

Callan



Mendocino County Employees Retirement Association

February 20, 2019 Meeting

Greg DeForrest, CFA
Senior Vice President

Claire Telleen, CFA
Senior Vice President

Callan

Callan's Business Model and Compliance

Client-Centric Consulting Heritage Developed Over 40+ Years



Independent & Focused

- Established in 1973
- Investment consulting remains our primary focus
- 100% employee owned, in Subchapter S Corporation

Experienced

- 401 Clients representing over \$2.3 trillion in assets
- Client-focused consultants with 8-12 clients each
- Consultant tenure – Average 12 years Callan / 22 years Industry
- Client tenure – Average of nearly 10 years

Fully Resourced

- Over 180 employees
- 47 CFA/CAIA Charterholders and 16 CFA/CAIA candidates
- 65 advanced degrees
- 55 specialists in every area of need
- Proprietary systems and databases

About Callan

One of the largest independently owned investment consulting firms in the U.S.

Our Mission

Collaborating with each client to build tailored and lasting investment solutions



Our Philosophies

#1 Investment Philosophy

Combine a long-term perspective with proven investments

#2 Consulting Philosophy

Fuse historical and market context with innovation to create custom strategies

#3 Hiring Philosophy

Attract & retain passionate, high-caliber people

How are we different?

Unique culture of collaboration and peer oversight, and combined benefits of both large and small investment consulting firms



Large firm benefits

Experienced consultants

+

Depth & breadth of specialist resources

+

Extensive, proprietary data & research

Small firm benefits

Employee ownership

+

Responsive & nimble

+

Personalized service

Our Core Values

Keep

client interests
#1

Exercise

independent
thought

Demand

quality &
integrity

Honor

every
commitment

Pursue

innovation
that matters

Lead

through
research &
education

Collaborate

& show
collegial
respect

Encourage

each
associate's
success



Building Successful Client Partnerships Since 1973

65 Public Defined Benefit clients

\$1.5 T Total Assets

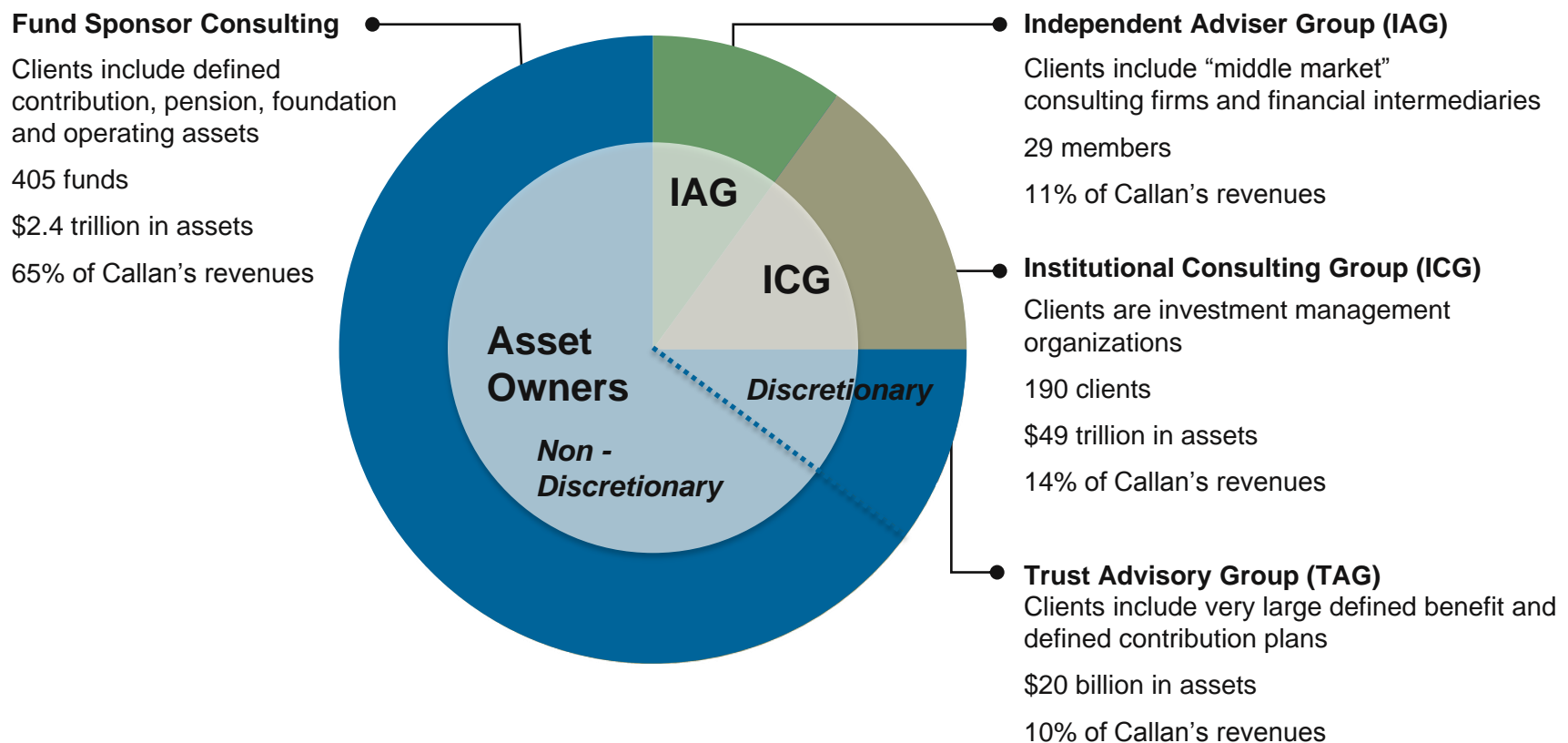
Representative Clients

\$740 M Median Plan Size Assets

Alameda County Employees' Retirement Association	Denver Water	North Dakota State Investment Board
Alaska Retirement Management Board	Sewerage & Water Board of New Orleans	Oregon Investment Council
Arkansas Judicial Retirement System	Firemen's Annuity and Benefit Fund of Chicago	Public Employee Retirement System of Idaho
Arkansas Public Employees' Retirement System	Florida State Board of Administration	Chicago Teachers
Arkansas State Highway Employees'	Fort Pierce Retirement & Benefit System	State of Wisconsin Investment Board
California Public Employees' Retirement System	Georgia Municipal Association	State Teachers Retirement System of Ohio
California State Teachers' Retirement System	Illinois Municipal Retirement Fund	State Universities Retirement System of Illinois
Charlotte Firefighters' Retirement System	Lexington-Fayette Urban County Government	The City and County of San Francisco
City of Atlanta General Employees' Pension Fund	Marin County Employees' Retirement Association	The North Carolina Department of State Treasurer
City of Aurora General Employees' Retirement Plan	MARTA (Metropolitan Atlanta Rapid Transit Authority)	Town of Fairfield
City of El Paso Employees Retirement Trust	Massachusetts PRIM	Tucson Supplemental Retirement System
City of Grosse Pointe Employees Retirement System	MEAG Power Retirement Plan	University of Puerto Rico Employees' Retirement
City of Norwalk Pension Board	Mendocino County Employees' Retirement Association	US Army
City of Tulsa Municipal Employees' Retirement Plan	Milwaukee Employees' Retirement System	Utah Retirement Systems
City of Wyoming Employees' Retirement System (MI)	Mississippi Public Employees' Retirement System	Washington State Investment Board
Cook County	Nevada Public Employees' Retirement System	Wichita Employees' Retirement Board
County Sanitation Districts of Orange County	New York City Employees' Retirement System	Wichita Police & Fire Retirement Board
DeKalb County Georgia		

Callan's Business Model

A diversified revenue stream has been critical to our ability to continue to reinvest in our people and our proprietary systems. It is what allows us to deliver greater capability to our clients at more competitive fees.



As of December 31, 2018

Callan's Ethics Policy

The success of our business depends on maintaining our unblemished record for providing clients with objective advice. Callan's approach has always been to acknowledge and then aggressively manage possible conflicts to ensure they never manifest in the advice we give clients. Our firm is vigilant about employing a highly systematized process that vets potential conflicts, maintains separation of business units, and ensures that we are being entirely transparent in all our relationships. We mitigate conflicts of interest by adhering to the following:

Code of ethical responsibility: Callan adheres to a firm-wide ethical code which each associate must review and acknowledge in writing every year. This code affirms for Callan employees that they must uphold their duty to our clients by adhering to specific policies and procedures. Any breach of this code can result in immediate termination.

Compliance: Our in-house compliance officer makes sure Callan is adhering to all industry standards and regulations, while also identifying risks and putting procedures in place to mitigate them. This officer reports directly to the board of directors to ensure that any employee and all compliance oversight have a separate and distinct line of reporting away from the internal manager and report structures.

Separation of business units: Each of Callan's business units maintains its own personnel, as well as its own profit-and-loss accounting system. Employee compensation is contained within each separate business unit. Clients from one business unit do not receive preferential treatment in another. This statement of fact is communicated to each client at the start of any relationship with Callan and reiterated in writing on an annual basis.

Peer Review: Every manager search or strategic planning project undertaken for a client is a collective effort involving the client, general consultant, a team of specialists, and ultimately a peer review committee. Callan's Manager Search Committee, composed of 14 senior consultants, verifies the accuracy, completeness and objectivity of all methods used in the manager screening process. For strategic planning services, the Client Policy Review Committee, which is comprised of 11 senior consultants, evaluates all reports before they are submitted to the client. This environment of complete transparency requires a thoroughly documented process that is free of unsupported personal opinions and biases.

Disclosure: Callan believes in being proactively transparent with respect to all business activities and relationships. We routinely furnish our fund sponsor clients with a complete list of all investment managers who have professional relationships with Callan. New clients receive this information at the outset of our relationship.

Callan's Commitment to Compliance & Corporate Governance

Overall Compliance program designed to aid Callan in meeting the requirements of its clients, the Investment Advisers Act of 1940 and ERISA

Senior level reporting and composition

- Separate and distinct line of reporting to the Board
- Management Committee oversight
- Resourced with experience (yrs industry/yrs Callan):
 - Chief Compliance Officer – Ann DeLuce (31/28)
 - Compliance managers –Rosanna Sangalang (30/26), Michael Bell (20/11), Doug Grochowski (20/1)
 - DLA Piper retainer relationship
 - NRS Risk Assessment consultant

Written policies and procedures

- Compliance manual which includes Callan's Code of Ethics
- Disclosure policies

Ongoing monitoring, review and assessment of Compliance Program

- Results of most recent regulatory examinations

Annual review and training of Compliance Program

- Most recent annual assessment

45+ year reputation of culture of compliance

Callan Committees

Alternatives Review Committee

Client Policy Review Committee

Defined Contribution Committee

Diverse and Emerging Manager Committee

ESG Committee (Environmental, Social, and Governance)

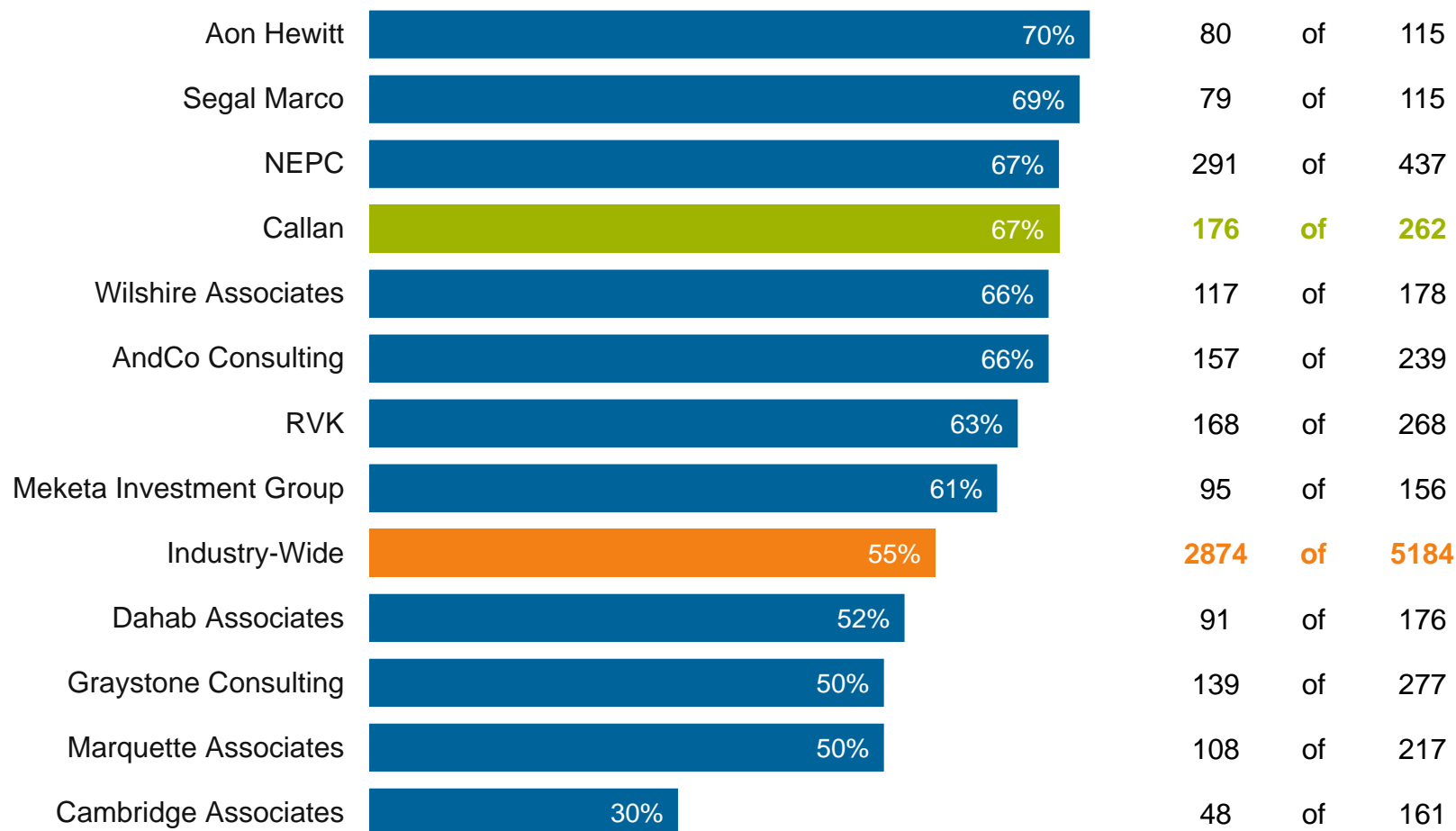
Institute Advisory Committee

Management Committee

Manager Search Committee

Industry-Wide Analysis of Search Activity

Percent of Mandates Awarded to Callan Manager Clients 2013 – 2017



Source: Represents reported public market searches for U.S. defined benefit plans, endowments, foundations and Taft-Hartley plans where a manager winner was identified. Search statistics provided by finsearches; list of Callan manager clients provided by Callan.

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Callan's 2019 Capital Market Projections

Agenda

Process Overview

- Why does Callan create capital market projections?

Current Market Conditions

2019 Expectations

- Economic outlook
- Asset class outlook
 - Equity
 - Fixed Income
 - Alternative investments
- Forecast parameters
 - Returns
 - Risk
 - Correlation

Detailed 2019 Projections and Resulting Portfolio Returns

Where do we go from here? Time horizon and strategic planning versus tactics

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Process Overview

Why Make Capital Market Projections?

Guiding Objectives and Process

Cornerstone of a prudent process is a long-term strategic investment plan.

- Capital market projections are key elements — set reasonable return and risk expectations for the appropriate time horizon.
- Projections represent our best thinking regarding the long-term (10-year) outlook, recognizing our median projections represent the midpoint of a range, rather than a specific number.
- Develop results that are readily defensible both for individual asset classes and for total portfolios.
- Be conscious of the level of change suggested in strategic allocations for long-term investors: DB plan sponsors, foundations, endowments, trusts, DC participants, families and individuals.
- Reflect common sense and recent market developments, within reason.

Callan's forecasts are informed by current market conditions, but are not built directly from them.

- Balance recent, immediate performance and valuation against long-term equilibrium expectations.

Why Make Capital Market Projections?

Guiding Objectives and Process

Underlying beliefs guide the development of the projections:

- An initial bias toward long-run averages.
- A conservative bias.
- An awareness of risk premiums.
- A presumption that markets ultimately clear and are rational.

Reflect our beliefs that long-term equilibrium relationships between the capital markets and lasting trends in global economic growth are key drivers to setting capital market expectations.

Long-term compensated risk premiums represent “beta”—exposure to each broad market, whether traditional or “exotic,” with limited dependence on successful realization of alpha.

The projection process is built around several key building blocks:

- Advanced modeling at the individual asset class level (for example, a detailed bond model, an equity model).
- A path for interest rates and inflation.
- A cohesive economic outlook.
- A framework that encompasses Callan beliefs about the long-term operation and efficiencies of the capital markets.

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Current Market Conditions

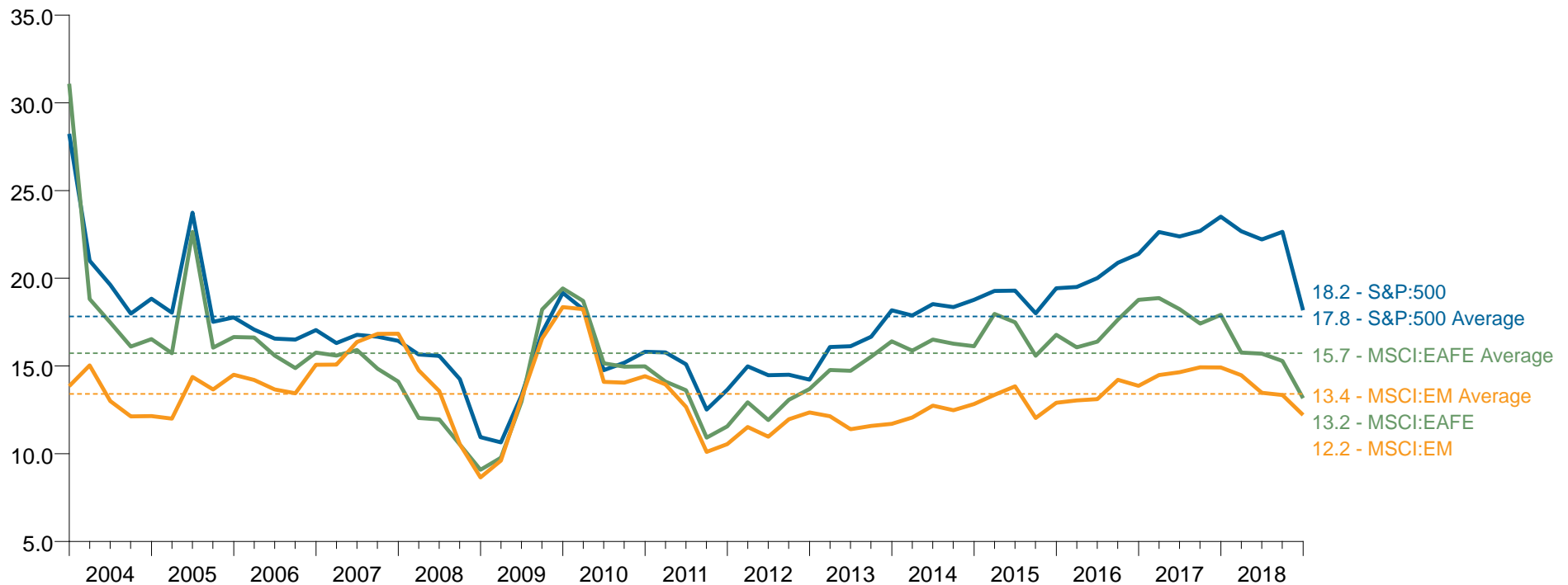
What Are We Talking About with Investors?

Common themes as we start 2019

- Current expansion is growing long in the tooth; has a downturn begun, should something be done about it?
- Urge to engage in market timing is very great: long-term benefit to higher equity but investors (and Callan) are nervous about ramping up right now.
 - Competing fears: equity market downturn vs. fear of missing out (FOMO!)
 - Refine definition of growth to include high yield, convertibles, low volatility equity, hedge funds, MACs, and option based strategies – tamp down risk within the growth allocation
 - Diversify cap-weighted equity with factor strategies
 - Conservative equity
 - Reduce equity allocation
 - Examine explicit risk mitigation strategies – hedges or diversifiers?
- Corporate plan dilemma: to de-risk (LDI) or not to de-risk (EROA)?
- Litany of macro investing concerns raising anxiety:
 - Trade wars
 - Oil price collapse
 - Weaker GDP cycle going forward
 - Inverted yield curve
 - Emerging markets underperformance
 - Value underperformance
 - Equity concentration risk
 - When does China become an asset class?
- Preparing for return to “normal” market volatility?

Global Equity Valuations—Historical Data

Price/Earnings Ratio (exc neg) for 15 Years ended December 31, 2018



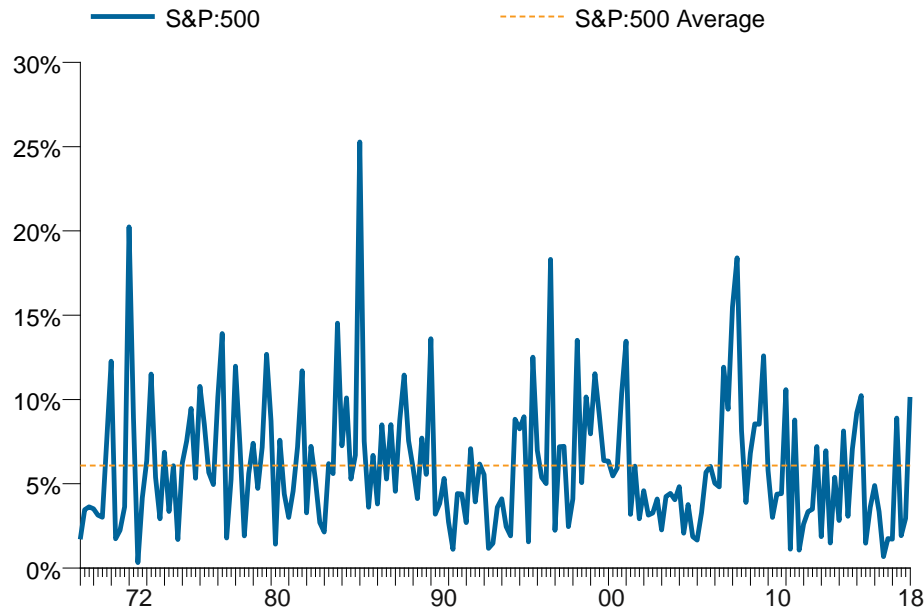
- U.S. equity valuations slipped in first three quarters of 2018 then plummeted in Q4, returning to their historical average. U.S. remains higher than non-U.S. developed and emerging market equity valuations relative to the 15-year average for each index.
- Current valuations are well below the tech-bubble era and have recuperated steadily after the Global Financial Crisis.
- U.S. equity valuations are higher relative to non-U.S. developed and emerging market equity.
- Despite reasonable relative valuations, both political and economic risks remain in international markets.
- Forward valuations have dropped in each of the first two quarters of 2018 and the 14.4 December reading is below the 25-year average.

