Callan

2018 Capital Market Expectations and ESG Discussion

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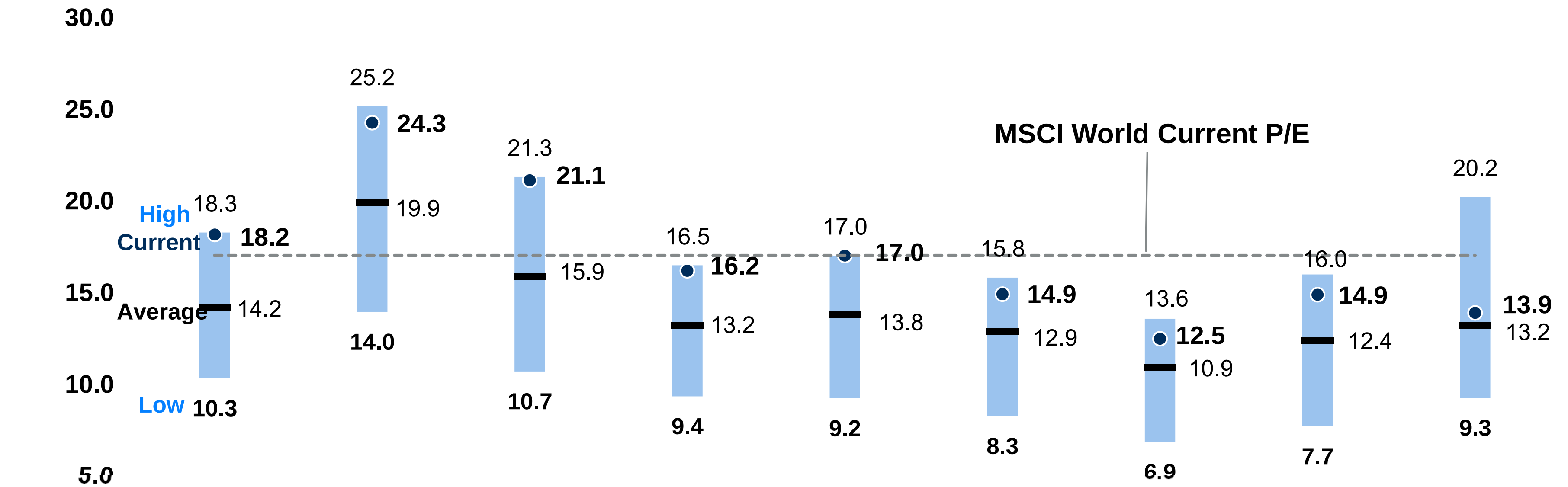
Issues to Consider

What Are Our Clients Discussing?

- Implications of Tax Reform
  - Effects on Pensions and Non-Profits
  - Asset Class implications
- Adjusting to lower capital market return expectations
  - Callan's 2018 10-Year Assumptions remain unchanged year over year
  - Diversification and discipline should remain the key elements points of emphasis
  - Caution when reaching for return/yield
- Both stock and bond valuations remain high
  - US looks expensive compared to Non-US Developed and Emerging Markets
  - Spreads of Non Government sectors are at or near historic lows
- Market volatility remains historically low despite domestic political tensions and increased geopolitical risks
  - What is suppressing volatility?
  - Will (when will?) it rise?
- Inflation remains benign – how should we think about inflation-hedging strategies?
- Incorporation of Environmental, Social, and Governance (ESG) into Investment Framework continues to garner interest

Global Equity Valuations

Current 1 Year Forward P/E vs. 10-Year High, Low, Average

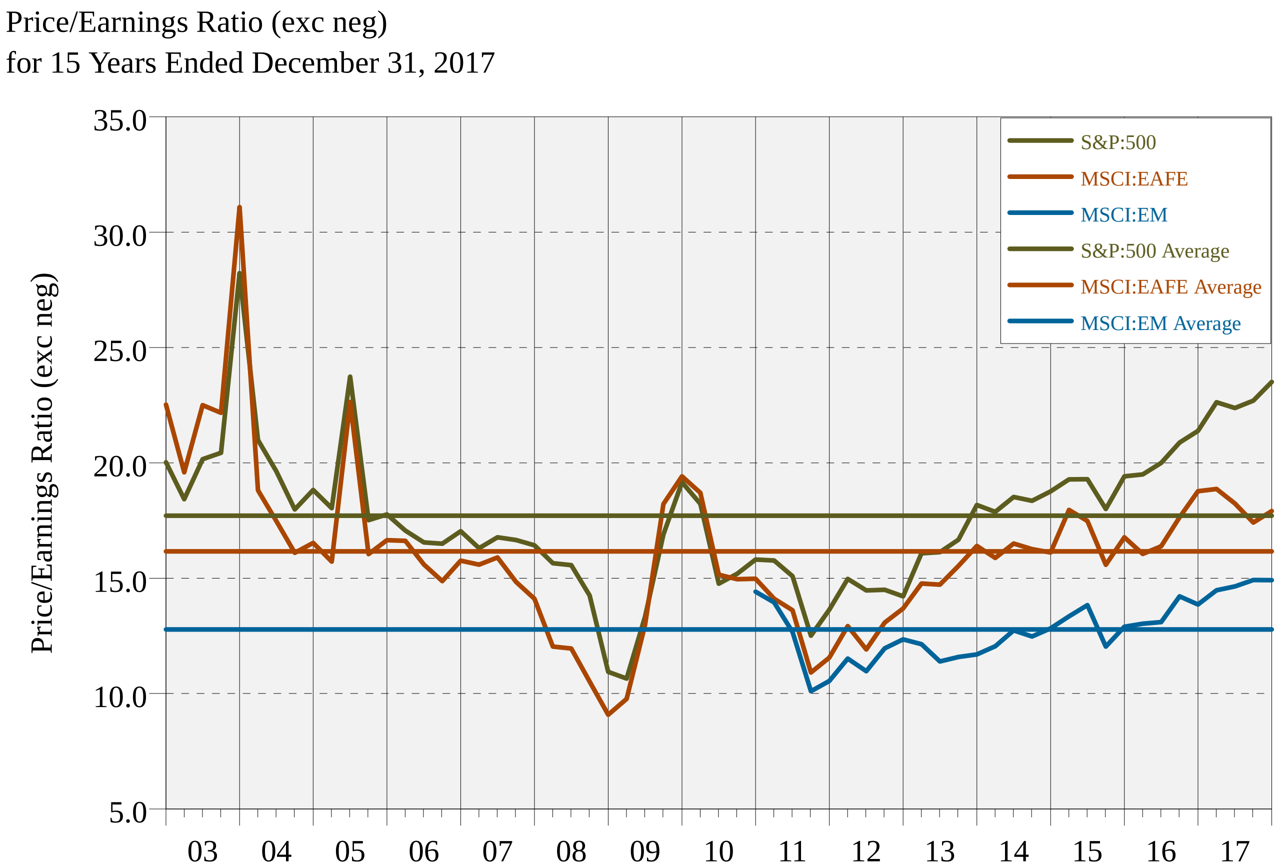


	S&P 500	Russell 2000	Russell 1000 Growth	Russell 1000 Value	MSCI World	MSCI EAFE	MSCI EM	MSCI Europe	MSCI AC Asia Pac
High Date	11/17	9/17	11/17	2/17	12/17	5/15	12/07	3/15	7/09
Low Date	9/11	9/11	11/08	9/11	10/08	10/08	10/08	10/08	10/08

- After continued strength in U.S. stocks the last several years, valuations have increased relative to other regions of the world.
- The current NTM P/E ratio represents a 10-year high for the S&P 500, Russell 2000, and Russell 1000 Growth.
- Non-U.S. regions, while above their 10-year averages, appear more reasonably valued versus the U.S.
- Despite reasonable relative valuations, both political and economic risks remain in international markets.

Source: Eaton Vance, FactSet as of 12/31/17. NTM P/E is market price per share divided by expected earnings per share over the next twelve months.
Data provided is for informational use only. Past performance is no guarantee of future results. See end of report for important additional information.

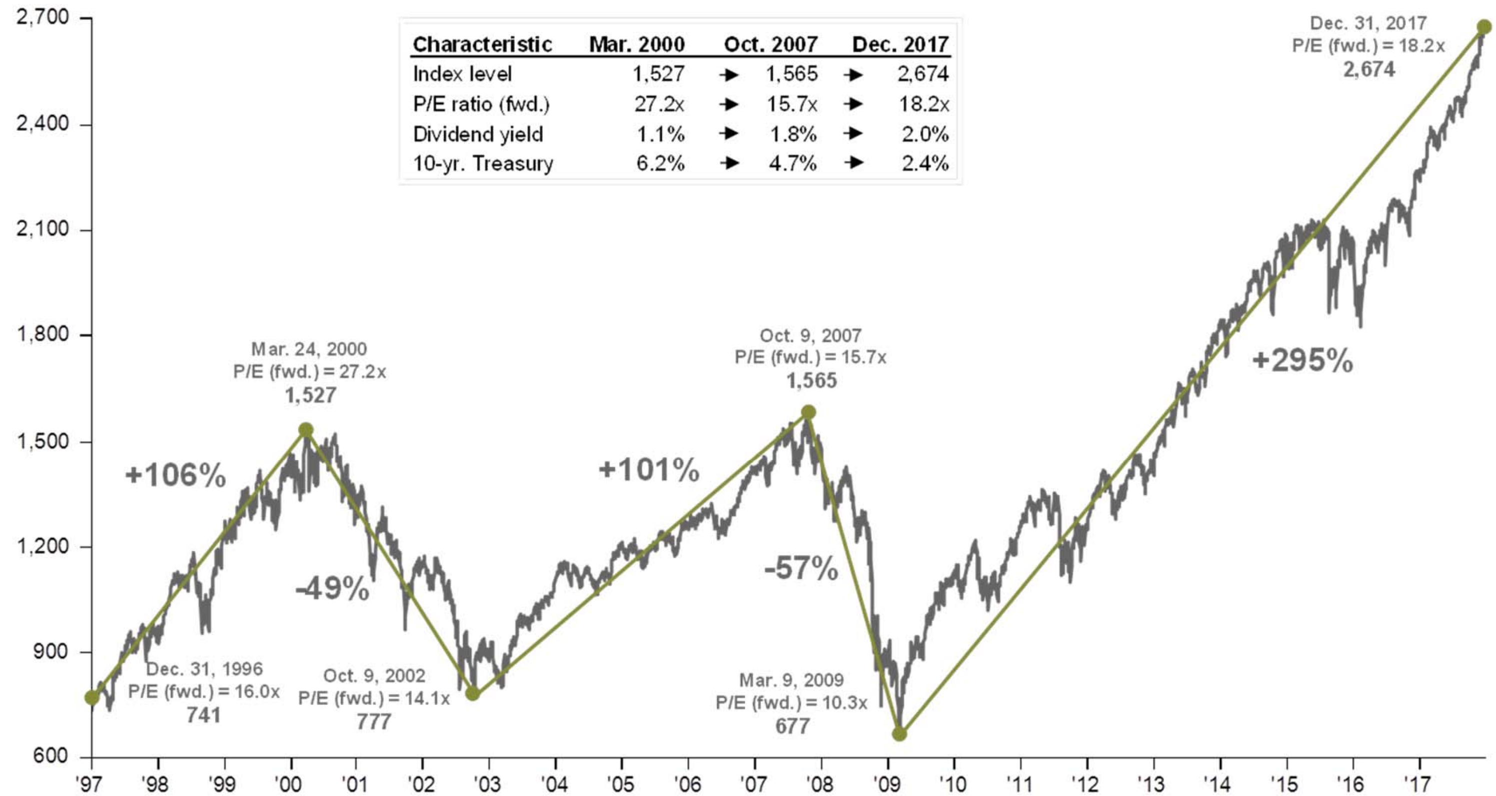
Equity Valuations



- U.S. equity valuations are slightly higher than international developed and emerging market equity valuations relative to the 15-year average.
- 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 international developed and emerging market equity.

U.S. Stock Market Extends an Incredible Run in 2017

S&P 500 Price Index



Characteristic	Mar. 2000		Oct. 2007		Dec. 2017
Index level	1,527	➜	1,565	➜	2,674
P/E ratio (fwd.)	27.2x	➜	15.7x	➜	18.2x
Dividend yield	1.1%	➜	1.8%	➜	2.0%
10-yr. Treasury	6.2%	➜	4.7%	➜	2.4%

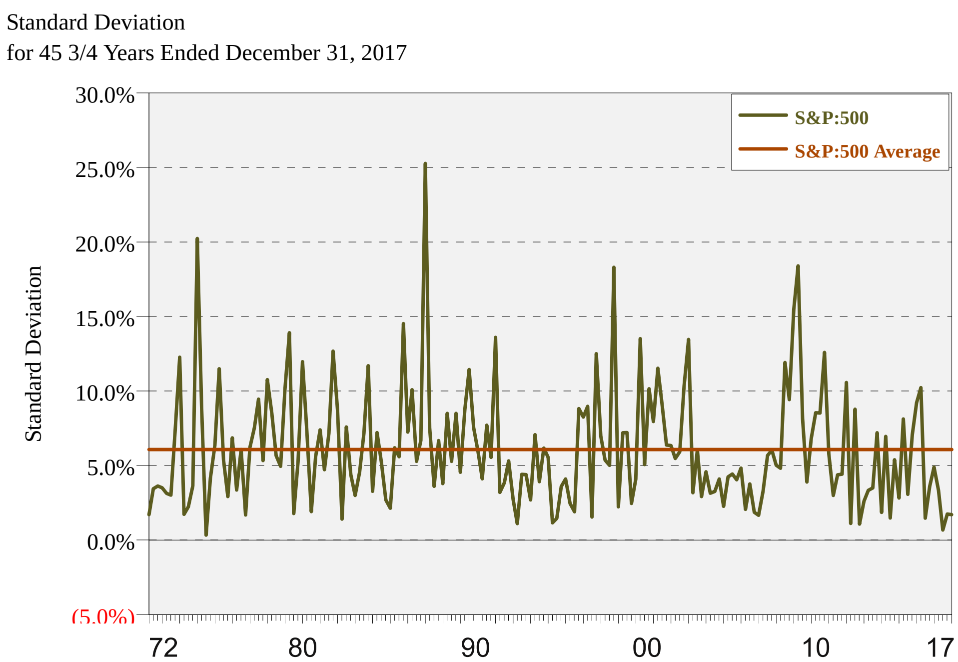
Source: Compustat, FactSet, Thomson Reuters, Federal Reserve, Standard & Poor's, J.P. Morgan Asset Management.
Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price to earnings ratio is a bottom-up 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 December 31, 2017.

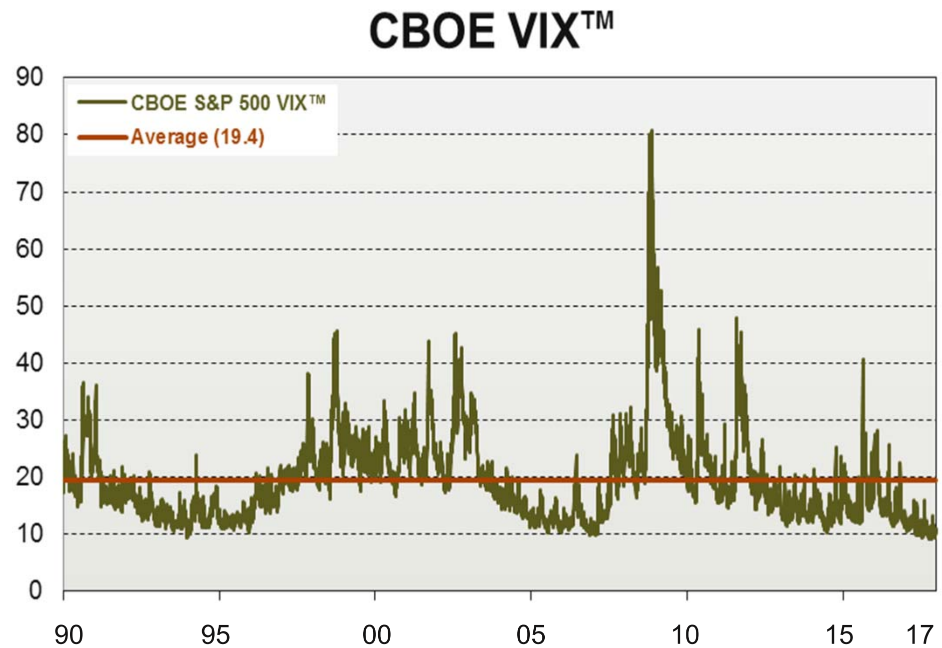
- Forward valuation creeps higher but is nowhere near the peak set in 2000.
- Dividend yield has been comparable to that of a 10-year Treasury for an extended period, gap just widening now; vastly different relationship between stock and bond yields in 2000 and 2007.

Source: J.P. Morgan Asset Management.

Market Volatility

Realized and Implied Volatility: S&P 500 Index





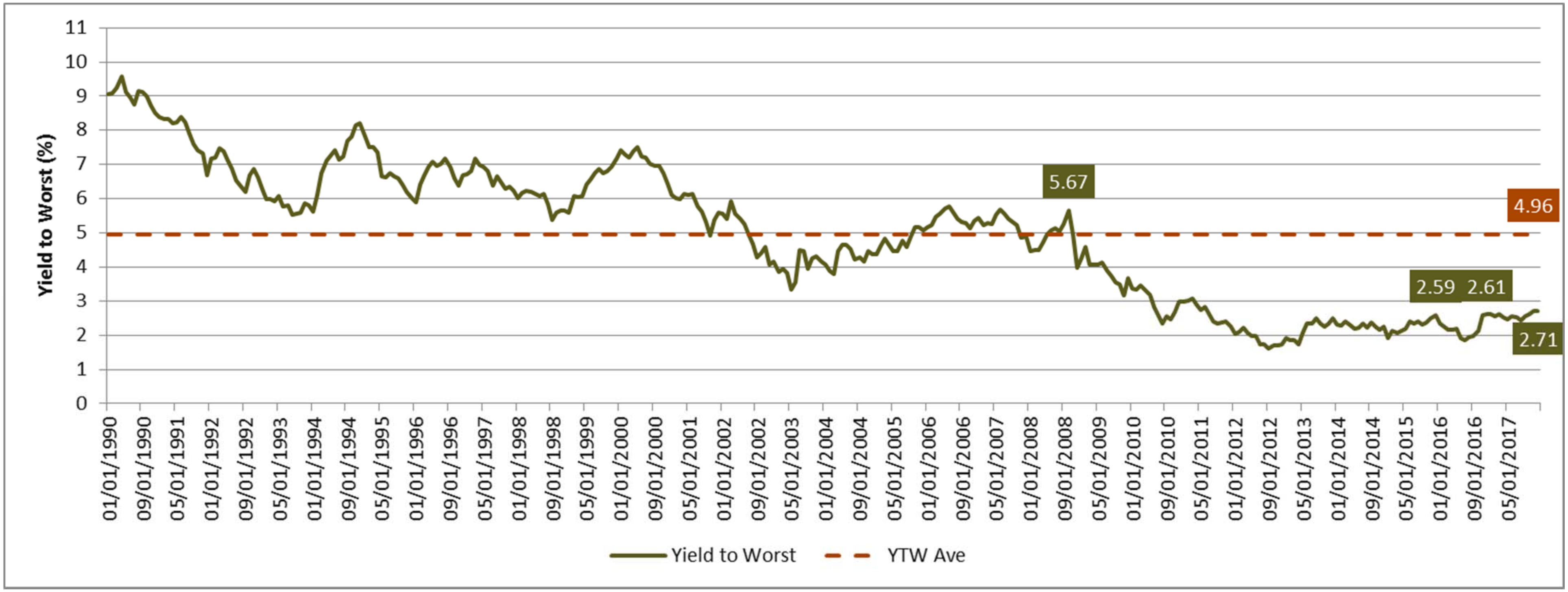
The VIX, measuring the implied volatility of S&P 500 Index options, closed the quarter at 11.0, well below the long-term average of 19.4.

The all-time intraday low (7/25 @ 8.84) as well as the all-time closing low (11/3 @ 9.14) have occurred in 2017.

Valuations as measured by traditional metrics like P/E remain high.

Fixed Income Yields Yet to Rise

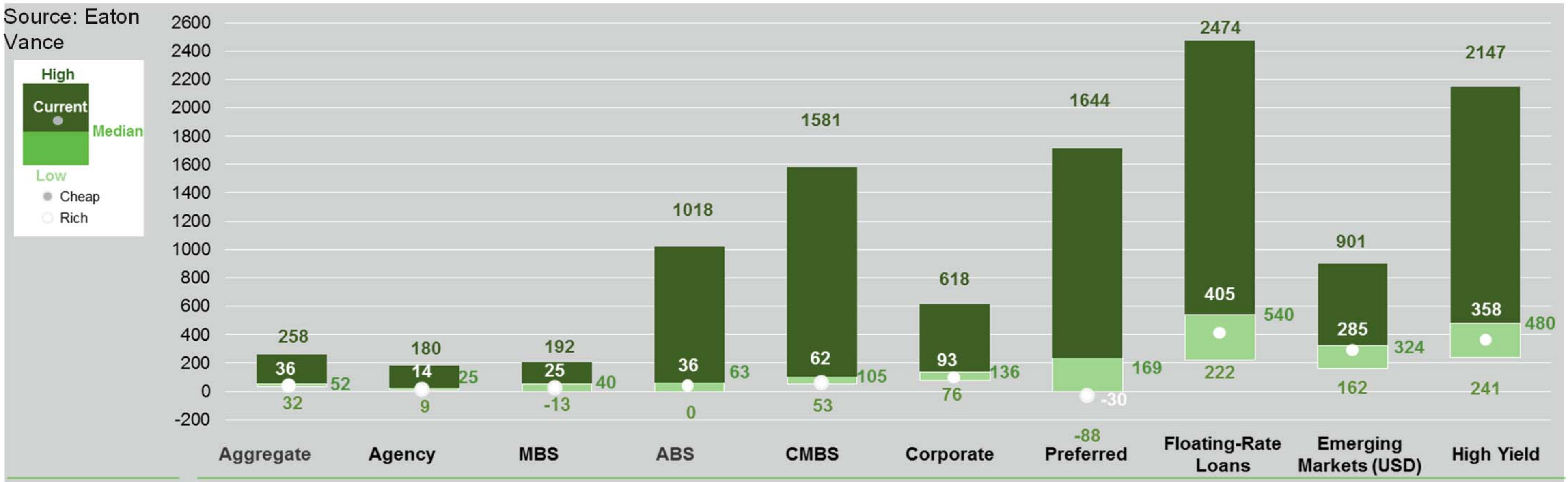
Bloomberg Barclays Aggregate Index Yield to Worst



- 12/29/17 = 2.71%

Yields last peaked at 5.67% in Q3 2008

Fixed Income Valuations



	Aggregate	Agency	MBS	ABS	CMBS	Corporate	Preferred	Floating-Rate Loans	Emerging Markets (USD)	High Yield
Max Spread Date	12/3/2008	11/20/2008	12/3/2008	1/6/2009	11/21/2008	12/3/2008	3/9/2009	12/19/2008	10/24/2008	12/15/2008
Min Spread Date	2/23/2005	3/12/2013	7/27/2010	10/1/2009	12/8/2004	3/11/2005	12/6/2017	3/31/2006	6/1/2007	6/1/2007
Spread on 12/31/17	36	14	25	36	62	93	-30	405	285	358
Spread on 12/31/16	43	21	15	59	75	123	213	465	342	422
Spread on 12/31/15	56	21	24	72	121	165	158	714	415	695

- Overall, spread sectors continue to trade at rich levels relative to Treasuries on a 15-year basis due to demand for yield the last several years.
- Below-investment grade sectors such as high yield and bank loans maintain a yield advantage over other spread sectors.

