



# **PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS**



PERIOD ENDING: MARCH 31, 2019

Investment Performance Review for

**Imperial County Employees' Retirement System**

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Verus<sup>777</sup>

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Investment Landscape

TAB I

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Investment Performance  
Review

TAB II



**PERSPECTIVES  
THAT DRIVE  
ENTERPRISE  
SUCCESS**

2<sup>ND</sup> QUARTER 2019  
Investment Landscape

# Recent Verus research

Visit: <https://www.verusinvestments.com/insights/>

## Sound thinking

### FOUR RULES OF OUTSOURCING

The choice to use the services of an Outsourced Chief Investment Officer (OCIO) provider is one of the most significant decisions that a board is likely to make. This piece is focused on the four most important rules that Verus believes investors should understand, and OCIO providers should deliver upon.

## Annual outlooks

### CAPITAL MARKET ASSUMPTIONS

Verus held the first Capital Market Assumptions Webinar. On the call, we discussed:

- How market shifts of 2018 have affected our long-term outlook
- Why the current environment continues to indicate modest long-term performance across most asset classes
- The important differences between shorter-term and longer-term forecasting exercises

### ACTIVE MANAGEMENT ENVIRONMENT

Our work on active management addresses some shortfalls of the traditional analysis, which uses the median product to describe the active management universe as a whole. These improvements and insights have allowed us to better understand product behavior and may allow for more informed selection in the future.

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# 1<sup>st</sup> quarter summary

## THE ECONOMIC CLIMATE

- Real GDP growth continued at 3.0% YoY - on pace with the third quarter (2.2% quarterly annualized rate). Forecasts for 2019 U.S. growth have weakened. The U.S. economy is expected to grow at a 2.4% pace in 2019, according to the Survey of Professional Forecasters, while the Federal Reserve expects 2.1% growth this year. [p. 8](#)
- In March, negotiations resumed between U.S. and Chinese trade delegations. The dialogue was viewed as constructive, and optimism picked up for a trade resolution being reached in the near-to-intermediate future. The two sides have yet to agree on a formal timeline. [p. 16](#)

## PORTFOLIO IMPACTS

- The Federal Open Market Committee reiterated its “patient” approach to policy, leaving rates unchanged, helping to push asset prices upward. Chairman Powell announced that starting in May the balance sheet runoff would slow from \$50 to \$30 billion a month, and would end in September. [p. 19](#)
- Risk assets exhibited strong performance over the quarter. U.S. equities delivered the greatest gains (S&P 500 +13.6%, MSCI ACWI +12.2%), reversing U.S. underperformance in Q4 2018 (S&P 500 -13.5%, MSCI ACWI -12.8%). This was followed by riskier credit with high single-digit returns, and safer credit and government bonds with low single-digit returns. [p. 46](#)

## THE INVESTMENT CLIMATE

- The first quarter was nearly a mirror image of 2018 Q4, as many assets retraced losses of the prior quarter. [p. 38](#)
- Declining long-term Treasury yields following the Fed meeting in March briefly caused the yield curve to invert, meaning that short-term yields (3-month) were higher than long-term yields (10-year). Investors have expressed concerns that this may signal a near term recession. We believe these concerns are overblown. [p. 21](#)
- The House of Commons in the British Parliament briefly took control of their government’s legislative agenda, but failed to reach a majority vote on a path forward. On April 10th, British Prime Minister Theresa May and the European Council agreed to extend the Brexit deadline from April 12th to October 31st. [p. 17](#)

## ASSET ALLOCATION ISSUES

- All major asset classes delivered positive performance in Q1, a refreshing change of pace from broad-based losses experienced in 2018. [p. 46](#)
- Economic conditions around the world have exhibited a weakening trend, leading to the question of whether a turn in the economic cycle is near. The first quarter was more mixed with strength in places, easing some concern. We remain watchful of this weakening trend, but believe the economy and market may have more room to run. [p. 17](#)

A neutral risk stance may be appropriate in today’s environment

# What drove the market in Q1?

## “Central banks take to stage as dovish outlooks spread”

### MARKET EXPECTATIONS FOR 1-YEAR CHANGE IN FED FUNDS RATE (BPS)

Oct	Nov	Dec	Jan	Feb	Mar
62	48	10	-10	-5	-31

Article Source: Bloomberg, February 16<sup>th</sup>, 2019

## “Slowing earnings growth, gloomy forecasts add to stock market’s woes”

### S&P 500 INDEX 12-MONTH FORWARD EPS ESTIMATE (\$)

Oct	Nov	Dec	Jan	Feb	Mar
175	175	174	171	171	172

Article Source: Wall Street Journal, January 13<sup>th</sup>, 2019

## “Part of the yield curve inverts as 3-month yield tops 10-year rate”

### 10-YEAR MINUS 3-MONTH TREASURY YIELD SPREAD (BPS)

Oct	Nov	Dec	Jan	Feb	Mar
82	65	33	25	28	2

Article Source: CNBC, March 22<sup>nd</sup>, 2019

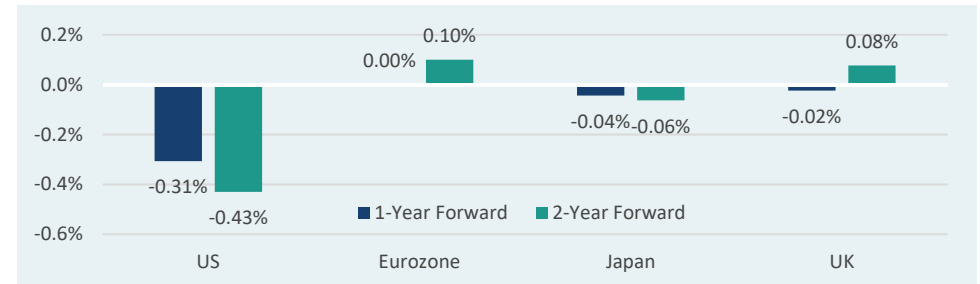
## “World markets hit 2019 high amid trade war optimism”

### NUMBER OF GOOGLE NEWS ARTICLES WITH ‘TRADE OPTIMISM’ IN TITLE

Oct	Nov	Dec	Jan	Feb	Mar
5	24	31	92	116	96

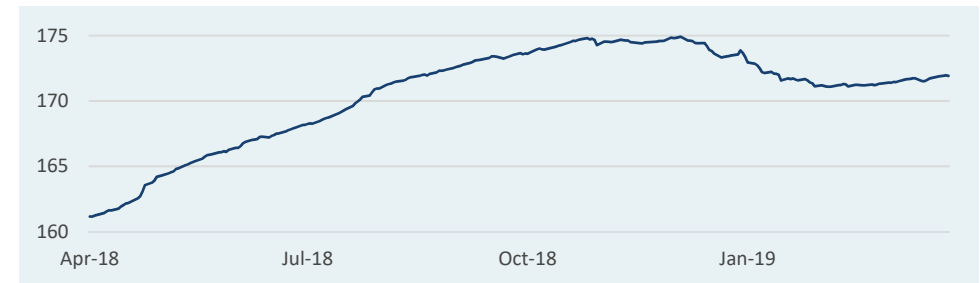
Article Source: The Guardian, February 18<sup>th</sup>, 2019

### MARKET EXPECTATIONS FOR CHANGES IN SHORT-TERM RATES



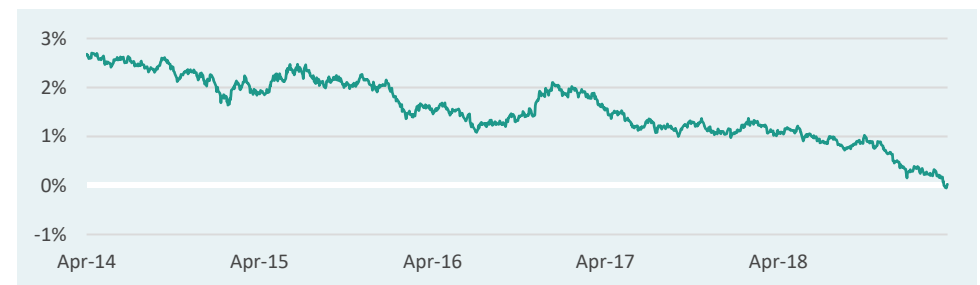
Source: Bloomberg, as of 4/2/19

### S&P 500 INDEX 12-MONTH FORWARD EPS ESTIMATE



Source: Bloomberg, as of 3/31/19

### 10-YEAR MINUS 3-MONTH TREASURY YIELD SPREAD



Source: Bloomberg, as of 3/31/19

# Economic environment

# U.S. economics summary

- Real GDP growth continued at 3.0% YoY, on pace with the third quarter (2.2% on a quarterly annualized rate).
- Forecasts for 2019 U.S. growth have weakened. The U.S. economy is expected to grow at a 2.4% pace in 2019, according to the Survey of Professional Forecasters, while the Federal Reserve expects 2.1% growth this year.
- In March, negotiations resumed between U.S. and Chinese trade delegations. The dialogue was viewed as constructive, and optimism picked up for a formal trade resolution being reached in the near future.
- U.S. inflation remained near the 2.0% Fed target. After dipping to 1.5% YoY in February, headline inflation recovered to 1.9% in March, resulting in no change over the quarter.
- Average hourly earnings grew 3.2% YoY in March, missing expectations of 3.3%. A slight tick up in the average non-farm private workweek from 34.4 to 34.5 hours likely contributed to the cooler wage data.
- The labor market remained strong in Q1. U-3 unemployment fell to 3.8% from 3.9% in December, though the labor force participation rate weakened from 63.1% to 63.0% during the period.
- The Federal Open Market Committee reiterated its “patient” approach to policy, leaving rates unchanged. Expectations for 2019 GDP growth and rate hikes were cut, and markets rallied. Chairman Powell announced that starting in May the balance sheet runoff would slow from \$50 billion per month to \$30 billion, and would end in September.

	Most Recent	12 Months Prior
GDP (YoY)	3.0% 12/31/18	2.5% 12/31/17
Inflation (CPI YoY, Core)	2.0% 3/31/19	2.1% 3/31/18
Expected Inflation (5yr-5yr forward)	2.0% 3/31/19	2.2% 3/31/18
Fed Funds Target Range	2.25 – 2.50% 3/31/19	1.50 – 1.75% 3/31/18
10 Year Rate	2.4% 3/31/19	2.7% 3/31/18
U-3 Unemployment	3.8% 3/31/19	4.0% 3/31/18
U-6 Unemployment	7.3% 3/31/19	7.9% 3/31/18

# GDP growth

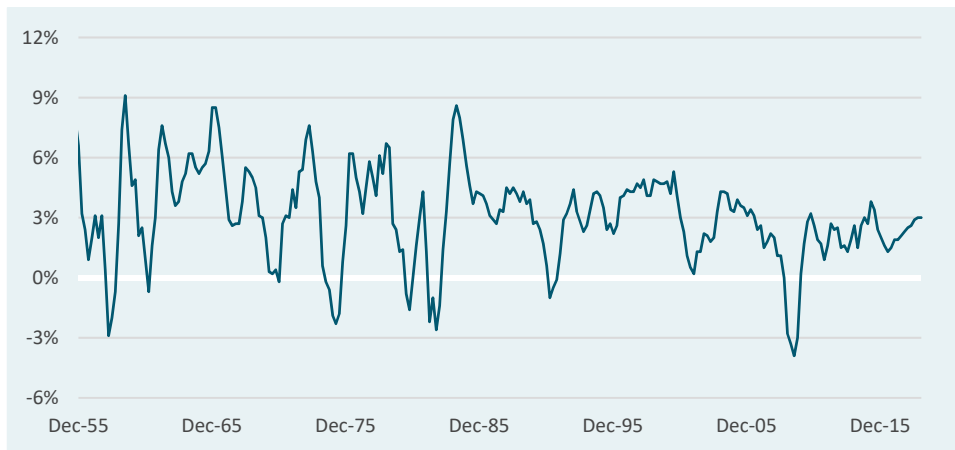
Real GDP growth continued at 3.0% YoY, on pace with growth in the third quarter (2.2% on a quarterly annualized rate). Consumption was the greatest contributor to real GDP growth.