Source: Callan LLC.

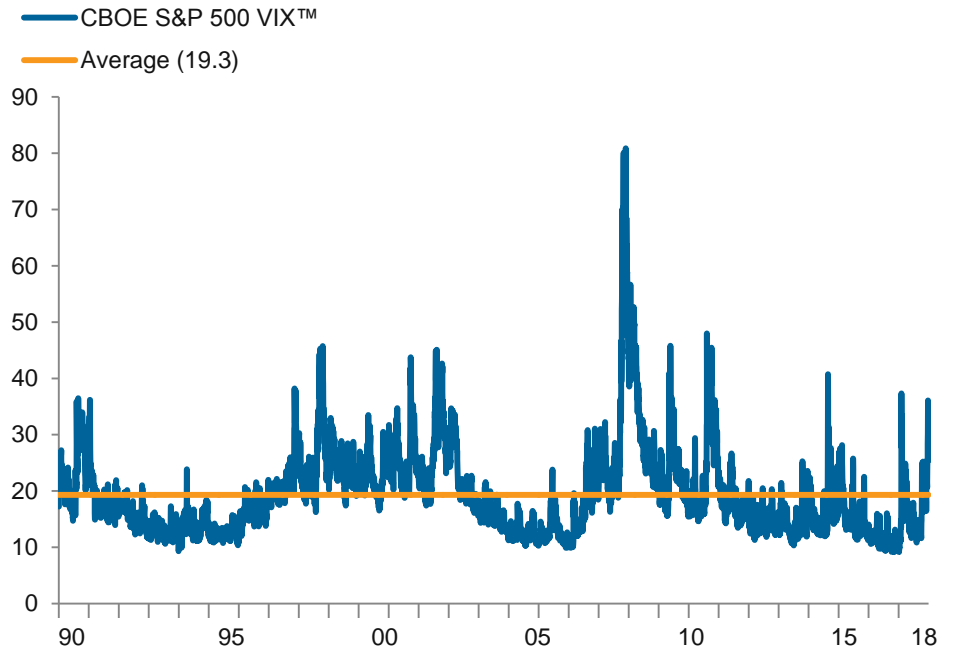
Market Volatility—Realized and Implied

S&P 500 Index

Standard Deviation for S&P 500



CBOE VIX™



- The VIX, measuring the implied volatility of S&P 500 Index options, spiked 116% on Feb 5 when the market sank 4%, marking the biggest jump ever recorded—albeit from historically low levels.
- Volatility remained elevated through March and April, then fell below the long-term average of 19.3 until October, when fear returned.
- Fourth quarter 2018 volatility was exacerbated by concerns about trade, slowing global growth, earnings after a peak, and generalized anxiety, all while US economic data continued to come in strong.
- Valuations as measured by traditional metrics like P/E are now at or below long term averages.

Source: Callan LLC.

Unprecedented Policy Response Is Finally Over

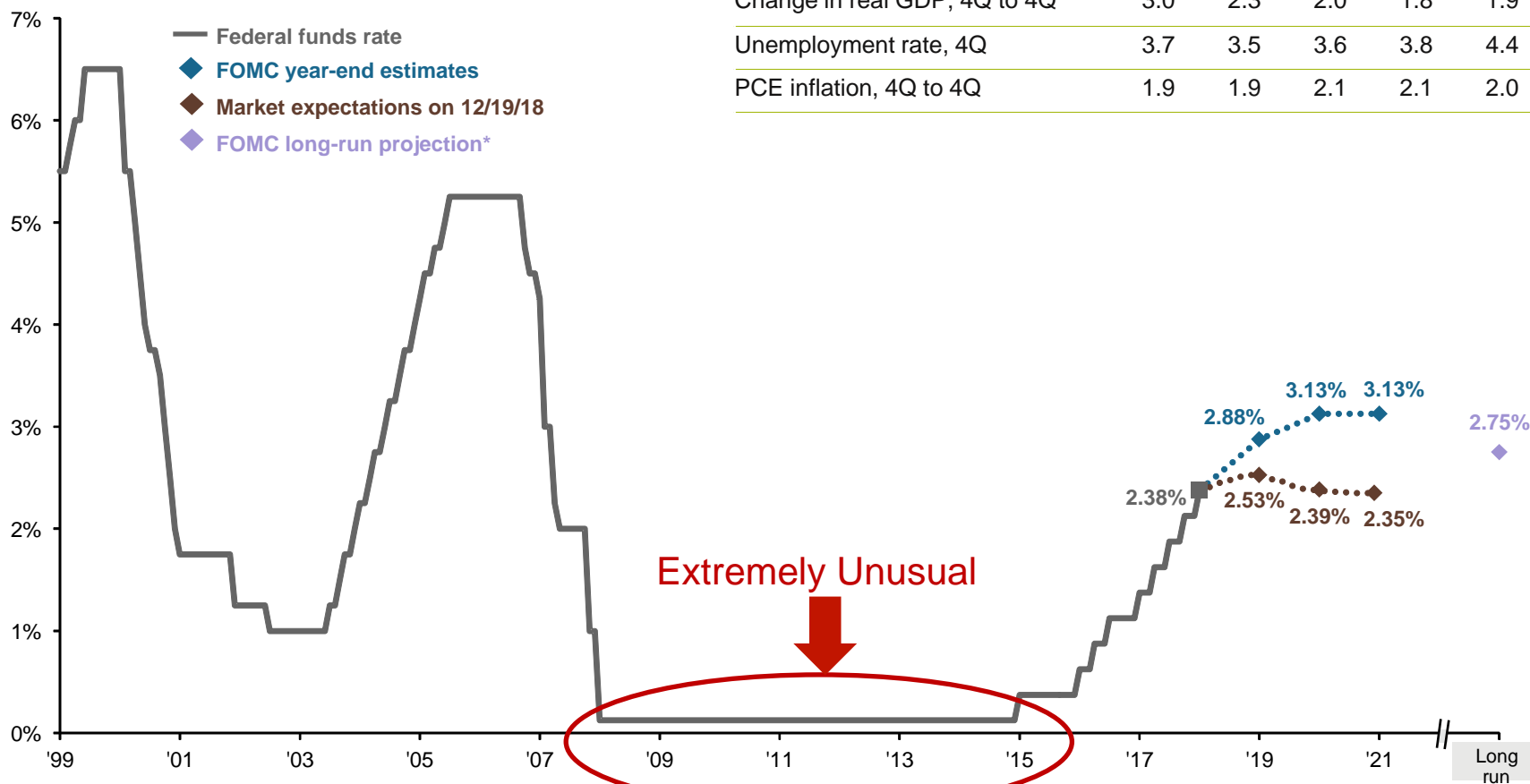
Fed moved toward normalization with four rate hikes in 2018; two more still projected for 2019

Federal funds rate expectations

FOMC and market expectations for the fed funds rate

FOMC December 2018 forecasts (percent)

	2018	2019	2020	2021	Long run
Change in real GDP, 4Q to 4Q	3.0	2.3	2.0	1.8	1.9
Unemployment rate, 4Q	3.7	3.5	3.6	3.8	4.4
PCE inflation, 4Q to 4Q	1.9	1.9	2.1	2.1	2.0



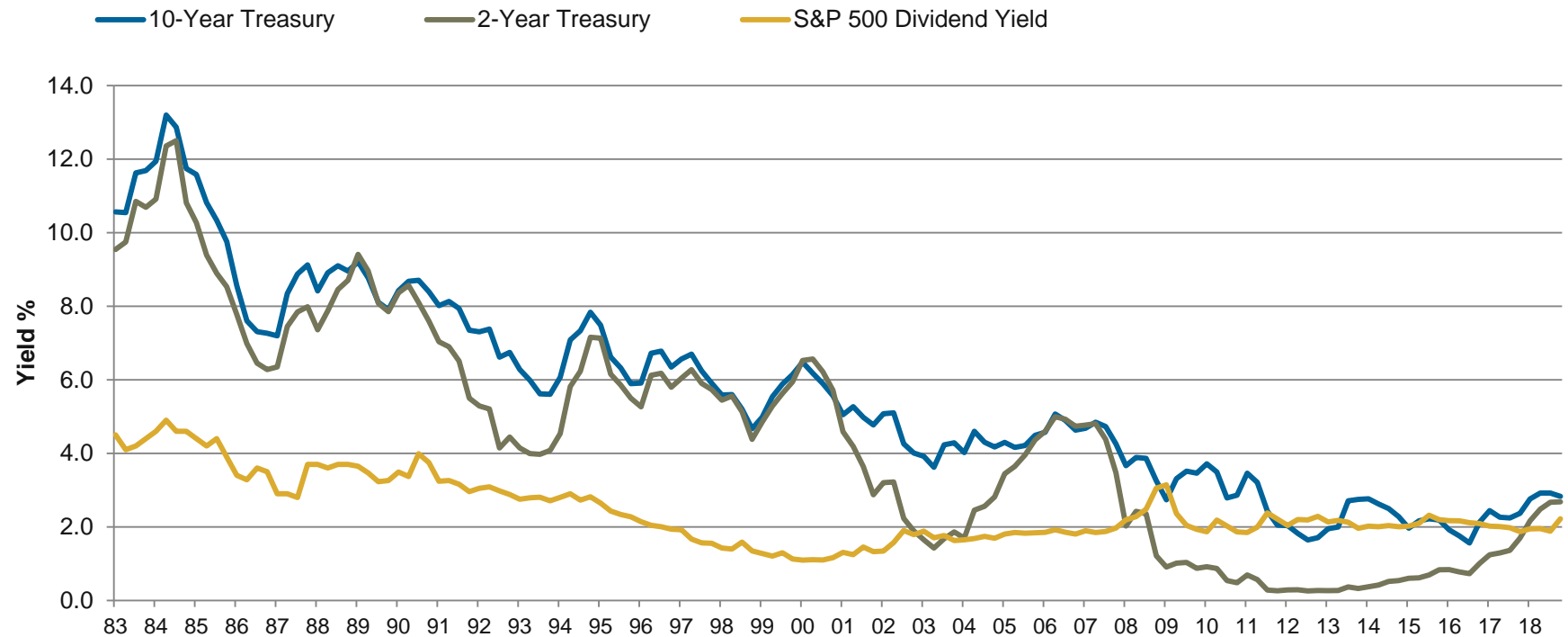
Source: Bloomberg, FactSet, Federal Reserve, J.P. Morgan Asset Management.

Market expectations are the federal funds rates priced into the fed futures market as of the date of the December 2018 FOMC meeting and are through November 2021. *Long-run projections are the rates of growth, unemployment and inflation to which a policymaker expects the economy to converge over the next five to six years in absence of further shocks and under appropriate monetary policy.

Guide to the Markets – U.S. Data are as of December 31, 2018.

Long Period of Zero Interest Rate Policy Skews Memories of 'Normal Markets'

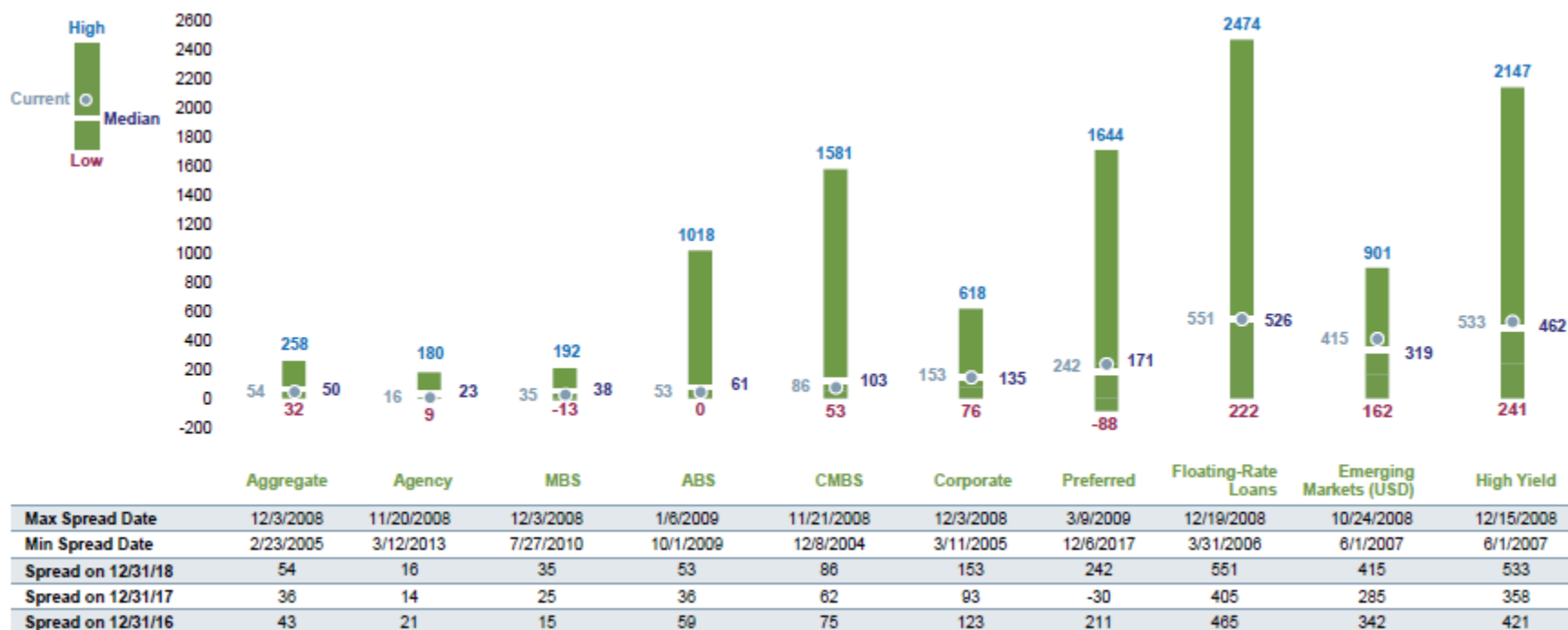
Yields on 2-Year Treasury notes are higher than the S&P dividend for the first time in 10 years



Long-term historical relationship between bond yields and dividends has been distorted by 10 years of extreme policy intervention.

Source: Callan LLC

Fixed Income Valuations



Source: Eaton Vance

- Spreads widened relative to Treasuries on a 15-year basis, rising from historically low levels at the end of 2017 as risk returned. Spreads are now at or above long term median levels for most sectors.
- Below-investment grade sectors such as high yield and bank loans still maintain a yield advantage over other spread sectors.

Source: Factset as of 12/31/18. Spread history measures past 15 years. Data provided is for informational use only. Past performance is no guarantee of future results. All fixed-income spreads are in basis points and measure option-adjusted yield spread relative to comparable maturity U.S. Treasuries using daily data. Loan Index spread represents the three-year discounted spread over LIBOR. Aggregate represented by Bloomberg Barclays US Aggregate Index. Agency represented by Bloomberg Barclays U.S. Agency Index. MBS represented by Bloomberg Barclays U.S. Mortgage Backed Securities (MBS) Index. ABS represented by Bloomberg Barclays U.S. Asset Backed Securities (ABS) Index. CMBS represented by Bloomberg Barclays U.S. CMBS Investment Grade Index. Corporate represented by Bloomberg Barclays U.S. Corporate Investment Grade Index. Preferred represented by ICE BofA ML Fixed Rate Preferred Securities Index. Floating-Rate Loans represented by S&P/LSTA Leveraged Loan Index. Emerging Markets(USD) represented by JPMorgan Emerging Markets Bond Index (EMBI) Global Diversified. High Yield represented by ICE BofA ML US High Yield Index.

Diversification Remains Key Risk Control

Periodic Table of Investment Returns 1998-2018

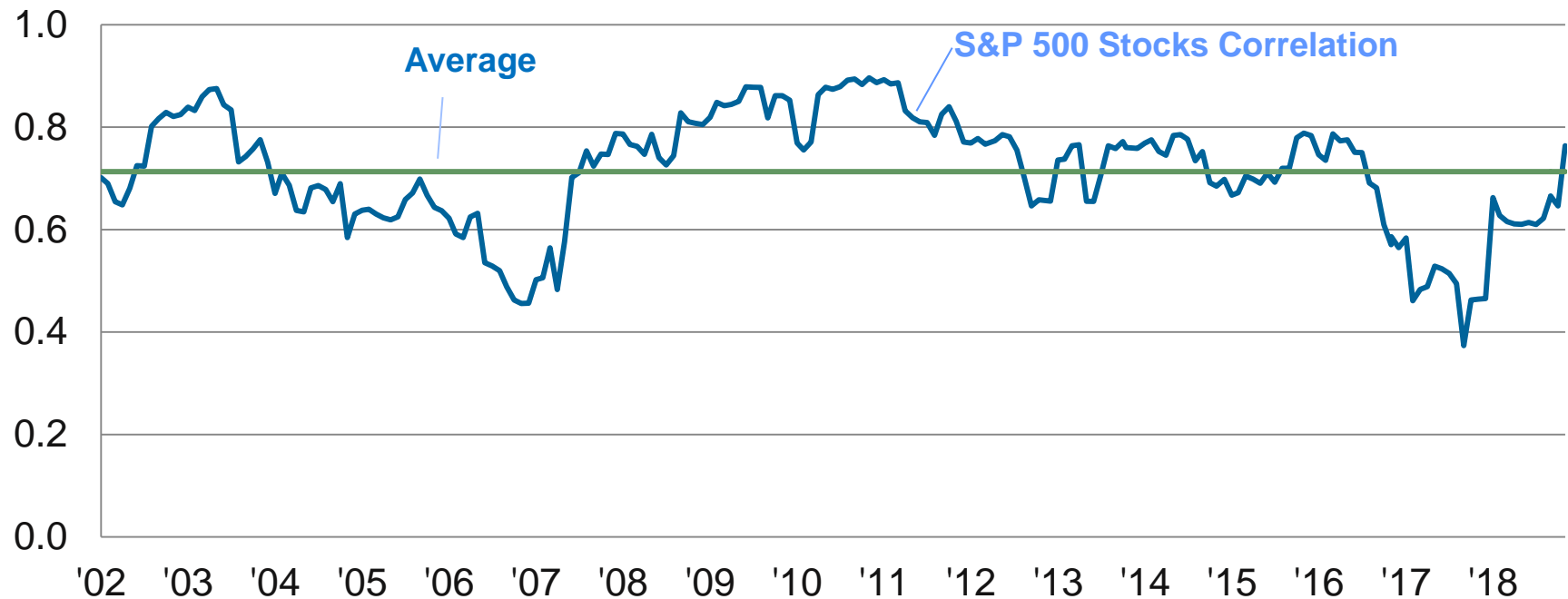
1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Russell 2000 Growth 43.09%	Russell 2000 Value 22.83%	Russell 2000 Value 14.02%	Bloomberg Barclays Agg 10.26%	MSCI Emerging Markets 55.82%	MSCI Emerging Markets 25.55%	MSCI Emerging Markets 34.00%	MSCI Emerging Markets 32.17%	MSCI Emerging Markets 39.38%	Bloomberg Barclays Agg 5.24%	MSCI Emerging Markets 78.51%	Russell 2000 Growth 29.09%	Bloomberg Barclays Agg 7.84%	MSCI Emerging Markets 18.23%	Russell 2000 Growth 43.30%	S&P 500 Growth 14.89%	S&P 500 Growth 5.52%	Russell 2000 Value 31.74%	MSCI Emerging Markets 37.28%	Bloomberg Barclays Agg 0.01%
S&P 500 Growth 28.24%	Bloomberg Barclays Agg 11.63%	Bloomberg Barclays Agg 8.43%	Bloomberg Barclays High Yield -1.37%	Russell 2000 Growth 48.54%	Russell 2000 Value 22.25%	MSCI World ex USA 14.47%	MSCI World ex USA 25.71%	MSCI World ex USA 12.44%	Bloomberg Barclays High Yield -26.16%	Bloomberg Barclays High Yield 58.21%	Russell 2000 26.85%	Bloomberg Barclays High Yield 4.98%	Russell 2000 Value 18.05%	Russell 2000 38.82%	S&P 500 13.69%	S&P 500 1.38%	Russell 2000 21.31%	S&P 500 Growth 27.44%	S&P 500 Growth -0.01%
MSCI World ex USA 27.92%	S&P 500 Value 6.08%	Bloomberg Barclays High Yield 5.28%	MSCI Emerging Markets -6.16%	Russell 2000 47.25%	MSCI World ex USA 20.38%	S&P 500 Value 5.82%	Russell 2000 Value 23.48%	S&P 500 Growth 9.13%	Russell 2000 Value -28.92%	Russell 2000 Growth 34.47%	Russell 2000 Value 24.50%	S&P 500 Growth 4.65%	S&P 500 Value 17.68%	Russell 2000 Value 34.52%	S&P 500 Value 12.36%	Bloomberg Barclays Agg 0.55%	S&P 500 Value 17.40%	MSCI World ex USA 24.21%	Bloomberg Barclays High Yield -2.08%
Russell 2000 21.26%	Russell 2000 -3.02%	Russell 2000 2.49%	Russell 2000 Value -11.43%	Russell 2000 Value 46.03%	Russell 2000 18.33%	S&P 500 4.91%	S&P 500 Value 20.81%	Russell 2000 Growth 7.05%	Russell 2000 -33.79%	MSCI World ex USA 33.67%	MSCI Emerging Markets 18.88%	S&P 500 2.11%	MSCI World ex USA 16.41%	S&P 500 Growth 32.75%	Bloomberg Barclays Agg 5.97%	Russell 2000 Growth -1.38%	Bloomberg Barclays High Yield 17.13%	Russell 2000 Growth 22.17%	S&P 500 -4.38%
S&P 500 21.04%	Bloomberg Barclays High Yield -5.86%	MSCI Emerging Markets -2.61%	MSCI World ex USA -15.80%	MSCI World ex USA 39.42%	S&P 500 Value 15.71%	Russell 2000 Value 4.71%	Russell 2000 18.37%	Bloomberg Barclays Agg 6.97%	S&P 500 Growth -34.92%	S&P 500 Growth 31.57%	Bloomberg Barclays High Yield 15.12%	S&P 500 Value -0.48%	Russell 2000 16.35%	S&P 500 32.39%	Russell 2000 Growth 5.60%	MSCI World ex USA -3.04%	S&P 500 11.96%	S&P 500 21.83%	S&P 500 Value -8.95%
S&P 500 Value 12.73%	S&P 500 -9.11%	Russell 2000 Growth -9.23%	Russell 2000 -20.48%	S&P 500 Value 31.79%	Russell 2000 Growth 14.31%	Russell 2000 4.55%	S&P 500 15.79%	S&P 500 5.49%	S&P 500 -37.00%	Russell 2000 27.17%	S&P 500 Value 15.10%	Russell 2000 Growth -2.91%	S&P 500 16.00%	S&P 500 Value 31.99%	Russell 2000 4.89%	S&P 500 Value -3.13%	Russell 2000 Growth 11.32%	S&P 500 Value 15.36%	Russell 2000 Growth -9.31%
Bloomberg Barclays High Yield 2.39%	MSCI World ex USA -13.37%	S&P 500 Value -11.71%	S&P 500 Value -20.85%	Bloomberg Barclays High Yield 28.97%	Bloomberg Barclays High Yield 11.13%	Russell 2000 Growth 4.15%	Russell 2000 Growth 13.35%	S&P 500 Value 1.99%	Russell 2000 Growth -38.54%	S&P 500 26.47%	S&P 500 15.06%	Russell 2000 -4.18%	Bloomberg Barclays High Yield 15.81%	MSCI World ex USA 21.02%	Russell 2000 Value 4.22%	Russell 2000 -4.41%	MSCI Emerging Markets 11.19%	Russell 2000 14.65%	Russell 2000 -11.01%
Bloomberg Barclays Agg -0.83%	S&P 500 Growth -22.08%	S&P 500 -11.89%	S&P 500 -22.10%	S&P 500 28.68%	S&P 500 10.88%	S&P 500 Growth 4.00%	Bloomberg Barclays High Yield 11.85%	Bloomberg Barclays High Yield 1.87%	S&P 500 Value -39.22%	S&P 500 Value 21.17%	S&P 500 Growth 15.05%	Russell 2000 Value -5.50%	S&P 500 Growth 14.61%	Bloomberg Barclays High Yield 7.44%	Bloomberg Barclays High Yield 2.45%	Bloomberg Barclays High Yield -4.47%	S&P 500 Growth 6.89%	Russell 2000 Value 7.84%	Russell 2000 Value -12.86%
Russell 2000 Value -1.49%	Russell 2000 Growth -22.43%	S&P 500 Growth -12.73%	S&P 500 Growth -23.59%	S&P 500 Growth 25.66%	S&P 500 Growth 6.13%	Bloomberg Barclays High Yield 2.74%	S&P 500 Growth 11.01%	Russell 2000 -1.57%	MSCI World ex USA -43.56%	Russell 2000 Value 20.58%	MSCI World ex USA 8.95%	MSCI World ex USA -12.21%	Russell 2000 Growth 14.59%	Bloomberg Barclays Agg -2.02%	MSCI Emerging Markets -2.19%	Russell 2000 Value -7.47%	MSCI World ex USA 2.75%	Bloomberg Barclays High Yield 7.50%	MSCI World ex USA -14.09%
		MSCI World ex USA -21.40%	Russell 2000 Growth -30.26%	Bloomberg Barclays Agg 4.10%	Bloomberg Barclays Agg 4.34%	Bloomberg Barclays Agg 2.43%	Bloomberg Barclays Agg 4.33%	Russell 2000 Value -9.78%	MSCI Emerging Markets -53.33%	Bloomberg Barclays Agg 5.93%	Bloomberg Barclays Agg 6.54%	MSCI Emerging Markets -18.42%	Bloomberg Barclays Agg 4.21%	MSCI Emerging Markets -2.60%	MSCI World ex USA -4.32%	MSCI Emerging Markets -14.92%	Bloomberg Barclays Agg 2.65%	Bloomberg Barclays Agg 3.54%	MSCI Emerging Markets -14.58%