Source: Factset as of 12/31/17. Spread history measures past 15 years. Data provided is for informational use only. Past performance is no guarantee of future results. See end of report for important additional information. 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 BofAML 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 BofAML US High Yield Index.

Diversification Remains Key Risk Control

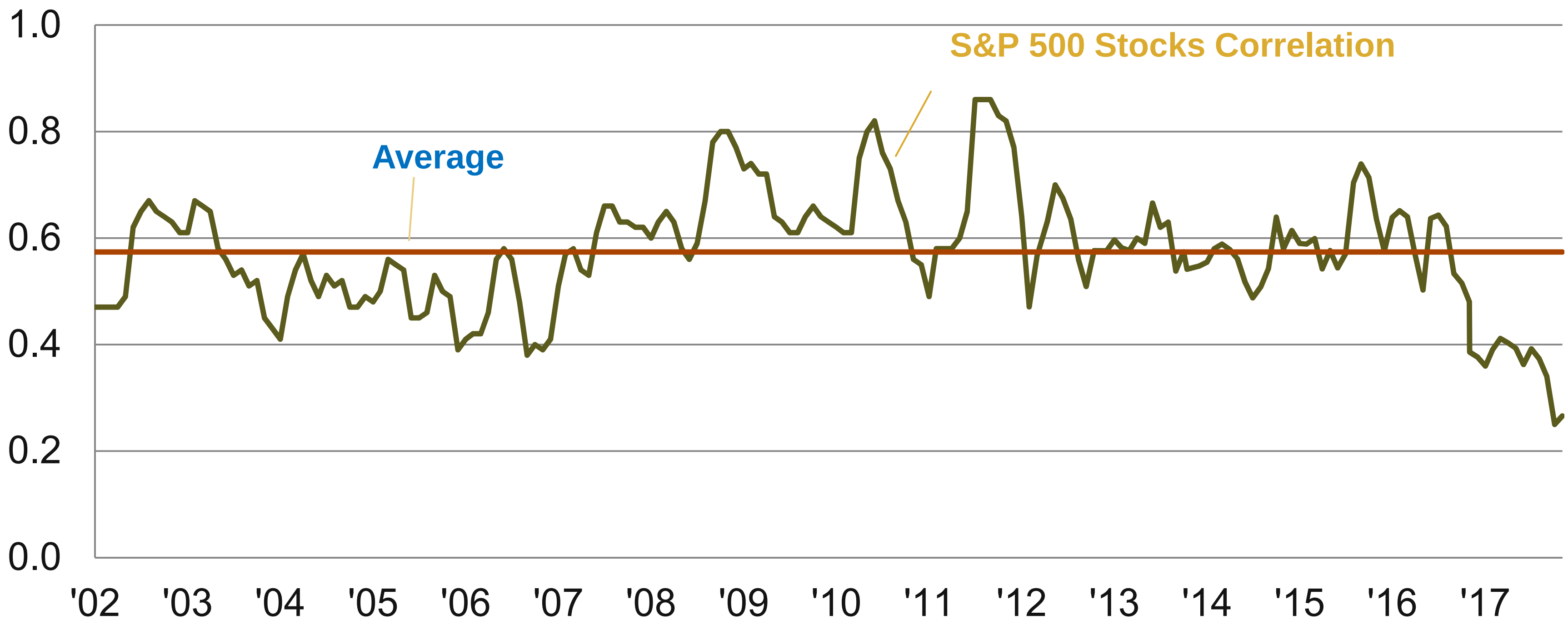
Periodic Table of Investment Returns 1998-2017

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
S&P 500 Growth 42.16%	MSCI Emerging Markets 66.84%	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%
S&P 500 28.58%	Russell 2000 Growth 43.09%	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%
MSCI World ex USA 18.77%	S&P 500 Growth 28.24%	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%
S&P 500 Value 14.68%	MSCI World ex USA 27.92%	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%
Bloomberg Barclays Agg 8.67%	Russell 2000 21.26%	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%
Bloomberg Barclays High Yield 1.87%	S&P 500 21.04%	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 1.23%	S&P 500 Value 12.73%	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 -2.55%	Bloomberg Barclays High Yield 2.39%	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 -6.45%	Bloomberg Barclays Agg -0.83%	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 Emerging Markets -25.34%	Russell 2000 Value -1.49%	MSCI Emerging Markets -30.71%	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%

Active vs. Passive Debate Continues

Correlations within Markets Reaching Lows

Correlation of S&P 500 Stocks



Lower cross sectional correlations, coupled with monetary and fiscal tightening, seems to have created a better environment for active managers

The Capital Markets at January 2018

U.S. and Global Capital Markets Rallied After Mid-Year Investor Uncertainty

Stock and bond markets enjoyed a solid year around the world, with particularly strong results in emerging markets equity. Underlying economic data remain positive, and tell a story of persistent growth in the U.S. and continued modest recovery in Europe.

Five-year US equity returns through 2017 are very strong. Ten-year returns no longer include the robust 2003-05 results. Fifteen-year equity returns are now close to long-run averages, and are above those of fixed income, as 2000-2002 downturn has rolled off the calculation.

- Private equity data is time-weighted return series for 1, 5, 10 and 15-year periods ended 6.30.2017 rather than 12.31.2017 in select columns due to a reporting lag.

							Average Annual Returns for periods ended 12.31.2017		
	2012	2013	2014	2015	2016	2017	5 Years	10 Years	15 Years
Broad U.S. Stock Market									
Russell 3000	16.42	33.55	12.56	0.48	12.74	21.13	15.58	8.60	10.25
Large Cap U.S. Stocks									
S&P 500	16.00	32.39	13.69	1.38	11.96	21.83	15.79	8.50	9.92
Small Cap U.S. Stocks									
Russell 2000	16.35	38.82	4.89	-4.41	21.31	14.65	14.12	8.71	11.17
Non-U.S. Stock Markets									
MSCI EAFE US$	17.32	22.78	-4.90	-0.81	1.00	25.03	7.90	1.94	8.11
MSCI Emerging Markets	18.63	-2.27	-1.82	-14.60	11.60	37.75	4.73	2.02	12.68
Fixed Income									
Barclays Aggregate	4.21	-2.02	5.97	0.55	2.65	3.54	2.10	4.01	4.15
Barclays Glbl Agg ex USD	4.09	-3.08	-3.09	-6.02	1.49	10.51	-0.20	2.40	4.25
Barclays Long Gov/Credit	8.78	-8.83	19.31	-3.30	6.67	10.71	4.43	7.26	6.77
Real Estate									
NCREIF	10.54	10.98	11.82	13.33	7.97	6.85	10.16	6.07	9.01
Hedge Funds									
CS Hedge Fund Index	7.67	9.73	4.13	-0.71	1.25	7.12	4.23	3.24	6.01
Private Equity									
Cambridge Private Equity*	13.54	21.02	11.80	8.66	9.26	15.76*	13.45*	8.85*	12.63*
Commodities									
Bloomberg Commodity	-1.06	-9.52	-17.01	-24.66	11.77	1.70	-8.45	-6.83	-0.27
Cash Market									
90-Day T-Bill	0.11	0.07	0.03	0.05	0.33	0.86	0.27	0.39	1.28
Inflation									
CPI-U	1.74	1.50	0.76	0.73	2.07	2.11	1.43	1.61	2.08

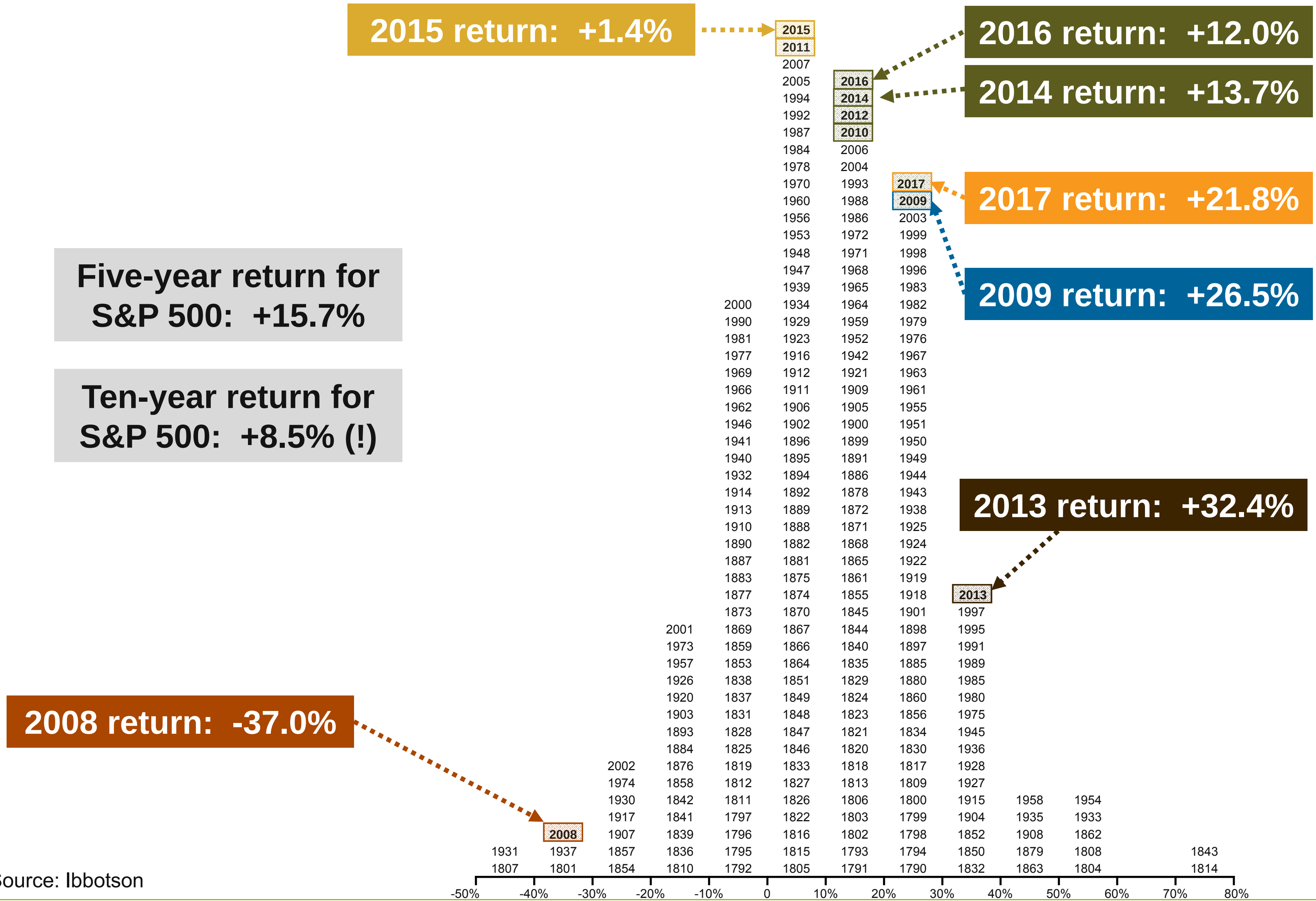
Source: Callan LLC

Stock Market Returns by Calendar Year

2017 Performance in Perspective: History of the U.S. Stock Market (229 Years of Returns)

Five-year return for S&P 500: +15.7%

Ten-year return for S&P 500: +8.5% (!)



Source: Ibbotson

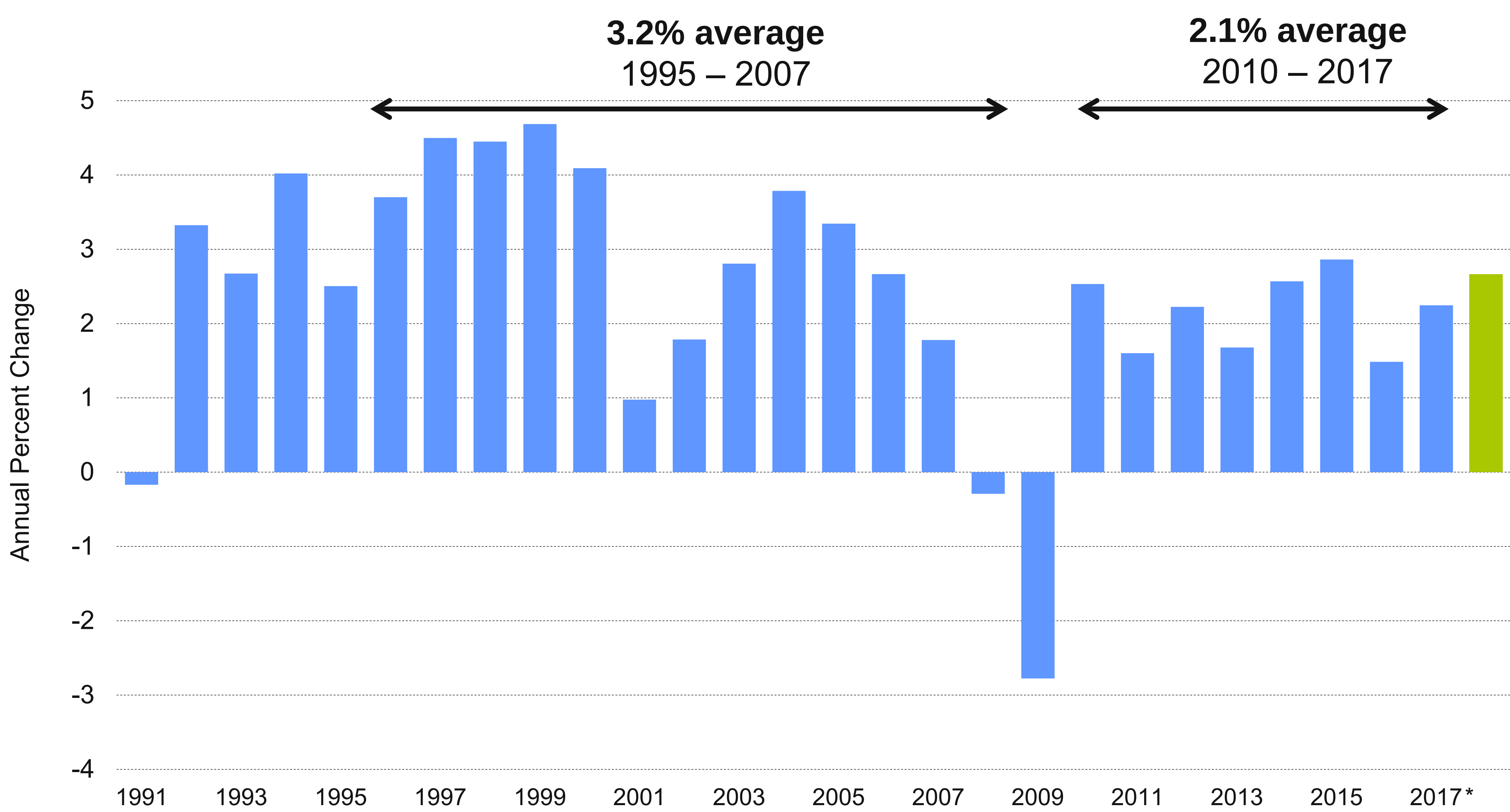
Economy Update Through December 2017

Modest Growth Continues in the US; Concerns Ease Elsewhere

- The US economy shows modest strength.
  - Real GDP grew in excess of 3% for the middle two quarters of 2017
    - *Well above the 10-year average of 1.4%*
    - *Higher than the 50-year average of 2.8%*
  - Job growth has been consistent and strong. Unemployment rate is down to 4.1%, well below any Fed target. Are we at full employment?
  - Consumer spending (70% of GDP) has been strong, driving GDP growth. However, inventories were built in anticipation of even stronger spending, which led to a weak start to 2016 and 2017.
- Modest recovery has taken shape in Europe in response to continued stimulus.
  - Progress a surprise in the face of refugee crisis, geopolitical change, fallout from Brexit.
- Fed has begun rate increases. Capital markets do not necessarily buy Fed's articulated pace of rate hikes: futures market predicts fewer hikes and a slower pace.
- Energy prices found a bottom, bringing inflation back to 2%.
- Uncertainty surrounding trade a major source of negative sentiment and market volatility.
  - Slowing growth in China, and context matters: China is now the second largest economy, slowing growth means dropping below 7%.
  - US economic exposure to China is relatively small compared to Europe and emerging markets.
  - Future of NAFTA, protectionist policies on the agenda for 2018

U.S GDP Growth on a Slower Trajectory

Real GDP Growth

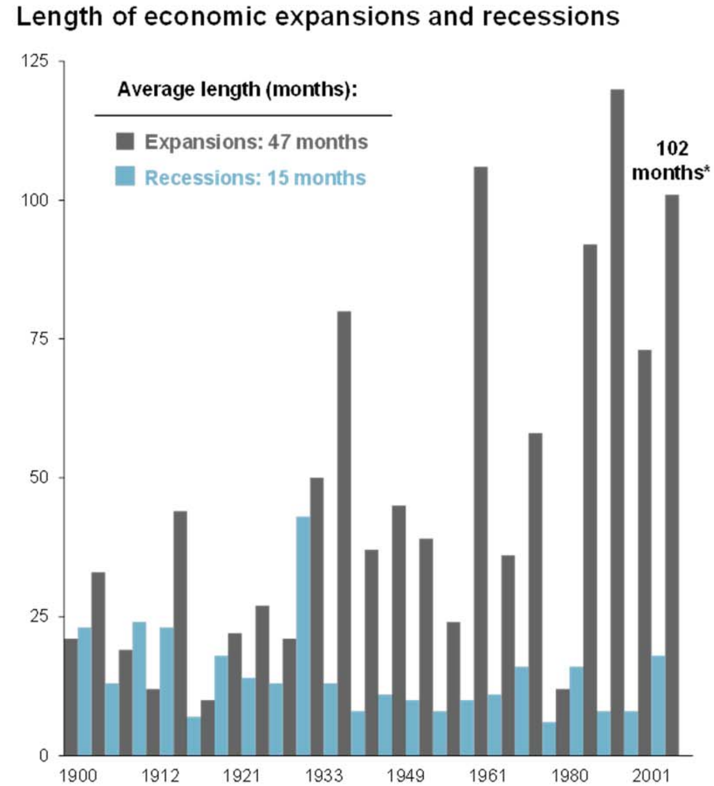


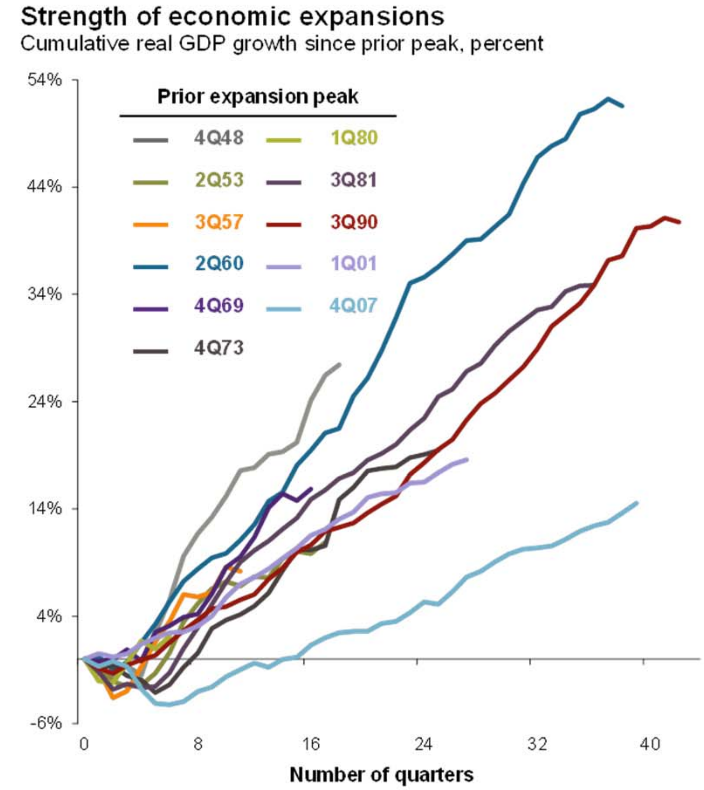
* 2018 forecast – IHS Markit
Source: IHS

Expansion is Re-energized by “Animal Spirits”

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 one of the longest, but also one of the slowest, averaging GDP growth in the U.S. of just 2.2%.
- Inverted yield curves suggest the onset of recession. The yield curve has flattened but is nowhere near inverted.



