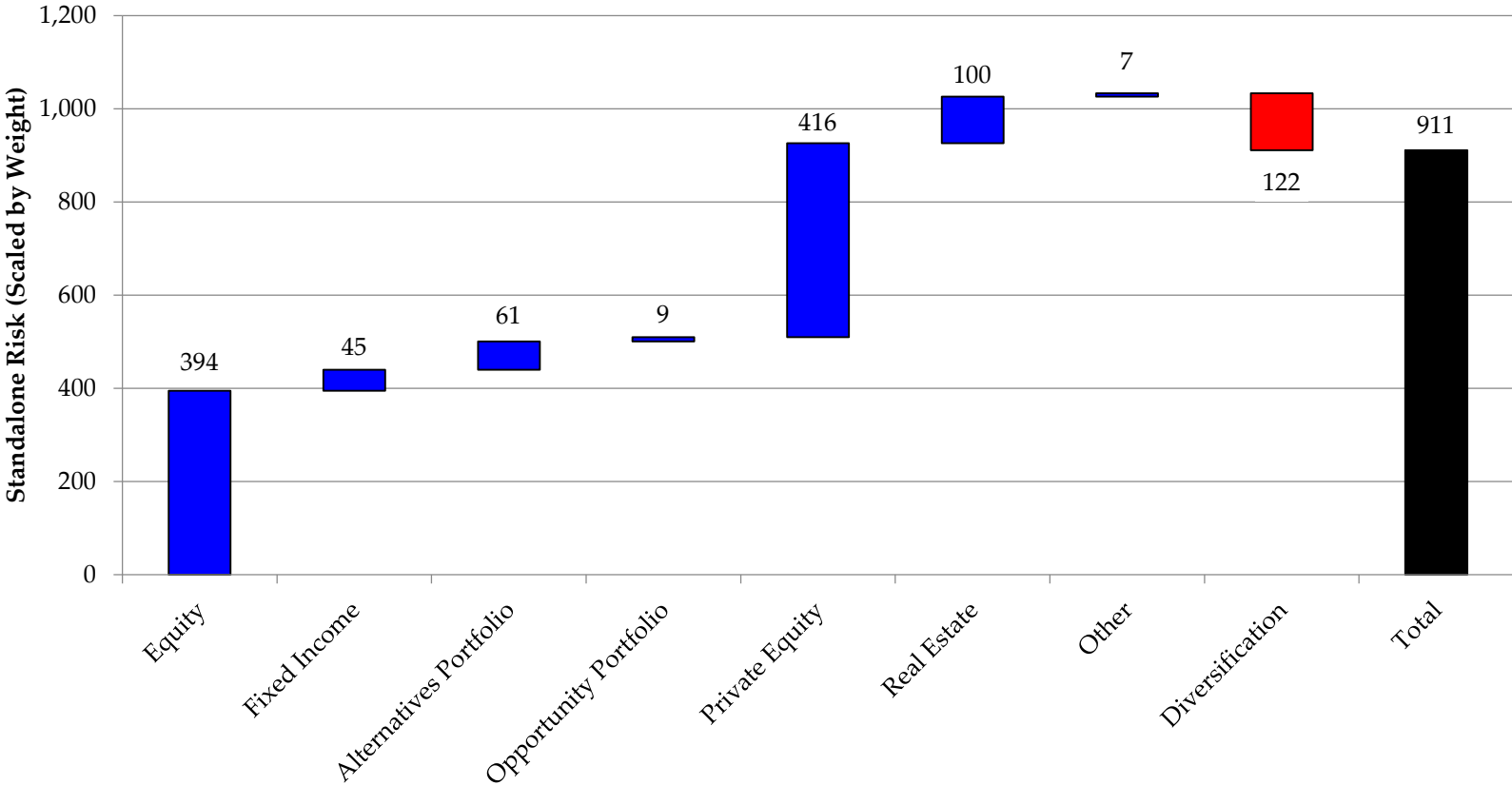
- Equity
- Fixed Income
- Alternatives Portfolio
- Opportunity Portfolio
- Private Equity
- Real Estate
- Cash
- Overlay

## RC % of Total



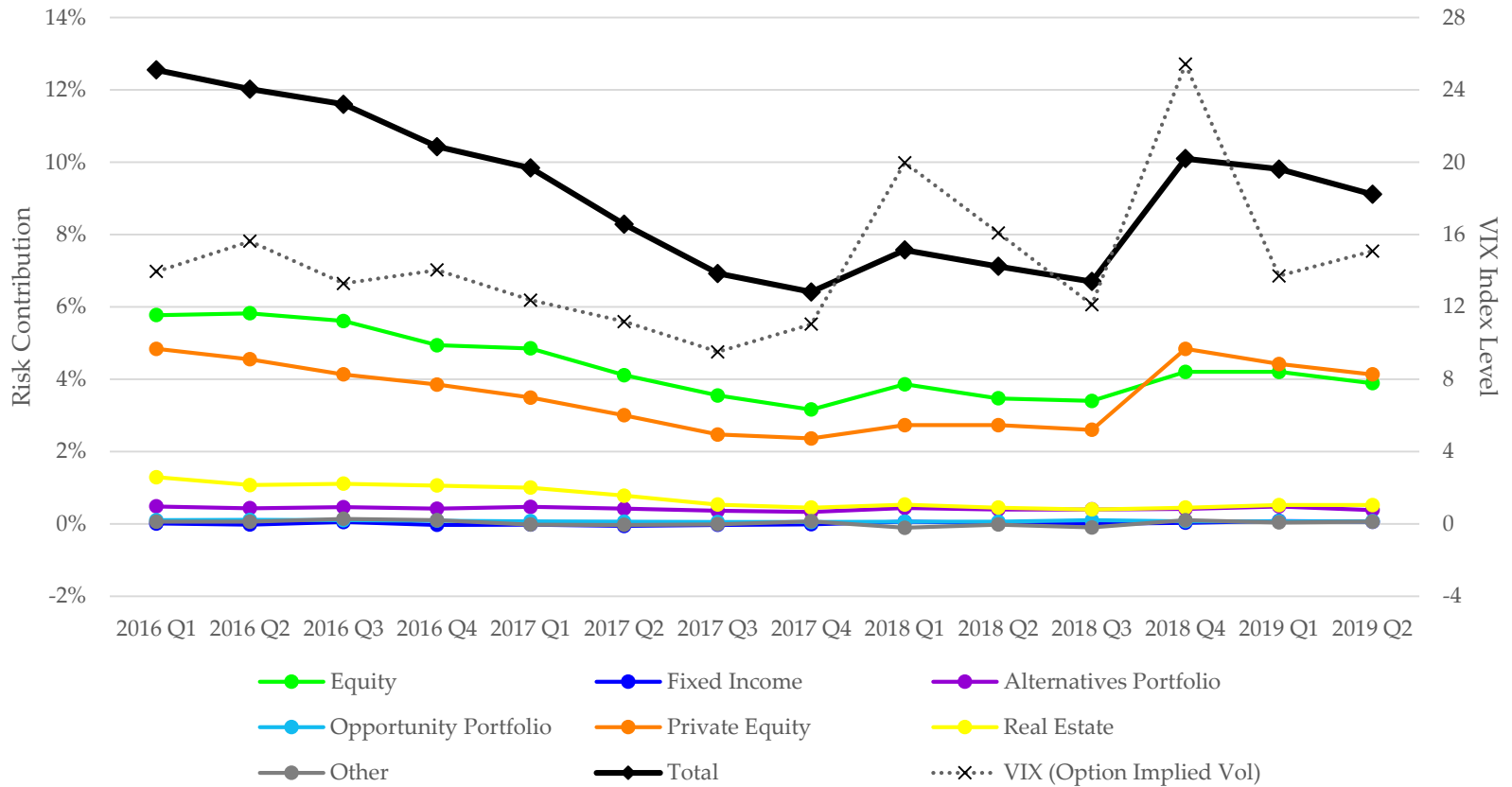
- Equity
- Fixed Income
- Alternatives Portfolio
- Opportunity Portfolio
- Private Equity
- Real Estate
- Cash
- Overlay

# Stand-alone Risk by Asset Class

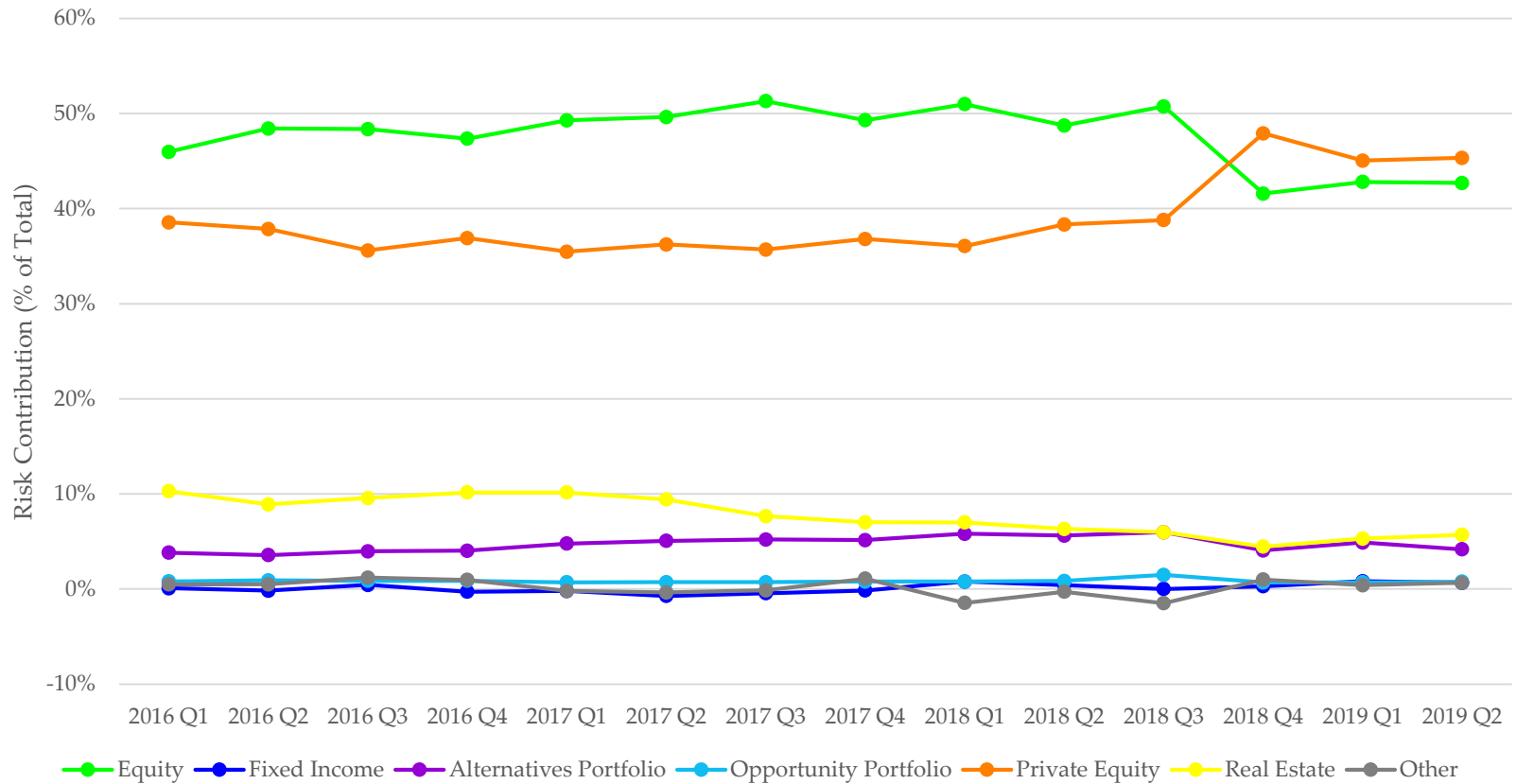




# 14-Quarter Risk Contribution Time Series



# 14-Quarter Risk Contribution Time Series



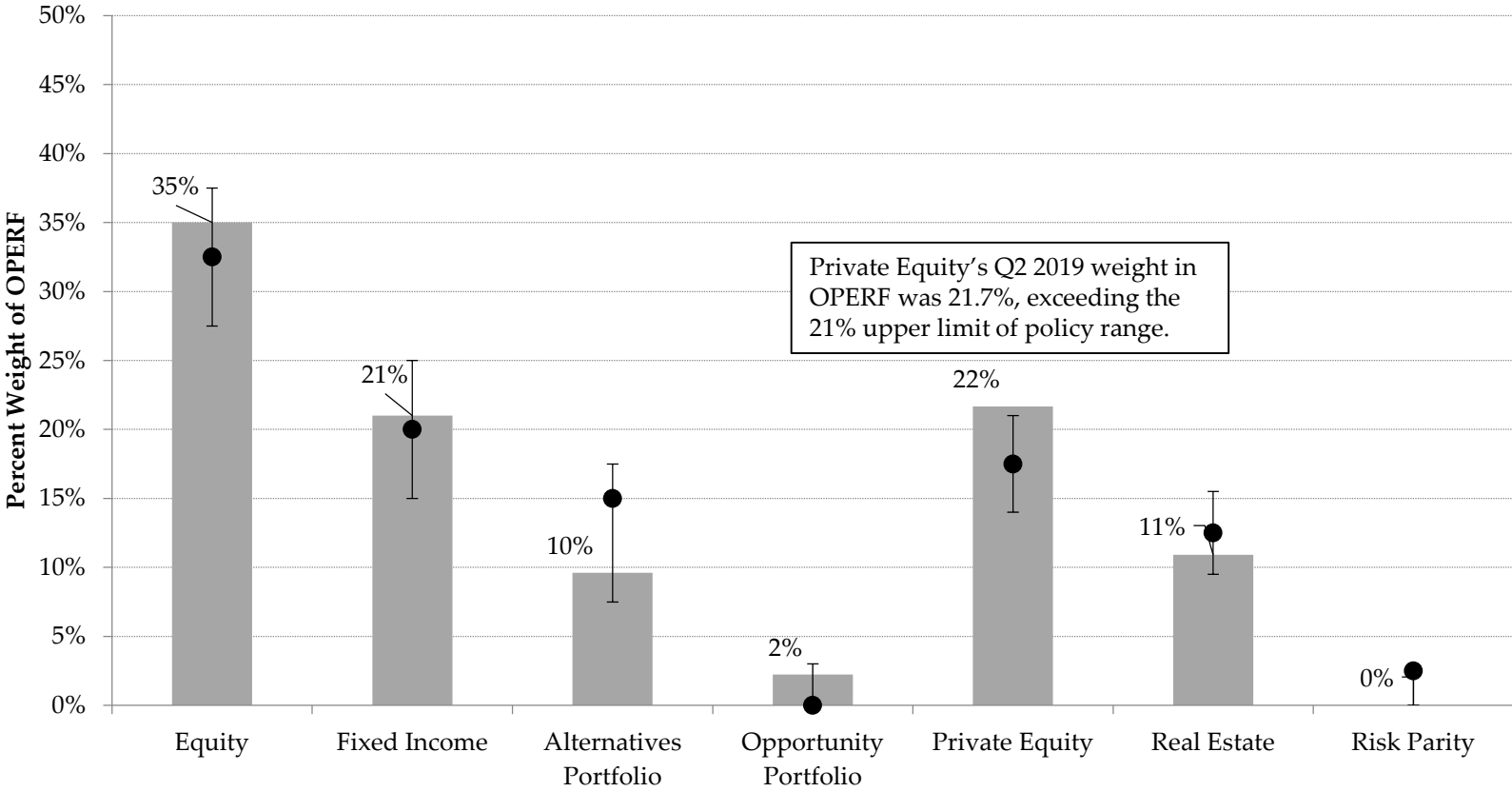
# Correlation Matrix by Asset Class

Expected Return	Expected Risk	Predicted Risk <sup>1</sup>	Jun 28, 2019	Equity	Fixed Income	Alternatives Portfolio	Opportunity Portfolio	Private Equity	Real Estate	OPERF
7.3%	18.8%	11.5%	Equity	1.00	0.04	0.55	0.68	0.95	0.41	0.98
3.8%	3.8%	2.2%	Fixed Income		1.00	0.19	0.06	0.04	0.31	0.14
7.0%	9.1%	6.0%	Alternatives Portfolio			1.00	0.47	0.55	0.34	0.62
		4.2%	Opportunity Portfolio				1.00	0.69	0.26	0.70
9.2%	26.3%	19.5%	Private Equity					1.00	0.40	0.98
7.0%	12.2%	9.1%	Real Estate						1.00	0.52
<b>7.3%</b>	<b>12.5%</b>	<b>9.1%</b>	<b>OPERF</b>							<b>1.00</b>

Capital Market Assumptions from Callan

<sup>1</sup> Ex-Ante, holdings-based correlations between asset classes as estimated by Aladdin

# OPERF Allocations



# Liquidity Report

Asset Class	Liquidity (\$M)				∞	Uncalled Commitment	Next 12 Months
	1 Week	1 Month	1 Quarter				
Cash & Overlay	1,268						
Public Equity	23,409	1,843	567	567			
Fixed Income	12,530	2,578					
Private Equity					16,517	-10,550	
Real Estate	607				7,692	-1,703	
Alternatives	1,069	1,245	985	4,033		-3,322	
Opportunity	354		236	1,115		-718	
Proj PERS Cash Flow							-3,600
<b>Total</b>	<b>39,238</b>	<b>5,666</b>	<b>1,789</b>	<b>29,924</b>		<b>-16,292</b>	<b>-3,600</b>

*Public Equity - 1 Month = AQR 130/30, Arrowstreet 130/30, & Callan US Micro Cap Value portfolios*

*Public Equity - 1 Quarter = 50% Lazard Closed-End Fund portfolio*

*Public Equity - ∞ = 50% Lazard Closed-End Fund portfolio*

*Fixed Income - 1 Month = Below Investment Grade*

*Real Estate - 1 Week = REIT composite*

Table periods approximate the time required to liquidate different OPERF allocations.

# Top 10 Exposures by Investment Firm

Rank	Asset Manager	Mkt Val (\$mm)	Mkt Val Weight	Asset Class
1	Internally-Managed	14,235	18.6%	Cash, Fixed Income, Public Equity
2	Dimensional Fund Advisors	4,778	6.2%	Public Equity
3	AQR	3,261	4.3%	Alternatives, Public Equity
4	KKR	3,011	3.9%	Fixed Income, Private Equity
5	Arrowstreet Capital	2,849	3.7%	Public Equity
6	AllianceBernstein	2,357	3.1%	Fixed Income, Public Equity
7	BlackRock	2,227	2.9%	Alternatives, Fixed Income
8	Lazard	1,960	2.6%	Public Equity
9	Western Asset Management Co	1,789	2.3%	Fixed Income
10	Wellington	1,759	2.3%	Fixed Income

# Expanded Correlation Matrix

- Aladdin estimates risk for every investment held by OPERF.
  - Staff has a higher degree of confidence in risk estimates for publicly-traded securities in separate accounts (i.e., most of Capital Markets and REITs) as the risk model is “trained” using daily returns of individual securities.
  - Illiquid investments without frequent pricing (i.e., most of the investments comprising the Alternatives Program) are proxied.
- While an overly-granular analysis may be noisy, looking below the asset class level to OPERF’s “sleeve-level” exposures may be informative.

# Expanded Correlation Matrix

Correlation																					
	Actual Weight	Target Weight	Risk Contrib	OPERF	Alternative Program	Alternative Portfolio	Diversifying Strategies	Real Assets	Opportunity Portfolio	Private Equity Portfolio	Real Estate Portfolio	Private Real Estate	REITS	Capital Markets	Public Equity Portfolio	Fixed Income Portfolio	Core	Below Investment Grade	U.S. Treasurys	Cash	Overlay
OPERF	100.0%	100.0%	911	1.00	0.99	0.62	-0.15	0.70	0.70	0.98	0.52	0.48	0.76	0.98	0.98	0.14	0.05	0.60	-0.17	-0.15	0.94
Alternative Program	44.4%	45.0%	509	1.00	0.64	-0.14	0.72	0.69	0.98	0.57	0.53	0.78	0.94	0.93	0.12	0.02	0.62	-0.18	-0.17	0.90	
Alternative Portfolio	9.6%	15.0%	38		1.00	0.28	0.91	0.47	0.55	0.34	0.31	0.46	0.57	0.55	0.19	0.12	0.51	-0.07	-0.17	0.54	
Diversifying Strategies	4.2%	7.5%	-4			1.00	-0.15	-0.27	-0.20	0.00	0.02	-0.10	-0.17	-0.18	0.05	0.09	-0.26	0.16	0.10	-0.13	
Real Assets	5.4%	7.5%	42				1.00	0.60	0.65	0.34	0.31	0.52	0.66	0.65	0.18	0.08	0.64	-0.14	-0.22	0.61	
Opportunity Portfolio	2.2%	0.0%	7					1.00	0.69	0.26	0.23	0.47	0.68	0.68	0.06	-0.05	0.71	-0.28	-0.25	0.59	
Private Equity Portfolio	21.7%	17.5%	413						1.00	0.40	0.36	0.70	0.94	0.95	0.04	-0.05	0.60	-0.25	-0.22	0.89	
Real Estate Portfolio	10.9%	12.5%	52							1.00	1.00	0.72	0.44	0.41	0.31	0.25	0.27	0.18	0.19	0.50	
Private Real Estate	10.1%	11.9%	44								1.00	0.67	0.40	0.37	0.31	0.25	0.24	0.19	0.20	0.46	
REITS	0.8%	0.6%	7									1.00	0.71	0.69	0.23	0.16	0.40	0.03	0.05	0.75	
Capital Markets	54.4%	55.0%	394										1.00	0.99	0.15	0.08	0.57	-0.15	-0.12	0.96	
Public Equity Portfolio	34.6%	32.5%	389											1.00	0.04	-0.03	0.57	-0.25	-0.21	0.93	
Fixed Income Portfolio	19.9%	20.0%	6												1.00	0.97	0.04	0.90	0.77	0.35	
Core	9.2%	9.2%	1													1.00	-0.17	0.94	0.82	0.30	
Below Investment Grade	3.4%	3.4%	9														1.00	-0.38	-0.37	0.43	
U.S. Treasurys	7.2%	7.4%	-4															1.00	0.87	0.10	
Cash	1.0%		0																	1.00	0.12
Overlay	0.2%		7																		1.00



# Diversifying Strategies & U.S. Treasury Sleeves

Both of these sleeve-level exposures diversify OPERF's predicted risk (i.e., they both exhibit low to negative correlation & negative risk contribution).

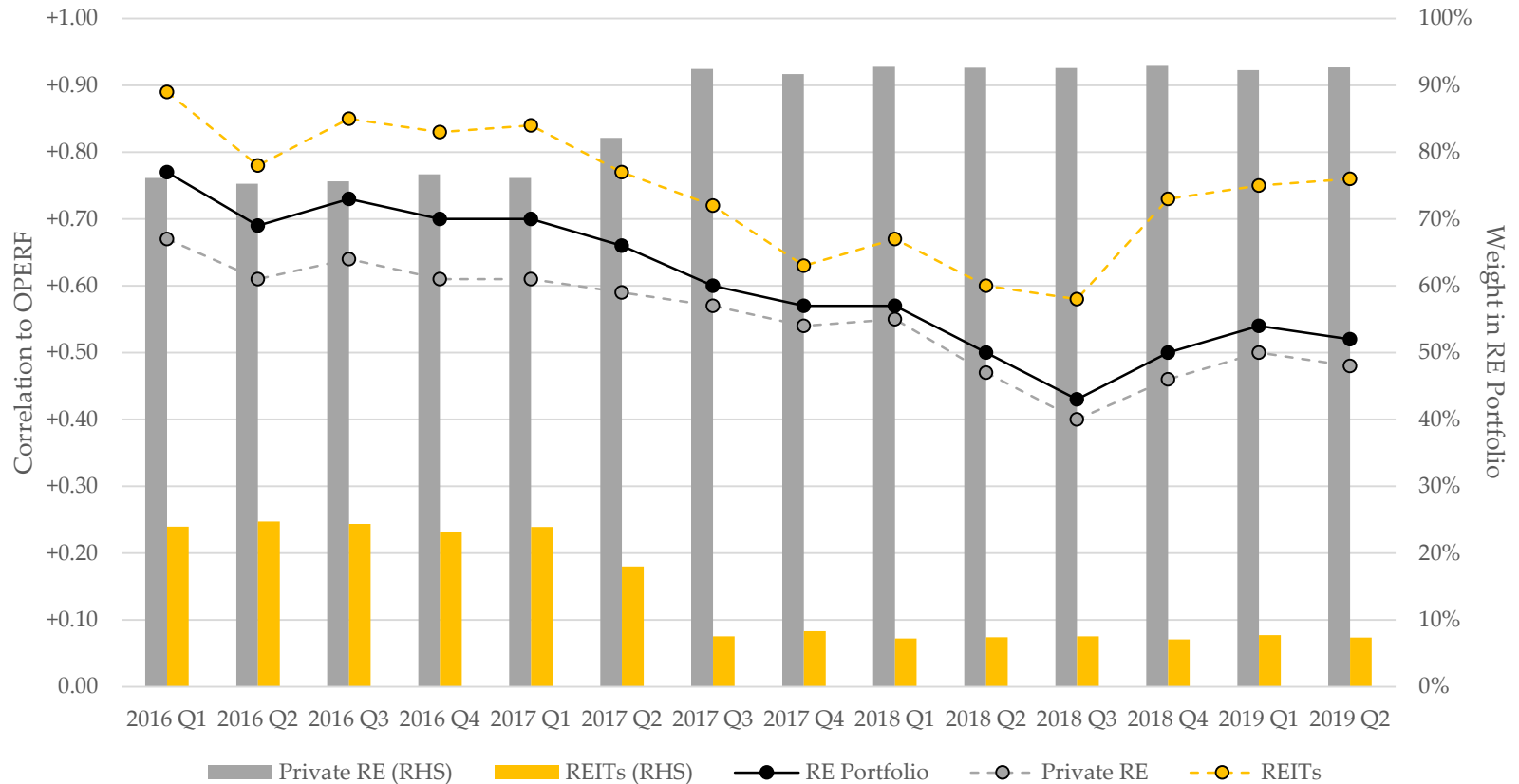
				Correlation																		
	Actual Weight	Target Weight	Risk Contrib	OPERF	Alternative Program	Alternative Portfolio	Diversifying Strategies	Real Assets	Opportunity Portfolio	Private Equity Portfolio	Real Estate Portfolio	Private Real Estate	REITS	Capital Markets	Public Equity Portfolio	Fixed Income Portfolio	Core	Below Investment Grade	U.S. Treasuries	Cash	Overlay	
<b>OPERF</b>	<b>100.0%</b>	<b>100.0%</b>	<b>911</b>	1.00	0.99	0.62	-0.15	0.70	0.70	0.98	0.52	0.48	0.76	0.98	0.98	0.14	0.05	0.60	-0.17	-0.15	0.94	
Alternative Program	44.4%	45.0%	509	1.00	1.00	0.64	-0.14	0.72	0.69	0.98	0.57	0.53	0.78	0.94	0.93	0.12	0.02	0.62	-0.18	-0.17	0.90	
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Private Real Estate	10.1%	11.9%	44									1.00	0.67	0.40	0.37	0.31	0.25	0.24	0.19	0.20	0.46	
REITS	0.8%	0.6%	7										1.00	0.71	0.69	0.23	0.16	0.40	0.03	0.05	0.75	
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# Real Estate Portfolio

				Correlation																	
	Actual Weight	Target Weight	Risk Contrib	OPERF	Alternative Program	Alternative Portfolio	Diversifying Strategies	Real Assets	Opportunity Portfolio	Private Equity Portfolio	Real Estate Portfolio	Private Real Estate	REITS	Capital Markets	Public Equity Portfolio	Fixed Income Portfolio	Core	Below Investment Grade	U.S. Treasurys	Cash	Overlay
<b>OPERF</b>	<b>100.0%</b>	<b>100.0%</b>	<b>911</b>	1.00	0.99	0.62	-0.15	0.70	0.70	0.98	0.52	0.48	0.76	0.98	0.98	0.14	0.05	0.60	-0.17	-0.15	0.94
Alternative Program	44.4%	45.0%	509	1.00	0.64	-0.14	0.72	0.69	0.98	0.57	0.53	0.78	0.94	0.93	0.12	0.02	0.62	-0.18	-0.17	0.90	
Alternative Portfolio	9.6%	15.0%	38		1.00	0.28	0.91	0.47	0.55	0.34	0.31	0.46	0.57	0.55	0.19	0.12	0.51	-0.07	-0.17	0.54	
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<b>Real Estate Portfolio</b>	<b>10.9%</b>	<b>12.5%</b>	<b>52</b>							<b>1.00</b>	<b>1.00</b>	<b>0.72</b>	<b>0.44</b>	<b>0.41</b>	<b>0.31</b>	<b>0.25</b>	<b>0.27</b>	<b>0.18</b>	0.19	0.50	
Private Real Estate	10.1%	11.9%	44								<b>1.00</b>	<b>0.67</b>	<b>0.40</b>	<b>0.37</b>	<b>0.31</b>	<b>0.25</b>	<b>0.24</b>	<b>0.19</b>	0.20	0.46	
REITS	0.8%	0.6%	7									<b>1.00</b>	<b>0.71</b>	<b>0.69</b>	<b>0.23</b>	<b>0.16</b>	<b>0.40</b>	0.03	0.05	0.75	
Capital Markets	54.4%	55.0%	394										<b>1.00</b>	<b>0.99</b>	<b>0.15</b>	<b>0.08</b>	<b>0.57</b>	<b>-0.15</b>	<b>-0.12</b>	<b>0.96</b>	
Public Equity Portfolio	34.6%	32.5%	389											<b>1.00</b>	<b>0.04</b>	<b>-0.03</b>	<b>0.57</b>	<b>-0.25</b>	<b>-0.21</b>	<b>0.93</b>	
Fixed Income Portfolio	19.9%	20.0%	6												<b>1.00</b>	<b>0.97</b>	<b>0.04</b>	<b>0.90</b>	<b>0.77</b>	<b>0.35</b>	
Core	9.2%	9.2%	1													<b>1.00</b>	<b>-0.17</b>	<b>0.94</b>	<b>0.82</b>	<b>0.30</b>	
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Cash	1.0%		0																<b>1.00</b>	<b>0.12</b>	
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The Real Estate portfolio has become a better diversifier.