Source: Callan LLC

Active vs. Passive Debate Continues

Correlations Shot Back Up After Reaching Markets Reaching Lows

Cross Correlation of S&P 500 Stocks



Lower cross sectional correlations, coupled with monetary and fiscal tightening, seemed to have created a better environment for active managers in 2016 and 2017.

Volatility spikes in 2018 saw correlations across sectors shoot back up.

Source: Callan LLC

Volatility Spikes in First and Fourth Quarters of 2018

Is this our return to normal?

- Surge in volatility in February subsided through 2nd and 3rd quarters, returned with a vengeance in Q4.
- 2 corrections (10% decline) in February and December, one near-correction in March.
- U.S. market suffered 5% loss for the year, while developed markets fell 14% and emerging dropped over 18%.
- Dollar rose more than 7% since mid-April, and more than 9% against the Yuan during this period.
- 10-year U.S. Treasury yields rose from 2.85% in June to 3.05% in September; yields are up 65 bps from the start of the year.
- The Fed raised rates in March, June, September and December, and signaled two more hikes in 2019.
- CPI fell back below 2% year-over-year in December, after threatening higher rates earlier in the year.
- Wage pressures are building as the unemployment rate falls below 4%.

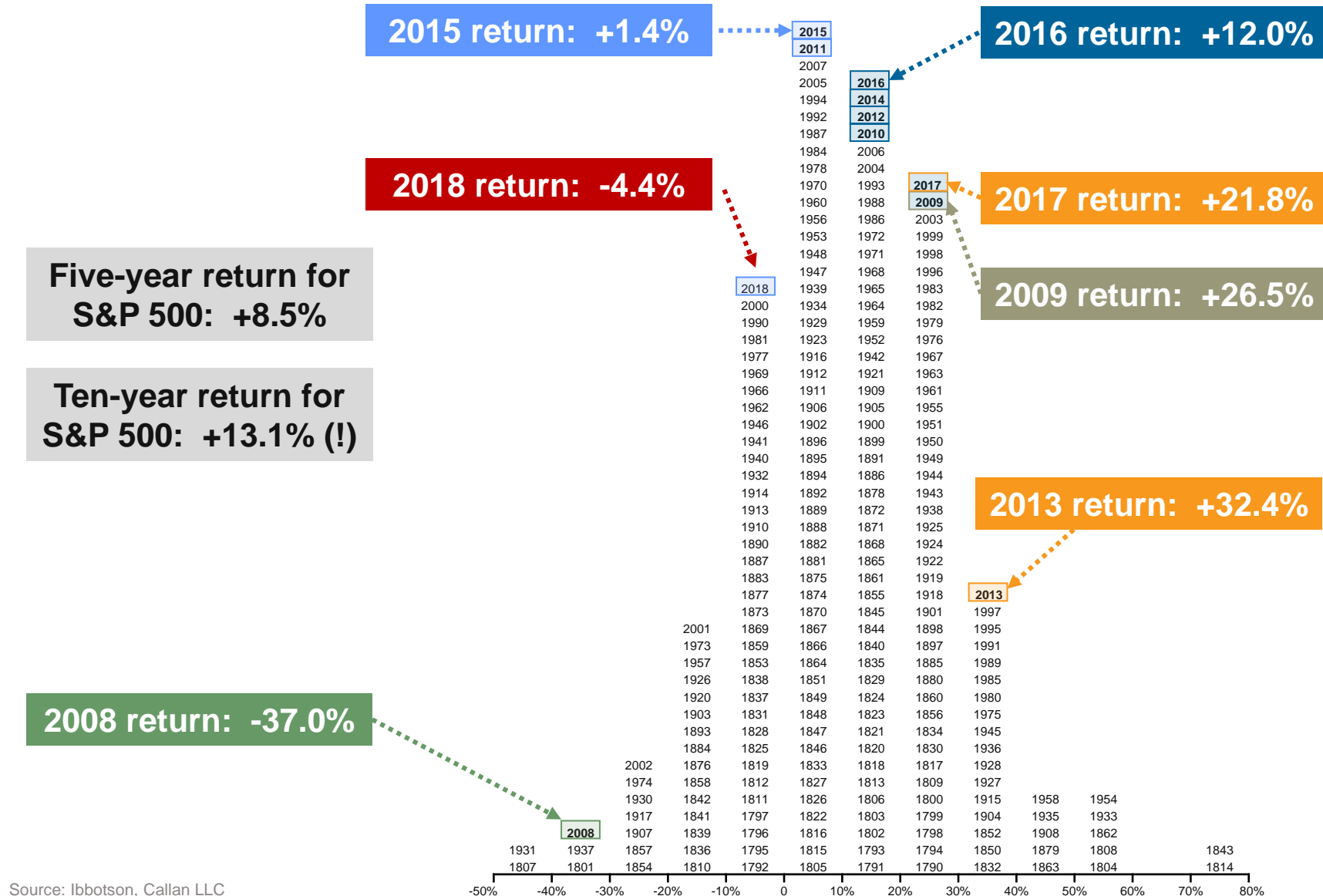
Returns for Periods ended December 31, 2018

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	-14.30	-5.24	7.91	13.18	9.04
S&P 500	-13.52	-4.38	8.49	13.12	9.07
Russell 2000	-20.20	-11.01	4.41	11.97	8.28
Non-U.S. Equity					
MSCI World ex USA	-12.78	-14.09	0.34	6.24	4.76
MSCI Emerging Markets	-7.47	-14.58	1.65	8.02	--
MSCI ACWI ex USA Small Cap	-14.43	-18.20	1.96	10.02	--
Fixed Income					
Bloomberg Barclays Aggregate	1.64	0.01	2.52	3.48	5.09
3-Month T-Bill	0.56	1.87	0.63	0.37	2.55
Bloomberg Barclays Long Gov/Credit	0.78	-4.68	5.37	5.88	6.82
Bloomberg Barclays Global Agg ex-US	0.91	-2.15	-0.01	1.73	4.39
Real Estate					
NCREIF Property	1.67	7.03	9.39	7.52	9.35
FTSE NAREIT Equity	-6.32	-4.62	7.90	12.12	9.76
Alternatives					
CS Hedge Fund	-4.30	-3.19	1.66	5.10	7.27
Cambridge Private Equity*	4.51	18.00	14.28	10.18	15.60
Bloomberg Commodity	-9.41	-11.25	-8.80	-3.78	2.03
Gold Spot Price	7.11	-2.14	1.28	3.78	4.85
Inflation - CPI-U	-0.48	1.91	1.51	1.80	2.20

*Cambridge PE data are available through June 30, 2018.
Source: Callan LLC

Stock Market Returns by Calendar Year

2018 Performance in Perspective: History of the U.S. Stock Market (230 Years of Returns)



Source: Ibbotson, Callan LLC

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Economic Outlook

Global Economic Update 2019

The Big Picture

- Globally, rate policies have yet to converge.
 - The Fed hiked rates a quarter point four times in 2018.
 - *Two more in 2019 expected.*
 - *The target range for the Fed Funds rate is now 2.25% to 2.5%.*
- Labor market continues to tighten.
 - Signs U.S. is reaching the limits of full employment.
 - *Unemployment fell to 3.7% in September 2018, a generational low, ticked up to 3.9% in December, as participation rate rose*
 - *Initial claims for unemployment insurance have fallen to the lowest level since 1969.*
 - *Employment cost index rose 2.8% year-over-year in Q2 and Q3, the highest rate of growth since 2007.*
 - Euro zone unemployment dropped to 7.9% in November, the lowest rate in 10 years.
- The U.S. and euro zone economies appear to be diverging again.
 - Eurozone economic growth stalled at 1.5% in the first half of 2018 after notching the strongest year in a decade in 2017.
 - *Geopolitical turmoil across the zone, from Italy to Brexit, and the uncertainty from trade wars are dampening sentiment along with reported slower gains in GDP.*
- China shows serious signs of slowing, with industrial output and retail sales reporting growth at rates lower than expected through the second and third quarters.
- Trade tensions with China on the rise.
 - U.S. dollar rose more than 7% since mid-April against a broad basket of developed market currencies, rebounding after 1st quarter concerns over a potential trade war with China and the fear of higher rates globally.
 - The dollar appreciated 9% against the Yuan during this period as growth appeared to diverge between the U.S. and developed non-U.S. markets, and the U.S. alone raised rates.
- Crude oil prices crested at \$78 in September, only to collapse in the fourth quarter.

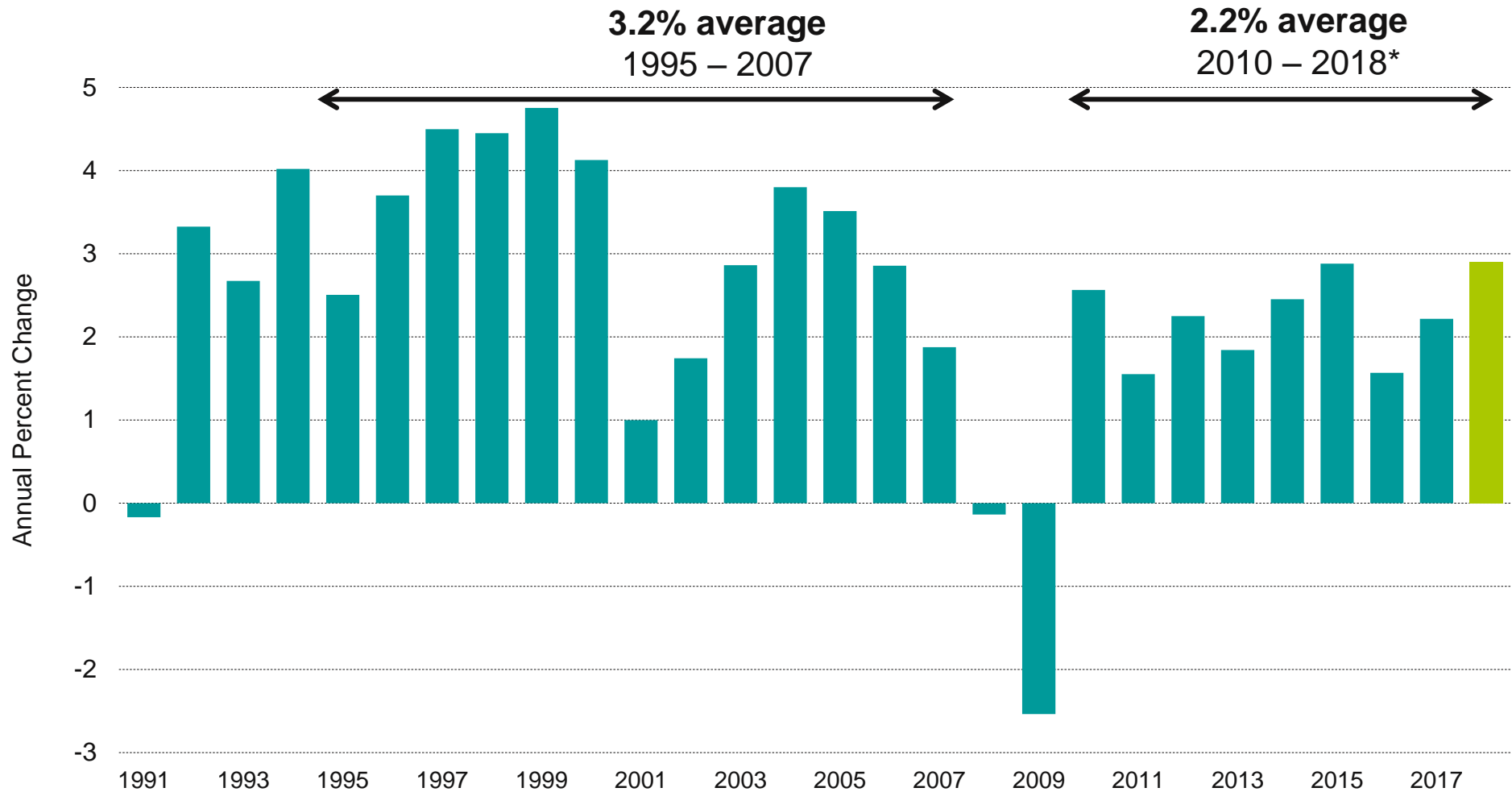
US Economic Update

The Big Picture

- A strong economic environment in the U.S. despite concerns about:
 - trade wars
 - inflation
 - an inverted yield curve
 - concerns about a market correction
 - *Length of the current expansion*
 - *Richly priced capital markets*
- The U.S. economy may be nearing peak growth for this cycle:
 - GDP clocked a solid 3.5% gain in the third quarter, following a robust 4.2% jump in the second quarter.
 - The unemployment rate dropped to 3.7% in September, the lowest reading since 2000
 - Wages are inching up; consumer spending remains robust, as does consumer confidence
 - Housing starts surged to an 11-year high in May, only to stall during the summer as short supply and higher rates took their toll.
 - The Fed raised rates for the fourth time in December 2018, bringing the Fed Funds rate to 2.25-2.5%.
- U.S. growth driven by international trade ahead of the imposition of tariffs.
 - Net exports declined in the third quarter, trimming GDP growth.
 - U.S. and China enacted tariffs on \$34 billion of imports in July.
- Consensus forecasts suggest a slowdown is coming
 - Impact of trade wars on economic growth to be seen.
 - Growth over the next 18 months will be tempered by depletion of inventories, regardless of a trade war.
- Inflation no longer on the rise?
 - Headline CPI rose 2.3% during the third quarter, down from the 2.9% reported in the second quarter; oil prices will drag down Q4
 - Core CPI (ex-food and energy) rose 2.2%, slightly above the Fed's 2% target.

U.S GDP Growth on a Slower Trajectory

Real GDP Growth



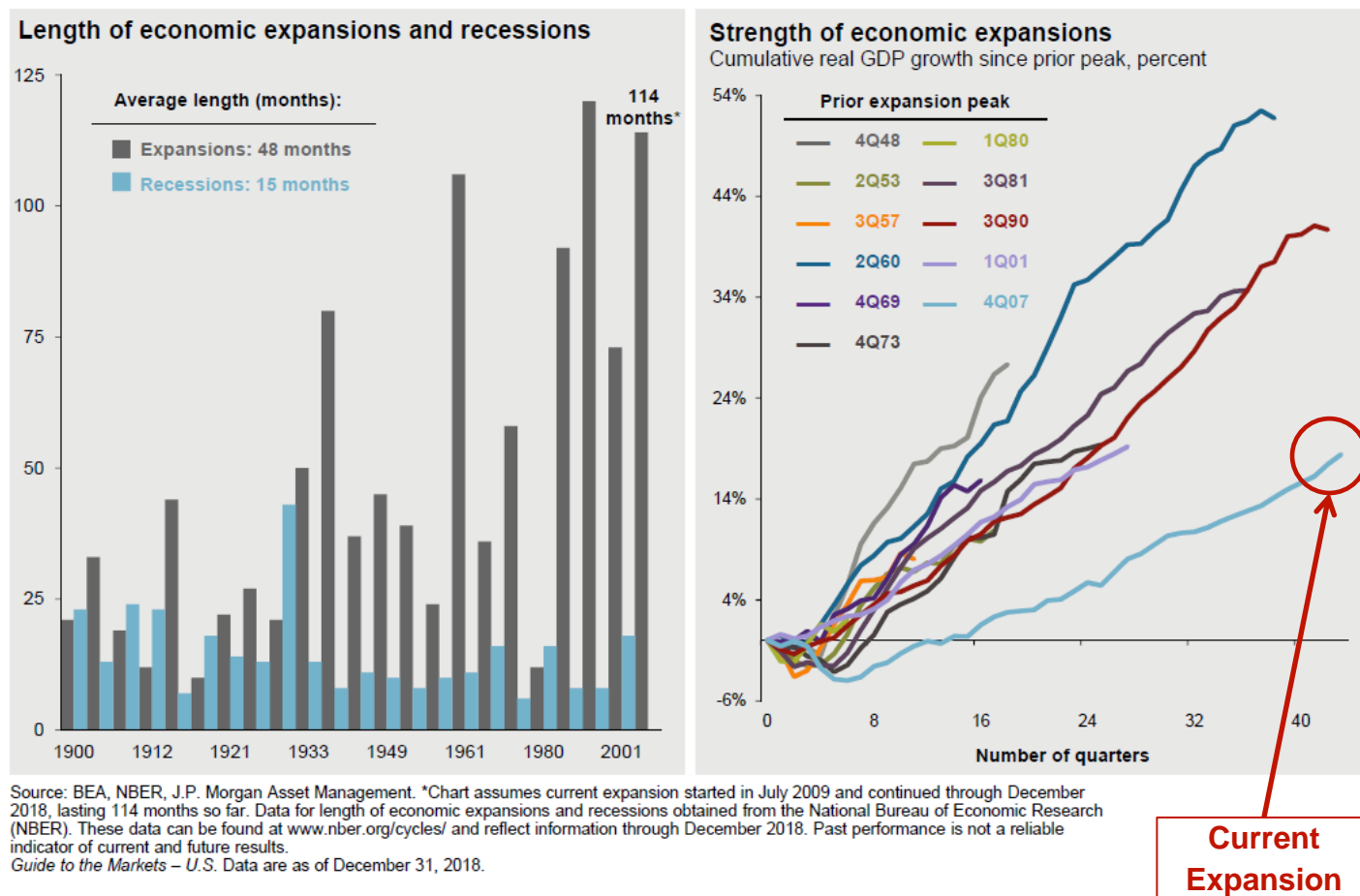
*2018 Forecast: IHS Markit

Source: IHS Markit

Expansion Continues, But Not Without Raising Concerns

Expansions do not die of old age, but this one is close to becoming the longest

- The slow burn in the current expansion may enable it to continue, at the risk of building up asset price bubbles even further.
- Current recovery is now the longest, but also one of the slowest, averaging GDP growth in the U.S. of just 2.2%.
- Inverted yield curves typically suggest the onset of recession. The yield curve has flattened but is not yet inverted. Long rates have not budged as short rates have been elevated.
- The explanatory power of an inverted yield curve has lessened in the wake of the GFC and QE. Demand on the long end and limited supply are driving the slope, holding down the long end.