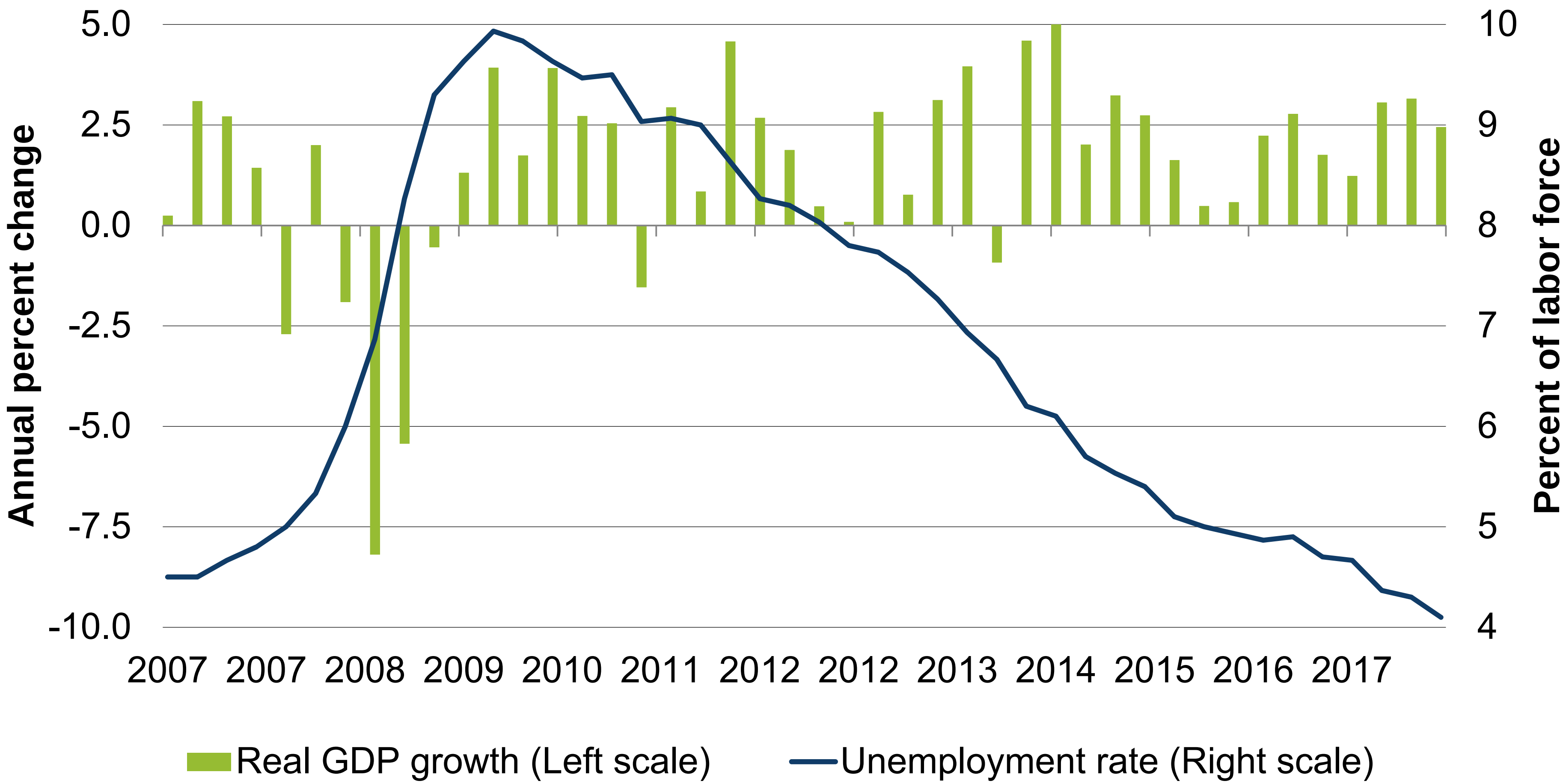


Source: BEA, NBER, J.P. Morgan Asset Management. *Chart assumes current expansion started in July 2009 and continued through December 2017, lasting 102 months so far. Data for length of economic expansions and recessions obtained from the National Bureau of Economic Research (NBER). These data can be found at www.nber.org/cycles/ and reflect information through December 2017. Past performance is not a reliable indicator of current and future results.
Guide to the Markets – U.S. Data are as of December 31, 2017.

Source: J.P. Morgan Asset Management.

Unemployment Declined Even With Modest GDP Growth

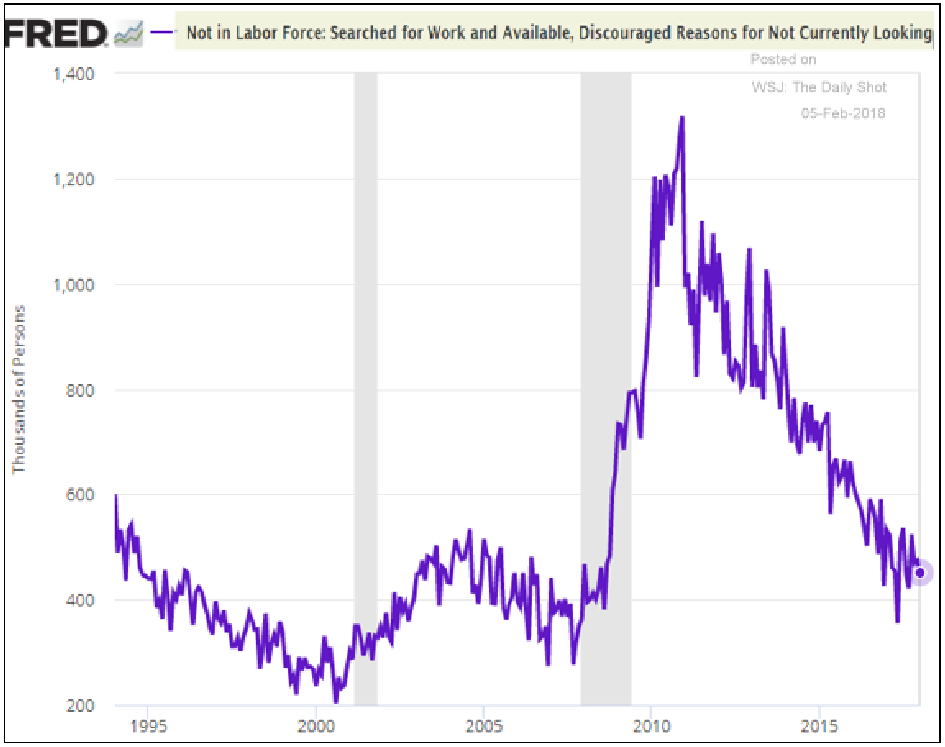
Rate Now Well Below Fed Target – A Full Employment?

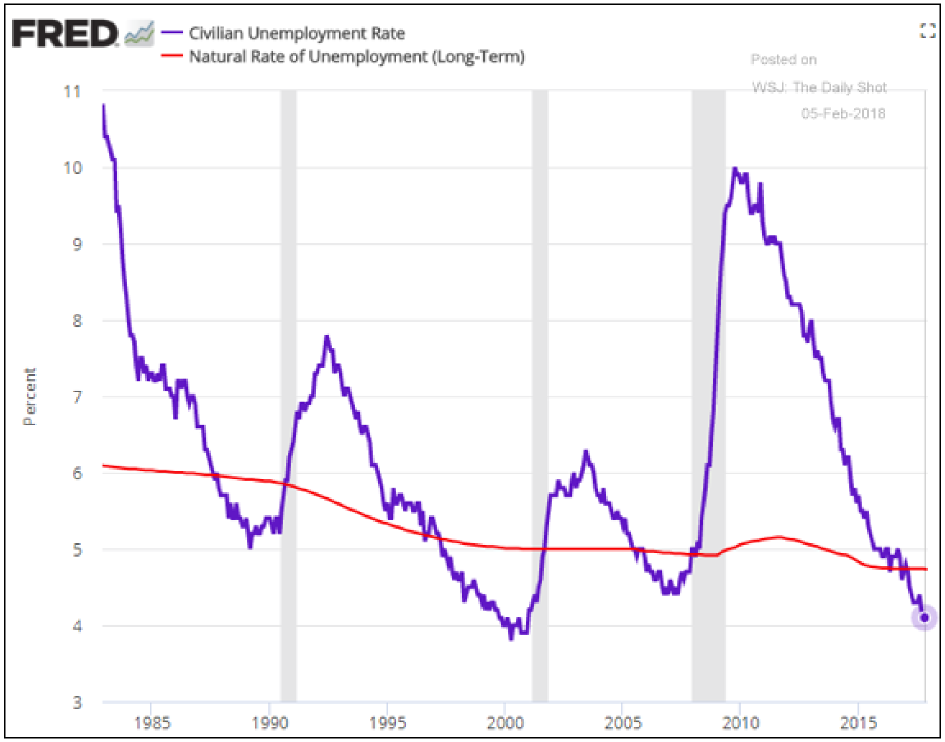


Source: Bureau of Labor Statistics, National Income and Product Accounts, and Callan

Will Inflation Catch Fire? The Job Market Squeeze on Policy

10 years of Persistent Monetary and Fiscal Stimulus Might Just Catch Up to Global Growth





- The U.S. unemployment rate is reaching a generational low, could drop below 4% soon.

- Discouraged worker effect has been pervasive since the Global Financial Crisis.
- Gradual, persistent growth has finally coaxed workers back from the sidelines, shrinking the slack in the job market.

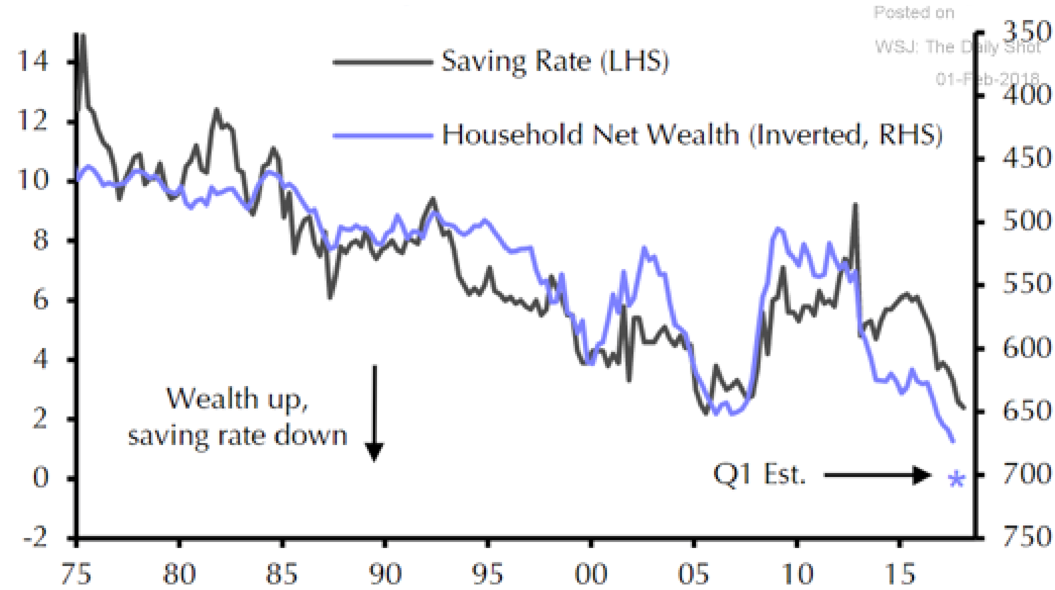
Source: Wall Street Journal

Are Consumers Tapped Out Yet?

Consumption is 2/3 of GDP, and the Sector Typically Leads Growth (and Contractions)

- The U.S. savings rate has fallen to its lowest level in a decade.
- Household net worth (inverted right scale) is setting new records.
- From Capital Economics: "The savings rate is at a decade low because the household net wealth is at a record high. This situation is sustainable IF housing and equity valuations don't fall."
- That remains a big IF…

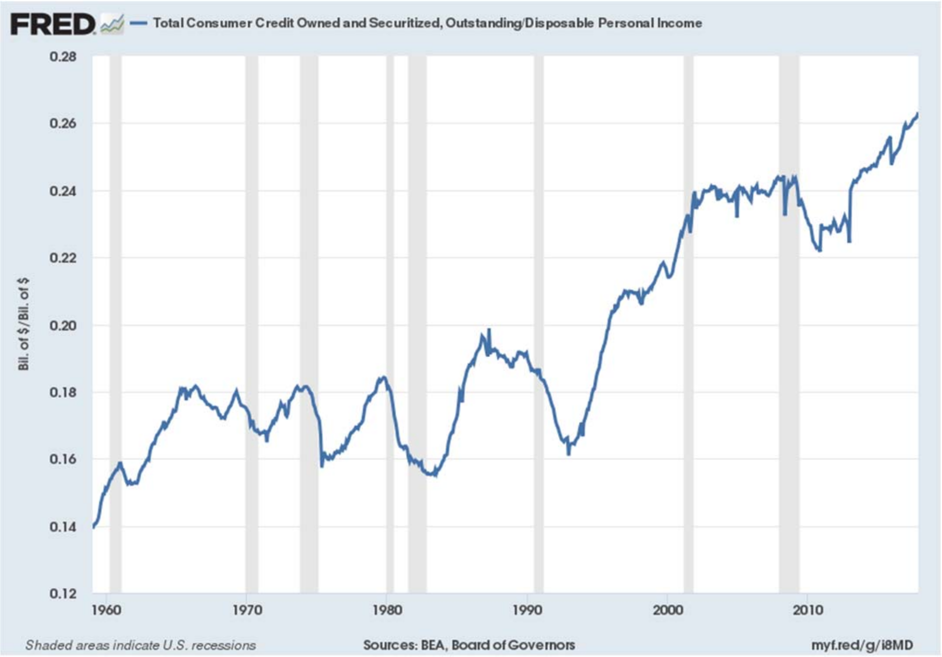
Household Saving & Net Wealth (as % of Disp. Inc)

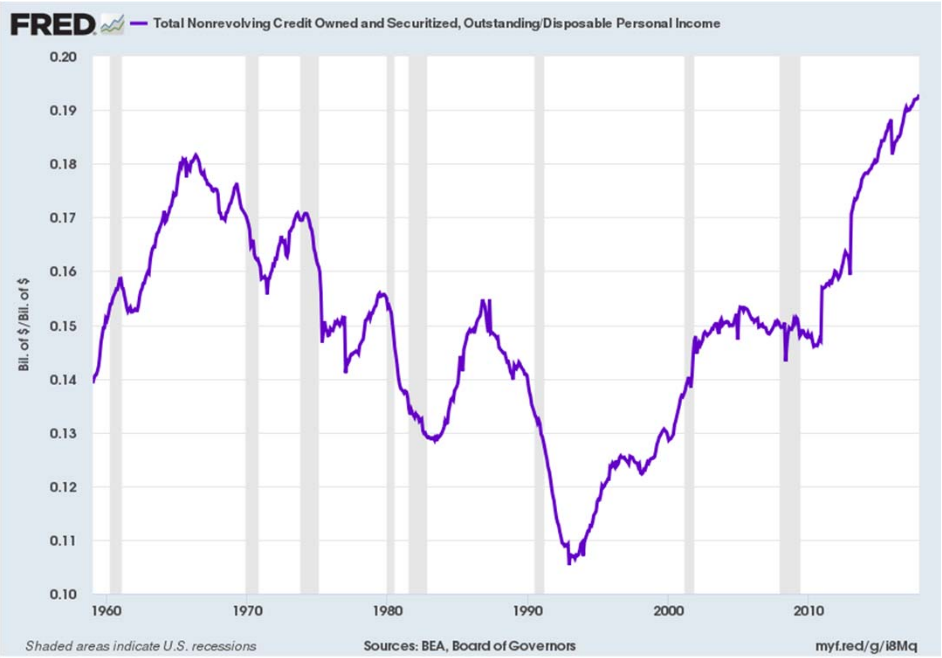


Source: Wall Street Journal

Consumer Borrowing Reaching New Heights

Leverage Clearly Fueling Consumption Growth, Suggests Vulnerability to Deleveraging



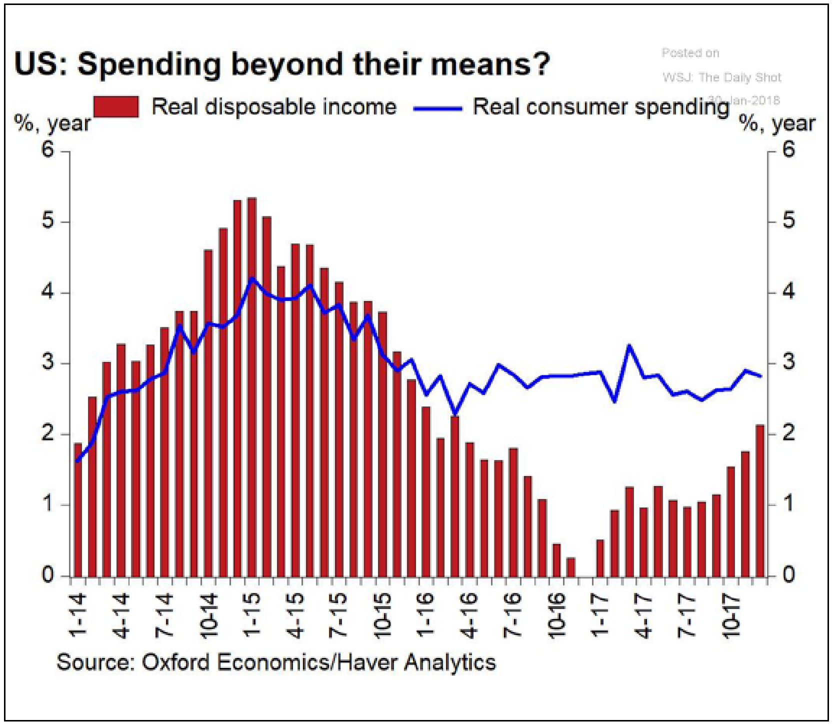


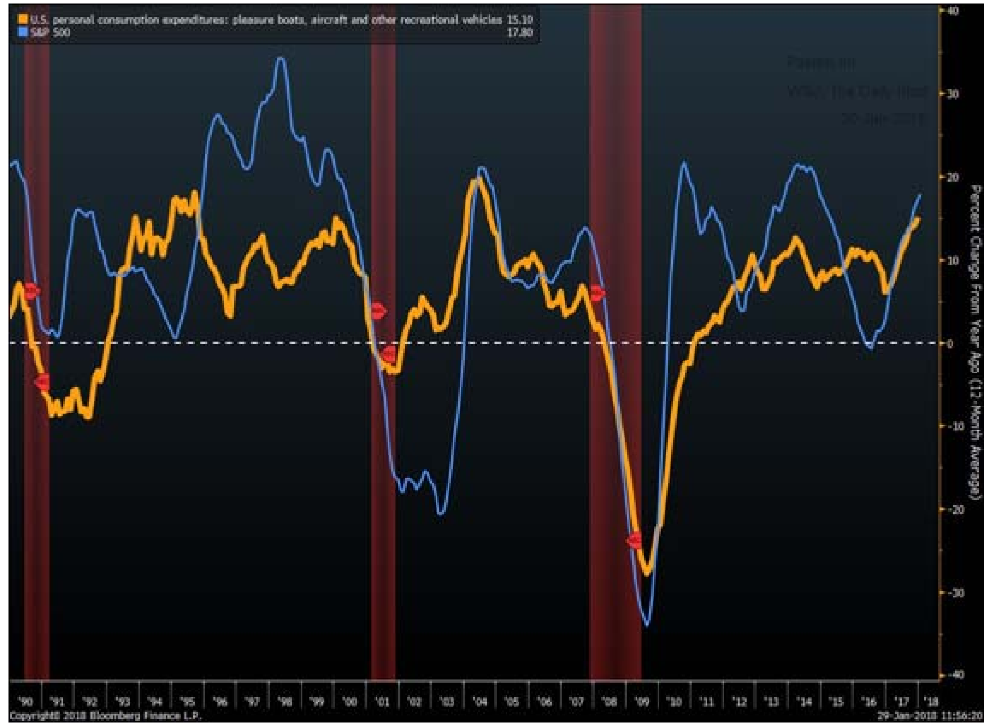
- Consumer credit (ex-mortgages) as a percentage of disposable income keeps climbing above the pre-GFC peak.
- The increase stems from non-revolving debt, mostly student and auto loans.

Source: Federal Reserve

Consumer Spending May be Entering Bubbly Territory

Spending May Be Getting Ahead of Means





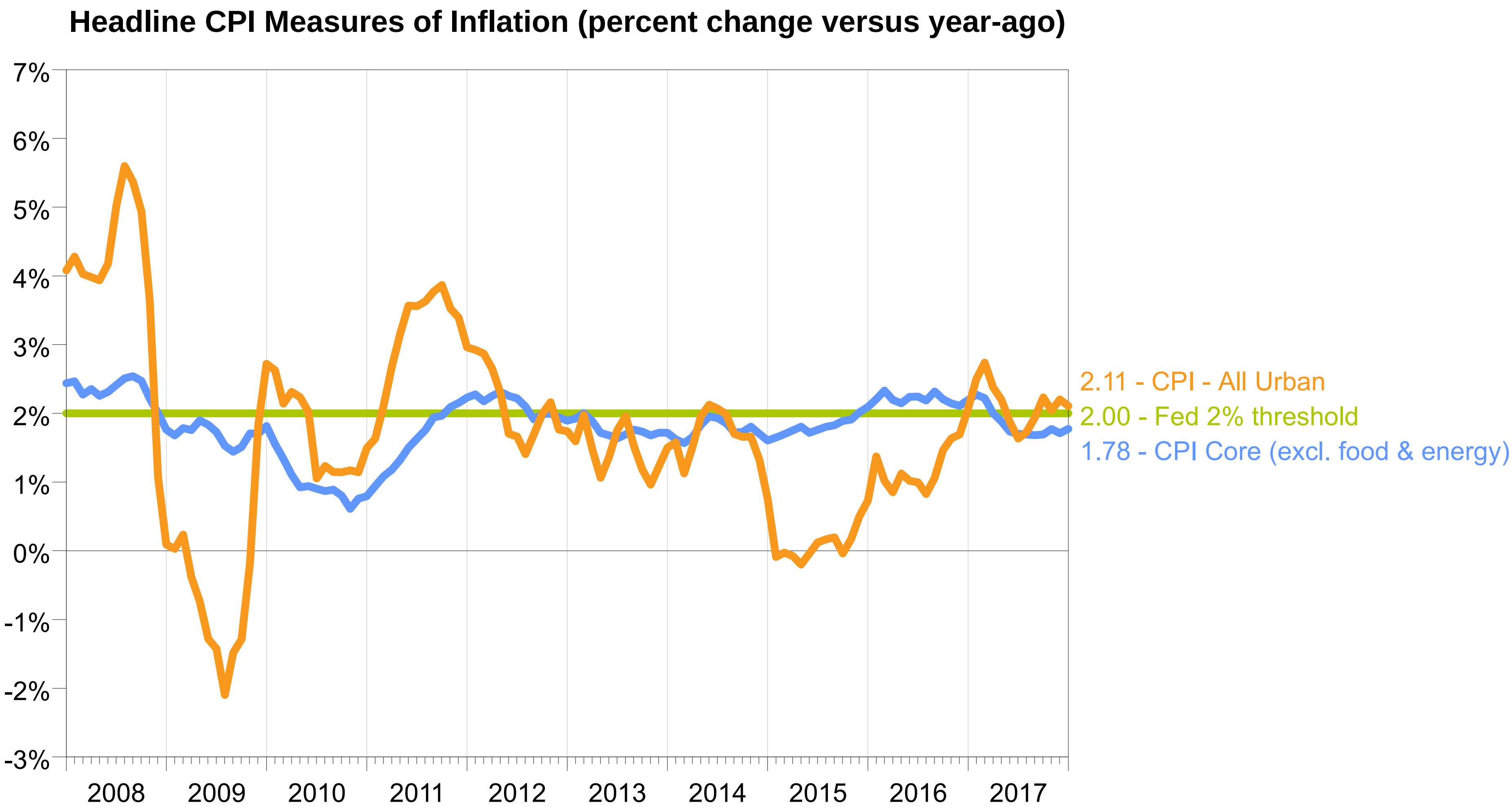
- Real consumer spending is growing much faster than real income after taxes.