# 14-Quarter Real Estate Portfolio Time Series



The Real Estate portfolio's estimated correlation to OPERF declined due to:

1. a declining correlation between private Real Estate and OPERF; and
2. a lower allocation to REITs.

# Below Investment Grade Sleeve

				Correlation																		
	Actual Weight	Target Weight	Risk Contrib	OPERF	Alternative Program	Alternative Portfolio	Diversifying Strategies	Real Assets	Opportunity Portfolio	Private Equity Portfolio	Real Estate Portfolio	Private Real Estate	REITS	Capital Markets	Public Equity Portfolio	Fixed Income Portfolio	Core	Below Investment Grade	U.S. Treasurys	Cash	Overlay	
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Cash	1.0%		0																1.00	0.12		
Overlay	0.2%		7																	1.00		

Preview of coming attractions: the Below Investment Grade sleeve is much more correlated to OPERF than the overall Fixed Income Portfolio.



# OREGON STATE TREASURY

Tobias Read  
Oregon State Treasurer

350 Winter St NE, Suite 100  
Salem, OR 97301-3896

[oregon.gov/treasury](https://oregon.gov/treasury)

TAB 5 – Annual Cost & Implementation Analysis

*OPERF*

# CEM Investment Benchmarking Analysis for: Oregon Public Employees Retirement Fund

# Key takeaways

## Returns

- Your 5-year net total return was 6.3%. This was above the U.S. Public median of 5.4% and above the peer median of 5.6%.
- Your 5-year policy return was 6.3%. This was above the U.S. Public median of 5.3% and above the peer median of 5.7%.

## Value added

- Your 5-year net value added was 0.0%. This was equal to the U.S. Public median of 0.0% and equal to the peer median of 0.0%.

## Cost

- Your investment cost of 76.4 bps was close to your benchmark cost of 77.6 bps. This suggests that your fund was normal cost compared to your peers.
- Your fund was normal cost because you paid less than peers for similar services. These savings were mostly offset by your higher cost implementation style.

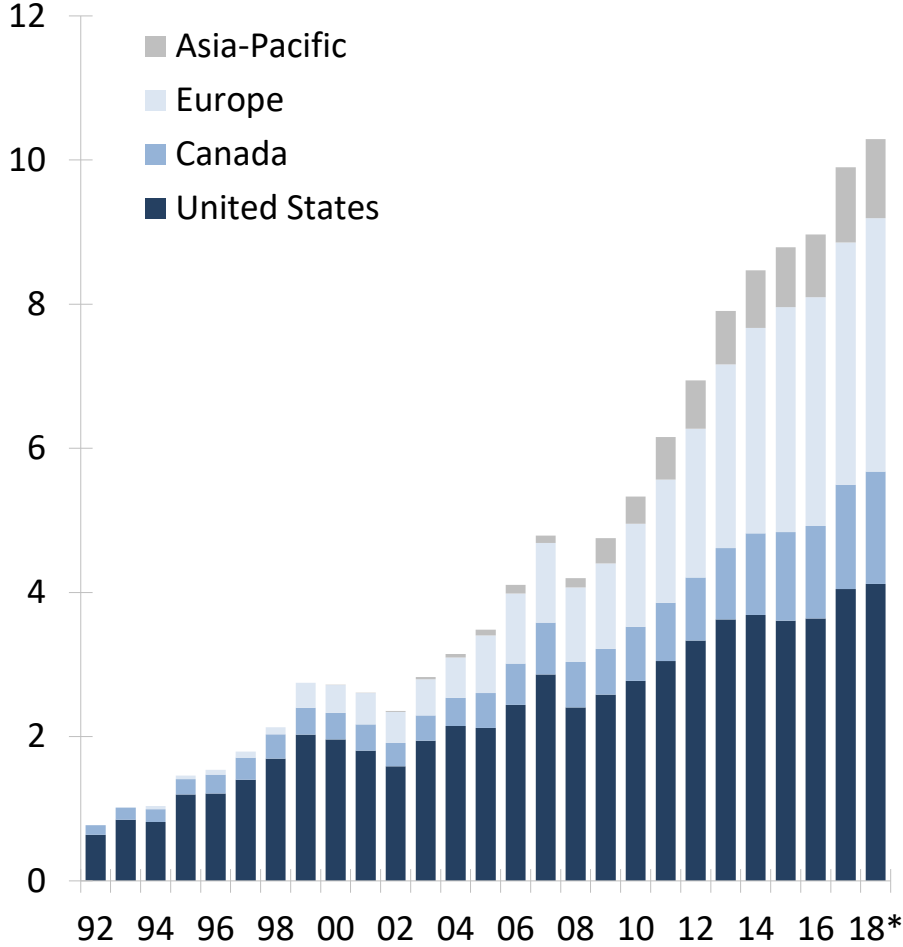


# This benchmarking report compares your cost and return performance to the 289 funds in CEM's extensive pension database.

- 149 U.S. pension funds participate. The median U.S. fund had assets of \$10.4 billion and the average U.S. fund had assets of \$24.0 billion. Total participating U.S. assets were \$3.6 trillion.
- 76 Canadian funds participate with assets totaling \$1.5 trillion.
- 57 European funds participate with aggregate assets of \$3.1 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- 5 Asia-Pacific funds participate with aggregate assets of \$696.3 trillion. Included are funds from Australia, New Zealand, China and South Korea.
- 3 Gulf region funds participate.

The most meaningful comparisons for your returns and value added are to the U.S. Public universe of 51 funds.

Participating assets (\$ trillions)

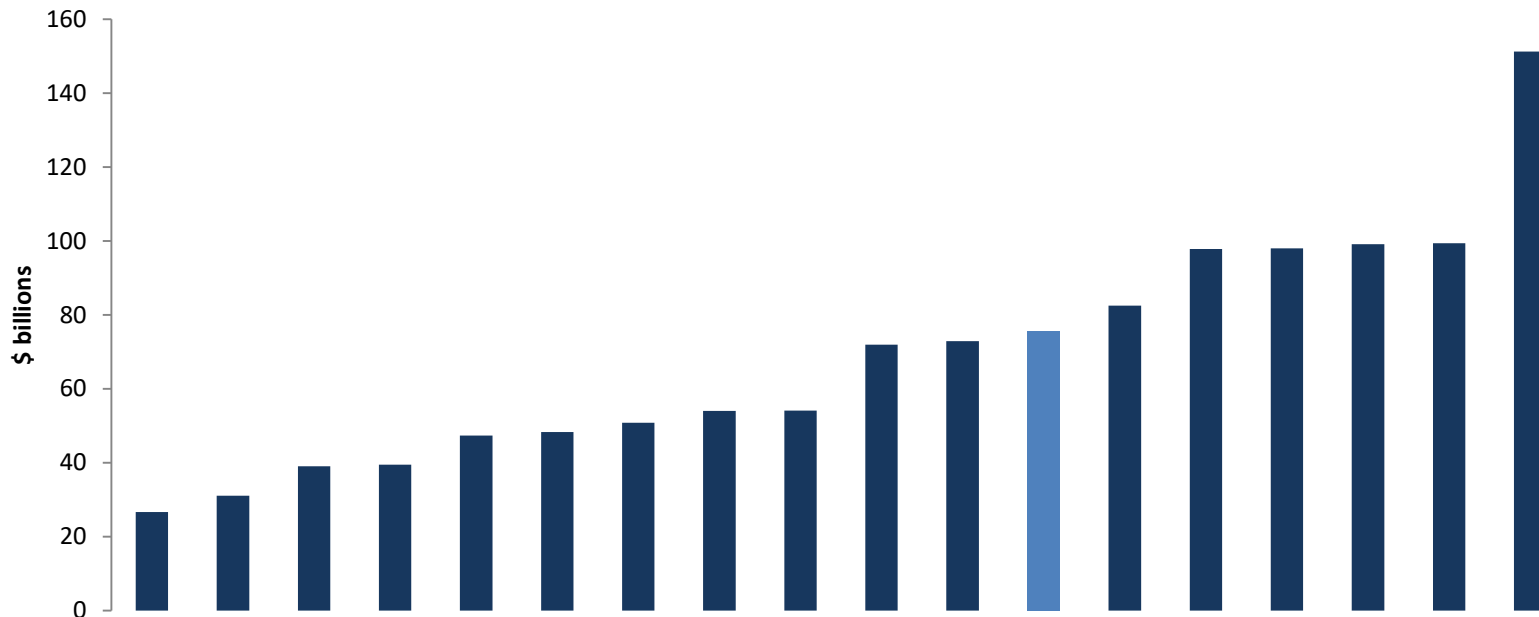


\*2018 assets includes both received and expected data.

# The most valuable comparisons for cost performance are to your custom peer group because size impacts costs.

## Peer group for Oregon Public Employees Retirement Fund

- 18 U.S. Public sponsors from \$26.6 billion to \$151.2 billion
- Median size of \$63.0 billion versus your \$75.6 billion



To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document.

## What gets measured gets managed, so it is critical that you measure and compare the right things:

### 1. Returns

Why do total returns differ from other funds? What was the impact of your policy mix decisions versus implementation decisions?

### 2. Net value added

Are your implementation decisions adding value (i.e., mostly the effectiveness of active management, as well as the amount of active management versus passive management)?

### 3. Costs

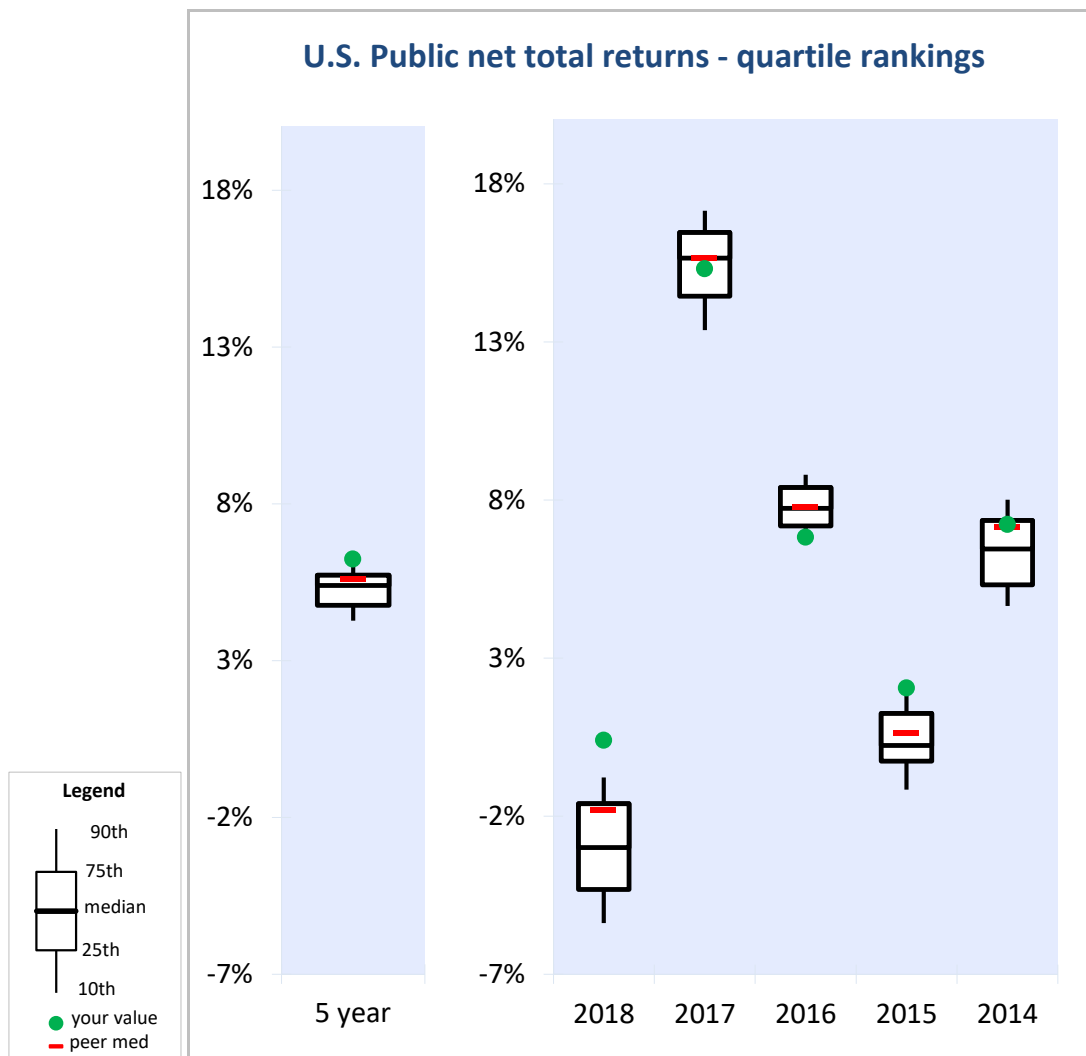
Are your costs reasonable? Costs matter and can be managed.

## Your 5-year net total return of 6.3% was above both the U.S. Public median of 5.4% and the peer median of 5.6%.

Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	Your 5-year
Net total fund return	6.3%
- Policy return	6.3%
= Net value added	0.0%

This approach enables you to understand the contribution from both policy mix decisions (which tend to be the board's responsibility) and implementation decisions (which tend to be management's responsibility).



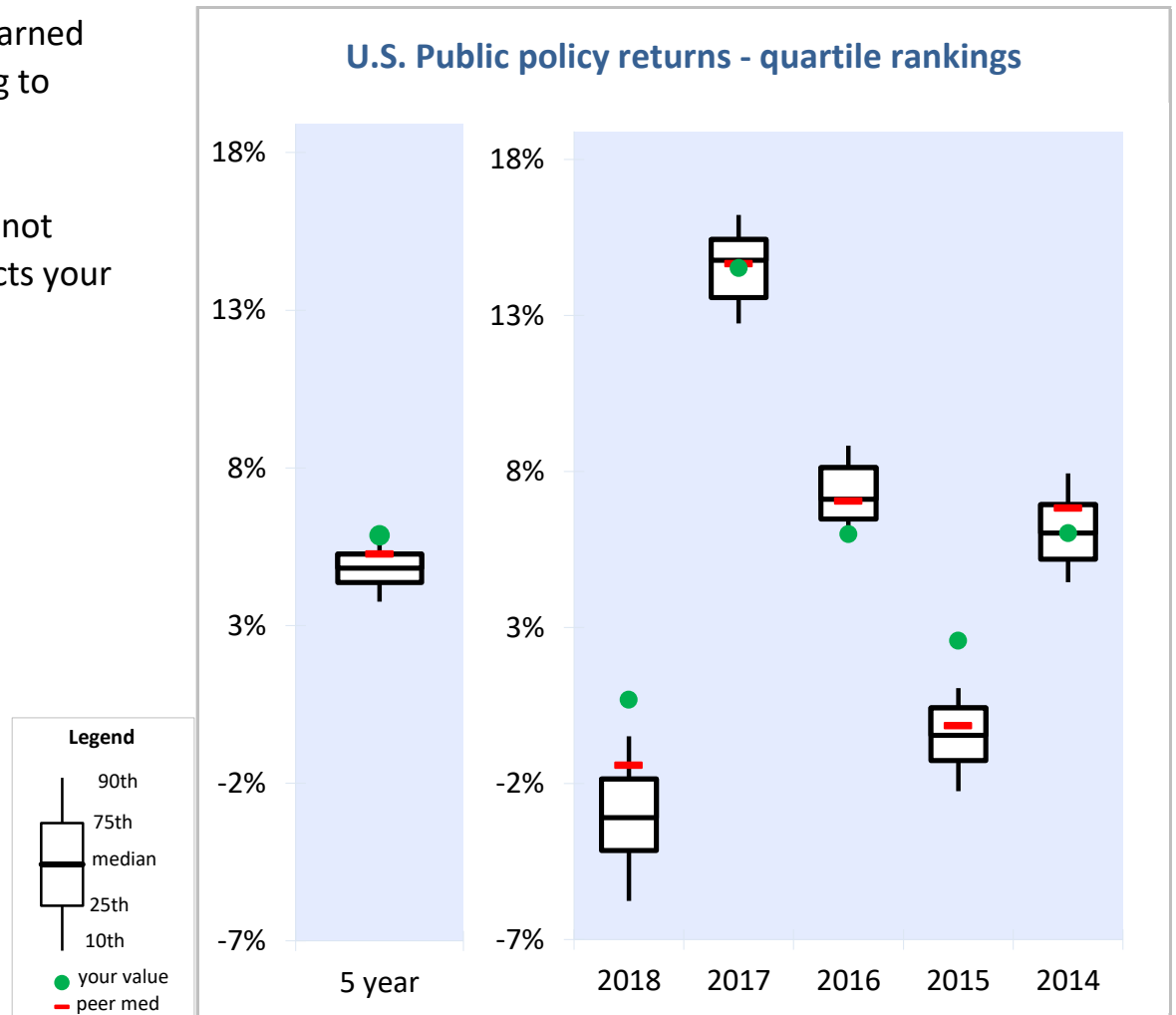
## Your 5-year policy return of 6.3% was above both the U.S. Public median of 5.3% and the peer median of 5.7%.

Your policy return is the return you could have earned passively by indexing your investments according to your policy mix.

Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

- Long term capital market expectations
- Liabilities
- Appetite for risk

Each of these three factors is different across funds. Therefore, it is not surprising that policy returns often vary widely between funds.



To enable fairer comparisons, the policy returns of all participants, including your fund, were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Prior to this adjustment, your 5-year policy return was 7.0%, 0.7% higher than your adjusted 5-year policy return of 6.3%. Mirroring this, your 5-year total fund net value added would be 0.7% lower.

## Your 5-year policy return of 6.3% was above the U.S. Public median of 5.3% primarily because of:

- Your higher relative weight in two of the best performing asset classes of the past 5 years: Real Estate (your 13% versus the U.S. Public 5-year average of 8%) and Private Equity (your 20% versus the U.S. Public 5-year average of 9%).

### 5-year average policy mix<sup>1</sup>

	Your Fund	U.S. Public Avg.	More/ Less
Stock	40%	50%	-10%
Fixed Income	23%	25%	-3%
Real Estate	13%	8%	4%
Alternatives <sup>1</sup>	5%	7%	-2%
Private Equity	20%	9%	10%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>0%</b>

1. Alternatives includes other diversifying strategies, commodities, natural resources and infrastructure.

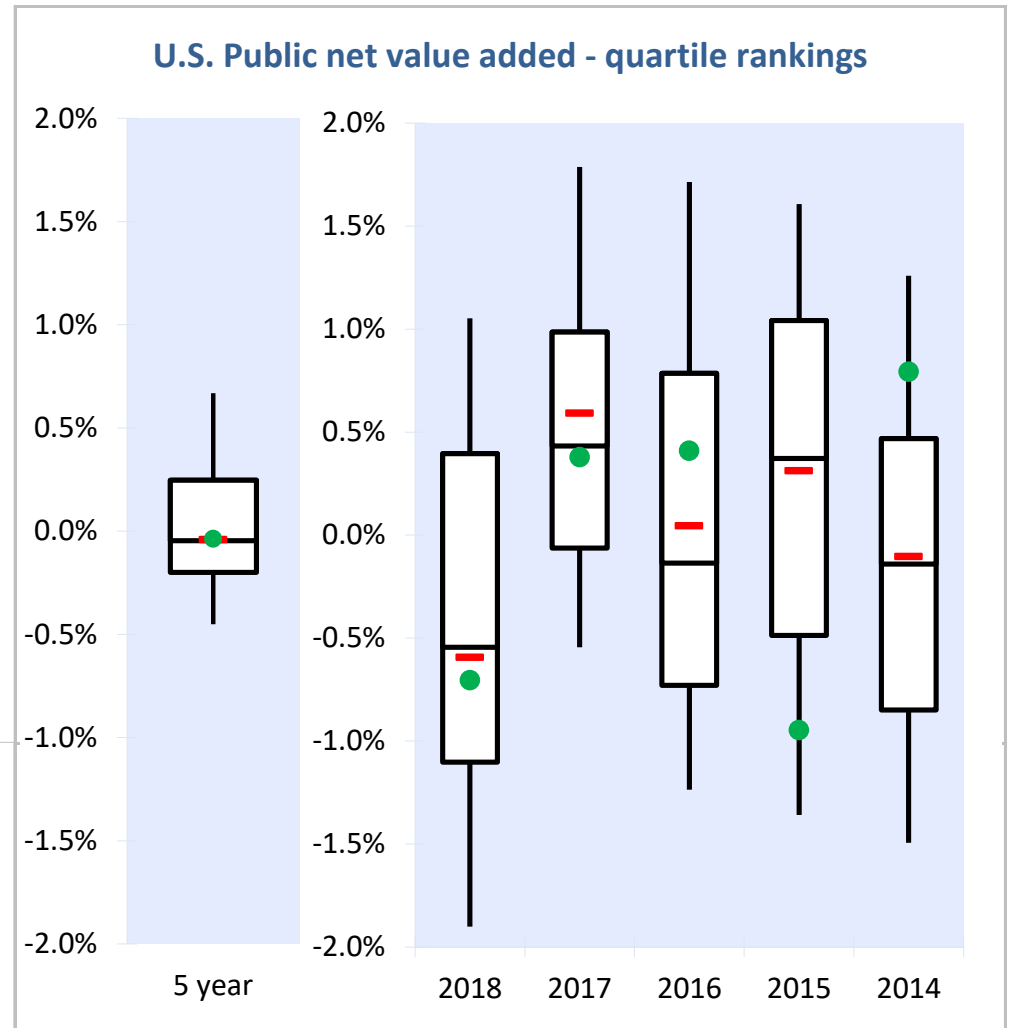
# Net value added is the component of total return from active management. Your 5-year net value added was 0.0%.

Net value added equals total net return minus policy return.

## Value added for Oregon Public Employees Retirement Fund

Year	Net Return	Policy Return	Net value Added
2018	0.4%	1.1%	-0.7%
2017	15.4%	15.0%	0.4%
2016	6.9%	6.5%	0.4%
2015	2.1%	3.0%	-0.9%
2014	7.3%	6.5%	0.8%
5-Year	6.3%	6.3%	0.0%

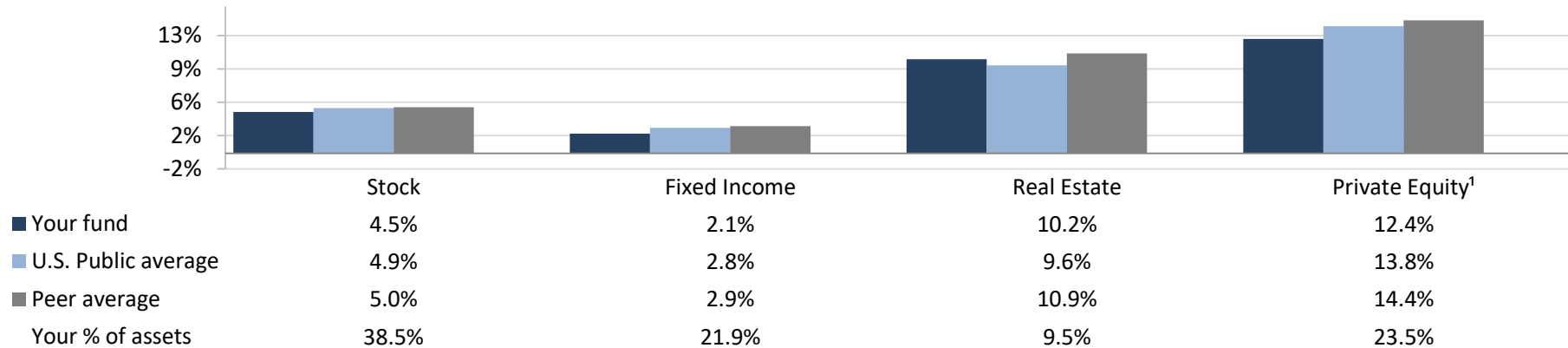
Your 5-year net value added of 0.0% compares to a median of 0.0% for your peers and 0.0% for the U.S. Public universe.