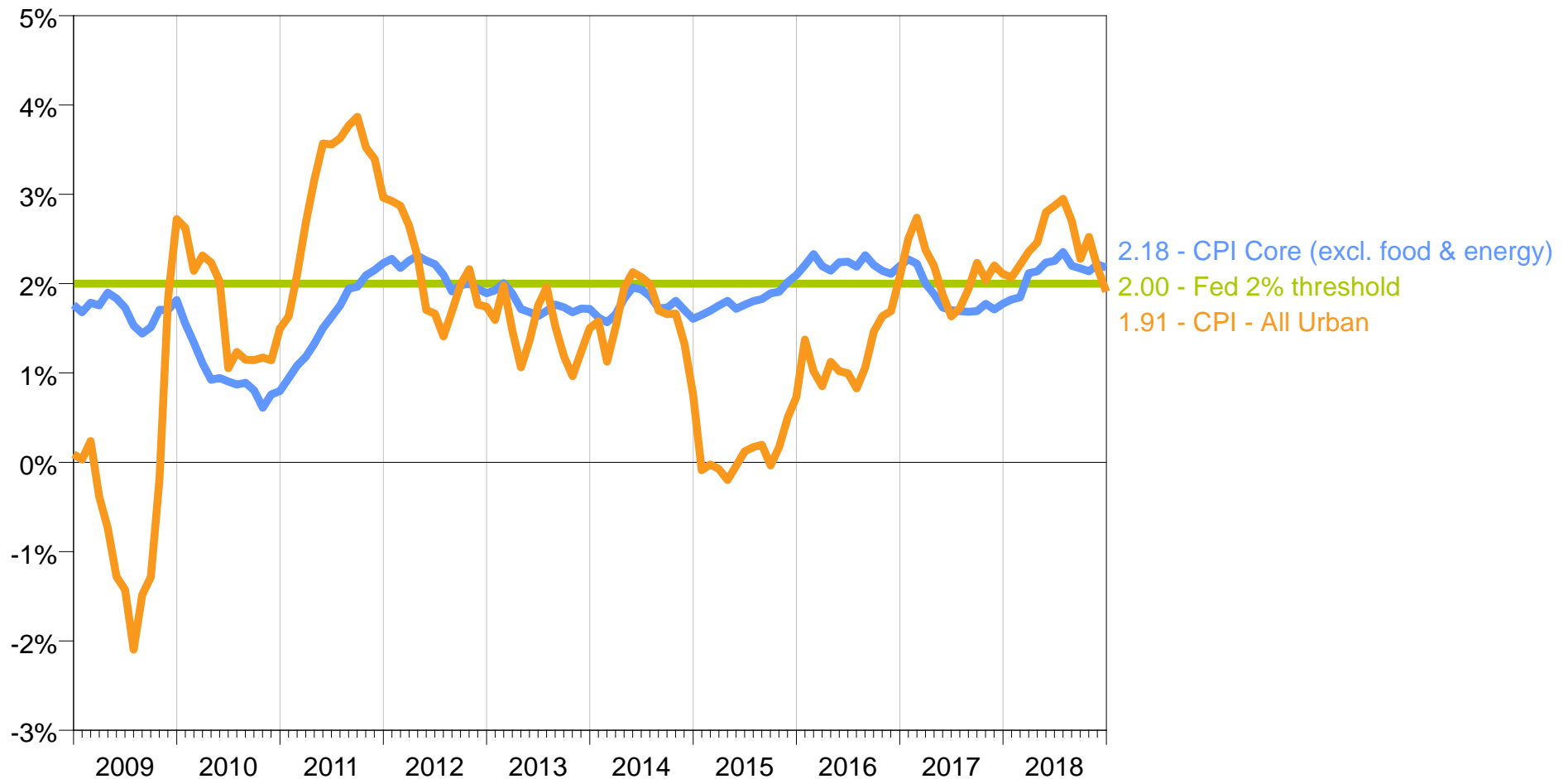


Source: J.P. Morgan Asset Management.

Inflation Concerns Subside Once Again

CPI Faces Another Collapse in Oil Prices

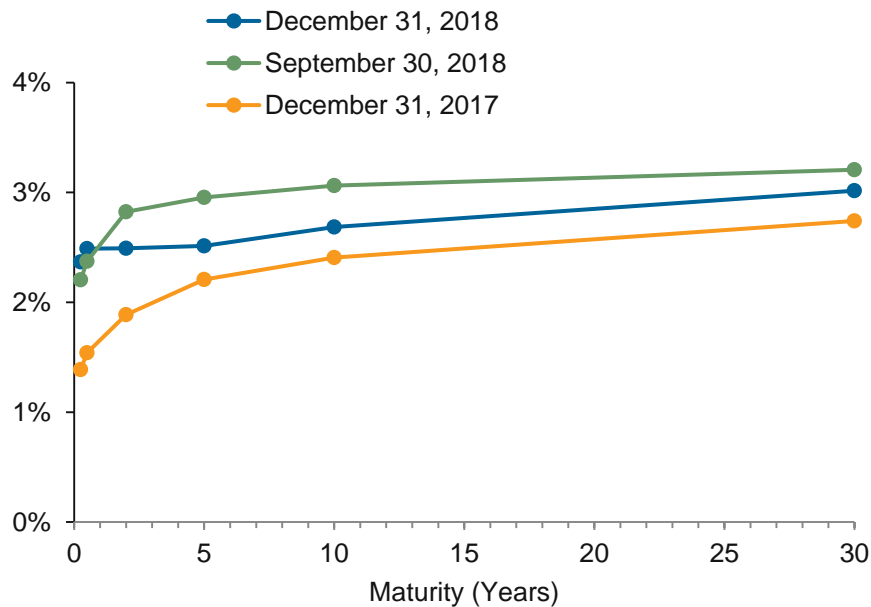
Headline CPI Measures of Inflation (percent change versus year-ago)



Source: Bureau of Labor Statistics and Callan LLC

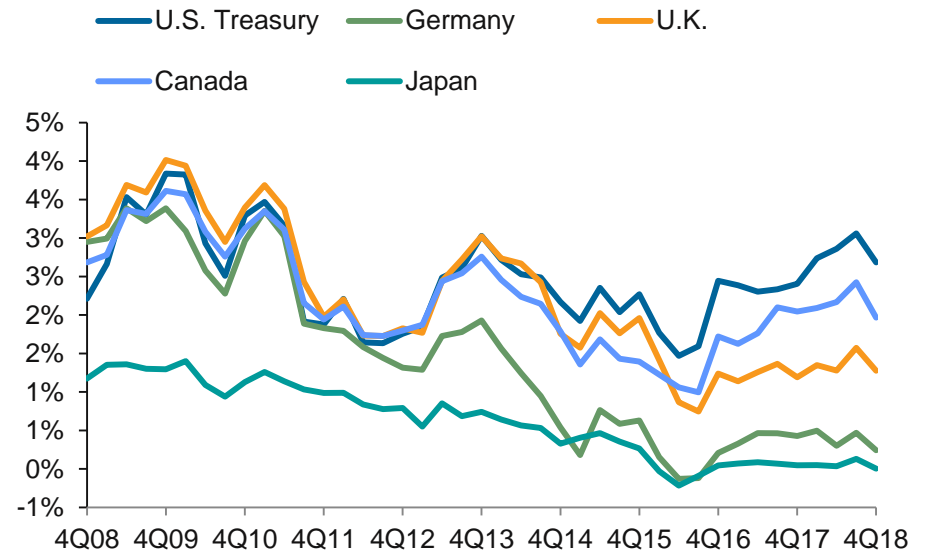
Flattening Yield Curve and Divergence in Global Rates

U.S. Treasury Yield Curves



Treasury yield curve has flattened as rates moved up on the short end but have not budged on the long end.

10-Year Global Government Bond Yields



US yields have diverged as monetary policies have fallen out of sync.

Source: Callan LLC

Market Watches the Fed, But Doesn't Always Believe It

Futures market discounts FOMC projections of future Fed funds target

- Median of 2019 projections (2.9%) lies above the current range of 2.25% to 2.5%, suggesting a total of two more rate hikes this year.
- Median for 2019 is 2.9%, and 3.1% in 2020, which is lower than mid-year 2018 projections.
- Longer term, median expectation is settled around 3%.
- Planned fed rate hikes would raise short rates above current long rates. Will the Fed persist and push the yield curve into an inverted position if long rates do not rise sufficiently?

Federal Reserve Dot Plot— December 2019

FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



Source: Federal Reserve

Economic Outlook

Role of Economic Variables

GDP and Inflation

- GDP forecasts provide a very rough estimate of future earnings growth.
- Inflation forecasts provide an approximate path for short-term yields.
- Inflation is added to the real return forecasts for equity and fixed income.

GDP Forecasts

- 2% to 2.5% for the US
- 1.5% to 2.0% for Developed Non-US Markets
- 4% to 5% for Emerging Markets

Inflation Forecasts

- 2% to 2.5% for the US
- 1.75% to 2.25% for Developed Non-US Markets
- 2.5% to 3.5% for Emerging Markets

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Asset Class Outlook

2019 Capital Market Projections

Subdued Expectations Across the Range of Capital Markets

- Over the next 10 years, we forecast annual GDP growth of 2% to 2.5% for the U.S., 1.5% to 2% for non-U.S. developed markets, and 4% to 5% for emerging markets. Embedded in all of these economic forecasts is the expectation that the path to this longer term growth will include cycles with recessions.
- For broad U.S. equity, we project an annualized return of 7.15% with a standard deviation (or risk) of 18.0%; for global ex-U.S. equity a return of 7.25% (risk: 21.05%).
- For broad U.S. fixed income we project a return of 3.75% (risk: 3.75%).

The intent of Callan's Capital Market Projections is long-term strategic planning.

- We have gradually ratcheted down our expectations over recent years to reflect a lower growth environment with lower expected returns. However, we only change our forecasts when we believe asset class prospects have materially changed.
- Callan raised fixed income expectations 75 bps for the broad US market, reflecting the fulfilment of rate increases in 2018, and expectations for 2019 and beyond.
- Callan nudged up equity expectations 25 bps. We lowered equity expectations 50 bps across public markets in our 2017 projections, and have maintained our expectation for modest equity returns in 2019. Even with the modest adjustment to equity return, we have reduced the equity risk premium 50 bps from our capital market projections set in 2018.
- We believe the rationale for our long-term projections set a year ago; we confirm our belief that a 10-year S&P 500 equity forecast of 4.75% in annualized real terms is solid. This forecast is somewhat lower than the index's longer-horizon performance and reflects more subdued prospects for U.S. economic growth relative to history.

Equity Forecasts

Overview

Fundamental Relationship

$$\text{Equity Return} = \text{Capital Appreciation} + \text{Income}$$

Broad US Equity

- Return = 7.15%, Risk = 18.0%
- Earnings growth likely to remain solid
 - Coming off strong period of gains, despite modest GDP growth
 - Benefitted from expansive economic policies
- Dividend yield consistent with recent history
 - Payout ratios close to historical norms
 - Yields have been stable for 20 years in the face of changing interest rates

Broad Non-US Equity

- Return = 7.25%, Risk = 21.05%
- Earnings growth likely to be moderate
 - Significant uncertainty in future economic policies
- Relatively high dividend yields will support returns
- Long period of relative undervaluation, potential for growth

Fixed Income Forecasts

Overview

Fundamental Relationship

$$\text{Bond Return} = \text{Capital Appreciation} + \text{Income} + \text{Roll Return}$$

Broad US fixed income

Return = 3.75%, Risk = 3.75%

- Interest rates expected to rise
- Yield curve expected to steepen as we return to a “normal” term structure
- Higher yields expected to be earned over most of the forecast horizon
- Capital losses expected as yields increase in first year
- Little impact from changing credit spreads
- Roll return expected to decline

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**Detailed 2019 Expectations and
Resulting Portfolio Returns**

2019 Callan Capital Market Projections

Risk and Return – 2019-2028

Asset Class	Index	PROJECTED RETURN			PROJECTED RISK	Projected Yield
		1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation	
Equities						
Broad Domestic Equity	Russell 3000	8.50%	7.15%	4.90%	18.00%	2.00%
Large Cap	S&P 500	8.25%	7.00%	4.75%	17.10%	2.10%
Small/Mid Cap	Russell 2500	9.55%	7.25%	5.00%	22.65%	1.55%
Global ex-US Equity	MSCI ACWI ex USA	9.20%	7.25%	5.00%	21.05%	3.10%
International Equity	MSCI World ex USA	8.70%	7.00%	4.75%	19.75%	3.25%
Emerging Markets Equity	MSCI Emerging Markets	10.70%	7.25%	5.00%	27.45%	2.65%
Fixed Income						
Short Duration	Bloomberg Barclays 1-3 Yr G/C	3.40%	3.40%	1.15%	3.40%	3.20%
Domestic Fixed	Bloomberg Barclays Aggregate	3.75%	3.75%	1.50%	3.75%	3.50%
Long Duration	Bloomberg Barclays Long G/C	4.25%	3.75%	1.50%	10.90%	4.50%
High Yield	Bloomberg Barclays High Yield	5.75%	5.35%	3.10%	10.35%	7.75%
Other						
Real Estate	Callan Real Estate Database	7.30%	6.25%	4.00%	15.70%	4.75%
Private Equity	TR Post Venture Capital	12.40%	8.50%	6.25%	29.30%	0.00%
Hedge Funds	Callan Hedge FoF Database	5.75%	5.50%	3.25%	8.85%	2.25%
Cash Equivalents	90-Day T-Bill	2.50%	2.50%	0.25%	0.90%	2.50%
Inflation	CPI-U		2.25%		1.50%	

Note that return projections for public markets assume index returns with no premium for active management.

Source: Callan LLC

2019 Callan Capital Market Projections

Correlation – 2019-2028

		Broad	Lg Cap	Sm/Mid	GlobxUS	Int'l Eq	Emerge	Short D	Dom Fix	Hi Yield	Real Est	Pvt Eq	Hedge Fd	Cash Eq	Inflation
1	Broad Domestic Equity	1.000													
2	Large Cap	0.996	1.000												
3	Small/Mid Cap	0.960	0.930	1.000											
4	Global ex-US Equity	0.853	0.842	0.842	1.000										
5	International Equity	0.811	0.800	0.800	0.988	1.000									
6	Emerging Markets Equity	0.872	0.860	0.860	0.940	0.875	1.000								
7	Short Duration	-0.250	-0.240	-0.270	-0.271	-0.250	-0.290	1.000							
8	Domestic Fixed	-0.113	-0.100	-0.145	-0.136	-0.115	-0.170	0.870	1.000						
9	High Yield	0.636	0.630	0.620	0.625	0.605	0.615	-0.140	0.020	1.000					
10	Real Estate	0.736	0.730	0.715	0.706	0.680	0.700	-0.165	-0.035	0.560	1.000				
11	Private Equity	0.917	0.915	0.875	0.883	0.860	0.855	-0.260	-0.225	0.550	0.660	1.000			
12	Hedge Funds	0.760	0.755	0.735	0.738	0.715	0.725	-0.130	0.090	0.570	0.640	0.620	1.000		
13	Cash Equivalents	-0.043	-0.030	-0.080	-0.040	-0.010	-0.100	0.300	0.100	-0.110	-0.060	0.000	-0.070	1.000	
14	Inflation	-0.010	-0.020	0.020	0.010	0.000	0.030	-0.200	-0.280	0.070	0.100	0.060	0.200	0.000	1.000

Relationships between asset classes are as important as standard deviation.

To determine portfolio mixes, Callan employs mean-variance optimization.

Return, standard deviation and correlation determine the composition of efficient asset mixes.

Source: Callan LLC

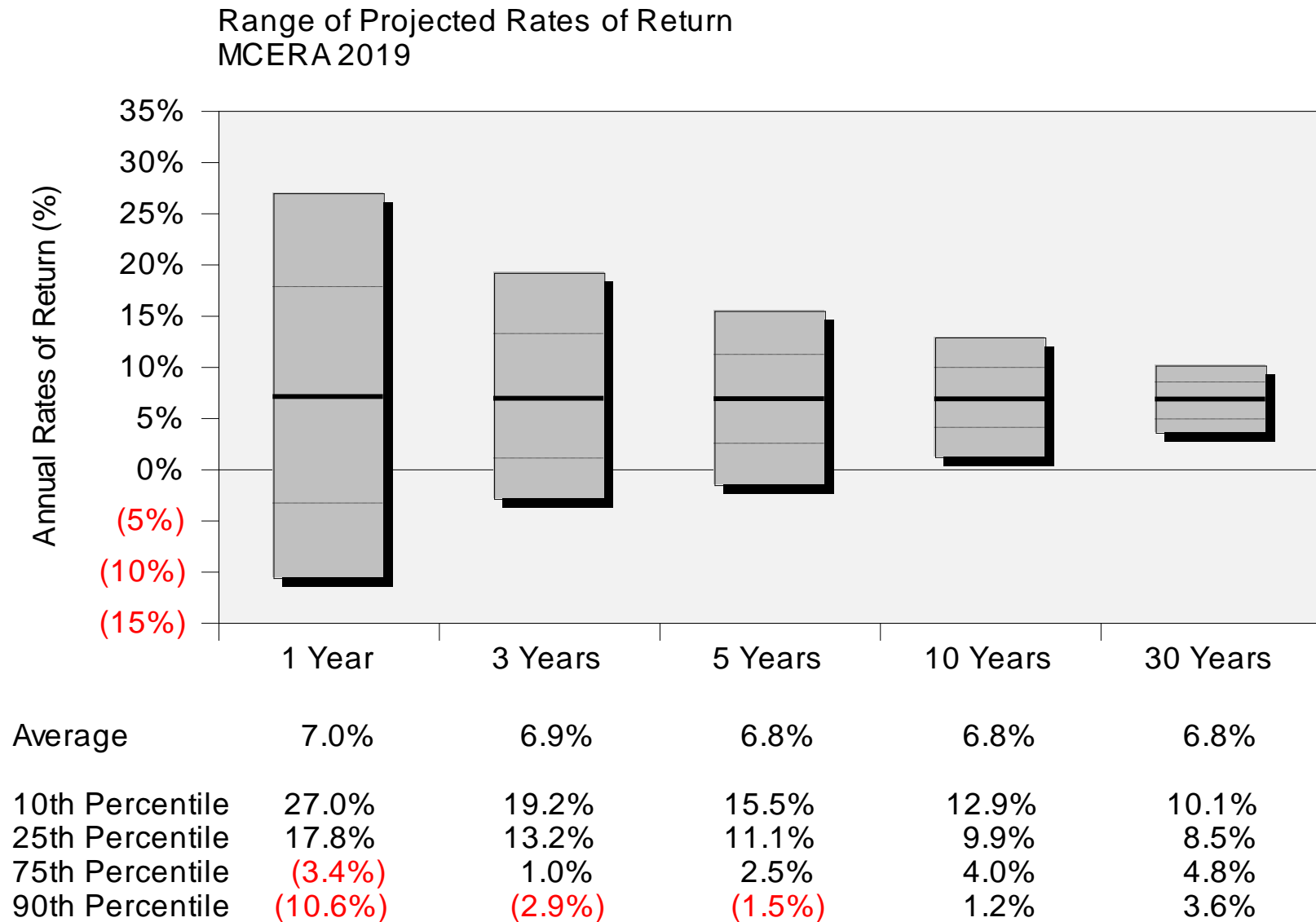
2019 Capital Market Projections – MCERA Current Target

Expected Return on Assets, Assuming Passive Implementation

Asset Classes	MCERA Target
Broad US Equity	38%
Global ex US Equity	29%
Domestic Fixed	22%
Real Estate	11%
Cash	0%
Totals	100%
Projected Arithmetic Return	7.5%
10 Yr. Geometric Mean Return	6.8%
Projected Standard Deviation	13.7%
Projected Sharpe Ratio	0.4
30 Yr. Geometric Mean Return	6.8%

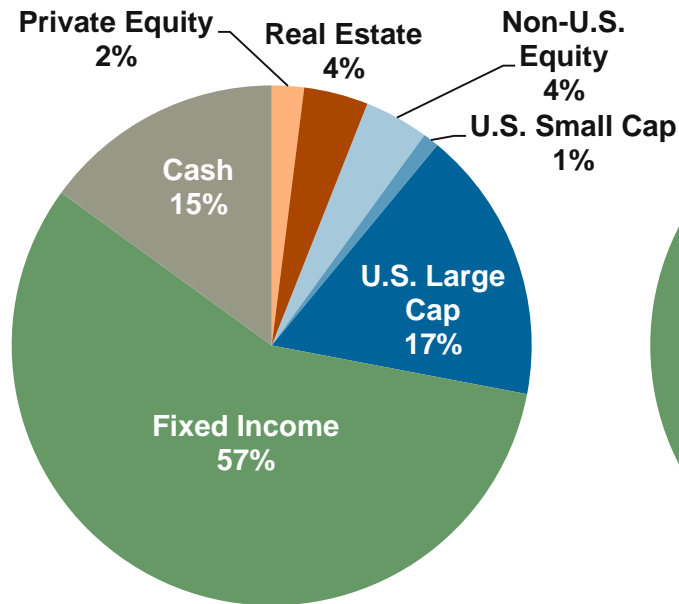
2019 Capital Market Projections – MCERA Current Target

Distribution of Projected Rates of Return



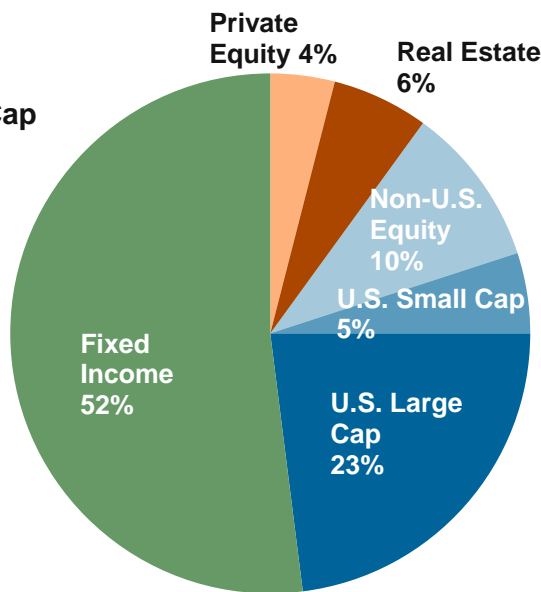
Expected Portfolio Returns Over Past 20 Years

Increasing Complexity



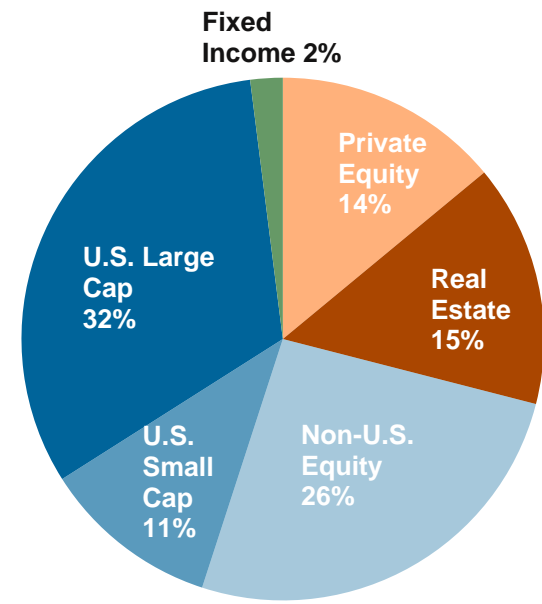
1998

Expected Return: 7.1%
Projected Std Deviation: 5.8%



2008

Expected Return: 7.1%
Projected Std Deviation: 8.7%



2018

Expected Return: 7.1%
Projected Std Deviation: 19.0%

Increasing Risk

- With cash and broad U.S. fixed income expectations of 4.8% and 6.6% respectively in 1998, an investor could have almost three-quarters of the portfolio in these low risk asset classes and still expect to earn 7.1%.
- Ten years later, an investor would have needed 48% relatively risky, return-seeking assets to achieve 7.1%.
- And by 2018, an investor had to risk up the portfolio even more and include 98% in return-seeking assets to earn 7.1%.
- Meanwhile, the risk (standard deviation) required to achieve a 7.1% return more than tripled from 5.8% in 1998 to 19% in 2018.