- Spending on pleasure boats, aircraft and other recreational vehicles is rising at the fastest pace since 2005. Signs of the wealth effect from the bull stock market?

Source: Wall Street Journal

Inflation Concerns Revive

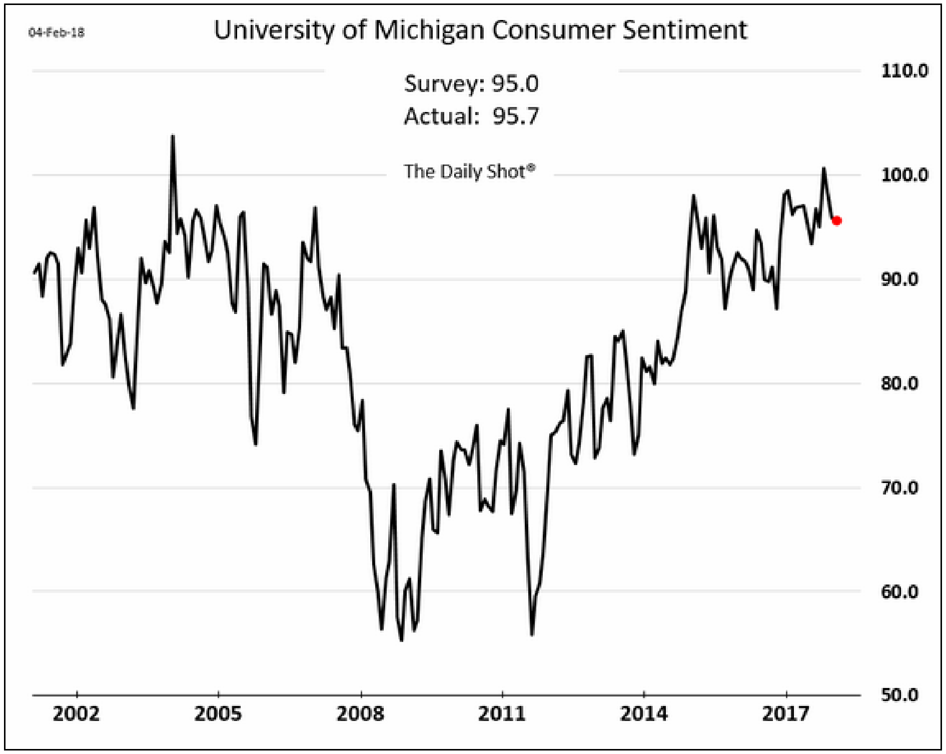
CPI Finally Rebounded From Collapse in Oil Prices

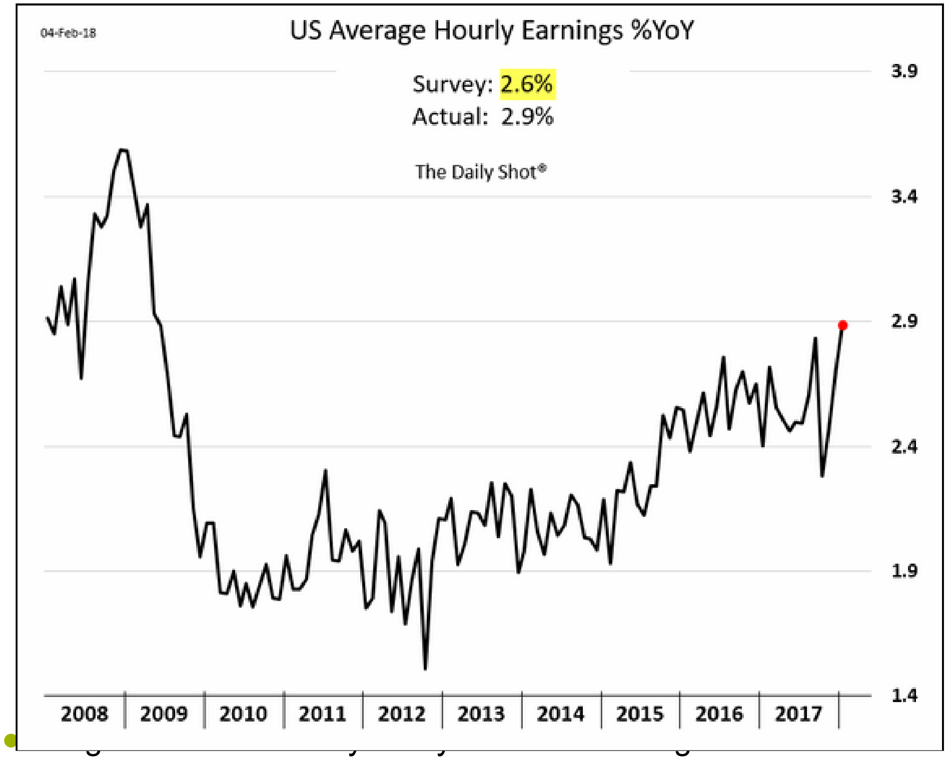


Source: Bureau of Labor Statistics and Callan

Job Market and Wage Growth Support Euphoric Sentiment

Wage Growth Joins Job Growth in Fueling Consumer Confidence





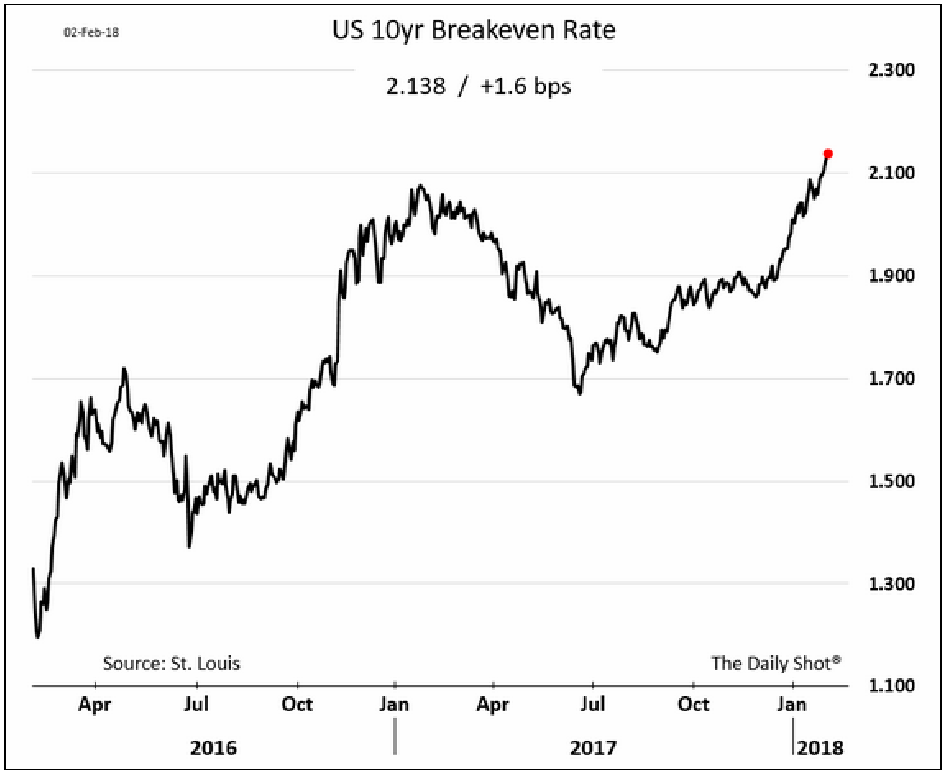
- Sentiment is high and rising, at or above levels prior to the GFC.

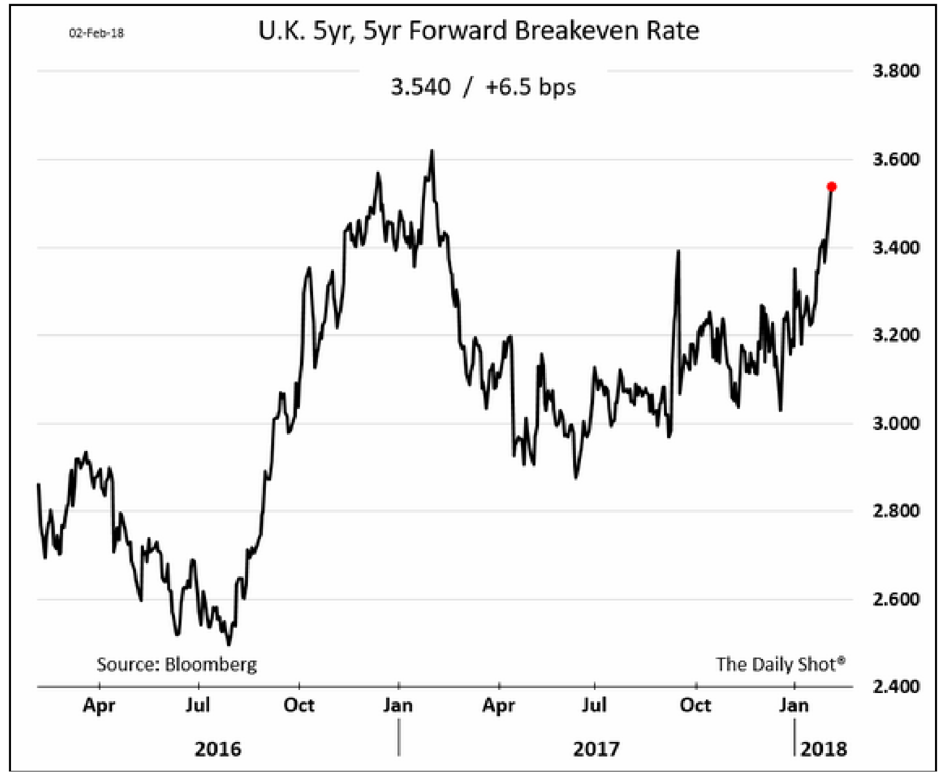
- growth. Tight labor markets might finally be pushing up wages. Good for workers and consumer spending.
- Tax cut may also flow to owners and wage earners, fueling further inflationary pressures.
- Such pressure has yet to show up in headline inflation or the PCE deflator (GDP inflation watched closely by the Fed

Source: Wall Street Journal

Broad Based Inflation Measures Still Benign in the U.S.

Expectations Are Higher, But Still Low Relative to Long-term History





- U.S. Inflation expectations as expressed by the break-even rate (TIPS vs Nominal Treasury yields) move higher, but have just cracked 2% as the year begins.
- 5-year forward rates suggest surprisingly higher inflation expectations in the U.K., spurred by uncertainty surrounding the fallout from Brexit.

Source: Wall Street Journal

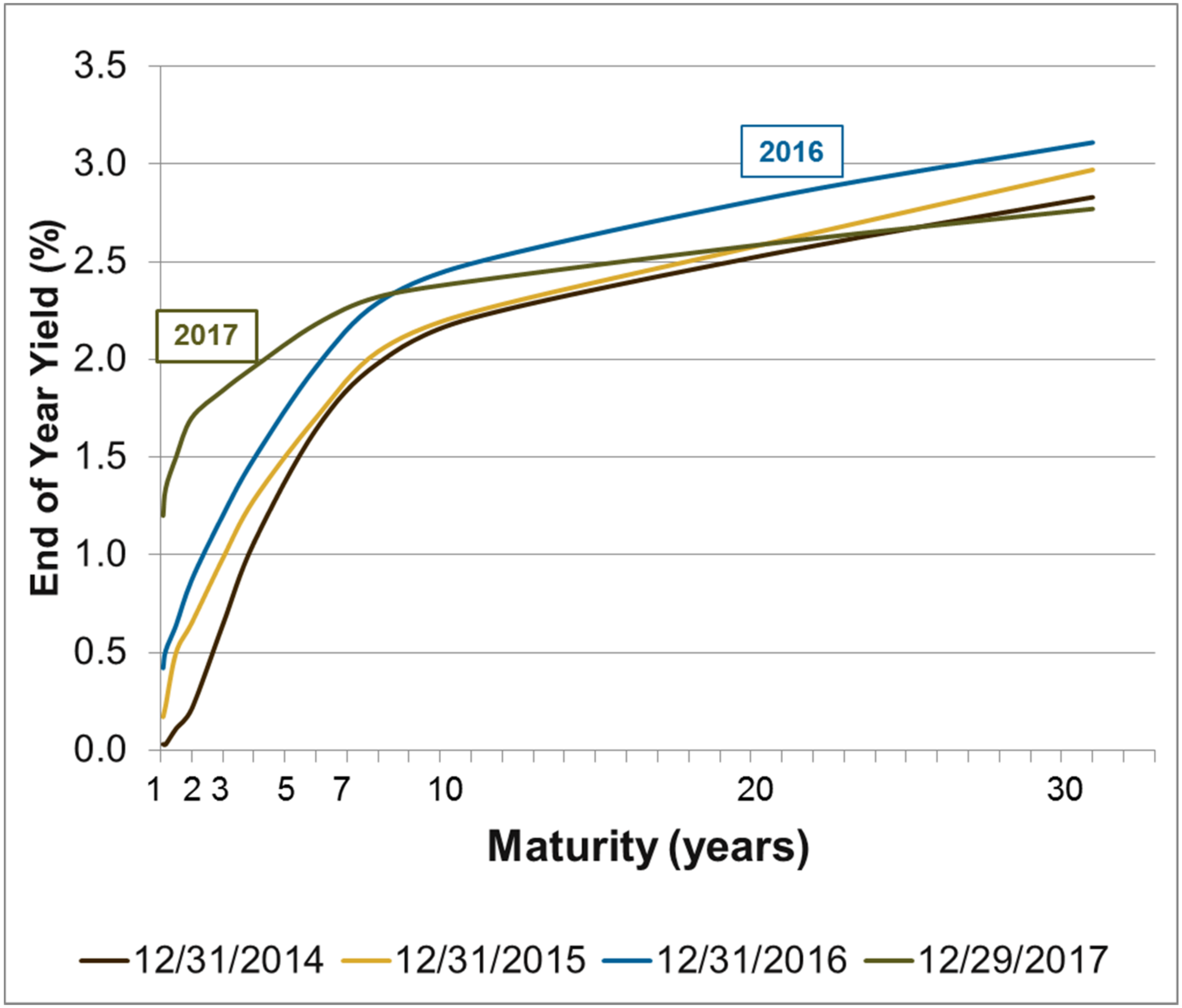
Treasury Rates at the End of 2017

Interest Rates, Historical US Treasury Yield Curves

The US Treasury yield curve flattened between the end of 2016 and the end of 2017

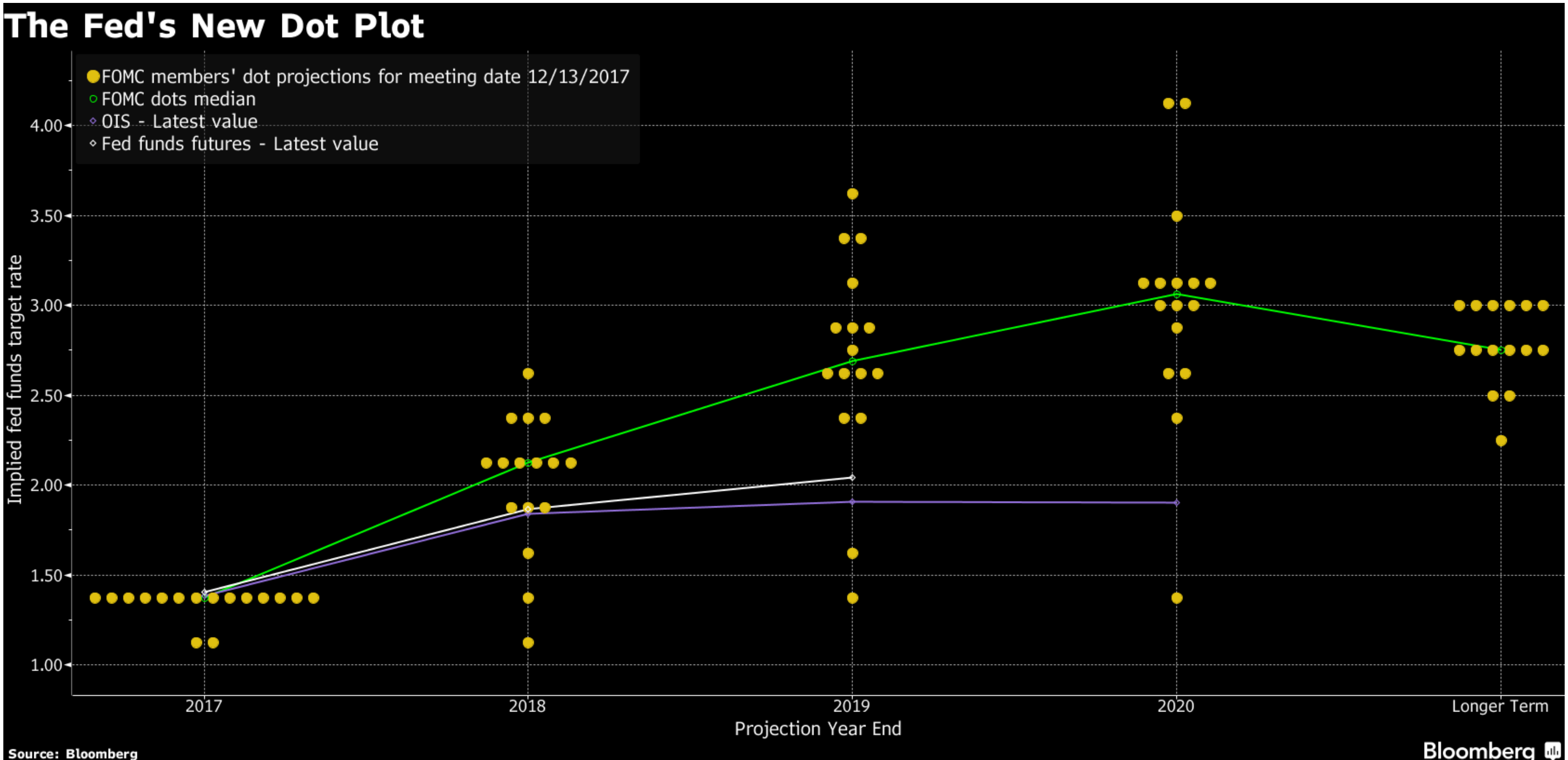
The short end rose in concert with increases in the Fed Funds rate

Yields on the long end declined with the 30 year yield falling from about 3.1% to just over 2.75%



Market Watches the Fed, But Doesn’t Believe It

Futures Market Discounts FOMC Projections of Future Fed Funds Target



Green line – median of the FOMC projections at December 2017

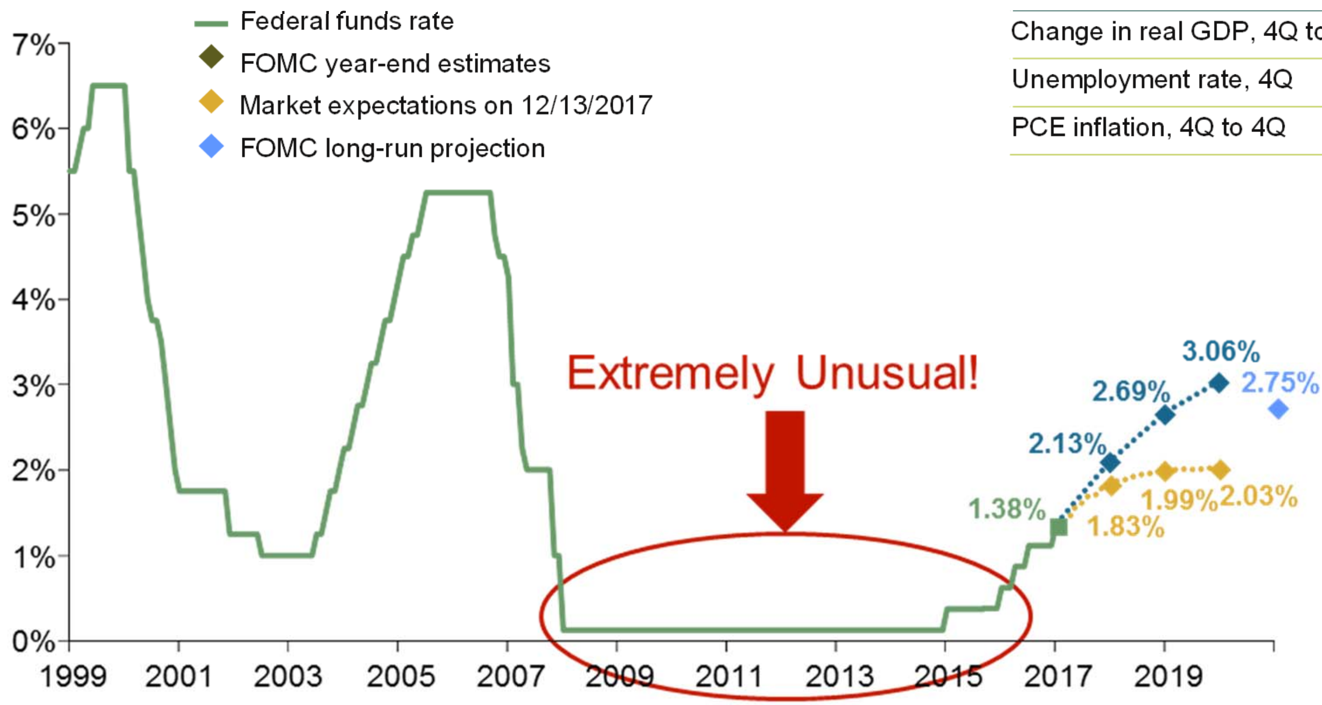
Grey line = Fed Fund futures; futures market does not believe we will be anywhere near the median of the Fed dot plots in 2019.

Unprecedented Policy Response Finally Over?