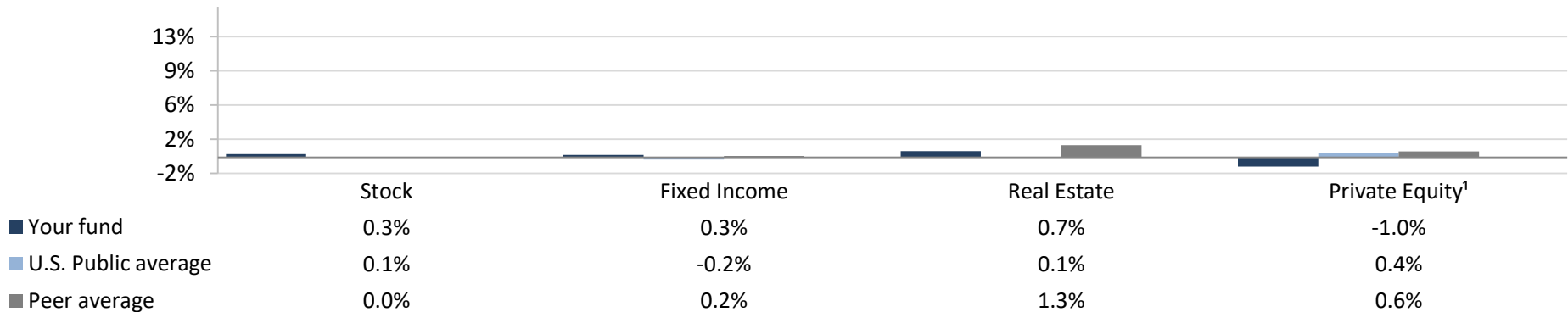
To enable fairer comparisons, the value added for each participant including your fund was adjusted to reflect private equity benchmarks based on investable public market indices. Prior to this adjustment, your fund's 5-year total fund net value added was -0.7%.

# Comparisons of your 5-year net return and net value added by major asset class.

## 5-year average net return by major asset class



## 5-year average net value added by major asset class



1. To enable fairer comparisons, the private equity benchmarks of all participants, including your fund were adjusted to reflect lagged, investable, public-market indices. Prior to this adjustment, your fund's 5-year private equity net value added was -4.4%.



## Your investment costs were \$577.7 million or 76.4 basis points in 2018.

Asset management costs by asset class and style (\$000s)	Internal Management			External Mgmt		Total
	Passive	Active	Overseeing of external	Passive fees	Active base fees	
Stock	2,071		3,636		72,214	77,922
Fixed Income	1,034	544	3,358		18,919	23,854
Real Estate			4,569		62,645	67,214
Alternatives*			4,617		62,240	66,857
Private Equity <sup>1 2</sup>			6,824		329,007	335,831
Derivatives/Overlays			665	775	1,300	2,740
Total excluding private asset performance fees						574,419 75.9bp
<b>Oversight, custodial and other costs</b>						
Oversight & consulting						2,097
Trustee & custodial						141
Audit						366
Other						687
Total oversight, custodial & other costs						3,291 0.4bp
Total investment costs (excl. transaction costs & private asset performance fees) <sup>3</sup>						577,710 76.4bp

### Footnotes

1. Fees are the weighted average management cost calculated using the detailed limited partnership survey provided.

2. Default underlying costs were added: Diversified Private Equity - FoFs 156 bp. Refer to Appendix A for full details regarding defaults.

3. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees. Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity.

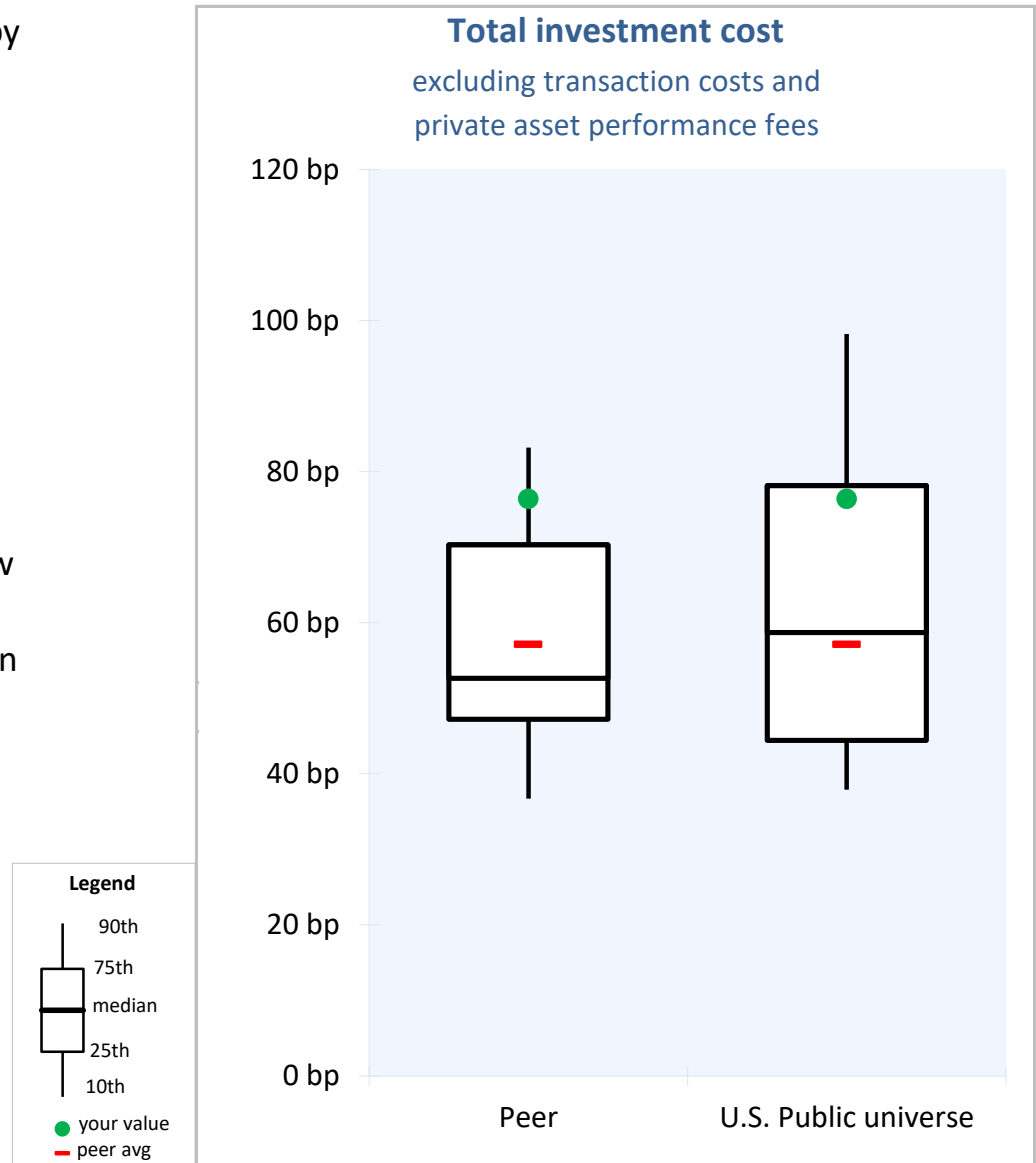
\*Alternatives includes other diversifying strategies, commodities, natural resources and infrastructure.

## Your total investment cost of 76.4 bps was above the peer median of 52.7 bps.

Differences in total investment cost are often caused by two factors that are often outside of management's control:

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl. REITS), infrastructure, hedge funds and private equity. These high cost assets equaled 37% of your funds assets at the end of 2018 versus a peer average of 27%.
- Fund size. Bigger funds have advantages of scale.

Therefore, to assess whether your costs are high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. This analysis is shown on the following page.



## Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was normal cost in 2018.

Your benchmark cost is an estimate of what your cost would be given your actual asset mix and the median costs that your peers pay for similar services. It represents the cost your peers would incur if they had your actual asset mix.

Your total cost of 76.4 bp was close to your benchmark cost of 77.6 bp. Thus, your cost savings were 1.2 bp.

### Your cost versus benchmark

	\$000s	basis points
Your total investment cost	577,710	76.4 bp
Your benchmark cost	587,146	77.6 bp
Your excess cost	(9,436)	(1.2) bp

## Your fund was normal cost because you paid less than peers for similar services. These savings were mostly offset by your higher cost implementation style.

### Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Higher cost implementation style		
• More active management, less lower cost passive	14,405	1.9
• More external management vs. lower cost internal	18,144	2.4
• Less partnerships as a percentage of external	(359)	(0.0)
• Less fund of funds	(10,475)	(1.4)
• Less co-investment as a percentage of LP/CO	8,386	1.1
• More overlays	800	0.1
	<u>30,902</u>	<u>4.1</u>
2. Paying less than peers for similar services		
• External investment management costs	(37,068)	(4.9)
• Internal investment management costs	1,053	0.1
• Oversight, custodial & other costs	(4,322)	(0.6)
	<u>(40,338)</u>	<u>(5.3)</u>
<b>Total savings</b>	<b>(9,436)</b>	<b>(1.2)</b>

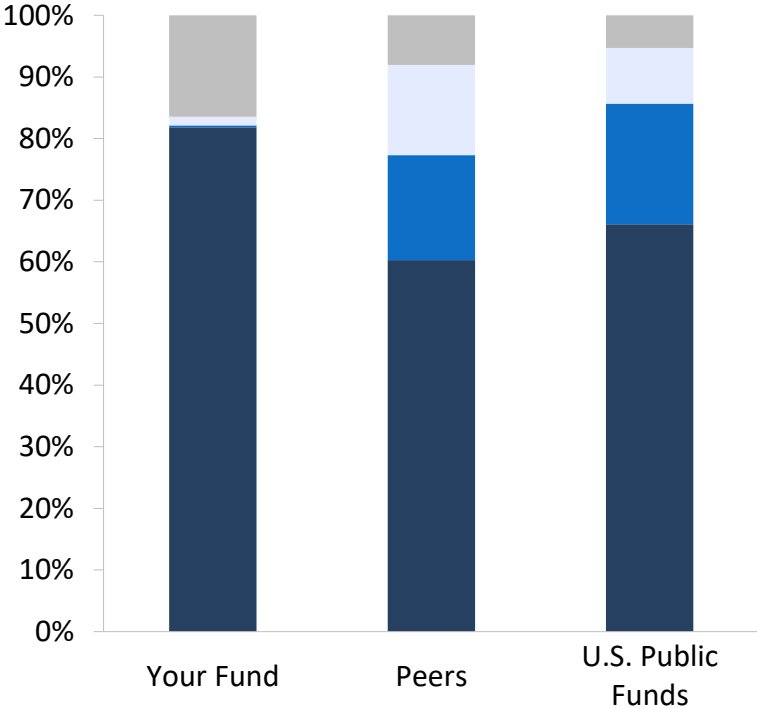
# Differences in cost performance are often caused by differences in implementation style.

Implementation style is defined as the way in which your fund implements asset allocation. It includes internal, external, active, passive and fund of funds styles.

The greatest cost impact is usually caused by differences in the use of:

- External active management because it tends to be much more expensive than internal or passive management. You used more external active management than your peers (your 82% versus 60% for your peers).
- Within external active holdings, fund of funds usage because it is more expensive than direct fund investment. You had similar amounts in fund of funds. Your 4% of hedge funds, real estate and private equity in fund of funds compared to 7% for your peers.

Implementation style<sup>1</sup>



■ Internal passive	16%	8%	5%
■ Internal active	1%	15%	9%
■ External passive	0%	17%	20%
■ External active	82%	60%	66%

1. The graph above does not take into consideration the impact of derivatives. The values in the graph above are calculated using average holdings.

## Summary of why you are high/low cost relative to the peer-median by asset category

### Why are you high/(low) cost by asset class?

Asset class/category	Due to impl. Style \$000s	Due to paying more/(less) \$000s	Total \$000s	Total bps
Stock	21,087	(10,696)	10,390	3.7
Fixed Income	6,956	7,806	14,762	10.5
Real Estate	4,496	3,429	7,925	9.6
Alternatives <sup>1</sup>	(19)	(5,059)	(5,078)	-5.2
Private Equity	(2,419)	(31,495)	(33,914)	-15.0
Derivative programs	800	0	800	0.1
Oversight, custodial & other	n/a	(4,322)	(4,322)	-0.6
<b>Total</b>	<b>30,902</b>	<b>(40,338)</b>	<b>(9,436)</b>	<b>-1.2</b>

1. Alternatives include other diversifying strategies, natural resources and infrastructure.

# Summary of key takeaways

## Returns

- Your 5-year net total return was 6.3%. This was above the U.S. Public median of 5.4% and above the peer median of 5.6%.
- Your 5-year policy return was 6.3%. This was above the U.S. Public median of 5.3% and above the peer median of 5.7%.

## Value added

- Your 5-year net value added was 0.0%. This was equal to the U.S. Public median of 0.0% and equal to the peer median of 0.0%.

## Cost

- Your investment cost of 76.4 bps was close to your benchmark cost of 77.6 bps. This suggests that your fund was normal cost compared to your peers.
- Your fund was normal cost because you paid less than peers for similar services. These savings were mostly offset by your higher cost implementation style.

## TAB 6 – Oregon Savings Growth Plan

*Annual Review and Update*





**OREGON  
STATE  
TREASURY**

**Tobias Read**  
State Treasurer

**Michael Kaplan**  
Deputy State Treasurer

Date: September 9, 2019

To: Oregon Investment Council

From: Wil Hiles, Investment Officer  
Michael Viteri, Senior Investment Officer  
Jennifer Peet, Corporate Governance Director

Re: *Deferred Compensation Program, 2nd Quarter 2019 Report*

### **Background**

The Oregon Savings Growth Plan (the “Plan” or “OSGP”) is the State of Oregon’s 457 Deferred Compensation plan. OSGP is a voluntary supplemental retirement plan that provides eligible state and local government employees the opportunity to defer a portion of their current salary on a pre-tax or after-tax (Roth) basis. These deferrals are invested in various investment options until participants draw funds at retirement. The Plan offers an array of equity and fixed income investment options, a suite of target-date retirement funds, which in aggregate constitute a single investment option, and a self-directed brokerage option. As of June 30, 2019, plan assets totaled \$2.33 billion from over 30,000 participants.

With support and assistance from the Oregon State Treasury (OST) Investment Division, the Oregon Investment Council (OIC) is responsible for oversight of the Plan’s investment program. Oversight of Plan administration is the responsibility of the Oregon Public Employees Retirement System Board (“PERS Board”), with support from OSGP staff. Additional oversight is provided by a seven-member Deferred Compensation Advisory Committee (the “Advisory Committee”) established under ORS 243.505.



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Tigard, OR 97224  
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503.378.4000

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[oregon.treasurer@state.or.us](mailto:oregon.treasurer@state.or.us)



**OSGP Performance**

Fund Option <i>Benchmarks</i>	Performance (%)					
	QTD	YTD	1 Year	3 Years	5 Years	10 Years
Stable Value Option	0.57	1.11	2.17	1.81	1.61	1.56
91 Day T-Bill	0.64	1.24	2.31	1.38	0.87	0.49
<i>Rolling Average 5 Year CMT*</i>	0.47	0.92	1.81	1.55	1.46	1.98
Active Fixed Income Option	2.89	5.81	7.23	2.97	3.21	4.69
<i>Barclays US Aggregate Bond Index</i>	3.08	6.11	7.87	2.31	2.95	3.90
Large Company Value Stock Option	3.81	16.21	8.47	10.12	7.27	13.05
<i>Russell 1000 Value Index</i>	3.84	16.24	8.46	10.19	7.46	13.19
Stock Index Option	4.06	18.67	8.89	13.91	10.08	14.53
<i>Russell 3000 Index</i>	4.10	18.71	8.98	14.02	10.19	14.67
Large Company Growth Stock Option	4.60	21.45	11.50	17.92	12.94	16.06
<i>Russell 1000 Growth Index</i>	4.64	21.49	11.56	18.07	13.39	16.28
International Stock Option	2.60	13.13	-0.60	7.91	2.20	6.81
<i>MSCI ACWI ex-US (net) Index</i>	2.98	13.60	1.29	9.39	2.23	6.89
Small Company Stock Option	2.24	16.85	-3.38	11.79	6.76	13.61
<i>Russell 2000 Index</i>	2.10	16.98	-3.31	12.30	7.20	14.19
Socially Responsible Stock Option	3.73	18.16	8.84	13.58	N/A	N/A
<i>Russell 3000 Index</i>	4.10	18.71	8.98	14.02	N/A	N/A
Real Return Option	1.27	7.18	1.31	3.31	N/A	N/A
<i>CPI + 3%</i>	1.70	3.67	4.90	5.17	N/A	N/A
BlackRock LifePath Retirement	3.13	10.04	6.42	5.66	4.05	6.56
BlackRock LifePath 2020	3.15	10.43	6.30	6.40	4.38	7.69
BlackRock LifePath 2025	3.17	11.81	6.37	7.44	4.88	8.41
BlackRock LifePath 2030	3.19	13.06	6.45	8.46	5.42	9.11
BlackRock LifePath 2035	3.20	14.06	6.35	9.23	5.73	9.59
BlackRock LifePath 2040	3.20	15.03	6.30	9.99	6.07	10.09
BlackRock LifePath 2045	3.18	15.74	6.18	10.43	6.26	10.49
BlackRock LifePath 2050	3.17	16.05	6.14	10.57	6.31	10.78
BlackRock LifePath 2055	3.17	16.09	6.15	10.56	6.27	N/A
BlackRock LifePath 2060	3.16	16.08	6.14	10.55	N/A	N/A

\* CMT is the Constant Maturity Treasury Yield.

Performance shown is a) net of fees and b) annualized for periods longer than one year.

OSGP has two types of fees, investment management and administrative fees.

Administrative fees are comprised of State of Oregon administration, recording keeping, custody, trust and communications fees.



**Additional OSGP Data**

<b>Fund Name</b>	<b>Market Value (\$)</b>	<b>% of Total</b>	<b>Plan Participants</b>	<b>IM Fees (bps)</b>	<b>Admin Fees (bps)</b>	<b>Total Fees (bps)</b>
Stable Value Option	286,760,388	12.7%	8,692	35.1	11.9	47.0
Active Fixed Income Option	149,943,814	6.2%	7,135	16.7	11.9	28.6
Large Company Value Stock Option	200,498,122	8.7%	10,605	2.6	11.9	14.5
Stock Index Option	271,151,785	11.6%	10,185	3.6	11.9	15.5
Large Company Growth Stock Option	279,295,370	11.9%	12,203	2.6	11.9	14.5
International Stock Option	121,174,045	5.2%	9,928	54.0	11.9	65.9
Small Company Stock Option	245,333,170	10.9%	11,155	39.4	11.9	51.3
Real Return Option	4,264,678	0.2%	732	22.0	11.9	33.9
Socially Responsible Investment Option	17,924,151	0.7%	1,758	17.0	11.9	28.9
BlackRock LifePath Retirement Fund	189,986,189	8.2%	3,607	9.0	11.9	20.9
BlackRock LifePath 2020 Fund	140,818,720	6.1%	3,050	9.0	11.9	20.9
BlackRock LifePath 2025 Fund	120,508,967	5.1%	3,537	9.0	11.9	20.9
BlackRock LifePath 2030 Fund	89,997,211	3.8%	3,598	9.0	11.9	20.9
BlackRock LifePath 2035 Fund	67,744,358	2.8%	3,567	9.0	11.9	20.9
BlackRock LifePath 2040 Fund	46,895,413	2.0%	3,322	9.0	11.9	20.9
BlackRock LifePath 2045 Fund	31,840,621	1.3%	2,912	9.0	11.9	20.9
BlackRock LifePath 2050 Fund	25,292,739	1.1%	2,268	9.0	11.9	20.9
BlackRock LifePath 2055 Fund	9,537,378	0.4%	1,222	9.0	11.9	20.9
BlackRock LifePath 2060 Fund	6,499,610	0.3%	835	9.0	11.9	20.9
Self-Directed Brokerage Option	20,572,166	0.9%	264	0.0	11.9	11.9
<b>Total</b>	<b>2,326,038,893</b>	<b>100%</b>				

Source: Market Value & Plan Participants data, OSGP record keeper, Voya Financial. Fee estimation, OST.

OSGP has two types of fees, investment management (IM) and administrative (Admin) fees.

Administrative fees are comprised of State of Oregon administration, recording keeping, custody, trust and communications fees.

The plan's Self-Directed Brokerage Option, executed through Charles Schwab, finished the quarter with \$20.6 million in assets, or 0.9% of total OSGP assets.

**Real Return Option Benchmark**

On September 19, 2018, the Oregon Investment Council (OIC) approved staff's recommendation to simplify the Real Return Option. As a result, the GMO Benchmark-Free Allocation Fund and the Wellington Real Return Fund were removed from the Real Return Option on March 22, 2019. The Real Return Option is now comprised of a single, underlying investment strategy, the SSgA Real Assets Fund. The SSgA Real Assets Fund seeks an investment return that approximates, as closely as practicable, before fees, the performance of a custom benchmark by diversifying across several inflation-sensitive asset classes such as commodities, REITs, TIPS, and global infrastructure.



Currently, the benchmark for the Real Return Option is the Consumer Price Index (CPI) + 3%, which was appropriate given the previous, multi-fund structure of the Real Return Option, prior to March 22, 2019. However, given that the SSgA Real Assets Fund is now the single, underlying investment strategy within the Real Return Option, and the SSgA Real Assets Fund is also passively implemented, staff and Callan recommend converting the Real Return Option's primary benchmark to the SSgA Real Assets Custom Blended Index, as a more appropriate reflection of the Real Return Option's underlying investments.

Additionally, the second objective of the SSgA Real Assets Fund is to seek a positive real return, targeting a long-term goal of CPI + 4% over a full market cycle. Therefore, staff and Callan also recommend utilizing CPI + 4% as a secondary benchmark for the Real Return Option.

### **BlackRock LifePath Index 2020 Fund**

After the close of business on November 15, 2019, BlackRock will conduct an exchange of units of the respective BlackRock LifePath Index 2020 Funds for units of the corresponding BlackRock LifePath Index Retirement Funds. As BlackRock's LifePath target date funds approach their target year, each fund shifts a portion of its investments out of equity and equity-like securities and into debt and debt-like securities, with the asset allocation gradually moving closer to that of the BlackRock LifePath Index Retirement Fund. During the 4th quarter of each year preceding the target year, the asset allocation becomes identical to the BlackRock LifePath Index Retirement Fund, thereby eliminating the need to have two separate funds in a plan lineup. This transition is an automated process and does not require any action on behalf of participants (unless, of course, a participant would prefer to transfer her/his current balance and/or future contributions to a different investment option). Voya and OSGP staff communicate this change to participants annually in advance of the aforementioned transition date.

Further, BlackRock also introduces a new LifePath target date fund every five years. Accordingly, the BlackRock LifePath Index 2065 Fund has been created and is expected to be added as an investment option prior to 2019 year-end.

### **Small Company Stock Option**

At staff's request, Callan, the Plan's retained investment consultant, performed an evaluation of the Plan's Small Company Stock Option which is currently comprised of the following three underlying funds: DFA US Small Cap Equity; Callan Small Cap Equity; and BlackRock Russell 2000 Index. In an attempt to more closely align the Plan's investment strategies with those in the Oregon Public Employees Retirement Fund (OPERF), staff recommends adding the BlackRock S&P 600 Index Fund, as a replacement for the BlackRock Russell 2000 Index Fund. Previously, OPERF was also utilizing a Russell 2000 Index strategy. Staff expects this change will improve the Small Company Stock Option's risk/return profile while maintaining an identical expense ratio.