What is the Appropriate Time Horizon for Setting Return Expectations?

Consensus is growing that the current cycle is long in the tooth.

- Assets are richly valued
- Downturn in the capital markets is imminent and inevitable
- Recession call is now 2020
- Growing chorus to “do something”

Should long term investors respond to short-term market movements and changes in valuation?

- Only when they reach an extreme
- Pessimistic capital market expectations overly reliant on current situation result in unfortunate consequences
 - Excessive risk taking when we may not believe it will be rewarded
 - Pursuit of the bright shiny object regardless of fit or understanding

Market cycles are inevitable and should be expected.

- Long term strategic plans already incorporate expected corrections and recessions
- The path to a long-term return is through shorter term periods of boom and bust

Time horizon is everything

- Is 10 years sufficient for a long-term investor?
 - Should portfolios differ whether you’re using a 10-year outlook or a long-term equilibrium?
 - How about 5 years?

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CY 4Q 2018 Capital Market Overview

U.S. Equity Performance: Broad-Based Losses

U.S. Equity Fell Drastically in 4Q18

- Decline driven by broad-based de-risking
- Trade tension, rising rates, concern over slowing growth, low oil prices, and government shutdown remain concerns
- Defensive “safe haven” sectors fared best; Cyclical sectors fared worst on end-of-cycle fears

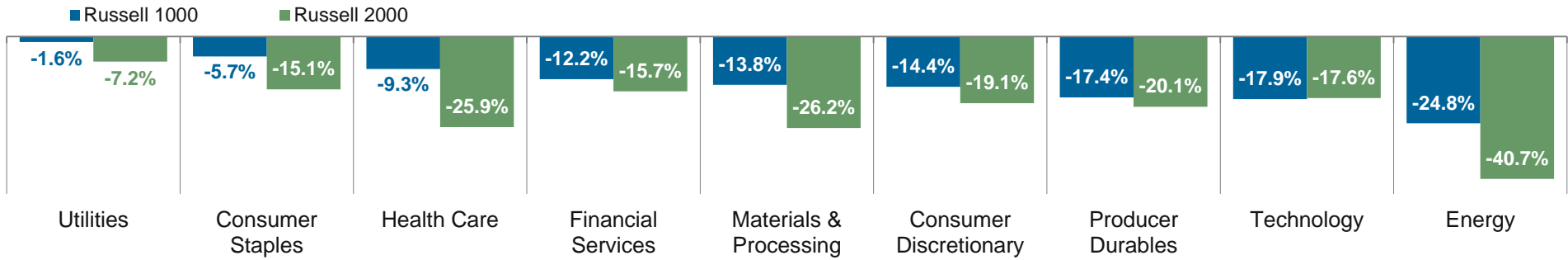
Growth Trailed Value for the Quarter

- Growth fell further than Value within both large and small cap due to larger weightings in poor performing Tech, Discretionary and Industrial sectors

Small Caps Hardest Hit

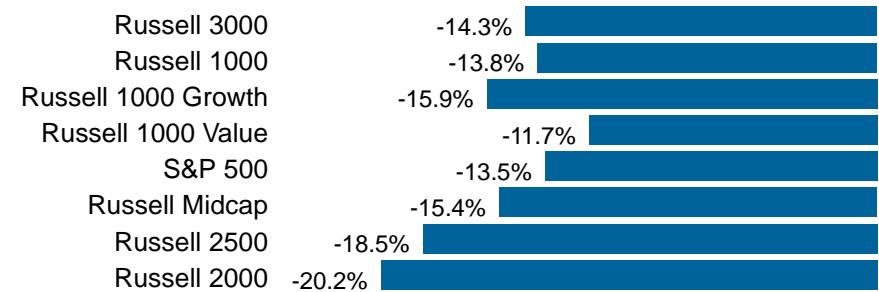
- Margin pressure, excess leverage, slowing growth and earnings expectations worried investors
- Russell 2000 fell over 22% from August peak

Economic Sector Quarterly Performance

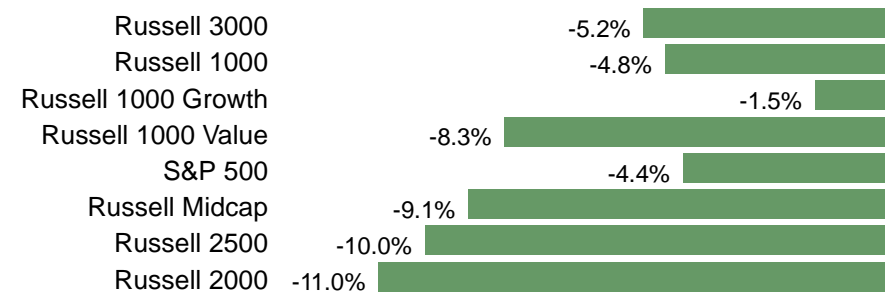


Sources: FTSE Russell, Standard & Poor's

U.S. Equity: Quarterly Returns



U.S. Equity: One-Year Returns



Non-U.S. Equity Performance

Markets Driven Down by Global Trade Dispute and Brexit impasse

- Dollar rallied against euro on fears of euro zone contraction; Yen gained against dollar as investors sought safe haven
- Defensive sectors fared better than cyclicals across all markets given risk-off environment
- Global growth concerns and falling oil prices challenged economically sensitive sectors
- Value outpaced growth (and quality outpaced volatility factors) across all markets as visible earners and stable businesses prevailed

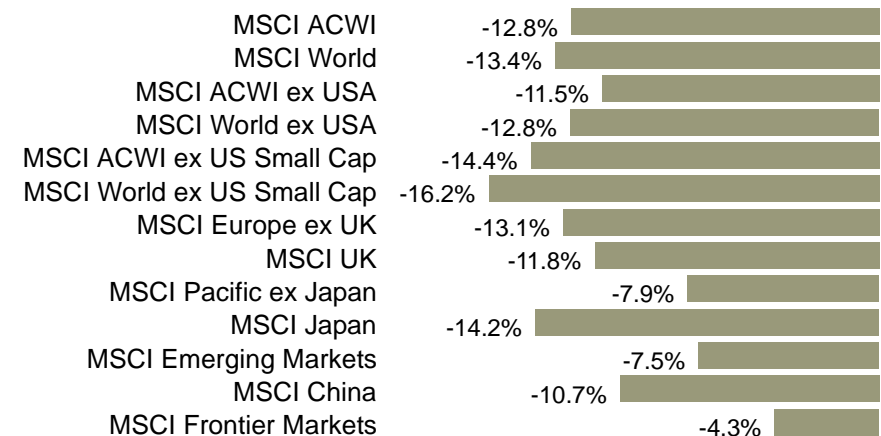
Emerging Markets Faltered

- China down double digits on rising dollar, trade tension and slowing economy
- Brazil up double digits on shifting growth and pension reform sentiment with presidential election
- Asian Tech companies down on soft demand, heightened regulation and consumption slowdown

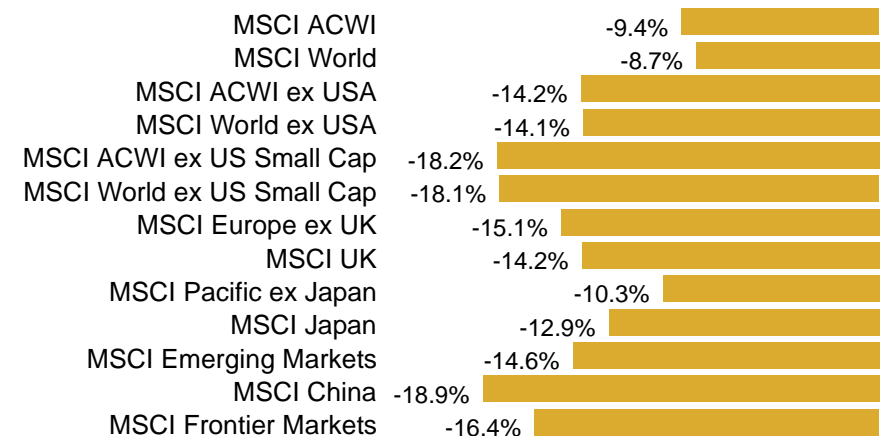
Non-U.S. Small Cap Trailed Large Cap

- Non-U.S. small cap also negatively impacted by U.S.-China trade tension and global growth fears

Global Equity: Quarterly Returns



Global Equity: Annual Returns



Source: MSCI

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Knowledge. Experience. Integrity.

U.S. Fixed Income Performance

Investors Rotated into Safe Haven Securities

- U.S. Treasuries returned 2.57% as the 10-year Treasury yield closed the quarter at 2.69%
- Yield curve continued to flatten with long-term rates declining faster than short-term rates
- IG corporates sank amid elevated leverage concerns
- Investment grade spreads widened to levels (+153 bps) not seen since July 2016
- Greater than 50% of new issuance came from BBB-rated issuers in 2018

High Yield Spreads Widened as Yield-to-Worst Approached 8%

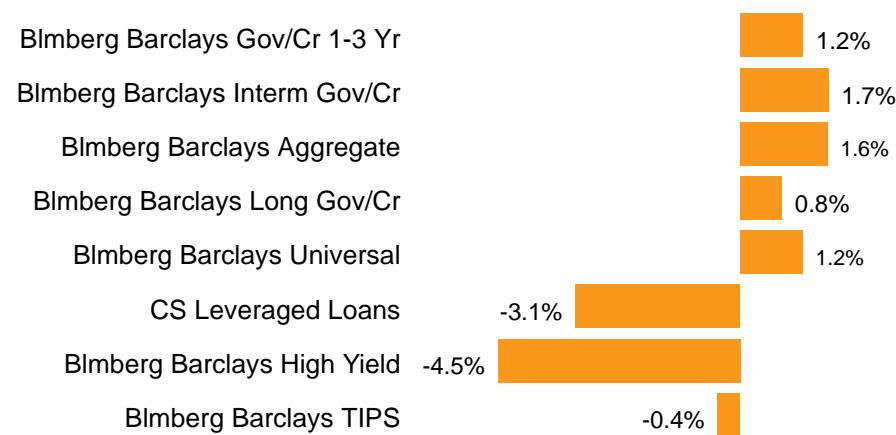
- High Yield funds saw \$20bn in outflows as sector dealt with flight to quality
- Energy sector led selloff amid volatile oil prices

Leveraged Loans Experienced \$17 bn in Outflows

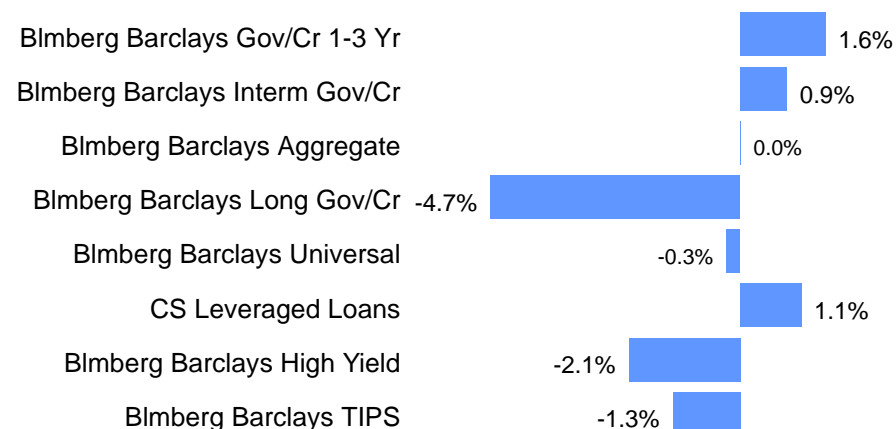
- Changing interest rate projections sparked additional volatility
- CLO formation decreased in December, pulling back from technical demand in 4Q

Sources: Bloomberg Barclays, Credit Suisse

U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: Annual Returns



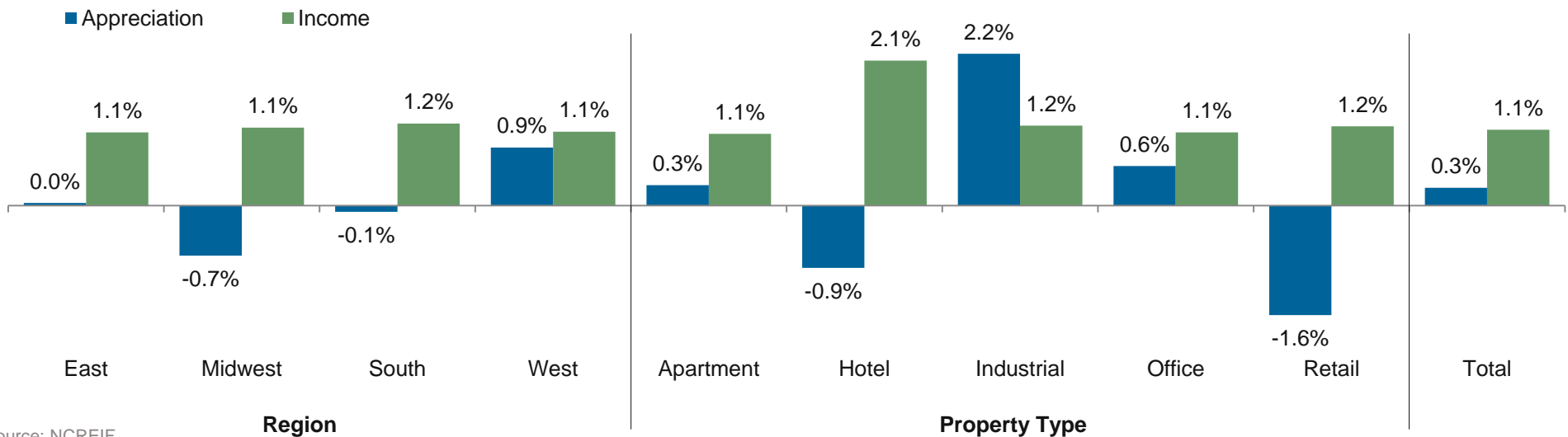
U.S. Real Estate

Returns Continue to Moderate

- U.S. Core real estate returns continue to shift toward income with limited appreciation
- Appreciation coming from NOI growth rather than further cap rate compression
- Industrial real estate remains best performer

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years
NCREIF ODCE	1.5%	7.4%	7.8%	9.7%	10.0%
Appreciation	0.7%	4.0%	3.8%	5.6%	6.0%
Income	0.8%	3.3%	3.4%	3.6%	3.8%
NCREIF Property Index	1.4%	6.7%	7.2%	9.3%	9.7%
Appreciation	0.3%	2.1%	2.5%	4.3%	4.4%
Income	1.1%	4.6%	4.7%	4.9%	5.1%

NCREIF Property Index Returns by Region and Property Type



Source: NCREIF

Broad Market Index Performance: January Update

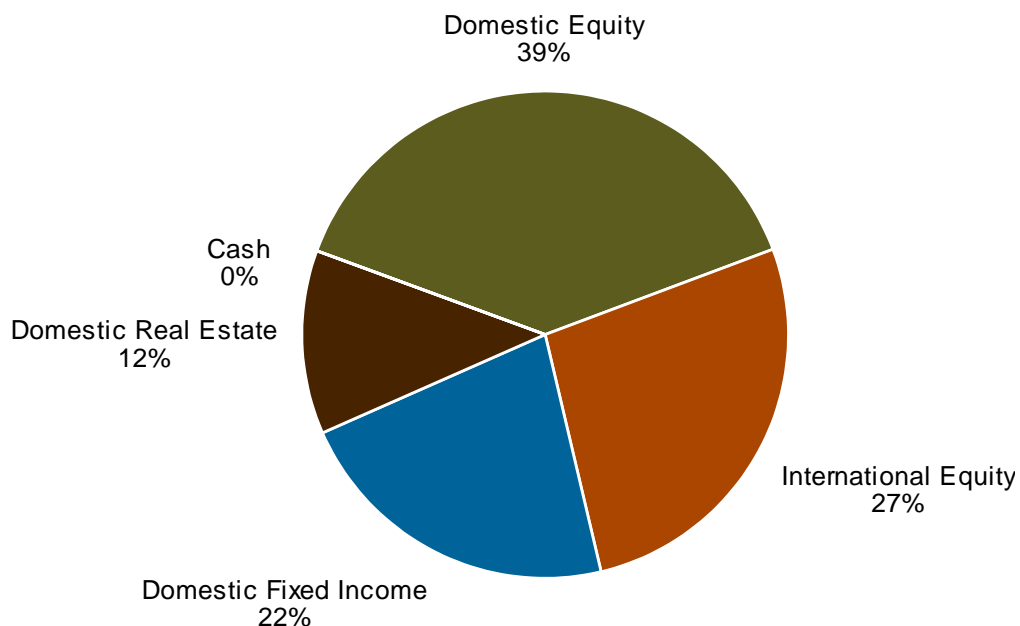
Broad Market Index Performance As of January 31, 2019	January	1 Year	3 Years
Russell 1000	8.38%	-2.17%	14.14%
S&P 500	8.01%	-2.31%	14.02%
Russell 2500	11.51%	-2.61%	14.42%
MSCI ACWI ex-US (net div)	7.56%	-12.58%	9.59%
MSCI Emerging Markets (net div)	8.76%	-14.24%	14.89%
Barclays 1-3 Year Gov/Cred	0.39%	2.27%	1.20%
Barclays Aggregate	1.06%	2.25%	1.95%
BofA ML High Yld BB-B Constrained	4.43%	1.86%	8.33%

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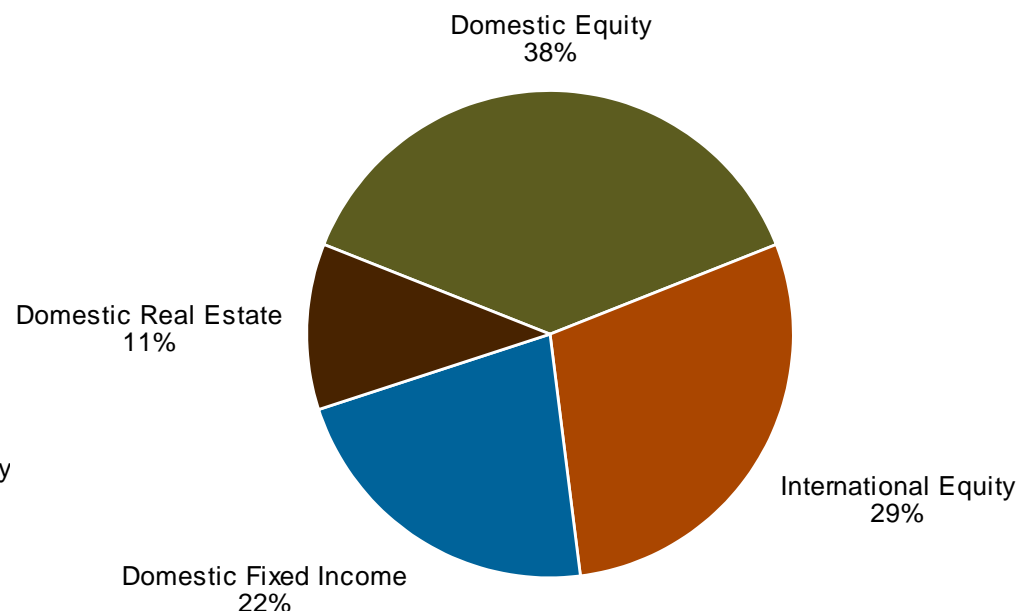
MCERA Plan Performance