Fed Moves Toward Normalization With Three Rate Hikes in 2017

Federal funds rate expectations

FOMC and market expectations for the fed funds rate



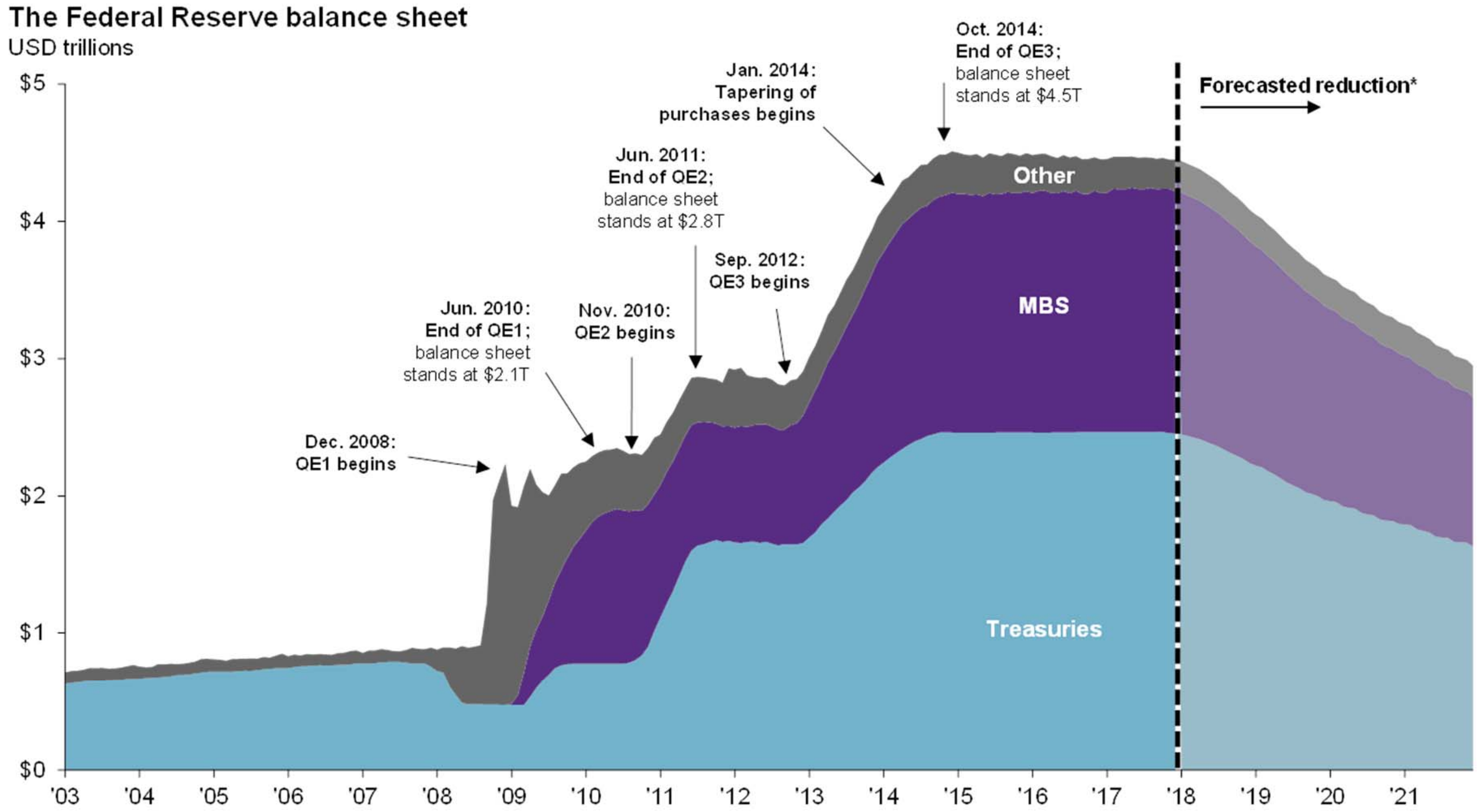
FOMC December 2017 forecasts (percent)

	2017	2018	2019	2020	Long run
Change in real GDP, 4Q to 4Q	2.5	2.5	2.1	2.0	1.8
Unemployment rate, 4Q	4.1	3.9	3.9	4.0	4.6
PCE inflation, 4Q to 4Q	1.7	1.9	2.0	2.0	2.0

Sources: FactSet, Federal Reserve, Bloomberg, J.P. Morgan Asset Management's *Guide to the Markets* (as of 12/31/17).
Market expectations are the federal funds rates priced into the fed futures market as of the December 2017 FOMC meeting

New Term to Enter the Lexicon – Quantitative Tightening (QT)

Fed to Reduce Its Balance Sheet, Suggesting Debt Sales and Upward Pressure on Rates



Source: Federal Reserve, FactSet, J.P. Morgan Asset Management.
Currently, the balance sheet contains $2.5 trillion in Treasuries and $1.8 trillion in MBS. The end balance forecast is $1.6 trillion in Treasuries and $1 trillion in MBS. *Balance sheet reduction assumes reduction from current level, beginning October 2017 until December 2021. Reduction of Treasuries and MBS is per FOMC guidelines from the September 2017 meeting minutes: the cap on Treasury securities will begin at $6 billion per month initially and reduction rate will increase in steps of $6 billion at three-month intervals over 12 months until reaching $30 billion per month; the MBS cap will begin at $4 billion per month initially and will increase in steps of $4 billion at three-month intervals over 12 months until reaching $20 billion per month; Other assets are reduced in proportion. In those months where the amount of maturing assets do not exceed the stated cap then the balance sheet will be reduced by the total amount of maturing assets.
Guide to the Markets – U.S. Data are as of December 31, 2017.

Source: J.P. Morgan Asset Management.

Economic Outlook

Economic Outlook

GDP Growth Forecasts

2% to 2.5% for the US

- Forecast stakes out a middle ground, lower than the last half century average but higher than the Fed's longer run growth estimate
- Factors which could lead to upper end of forecast
  - Strong labor market
  - Consumer spending on services rebounds to levels at or above its historical average
  - Tax and regulatory environment spur further increases in business investment as well as consumer spending
- Factors which could lead to lower end of forecast
  - Consumers cut spending on durable goods, causing businesses to curtail their investment spending
  - Higher mortgage rates limit private domestic residential investment
  - Unexpected rise in inflation leads to unexpected faster increase in interest rates

1.5% to 2.0% for Developed Non-US Markets

- Lower than the US due to concerns about political, fiscal and monetary policy as well as the banking system
  - Real growth rates improved through 2017
  - Employment picture is brightening
  - Threat of political instability has subsided
- Factors which could lead to the higher end of the forecast
  - More consumer and governmental spending in Germany
  - Clearer path to Brexit
- Factors which could lead to the lower end of the forecast
  - ECB tightening
  - Stubbornly high unemployment

Economic Outlook

GDP Growth Forecasts

4% to 5% for Emerging Markets

- Actual growth rate depends heavily on performance of China and India
  - Absolute of China and India limits growth to below recent historical values
- Growth rates still substantially exceed those of the developed markets
- Smaller economies need to grow at least at the rates of developed markets

Factors which could lead to the higher end of the forecast

- Demand for exports of consumer products and natural resources remains high
- Unemployment falls at a faster rate than forecast

Factors which could lead to the lower end of the forecast

- Political uncertainty
- Difficulties in the private borrowing markets
- Global growth fades

Economic Outlook

Inflation Forecasts

2% to 2.5% for the US

- Headline CPI-U growth accelerated in 2016 but drifted down to near 2% in 2017
- Core CPI dropped below 2% early in 2017 and has remained there
- PCE growth touched 2% but subsided as the year progressed
- Oil prices could have a transient impact if they rise moderately
- Real employment compensation growth appears anchored at low levels
- Factors which could lead to significant deviations from the forecast
  - Sustained changes in energy prices that pass through to prices of finished goods
  - Variations in employment compensation expectations
  - Significant changes in the value of the dollar

1.75% to 2.25% for Developed Non-US Markets

- Inflation is starting to tick up but is very low in largest economies
- Factors which could lead to upper end of forecast
  - The ECB or the BoJ raise interest rates too slowly
  - Increases in energy prices
  - Improving labor markets lead to wage inflation
- Factors which could lead to lower end of forecast
  - High levels of government debt constrain necessary fiscal stimulus
  - Unemployment does not improve as expected

Economic Outlook

Inflation Forecasts

2.5% to 3.5% for Emerging Markets

- Future inflation is uncertain
- Path of prices depends on government policies, relative currency strength, trade policies, the balance of internal supply and demand, and commodity prices

Asset Class Outlook

Equity Forecasts

Overview

Fundamental Relationship

Equity Return = Capital Appreciation + Income

Forecast capital appreciation depends on projected future earnings

- Long-term earnings tend to correspond to long-term GDP growth
  - Weak short-term relationship
  - Relationship more robust in developed than emerging markets economies
- Investors will pay more for stocks with better future earnings potential
  - Prices don’t depend on historical or current earnings

Forecast income also depends on projected future earnings

- Income is related to earnings via the payout ratio
- Income also influenced by
  - Prospects for future corporate investments
  - Interest rates

Valuations have limited impact on forecasts

- Average P/Es over different market cycles differ markedly
  - Oil Boycott
  - Tech Bubble
  - Global Financial Crisis
- Capital market projections only impacted when markets reach extreme valuations

Equity Forecasts

Broad US Equity

Return = 6.85%, Risk = 18.25%

Broad US equity is represented by the Russell 3000 index

Earnings growth must continue to keep pace with returns

- Short-term measures of valuations are above average but not at extremes
  - Strong earnings growth in excess of returns could reduce valuations without a significant market correction
- Longer-term valuation measure provides imprecise forecasts
- Large cap earnings growth anticipated to modestly outpace GDP growth
- Small cap earnings growth should grow faster than large cap
- US consumers have to continue to buy in the face of limited wage growth
- Firms need to continue to invest to improve productivity and profits

Dividend yield consistent with recent history

- Growth in dividends likely to continue at current pace while returns moderate leading to modestly higher yields
- Dividend growth may suffer if firms focus on investment but additional investment will improve expected capital appreciation
- Yields have been stable for 20 years in the face of changing interest rates so higher rates are unlikely to have a large impact

Inflation is added to earnings growth and dividend yield to get the nominal return

Equity Forecasts

Global ex US Equity

Return = 7.00%, Risk = 21.00%

Global ex US equity is represented by the MSCI All-Country World ex USA index

Earnings growth likely to be moderate

- Earnings expected to be at the top end of GDP growth for developed markets
- Emerging markets earnings growth is expected to modestly lag GDP growth consistent with history
- Improving projections for GDP growth support earnings in developed markets
  - ECB and BoJ likely to err on the side of maintaining looser monetary policy which will support economic growth and earnings
- Valuations above average but not substantially so in both developed and emerging markets
- Moderate uncertainty remains for future political and economic policies

Relatively high dividend yields will support returns

- Developed markets yields are expected to recover to average levels of ~3%
- Dividend yields for emerging markets expected to at least move toward historical average of about 2.5%

Fixed Income Forecasts

Overview

Fundamental Relationship

Bond Return = Capital Appreciation + Income + Roll Return

Forecast capital appreciation depends on projected future interest rates

- Inflation
- Central bank policy
- Credit conditions

Income = yield

Roll return reflects capital appreciation from declines in yields as bonds move toward maturity with upward sloping yield curves

Fixed Income Forecasts

Broad US Fixed Income

Return = 3.00%, Risk = 3.75%

Broad US fixed income is represented by the Bloomberg Barclays Aggregate index

Higher starting yields for intermediate fixed income offset by a small negative from changing credit spreads leaves forecasted returns unchanged from last year

Interest rates expected to rise

- Yield to worst has been stable for 3 years maintaining the starting point for the forecast
- Most of the increase is expected over the next 3 years
- Our path is consistent with that forecast by the Fed

Capital losses expected as yields increase in early years

- Losses consistent with moderate duration
  - Historically about 5 but currently closer to 6

Higher yields expected to be earned over most of the forecast horizon

Alternative Investment Forecasts

Hedge Funds

Return = 5.05%, Risk = 9.15%

Hedge funds are represented by the Callan Hedge Fund of Funds database

Hedge fund returns will be supported by increasing interest rates

- Hedge fund returns consist of cash plus a spread
- 2.25% cash forecast

Hedge funds overall tend to have an equity beta

- Beta tends to be about 0.4
- Return expected between that of stocks and bonds; benefit to hedge fund investing derives from potential for diversification to stocks and bonds

Hedge funds earn risk premia

- Exotic beta
- Illiquidity

Forecast does not include a net active management premium beyond beta and illiquidity

- Broad spectrum of possible returns
- Represents an average expectation for return across the universe
- Skillful managers expected to earn net excess returns

Alternative Investment Forecasts

Real Estate

Return = 5.75%, Risk = 16.35%

Real estate is represented by the Callan Real Estate database

Real estate returns reflect decreases in cap rates

- Cap rates continued to declined in 2017
- Spread between cap rates and bonds has compressed making real estate relatively less attractive
- Demand remains high as equity gains rebalanced into real estate

Overall real estate tends to have an equity beta

- Stylized beta tends to be about 0.75
- Reduced equity projections weigh on real estate return

Risk reflects economic realities rather than volatility observed under normal conditions

- Observed volatility is generally less than 5% in normal markets
- Our forecast volatility better represents the risk of loss
  - Assuming a 3% standard deviation would imply that the real estate loss experienced during the financial crisis was a 10+ standard deviation event

Alternative Investment Forecasts

Private Equity

Return = 7.35%, Risk = 32.90%

Private equity is represented by the Cambridge Private Equity index

Private equity forecasts related to public equity forecasts

- Both returns driven by similar economic factors
  - Risk premia for both should rise and fall together
- Public equity markets are often the exit strategy for private equity investments
  - Less attractive public markets reduce the outlook for private equity
- The compound return reflects heightened risk
  - In any single period the private equity forecast has a 4.15% spread over the US public equity forecast

Wide range of results across implementations

- The best managers far outperform the worst managers in any given period
- Superior managers could substantially outperform our projected return

Risk reflects economic realities rather than volatility observed under normal conditions

- Observed volatility is generally less than that of the S&P 500
- Variations in investment values can't be observed since private equity is not frequently priced in public markets
- Our forecast volatility puts private equity on the security market line

2018 Capital Market Expectations—Return and Risk

Summary of Callan's Long-Term Capital Market Projections (2018 – 2027)

Asset Class	Index	PROJECTED RETURN 1-Year Arithmetic	PROJECTED RETURN 10-Year Geometric*	PROJECTED RETURN Real	PROJECTED RISK Standard Deviation	Sharpe Ratio	Projected Yield
Equities							
Broad Domestic Equity	Russell 3000	8.30%	6.85%	4.60%	18.25%	0.332	2.00%
Large Cap	S&P 500	8.05%	6.75%	4.50%	17.40%	0.333	2.10%
Small/Mid Cap	Russell 2500	9.30%	7.00%	4.75%	22.60%	0.312	1.55%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.95%	7.00%	4.75%	21.00%	0.319	3.10%
International Equity	MSCI World ex USA	8.45%	6.75%	4.50%	19.70%	0.315	3.25%
Emerging Markets Equity	MSCI Emerging Markets	10.50%	7.00%	4.75%	27.45%	0.301	2.65%
Fixed Income							
Short Duration	Barclays G/C 1-3	2.60%	2.60%	0.35%	2.10%	0.167	2.85%
Domestic Fixed	Barclays Aggregate	3.05%	3.00%	0.75%	3.75%	0.213	3.50%
Long Duration	Barclays Long G/C	3.50%	3.00%	0.75%	10.95%	0.116	4.45%
TIPS	Barclays TIPS	3.10%	3.00%	0.75%	5.25%	0.162	3.35%
High Yield	Barclays High Yield	5.20%	4.75%	2.50%	10.35%	0.285	7.75%
Non-U.S. Fixed	Barclays Global Aggregate ex US	1.80%	1.40%	-0.85%	9.20%	-0.049	2.50%
Emerging Market Debt	EMBI Global Diversified	4.85%	4.50%	2.25%	9.60%	0.271	5.75%
Other							
Real Estate	Callan Real Estate	6.90%	5.75%	3.50%	16.35%	0.284	4.75%
Private Equity	TR Post Venture Cap	12.45%	7.35%	5.10%	32.90%	0.310	0.00%
Hedge Funds	Callan Hedge FOF Database	5.35%	5.05%	2.80%	9.15%	0.339	2.25%
Commodities	Bloomberg Commodity	4.25%	2.65%	0.40%	18.30%	0.109	2.25%
Cash Equivalents	90-Day T-Bill	2.25%	2.25%	0.00%	0.90%	0.000	2.25%
Inflation	CPI-U		2.25%		1.50%		

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

Source: Callan LLC

2018 Capital Market Expectations—Correlation Coefficient Matrix

Key to Constructing Efficient Portfolios

	Broad US Eq	Large Cap	Sm/Mid Cap	Global ex-US	Non-US Equity	Em Mkt Eq	Sht Dur	US Fixed	Long Duration	TIPS	High Yield	Non-US Fixed	Em Mkt Debt	Real Estate	Private Equity	Hedge Funds	Comm	Cash Equiv	Inflation
Broad US Equity	1.000																		
Large Cap	0.996	1.000																	
Small/Mid Cap	0.966	0.940	1.000																
Global ex-US Equity	0.874	0.872	0.839	1.000															
Non-US Equity	0.840	0.840	0.800	0.987	1.000														
Em Mkts Equity	0.866	0.860	0.845	0.936	0.865	1.000													
Short Duration	-0.250	-0.240	-0.270	-0.271	-0.250	-0.290	1.000												
US Fixed	-0.110	-0.100	-0.135	-0.130	-0.115	-0.160	0.870	1.000											
Long Duration	0.109	0.112	0.096	0.080	0.094	0.043	0.739	0.930	1.000										
TIPS	-0.054	-0.045	-0.080	-0.049	-0.030	-0.085	0.525	0.600	0.532	1.000									
High Yield	0.636	0.635	0.610	0.627	0.605	0.615	-0.140	0.020	0.190	0.060	1.000								
Non-US Fixed	0.013	0.050	-0.100	0.013	0.060	-0.090	0.480	0.510	0.539	0.340	0.120	1.000							
Em Mkt Debt	0.573	0.570	0.555	0.577	0.550	0.580	-0.040	0.100	0.143	0.180	0.600	0.010	1.000						
Real Estate	0.732	0.730	0.705	0.677	0.660	0.650	-0.165	-0.030	0.168	0.000	0.560	-0.050	0.440	1.000					
Private Equity	0.948	0.945	0.915	0.927	0.895	0.910	-0.260	-0.200	-0.005	-0.110	0.640	-0.060	0.570	0.715	1.000				
Hedge Funds	0.802	0.800	0.770	0.760	0.730	0.755	-0.130	0.080	0.287	0.075	0.570	-0.080	0.540	0.605	0.780	1.000			
Commodities	0.152	0.150	0.150	0.161	0.155	0.160	-0.220	-0.100	-0.041	0.120	0.100	0.050	0.190	0.200	0.180	0.210	1.000		
Cash Equivalents	-0.043	-0.030	-0.080	-0.040	-0.010	-0.100	0.300	0.100	-0.041	0.070	-0.110	-0.090	-0.070	-0.060	0.000	-0.070	0.070	1.000	
Inflation	-0.010	-0.020	0.020	0.010	0.000	0.030	-0.200	-0.280	-0.288	0.180	0.070	-0.150	0.000	0.100	0.060	0.200	0.400	0.000	1.000

Relationships between asset classes is 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

2018 Capital Market Assumptions

Expected Return on Assets, Assuming Passive Implementation

Asset Classes	MCERA Target
US Broad Equity	38%
Global ex-US Equity	29%
Domestic Fixed	22%
Real Estate	11%
Cash Equivalents	0%
Totals	100%

Projected 1-Year Arithmetic Return	7.2%
10-Year Geometric Mean Return	6.4%
Projected Risk (Standard Deviation)	13.9%
Projected Sharpe Ratio	0.4

2018 Capital Market Expectations

Distribution of Projected Rates of Return

	1 Year	3 Years	5 Years	10 Years
Average	6.6%	6.5%	6.4%	6.4%
10th Percentile	28.0%	19.0%	14.8%	12.4%
25th Percentile	17.0%	12.5%	10.8%	9.5%
75th Percentile	(4.1%)	0.6%	2.3%	3.5%
90th Percentile	(11.4%)	(3.4%)	(1.8%)	0.7%

February 21, 2018

ESG Investing

Environmental
Social
Governance

Mark Wood, CFA
Global Manager Research

Greg DeForrest, CFA
Fund Sponsor Consulting

Discussion Outline

–

- **Introduction**
- **What is ESG? Defining ESG/SRI and Impact Investing**
- **Callan ESG Survey**
- **Investment Manager Activity**
- **ESG Research**
- **Closing Remarks**

Introduction and Opening Remarks

- "ESG" (Environmental, Social, Governance) is an umbrella term that encompasses a wide variety of investment strategies ranging from "exclusionary" to "impact," with many falling in between. Motivations range from ethics-based to financial, and methods of implementing are also diverse.
- ESG is rapidly evolving. We have observed regional differences in implementation and approaches in Europe, Asia, and the U.S. that reflect unique cultural, governmental, and political factors.
- Callan takes an informed, neutral approach to ESG investing. This is consistent with our general consulting philosophy: customized solutions are required to meet each client's unique perspective.
- In response to increased interest in this space, Callan has created an ESG Manager Research Team as well as ESG Committee comprised of professionals from Manager Research, Fund Sponsor Consulting, Database, Published Research, and the Independent Adviser Group.

Callan's ESG Committee

The ESG Committee meets regularly to discuss industry trends, create solutions to issues facing our clients, and develop research to bring transparency and insight to the rapidly changing ESG landscape.

Amit Bansal (20/20)
Kristin Bradbury (10/10)
Ivan "Butch" Cliff, CFA (27/29)
Andy Iseri, CFA (10/19)
Matthew Lai (6/6)*

Robert Nagel (3/3)
Bud Pellecchia (17/29)
Tom Shingler (6/17)
Ben Taylor (6/11)*

Uvan Tseng, CFA (8/19)
Anna West (11/11)
Nathan Wong, CFA (3/13)
Mark Wood, CFA (3/9)
***Not included in photograph**

Note: Numbers in parenthesis represent years experience with Callan/Industry.

What is ESG?