The U.S. economy faces multiple headwinds, including the broad impacts of slowing global growth, fading of 2018 fiscal stimulus, and a tight labor market which constrains further upside from employment gains. While the U.S. is in a strong position relative to other developed nations, the economy is expected to grow at a 2.4% pace in 2019 according to a

survey of professional forecasters. The Federal Reserve expects 2.1% growth this year.

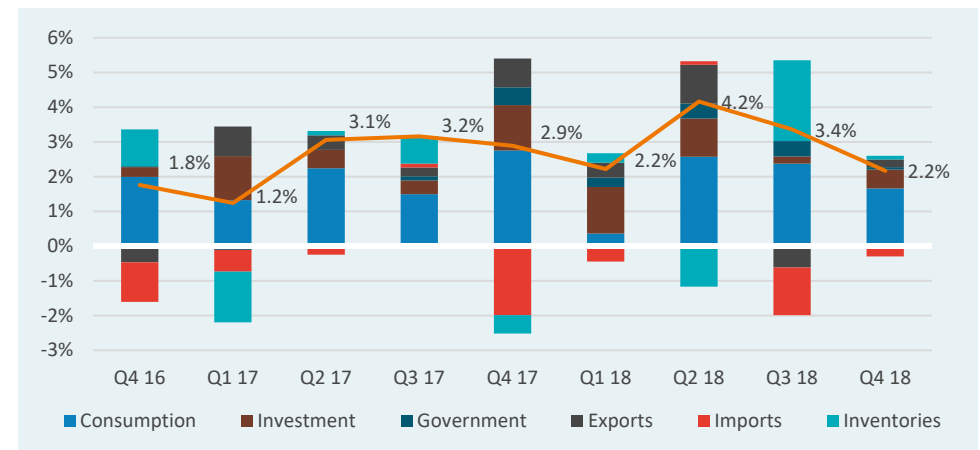
The Trump administration appears to have succeeded in reaching its 3% U.S. growth target during 2018. The Tax Cuts & Jobs Act helped stimulate the economy in the form of reduced taxes for individuals, which increased after-tax incomes and greatly reduced corporate tax burdens. These changes likely had positive impacts on worker wages and spurred recent capital investment.

**U.S. REAL GDP GROWTH (YOY)**



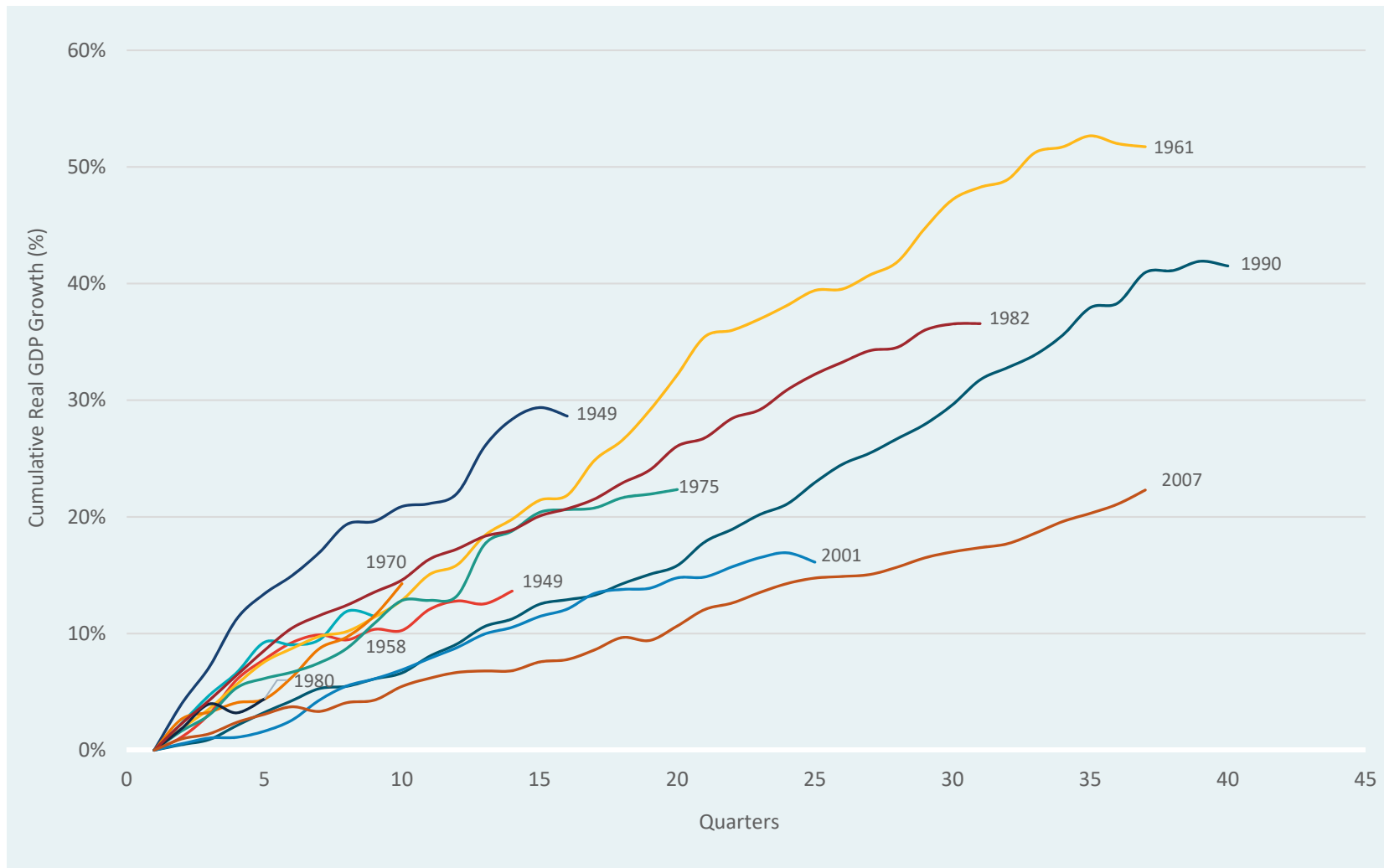
Source: Bloomberg, as of 12/31/18

**U.S. GDP GROWTH ATTRIBUTION**



Source: BEA, annualized quarterly rate, as of 12/31/18

# A long but moderate expansion



The current economic cycle is just three quarters shy of matching the longest expansion on record

Source: FRED, Verus, as of 12/31/18 – each expansion is labeled with the starting year of expansion

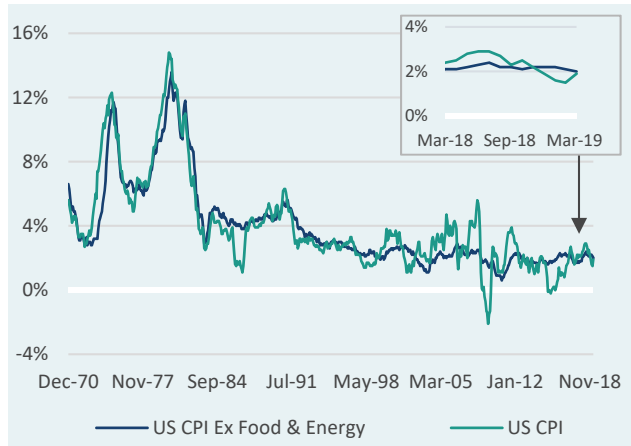
# Inflation

U.S. inflation remained near the Federal Reserve's 2.0% target. After dipping to 1.5% YoY in February, headline CPI recovered to 1.9% in March, unchanged over the quarter. Core CPI, which removes the impact of energy and food prices, continued to ease, falling to 2.0% YoY at quarter-end. Moderate inflation around 2% has helped justify the Fed's recent pause in monetary tightening and has allowed for a patient approach. A material shift in either direction might place Fed officials in a difficult position, and should be watched closely.

Inflation in services was the sole contributor to the year-over-year growth in CPI as goods prices were unchanged during the period. Within services, shelter prices (+3.4% YoY) continued to be the main driver of inflation.

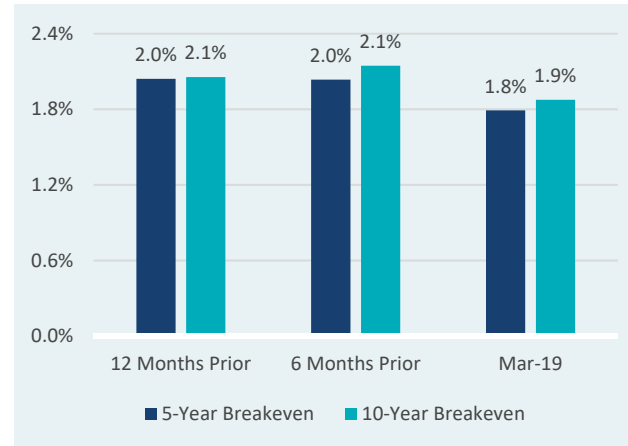
Market participants' expectations for future inflation recovered from depressed levels after falling sharply last quarter. The 10-year TIPS breakeven inflation rate rose 22 bps to 1.93%. Meanwhile, consumers' view of future inflation moderated from 2.7% to 2.5% as indicated by the University of Michigan survey.