September 18, 2019

# Oregon Savings Growth Plan Annual Review

**Michael Viteri**

*Senior Investment Officer*

**Wil Hiles**

*Investment Officer*



**OREGON  
STATE  
TREASURY**



# Agenda

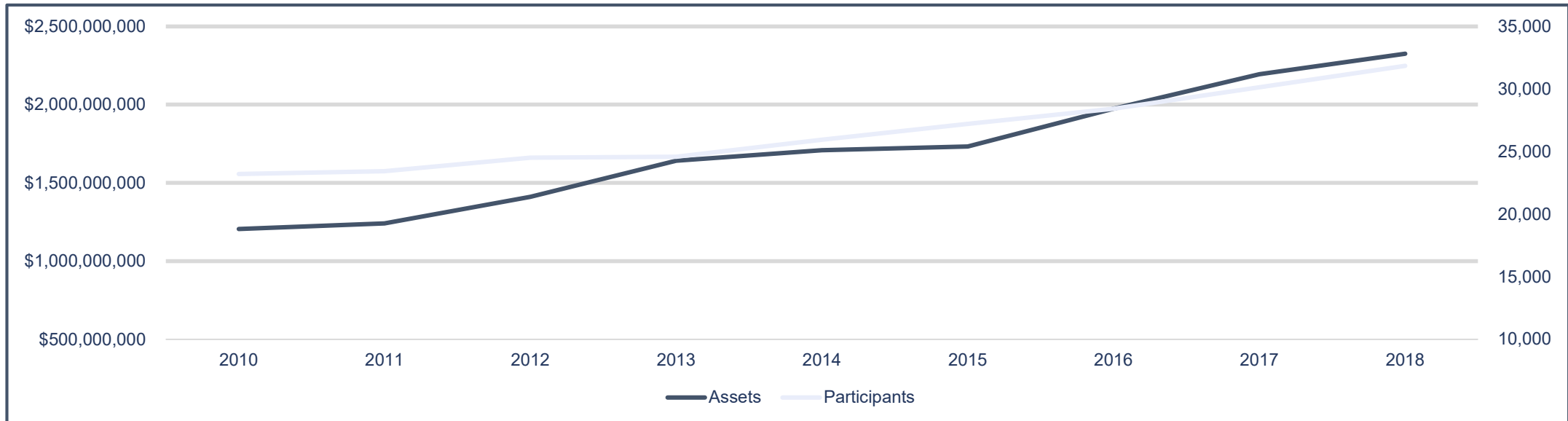
- BlackRock LifePath Research
- Target Date Fund Suitability Study
- Small Company Stock Option Structure Evaluation
- Plan Update
- Recommendations

# Plan Update

## Oregon Savings Growth Plan (OSGP)

Assets	\$2.33 billion
Participants	31,854

## Change in Total Plan Assets & Participants



# Plan Update

## Core Funds

Stable Value Option	Stock Index Option	Small Company Stock Option
Active Fixed Income Option	Large Company Growth Stock Option	Real Return Option
Large Company Value Stock Option	International Stock Option	Socially Responsible Investment Option

## Asset Allocation Funds

BlackRock LifePath Funds

## Self-Directed Brokerage Option

Schwab Personal Choice Retirement Account (PCRA)



# Plan Update

Market Values			Participants
Stable Value Option	286,760,388	12.7%	8,692
Active Fixed Income Option	149,943,814	6.2%	7,135
Large Company Value Stock Option	200,498,122	8.7%	10,605
Stock Index Option	271,151,785	11.6%	10,185
Large Company Growth Stock Option	279,295,370	11.9%	12,203
International Stock Option	121,174,045	5.2%	9,928
Small Company Stock Option	245,333,170	10.9%	11,155
Real Return Option	4,264,678	0.2%	732
Socially Responsible Investment Option	17,924,151	0.7%	1,758
BlackRock LifePath Funds	729,121,206	31.3%	27,918
Self-Directed Brokerage Option	20,572,166	0.9%	264
<b>Total</b>	<b>\$2,326,038,893</b>	<b>100%</b>	



# Plan Update

## Upcoming Changes:

- Collapse BlackRock LifePath 2020 Fund into BlackRock LifePath Retirement Fund
- Launch BlackRock LifePath 2065 Fund

# Recommendations

- Real Return Option Benchmark Change – Utilize SSgA Real Assets Custom Blended Index and Consumer Price Index + 4%
- Small Company Stock Option – Replace Russell 2000 Index Fund with S&P 600 Index Fund



# OREGON STATE TREASURY

Tobias Read  
Oregon State Treasurer

16290 SW Upper Boones Ferry Road  
Tigard, OR 97224

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# Callan

September 18, 2019



## 2019 Annual Review

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**Anne Heaphy**

Fund Sponsor Consulting


**Uvan Tseng, CFA**

Fund Sponsor Consulting



OSGP Annual Review

# OSGP Investment Structure

OSGP Investment Structure			
Risk Spectrum	Tier I. Asset Allocation Options	Tier II. Core Options	Tier III. Specialty Options
Conservative  Aggressive	<u>Target Date Funds</u> LifePath Portfolios	<u>Capital Preservation</u> Stable Value Option	
		<u>Fixed Income</u> Active Fixed Income Option	
		<u>Broad U.S. Equity</u> Stock Index Option - Russell 3000	<u>Specialty Equity</u> Socially Responsible Investment Option
		<u>Large Cap U.S. Equity</u> Large Company Value Stock Option Large Company Growth Stock Option	
		<u>Small Cap U.S. Equity</u> Small Company Stock Option	
		<u>International Equity</u> International Stock Option	<u>Inflation Sensitive</u> Real Return Option
			<u>Brokerage Window</u> Schwab PCRA

# Asset Distribution

	June 30, 2019			June 30, 2018		
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
<b>Tier I - Asset Allocation Options</b>						
<b>Target Date Funds</b>	<b>\$728,529,198</b>	<b>31.32%</b>	<b>\$(1,343,197)</b>	<b>\$42,911,505</b>	<b>\$686,960,890</b>	<b>31.51%</b>
LifePath Index Retirement Fund L	189,917,979	8.17%	(17,073,775)	11,342,178	195,649,576	8.97%
LifePath Index 2020 Fund L	140,893,358	6.06%	(9,837,221)	8,482,525	142,248,054	6.52%
LifePath Index 2025 Fund L	120,409,865	5.18%	5,005,329	7,027,605	108,376,931	4.97%
LifePath Index 2030 Fund L	89,912,336	3.87%	4,720,281	5,281,726	79,910,330	3.66%
LifePath Index 2035 Fund L	67,441,347	2.90%	4,865,707	3,815,789	58,759,852	2.69%
LifePath Index 2040 Fund L	46,810,016	2.01%	4,814,622	2,736,748	39,258,645	1.80%
LifePath Index 2045 Fund L	31,855,181	1.37%	4,313,496	1,871,362	25,670,322	1.18%
LifePath Index 2050 Fund L	25,262,069	1.09%	512,127	1,442,066	23,307,876	1.07%
LifePath Index 2055 Fund L	9,533,426	0.41%	306,253	523,609	8,703,565	0.40%
LifePath Index 2060 Fund L	6,493,622	0.28%	1,029,985	387,898	5,075,738	0.23%
<b>Tier II - Core Investment Options</b>						
<b>Stable Value Option</b>						
Galliard	286,833,937	12.33%	67,986,856	5,259,137	213,587,945	9.80%
<b>Active Fixed Income Option</b>						
BlackRock / DoubleLine / Wellington	149,801,970	6.44%	29,263,429	9,659,675	110,878,866	5.09%
<b>Stock Index Option</b>						
BlackRock	271,263,366	11.66%	(3,886,731)	21,511,602	253,638,495	11.63%
<b>Large Company Value Stock Option</b>						
BlackRock	200,621,223	8.63%	(5,139,969)	16,032,792	189,728,400	8.70%
<b>Large Company Growth Stock Option</b>						
BlackRock	279,457,549	12.02%	(3,973,887)	34,015,115	249,416,321	11.44%
<b>Small Company Stock Option</b>						
BlackRock / Callan / DFA	245,359,509	10.55%	(16,394,886)	(16,842,012)	278,596,406	12.78%
<b>International Stock Option</b>						
AQR / Arrowsstreet / DFA* / Lazard	121,110,193	5.21%	6,136,642	(1,859,212)	116,832,763	5.36%
<b>Tier III - Specialty Options</b>						
<b>Socially Responsible Investment Option</b>						
TIAA-CREF	17,868,122	0.77%	2,953,305	2,820,365	12,094,452	0.55%
<b>Real Return Option</b>						
State Street	4,344,058	0.19%	(1,710,759)	1,933,469	4,121,348	0.19%
Brokerage Window	20,669,536	0.89%	5,979,344	468,447	14,221,745	0.65%
<b>Total Fund</b>	<b>\$2,325,869,489</b>	<b>100.0%</b>	<b>\$28,854,545</b>	<b>\$116,626,827</b>	<b>\$2,180,388,117</b>	<b>100.0%</b>



# Summary Returns

Periods Ended June 30, 2019

	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
<b>Tier I - Asset Allocation Options</b>					
<b>LifePath Index Retirement Fund L</b>	6.55	5.82	4.21	5.32	6.75
LifePath Index Retirement Benchmark	6.60	5.82	4.21	5.31	6.76
<b>LifePath Index 2020 Fund L</b>	6.43	6.56	4.54	6.29	7.88
LifePath Index 2020 Benchmark	6.46	6.54	4.51	6.26	7.88
<b>LifePath Index 2025 Fund L</b>	6.48	7.59	5.04	7.07	8.59
LifePath Index 2025 Benchmark	6.46	7.54	4.99	7.03	8.58
<b>LifePath Index 2030 Fund L</b>	6.49	8.51	5.48	7.75	9.23
LifePath Index 2030 Benchmark	6.43	8.42	5.40	7.69	9.18
<b>LifePath Index 2035 Fund L</b>	6.48	9.39	5.89	8.40	9.78
LifePath Index 2035 Benchmark	6.38	9.27	5.78	8.30	9.73
<b>LifePath Index 2040 Fund L</b>	6.41	10.15	6.23	8.93	10.28
LifePath Index 2040 Benchmark	6.32	10.00	6.10	8.83	10.21
<b>LifePath Index 2045 Fund L</b>	6.30	10.58	6.42	9.37	10.68
LifePath Index 2045 Benchmark	6.14	10.41	6.27	9.25	10.59
<b>LifePath Index 2050 Fund L</b>	6.28	10.73	6.48	9.67	10.98
LifePath Index 2050 Benchmark	6.07	10.55	6.32	9.54	10.90
<b>LifePath Index 2055 Fund L</b>	6.28	10.72	6.43	9.87	--
LifePath Index 2055 Benchmark	6.08	10.56	6.29	9.75	--
<b>LifePath Index 2060 Fund L</b>	6.27	10.70	--	--	--
LifePath Index 2060 Benchmark	6.08	10.56	--	--	--

# Summary Returns

Periods Ended June 30, 2019

	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
<b>Tier II - Core Investment Options</b>						
<b>Stable Value Option</b>	2.44	2.10	1.91	1.83	1.88	2.70
3-month Treasury Bill	2.31	1.38	0.87	0.65	0.49	1.38
<b>Active Fixed Income Option</b>	7.44	3.16	3.36	3.20	4.88	4.76
Bloomberg Aggregate Index	7.87	2.31	2.95	2.62	3.90	4.27
<b>Stock Index Option</b>	9.05	14.11	10.28	13.87	14.75	8.92
Russell 3000 Index	8.98	14.02	10.19	13.79	14.67	8.88
<b>Large Company Value Stock Option</b>	8.62	10.29	7.47	12.67	13.25	7.98
Russell 1000 Value Index	8.46	10.19	7.46	12.09	13.19	7.84
<b>Large Company Growth Stock Option</b>	11.54	18.06	13.06	15.72	16.15	9.55
Russell 1000 Growth Index	11.56	18.07	13.39	15.76	16.28	9.90
<b>Small Company Stock Option</b>	(3.36)	11.88	6.81	11.55	13.65	8.84
Russell 2000 Index	(3.31)	12.30	7.06	11.63	13.45	8.15
<b>International Stock Option</b>	(0.25)	8.26	2.43	7.04	6.96	5.52
MSCI ACWI ex US Index	1.29	9.39	2.16	6.36	6.54	5.85
<b>Tier III - Specialty Options</b>						
<b>Socially Responsible Investment Option</b>	8.85	13.60	--	--	--	--
Russell 3000 Index	8.98	14.02	10.19	13.79	14.67	8.88
<b>Real Return Option</b>	1.39	3.39	--	--	--	--
Consumer Price Index + 3%	4.44	5.01	4.25	4.44	4.70	5.01

## Investment Options Fee Summary

Asset Class and Strategy	Total Annual Operating Expense Ratio*	Institutional Peer Group Median
<b>Asset Allocation Options</b>		
LifePath Index Retirement, 2020 – 2060 Funds; L	0.090%	0.12% - 0.13%
<b>Capital Preservation</b>		
Stable Value Option	0.351%	0.55%
<b>Fixed Income</b>		
Active Fixed Income Option	0.1670%	0.77%
<b>U.S. Large Cap Equity</b>		
Stock Index Option	0.036%	0.04%
Large Company Value Stock Option	0.026%	0.04%
Large Company Growth Stock Option	0.026%	0.04%
<b>U.S. Small Cap Equity</b>		
Small Company Stock Option	0.394%	1.17%
<b>International Equity</b>		
International Stock Option	0.540%	1.10%
<b>Specialty Options</b>		
Socially Responsible Investment Option	0.170%	0.94%
Real Return Option	0.220%	0.63%

\*Fee data provided by OST.



## TDF Suitability Study Summary

## Introduction

- The purpose of this study is to examine the suitability of the BlackRock LifePath target date funds for the Oregon Savings Growth Plan. The evaluation using the DOL Tips as a starting point will evaluate suitability through various lenses, including but not limited to: track record, fees, team, organization and projected outcomes.
- The study looks to establish suitability and not optimality. Though an option may be suitable this does not imply is it the best possible option. Since there is a tradeoff between the various risks faced by participants, no solution can optimally address all risks simultaneously.

### DOL Tips



Even for a non-ERISA plan, Callan believes a **higher standard** may apply to target date fund decision-making going forward than has been applied in the past. The DOL Tips provide a framework for reviewing the suitability of a target date solution for a specific plan given its demographics and plan design.

## Considerations

### Plan Specific Considerations

**DOL Tip:** Establish a process for comparing and selecting TDFs. Plan sponsors should discuss the significance of other characteristics of the participant population, such as participation in a traditional defined benefit pension plan offered by the employer, salary levels, turnover rates, contribution rates and withdrawal patterns.

Consideration	Notes
Presence of a DB plan (and coverage)	For the purposes of this study participants are assumed to participate in either the Tier I, Tier II or OPSRP Pension. The targeted payout from these pensions is 45% income replacement.
Assumed retirement age	Participants are assumed to retire any time after age 50 (minimum of 25 years of service time).
Average total contribution	The study models contribution rates of 6, 7 and 8%. These rates are supported by underlying participant data.
Post-retirement health care benefits	Most participants have access to the PERS Health Insurance Program (PHIP) which is an option for retiree health coverage.
Male-to-female ratio	The study assumes a 50/50 male-to-female split.
Age concentration	The population of participants as well as target date users is concentrated in those over age 50. Those aged 65 and older are the largest demographic group.
Turnover	Compared to the typical plan, turnover at 16 years is low relative to the wider DC market as well as the public space. With working-age participants staying within the plan, there is presumably more time for them to recover from market downturns.

## Underlying Funds and Managers

**DOL Tip:** Understand the fund's investments – the allocation in different asset classes (stocks, bonds, cash), individual investments, and how these will change over time.

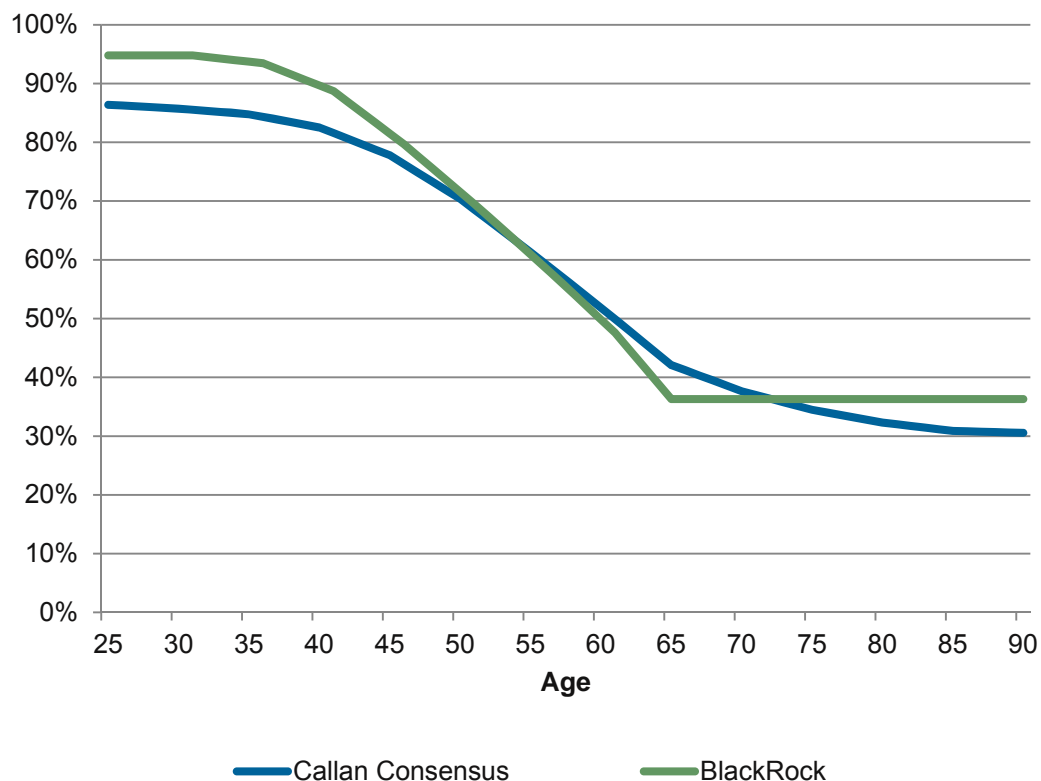
- The most notable aspects of the underlying allocations are allocations to global REITs and commodities which are not always offered in other passively implemented solutions.
- Additionally BlackRock breaks out the allocation to large and small/mid-cap domestic equity while other passive providers often offer single all-cap domestic exposure.

### Underlying Funds within the LifePath Series

Asset Class	Fund (Index Tracked): Allocation Range (Retirement/2060)
U.S. Equity	Russell 1000: 21% / 48%
	Russell 2000: 4% / 1%
Non-U.S. Equity	ACWI ex USA Equity IMI Fund: 12% / 32%
Real Assets	Developed Real Estate Index Fund (FTSE/NAREIT Developed Real Estate Index): 1% / 15%
	Bloomberg Commodity Index NL Fund: 4% / 4%
US Fixed Income	US Debt Index Fund (Bloomberg US Aggregate Bond Index): 51% / 1%
Money Market	Money Market Fund (MOEBT): 0% / 0.0%
TIPS	US TIPS Fund (Bloomberg Barclays TIPS Index): 9% / 0%

All underlying options are managed by BlackRock.

## Glide Path and Growth Asset Rolldown\*



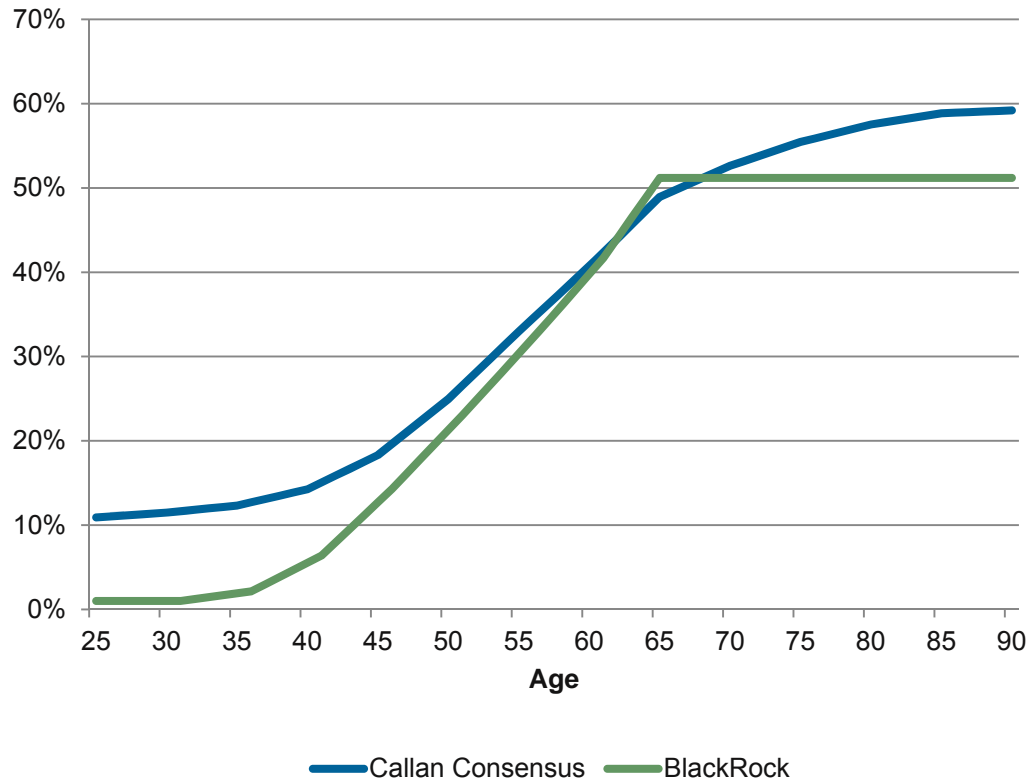
- This rolldown chart plots the change in “growth assets” over time. Growth assets are defined as those displaying equity-like characteristics. It gives a more accurate image of a “risk rolldown” than equity only illustrations.
- Early on, the LifePath funds have a significantly higher allocation to growth assets relative to the Callan Consensus Glide Path. Around age 50, that gap closes.
- However, because the BlackRock glide path is “to” path that goes static starting at age 65 (at about 37% in equities), it eventually comes to have a higher allocation to equities versus the average target date fund, many of which continue to glide down during retirement.

\*Callan’s Glide Path model currently simulates 24 asset classes. Asset classes are categorized as Growth assets, Downside Protection assets or Inflation Protection assets.

Growth Assets include: U.S. Large Cap Equity, U.S. Small/Mid Cap Equity, Non-U.S. Equity, Emerging Markets Equity, High Yield, REITs, and Private Real Estate (REITs and Private Real Estate fall under both Growth and Inflation Protection categories as they can play a dual role in the glide path)



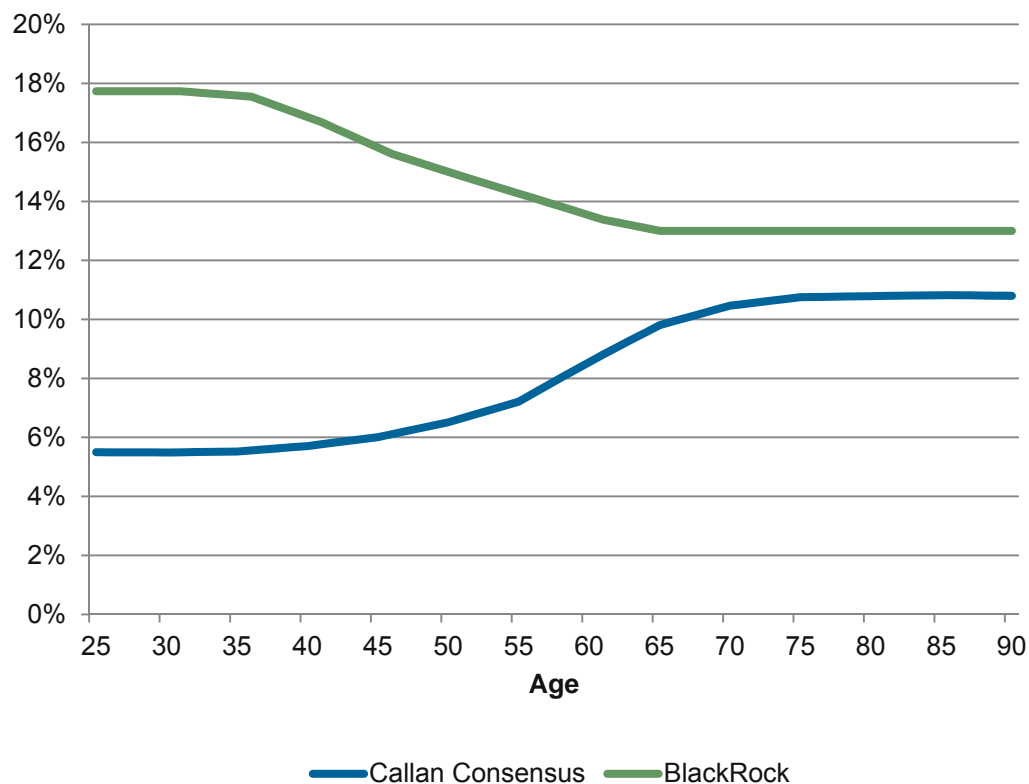
## Downside Protection Assets\*



- Downside protection assets include core and short-term fixed income, international fixed income as well as cash.
- Early on and in late retirement, BlackRock's glide path features a significantly lower allocation to downside protection assets.
- The downside protection comes primarily through core fixed income.

\*U.S. Fixed, Non-U.S. Fixed, Hedge Funds, Long Duration, Stable Value, Short Duration, and Cash

## Inflation Protection Assets\*



- Inflation protection assets include TIPS, REITs and commodities.
- The LifePath funds have an inflation sensitive allocation covering commodities, global REITs and TIPS.
- BlackRock’s inflation protection glide path differs from that of the Callan Consensus, being higher early on, and lower later on in the glide path.
- As the participant ages, the allocation to REITs and commodities decreases while the allocation to TIPS increases.
- The total allocation to combined inflation protection assets decreases across the glide path. However, it is higher than that of the Callan Consensus throughout the glide path.

\*Inflation Protection Assets include TIPS, Commodities, REITs and Private Real Estate

## Target Income Replacement Assumptions

- The following pages take the Plan’s demographics and projected outcomes based on a 40-year holding period and Callan’s capital market expectations.
- The income replacement ratio is equal to projected post-retirement annual income divided by projected final salary in the year before retirement.
- Typically, an individual needs less than 100% income replacement in retirement to maintain the same standard of living. The primary reasons for this are:
  - A decrease in income taxes
  - Reduced spending on wardrobe (presumably work related) and less spending from “walk-around money” (think of lunch and coffee purchases)
  - Reduced spending on transportation largely attributable to no longer commuting
  - Saving for retirement ceases
- Studies have found that income replacement ratios in the range of 80-90% are generally required to maintain one’s same standard of living in retirement. For the purposes of this study, a target of 80% will be used.
  - Post-retirement healthcare costs may require a higher level of income replacement\*
- The following table outlines the assumptions used to arrive at target replacement:

### Income in Retirement Goals

OPSRP	DC Replacement	Total
45%	35%	80%

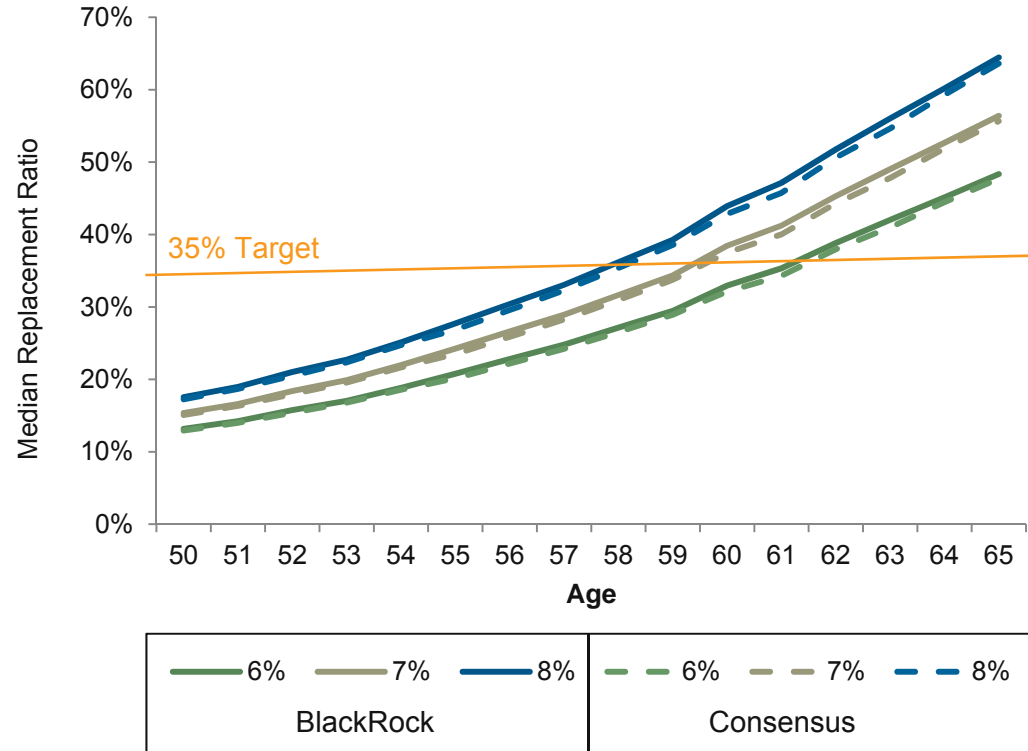
\*Measuring Retirement Income Adequacy: Calculating Realistic Income Replacement Rates, EBRI 2006

## Shortfall Risk

Risk of not accumulating enough assets to retire

- With various timeframes for retirement (eligibility with full benefits ranges from 25 to 30 years of service time), the chart to the right illustrates the age and savings levels that would project in the median case achieving the target replacement ratio.
- BlackRock offers slightly more upside relative to the market Consensus glide path.