MCERA Actual vs Target Asset Allocation as of December 31, 2018

Actual Asset Allocation



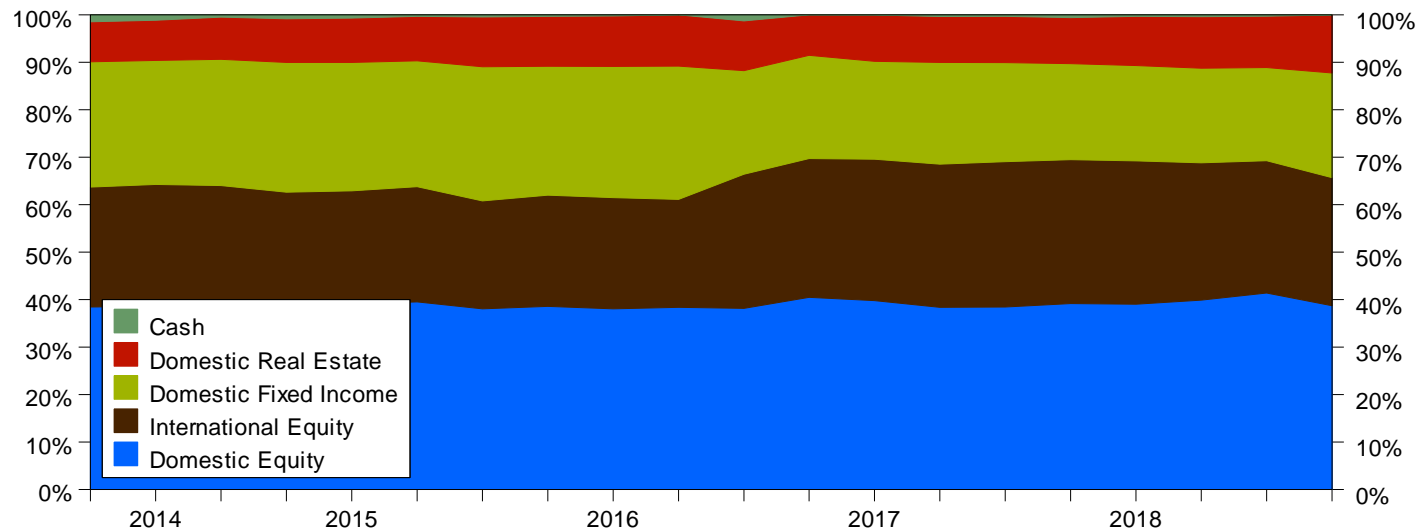
Target Asset Allocation



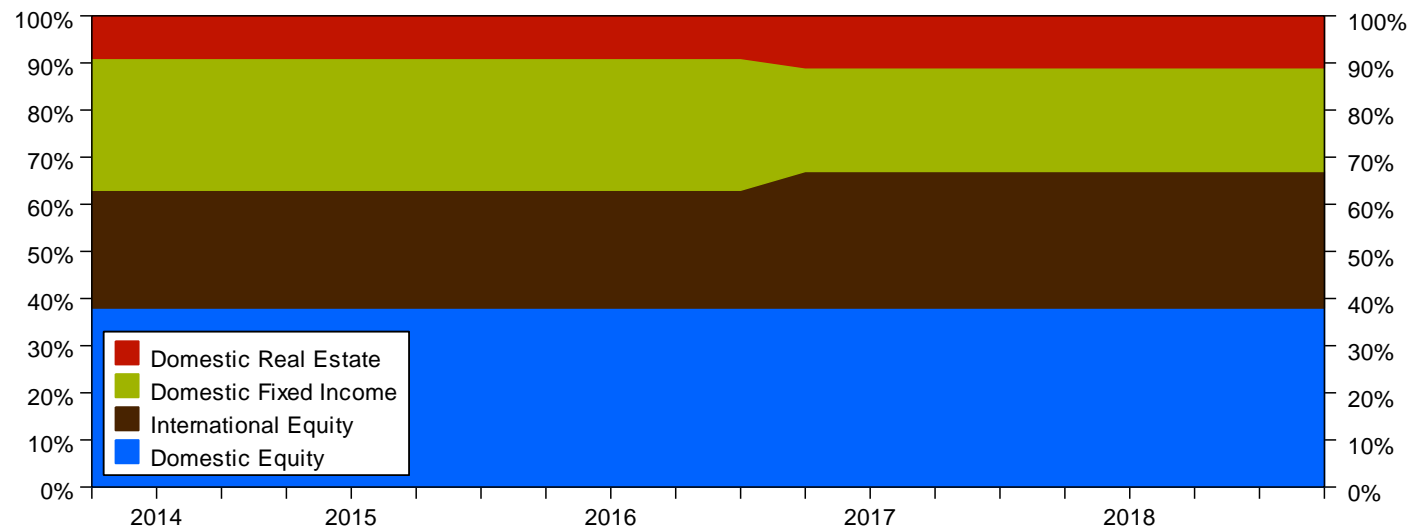
Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Domestic Equity	184,400	38.7%	38.0%	0.7%	3,445
International Equity	128,491	27.0%	29.0%	(2.0%)	(9,606)
Domestic Fixed Income	105,019	22.1%	22.0%	0.1%	256
Domestic Real Estate	58,114	12.2%	11.0%	1.2%	5,732
Cash	174	0.0%	0.0%	0.0%	174
Total	476,198	100.0%	100.0%		

MCERA Actual vs Target Historical Asset Allocation

Actual Historical Asset Allocation

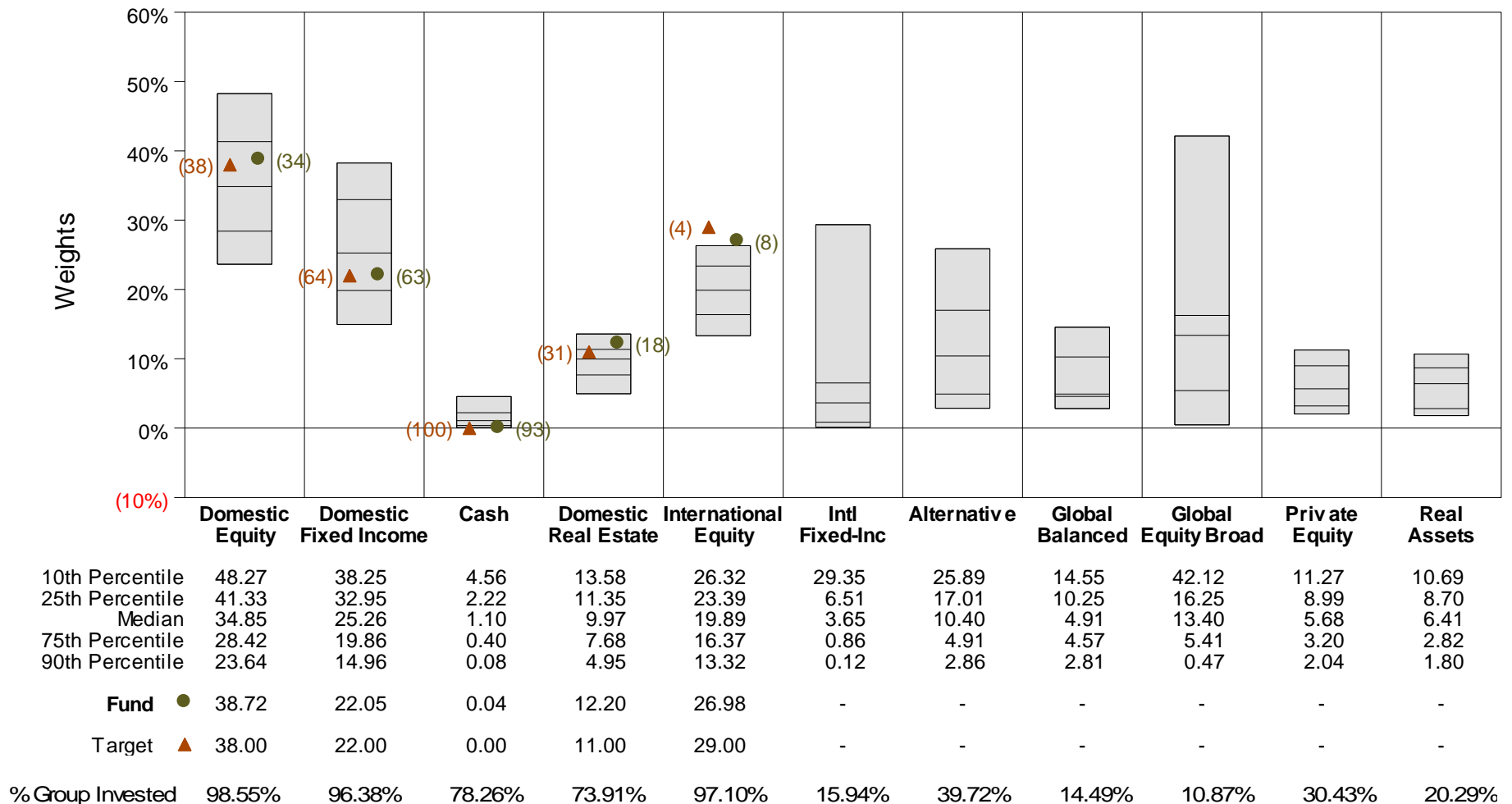


Target Historical Asset Allocation



MCERA Asset Class Weights vs Callan Public Fund Sponsor Database

Asset Class Weights vs Callan Public Fund Sponsor Database



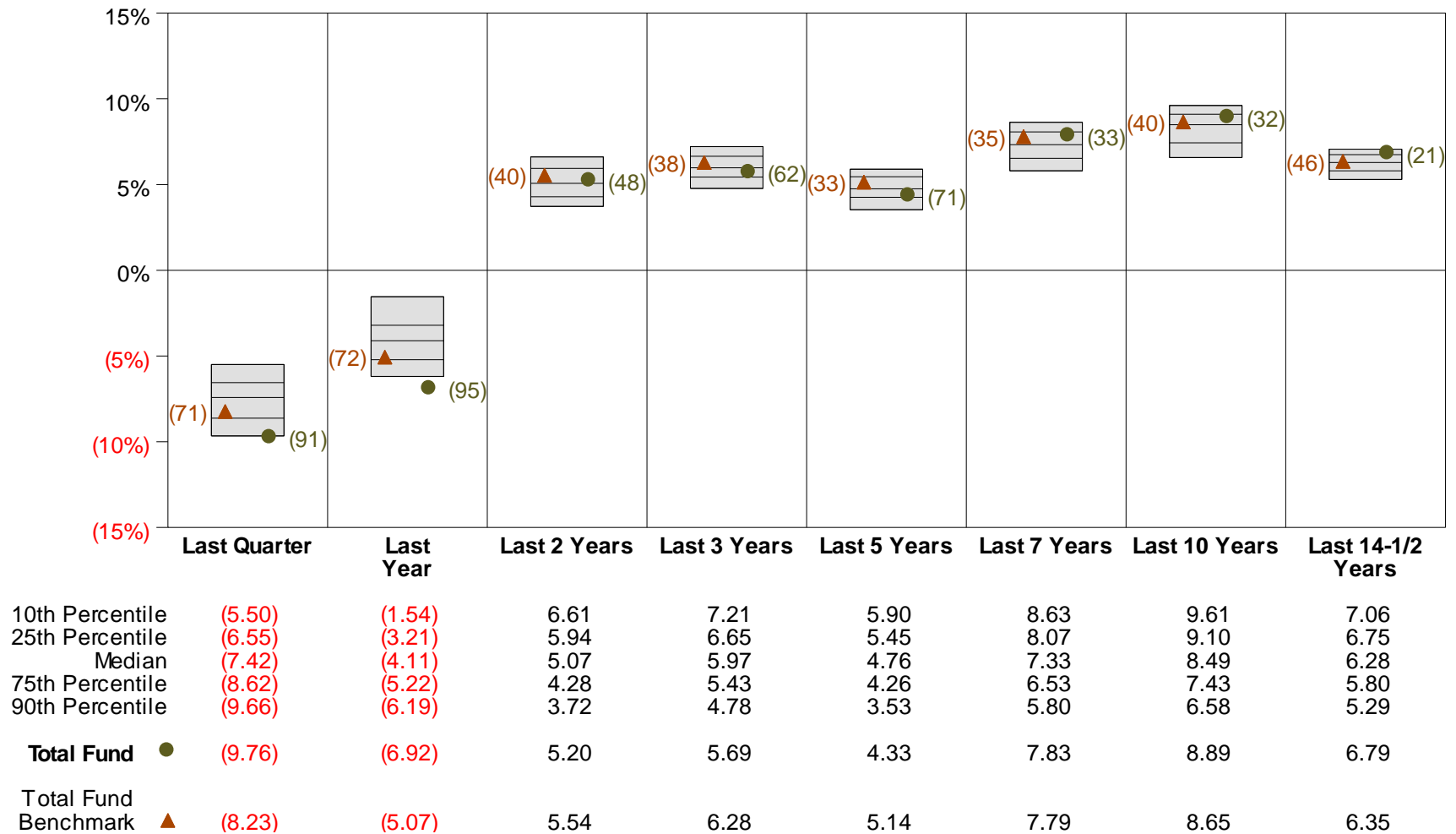
- The chart above ranks MCERA's asset allocation and the target allocation versus the Callan Public Fund Sponsor Database

Asset Allocation as of December 31, 2018

	December 31, 2018				September 30, 2018	
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
Domestic Equities	\$184,399,863	38.72%	\$(1,504,598)	\$(33,724,749)	\$219,629,210	41.40%
Large Cap Equities	\$129,219,488	27.14%	\$(1,504,598)	\$(22,022,278)	\$152,746,364	28.80%
Vanguard S&P 500 Index	32,735,958	6.87%	(1,500,000)	(5,281,106)	39,517,064	7.45%
SSGA S&P Equal Weighted NL CTF	32,010,988	6.72%	(4,598)	(5,253,563)	37,269,149	7.03%
Boston Partners	32,537,584	6.83%	0	(5,226,587)	37,764,171	7.12%
Harbor Cap Appreciation	31,934,958	6.71%	0	(6,261,022)	38,195,980	7.20%
Mid Cap Equities	\$28,871,786	6.06%	\$0	\$(4,538,313)	\$33,410,099	6.30%
Fidelity Low Priced Stock	13,690,677	2.87%	0	(2,143,475)	15,834,152	2.98%
Janus Enterprise	15,181,110	3.19%	0	(2,394,838)	17,575,947	3.31%
Small Cap Equities	\$26,308,589	5.52%	\$0	\$(7,164,158)	\$33,472,747	6.31%
Prudential Small Cap Value	11,324,250	2.38%	0	(2,853,663)	14,177,912	2.67%
AB US Small Growth	14,984,339	3.15%	0	(4,310,495)	19,294,834	3.64%
International Equities	\$128,491,331	26.98%	\$0	\$(19,399,640)	\$147,890,970	27.88%
EuroPacific	22,966,876	4.82%	0	(3,309,106)	26,275,982	4.95%
Harbor International	25,469,548	5.35%	0	(3,987,931)	29,457,479	5.55%
Oakmark International	23,971,484	5.03%	0	(4,726,207)	28,697,691	5.41%
Mondrian International	23,920,566	5.02%	0	(2,326,807)	26,247,373	4.95%
T. Rowe Price Intl Small Cap	18,833,937	3.96%	0	(3,582,805)	22,416,742	4.23%
Investec	13,328,920	2.80%	0	(1,466,782)	14,795,702	2.79%
Domestic Fixed Income	\$105,019,140	22.05%	\$0	\$870,646	\$104,148,494	19.63%
Dodge & Cox Income	52,582,058	11.04%	0	153,461	52,428,596	9.88%
PIMCO	52,437,082	11.01%	0	717,184	51,719,898	9.75%
Real Estate	\$58,113,647	12.20%	\$(22,840)	\$663,706	\$57,472,781	10.83%
RREEF Private Fund	29,836,945	6.27%	0	270,466	29,566,479	5.57%
Barings Core Property Fund	27,126,702	5.70%	0	370,400	26,756,302	5.04%
625 Kings Court	1,150,000	0.24%	(22,840)	22,840	1,150,000	0.22%
Cash	\$173,604	0.04%	\$(1,142,896)	\$0	\$1,316,500	0.25%
Total Fund	\$476,197,584	100.0%	\$(2,670,334)	\$(51,590,037)	\$530,457,955	100.0%

MCERA Total Fund Performance as of December 31, 2018

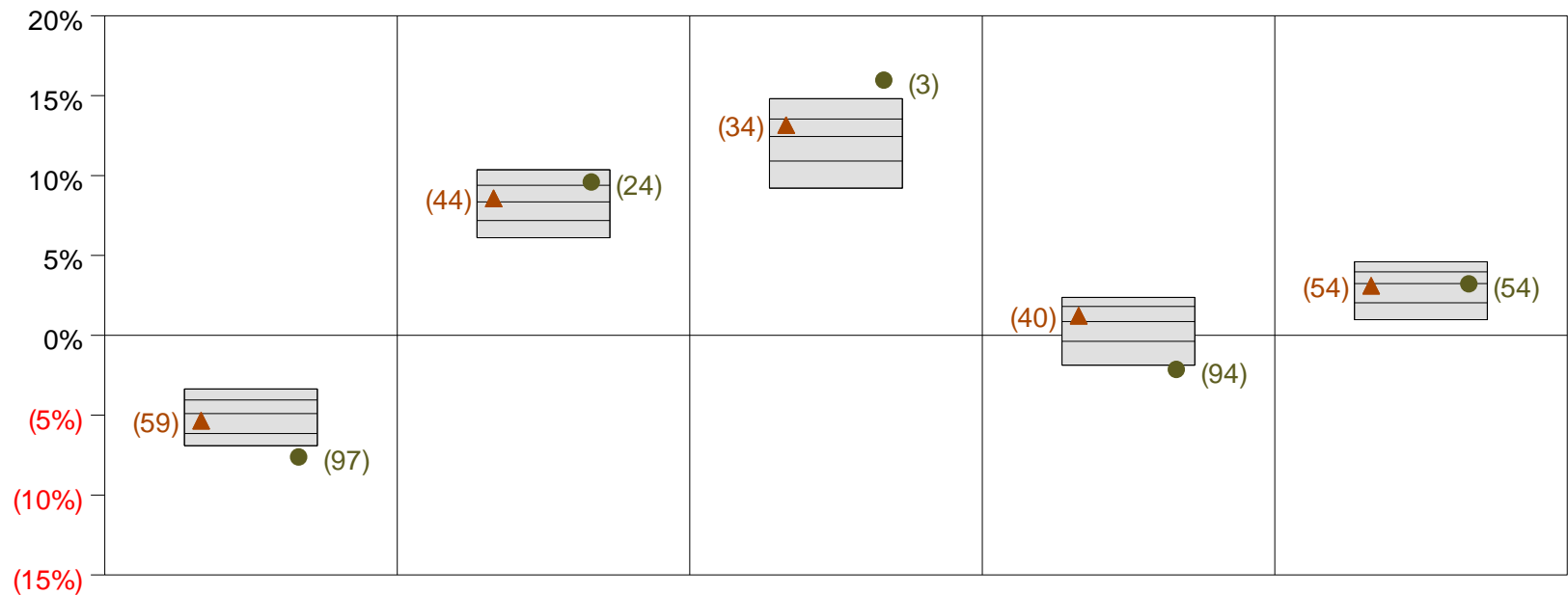
Performance vs Callan Public Fund Sponsor Database (Gross)



- The Callan Public Fund Sponsor Database consists of public employee pension total funds including both Callan LLC client and surveyed non-client funds.
- Returns greater than one year are annualized

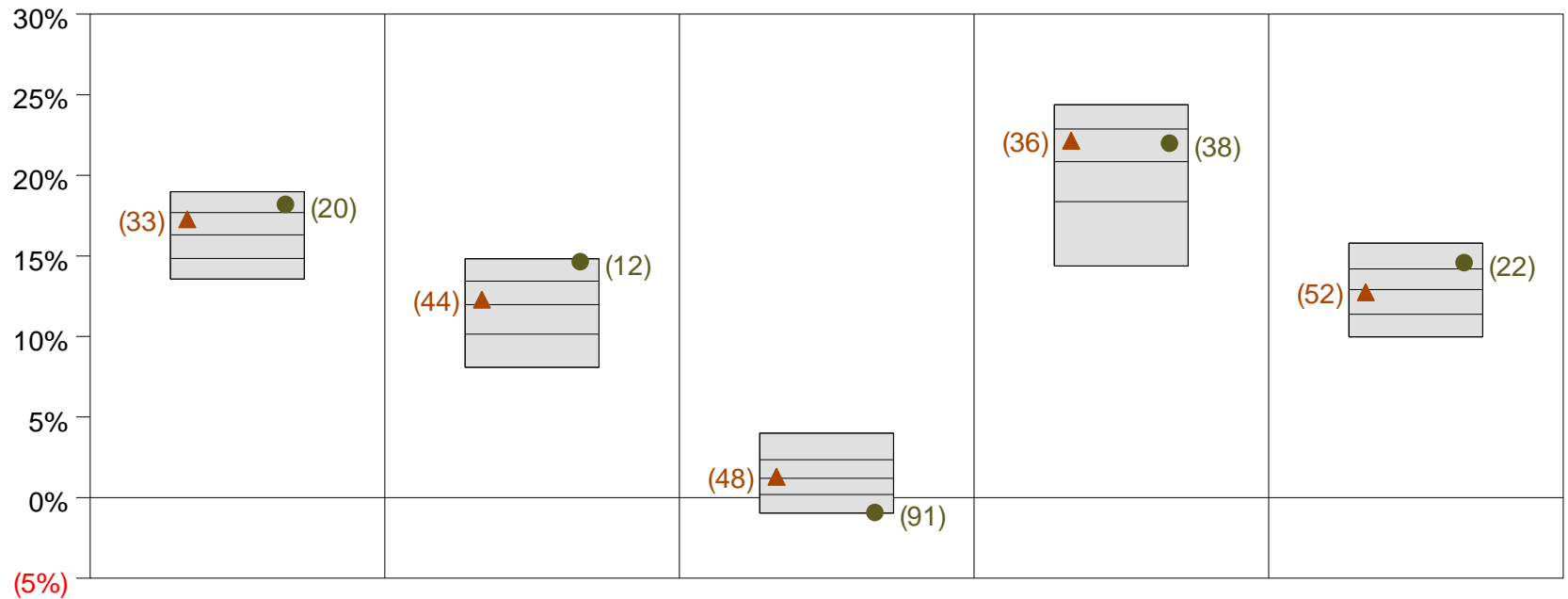
MCERA Total Fund Fiscal Year Performance

December 31, 2018



	Fiscal YTD	FY 2018	FY 2017	FY 2016	FY 2015
10th Percentile	(3.36)	10.37	14.81	2.37	4.61
25th Percentile	(4.05)	9.40	13.54	1.80	3.98
Median	(4.90)	8.35	12.45	0.86	3.23
75th Percentile	(6.14)	7.18	10.91	(0.38)	2.04
90th Percentile	(6.91)	6.10	9.21	(1.87)	0.98
Total Fund	(7.74)	9.48	15.86	(2.26)	3.09
Total Fund Benchmark	(5.34)	8.57	13.16	1.23	3.10

MCERA Total Fund Fiscal Year Performance (continued)