**U.S. CPI (YOY)**



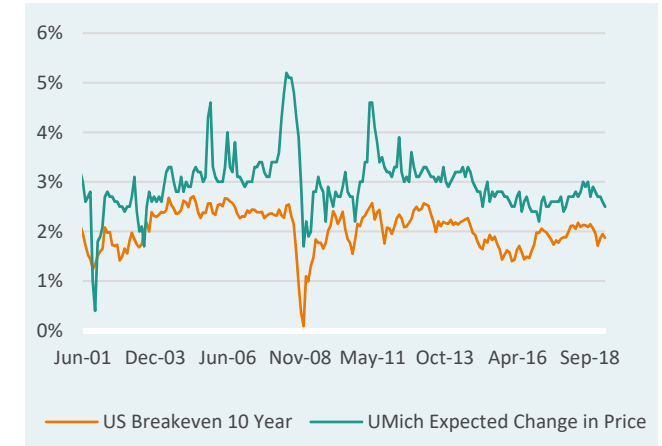
Source: Bloomberg, as of 3/31/19

**BREAKEVEN INFLATION RATES**



Source: FRED, as of 3/31/19

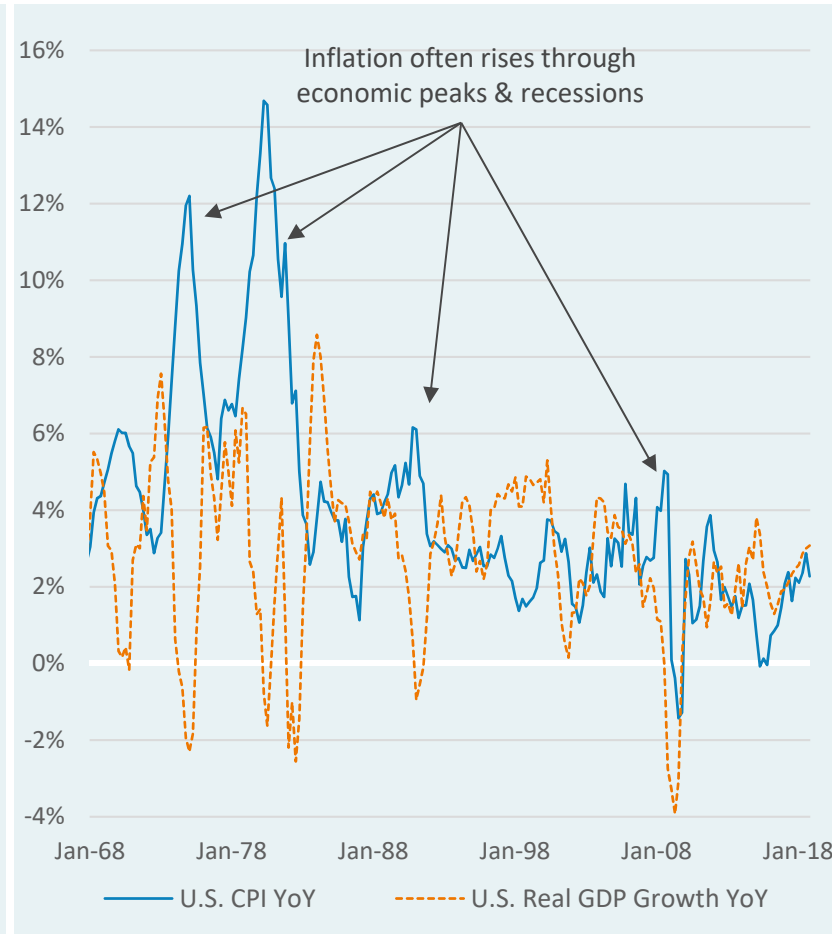
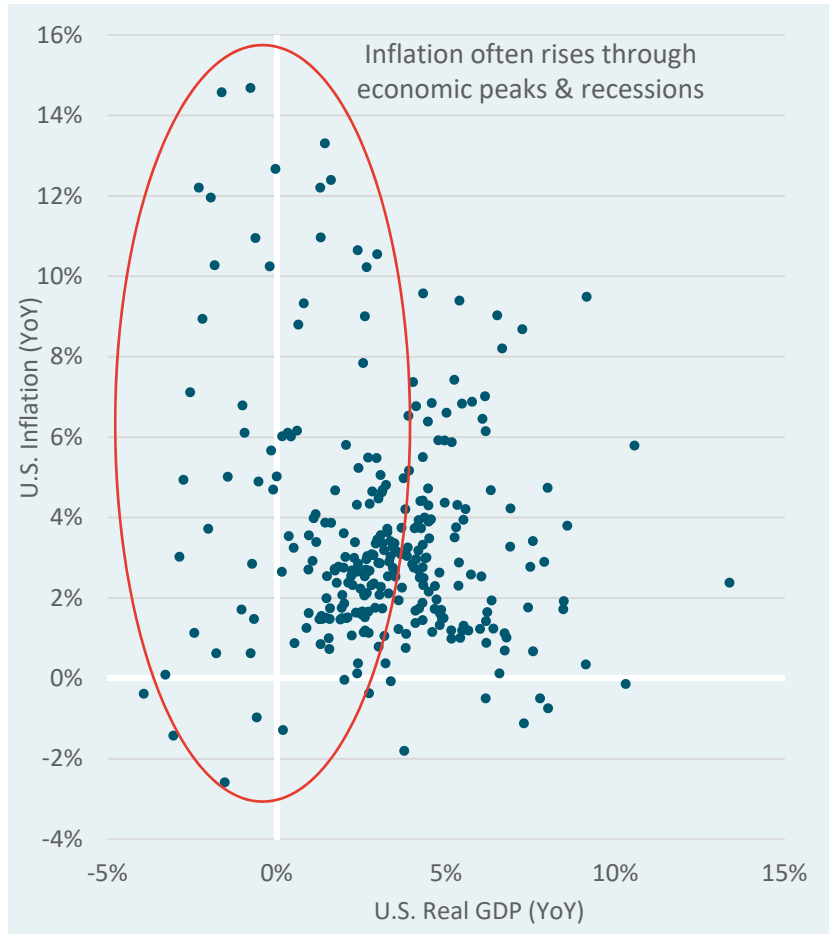
**INFLATION EXPECTATIONS**



Source: Bloomberg, as of 3/31/19

# Relationship – inflation & growth

Inflation risk has been more acute during late cycle & recession



History suggests inflation risks are still present at the later stage of the economic cycle

Source: FRED, Verus

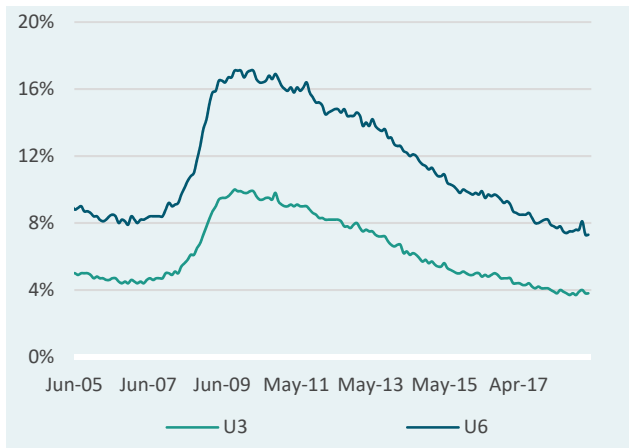
# Labor market

Although there was some month-to-month volatility in job growth during the quarter, net additions to non-farm payrolls averaged 180,000 per month. Meanwhile, the U-3 unemployment rate fell slightly from 3.9% to 3.8%, just above the cycle low of 3.7%. The U-6 unemployment rate, which includes underemployed and discouraged workers, fell to a cycle low of 7.3%. The spread between the U-6 and U-3 unemployment rates compressed from 3.7% to 3.5%, the smallest difference since 2006. The decline in underemployed and discouraged workers indicates a further tightening of the labor market.

Wages continued to grow at a modest pace, but not fast enough to warrant concern over corporate margin deterioration or a flow through to general price inflation. In March, average hourly earnings rose 3.2% from 12 months ago.

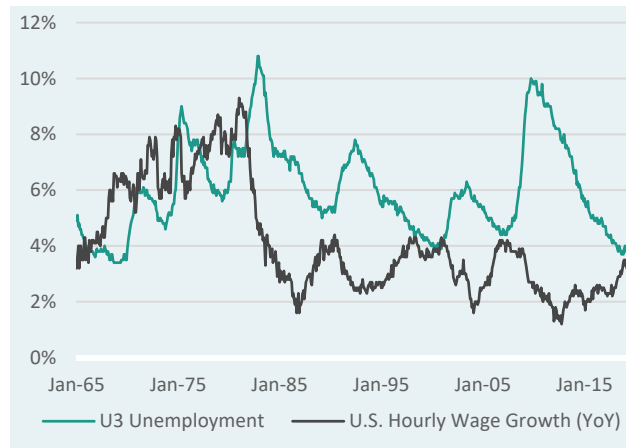
Given the relatively few number of unemployed persons and high percentage of companies reporting that jobs are hard to fill, we believe it may be difficult for job growth to continue at its recent strong rate.

**UNEMPLOYMENT RATE**



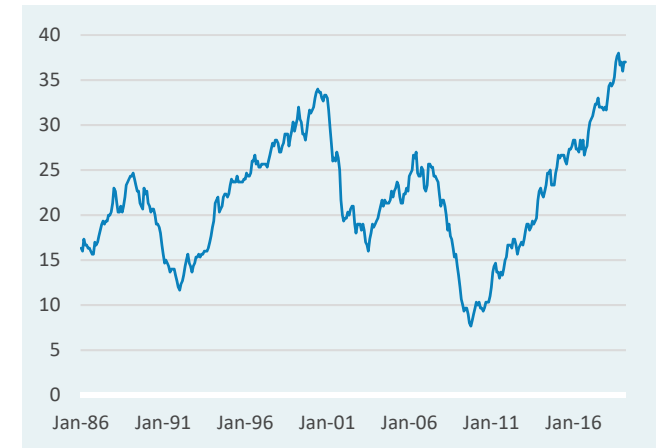
Source: FRED, as of 3/31/19

**LONG-TERM EMPLOYMENT & WAGE GROWTH**



Source: Bloomberg, as 3/31/19

**NFIB: JOBS HARD TO FILL (3-MONTH AVG)**



Source: NFIB, as of 3/31/19, net % of small businesses reporting that open positions are hard to fill

# The consumer

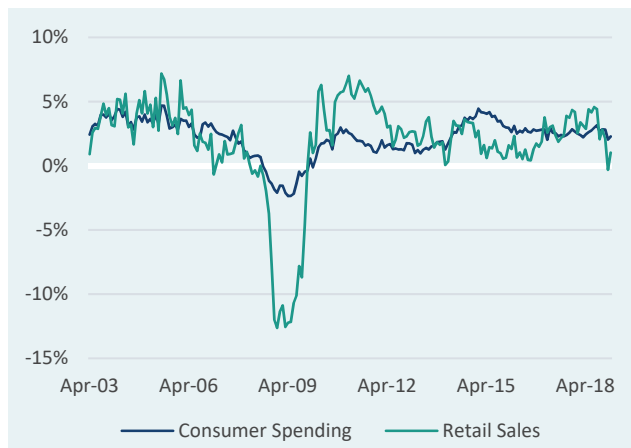
February retail sales grew 2.2% year-over-year, rebounding from a sharp slowdown in the fourth quarter. Real consumer spending continued along at a modest 1.8% pace from the previous year.

Further labor market strength, wage gains, and low interest rates would likely provide support for spending. Consumer behavior remains conservative relative to past cycles, as indicated by broad spending and borrowing patterns. While consumer credit growth has been fairly muted, other specific spending areas such as auto sales were very strong in recent

years – perhaps as consumers played catch-up from restrained purchases during the global financial crisis.