Defining ESG, SRI, and Impact Investing

Definitions

Terms blur together, but bring important distinctions

ESG = Environmental, Social, and Governance (broadest term)

- Sustainable investing, responsible investing, alpha source, risk mitigation, integrated vs. post/pre-screened universes, best-in-class, positive/negative screens, key performance indicators (KPIs), ESG factor tilts……

SRI = Socially Responsible Investing

- Ethics-based (one's ethical framework is important)
- Applying a negative screen to exclude investments that cause social or environmental harm

Sustainability themed investing

- Investment in themes or assets specifically related to sustainability (e.g., clean energy, green technology, sustainable agriculture, water, efficiency, mitigation, etc.)
- Financial return of equal or greater importance to social impact

Impact Investing = Environmental or Social returns primary, financial returns secondary

- Targeted investments, typically made in private markets, aimed at solving social or environmental problems
- Financing may be provided to businesses with a clear social or environmental purpose (e.g., carbon reduction, renewable energy, obesity reduction, health care, gun violence)
- Values-based strategies that sacrifice financial return to invest only in stocks/bonds that promote social welfare and/or climate change initiatives

ESG Evolution

ESG investing began in the 1500's with values-based investors wanting to avoid "sin" stocks
- Recent examples of sin stocks include: alcohol, tobacco, firearms/munitions, adult entertainment, birth control
- Sharia/Islam investors avoid pork products and interest bearing investments

1971 – first ethically oriented mutual fund was launched
- Arose following public outcry against Vietnam War and rising national social consciousness

Late 1900s – other investors wanted to avoid unethical behavior or meet statutory requirements
- Apartheid, Sudan, Iran, (most recently) thermal coal

Events/accidents/behavior heightened the attention on "bad corporate citizens"
- Behavior: Enron, WorldCom, Tyco, Bernie Madoff, AIG, Wells Fargo, Volkswagen, Equifax
- Accidents: Exxon Valadez, Deepwater Horizon, Chernobyl, Three Mile Island, Fukushima earthquake/tsunami
- Events: Sandy Hook Elementary School, Columbine High School, Las Vegas
- Led to further calls for divestment, or at a minimum consideration of non-financial risks

More recently, attention on climate change has brought spotlight to environmental issues
- Negative screens: divestment of fossil fuels and coal
- Positive screens: investment and subsidies to renewable and alternative energy

ESG Evolution

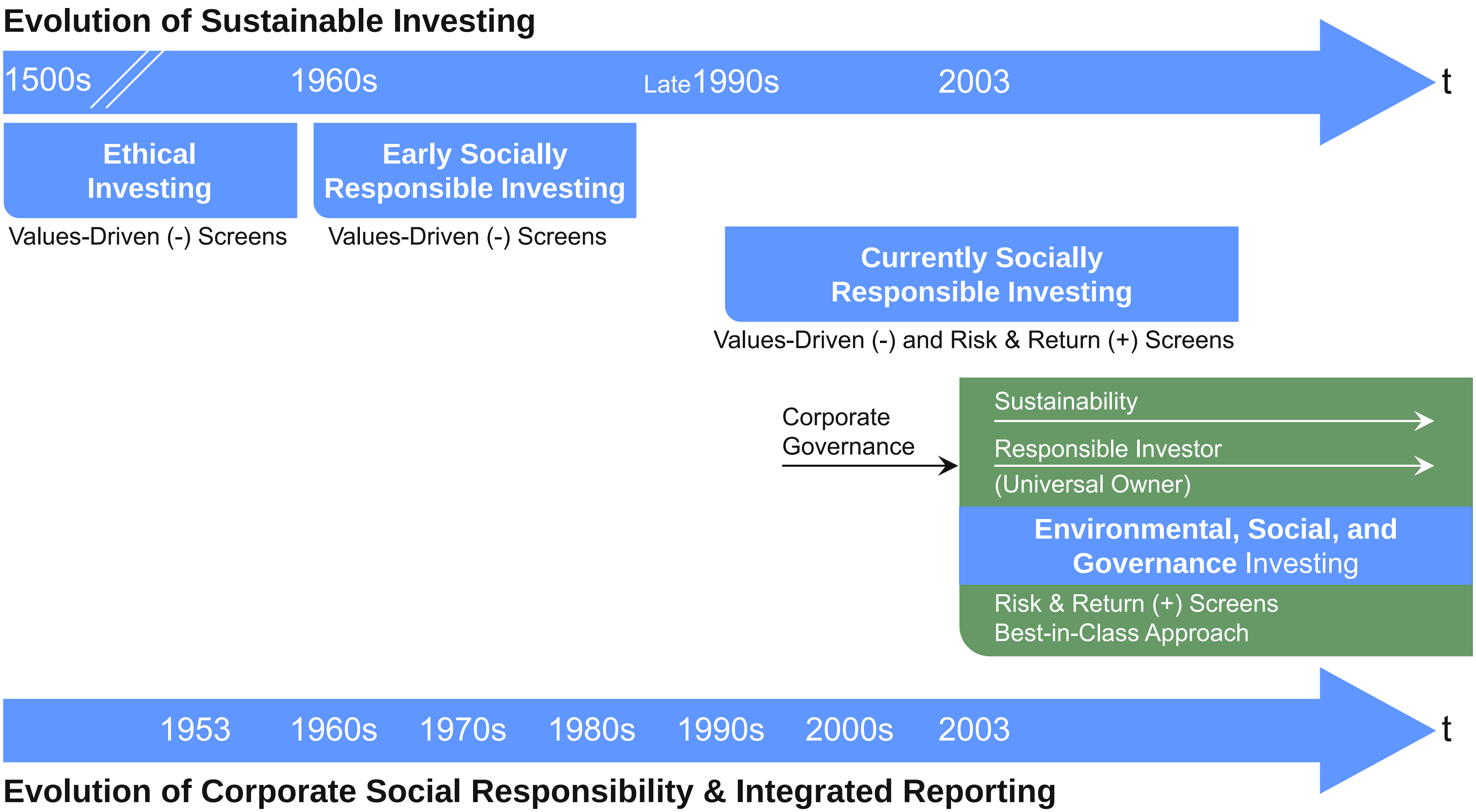
Governance

- Has been around for a long time (capital allocation, dividend payout ratio, shareholder focus)
- Recently, governance has focused on more social aspects (board diversity/independence, executive pay)
- New focus on economic sustainability over short-term profit
- There are now two types of governance: traditional governance and ESG-governance

ESG is a broad term encompassing Environmental, Social, Governance, Responsible, and Sustainable investing

- It is important to understand the different subsets and nuances within ESG investing
- The broadness of the term “ESG” is problematic

Timeline of the Evolution of Sustainable Investment



Source: DBCCA

ESG Today

ESG has evolved: no longer just SRI, divestment, and ethics-based investing

ESG investing is often mistakenly equated with SRI and divestment

- Divestment is just one potential implementation option
- Engagement is a growing and preferred method by many investors

ESG factor integration and positive sustainable investment can be incorporated into traditional fundamental analysis

- Quantitative analysis remains difficult (data integrity, data history, quantitative methodologies), but it's coming
- ESG factor investing (smart beta) is gaining traction

Risk mitigation and management are additional motivations

- Remove the VWs and Equifax's from your portfolio before they blow up
- Analyzing companies using ESG factors can help flag potential big-time losers before they flop
- Efficacy remains low: it's difficult to forecast fraud and accidents
- False positives are high

Forward-looking, emerging megatrends (climate, technology, communications, etc.) will shape our economy and businesses in the coming years

- Many have not previously been factored into valuations

It's difficult to judge ESG efficacy by looking backward. ESG is a forward-looking concept.

Diversity discussions have expanded to include age diversity

We live in "disruptive" times

Defining the ESG Landscape

Traditional Investing	Responsible Impact Investing	Sustainable Impact Investing	Thematic Impact Investing	Impact First Investing	Philanthropy
Competitive Returns	ESG Risk Management	ESG Opportunities	Maximum-Impact Solutions		
Seeks financial returns regardless of Environmental, Social or Governance (ESG) factors	Investments are screened out based on ESG risk	Sustainability factors and financial returns drive investment selection	Targeted themes and financial returns drive investment selection	Social and environmental considerations take precedence over financial returns	Financial returns disregarded in favor of social and environmental solutions
	Negative Screens: Tobacco Alcohol Weapons Gambling Pornography Nuclear Energy	**Factors Considered:** Carbon footprint Resource use Waste reduction Compensation Product safety Gender equality	**Solutions For:** Climate change Population growth Urbanization Water scarcity Food systems	**Support For:** Innovation & Risk Taking Proof of Concept/Pilots Enabling Environments Commercial Capital Leverage	

Source: Sonen Capital

Callan ESG Survey

ESG Factor Adoption Rates Overall

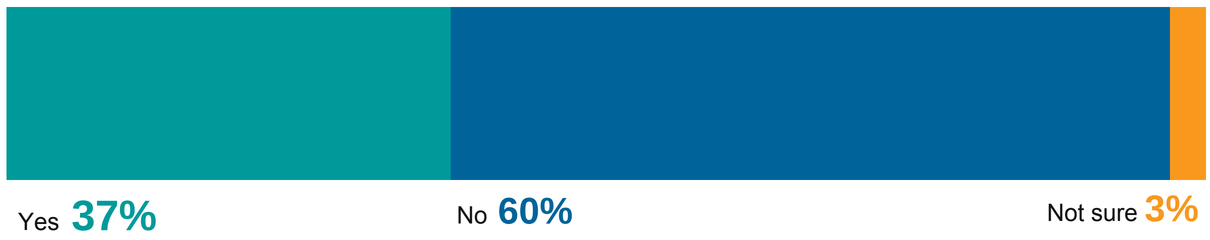
37%

of respondents had incorporated ESG factors into investment decisions in 2017, on par with 2016. The 2017 survey reflects a greater portion of responses from smaller funds (<$500 mm) and corporate funds, which are less likely than larger funds and other fund types to incorporate ESG into the investment process.

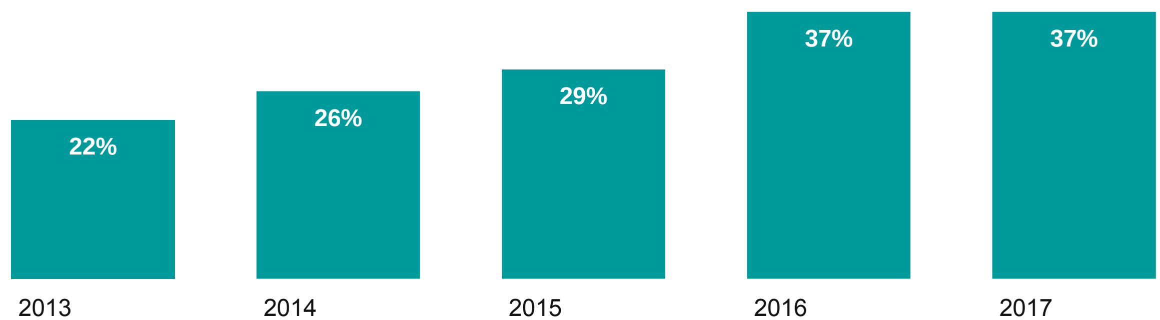
68%

increase in respondents that have incorporated ESG factors into investment decisions from 2013 to 2017.

2017: Does your fund incorporate ESG factors into investment decisions?



Funds that have incorporated ESG factors into investment decisions over time

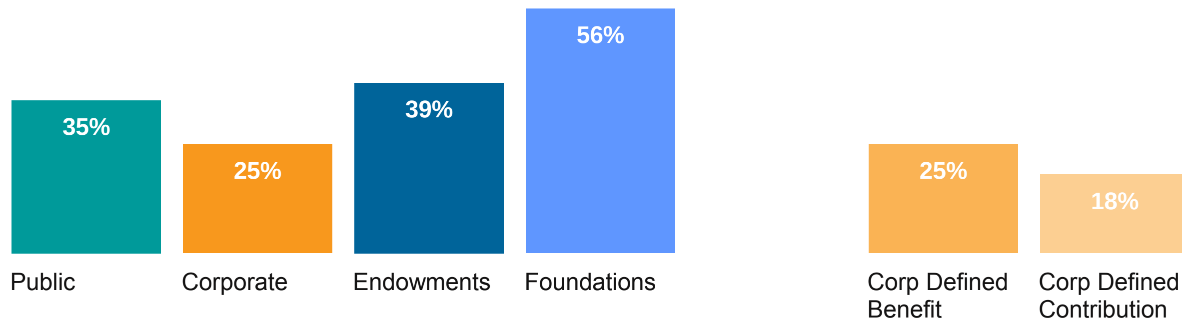


ESG Factor Adoption Rates by Fund Type

56%

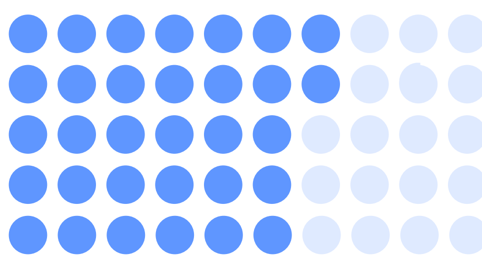
of foundations have incorporated ESG factors into investment decisions, the 2017 survey found. Foundations have incorporated ESG factors at a higher rate than all other fund types in 4 out of the 5 years that Callan has fielded this survey.

2017 funds that are incorporating ESG factors into investment decisions



By fund type over last five years

2013	2014	2015	2016	2017
Foundations **31%**	Foundations **35%**	Foundations **39%**	Endowments **53%**	Foundations **56%**
Endowments **22%**	Endowments **34%**	Endowments **37%**	Foundations **48%**	Endowments **39%**
Corporate **22%**	Public **22%**	Public **27%**	Corporate **30%**	Public **35%**
Public **15%**	Corporate **15%**	Corporate **15%**	Public **25%**	Corporate **25%**



64%

of foundations have incorporated ESG factors into investment decisions in 2017 or are considering doing so in the future.

ESG Implementation

Similar to ESG definitions, implementation strategies vary substantially from fund to fund, as investors find the approach that best accomplishes their unique goals. Callan asked survey respondents that have incorporated ESG factors into investment decisions specifically how they had done so to gauge which implementation strategies are most prevalent.

The top implementation method for survey respondents that are incorporating ESG into investment decisions in 2017 was to add language to the investment policy statement (50%), which was also the most common implementation method in 2016 (53%). Callan finds that adding language to investment beliefs or policy statements is frequently a first step that many institutional investors take when pursuing an integrated approach to incorporating ESG factors in investment decisions.

The next most prevalent implementations were:

- **to communicate to their investment managers that ESG is important to the fund,**
- **to hire a manager that has incorporated ESG, and**
- **to incorporate a screening process and to communicate to investment managers that ESG is important to the fund (42% each).**

A negative screening process can address a specific issue (e.g., screen out investments related to tobacco or fossil fuels), but positive screening is also becoming more prevalent (e.g., screen to include only securities that have best practices in a specific sector). Engagement/proxy voting ranked fifth, with 32% of investors utilizing this method. One-fifth of respondents (21%) indicate they are a Principles for Responsible Investment (PRI) signatory, double the rate in 2016 (10%).

ESG Implementation

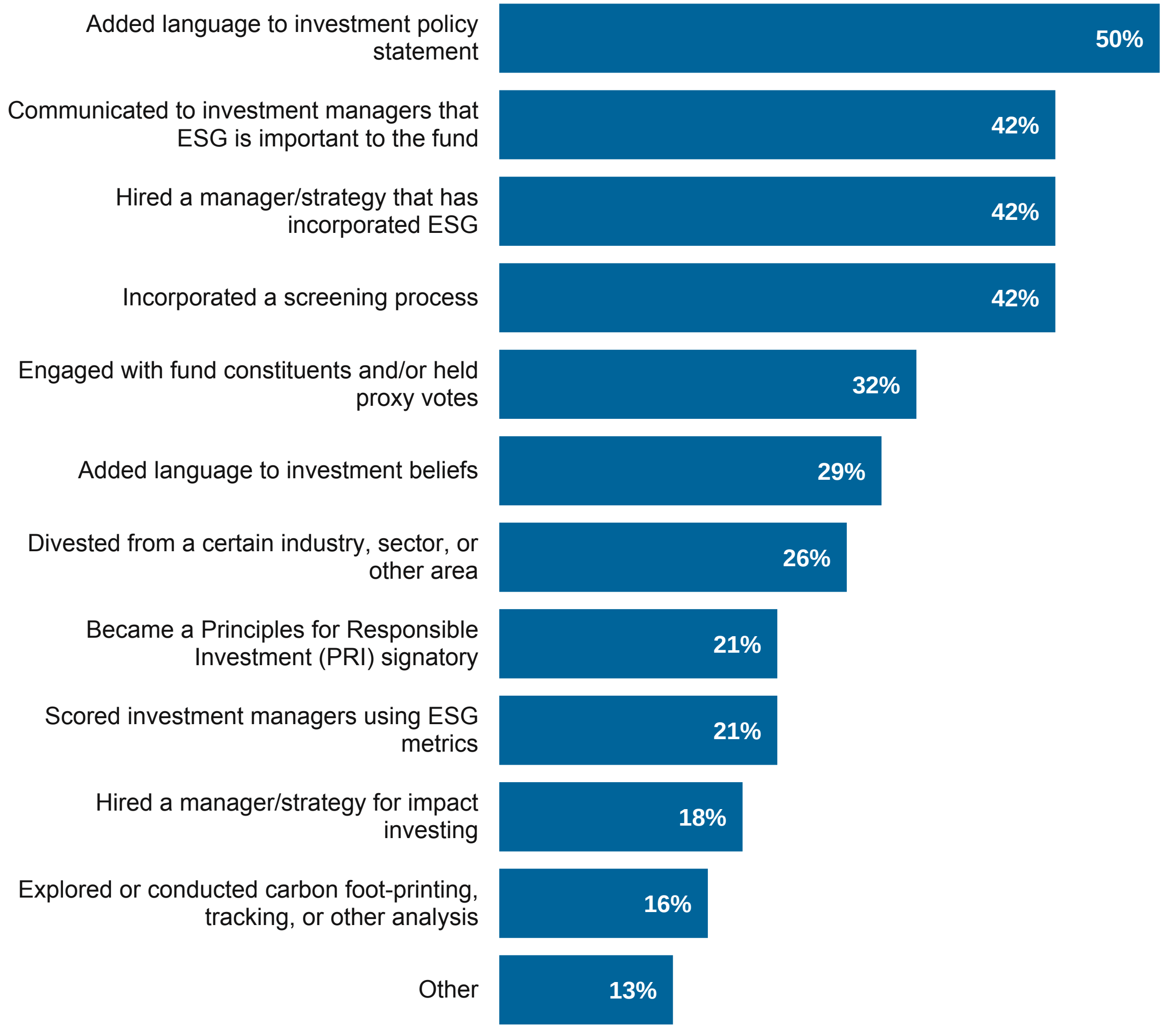
"Other" responses include:

"Divested [out] of industries with negative environmental records"

"Adopted a five-year strategic plan for ESG which includes KPIs, milestones, with targets included in senior staff performance targets"

"Use [consultant] on an ad hoc basis for ESG analysis of managers"

Implementation methods for incorporating ESG factors into the investment decision-making process



Reasons For and Against ESG

Reasons for incorporating ESG factors into the investment decision-making process*

88%

of corporate funds surveyed utilize ESG factors in order to fulfill their fiduciary duty.

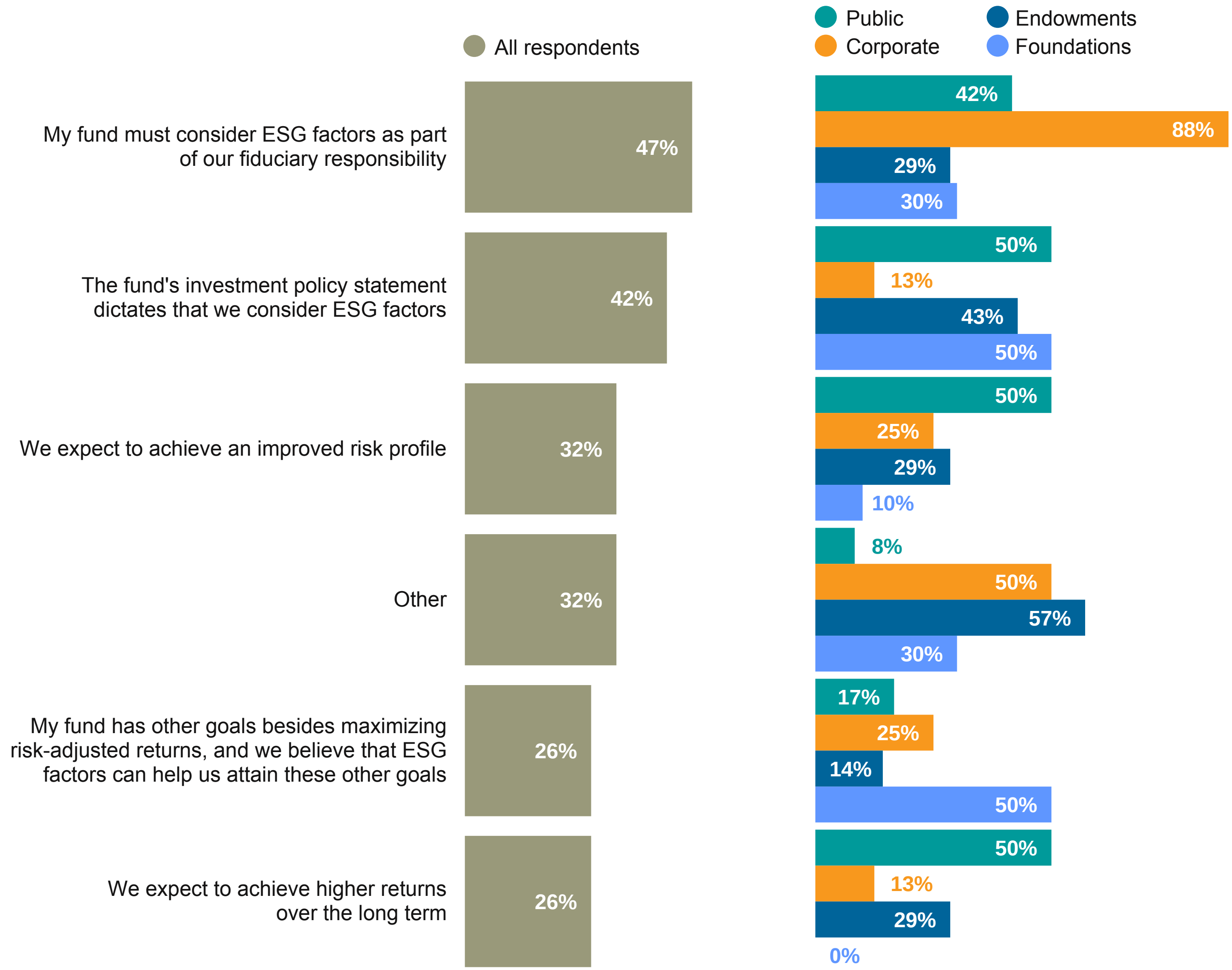
More investors expect to improve their fund's risk profile by applying an ESG lens in 2017 (32%) than fiver years ago (17%).