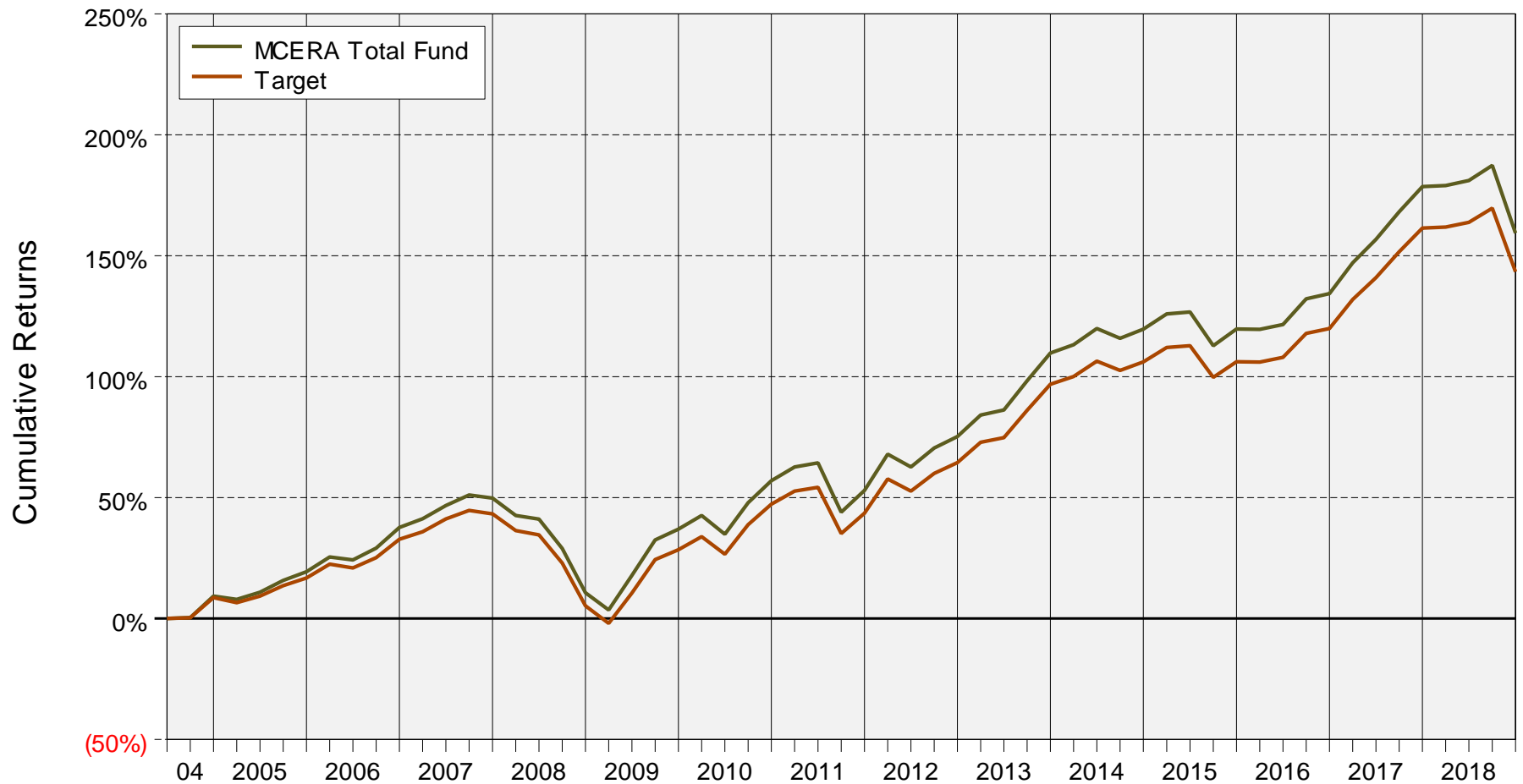


	FY 2014	FY 2013	FY 2012	FY 2011	FY 2010
10th Percentile	18.99	14.82	3.99	24.38	15.80
25th Percentile	17.69	13.43	2.36	22.87	14.20
Median	16.31	11.98	1.20	20.86	12.90
75th Percentile	14.83	10.14	0.20	18.36	11.38
90th Percentile	13.56	8.08	(0.96)	14.38	9.98
Total Fund ●	18.08	14.52	(1.04)	21.87	14.47
Total Fund Benchmark ▲	17.27	12.29	1.30	22.15	12.74

MCERA Cumulative Total Fund Performance

For 14 ½ Years Ended December 31, 2018

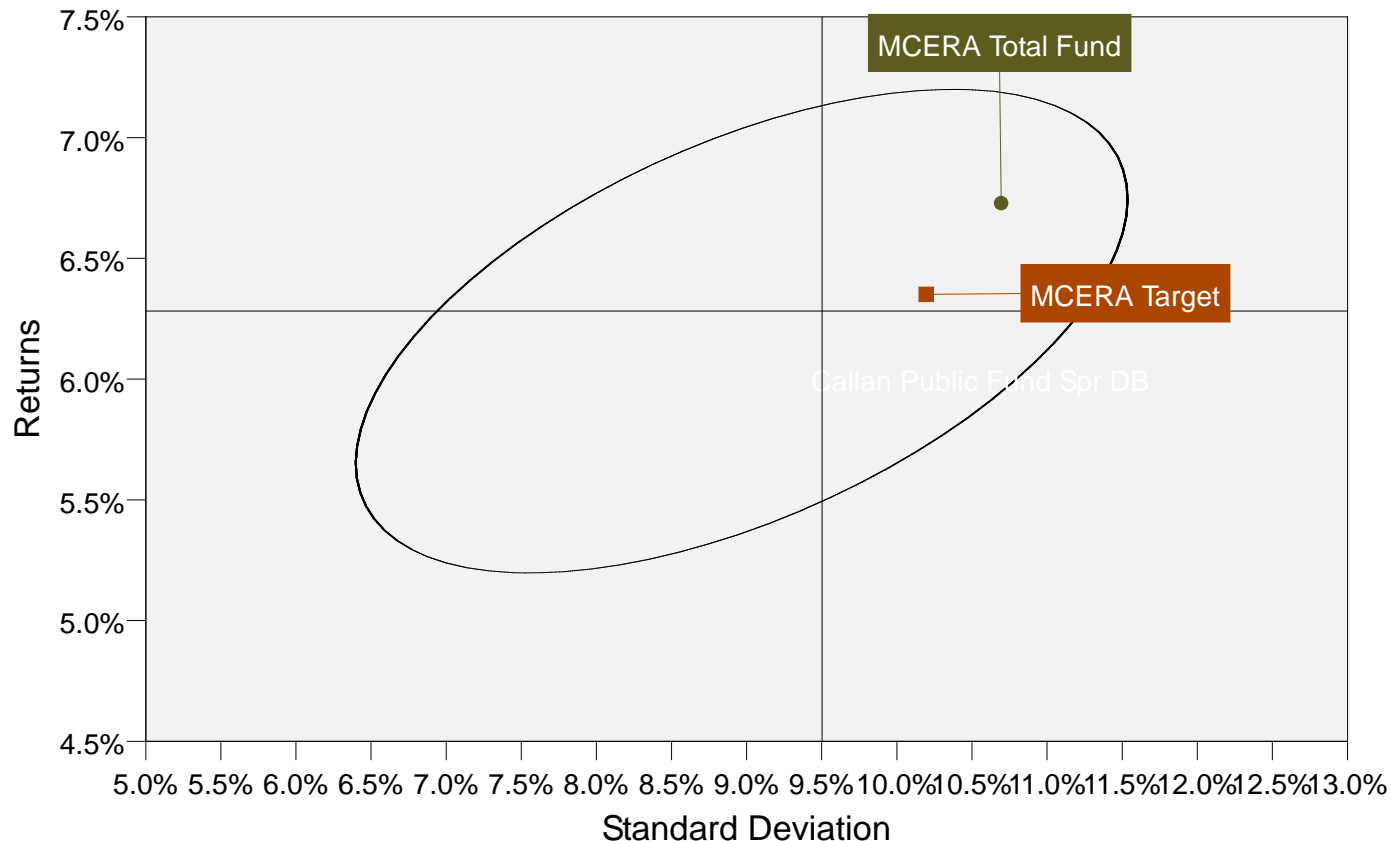
Fourteen and One-Half Year Cumulative Returns



MCERA Annualized Return vs Risk

14 1/2 Years Ended December 31, 2018

Group: Callan Public Fund Sponsor Database



- The chart above plots 14 ½ year annualized return vs standard deviation of the MCERA Total Fund and the Total Fund Target. Over the trailing 14 ½ year period the MCERA Total Fund has achieved an annualized return higher than the Total Fund Target with moderately higher volatility.

Investment Manager Returns for Periods Ended December 31, 2018

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Domestic Equities	(15.39%)	(6.04%)	8.84%	7.13%	13.69%
Russell 3000 Index	(14.30%)	(5.24%)	8.97%	7.91%	13.18%
Large Cap Equities					
Vanguard S&P 500 Index	(13.53%)	(4.42%)	9.22%	8.46%	-
S&P 500 Index	(13.52%)	(4.38%)	9.26%	8.49%	13.12%
SSGA S&P Eq Weighted NL CTF	(14.11%)	(7.83%)	-	-	-
S&P 500 Eq Weighted	(13.90%)	(7.64%)	8.03%	7.14%	14.95%
Boston Partners	(13.84%)	(8.95%)	7.29%	5.40%	-
S&P 500 Index	(13.52%)	(4.38%)	9.26%	8.49%	13.12%
Russell 1000 Value Index	(11.72%)	(8.27%)	6.95%	5.95%	11.18%
Harbor Cap Appreciation (1)	(16.39%)	(0.96%)	10.24%	10.33%	15.29%
S&P 500 Index	(13.52%)	(4.38%)	9.26%	8.49%	13.12%
Russell 1000 Growth Index	(15.89%)	(1.51%)	11.15%	10.40%	15.29%
Mid Cap Equities					
Fidelity Low Priced Stock	(13.54%)	(10.75%)	5.42%	4.63%	12.85%
Russell MidCap Value Idx	(14.95%)	(12.29%)	6.06%	5.44%	13.03%
Janus Enterprise (2)	(13.63%)	(0.81%)	12.10%	10.30%	16.13%
Russell MidCap Growth Idx	(15.99%)	(4.75%)	8.59%	7.42%	15.12%
Small Cap Equities					
Prudential Small Cap Value (3)	(20.13%)	(18.82%)	5.00%	2.65%	-
US Small Cap Value Idx	(18.03%)	(12.94%)	6.67%	4.34%	11.87%
Russell 2000 Value Index	(18.67%)	(12.86%)	7.37%	3.61%	10.40%
AB US Small Growth (4)	(22.34%)	(0.60%)	12.79%	7.08%	17.55%
Russell 2000 Growth Index	(21.65%)	(9.31%)	7.24%	5.13%	13.52%

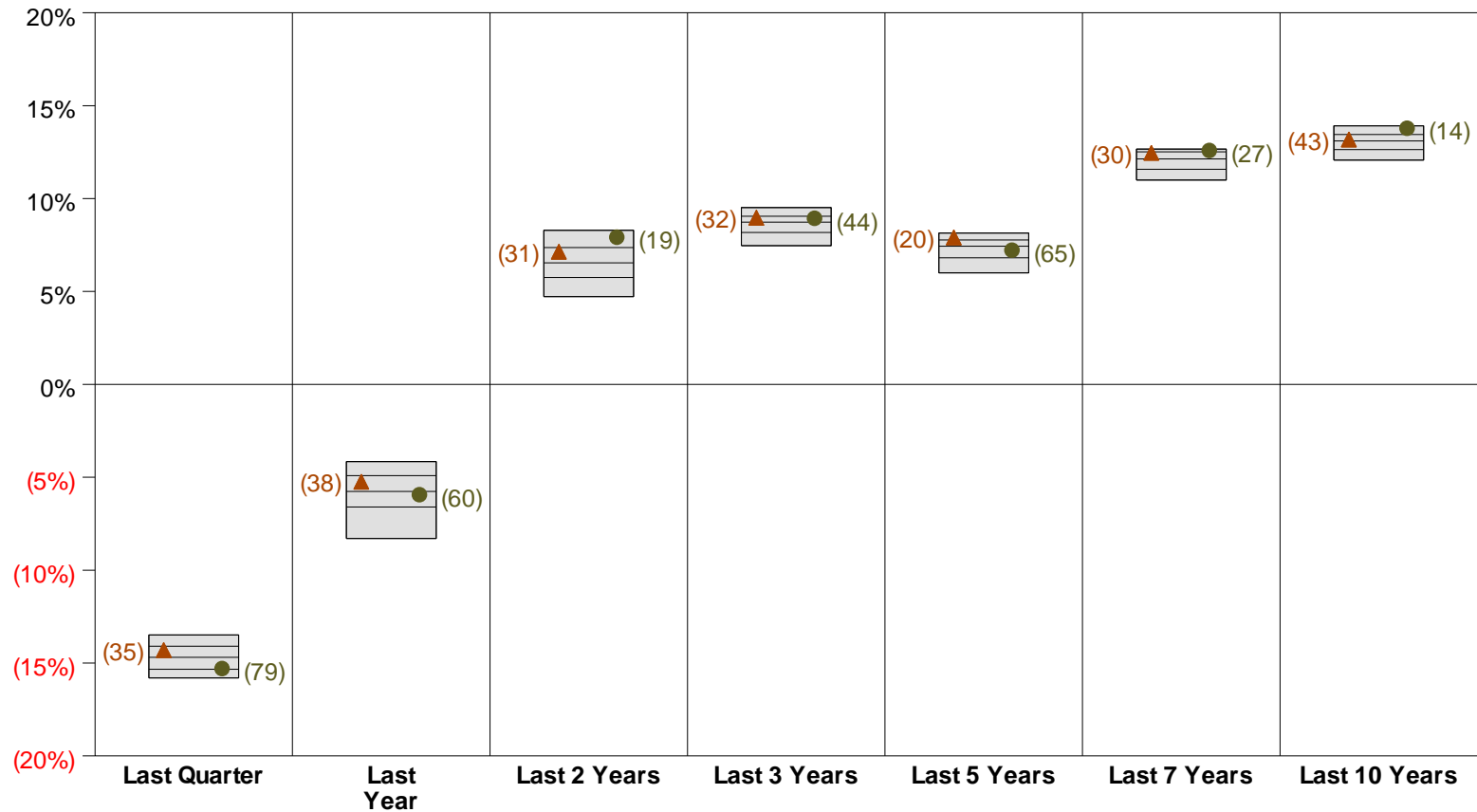
Investment Manager Returns for Periods Ended December 31, 2018 (continued)

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
International Equities	(13.20%)	(17.49%)	2.78%	(0.48%)	7.21%
MSCI ACWI ex-US Index	(11.40%)	(13.77%)	4.98%	1.14%	7.06%
EuroPacific	(12.59%)	(14.91%)	4.08%	1.86%	7.71%
Harbor International (1)	(13.54%)	(17.89%)	0.41%	(1.92%)	5.86%
Oakmark International (2)	(16.47%)	(23.51%)	2.59%	(0.39%)	9.85%
Mondrian International	(9.05%)	(12.71%)	3.71%	0.46%	-
MSCI EAFE Index	(12.54%)	(13.79%)	2.87%	0.53%	6.32%
MSCI ACWI ex-US Index	(11.40%)	(13.77%)	4.98%	1.14%	7.06%
T. Rowe Price Intl Small Cap	(16.21%)	(18.49%)	-	-	-
MSCI ACWI ex US Small Cap	(14.43%)	(18.20%)	3.82%	1.96%	10.02%
Investec	(10.03%)	(15.80%)	-	-	-
MSCI Emerging Markets Index	(7.46%)	(14.57%)	9.25%	1.65%	8.02%
Domestic Fixed Income	0.84%	(0.28%)	2.83%	2.71%	4.65%
Blmbg Aggregate Index	1.64%	0.01%	2.06%	2.52%	3.48%
Dodge & Cox Income	0.29%	(0.31%)	3.19%	2.88%	5.09%
PIMCO	1.39%	(0.26%)	2.46%	2.55%	-
Blmbg Aggregate Index	1.64%	0.01%	2.06%	2.52%	3.48%
Real Estate	1.15%	6.90%	6.93%	9.44%	8.61%
Real Estate Custom Benchmark (3)	1.39%	7.30%	7.61%	9.81%	10.06%
RREEF Private	0.91%	7.41%	7.26%	9.82%	6.75%
Barings Core Property Fund	1.38%	6.34%	7.18%	8.61%	-
NFI-ODCE Equal Weight Net	1.39%	7.30%	7.53%	9.60%	5.92%
625 Kings Court	1.99%	7.51%	14.25%	12.93%	8.85%
Total Fund	(9.76%)	(6.92%)	5.69%	4.33%	8.89%
Total Fund Benchmark*	(8.23%)	(5.07%)	6.28%	5.14%	8.65%

MCERA Domestic Equity Composite Performance

For Periods Ended December 31, 2018

Performance vs Public Fund - Domestic Equity (Gross)



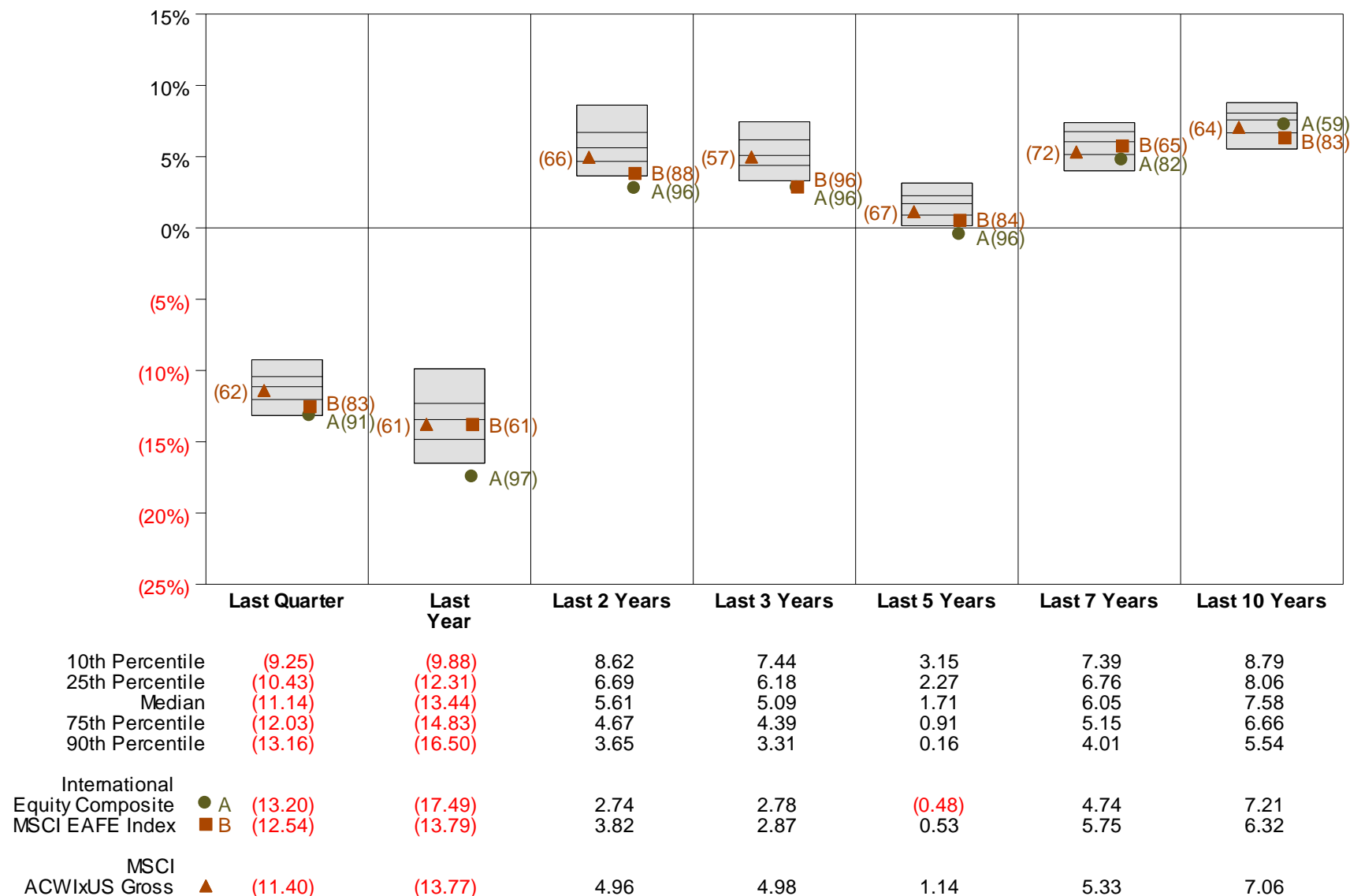
10th Percentile	(13.49)	(4.16)	8.29	9.51	8.15	12.66	13.92
25th Percentile	(14.10)	(4.91)	7.36	9.05	7.77	12.52	13.45
Median	(14.70)	(5.76)	6.54	8.73	7.44	12.13	13.10
75th Percentile	(15.34)	(6.60)	5.75	8.18	6.82	11.58	12.64
90th Percentile	(15.80)	(8.30)	4.72	7.46	6.00	10.99	12.07

Domestic Equity Composite	●	(15.39)	(6.04)	7.82	8.84	7.13	12.50	13.69
Russell 3000 Index	▲	(14.30)	(5.24)	7.14	8.97	7.91	12.46	13.18

MCERA International Equity Composite Performance

For Periods Ended December 31, 2018

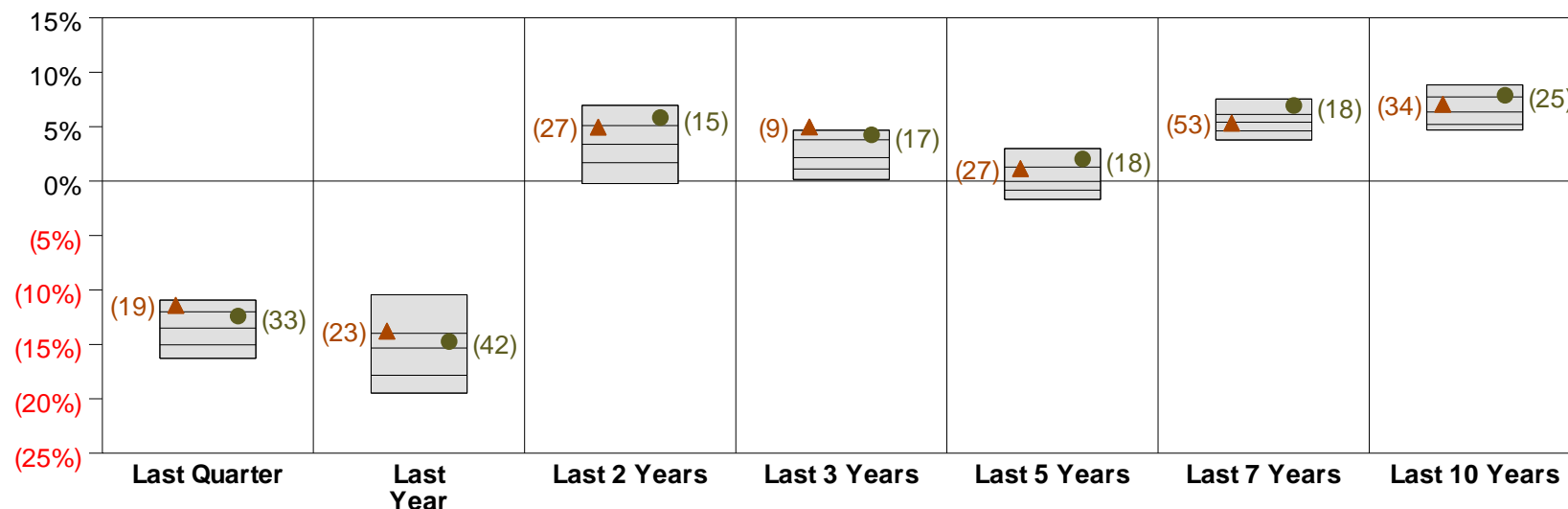
Performance vs Public Fund - International Equity (Gross)