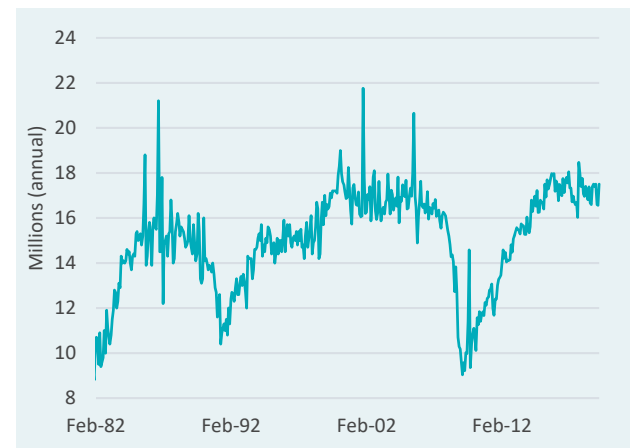
In 2018, there were rising concerns that higher interest rates would squeeze budgets and lead to a slowdown in spending and business activity. These fears have subsided as interest rates have fallen back to previous levels and the Federal Reserve is not expected to raise rates in the near future.

## REAL CONSUMER SPENDING & RETAIL SALES GROWTH (YOY)



Source: Bloomberg, as of 1/31/19

## AUTO SALES



Source: FRED, as of 3/31/19

## CONSUMER CREDIT OUTSTANDING (YOY)



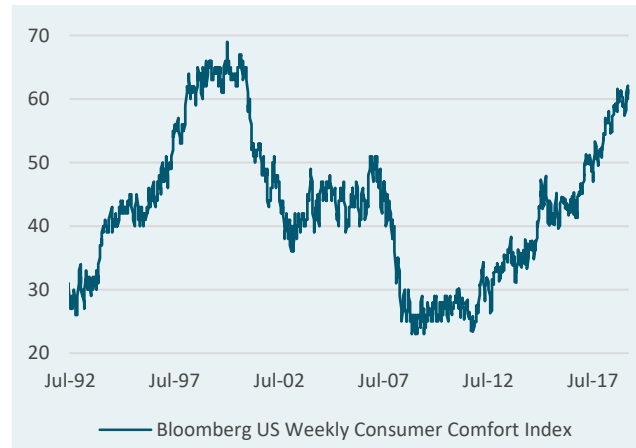
Source: Federal Reserve, as of 2/28/19

# Sentiment

Consumer sentiment indicators fell sharply in January before rebounding in February and March. The fall in sentiment early in the year was driven by more muted consumer expectations of future growth, influenced by the sell-off in global equity markets and the extended U.S. government shutdown. However, the University of Michigan Consumer Sentiment Index finished the quarter at 98.4, slightly above its December reading and the Bloomberg Consumer Comfort Index was at a cycle high.

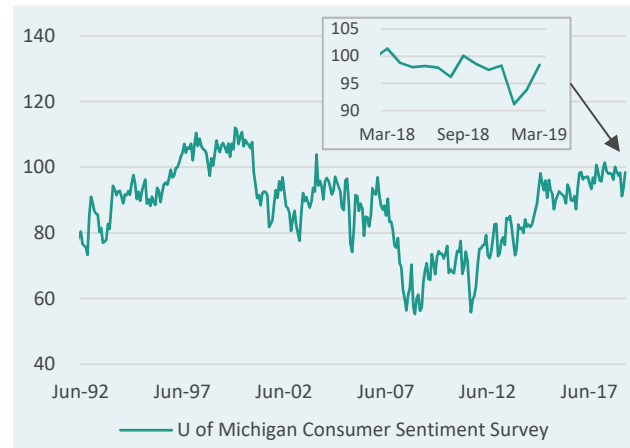
Small business sentiment continued to trend lower from historically strong levels. The NFIB Small Business Optimism Index dipped from 104.4 in December to 101.8 in March. The March reading of 101.8 ranked in the 79<sup>th</sup> percentile based on 45 years of history. Small business owners' expectations of future economic conditions moderated further in the first quarter. A net 11% of small businesses expected the economy to improve, down from 16% at the end of last year and 50% at the end of 2016.

**CONSUMER COMFORT INDEX**



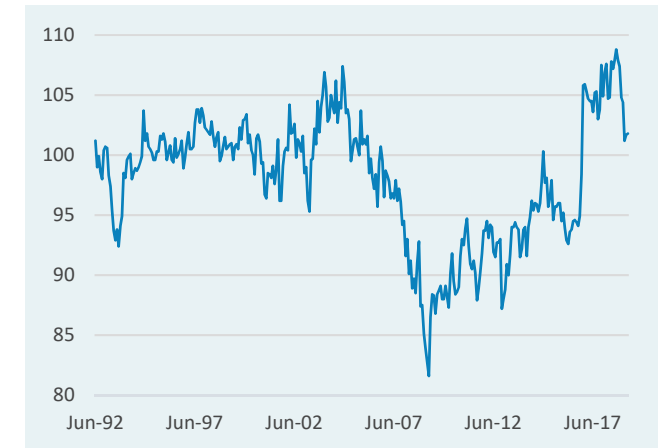
Source: Bloomberg, as of 3/24/19 (see Appendix)

**CONSUMER SENTIMENT**



Source: University of Michigan, as of 3/31/19 (see Appendix)

**NFIB SMALL BUSINESS OPTIMISM INDEX**



Source: NFIB, as of 3/31/19 (see Appendix)

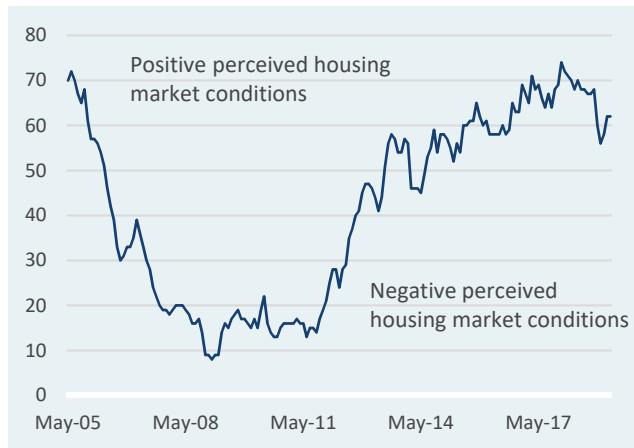
# Housing

The U.S. housing market remains strong, though higher prices have dampened affordability and led to less demand. Rising interest rates in the fourth quarter generated fear of a housing slowdown, as borrowing costs have a large impact on home purchase activity. However, a reversal of monetary policy from expected tightening to expected neutrality (or easing) has placed downward pressure on the 30-year fixed mortgage rate. Given the importance of borrowing costs on housing demand, the move from 4.95% borrowing rates (peak reached in Q4) to 4.05% at the end of Q1 should ease concerns of a slowdown and bolster buying activity.

The National Association of Homebuilders (NAHB) Housing Market Index, based on a monthly survey of NAHB members designed to take the pulse of the single-family housing market, improved from 56 to 62 – above the neutral level of 50.

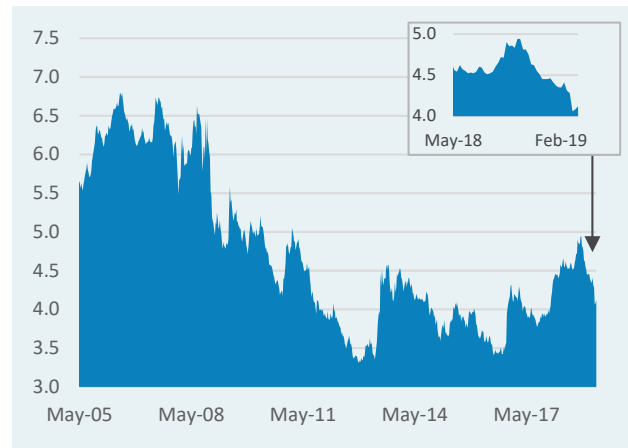
Home prices have faltered a bit, with the median U.S. home sales price falling -6.1% year-over-year in Q4. As is often the case, home price trends can vary significantly from city to city, which makes annual summary statistics difficult to interpret on a local level.

**NAHB HOUSING MARKET INDEX**



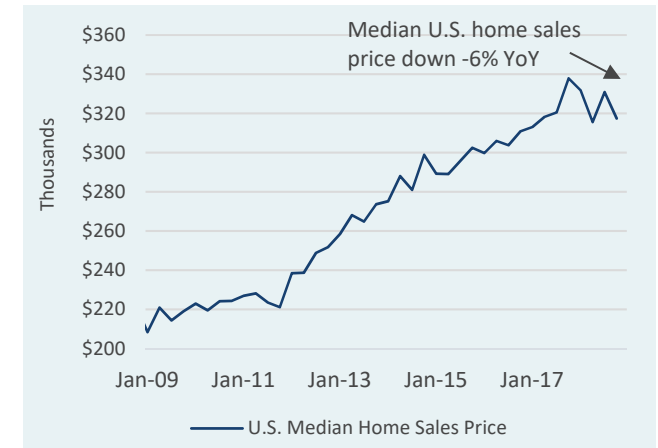
Source: Bloomberg, NAHB, as of 3/31/19 (see appendix)

**30-YEAR FIXED MORTGAGE RATE**



Source: FRED, as of 3/31/19

**MEDIAN U.S. HOME SALES PRICE**



Source: FRED, as of 12/31/18

# International economics summary

- Global growth expectations for the next two years were revised materially lower in Q1. The OECD's global GDP growth forecast for 2019 and 2020 fell from 3.5% to 3.3%, and from 3.5% to 3.4%, respectively.
- In March, negotiations resumed between high-level U.S. and Chinese trade delegations. The dialogue was viewed as constructive, and optimism picked up for some sort of formal trade resolution being reached in the near-to-intermediate future, although the two sides have yet to agree on a formal timeline.
- The German Manufacturing PMI fell from 47.6 to 44.1 in March, falling further into the contractionary territory below 50. New orders and export sales data came in weaker than expected which contributed to a more pessimistic outlook for German manufacturing activity.
- The House of Commons in the British Parliament briefly took control of their government's legislative agenda, but failed to reach a majority vote on a path forward. On April 10th, British Prime Minister Theresa May and the European Council agreed to extend the Brexit deadline from April 12th to October 31st.
- The spread between the JP Morgan Global Services and Manufacturing PMIs rose to 3.1 in March. Last March, the spread was at 0.0, indicating that over the past year the outlook for global manufacturing activity has weakened relative to the outlook for global services activity. Typically, services activity is more resilient to a worsening economic backdrop.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	3.0% 12/31/18	1.5% 2/28/19	3.8% 3/31/19
Eurozone	1.1% 12/31/18	1.4% 3/31/19	7.8% 2/28/19
Japan	0.3% 12/31/18	0.2% 2/28/19	2.3% 2/28/19
BRICS Nations	5.8% 12/31/18	2.4% 3/31/19	5.3% 12/31/18
Brazil	1.1% 12/31/18	3.9% 2/28/19	12.2% 3/31/19
Russia	2.7% 12/31/18	5.3% 3/31/19	4.9% 2/28/19
India	7.2% 12/31/18	2.6% 2/28/19	8.5% 12/31/17
China	6.4% 12/31/18	1.5% 2/28/19	3.8% 12/31/18

# International economics

Global economic growth trended lower over the past quarter. Most of the world experienced a deceleration in inflation, while labor markets showed moderate improvement. Global central banks took a more dovish stance in response to these conditions, which contributed to a sharp decline in global sovereign yields in March.