Median Replacement at Various Ages and Savings Rates



## Downside Risk

Risk of volatility, particularly in the preretirement period

	Number of Downside Protection Assets	Age 50 to 65			
		Roll Down Rate*	Average % of Downside Protection Assets**	Expected Standard Deviation	Worst Case Multi-Year Return
LifePath	3 ***	2.3%	41%	10.6%	-31%
Callan Consensus	3	1.9%	41%	10.4%	-32%

- Closely mirroring the Callan Consensus, the LifePath funds feature metrics similar to the Consensus.
- There is often an explicit tradeoff between downside risk and shortfall risk.

\*Rolldown Rate is the slope of growth assets from age 50 to age 65.

\*\*For a complete definition please see Appendix VI: Glossary.

\*\*\*Although there are three downside protection assets, there is currently no allocation to cash, though this is an asset class the funds may allocate to.

"Worst Case" is defined as the 97.5th percentile worst case drawdown from age 50-65. "Expected" is the median result.

Glide path allocations reflect strategic glide path weights.

## Inflation Risk

Risk of inflation adversely affecting outcomes

	Average Inflation Assets (65-85)	% of Inflation Protection Assets at Age 60	% of Inflation Protection Assets at Age 65	Number of Inflation Protection Assets
LifePath	13.0%	13.5%	13.0%	3
Callan Consensus	10.6%	8.6%	9.8%	2*

- The ability to respond to inflation is a function not only of a glide path's exposure to inflation sensitive assets but also of the breadth of this exposure. Various asset classes respond to different types of inflation at different times.
- The LifePath funds provide early exposure to inflation sensitive assets through REITs and commodities. As these allocations decrease there is an increase in TIPS.
- The overall decrease in REITs and commodities is of greater magnitude than the commensurate increase in TIPS leading to an overall decrease in inflation sensitive assets over the course of the glide path.

Glide path allocations reflect strategic glide path weights.

\*Represents the average across the universe.

## Longevity Risk

Risk of assets being depleted in retirement

	Growth Assets (Average 65-95)	Worst Case Multi-Year Return (65-75)	Worst Case Multi-Year Return at Age 75+
LifePath	35%	-15%	-20%
Callan Consensus	40%	-16%	-17%

- There is a balance between generating returns in retirement and avoiding potential losses.
- Since the glide path reaches a static allocation at age 65, the worst case outcomes for age 75+ are worse than 65-75 age range by virtue of there being a longer time horizon in the age 75+ category. Additionally for much of the post-retirement period, the BlackRock funds feature a higher allocation to growth assets relative to the Consensus.
- The BlackRock funds post age-65 feature a 60% allocation to the Barclays Bloomberg U.S. Aggregate Index. This can expose participants to interest rate risk as the Aggregate Index features a duration over 6 years. Post-retirement allocations and risk profile are of particular interest given the plan's concentration of both assets and participants in the Retirement vintage.

Assumes annual spend down equal to the target replacement rate.

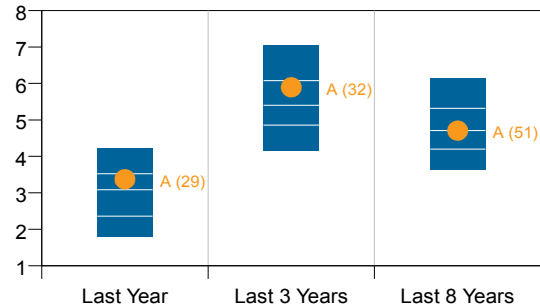
"Worst Case" is defined as the 97.5th percentile. "Expected" is the median result.

Glide path allocations reflect strategic glide path weights.

# Target Date Review

## Past Performance Retirement

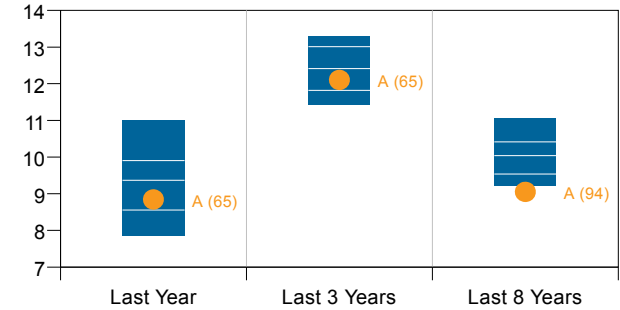
**Institutional Net Returns for Periods ended September 30, 2018**  
**Group: Callan Target Date Retirement Income**



	Last Year	Last 3 Years	Last 8 Years
10th Percentile	4.24	7.04	6.15
25th Percentile	3.53	6.08	5.32
Median	3.09	5.40	4.71
75th Percentile	2.36	4.86	4.20
90th Percentile	1.81	4.14	3.64

BlackRock LifePath Retirement ● A 3.37 5.89 4.71

**Institutional Net Returns for Periods ended September 30, 2018**  
**Group: Callan Target Date 2045**



	Last Year	Last 3 Years	Last 8 Years
10th Percentile	10.99	13.29	11.06
25th Percentile	9.91	13.01	10.42
Median	9.37	12.42	10.04
75th Percentile	8.56	11.82	9.54
90th Percentile	7.85	11.42	9.22

BlackRock LifePath 2045 ● A 8.85 12.11 9.05

- The Retirement vintage has the highest share of target date assets (28%).
- The vintage has a 60% allocation to the Bloomberg Barclays Aggregate Index. The strong historical results of the index are one reason why this vintage is within the top quartile of performers.

- Looking at the farther dated funds, the 2045 fund has trailed the peer group median over the 1 and 3-year periods.
- Longer term, this vintage falls well below the median; however, this timeframe includes periods that predate (pre-2014) the glide path changes which increased the allocation to growth assets.



## Target Date Review

### Fees

**DOL Tip:** Review the fund's fees and investment expenses.

#### Investment Management Fees Across Target Date Universe

	Fee
90th percentile	0.73%
75th percentile	0.63%
Median	0.48%
25th percentile	0.26%
10th percentile	0.10%
LifePath (current)	0.09%

- The table to the left contains the investment management fee distribution across the entire off-the-shelf target date universe (active and passive underlying implementations). This universe includes mutual funds as well as collective trusts. As this universe does include mutual funds, some of the constituents contain revenue sharing embedded in their management fees.
- If we limit the universe to only passively implemented target date suites the median fee is 12 basis points.
- The investment management fee across the trusts is a level 9 basis points, below the broader (all target date vehicles) group fees and below the median fee for passively implemented options.
- The fee differentials for the passively implemented group largely represent exposures to different underlying asset classes with varying related expenses. In short, passively implemented target date funds largely do not resemble one another, and the fees reflect the fact that they are not commodities.

## Target Date Funds – Custom?

### Strengths and Weaknesses of Various Approaches of Approaches

	Off-the-Shelf	Custom
Customized to Demographics	√	+√
Ability to Exercise Control Over Glide path	-	+√
Ability to Change Underlying Funds	-	+√
Ability to Leverage Core Funds	-	+√
Product Availability	+√	+√
Ease of Rebalancing	+√	√
Ease of Matching with Glide path with Demographics	√	+√
QDIA Appropriateness	+√	+√
Ease of Communication	+√	√
Ease of Implementation	+√	-

Strongly addresses	+√
Moderately addresses	√
Does not address	-

Given the underlying population and the current resource constraints, Callan does not recommend pursuing a custom target date solution at this time. More likely than not, one of the 45 off-the-shelf glide paths would prove suitable for the Plan.

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## Proprietary Funds and Communications

### The DOL also advises plan sponsors to:

- Inquire about whether a custom or non-proprietary target date fund would be a better fit for your plan
- Develop effective employee communications

- Given the dearth of institutional, open-architecture products, the BlackRock funds remain suitable. This conclusion is reached based on the analysis presented in this report.
- With regard to participant communications materials, Callan views BlackRock as being among the top-tier providers. The firm is well resourced and appears committed to management of defined contribution assets.

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## Summary

Consideration	Notes
Historical Performance	With regard to past performance, the funds have by-and-large bested peers on an absolute and risk-adjusted basis. This outperformance is more pronounced in shorter time periods which account for the changes to the glide path (which occurred in 2014).
Team and Organization	The funds feature a long-tenured, stable team backed by a deep and committed organization.
Number, type and Quality of underlying funds	There are eight underlying building blocks that are limited by the low-cost passive implementation. Given the fully passive implementation, they are unlikely to include tough-to-index asset classes. There is limited exposure to diversified fixed income asset classes.
Glide path construction	The glide path underwent a shift in the fourth quarter of 2014. As currently constituted it represents a moderate (as opposed to aggressive or conservative) allocation, with a higher allocation to growth assets early on and in late retirement (age 75+).
Forward looking projections (Risks)	Overall, many of the risks present are classified as “moderate” relative to the wider universe. The funds feature more and higher allocations to inflation sensitive assets.
Fees	The investment management fees across the product suite remain reasonable compared to other passively implemented collective trusts.



## OSGP Small Cap Option Structure Analysis

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## OSGP Small Company Stock Option Structure

### Overview

OSGP's Small Company Stock Option consists of the following underlying strategies with a 1/3 target allocation to each:

- BlackRock Russell 2000 Index Fund
- DFA US Small Cap Portfolio
- Callan Small Cap Equity Fund

This structure has been in place since 2015. Longer term history represents a different structure.

Callan and OST Investment Staff regularly monitor the performance of the underlying strategies to determine if:

- Underperformance is structural, driven by market conditions, or other reasons
- There are better and/or more complementary strategies
- The underlying strategies should be active, passive, or both

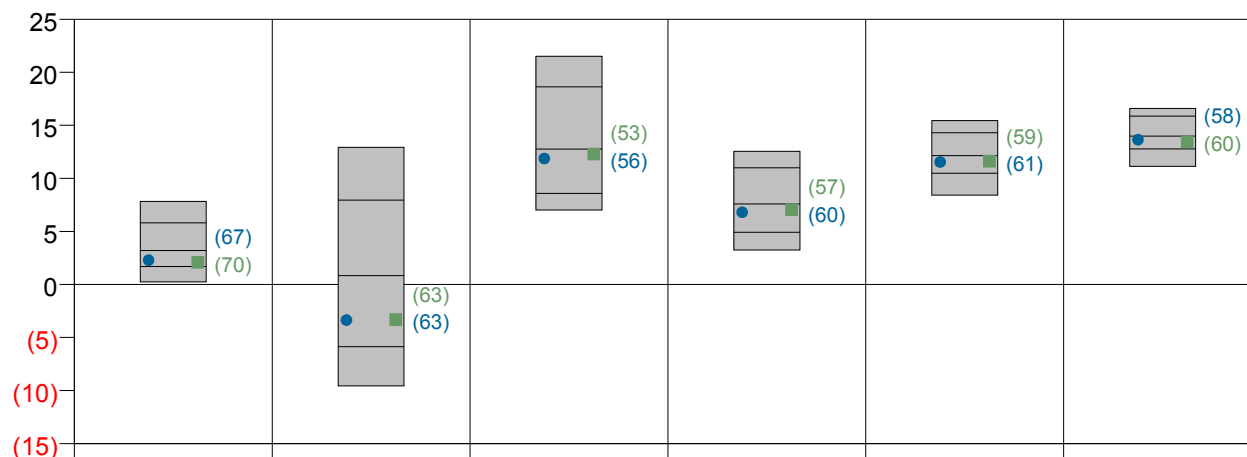
Recommendation:

- Continue to monitor the active portfolios
- Replace the BlackRock Russell 2000 Index Fund with the BlackRock S&P 600 Index Fund
- Performance of the S&P 600 Index has outpaced the Russell 2000 Index over intermediate and long-term time periods
- The fee impact would be neutral
- Would further align OSGP with OPERF

# Small Company Stock Option

Periods Ended June 30, 2019

Performance vs Callan Small Cap Mutual Funds (Institutional Net)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	7.83	12.92	21.52	12.55	15.45	16.61
25th Percentile	5.81	7.96	18.64	10.99	14.32	15.88
Median	3.20	0.83	12.76	7.60	12.14	13.99
75th Percentile	1.69	(5.87)	8.59	4.93	10.51	12.78
90th Percentile	0.26	(9.55)	7.02	3.25	8.43	11.15
<b>Small Company Stock Option</b> ●	2.30	(3.36)	11.88	6.81	11.55	13.65
Russell 2000 Index ■	2.10	(3.31)	12.30	7.06	11.63	13.45

## Russell 2000 Index vs. S&P 600 Index – Construction Methodology

### Russell 2000 Index

- Inception: 1984
- FTSE Russell ranks the top 3000 public U.S. companies by market capitalization.
  - The top 1000 companies become the Russell 1000 Index (large cap).
  - The bottom 2000 companies become the Russell 2000 Index (small cap). Market cap ranges from \$169 million to \$4 billion.
- No other requirements involved such as quality or profitability
- Reconstituted annually each June – the top 3000 companies are re-ranked and the indices are rebuilt.
  - IPO's can be added quarterly.

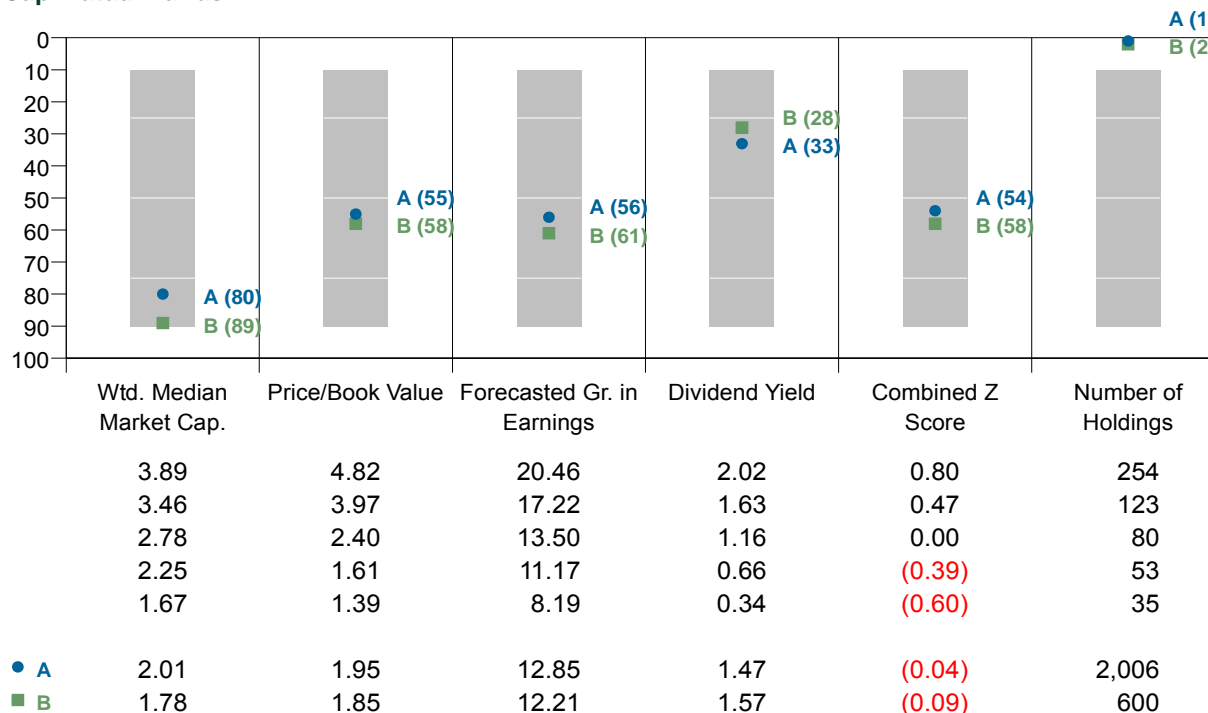
### S&P 600 Index

- Inception: 1994
- Standard & Poor's maintains the index which contains 600 companies.
- The following factors must be met for inclusion:
  - Must be a U.S. publicly traded company for at least one year (no IPOs)
  - Must have a market capitalization between \$600 million to \$2.4 billion.
  - Must have a positive net income over the previous 12 months including most recent quarter.
- The index is weighted by market cap and rebalanced quarterly.
  - There is no scheduled reconstitution.
  - Changes can be made to the index at any time in response to corporate actions or market developments.



# Portfolio Characteristics

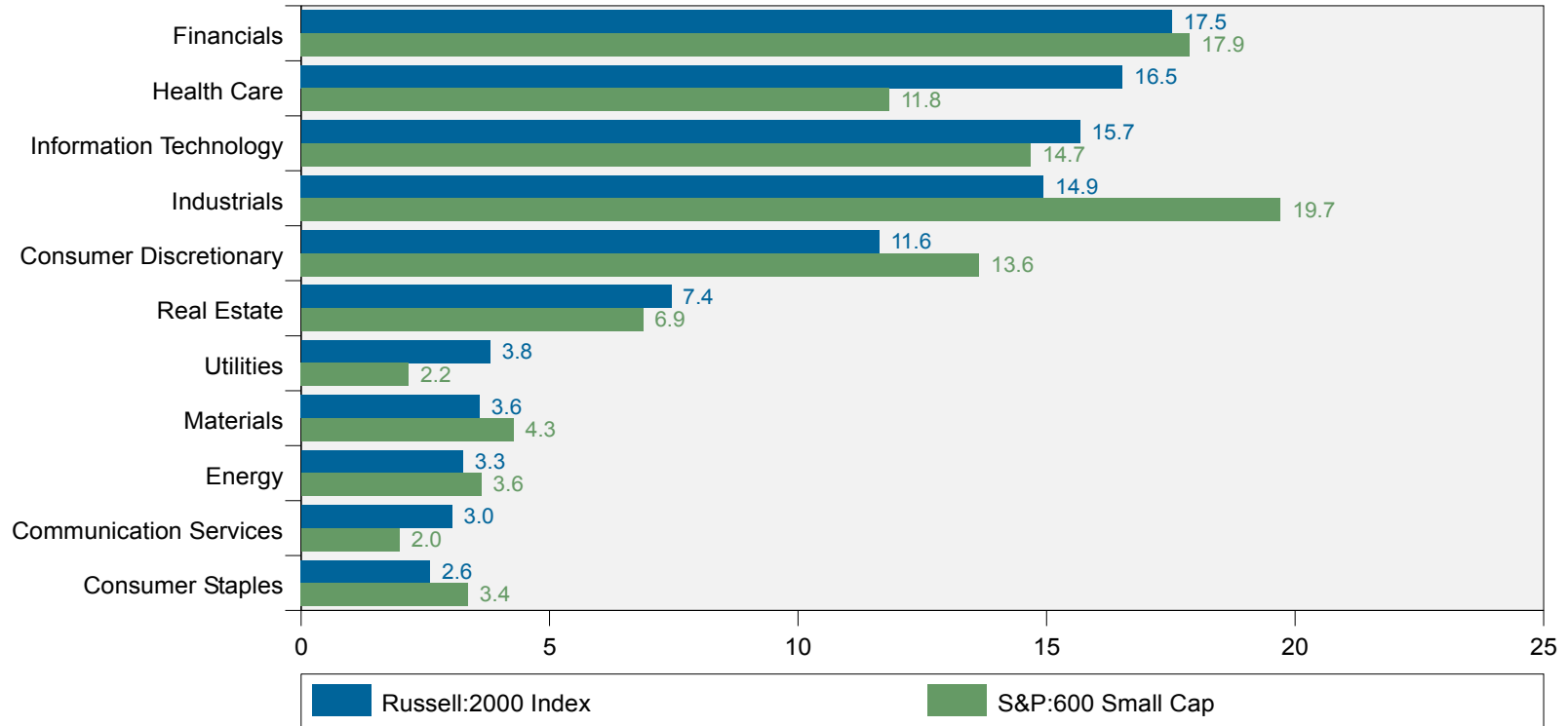
Portfolio Characteristics for Quarter Ended June 30, 2019  
Group: Callan Small Cap Mutual Funds



- Characteristics between the Russell 2000 Index and S&P 600 Index are mostly similar.
- The main differences are in the weighted median market cap and the number of holdings.

# Sector Allocations

Sector Allocation  
June 30, 2019



- Sector weights vary quite a bit between the indices.

# Annualized Performance

Returns Rankings  
for Periods Ended June 30, 2019  
Group: Callan Small Cap Mutual Funds



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
10th Percentile	7.89	14.35	21.42	12.25	15.33	16.30	10.41	9.73
25th Percentile	6.12	8.95	18.83	10.57	14.05	15.34	9.39	8.89
Median	3.54	0.92	13.08	7.72	12.17	13.70	8.44	8.07
75th Percentile	2.02	(5.47)	8.48	4.60	10.18	11.84	6.83	6.75
90th Percentile	0.23	(9.66)	6.79	3.24	8.68	10.44	5.87	5.28
Russell:2000 Index ● A	2.10	(3.31)	12.30	7.06	11.63	13.45	8.15	7.77
S&P:600 Small Cap ■ B	1.87	(4.88)	11.97	8.41	13.00	14.99	9.43	9.75

- The S&P 600 Index has outperformed the Russell 2000 Index in nearly all periods shown in the chart and has ranked in the top half of the peer group.



Appendix

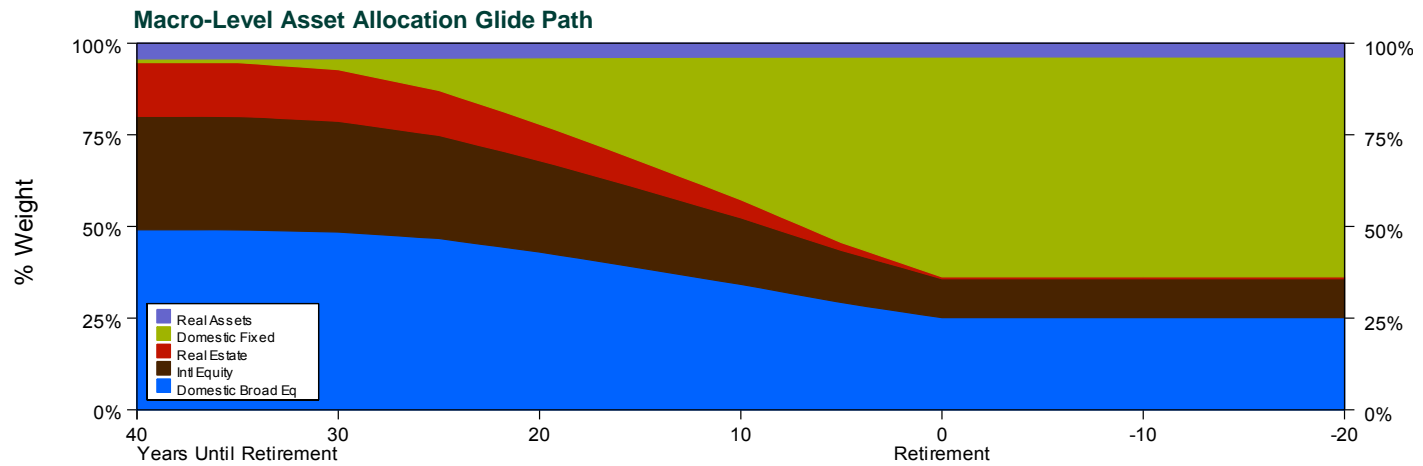
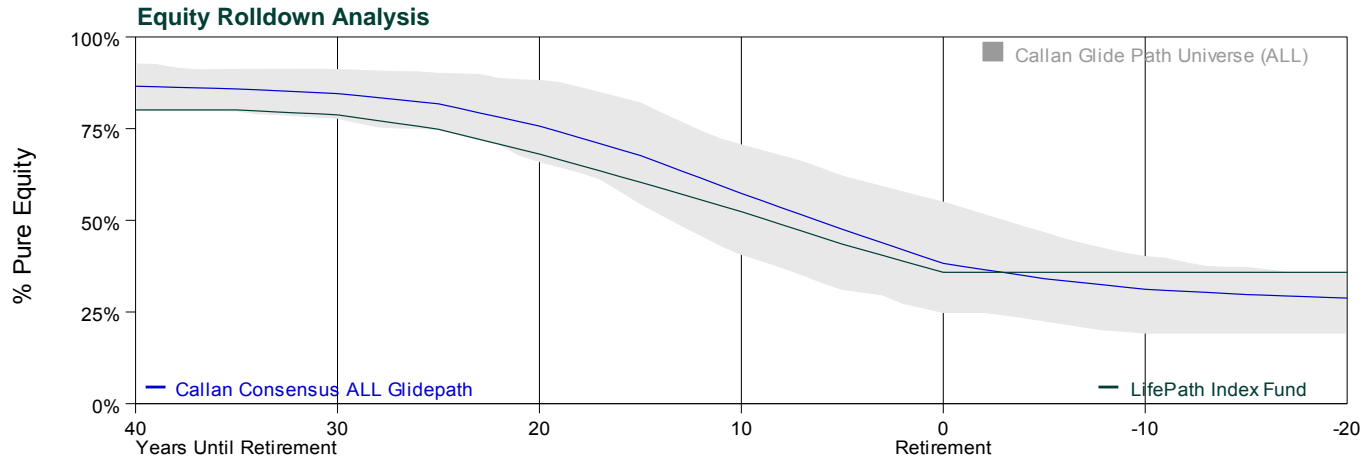
Callan

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**OSGP Investment Option Performance**  
Second Quarter 2019

# BlackRock LifePath Index Target Date Funds

## Glide Path Analysis



# LifePath Index Retirement Fund

Periods Ended June 30, 2019

Performance vs Callan Target Date Retirement Income (Institutional Net)