EuroPacific Growth Performance

For Periods Ended December 31, 2018

Performance vs Callan Non US Equity Mutual Funds (Net)



10th Percentile	(10.93)	(10.44)	6.96	4.67	2.99	7.53	8.84
25th Percentile	(12.01)	(13.99)	5.10	3.79	1.29	6.12	7.73
Median	(13.50)	(15.33)	3.39	2.16	(0.02)	5.41	6.35
75th Percentile	(15.04)	(17.83)	1.69	1.11	(0.82)	4.61	5.21
90th Percentile	(16.28)	(19.47)	(0.22)	0.15	(1.68)	3.78	4.70

EuroPacific ● (12.59) (14.91) 5.65 4.08 1.86 6.77 7.71

MSCI ACWIxUS Gross ▲ (11.40) (13.77) 4.96 4.98 1.14 5.33 7.06

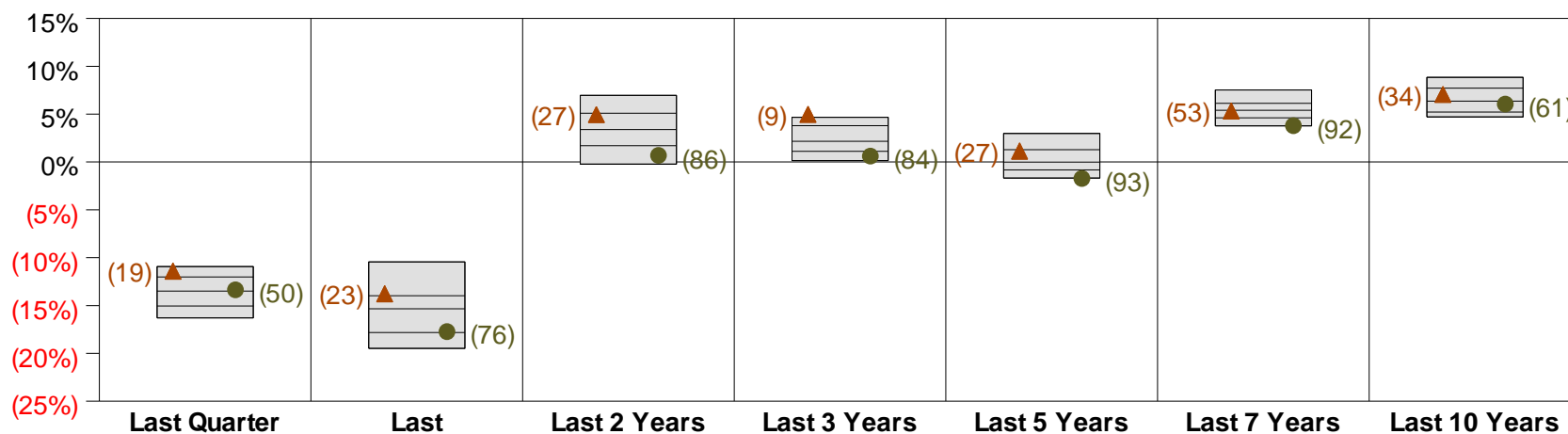
Investment Philosophy

Capital Group has a research-driven approach to non-U.S. investing. Their bottom-up fundamental approach is blended with macroeconomic and political judgments on the outlook of economies, industries, currencies, and markets. The fund uses a "multiple manager" approach where individual portfolio managers, each with different styles, manage separate sleeves of the strategy independently. Sleeves are combined to form the fund. Individual managers are selected so that the aggregate fund adheres to its stated objective of capital appreciation. Switched from Class R-5 Shares to Class R-6 Shares in December 2009.

Harbor International Performance

For Periods Ended December 31, 2018

Performance vs Callan Non US Equity Mutual Funds (Net)



10th Percentile	(10.93)	(10.44)	6.96	4.67	2.99	7.53	8.84
25th Percentile	(12.01)	(13.99)	5.10	3.79	1.29	6.12	7.73
Median	(13.50)	(15.33)	3.39	2.16	(0.02)	5.41	6.35
75th Percentile	(15.04)	(17.83)	1.69	1.11	(0.82)	4.61	5.21
90th Percentile	(16.28)	(19.47)	(0.22)	0.15	(1.68)	3.78	4.70
Harbor International	● (13.54)	(17.89)	0.49	0.41	(1.92)	3.61	5.86
MSCI ACWIxUS Gross	▲ (11.40)	(13.77)	4.96	4.98	1.14	5.33	7.06

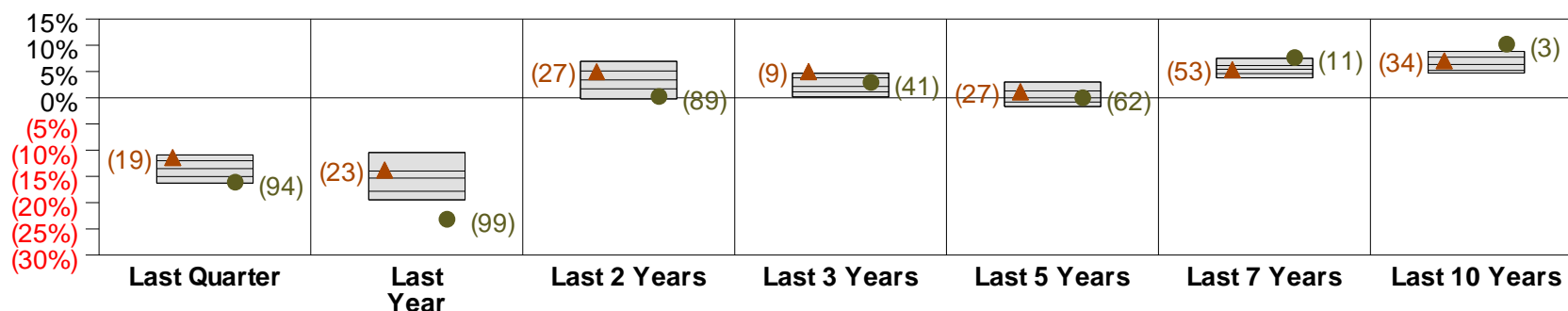
Investment Philosophy

The Harbor International Fund is sub-advised by Marathon-London. At the heart of Marathon's investment philosophy is the "capital cycle" approach to investment. This is based on the idea that the prospect of high returns will attract excessive capital (and hence competition), and vice versa. In addition, the assessment of how management responds to the forces of the capital cycle - particularly whether they curtail investment when returns have been poor - and how they are incentivized are critical to the investment outcome. Given the contrarian and long-term nature of the capital cycle, the investment philosophy results in strong views versus the market and long holding periods (5 years plus). The attractiveness of an individual security, therefore, should be evaluated within this timeframe.

Oakmark International Performance

For Periods Ended September 30, 2018

Performance vs Callan Non US Equity Mutual Funds (Net)



10th Percentile	(10.93)	(10.44)	6.96	4.67	2.99	7.53	8.84
25th Percentile	(12.01)	(13.99)	5.10	3.79	1.29	6.12	7.73
Median	(13.50)	(15.33)	3.39	2.16	(0.02)	5.41	6.35
75th Percentile	(15.04)	(17.83)	1.69	1.11	(0.82)	4.61	5.21
90th Percentile	(16.28)	(19.47)	(0.22)	0.15	(1.68)	3.78	4.70
Oakmark International	● (16.47)	(23.51)	(0.10)	2.59	(0.39)	7.31	9.85
MSCI ACWIxUS Gross	▲ (11.40)	(13.77)	4.96	4.98	1.14	5.33	7.06

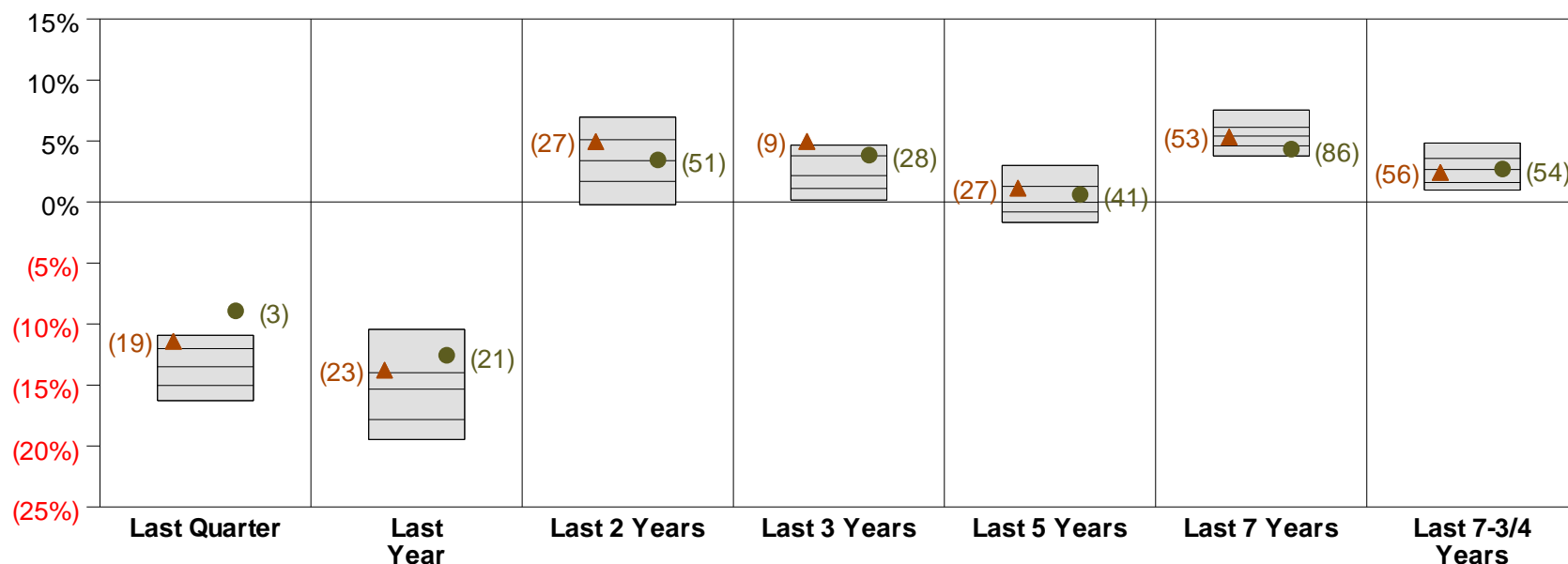
Investment Philosophy

Harris Associates are value investors. They seek to invest in companies that trade at a substantial discount to their underlying business values and run by managers who think and act as owners. They believe that purchasing a quality business at a discount to its underlying value minimizes risk while providing substantial profit potential. Over time, they believe the price of a stock will rise to reflect the company's underlying business value; in practice, their investment time horizon is generally three to five years. They are concentrated investors, building focused portfolios that provide diversification but are concentrated enough so that their best ideas can make a meaningful impact on investment performance. They believe they can add value through their stock selection capabilities and low correlation to international indices and peers. Harris believes their greatest competitive advantage is their long-term investment horizon, exploiting the mispricing of securities caused by what they believe is the short-term focus of many market participants. *This fund was converted into a CIT in November 2015.

Mondrian International Performance

For Periods Ended December 31, 2018

Performance vs Callan Non US Equity Mutual Funds (Net)



10th Percentile	(10.93)	(10.44)	6.96	4.67	2.99	7.53	4.83
25th Percentile	(12.01)	(13.99)	5.10	3.79	1.29	6.12	3.57
Median	(13.50)	(15.33)	3.39	2.16	(0.02)	5.41	2.66
75th Percentile	(15.04)	(17.83)	1.69	1.11	(0.82)	4.61	1.60
90th Percentile	(16.28)	(19.47)	(0.22)	0.15	(1.68)	3.78	0.98

Mondrian International ● (9.05) (12.71) 3.32 3.71 0.46 4.17 2.58

MSCI ACWIxUS Gross ▲ (11.40) (13.77) 4.96 4.98 1.14 5.33 2.43

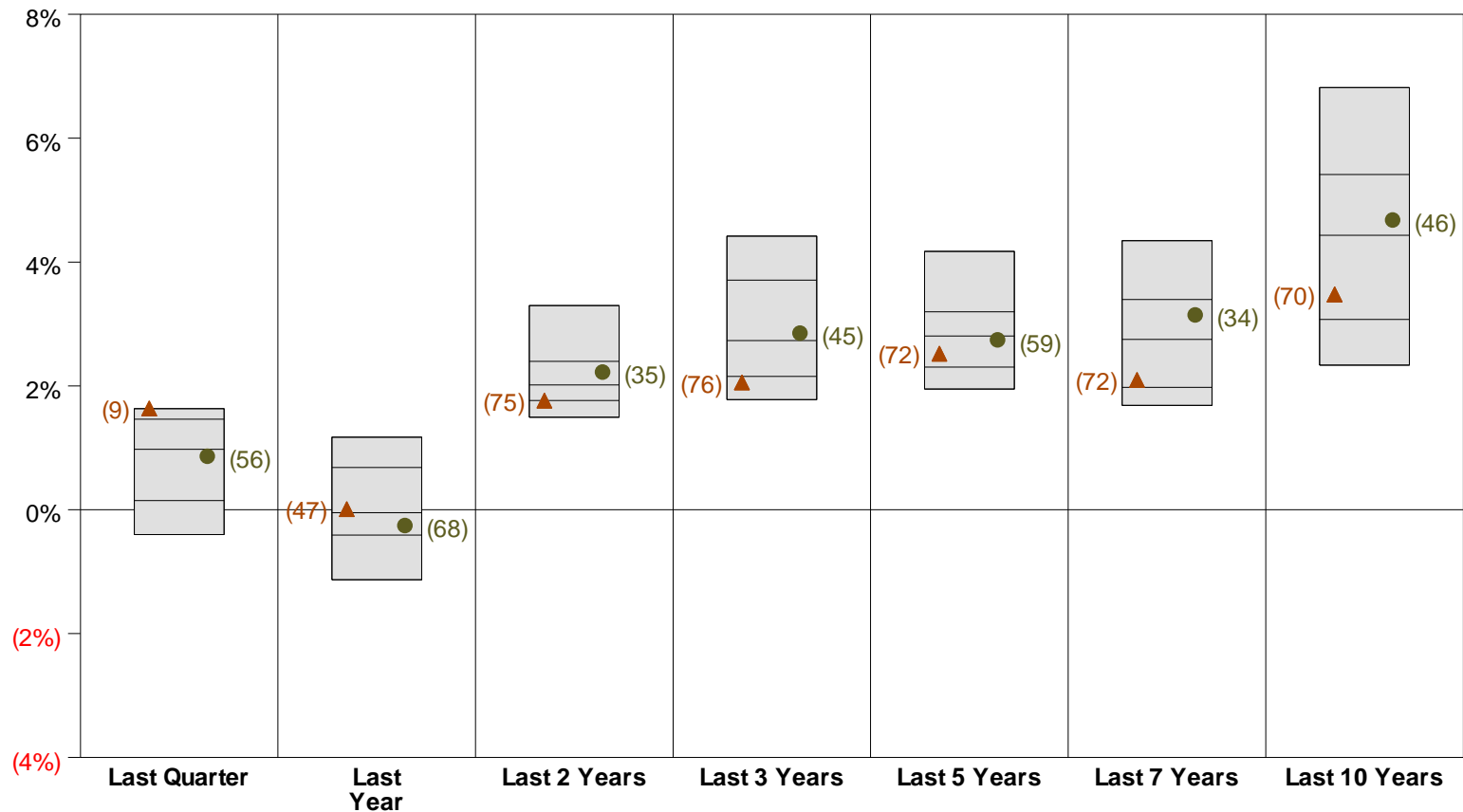
Investment Philosophy

Mondrian's value driven investment philosophy is based on the belief that investments need to be evaluated in terms of their fundamental long-term value. In the management of international equity assets, they invest in securities where rigorous dividend discount analysis identifies value in terms of the long term flow of income. Mondrian's management fee is 80 bps on all assets.

MCERA Fixed Income Composite Performance

For Periods Ended December 31, 2018

Performance vs Public Fund - Domestic Fixed (Gross)



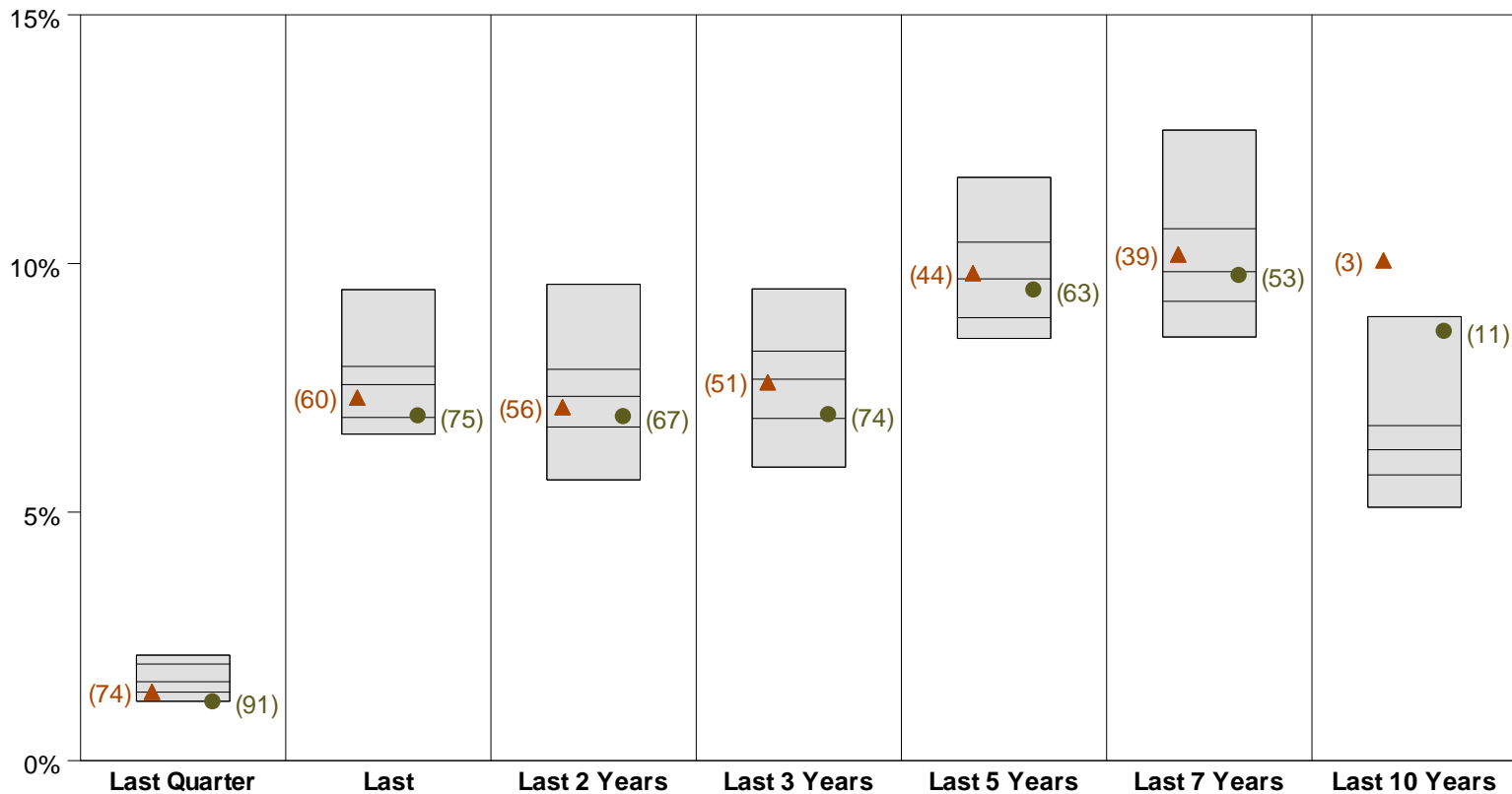
10th Percentile	1.63	1.17	3.30	4.42	4.17	4.35	6.82
25th Percentile	1.46	0.68	2.40	3.71	3.20	3.40	5.41
Median	0.98	(0.05)	2.02	2.73	2.81	2.75	4.43
75th Percentile	0.15	(0.41)	1.77	2.15	2.30	1.98	3.07
90th Percentile	(0.40)	(1.13)	1.49	1.78	1.95	1.69	2.33

Domestic Fixed Income Composite	●	0.84	(0.28)	2.20	2.83	2.71	3.12	4.65
Blmbq Aggregate	▲	1.64	0.01	1.76	2.06	2.52	2.10	3.48

MCERA Real Estate Composite Performance

For Periods Ended December 31, 2018

Performance vs Callan Open End Core Cmmingled Real Est (Net)



10th Percentile	2.12	9.47	9.58	9.49	11.73	12.68	8.93
25th Percentile	1.94	7.93	7.87	8.24	10.43	10.70	6.74
Median	1.59	7.56	7.33	7.67	9.69	9.84	6.25
75th Percentile	1.38	6.90	6.71	6.88	8.91	9.24	5.75
90th Percentile	1.20	6.57	5.65	5.90	8.49	8.52	5.10

Real Estate Composite	●	1.15	6.90	6.89	6.93	9.44	9.73	8.61
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Real Estate Custom Benchmark	▲	1.39	7.30	7.11	7.61	9.81	10.18	10.06
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Callan

Callan Update

Published Research Highlights from 4Q18

2018 Nuclear Decommissioning Funding Study



Greg Allen's Reflections on 30 Years at Callan



Puttin' on the Risk: How Investors Can Use Open Protocol



Considering Currency Hedging: 10 Charts to Think About



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Anna West

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Private Equity Trends quarterly newsletter

Active vs. Passive quarterly charts

Capital Market Review quarterly newsletter

Monthly Updates to the Periodic Table

Market Pulse Flipbook quarterly markets update

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Upcoming Conferences, Workshops, and Webinars

2019 June Regional Workshops

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

“Callan College”—Ongoing fiduciary education Introduction to Investments sessions

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

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

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

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



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— Greg Allen, CEO, CRO



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