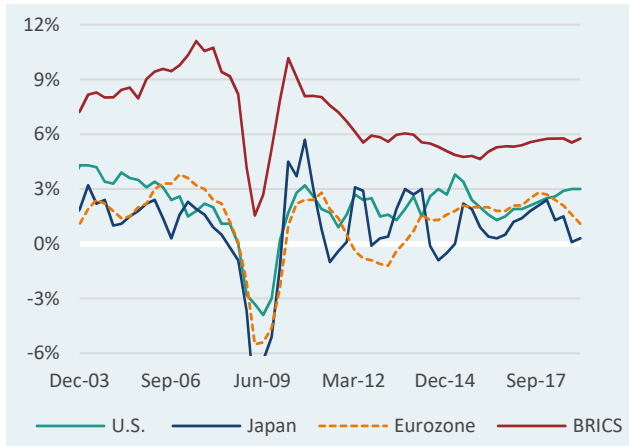
Real GDP in the Eurozone decelerated in Q4 from 1.6% to 1.1% YoY as the region continued to show weakness. Uncertainty surrounding Brexit, and the dependence of European economies on China likely factored into the regional outlook. Additionally, Europe faces significant

structural issues which are important to monitor, though perhaps not immediate in nature. As the ECB begins to discuss a tiered, sub-zero interest rate regime, the inability of EU members to pursue their own fiscal and monetary policies could prolong economic slowdowns and undermine subsequent recoveries.

Global growth forecasts were revised lower

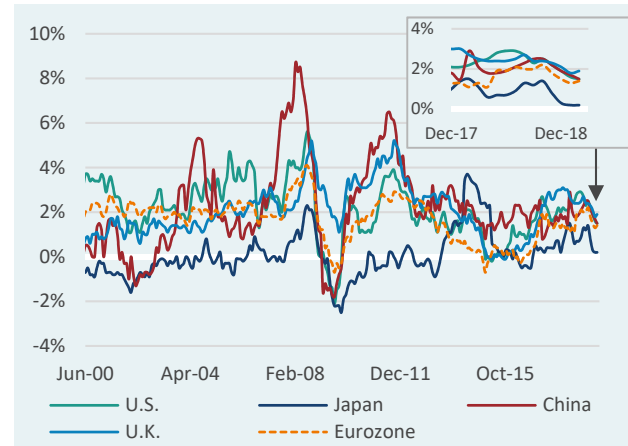
Following the failure of the House of Commons in British Parliament to agree on a Brexit strategy through “indicative votes”, Prime Minister Theresa May negotiated an extension of the Brexit deadline from April 12<sup>th</sup> to October 31<sup>st</sup>.

**REAL GDP GROWTH (YOY)**



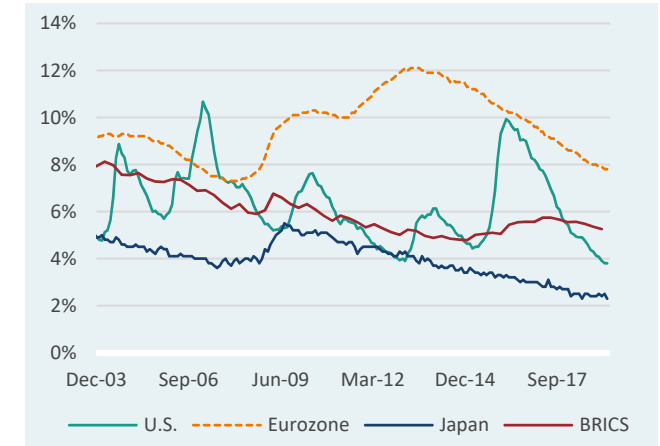
Source: Bloomberg, as of 12/31/18

**INFLATION (CPI YOY)**



Source: Bloomberg, as of 2/28/19

**UNEMPLOYMENT RATE**



Source: Bloomberg, as of 2/28/19 or most recent release

# Fixed income rates & credit

# Interest rate environment

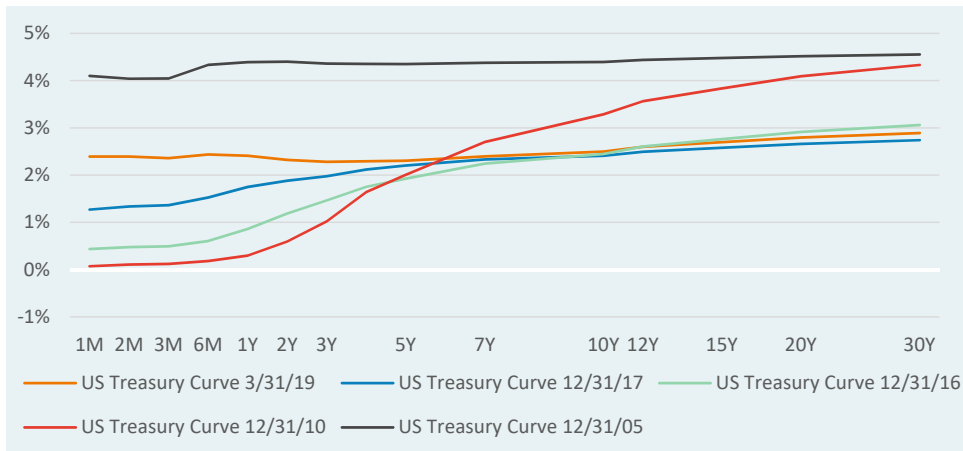
- The Federal Reserve held the fed funds rate unchanged over the quarter, and communicated a much more dovish stance on monetary policy amid slower growth expectations and stable inflation near 2%.
- Fed officials lowered their collective expectations for rate hikes in 2019 from two to zero, and announced that the balance sheet unwind would conclude in September, much earlier than previously anticipated.
- More dovish expectations for monetary policy and concerns over economic growth likely helped push long-term Treasury yields lower. The 10-year yield fell 28 bps to just above 2.4%.
- Falling long-term yields and stable short-term yields led to a brief inversion of the Treasury curve between the 10-year and 3-month yields.
- While widely considered a bearish signal for the economy and risk markets, the timing between curve inversion and bearish economic and market environments has varied widely. Additionally, Fed asset purchases of long-term Treasuries has artificially lowered yields and muddled the information conveyed by the yield curve.
- The ECB also pivoted to a more dovish stance as officials announced that deposit rates will be on hold through at least the end of the year.
- The 10-year German bund yield dipped back into negative territory for the first time since late 2016.
- Emerging market local bonds offer attractive yields relative to developed markets, even after adjusting for inflation. The JPM GBI-EM Index yielded 7% at the end of March.

Area	Short Term (3M)	10-Year
United States	2.39%	2.41%
Germany	(0.53%)	(0.07%)
France	(0.54%)	0.32%
Spain	(0.40%)	1.10%
Italy	(0.20%)	2.49%
Greece	0.87%	3.73%
U.K.	0.80%	1.00%
Japan	(0.17%)	0.08%
Australia	1.68%	1.77%
China	2.08%	3.07%
Brazil	6.31%	8.97%
Russia	7.35%	8.41%