"Other" responses include:

"Participants desire to incorporate"

"We believe it is an important attribute for certain generations of participants"

"Mission alignment with our organization"



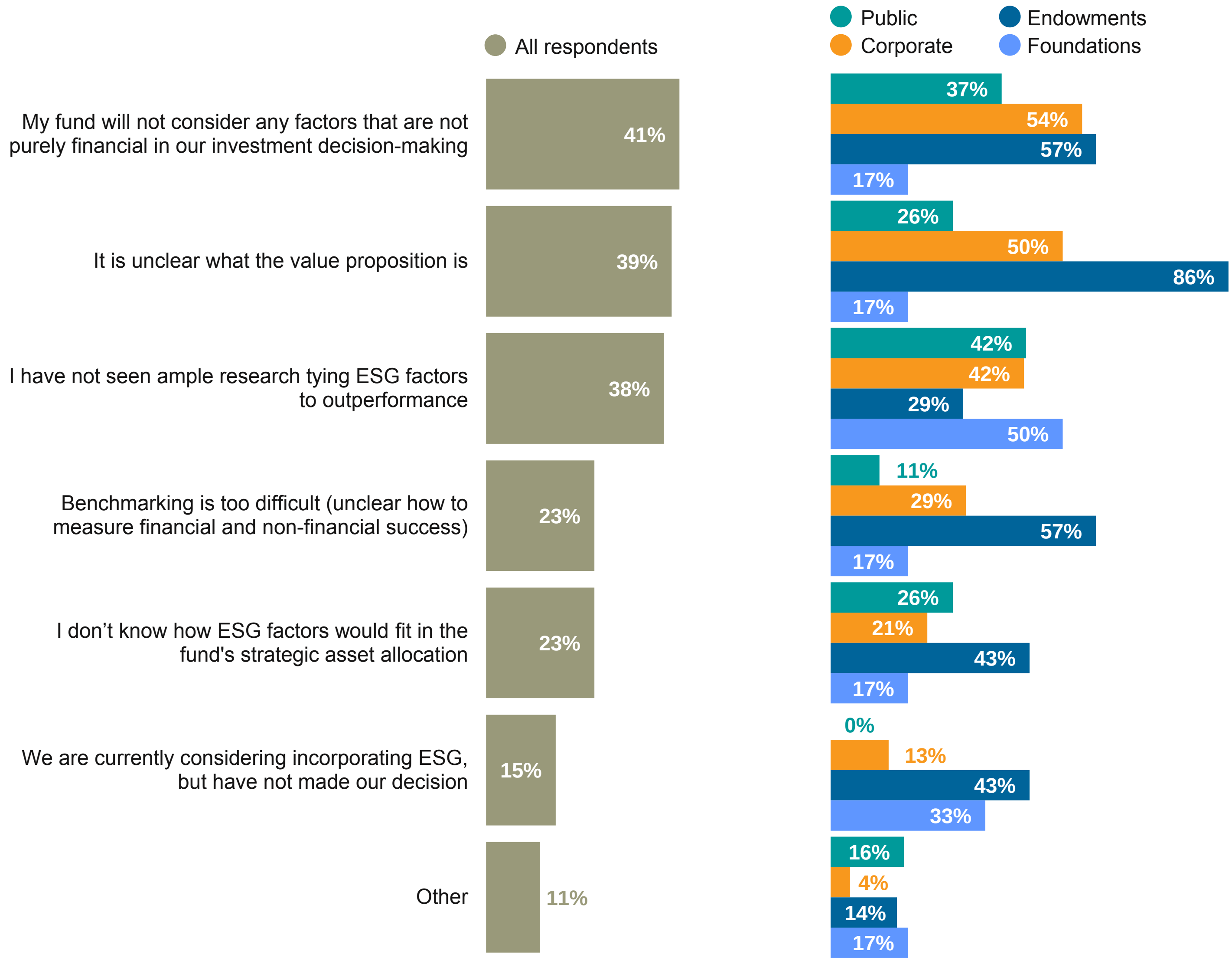
* Multiple responses were allowed.

Reasons For and Against ESG

More clarity

Years of education around ESG by movement proponents appears to be paying off, as the percentage of participants that were unclear of the value proposition of incorporating ESG factors declined from 53% in 2013 to 39% in 2017. However, for endowments this remained the top reason for not incorporating ESG factors.

Reasons for NOT incorporating ESG factors into the investment decision-making process*



*** Multiple responses were allowed.**

Investment Manager Activity

What are Investment Managers Doing?

Principles for Responsible Investment

PRI | Principles for Responsible Investment

In an effort to formalize certain ESG standards and goals, the United Nations introduced the Principles for Responsible Investment (PRI) in April 2006. PRI is a voluntary initiative in which signatories agree to incorporate six principles into their investment processes.

Signatories commit to:

1. Incorporating ESG issues into investment analysis and decision-making processes
2. Being active owners and incorporate ESG issues into ownership policies and practices
3. Seeking appropriate disclosure on ESG issues by the entities in which they invest
4. Promoting acceptance and implementation of the Principles within the investment industry
5. Working together to enhance effectiveness in implementing the Principles
6. Reporting on activities and progress toward implementing the Principles

Additionally, signatories publicly assert their adherence to these six principles through the PRI list of signatories.

As of November 2, 2017, there were 1,850 PRI signatories with nearly $70 trillion in assets under management.

- Signatories include asset owners (364), investment managers (1251), and service providers (235).

Source: www.unpri.org

ESG Applications in Public Equity Products

Sample framework for ESG Analysis for publicly listed equities

Economic Analysis	Industry Analysis	Company Strategy	Financial Reports	Valuation Tools
Understanding how ESG factors affect economic growth and macro themes, such as resource scarcity	Understanding how ESG factors influence consumer preference and regulatory change, such as environmental legislation	Understanding how a company manages ESG risks and opportunities, for example in supply chain management	Understanding how ESG factors impact on earnings growth, operational efficiency, intangible assets, and underlying cash flows	Understanding how analysts are integrating ESG considerations into valuation tools, such as discount rates and economic value added

Sources: Callan, PRI

ESG Application in Alternatives

Less transparency, but demand from investors continues to rise

Private Equity

- Private equity model has traditionally recognized governance as an important issue; now LPs are more interested and concerned with environmental and social policies
  - PRI (Principles for Responsible Investment – United Nations) report indicated the integration of ESG issues in mergers and acquisitions transactions showed that poor performance on ESG factors can affect the likelihood of a deal taking place, while good ESG performance can increase the motivation of a trade buyer to complete a deal
- June, 2017: more than 300 GPs are PRI signatories, growing from 150 in 2013 and just 2 GPs in 2008

Venture Capital

- Similar to private equity, but companies are less established and formalized ESG reporting is more sparse
- Venture Capital firms may invest with intent to promote a company's business model that targets a specific ESG issue (e.g., renewable energy, micro-finance, developing world economic development, etc.)

ESG Applications Conclusion

Overall, quality of ESG analysis is improving across investment management industry

Questions of HOW analysis is done (personnel, structure, resources, data sourcing) replacing questions of IF analysis can be done

- Analysis becoming institutional quality and standardized
- Difficulty remains in acquiring consistent, comparable, and audited information on relevant ESG KPIs
- Cost of resources to acquire information and conduct analysis remains a primary concern of managers

Level of ESG Integration*

Low	Moderate	Moderate	High
	Public U.S. Equity	Real Assets	
Hedge Funds	Fixed Income	Private Equity	Public non-U.S. Equity

*Ranked relative to other asset classes based on percentage of strategies within asset class utilizing some aspect of ESG analysis

ESG Research

Callan's ESG Manager Due Diligence

Understanding the unique capabilities and strengths of managers

Callan has always considered ESG in a holistic manager research approach

- Consider everything that matters
- ESG is not appropriate for all strategies

Callan has formalized our ESG research efforts and created an ESG research team including:

- Manager research group members
- Published research group members
- Database /quantitative research group members

ESG specific questions – proprietary manager database

Purchased ESG scoring data (MSCI ESG Ratings):

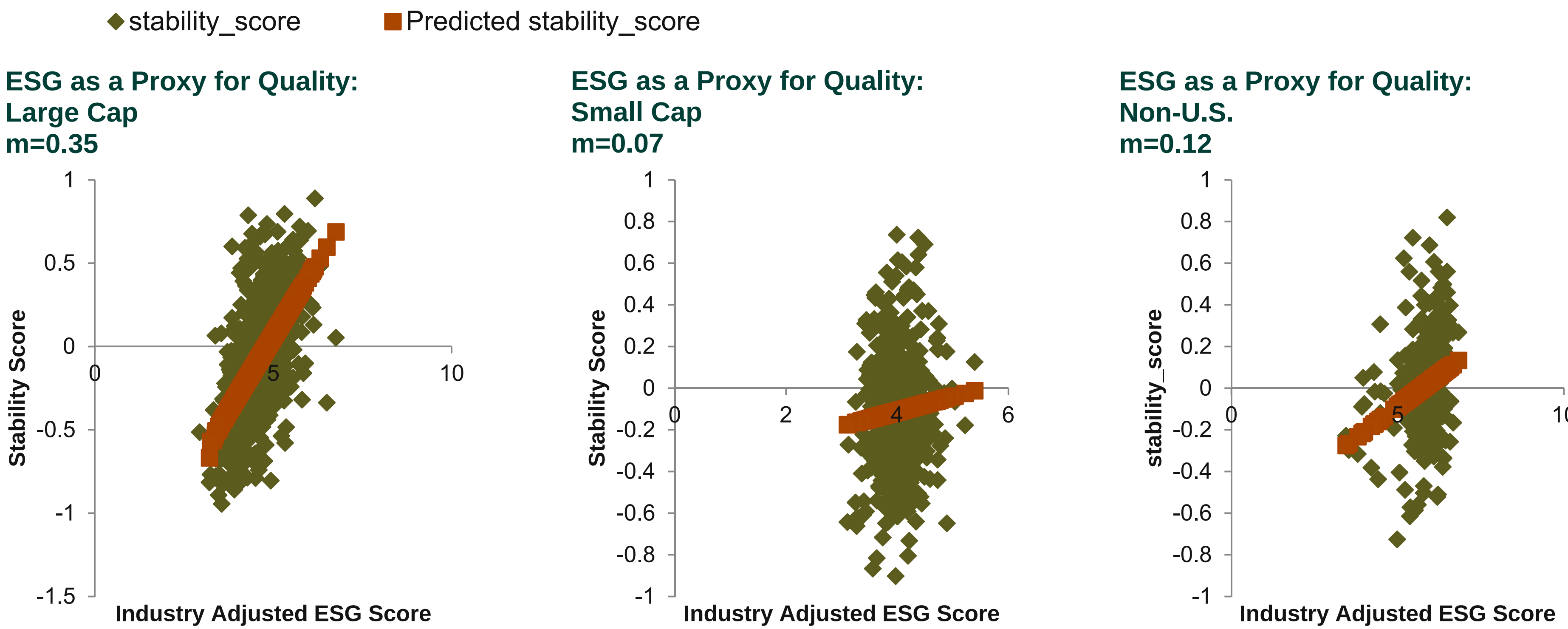
- The data is at the holdings level in our database and we compute portfolio scores based on the E, S, & G criteria at the individual holding level. That score is aggregated into a portfolio score.
- Facilitate ESG factor research
- Client reporting and communication

ESG is treated like any other set of factors in the due diligence process

- There are many nuances to how managers use ESG – no one-size fits all approach to research
- Just as "valuation" is multi-faceted – so is ESG

Nothing replaces sitting down with a manager and discussing how they think about ESG

How is ESG Data Utilized and Sourced?



Our review of scored portfolios reveals that high ESG scores correlate to:

- Size: larger cap companies earn the highest ratings
- Stability: ESG correlates to the Russell Stability Index (which includes measures of quality)
- Biases must be considered to isolate ESG effect
- Clients may already be “ESG tilted” with traditional quality, stable strategies

Sources: Callan, Russell, MSCI

How is ESG Data Utilized and Sourced?

With a grain of salt

Callan is building ESG style groups (peer groups)

- Should we include strategies that were self-selected as ESG?
- Should we include strategies that rate high by MSCI standards?

Our findings

- Some self-selected ESG strategies rate low
  - We surmise that “company lack of disclosure” led to low ESG scores by MSCI
  - Fundamental ESG managers that uncovered “good” ESG companies that lacked disclosure were buying low rated stocks
- Many traditional strategies rate very high
  - Perhaps they were large cap, stable, quality biased strategies?

Benchmarks

- Every major index family has launched ESG related indices
- Index construction mythology and the nature of various ESG indices vary greatly

How is ESG Data Utilized and Sourced?

Quantitative Approach

Can a quantitative ESG approach work?

- Will the goal be to maximize ESG rating, risk/return, or impact?
- Which data source(s) to use?
- What to do when ESG data conflicts?
  - MSCI and Sustainalytics rate Baidu positive and negative (see below)
  - Manager back testing shows negative correlation between several MSCI and Sustainalytics rating categories
- We have yet to see wide adoption of ESG factors in a traditional quant strategy (despite many back tests)
  - **Unpublished research is telling**
- What do you do if ESG is expensive?

Which is better – high absolute ESG scores or improving ESG scores?

- Is contrarian ESG investing more effective than buying the best ESG companies?
- Discussions with managers who have back tested say ESG momentum is more important.
- Is a "good company" always a "good investment?

	MSCI			Sustainalytics		
	E	S	G	E	S	G
BIDU	0.787	0.885	-1.395	-0.832	-0.340	0.759

Note: ESG ratings are scaled for consistency between providers to +3 to -3 with the average being zero. This information is provided at your request solely for due diligence purposes. It is not intended to be relied on for investment advice. It may not be re-distributed without Causeway's consent.

Sources: Causeway Analytics, MSCI, Sustainalytics

What are Managers Saying?

Published research tends to support the notion that ESG won't hurt returns

- Sources usually have a product to sell

Unpublished research—gleaned through manager interviews—tells a different story

- G can add value
- E & S are less reliable

Everyone does "G" – but there are different types of "G"

- Traditional Governance
  - Capital allocation
  - Dividend payout ratio
  - Shareholder protection
  - Accounting practices
- "ESG – G"
  - Board diversity
  - Ethics policy
  - Environmental policy
- "Grey area G" - hybrid
  - Compensation
  - Ownership
  - Worker safety

ESG and Returns

Is the jury "still out," or is the case closed? Opinions differ

Return enhancement research

- It depends on who you ask
- A growing body of academic research suggests that ESG factors could add a small return premium (Governance in particular, has done well in stock-level analyses)
  - That's the published research trend
- Manager research is uncovering conflicting results – why haven't all strategies adopted ESG?
  - Most quants have back tested – none that we know of have incorporated ESG into their alpha models
  - Some have incorporated ESG into their risk models – but very few
  - That's the unpublished research trend

New/better ways to link sustainability data to core financial results are emerging

- There may be opportunity for information advantages with proprietary research

Many different strategies have been lumped together

- SRI strategies with negative screens drag on returns, but no penalty for funds with a positive focus

ESG data (and analytics) is still new and time-period dependent, leading to lack of strong evidence and/or "smoking gun" to make broad based conclusions

- Published and unpublished research continues to be conducted – results are conflicting
- Most interesting findings may remain confidential (so as not to give away a potential competitive advantage)

ESG and Returns

Does ESG enhance or diminish returns?

Current back testing is dominated by an environment awash in excessive liquidity

- ESG activity can be capital intensive – what happens if/when interest rates rise?
- Out of sample?

ESG strategies vary substantially, so applying one blanket statement about returns doesn't make sense (e.g., would you say "small cap value managers can't enhance returns?")

- Past studies analyzing SRI and ESG strategies together have been criticized for being skewed
- Most studies do not adequately adjust for biases (quality, size, stability)

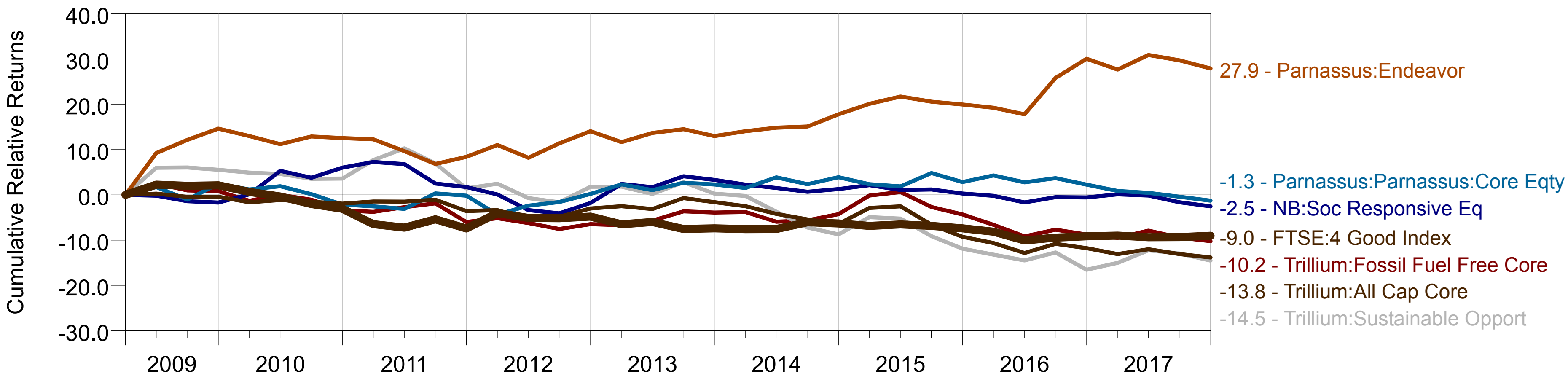
Major companies have gained billions of dollars of increased sustainability-related revenue and cost savings

- Their can be a financial effect from sustainability-related activity
- Improvements in safety records can result in cost savings (Dow, Dupont)
- Expansion into sustainable products can result in revenue growth (GM Chevy Volt, GE wind turbines)
- Efficiency efforts can lower operating expenses (composite airplanes)

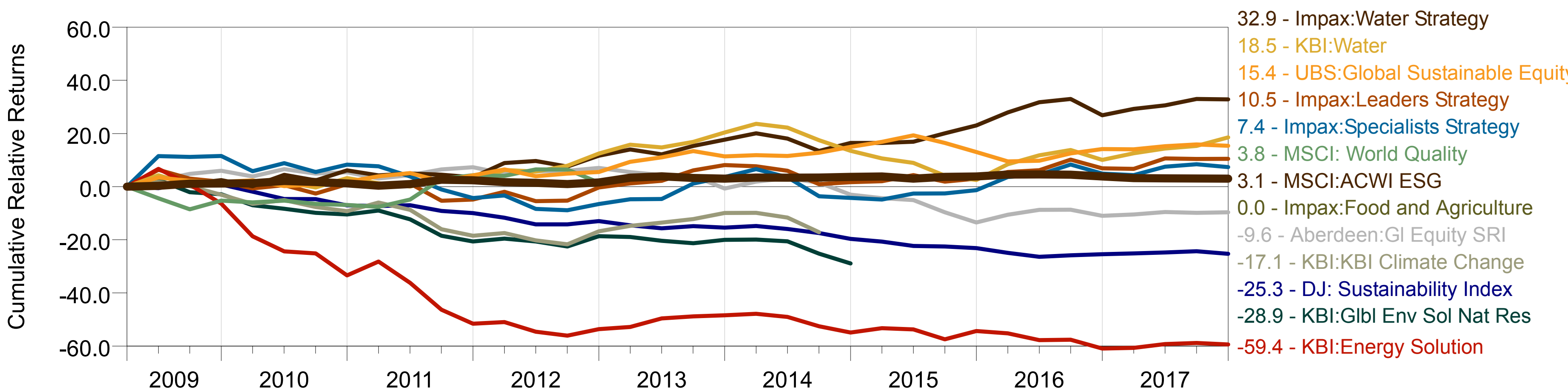
ESG and Returns

Comparing apples to oranges – not all ESG strategies are the same – since the bottom

Cumulative Relative Returns Relative To S&P 500 for 8 3/4 Years ended December 31, 2017



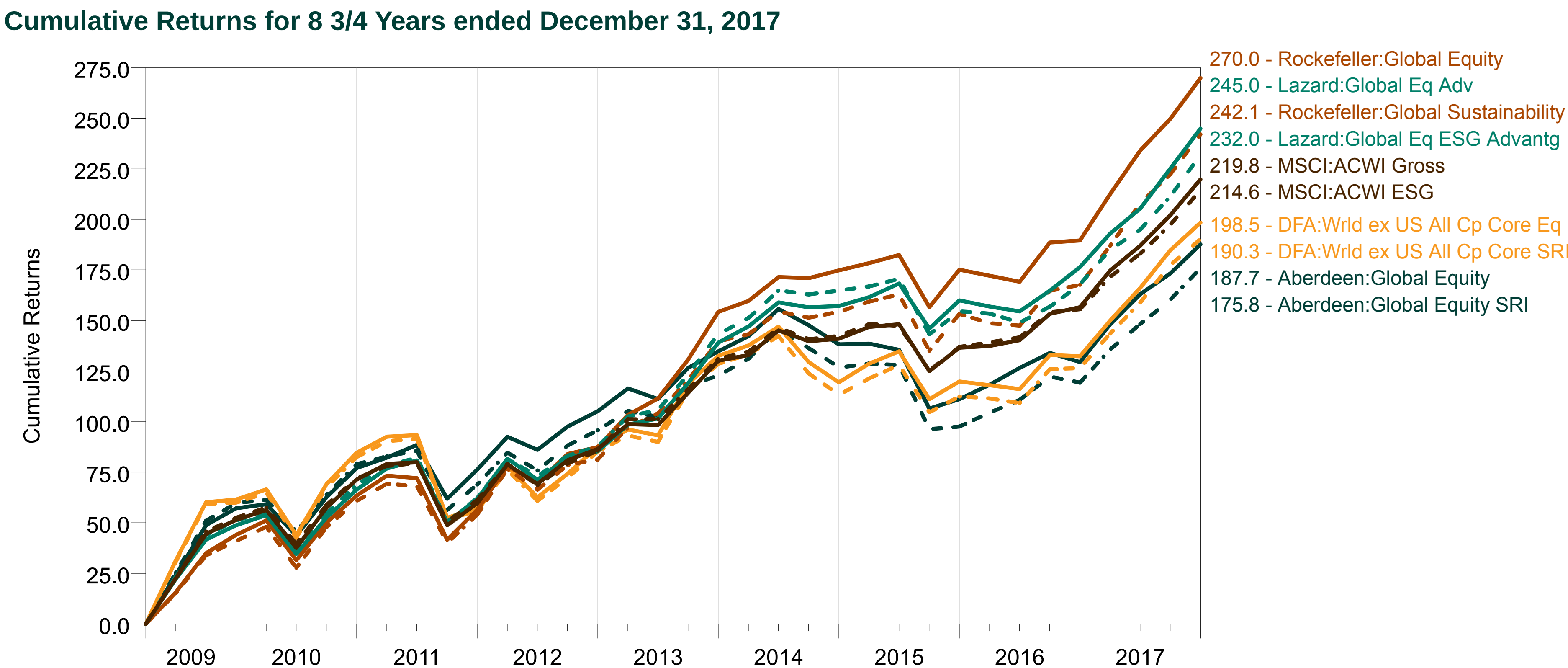
Cumulative Relative Returns Relative To MSCI ACWI (net) for 8 3/4 Years ended December 31, 2017