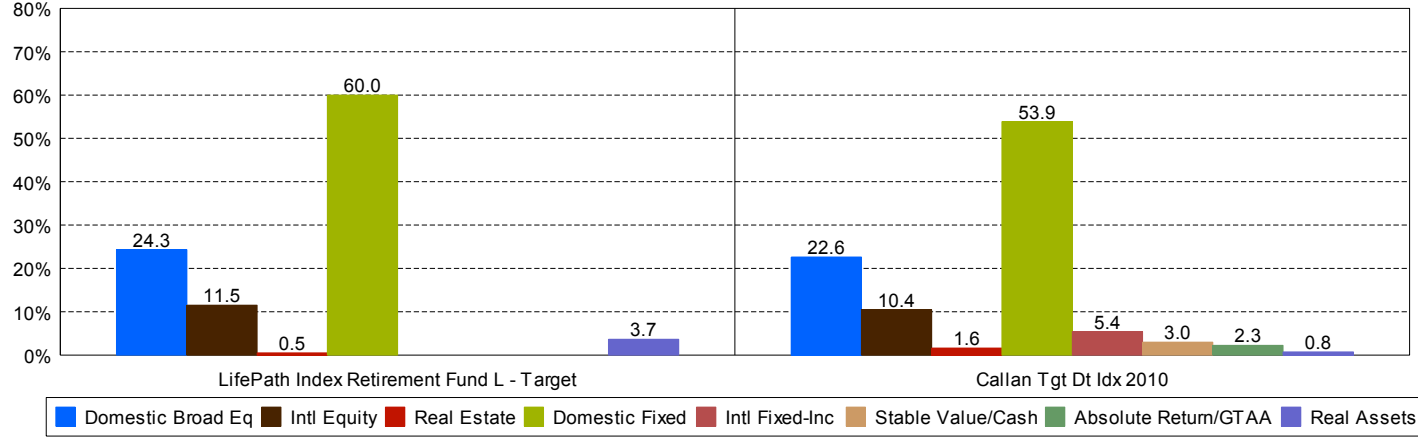


10th Percentile	3.22	7.15	6.39	4.52	5.95	7.55	5.37
25th Percentile	3.08	6.72	5.74	4.25	5.43	6.72	4.95
Median	2.91	5.97	5.26	3.85	4.60	6.10	4.55
75th Percentile	2.62	5.71	4.70	3.32	4.03	5.24	3.99
90th Percentile	2.28	4.97	3.91	2.72	3.25	4.86	3.11
<b>LifePath Index Retirement Fund L</b>	<b>3.16</b>	<b>6.55</b>	<b>5.82</b>	<b>4.21</b>	<b>5.32</b>	<b>6.75</b>	<b>5.27</b>
LifePath Index Retirement Benchmark	3.21	6.60	5.82	4.21	5.31	6.76	5.36

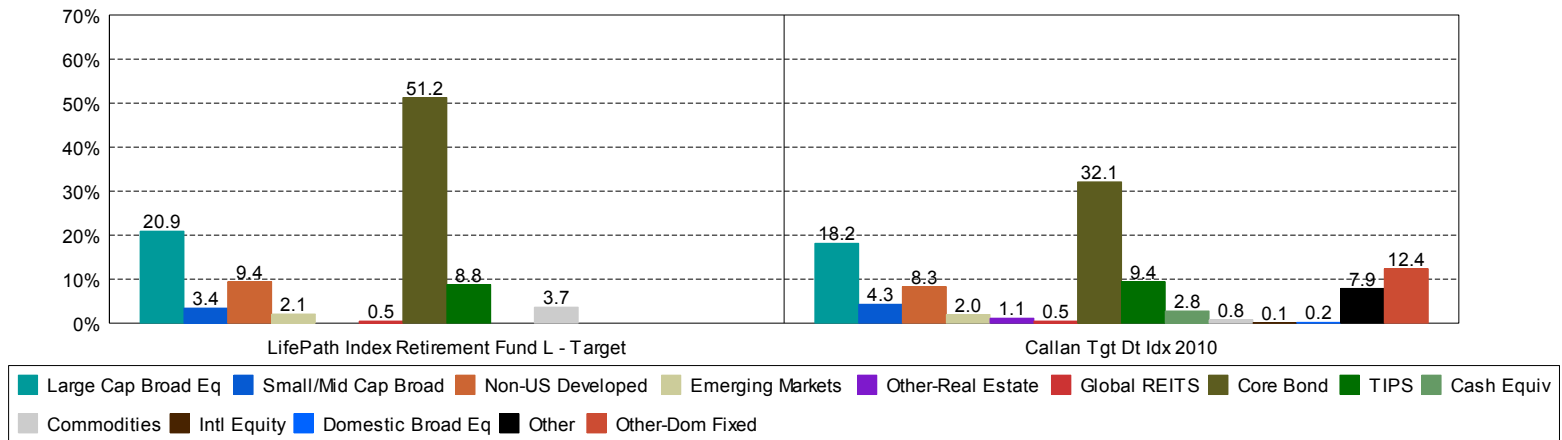
# LifePath Index Retirement Fund

## Target Asset Allocation

Macro-Level Asset Allocation



Micro-Level Asset Allocation

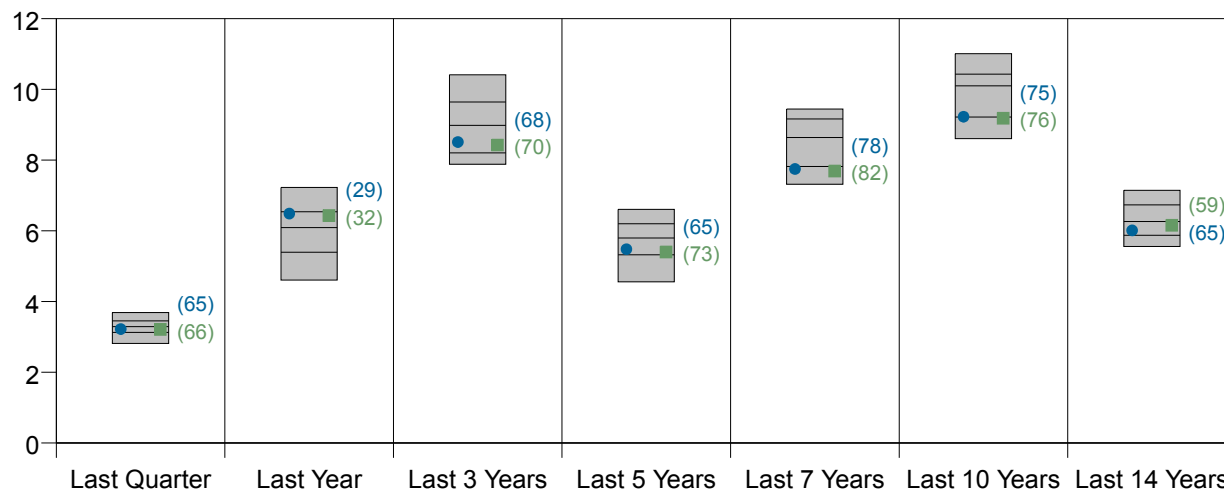




# LifePath Index 2030 Fund

Periods Ended June 30, 2019

Performance vs Callan Target Date 2030 (Institutional Net)



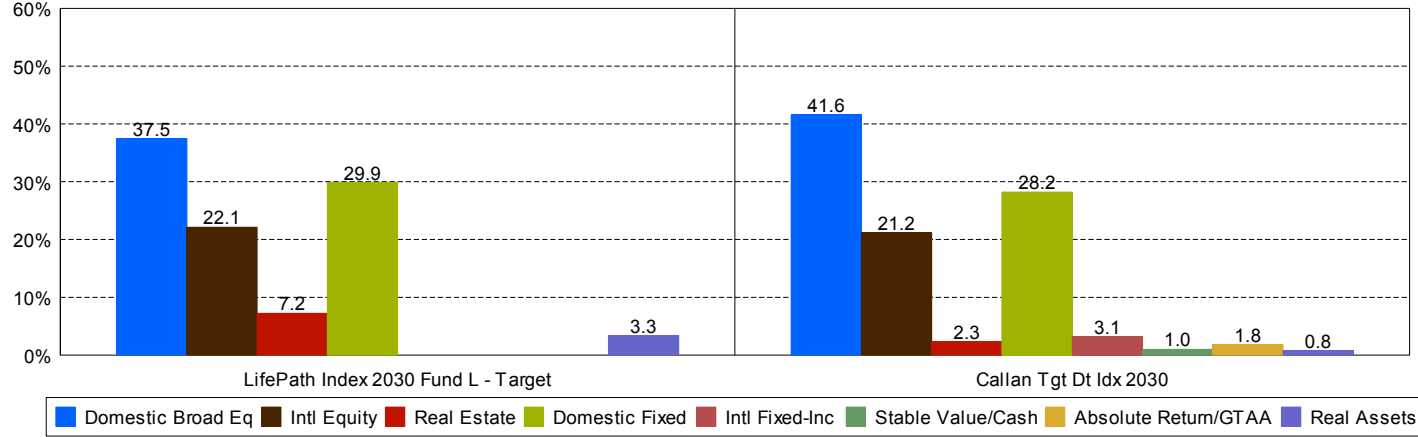
	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 14 Years
10th Percentile	3.69	7.23	10.41	6.60	9.44	11.01	7.14
25th Percentile	3.45	6.54	9.65	6.20	9.17	10.43	6.73
Median	3.29	6.09	8.98	5.80	8.64	10.10	6.26
75th Percentile	3.13	5.40	8.20	5.32	7.82	9.22	5.88
90th Percentile	2.82	4.60	7.88	4.56	7.31	8.61	5.55

<b>LifePath Index 2030 Fund L</b>	•	3.22	6.49	8.51	5.48	7.75	9.23	6.01
LifePath Index 2030 Benchmark	■	3.21	6.43	8.42	5.40	7.69	9.18	6.16

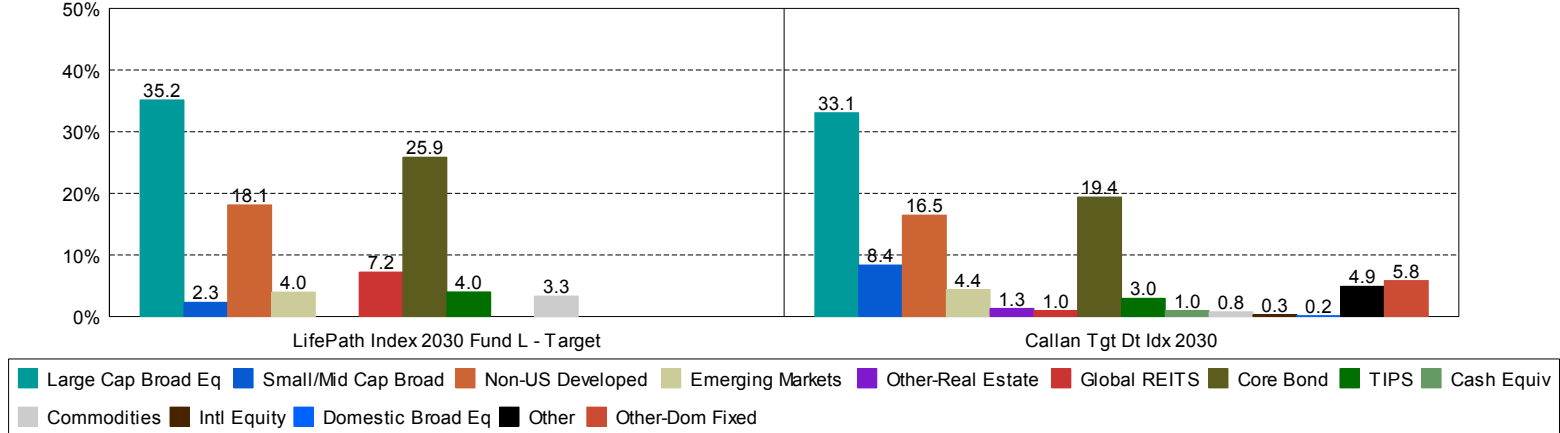
# LifePath Index 2030 Fund

## Target Asset Allocation

Macro-Level Asset Allocation



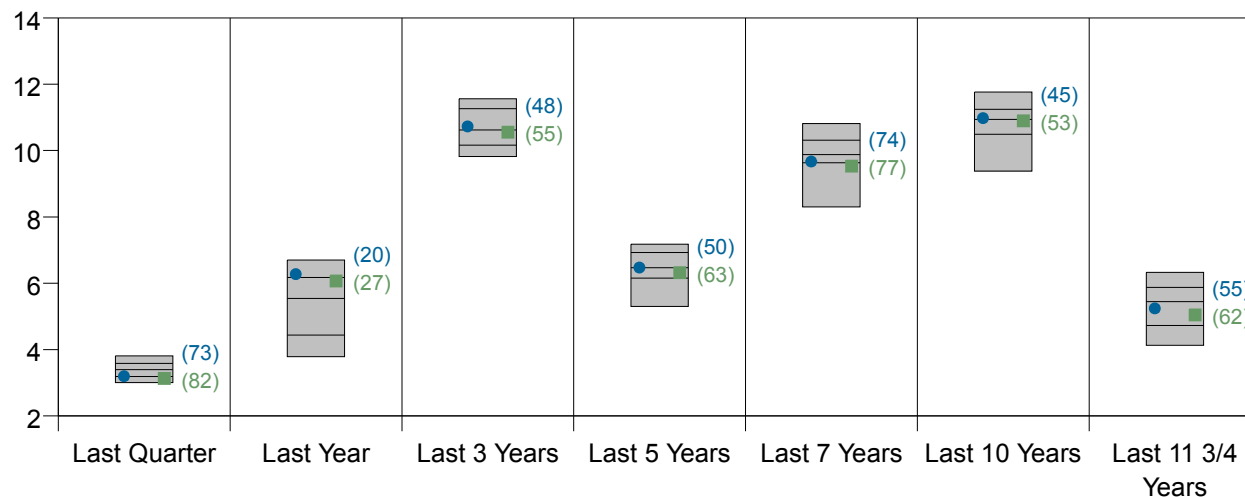
Micro-Level Asset Allocation



# LifePath Index 2050 Fund

Periods Ended June 30, 2019

Performance vs Callan Target Date 2050 (Institutional Net)

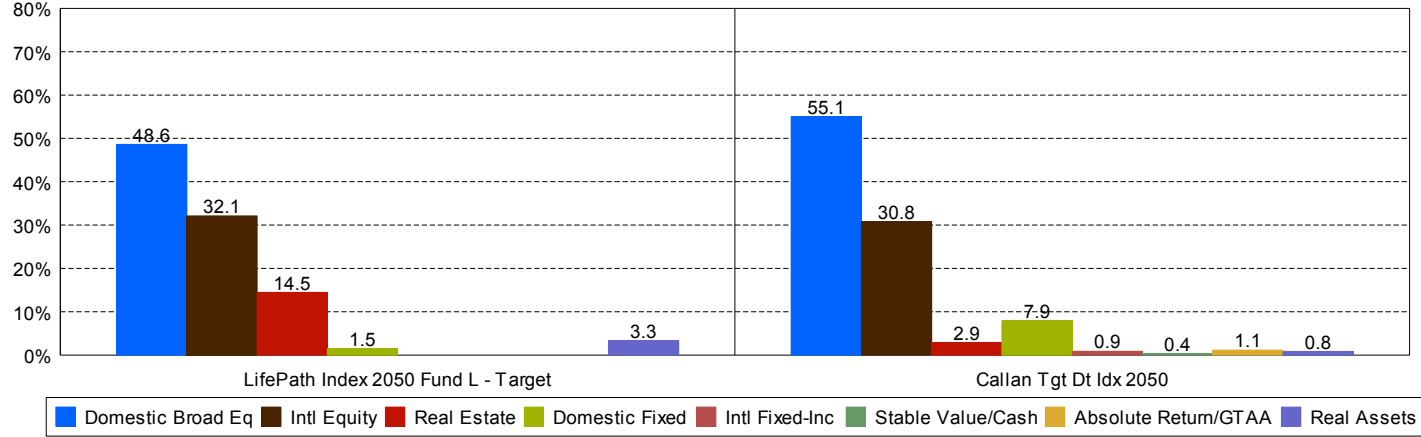


10th Percentile	3.81	6.70	11.57	7.18	10.82	11.77	6.33
25th Percentile	3.59	6.18	11.27	6.93	10.32	11.25	5.88
Median	3.40	5.55	10.62	6.47	9.88	10.94	5.45
75th Percentile	3.19	4.44	10.17	6.16	9.64	10.49	4.73
90th Percentile	3.01	3.79	9.83	5.31	8.30	9.39	4.13
<b>LifePath Index 2050 Fund L</b> ●	3.20	6.28	10.73	6.48	9.67	10.98	5.24
LifePath Index 2050 Benchmark ■	3.13	6.07	10.55	6.32	9.54	10.90	5.05

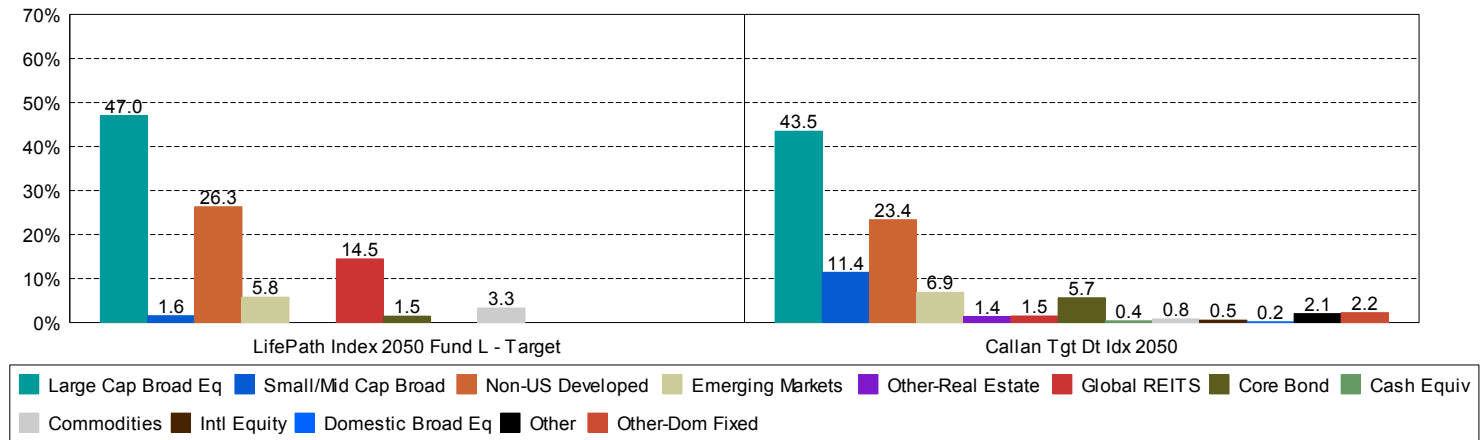
# LifePath Index 2050 Fund

## Target Asset Allocation

Macro-Level Asset Allocation



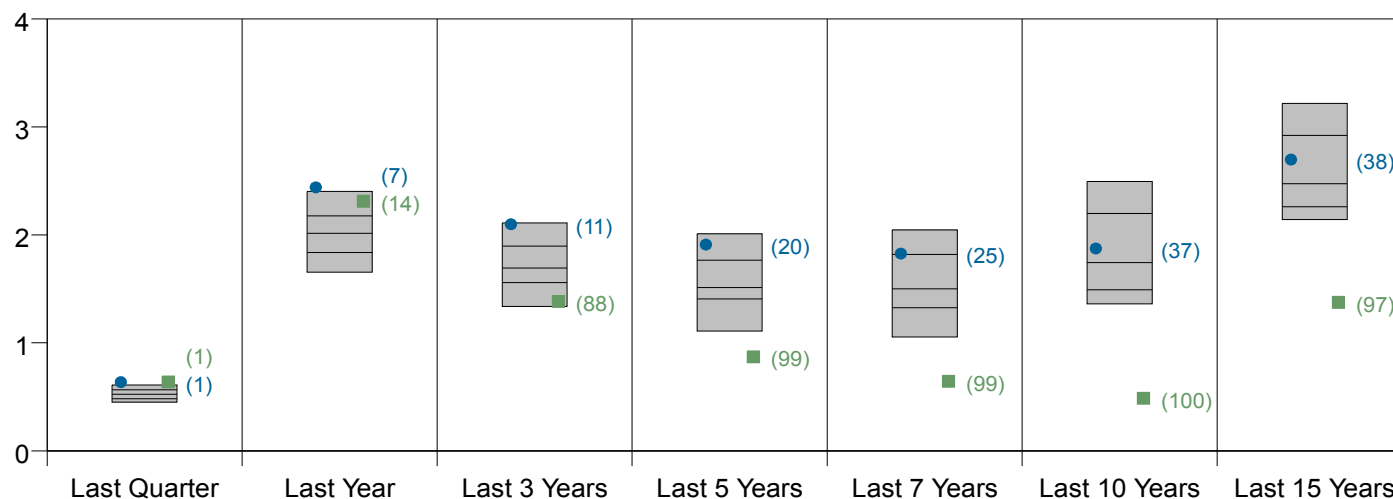
Micro-Level Asset Allocation



# Stable Value Option

Periods Ended June 30, 2019

Performance vs Callan Stable Value CT (Institutional Net)

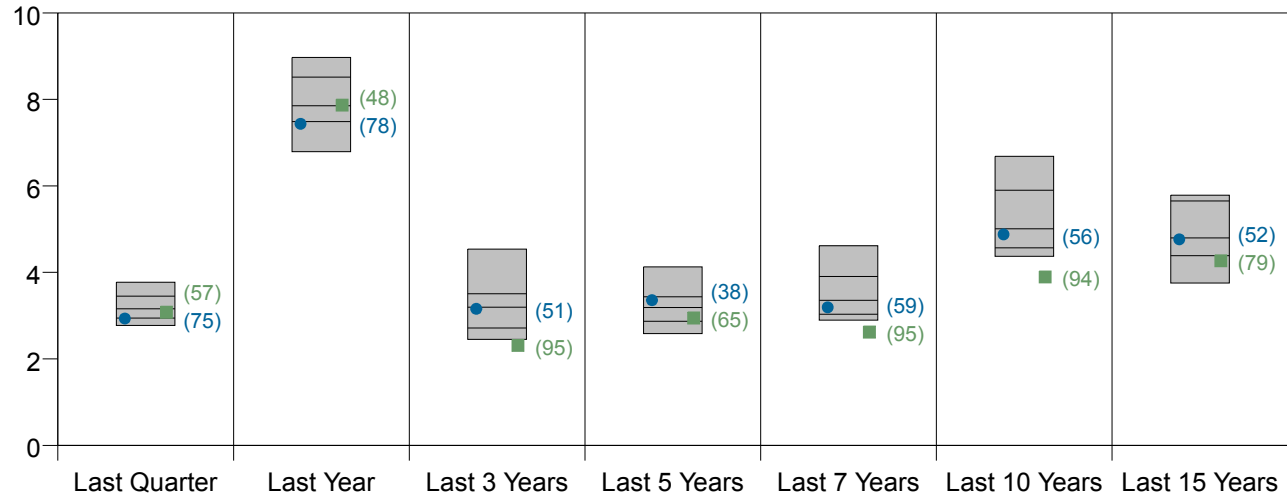


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
10th Percentile	0.61	2.40	2.11	2.01	2.05	2.50	3.22
25th Percentile	0.57	2.18	1.90	1.77	1.82	2.20	2.92
Median	0.53	2.02	1.69	1.51	1.50	1.75	2.47
75th Percentile	0.48	1.84	1.56	1.41	1.33	1.49	2.26
90th Percentile	0.45	1.66	1.34	1.11	1.06	1.36	2.14
<b>Stable Value Option</b> ●	0.64	2.44	2.10	1.91	1.83	1.88	2.70
3-month Treasury Bill ■	0.64	2.31	1.38	0.87	0.65	0.49	1.38

# Active Fixed Income Option

Periods Ended June 30, 2019

Performance vs Callan Core Plus Mutual Funds (Institutional Net)

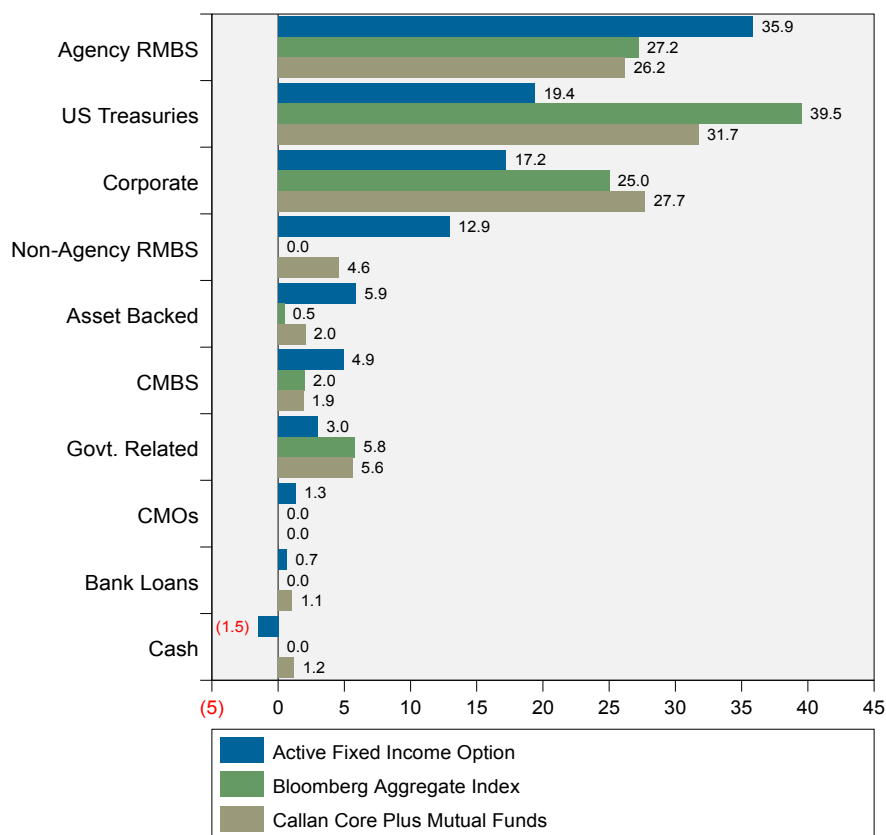


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
10th Percentile	3.77	8.97	4.54	4.13	4.62	6.68	5.78
25th Percentile	3.45	8.52	3.51	3.44	3.91	5.90	5.65
Median	3.16	7.85	3.20	3.19	3.35	5.01	4.80
75th Percentile	2.95	7.49	2.71	2.87	3.03	4.57	4.39
90th Percentile	2.77	6.79	2.45	2.59	2.89	4.37	3.75
<b>Active Fixed Income Option</b> ●	2.94	7.44	3.16	3.36	3.20	4.88	4.76
Bloomberg Aggregate Index ■	3.08	7.87	2.31	2.95	2.62	3.90	4.27