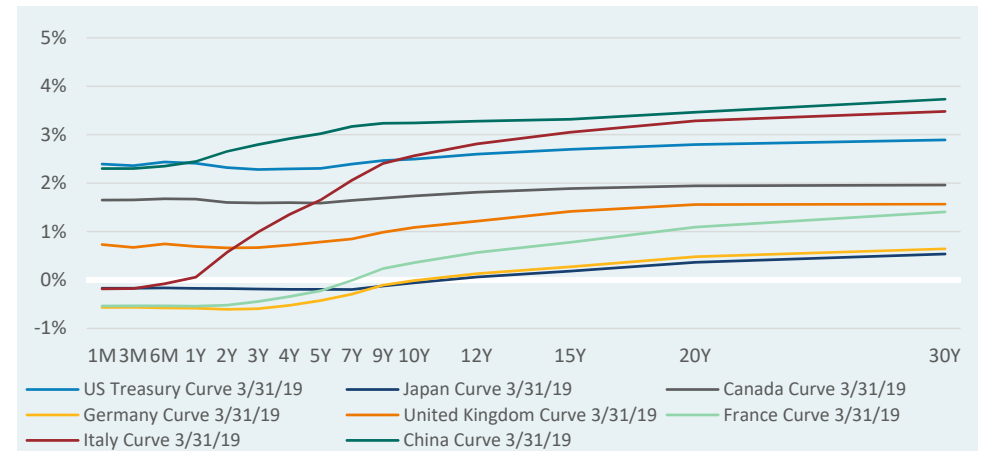
Source: Bloomberg, as of 3/31/19

# Yield environment

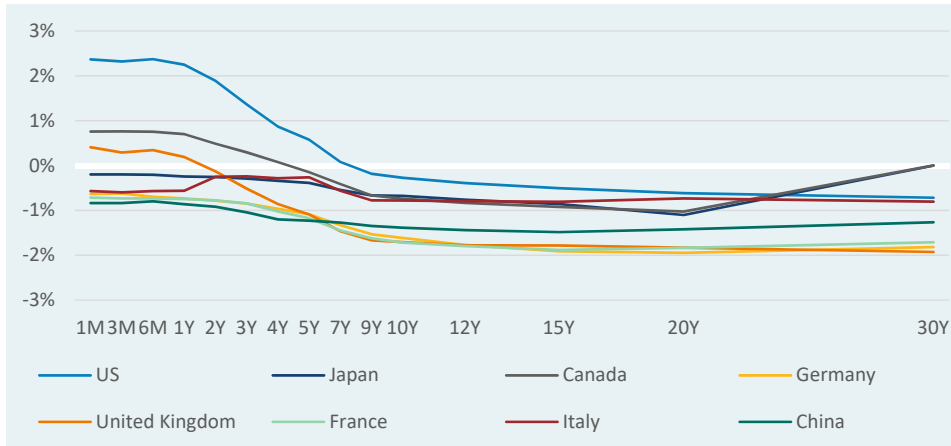
## U.S. YIELD CURVE



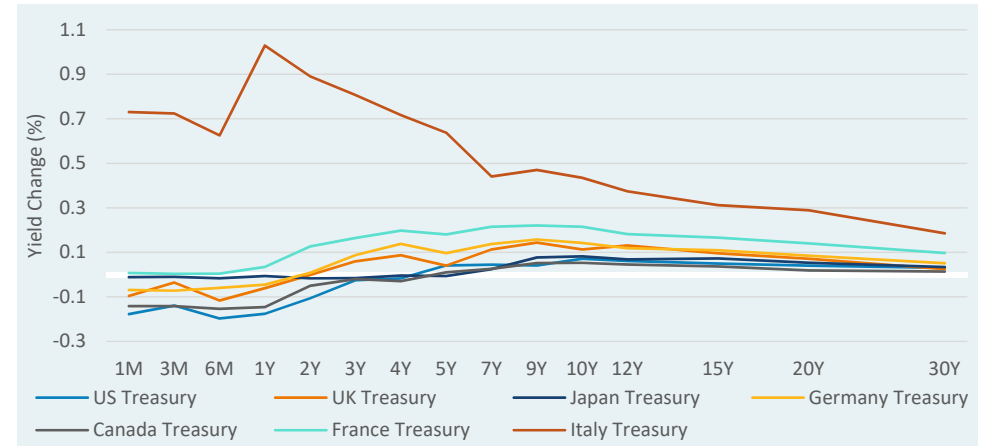
## GLOBAL GOVERNMENT YIELD CURVES



## YIELD CURVE CHANGES OVER LAST FIVE YEARS



## IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 3/31/19

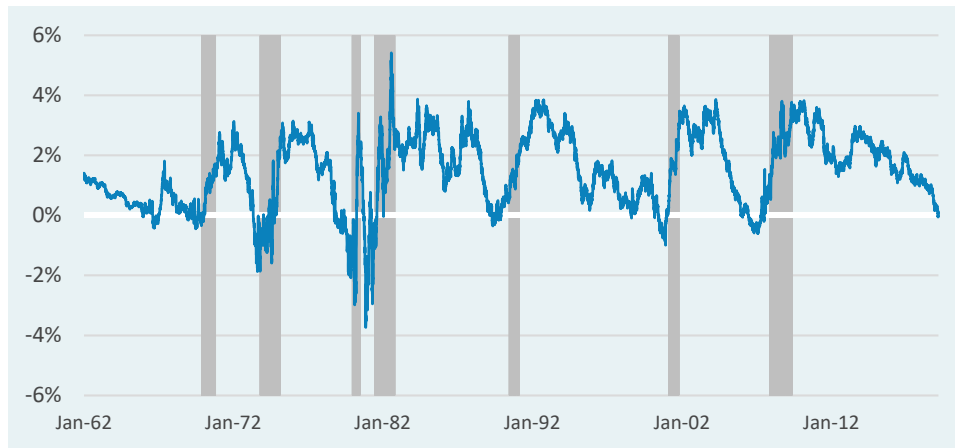
# Yield curve inversion

The drop in long-term Treasury yields following the Fed meeting in March briefly caused the yield curve to invert, meaning that short-term yields (3-month) were higher than long-term yields (10-year). Investors have widely considered yield curve inversion as a sign that the economic cycle is coming to an end. At a high level, the shape of the yield curve tells investors something about what the market is expecting. All else equal, when the curve is steep, markets are expecting a positive growth environment and when the curve is flat or inverted, markets are expecting a negative growth environment.

While we have previously noted that the wide range of timing between curve inversion and recession has made the signal less useful, it is also important to note that the Fed's purchases of Treasuries has artificially lowered long-term yields. Therefore, Fed policy has obscured the market's expectation of future growth that is embedded in the shape of the yield curve. Although we are always wary of "this time is different" arguments, we believe that the recent yield curve inversion is not signaling an imminent recession.

The information conveyed by the shape of the yield curve has been obscured by Fed asset purchases

## 10-YEAR MINUS 3-MONTH TREASURY YIELD CURVE



Source: Bloomberg, as of 3/31/19, recessions are shaded with the dates defined by NBER

## TIME FROM CURVE INVERSION TO THE NEXT RECESSION

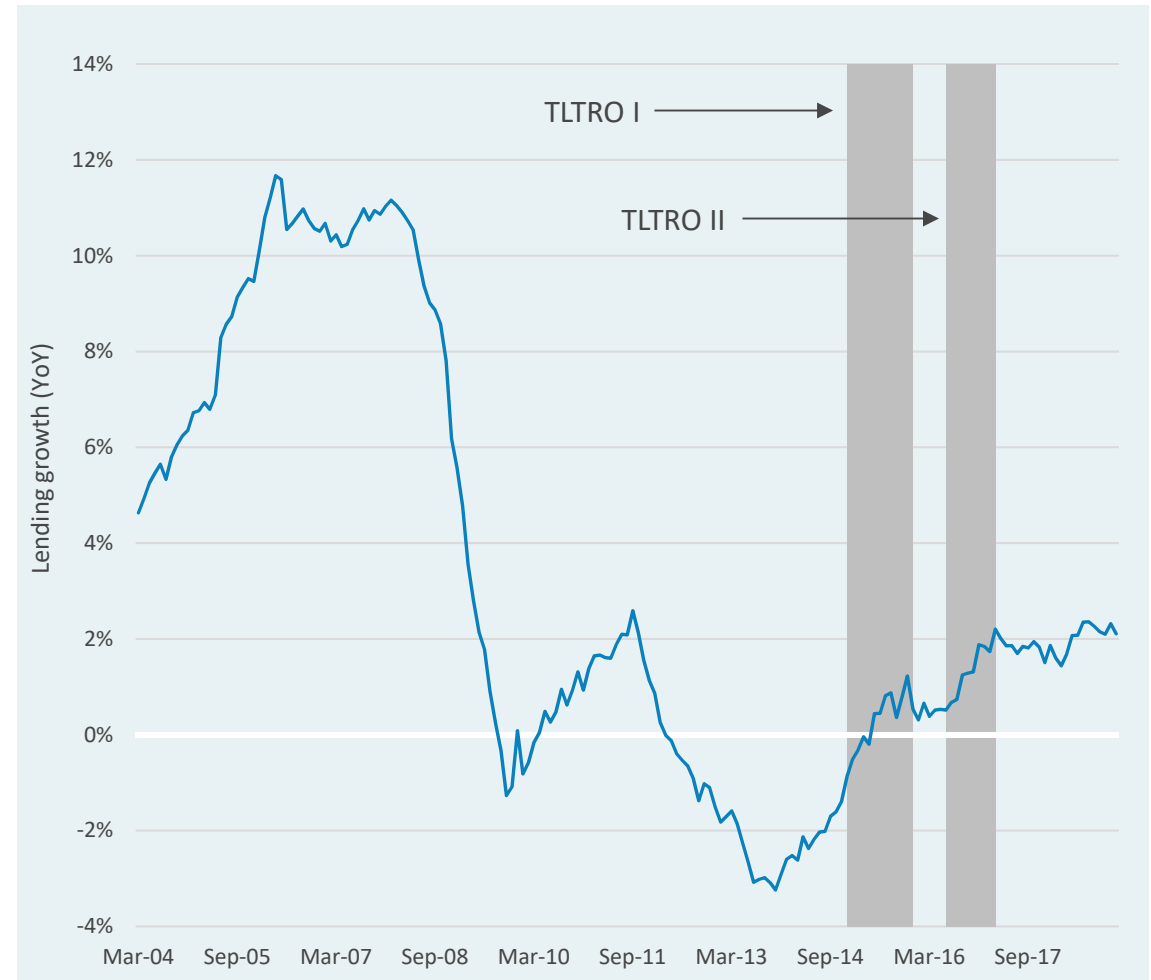
Start of Curve Inversion	Beginning of Next Recession	Months From Inversion to Recession
Jan-66	Dec-69	23
Dec-68	Dec-69	12
Jun-73	Nov-73	5
Nov-78	Jan-80	14
Oct-80	Jul-81	9
Mar-89	Jul-90	15
Jul-00	Mar-01	8
Jan-06	Dec-07	23
<b>Average</b>		<b>13.6</b>

Source: Bloomberg, recession dates defined by NBER

# Eurozone monetary policy

- The European Central Bank (ECB) followed the Fed by pivoting to a more dovish monetary policy stance amid expectations of slower economic growth and muted inflation. ECB officials' latest growth forecasts show they expect only 1.1% real GDP growth in 2019.
- To counteract a potential growth slowdown, the ECB announced a third round of targeted long-term refinancing operations (TLTRO) and that it will keep deposit rates on hold through at least the end of the year. In the TLTRO program, the ECB gives out cheap short-term financing to banks with incentives for them to lend this money out to corporations and households.
- A total of €739 billion were lent out in the first two rounds of TLTROs, which helped lead to a modest pick up in bank lending growth. While this round of TLTROs may lead to banks rolling over previous loans, it is not likely to result in a significant increase in lending as the Eurozone already has ample liquidity and credit demand remains weak.
- Despite these recent steps, the ECB has limited ability to effectively ease. This puts the region at risk of a self-reinforcing downturn if conditions were to worsen, particularly since countries also have little room to provide fiscal stimulus.

EUROZONE BANK LENDING TO HOUSEHOLDS & CORPORATES



Source: Bloomberg, as of 1/31/19

# Credit environment

High yield bond yields fell in March, impacted by the Fed's pause in the hiking cycle. Anticipation of an easier policy, which could potentially lengthen the credit cycle, has strengthened sentiment for risk assets. BB-rated bonds outperformed both CCC- and B-rated bonds in March. High yield bonds returned 7.3% YTD which is the strongest start to a calendar year on record for the asset class since 2003.

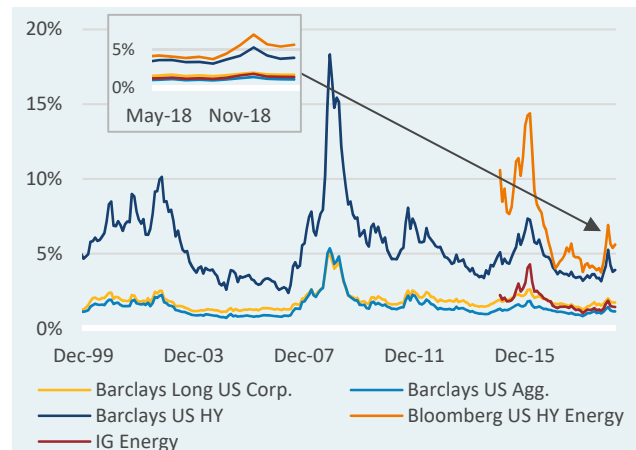
Leveraged loan prices declined during March as the asset class deals with outflows and a pause in the Fed's hiking cycle. The outflows have exceeded \$30 billion over the past two quarters

which represents 20% of assets under management, according to J.P. Morgan. Leveraged loans have returned 3.8% YTD, underperforming both high yield and investment grade bonds.

Based on concerns over late-cycle behavior in credit markets, we do not believe investors are being adequately compensated for credit risk. Late-cycle volatility tends to coincide with a jump in credit spreads and steep credit losses. An underweight to U.S. investment grade, high yield credit, and bank loans may be warranted. Within credit, higher quality and more liquid assets appear most attractive.