Sources: Callan, Dow Jones, Managers, MSCI

ESG and Returns – Individual Manager Examples

Comparing apples to apples – since the bottom



Random sample of managers offering ESG and non-ESG versions of the same strategy managed by the same teams using the same approach

In the recent “up market” since the Global Financial Crisis – ESG/SRI version have tended to trail

History is too short to draw any conclusions

Sources: Callan, Managers, MSCI

ESG and Risk/Return – Individual Manager Examples

Comparing apples to apples – since the bottom

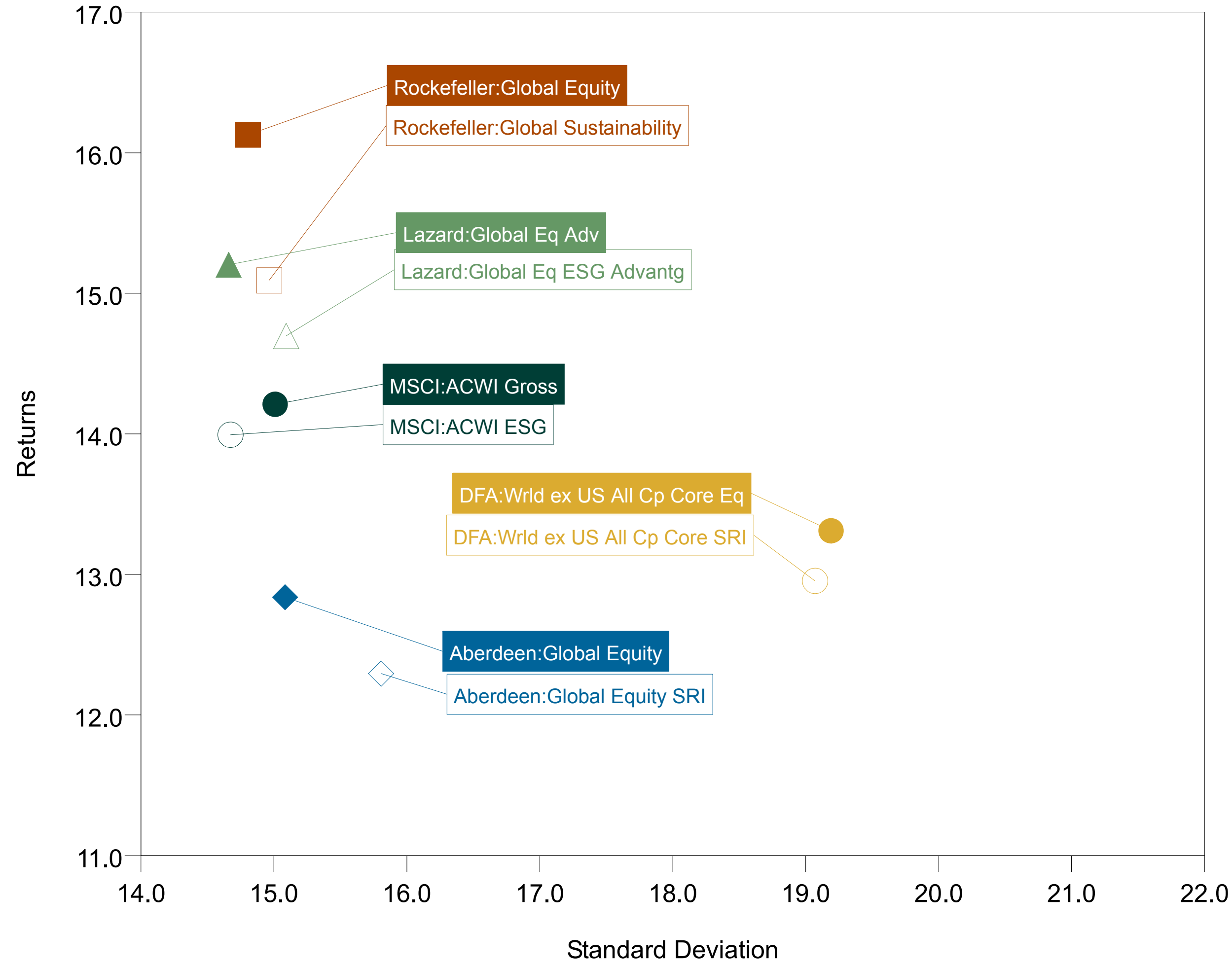
Random sample of managers offering ESG and non-ESG versions of the same strategy managed by the same teams using the same approach

Return effect is consistently negative

Risk effect is not consistent

History is too short to draw any conclusions

Scatter Chart for 8 3/4 Years ended December 31, 2017



Sources: Callan, Managers, MSCI

What does MSCI Barra Say?

ESG risk premium as measured by Barra Custom Factor Attribution

	E	S	G
US: Feb 2011 - Sep 2016			
Return	-0.9%	-0.8%	0.7%
Std. Dev.	0.1%	0.2%	0.2%
Global Equity: Feb 2014 - Sep 2016			
Return	1.0%	-0.1%	0.9%
Std. Dev.	0.1%	0.1%	0.1%
Emerging Markets: Feb 2014 - Sep 2016			
Return	2.0%	2.7%	-2.6%
Std. Dev.	0.2%	0.1%	0.2%

Sources: MSCI ESG Research, Analytics. 'USSLOWL', 'GEMLTL', 'EMM1L' used as base risk models in BPM Custom Factor Attribution

In Closing……

ESG is a broad yet nuanced area of investing

Investors in the U.S. have yet to embrace ESG, but it's growing

Managers (and consultants) have dedicated resources to understanding ESG

Research remains inconclusive at best

Appendix

ESG Managers

Sample of ESG Strategies (mutual funds and ETFs) – not a search list

DFSIX @ 0.25% fee: DFA US Sustainability Core 1 (Dimensional Fund Advisors)

DFSPX @ 0.38%: DFA International Sustainability Core 1 (Dimensional Fund Advisors)

LOWC @ 0.20%: SPDR MSCI ACWI Low Carbon Target ETF (SSGA)

SHE @ 0.20%: SPDR SSGA Gender Diversity Index ETF (SSGA)

PGINX @ 0.98%: Pax Global Environmental Markets (Impax Asset Management)

NSRIX @ 0.31%: Northern Global Sustainability Index (Northern Trust Asset Management)

TROCX @ 0.90%: Touchstone Sustainability & Impact Equity (Rockefeller & Co)

PORIX @1.08%: Portfolio 21 Global Equity (Trillium Asset Management)

GGEIX @ 0.95%: Nationwide Global Sustainable Equity (UBS Asset Management)

DOMOX @1.04%: Domini Impact International Equity Fund (Domini Impact Investors)

VFTNX @ 0.12%: Vanguard FTSE Social Index Fund (Vanguard Group)

DSI @ 0.50%: iShares MSCI KLD 400 Social ETF (Blackrock)

ESGD @ 0.20%: iShares MSCI EAFE ESG Optimized ETF (Blackrock)

***Current manager Lazard Asset Management offers Global ESG – not in MF/ETF vehicles**

Callan Database ESG Manager Due Diligence

Callan Manager Database Questionnaire

1. **Does your investment process include environmental, social, or governance (ESG) considerations?**
2. **Does your investment process include social responsibility (SRI) considerations?**
   - If so, is it a primary, secondary or integrated focus of your strategy?
3. **Indicate which ESG factors are considered (check all that apply):**
   - Environmental, Social, Governance, Religious, Hazardous Waste, Pollution, Emissions, Nuclear, Alcohol, Gambling, Firearms, Sexually Explicit Material, Stem Cell, Workers' Rights, Community Relations, Other
4. **Indicate the primary use of ESG criteria within the investment process (select one):**
   - Social Reasons, Risk Mitigation, Alpha Generation, Shareholder Engagement, Other
5. **Indicate the source(s) of your ESG research (check all that apply):**
   - Internally generated, Third-party research (please specify)
6. **Indicate how ESG factors are incorporated into the investment process (e.g., as an exclusionary screen, positively weighted factor, etc.)**

Callan ESG Manager Meeting Due Diligence

Questions we ask managers

Nothing replaces sitting down with a manager to understand:

- ESG philosophy?
- Is ESG adopted firm-wide?
- Is ESG considered a risk management tool or alpha input?
- Importance of ESG relative to other factors (primary, secondary, integrated)?
- ESG resources – internal or third-party or mix?
- ESG research analyst and PM background (financial vs. environmental sciences – maybe both)?
- Is ESG research conducted fundamentally or quantitatively?
- How are ESG findings integrated into the process (adjusted discount rates, eliminated from universe)?
- Specific stock exposures (how can Coke be included when they contribute to diabetes – water efficiency?)
- Is nuclear good or bad?
- Company research supporting ESG?

What is the best "ESG darling" you don't hold?

- Seeking an investment rationale for not investing

What is the worst ESG company you hold?

- Seeking an investment rationale for investing to gauge relative importance of ESG
- Balancing that investment rationale against the goal of positive ESG impact

And all the typical questions we ask all managers

Every meeting we ask – any progress on carbon sequestration?

ESG Applications in Public Equity Products

Sample Questions for Analysis

Framework	Sample Questions Asked by Investment Managers
Economic	– Are long-term growth forecasts reflective of ESG constraints? – What demographic trends are playing out? – What infrastructure is being invested? – How strong is government regulation of potential environmental and human rights violations?
Industry Analysis	– What specific ESG risks and opportunities are faced by industry? – How will legislative and regulatory changes impact growth? – What ESG factors will drive or constrain preferences and demand trends? – Which information services are capable of delivering relevant ESG data within industry?
Company Strategy	– Is the company actively aware of ESG factors in economy/industry? – Does management prioritize ESG factors or knowledgeable on these factors? Is this supported at the board level? – How detailed is reporting on ESG performance at the company? – Is ESG reporting linked to financial performance? – Does the company seek out opportunities arising from ESG dynamics?
Financial Statements	– How might ESG trends impact a company's core markets? – Are the company's key markets sustainable in terms of resources use/disposal and/or consumer preference and social trends? – Is there a risk that input costs will rise? Is company aware of these risks? – Do margin projections account for these risks? – What is company doing to mitigate ESG risks? Does company report on these risks? – What is company litigation history? – What is structure and diversity of board and executive management?
Valuation Tools	– Should discount rates be adjusted to reflect variations in ESG performance? – Should improvements in governance be reflected in lower forecasted beta? – Does integration of ESG analysis into fundamental equity valuation reduce or strengthen conviction in a company's intrinsic value?

Sources: Callan, UN PRI

Research Implementation

Applications differ depending on goals of investors

Integration of ESG factors

- Systematic and explicit inclusion by investment managers of ESG factors into traditional financial analysis
- Adjust other metrics (e.g., valuation hurdles, growth hurdles)
- Factor investing (smart beta)

Negative/exclusionary screen (exclusion/divestment)

- Exclude certain sectors, companies, or practices based on specific ESG criteria
- Tobacco, “sin” stocks, fossil fuel, coal (thermal vs. metallurgical), Sudan, Iran, poor labor practices
- Revenue hurdle

Positive/best-in-class screen (inclusion)

- Investment in sectors, companies, or projects selected for positive ESG performance relative to industry peers
- Best-in-class, positive impact (e.g., renewable energy, energy efficiency), conservation/recycling, non-GMO foods, community development, affordable housing (fixed income/private equity), redevelopment of distressed communities, access to financing

Norms-based screening

- Screening of investments against minimum standards of business practice based on international norms set by World Bank, United Nations, International Monetary Fund, etc.

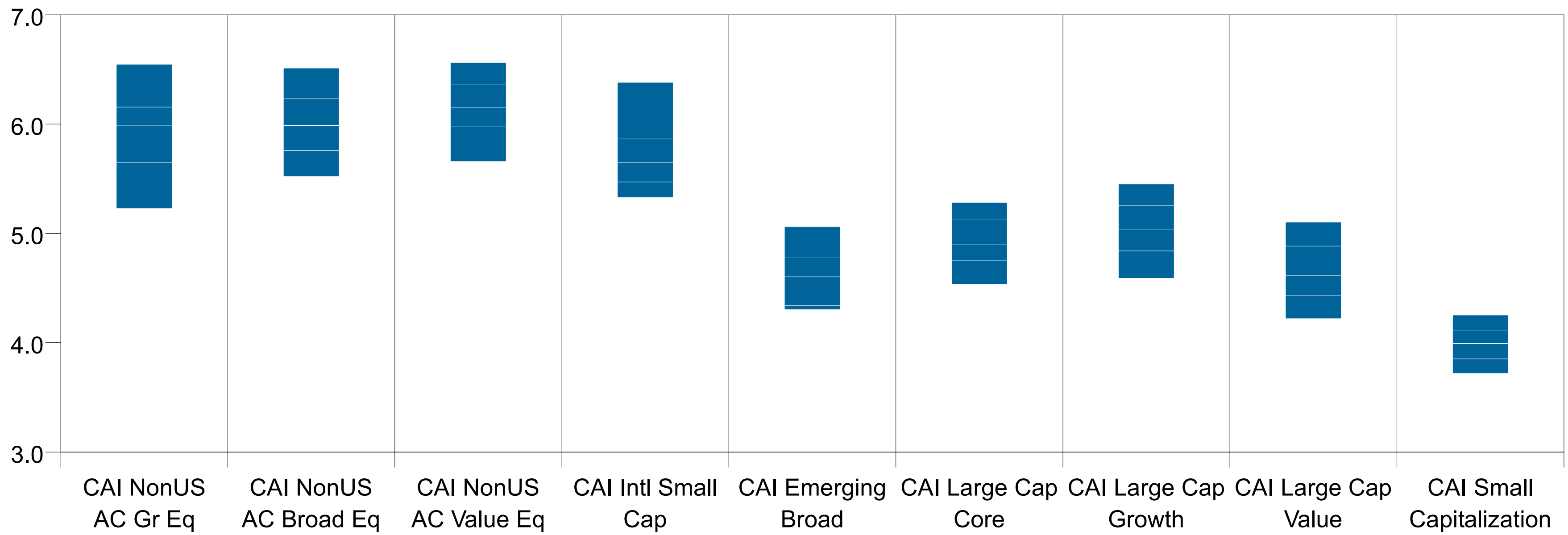
Corporate engagement and shareholder action

- Use of shareholder power to influence corporate behavior, including through direct corporate engagement (i.e., communicating with senior management and/or boards of companies), filing or co-filing shareholder proposals, and proxy voting that is guided by comprehensive ESG guidelines

How is ESG Data Utilized and Sourced?

Different sub-asset classes bring different MSCI ESG scores

Industry Adjusted Score for 1 Quarter ended June 30, 2017



	CAI NonUS AC Gr Eq	CAI NonUS AC Broad Eq	CAI NonUS AC Value Eq	CAI Intl Small Cap	CAI Emerging Broad	CAI Large Cap Core	CAI Large Cap Growth	CAI Large Cap Value	CAI Small Capitalization
10th Percentile	6.55	6.51	6.56	6.38	5.06	5.28	5.45	5.10	4.25
25th Percentile	6.16	6.23	6.37	5.87	4.78	5.12	5.26	4.89	4.11
Median	5.99	5.99	6.16	5.65	4.60	4.90	5.04	4.62	3.99
75th Percentile	5.65	5.76	5.98	5.47	4.34	4.75	4.84	4.43	3.85
90th Percentile	5.23	5.52	5.66	5.33	4.30	4.53	4.59	4.22	3.72
Member Count	37	78	17	14	24	53	68	60	154

Source: Callan, MSCI

Sources of ESG Data

Consolidation and partnerships

Third-party data providers:

- MSCI (IRRC, KLD, Innovest, GMI Ratings)
- FTSE Russell (JSE, LCE Risk)
- S&P Dow Jones (RobecoSAM)
- Sustainalytics (Dutch Sustainability Research, Scoris, AIS, Jantzi Research, Stoxx)
- TruCost
- South Pole Group
- Morningstar (Sustainalytics)
- ISS (RepRisk)
- Glass Lewis
- Bloomberg
- SASB
- More each day

Types of ratings:

- Company ratings
- Industry ratings
- Carbon Measurement
  - Carbon footprinting – emissions – scope 1, 2, 3
  - Estimation vs. company reporting
- Fund ratings

Managers partnering with service providers

How is ESG Data Utilized

The key to ESG data utilization is an appropriate interpretation

- Company or portfolio level "rating" or "ranking?" – understand the methodology
- Does the data measure ESG impact/performance or ESG risk?
- Is the data estimated or directly reported by a company?
- Is the data required by disclosure or voluntary? (SASB)

Data sources:

- Resources behind the data?
- Is the data source a measurement service?
- Is the data proprietary to an investment manager?
- Do ESG scoring outcomes conflict?

ESG data use:

- Is absolute ESG score more important than ESG score "momentum"?
  – Is there a case for "contrarian ESG investing"?

Other ESG data issues:

- Coverage versus reliability/accuracy
- ESG factor correlation – is this normalized for true isolation of ESG effect?
  – Size
  – Stability
  – Quality

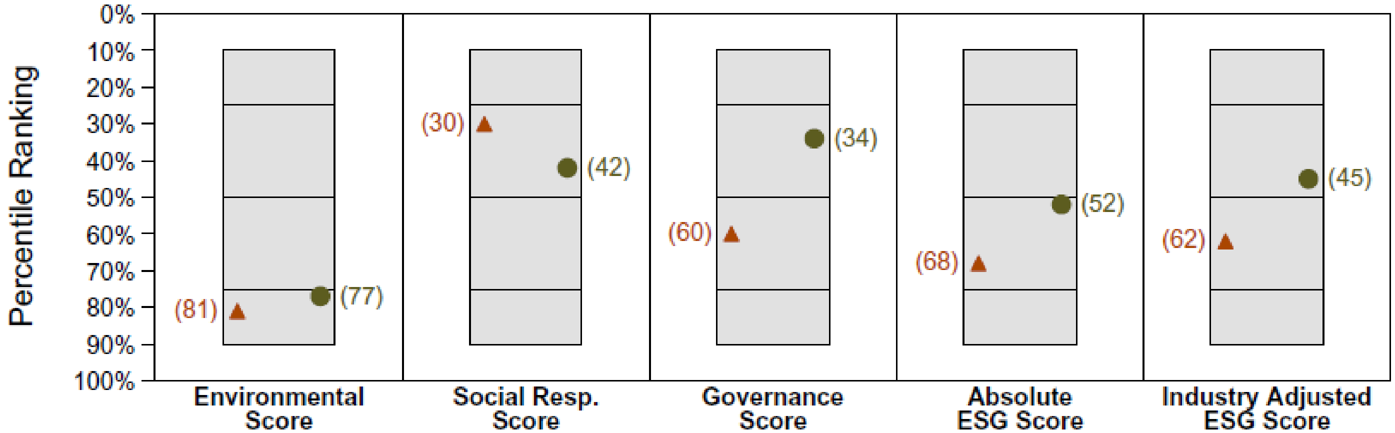
Callan ESG Reporting

Client Reporting (ESG) – International Equity Manager Example

Portfolio Characteristics

This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

Portfolio Characteristics Percentile Rankings
Rankings Against Pub Pln- International Equity
as of September 30, 2014



Example of client report—one of many characteristic sets

	Environmental Score	Social Resp. Score	Governance Score	Absolute ESG Score	Industry Adjusted ESG Score
10th Percentile	6.13	4.81	6.60	5.26	6.13
25th Percentile	6.04	4.75	6.45	5.18	5.91
Median	5.81	4.68	6.33	5.12	5.78
75th Percentile	5.71	4.63	6.22	5.05	5.66
90th Percentile	5.58	4.59	6.03	5.00	5.56
*International Equity ●	5.70	4.70	6.42	5.11	5.79
MSCI ACWI ex-US IMI Index ▲	5.68	4.73	6.31	5.08	5.73

Sources: Callan, MSCI

Analytics and Data-Driven Decisions

MSCI Key Performance Indicators (KPI) carry different weights in different sectors

ESG HIERARCHY EFFECTIVE Q4 2016

ESG (IVA) Rating

- **Environment Pillar**
  - Climate Change
    - Carbon Emissions[1]
    - Product Carbon Footprint
    - Financing Environmental Impact
    - Climate Change Vulnerability
  - Natural Capital
    - Water Stress
    - Biodiversity & Land Use
    - Raw Material Sourcing
  - Pollution & Waste
    - Toxic Emissions & Waste
    - Packaging Material & Waste
    - Electronic Waste
  - Env. Opportunities
    - Opportunities in Clean Tech
    - Opportunities in Green Building
    - Opportunities in Renewable Energy
- **Social Pillar**
  - Human Capital
    - Labor Management
    - Health & Safety
    - Human Capital Development
    - Supply Chain Labor Standards
  - Product Liability
    - Product Safety & Quality
    - Chemical Safety
    - Financial Product Safety
    - Privacy & Data Security
    - Responsible Investment
    - Insuring Health & Demographic Risk
  - Stakeholder Opposition
    - Controversial Sourcing
  - Social Opportunities
    - Access to Communication
    - Access to Finance
    - Access to Health Care
    - Opportunities in Nutrition & Health
- **Governance Pillar**
  - Corporate Governance
    - Board
    - Pay
    - Ownership
    - Accounting
  - Corporate Behavior
    - Business Ethics
    - Anti-Competitive Practices
    - Corruption & Instability
    - Financial System Instability
    - Tax Transparency

Summary of Changes Effective Q4 2016:
Introduction of Tax Transparency under Corporate Behavior Theme

Source: MSCI Intangible Value Assessment (IVA)

Carbon Footprint Measurement

Consolidation and partnerships

Callan has been evaluating carbon footprinting measurement services

- MSCI
- S&P
- South Pole
- Trucost

Important considerations:

- Estimation methodology
- Coverage
- Disclosure bias
- Confidence level
- Audit of results (feedback loop with companies)

FTSE uses a “revenue source” method in creating their low-carbon index

- Does not measure actual impact

Managers have developed methods of measurement

- Some have their processes audited and verified

ESG Research

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