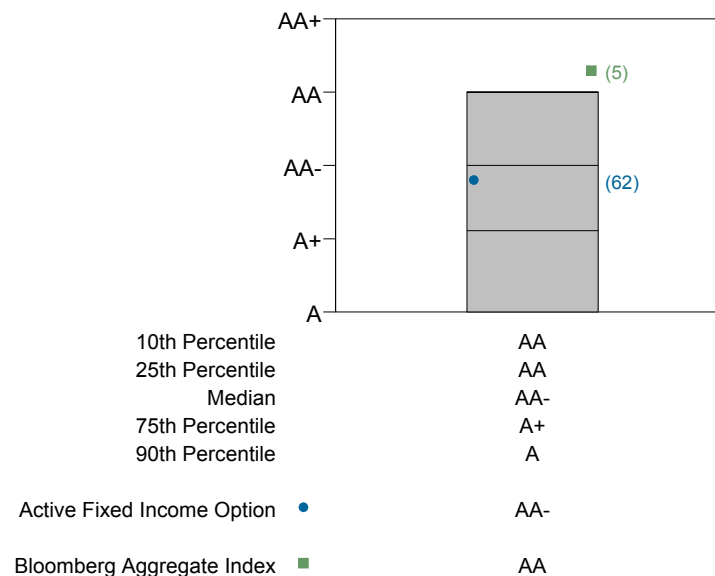
# Active Fixed Income Option

Portfolio Characteristics as of June 30, 2019

**Sector Allocation**  
June 30, 2019



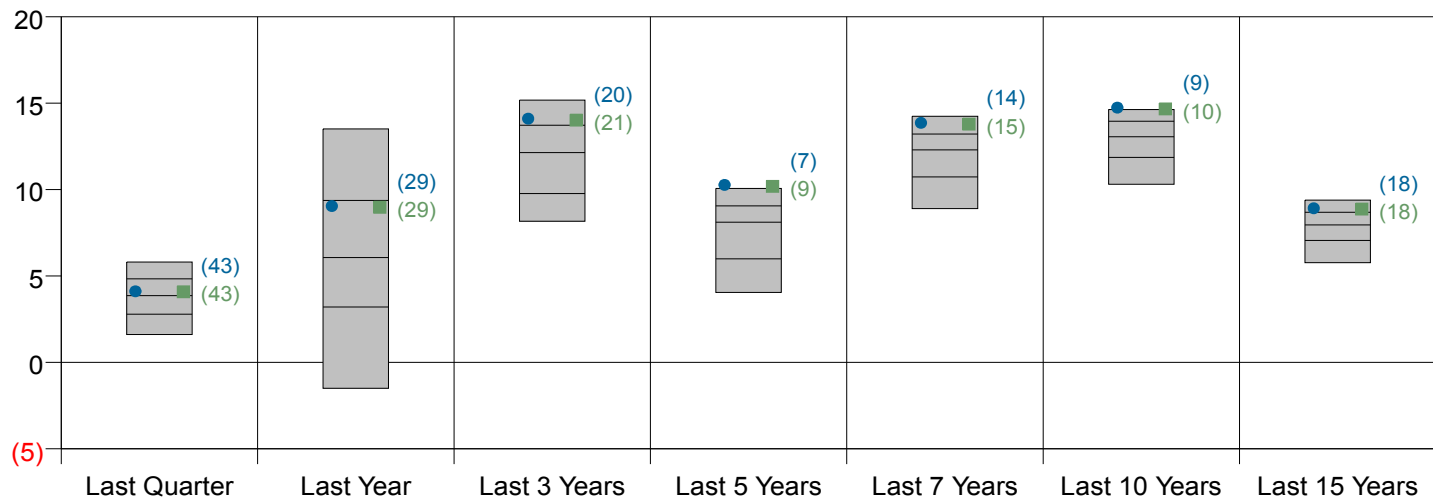
**Quality Ratings**  
vs Callan Core Plus Mutual Funds



# Stock Index Option

Periods Ended June 30, 2019

Performance vs Callan All Cap Core Mutual Funds (Institutional Net)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
10th Percentile	5.82	13.51	15.18	10.07	14.25	14.64	9.39
25th Percentile	4.84	9.38	13.73	9.06	13.22	13.97	8.69
Median	3.86	6.08	12.15	8.12	12.31	13.06	7.96
75th Percentile	2.80	3.21	9.78	5.99	10.74	11.87	7.07
90th Percentile	1.63	(1.50)	8.17	4.05	8.91	10.32	5.78

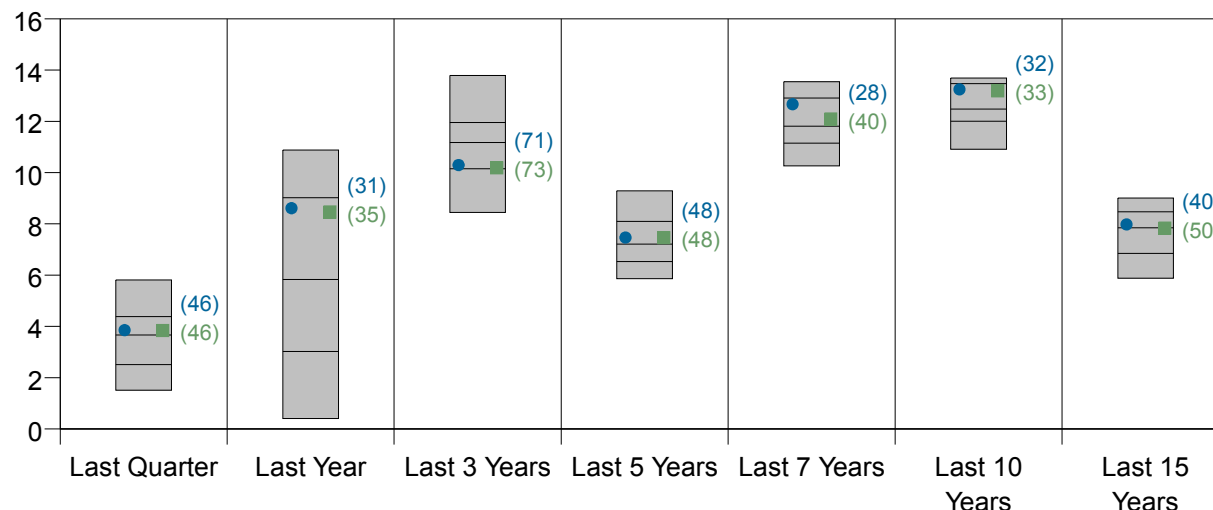
<b>Stock Index Option</b>	•	4.12	9.05	14.11	10.28	13.87	14.75	8.92
Russell 3000 Index	■	4.10	8.98	14.02	10.19	13.79	14.67	8.88



# Large Company Value Stock Option

Periods Ended June 30, 2019

Performance vs Callan Large Cap Value Mutual Funds (Institutional Net)

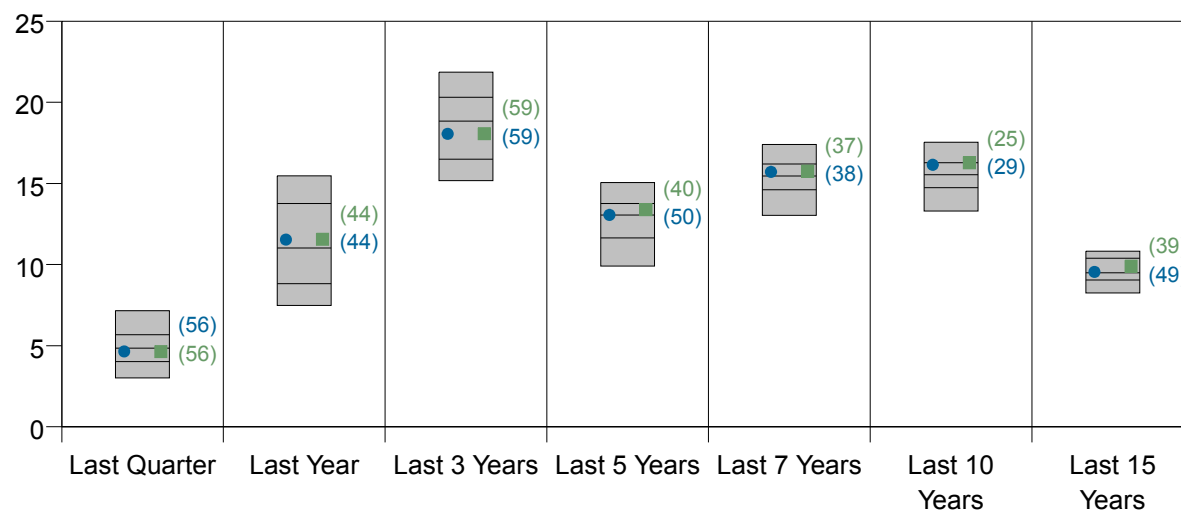


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
10th Percentile	5.81	10.89	13.79	9.29	13.55	13.69	9.01
25th Percentile	4.38	9.02	11.95	8.09	12.91	13.48	8.47
Median	3.67	5.83	11.17	7.21	11.81	12.48	7.85
75th Percentile	2.51	3.02	10.16	6.54	11.15	12.01	6.85
90th Percentile	1.51	0.41	8.45	5.87	10.27	10.91	5.88
<b>Large Company Value Stock Option</b> ●	3.86	8.62	10.29	7.47	12.67	13.25	7.98
Russell 1000 Value Index ■	3.84	8.46	10.19	7.46	12.09	13.19	7.84

# Large Company Growth Stock Option

Periods Ended June 30, 2019

Performance vs Callan Large Cap Growth Mutual Funds (Institutional Net)

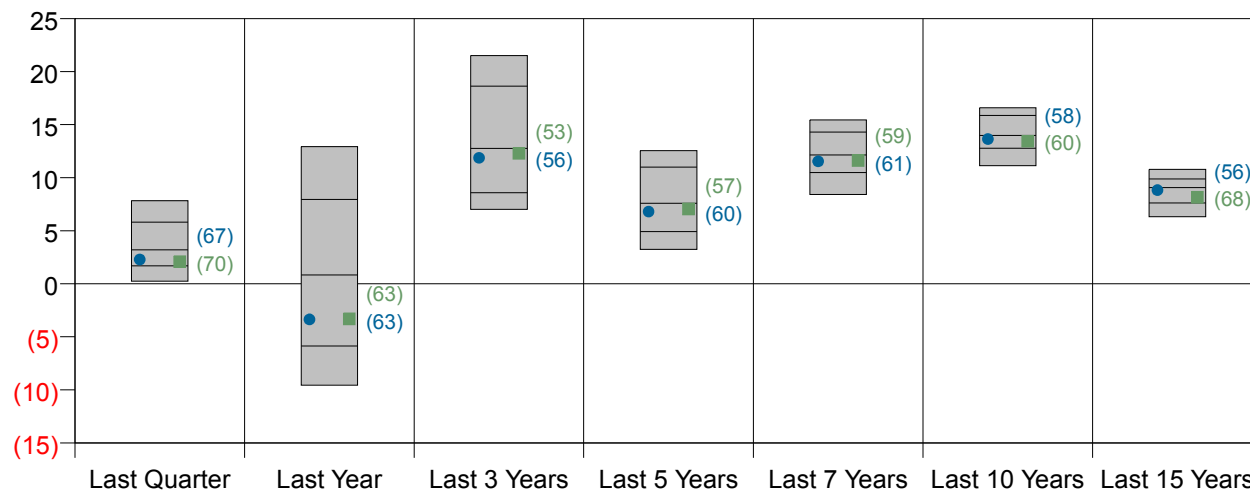


10th Percentile		7.16	15.47	21.86	15.06	17.41	17.54	10.82
25th Percentile		5.69	13.77	20.32	13.76	16.21	16.28	10.39
Median		4.86	11.03	18.85	13.05	15.47	15.55	9.50
75th Percentile		4.02	8.83	16.49	11.65	14.62	14.74	9.05
90th Percentile		3.02	7.49	15.18	9.91	13.03	13.30	8.25
<b>Large Company Growth Stock Option</b>	●	4.65	11.54	18.06	13.06	15.72	16.15	9.55
Russell 1000 Growth Index	■	4.64	11.56	18.07	13.39	15.76	16.28	9.90

# Small Company Stock Option

Periods Ended June 30, 2019

Performance vs Callan Small Cap Mutual Funds (Institutional Net)



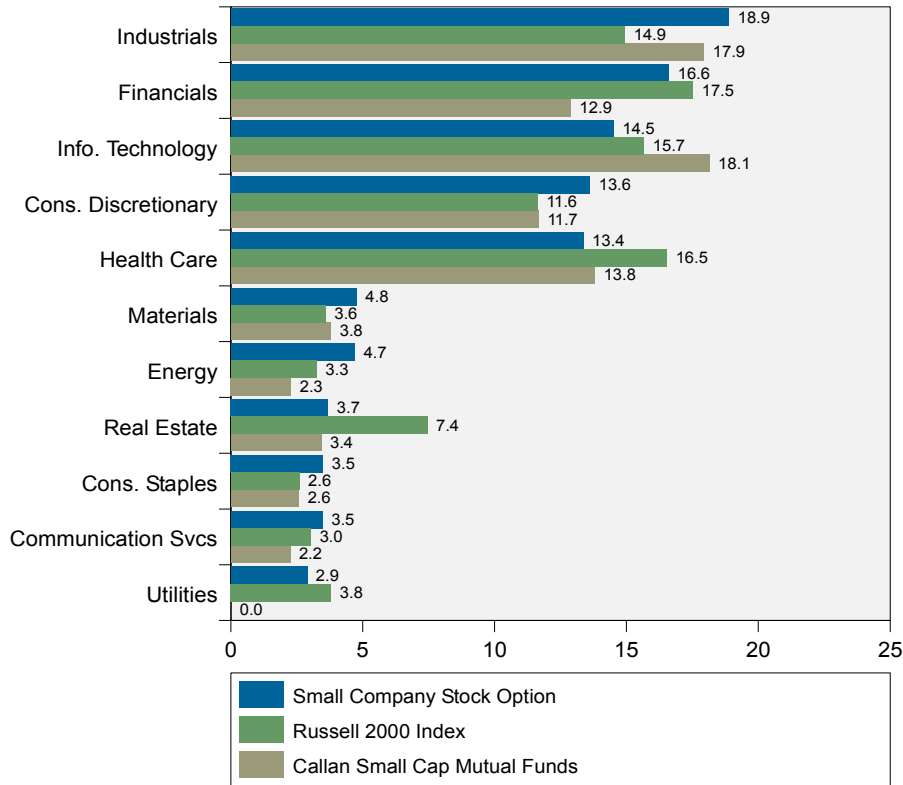
	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
10th Percentile	7.83	12.92	21.52	12.55	15.45	16.61	10.79
25th Percentile	5.81	7.96	18.64	10.99	14.32	15.88	9.89
Median	3.20	0.83	12.76	7.60	12.14	13.99	9.07
75th Percentile	1.69	(5.87)	8.59	4.93	10.51	12.78	7.62
90th Percentile	0.26	(9.55)	7.02	3.25	8.43	11.15	6.33

<b>Small Company Stock Option</b>	•	2.30	(3.36)	11.88	6.81	11.55	13.65	8.84
Russell 2000 Index	■	2.10	(3.31)	12.30	7.06	11.63	13.45	8.15

# Small Company Stock Option

Portfolio Characteristics as of June 30, 2019

**Sector Allocation**  
June 30, 2019



**Style Exposure Matrix**  
Holdings as of June 30, 2019

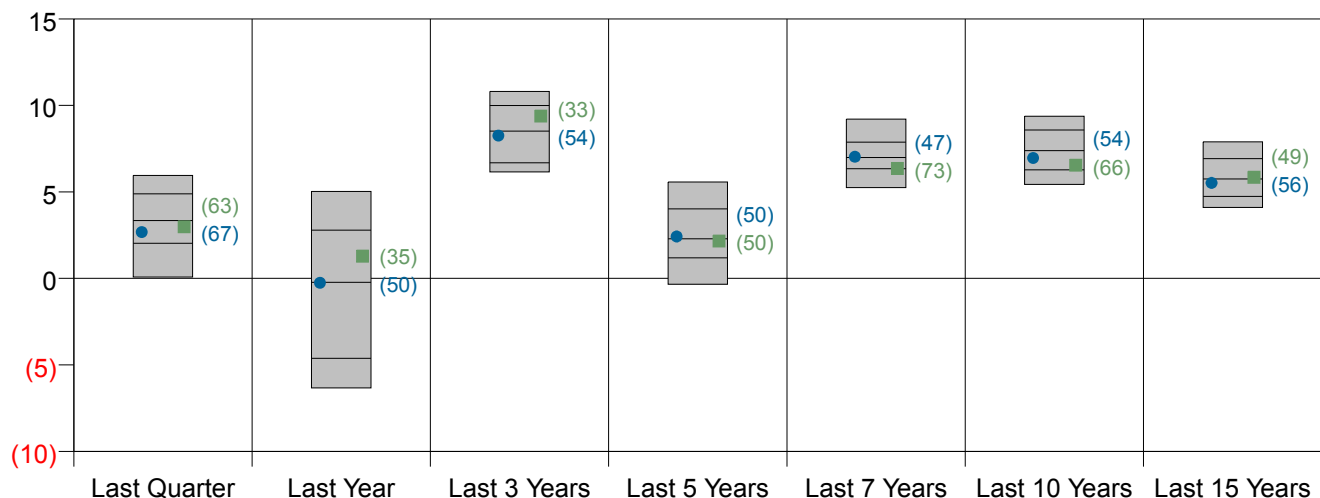
	Value	Core	Growth	Total
<b>Large</b>	0.2% (3)	0.1% (2)	0.6% (9)	0.8% (14)
<b>Mid</b>	2.5% (52)	4.5% (73)	8.6% (113)	15.6% (238)
<b>Small</b>	17.2% (312)	28.8% (491)	22.9% (390)	69.0% (1193)
<b>Micro</b>	5.0% (455)	5.4% (603)	4.1% (252)	14.5% (1310)
<b>Total</b>	24.9% (822)	38.9% (1169)	36.2% (764)	100.0% (2755)
	25.0% (571)	39.7% (821)	35.3% (596)	100.0% (1988)

-- Small Company Stock Option  
-- Russell 2000 Index

# International Stock Option

Periods Ended June 30, 2019

Performance vs Callan Non US Equity Mutual Funds (Institutional Net)

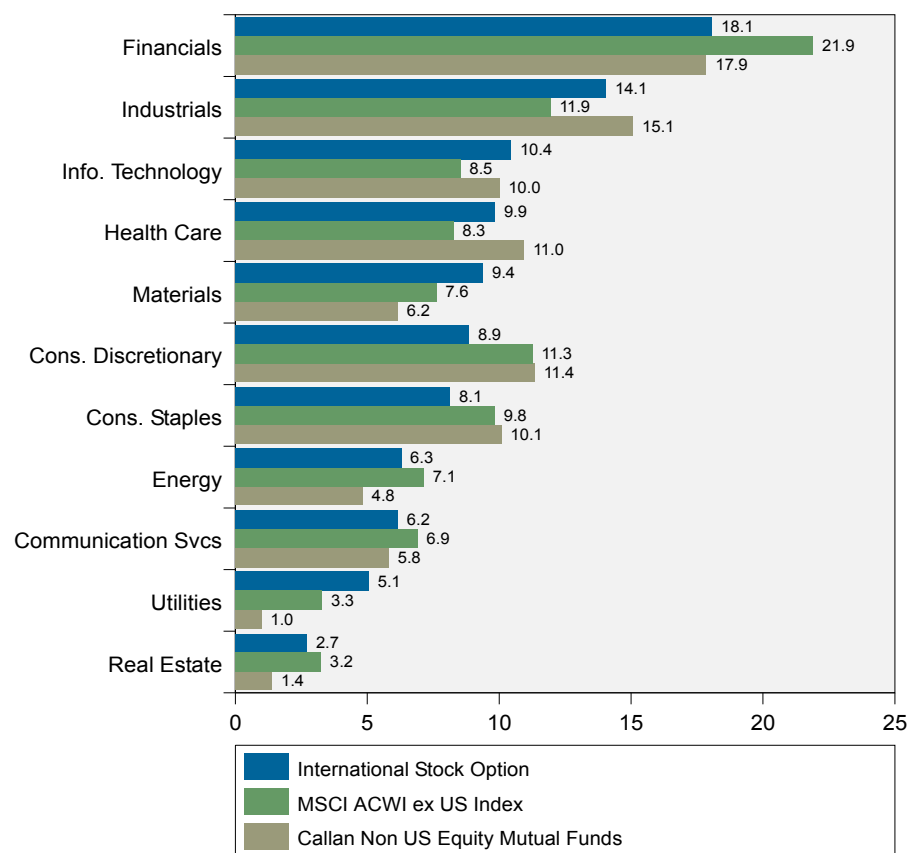


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 15 Years
10th Percentile	5.95	5.03	10.81	5.58	9.21	9.37	7.89
25th Percentile	4.89	2.79	9.99	4.03	7.88	8.58	6.93
Median	3.34	(0.22)	8.51	2.29	7.00	7.39	5.75
75th Percentile	2.04	(4.61)	6.68	1.19	6.35	6.28	4.74
90th Percentile	0.08	(6.33)	6.16	(0.34)	5.25	5.43	4.10
<b>International Stock Option</b> •	2.68	(0.25)	8.26	2.43	7.04	6.96	5.52
MSCI ACWI ex US Index ■	2.98	1.29	9.39	2.16	6.36	6.54	5.85

# International Stock Option

Portfolio Characteristics as of June 30, 2019

**Sector Allocations  
June 30, 2019**



**Regional Exposure Matrix  
Holdings as of June 30, 2019**

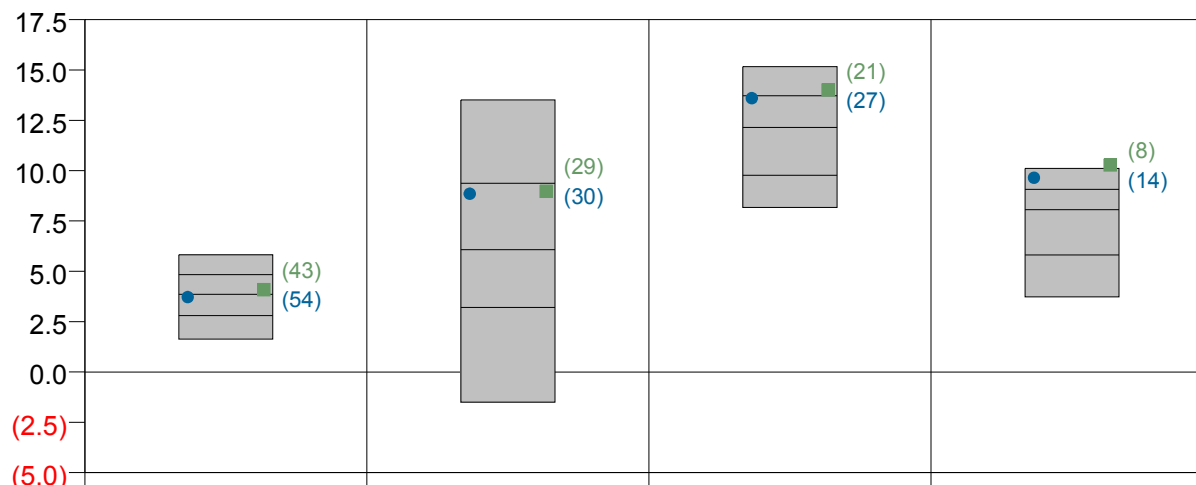
<b>Europe</b>	12.3% (629)	15.7% (684)	19.1% (571)	47.2% (1884)
	13.1% (144)	11.3% (128)	18.1% (178)	42.5% (450)
<b>N. America</b>	1.9% (148)	1.9% (145)	3.0% (98)	6.9% (391)
	2.2% (33)	2.6% (24)	2.1% (32)	6.9% (89)
<b>Pacific</b>	5.5% (1232)	8.2% (963)	6.9% (804)	20.5% (2999)
	7.1% (153)	9.1% (157)	8.3% (159)	24.5% (469)
<b>Emerging</b>	8.9% (1834)	9.3% (1619)	7.2% (1218)	25.4% (4671)
	7.6% (417)	8.1% (370)	10.4% (382)	26.1% (1169)
<b>Total</b>	28.7% (3843)	35.1% (3411)	36.2% (2691)	100.0% (9945)
	30.0% (747)	31.1% (679)	38.9% (751)	100.0% (2177)
	<b>Value</b>	<b>Core</b>	<b>Growth</b>	<b>Total</b>

-- International Stock Option  
-- MSCI ACWI exUS Index

# Socially Responsible Investment Option

Periods Ended June 30, 2019

Performance vs Callan All Cap Core Mutual Funds (Institutional Net)



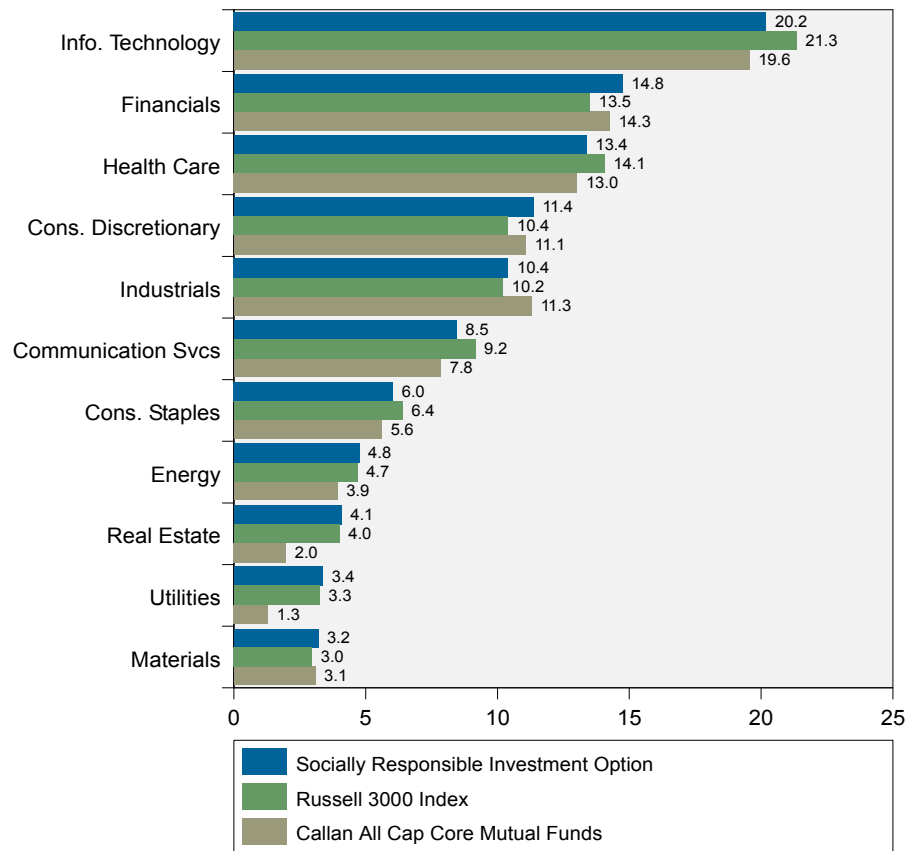
	Last Quarter	Last Year	Last 3 Years	Last 4 1/4 Years
10th Percentile	5.82	13.51	15.18	10.12
25th Percentile	4.84	9.38	13.73	9.08
Median	3.86	6.08	12.15	8.06
75th Percentile	2.80	3.21	9.78	5.82
90th Percentile	1.63	(1.50)	8.17	3.73