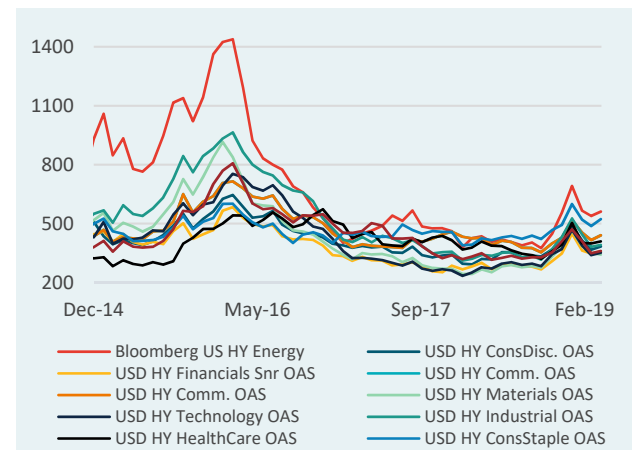
Credit spreads widened due to concerns over slowing global growth and broader risk-off behavior

## SPREADS



Source: Barclays, Bloomberg, as of 3/31/19

## HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 3/31/19

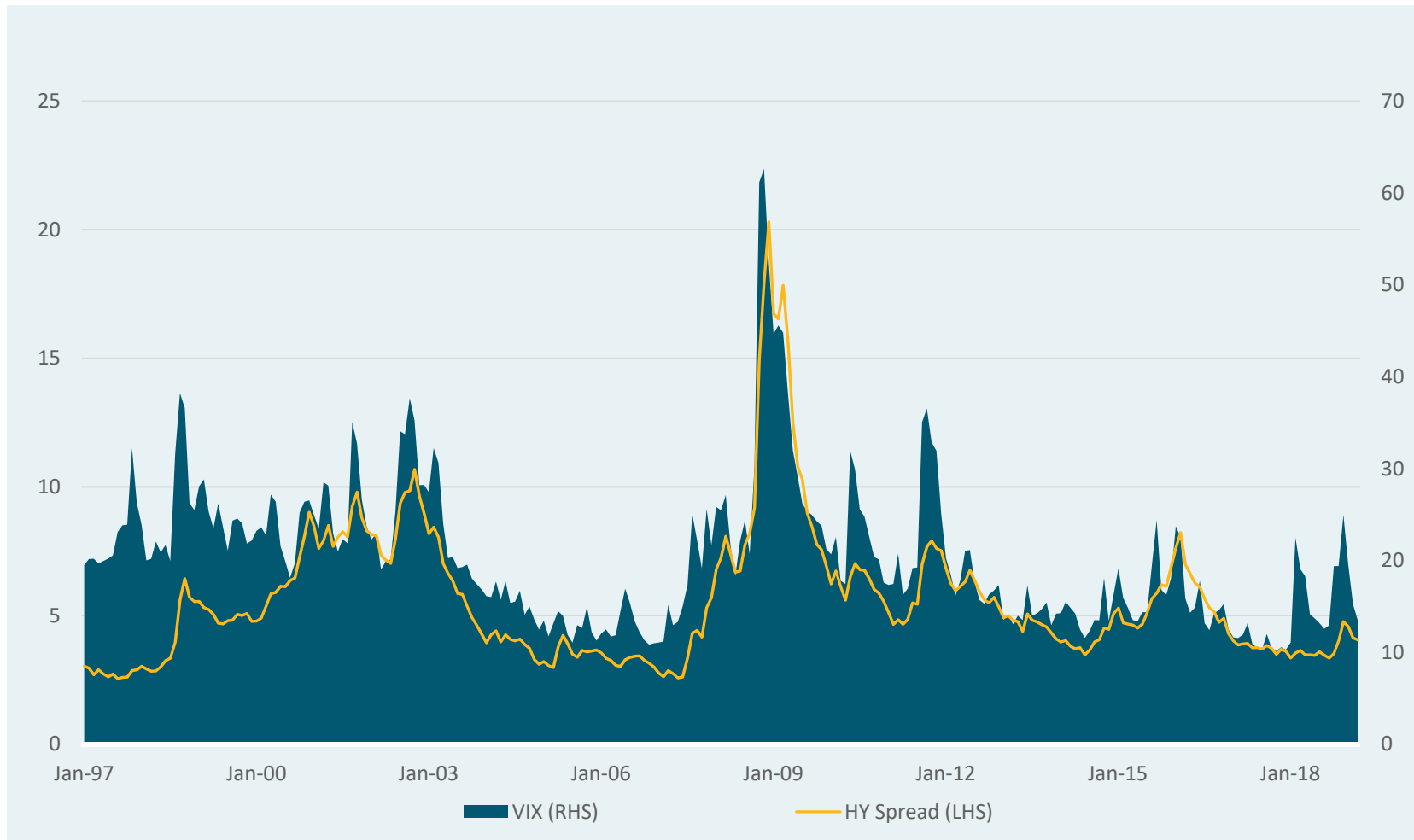
Market	Credit Spread (OAS)	
	3/31/19	3/31/18
Long U.S. Corp	1.7%	1.5%
U.S. Agg Corp	1.2%	1.1%
U.S. High Yield	3.9%	3.5%
U.S. Bank Loans*	4.4%	3.9%

Source: Barclays, Credit Suisse, Bloomberg, as of 3/31/19

\*Discount margin (4-year life)

# Credit is sensitive to equity volatility

HIGH YIELD BOND SPREADS & VOLATILITY



When volatility rises, higher risk credit typically experiences losses

Source: Cboe, FRED, as of 3/31/19

# Default & issuance

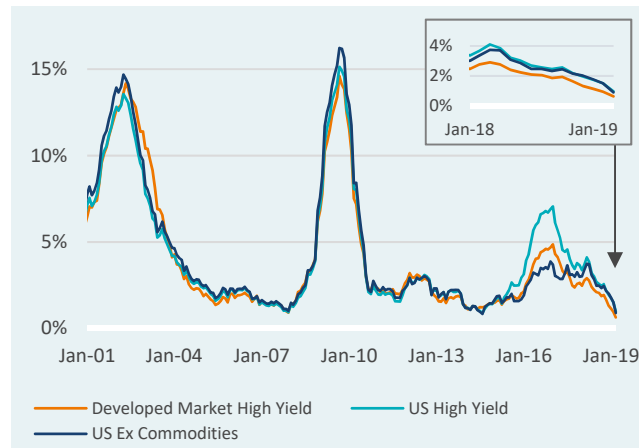
Default activity has been low and stable in the U.S. credit market, despite volatility in spreads. The par-weighted default rate declined to 0.9% and remains below its long-term average range of 3.0-3.5%. For loans, the par-weighted default rate at the end of March was 1.0%, its lowest level since April 2012 (0.8%), according to data from JPMorgan. Sectors that have been more prone to defaults include: consumer, retail, telecom, and automotive. The 2018 loan par-weighted default rate was 1.6%.

Senior loan and high yield markets have essentially

recovered from a wave of defaults seen in 2015-2016 that were generated from the energy and metals/mining sectors. High yield bond recovery rates have improved significantly since that time.

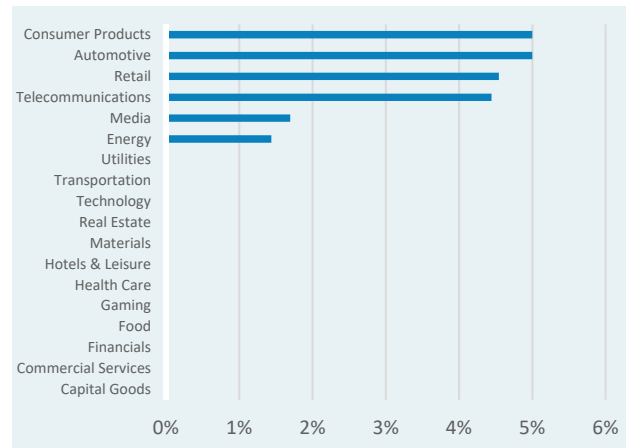
Gross high yield issue activity increased in March to the highest level seen since March of 2018. Loan market issuance is significantly behind last year's pace, likely influenced by a lower demand for floating rate securities now that the Fed has paused monetary tightening.

**HY DEFAULT RATE (ROLLING 1-YEAR)**



Source: BofA Merrill Lynch, as of 3/31/19

**U.S. HY SECTOR DEFAULTS (LAST 12 MONTHS)**



Source: BofA Merrill Lynch, as of 3/31/19 – par weighted

**GLOBAL ISSUANCE (\$ BILLIONS)**



Source: Bloomberg, BofA Merrill Lynch, as of 3/31/19

# Private credit

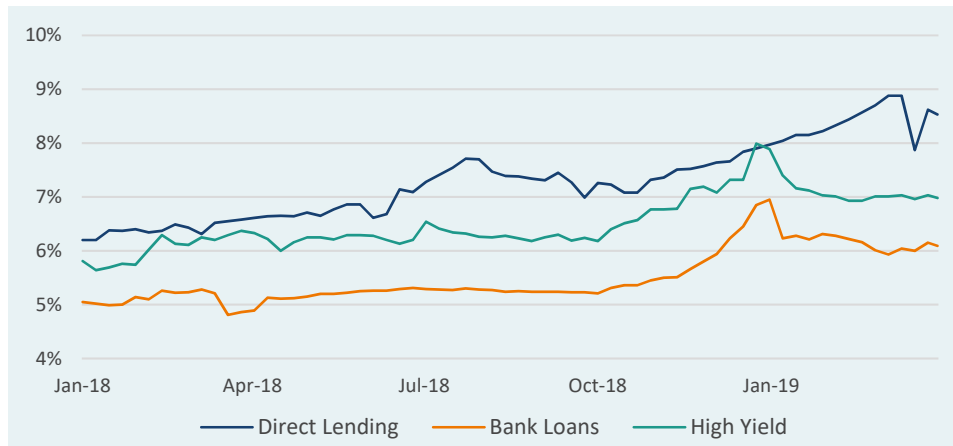
Fundraising in the private credit market slowed through year-end 2018. A total of 163 funds closed on \$110 billion during the year, which was down from 189 funds and \$129 billion in 2017. Direct lending, mezzanine, and distressed debt were the most active strategies, raising \$45 billion, \$31 billion, and \$21 billion, respectively. Even with slower fundraising, dry powder in private credit is at record levels. Private debt dry powder at the end of 2018 was \$280 billion, which beat the 2017 record of \$246 billion.

Yields for loans made by direct lending funds finished March at 8.5%. While yields have been aided by slightly higher LIBOR rates, which grew from 2.3% to 2.6% year-to-date, spreads increased from 4.3% to 5.9% year-to-date.

Credit spreads expanded in the first quarter, along with the debt multiples for borrowers. Borrowers now average debt totaling 5.9x EBITDA at the end of March, a 0.4x increase from one year prior.