<b>Socially Responsible Investment Option</b>	•	3.72	8.85	13.60	9.66
Russell 3000 Index	■	4.10	8.98	14.02	10.29

# Socially Responsible Investment Option

Portfolio Characteristics as of June 30, 2019

**Sector Allocations  
June 30, 2019**



**Style Exposure Matrix  
Holdings as of June 30, 2019**

	Value	Core	Growth	Total
<b>Large</b>	24.2% (54)	21.8% (51)	31.8% (51)	77.8% (156)
	25.0% (107)	20.1% (92)	30.6% (99)	75.7% (298)
<b>Mid</b>	4.2% (71)	6.2% (86)	6.2% (62)	16.5% (219)
	4.9% (180)	6.1% (210)	5.8% (207)	16.8% (597)
<b>Small</b>	1.2% (88)	1.9% (109)	1.9% (86)	5.0% (283)
	1.8% (324)	2.7% (486)	2.1% (384)	6.7% (1194)
<b>Micro</b>	0.2% (23)	0.3% (45)	0.2% (18)	0.7% (86)
	0.3% (297)	0.3% (382)	0.2% (217)	0.8% (896)
<b>Total</b>	29.8% (236)	30.1% (291)	40.1% (217)	100.0% (744)
	32.1% (908)	29.2% (1170)	38.7% (907)	100.0% (2985)

-- Socially Responsible Investment Option  
-- Russell 3000 Index



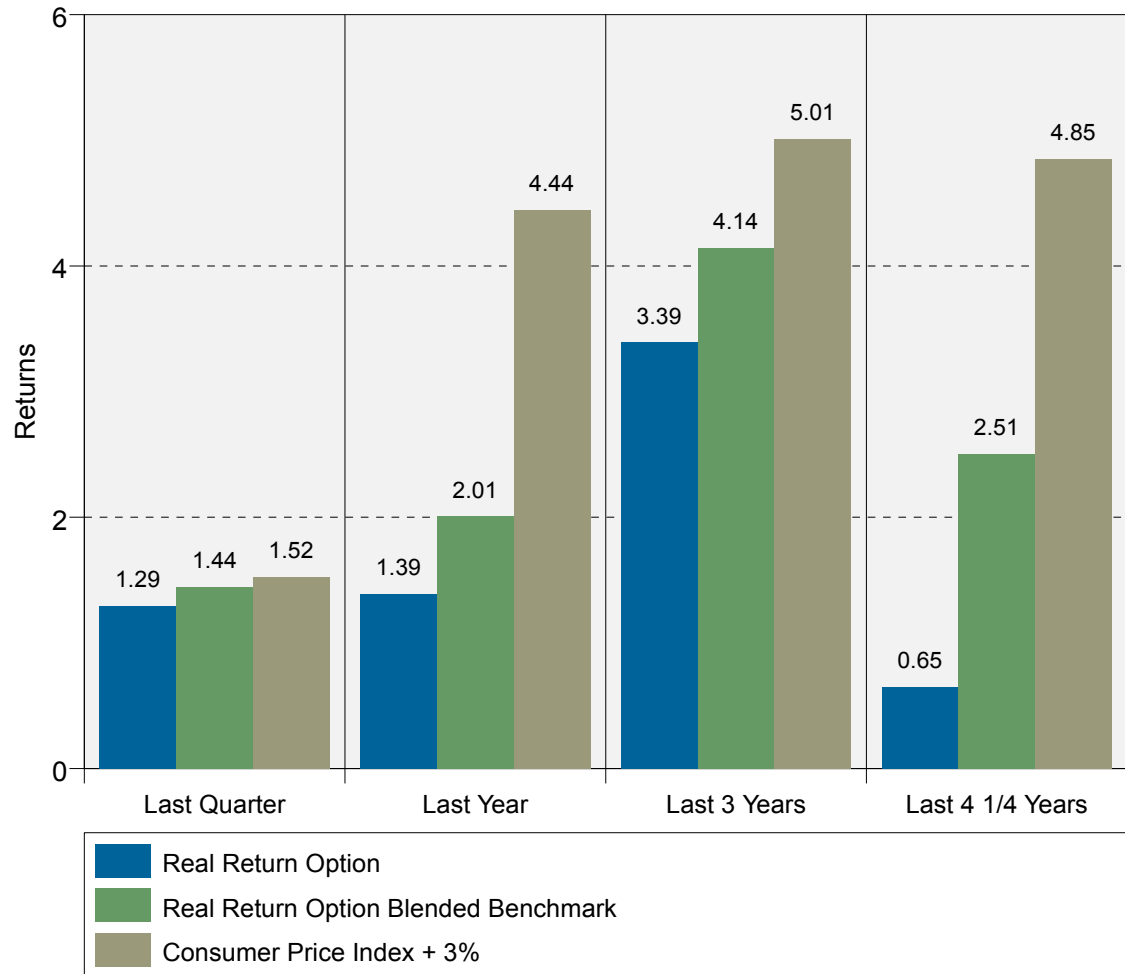
# Real Return Option

Periods Ended June 30, 2019

The Real Return Option was reconstituted during the first quarter of this year.

The current structure is passively managed with the following target allocations (as represented by the Blended Benchmark):

- 15% REITS
- 25% Commodities
- 25% Global Natural Resources
- 25% Treasury Inflation Protected Securities (TIPS)
- 10% Global Infrastructure



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## Disclosure

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## TAB 7 – Asset Allocations & NAV Updates

**Asset Allocations at July 31, 2019**

OPERF	Regular Account						Target Date Funds	Variable Fund	Total Fund	
	Policy	Target <sup>1</sup>	\$ Thousands	Pre-Overlay	Overlay	Net Position	Actual	\$ Thousands	\$ Thousands	\$ Thousands
Public Equity	27.5-37.5%	32.5%	26,433,447	34.5%	31,536	26,464,983	34.5%	1,013,043	475,877	27,953,902
Private Equity	13.5-21.5%	17.5%	16,786,023	21.9%		16,786,023	21.9%			16,786,023
<b>Total Equity</b>	<b>45.0-55.0%</b>	<b>50.0%</b>	<b>43,219,470</b>	<b>56.4%</b>	<b>31,536</b>	<b>43,251,006</b>	<b>56.4%</b>			<b>44,739,926</b>
Opportunity Portfolio	0-3%	0.0%	1,709,554	2.2%		1,709,554	2.2%			1,709,554
Fixed Income	15-25%	20.0%	15,140,738	19.7%	899,329	16,040,066	20.9%	1,372,296		17,412,363
Risk Parity	0.0-2.5%	2.5%	-	0.0%		-	0.0%			-
Real Estate	9.5-15.5%	12.5%	8,240,310	10.7%	(2,400)	8,237,910	10.7%			8,237,910
Alternative Investments	7.5-17.5%	15.0%	7,440,289	9.7%		7,440,289	9.7%			7,440,289
Cash <sup>2</sup>	0-3%	0.0%	938,613	1.2%	(928,464)	10,148	0.0%		9,010	19,158
<b>TOTAL OPERF</b>		<b>100%</b>	<b>\$ 76,688,974</b>	<b>100.0%</b>	<b>\$ -</b>	<b>\$ 76,688,974</b>	<b>100.0%</b>	<b>\$ 2,385,339</b>	<b>\$ 484,886</b>	<b>\$ 79,559,199</b>

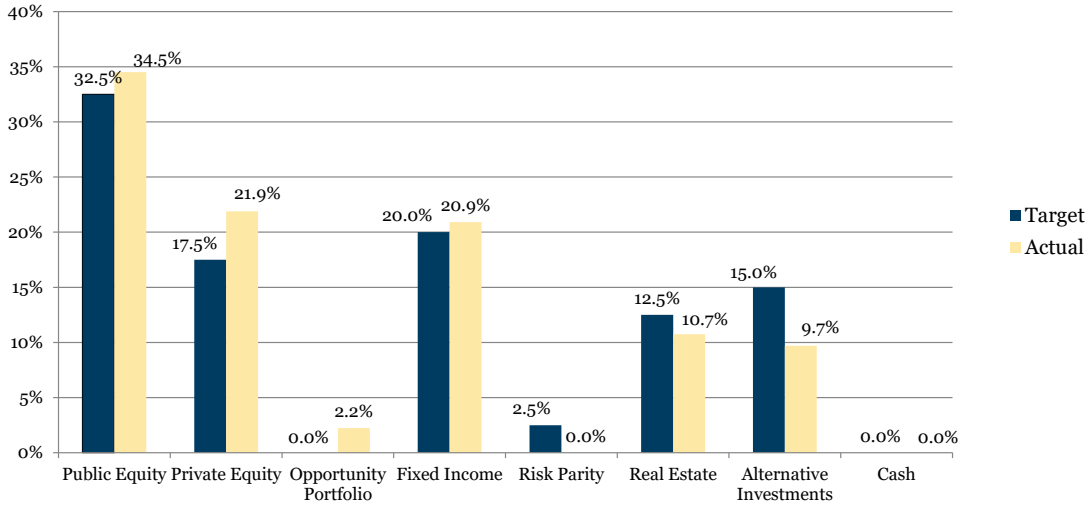
<sup>1</sup>Targets established in June 2015. Interim policy benchmark consists of: 40% MSCI ACWI IMI Net, 22.5% Custom FI Benchmark, 20% Russell 3000+300bps (1 quarter lagged), 12.5% NCREIF ODCE net (1 quarter lagged), & 5% CPI+400bps.

<sup>2</sup>Includes cash held in the policy implementation overlay program.

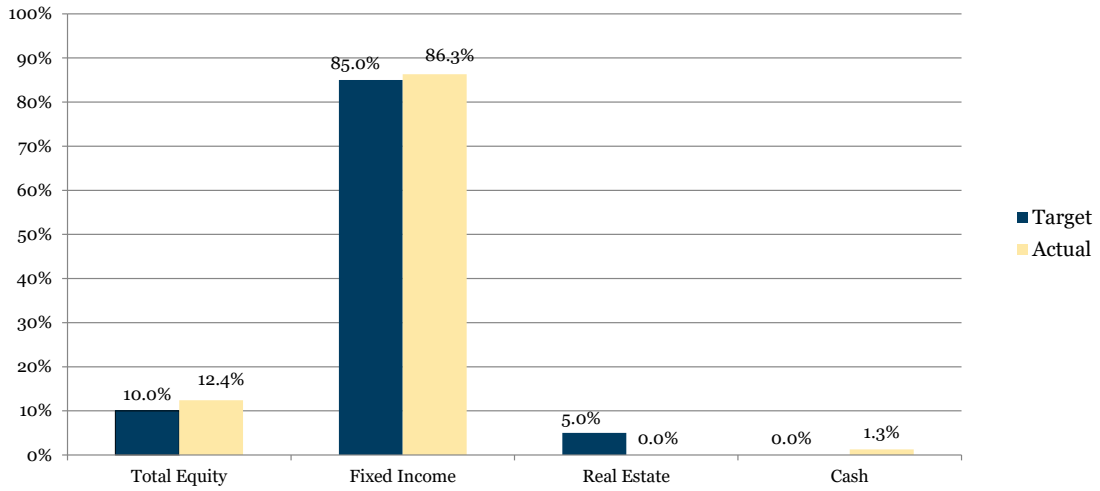
SAIF	Policy	Target	\$ Thousands	Actual
<b>Total Equity</b>	<b>7-13%</b>	<b>10.0%</b>	<b>619,843</b>	<b>12.4%</b>
Fixed Income	80-90%	85.0%	4,319,093	86.3%
Real Estate	0-7%	5.0%	-	0.0%
Cash	0-3%	0.0%	63,834	1.3%
<b>TOTAL SAIF</b>			<b>\$ 5,002,771</b>	<b>100.0%</b>

CSF	Policy	Target	\$ Thousands	Actual
Global Equities	40-50%	45.0%	822,077	46.5%
Private Equity	8-12%	10.0%	208,065	11.8%
<b>Total Equity</b>	<b>58-62%</b>	<b>55.0%</b>	<b>1,030,142</b>	<b>58.2%</b>
Fixed Income	25-35%	25.0%	475,362	26.9%
Real Estate	8-12%	10.0%	126,924	7.2%
Alternative Investments	8-12%	10.0%	115,806	6.5%
Cash	0-3%	0.0%	21,116	1.2%
<b>TOTAL CSF</b>			<b>\$ 1,769,349</b>	<b>100.0%</b>

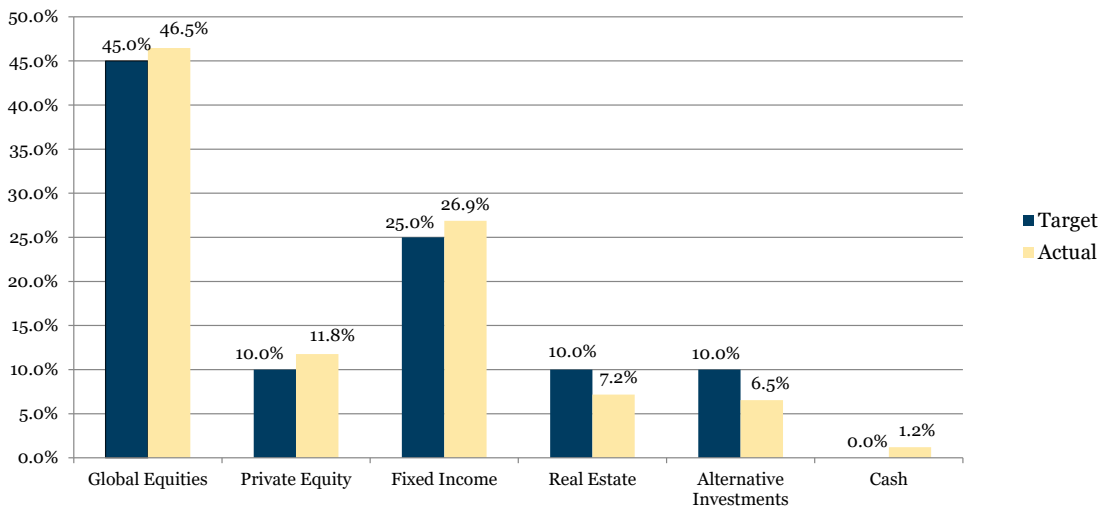
### OPERF Asset Allocation



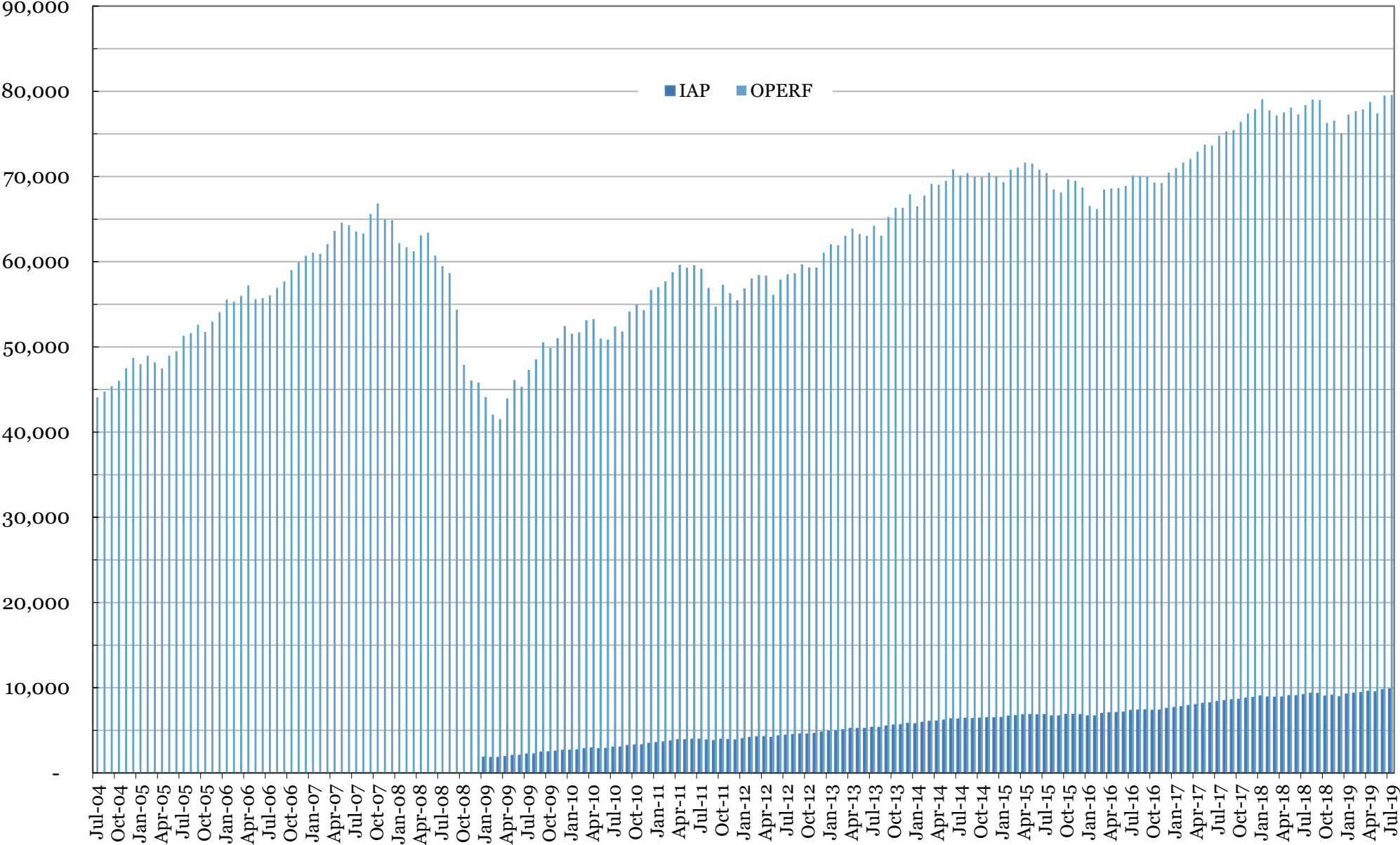
### SAIF Asset Allocation



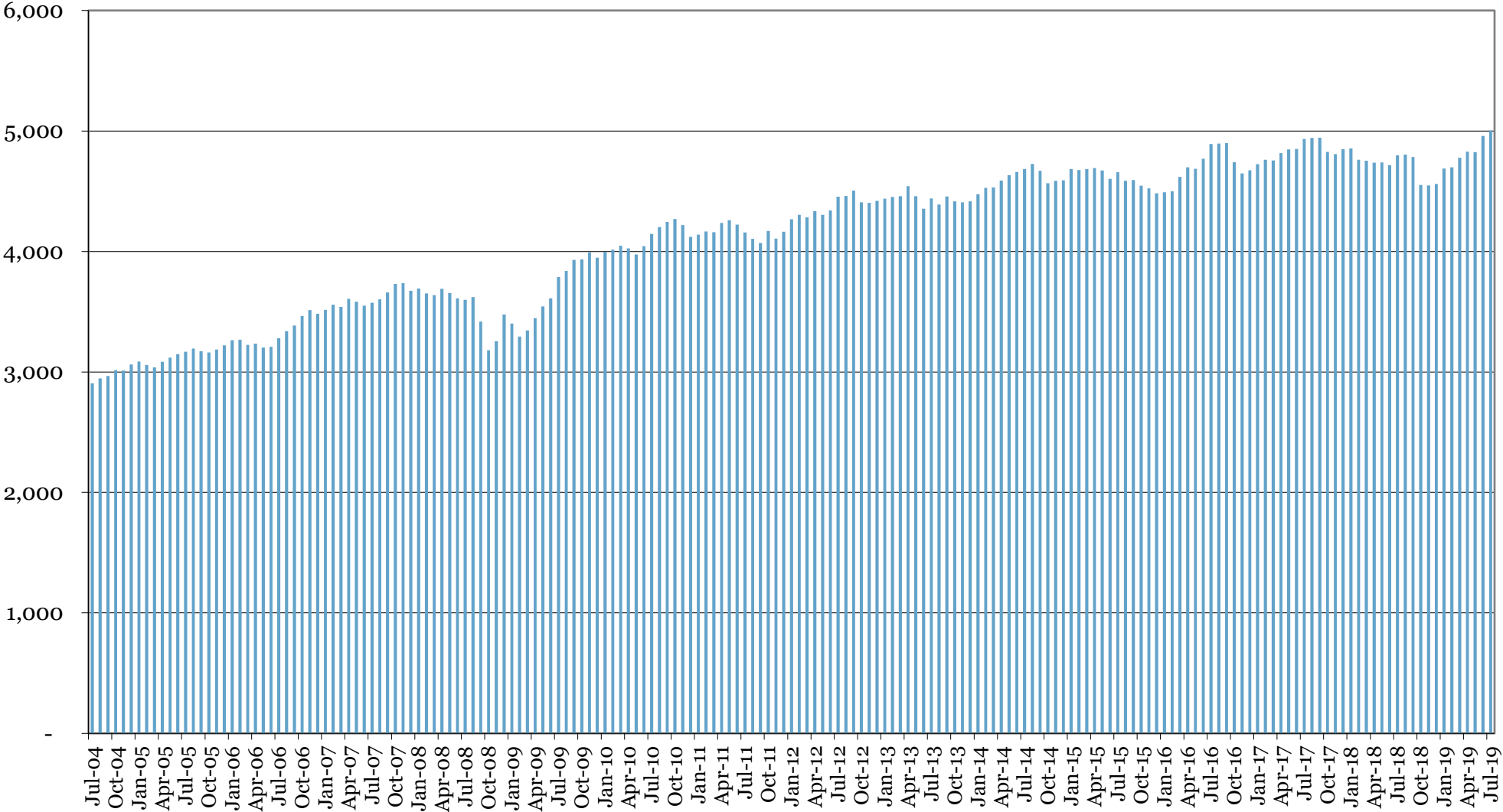
### CSF Asset Allocation



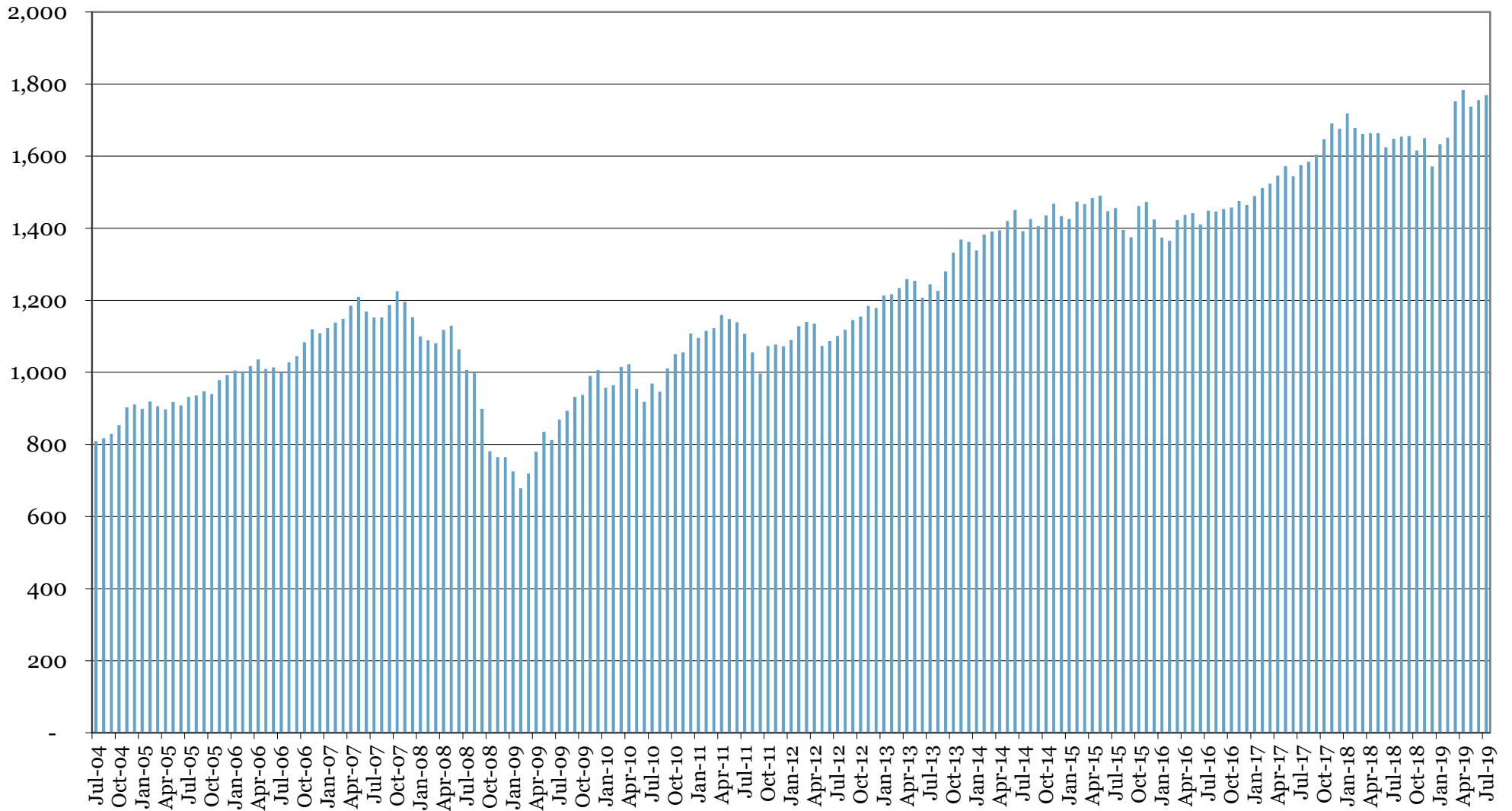
**OPERF NAV**  
**15 years ending July 31, 2019**  
**(\$ in Millions)**



**SAIF NAV**  
**15 years ending July 31, 2019**  
**(\$ in Millions)**



**CSF NAV**  
**15 years ending July 31, 2019**  
**(\$ in Millions)**





## TAB 8 – Calendar — Future Agenda Items

## **2019/20 OIC Forward Calendar and Planned Agenda Topics**

<b>October 30, 2019</b>	Currency Overlay Review and Manager Recommendation ESG Update Public Equity Program Review Opportunity Portfolio Review
<b>December 11, 2019</b>	Fixed Income Program Review Q3 Performance & Risk Report Policy Updates OIC Governance Discussion
<b>January 30, 2020:</b>	2021 OIC Calendar Approval Private Equity Program Review Placement Agent Report IAP Update
<b>March 11, 2020:</b>	Liquidity Update & Analysis CSF Annual Review Real Estate Portfolio Review Q4 2019 Performance & Risk Report
<b>April 22, 2020:</b>	Asset Allocation & Capital Market Assumptions Update Securities Lending Update Overlay Review SAIF Annual Review Real Estate Consultant Recommendation
<b>June 3, 2020</b>	Alternatives Portfolio Review Overlay Review Q1 Performance & Risk Report Operations Update
<b>September 9, 2020</b>	Opportunity Portfolio Review OSGP Annual Review Corporate Governance Update