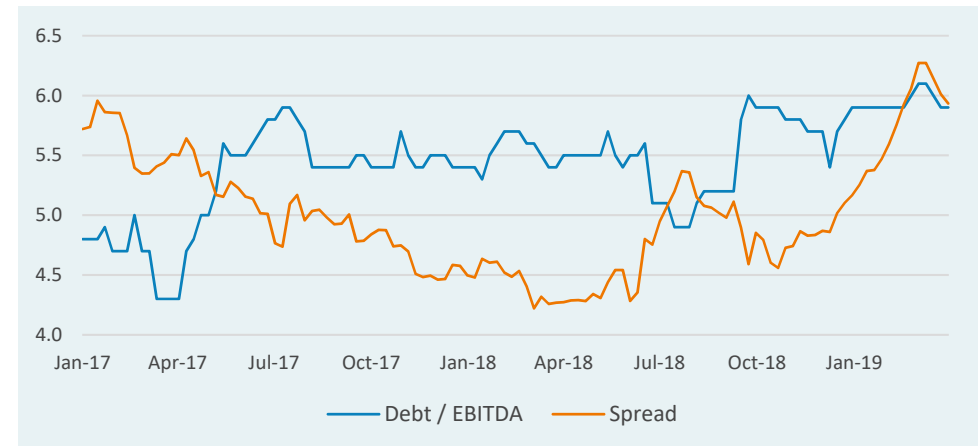
Fundraising slowed in private credit last year

**YIELDS FOR DIRECT LENDING, BANK LOANS & HIGH YIELD**



Source: The Lead Left, Middle Market, EBITDA < \$50MM; S&P LSTA US Leveraged Loan Index; ICE BofAML US High Yield Master II, as of 3/31/19

**DIRECT LENDING LEVERAGE MULTIPLES (DEBT / EBITDA) & SPREAD**



Source: The Lead Left, Middle Market Credit Stats, as of 3/31/19

# Equity

# Equity environment

- U.S. equities experienced a 13.6% total return (S&P 500 Index) in Q1, nearly a mirror image of Q4 2018. The first quarter has indeed been one of the strongest quarters recently, but was simply a bounce back in lost performance from the prior quarter. At the end of March, the S&P 500 price index was just 3.2% below its high watermark that was reached in September.
- Currency movement had little impact on unhedged international equity over the quarter, though currencies on a 1-year basis have had a substantially negative effect. An unhedged investment in international developed equities (MSCI EAFE) lost 8.9% of portfolio value due to currency movement.
- First quarter earnings growth for S&P 500 companies is expected to be negative for the first time since Q2 2016. If corporate earnings expectations continue to be downgraded, this will likely hold back markets around the world. The greatest determinant of medium and long-term equity performance is typically the underlying trend of corporate earnings.
- The risk-on quarter drove small cap equities forward. The Russell 2000 Index posted a 14.6% return, compared to the 13.8% return of the Russell 1000 Index.
- Value equities underperformed growth equities over the quarter (Russell 1000 Value +11.7%, Russell 1000 Growth +16.0%). Performance over the quarter reversed value's gains from Q4 2018.
- After spiking in the fourth quarter, U.S. equity volatility returned to muted levels.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
US Large Cap (Russell 1000)	13.8%		8.7%	
US Small Cap (Russell 2000)	14.6%		2.1%	
US Large Value (Russell 1000 Value)	11.7%		4.9%	
US Large Growth (Russell 1000 Growth)	16.0%		12.3%	
International Large (MSCI EAFE)	10.0%	11.3%	(3.7%)	5.2%
Eurozone (Euro Stoxx 50)	10.6%	12.9%	(6.3%)	5.8%
U.K. (FTSE 100)	9.5%	10.1%	(0.2%)	9.6%
Japan (NIKKEI 225)	6.8%	7.6%	(3.4%)	2.9%
Emerging Markets (MSCI Emerging Markets)	9.9%	9.8%	(7.4%)	(2.1%)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 3/31/19

# Domestic equity

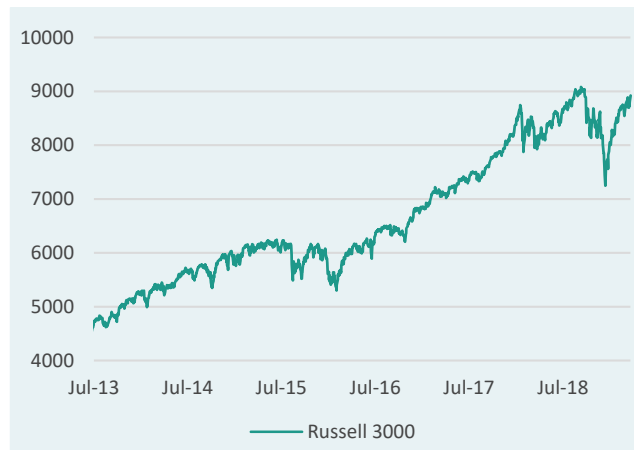
U.S. equities experienced a 13.6% total return (S&P 500 Index) in the first quarter, rebounding from the sharp sell-off in the prior quarter. At the end of March, the S&P 500 price index was just 3.2% below its high watermark that was reached in September. The bounce back in equity prices was driven by better than expected/fearful Q1 corporate earnings, improving sentiment toward a U.S.-China trade deal, and the Fed's pivot to a more patient approach to monetary policy. The fall and subsequent rise in equities was primarily reflected in valuation changes. After dropping to a low of 13.6 in December, the forward 12-month P/E ratio on the S&P 500 finished the

quarter at 16.7, essentially unchanged over the past six months.

Now 10 years removed from the bottom of the financial crisis, it is worth noting that U.S. equities have experienced one of their best decades of performance ever. The S&P 500 had a compound price return of 14.2% per year, and over 75% of this was due to profit margin and valuation expansion. With both of these measures at above average levels, we do not think that it is reasonable to expect this level of performance to continue moving forward.

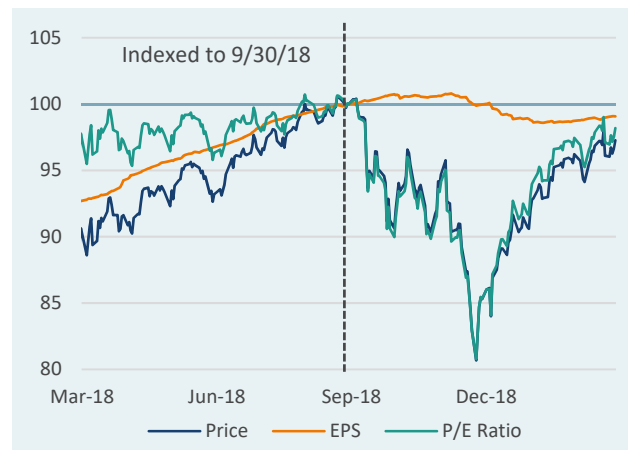
We maintain a neutral view on U.S. equities

## U.S. EQUITIES



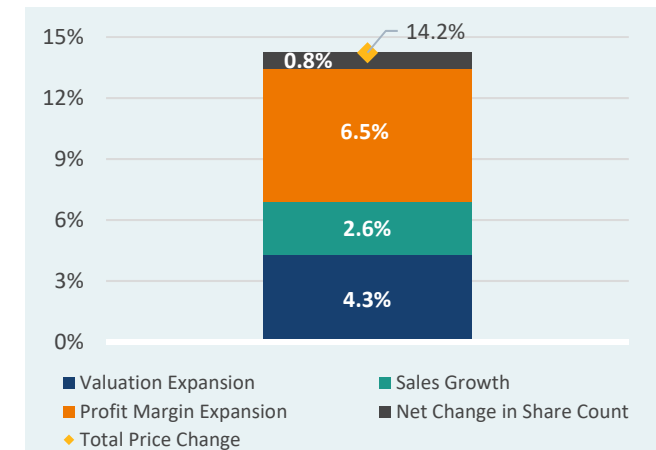
Source: Russell Investments, as of 3/31/19

## S&P 500 PRICE MOVEMENT ATTRIBUTION



Source: Bloomberg, as of 3/31/19

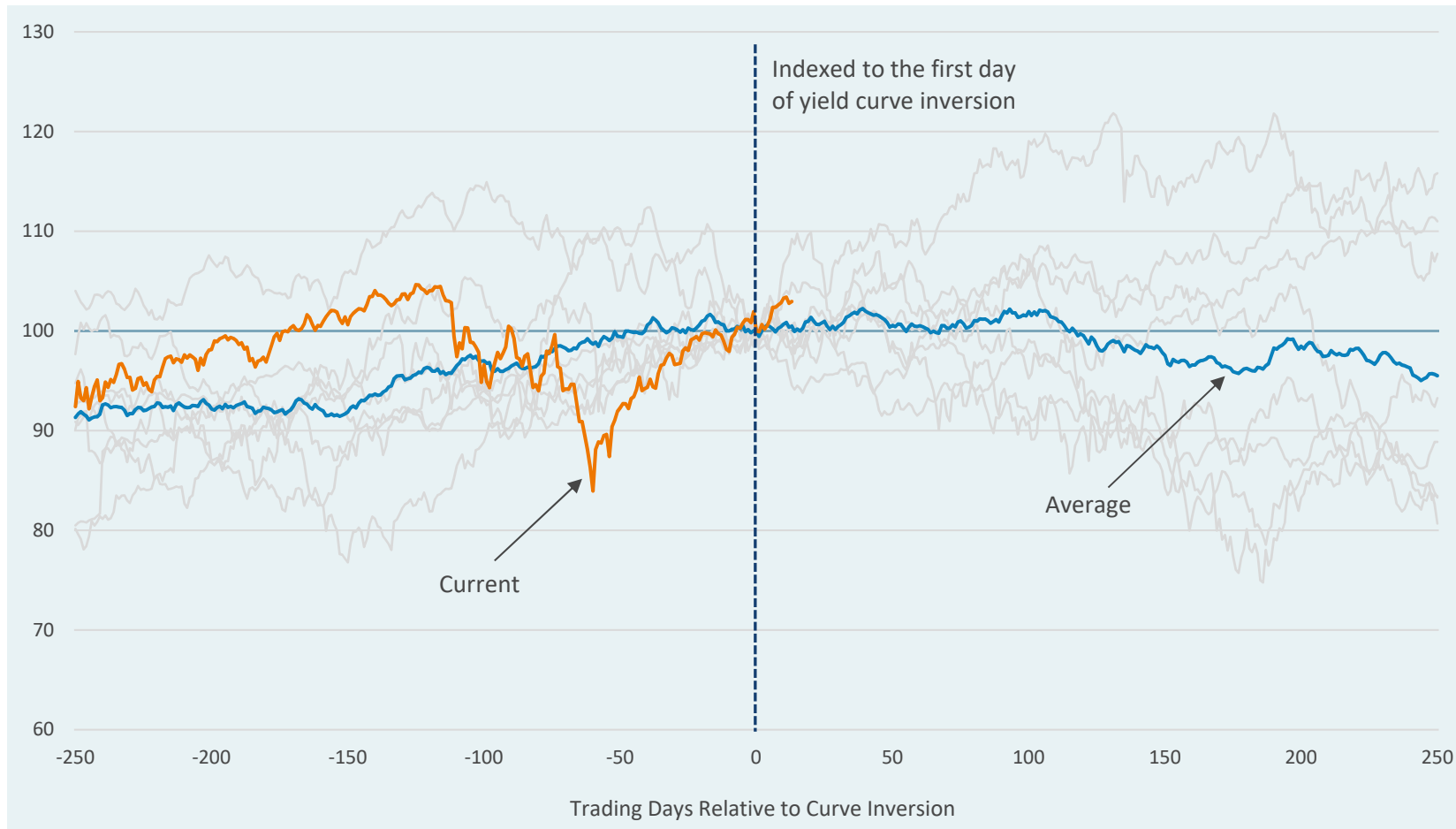
## S&P 500 10-YR PRICE RETURN ATTRIBUTION



Source: Verus, Bloomberg, as of 3/31/19

# Equity markets and yield curve inversions

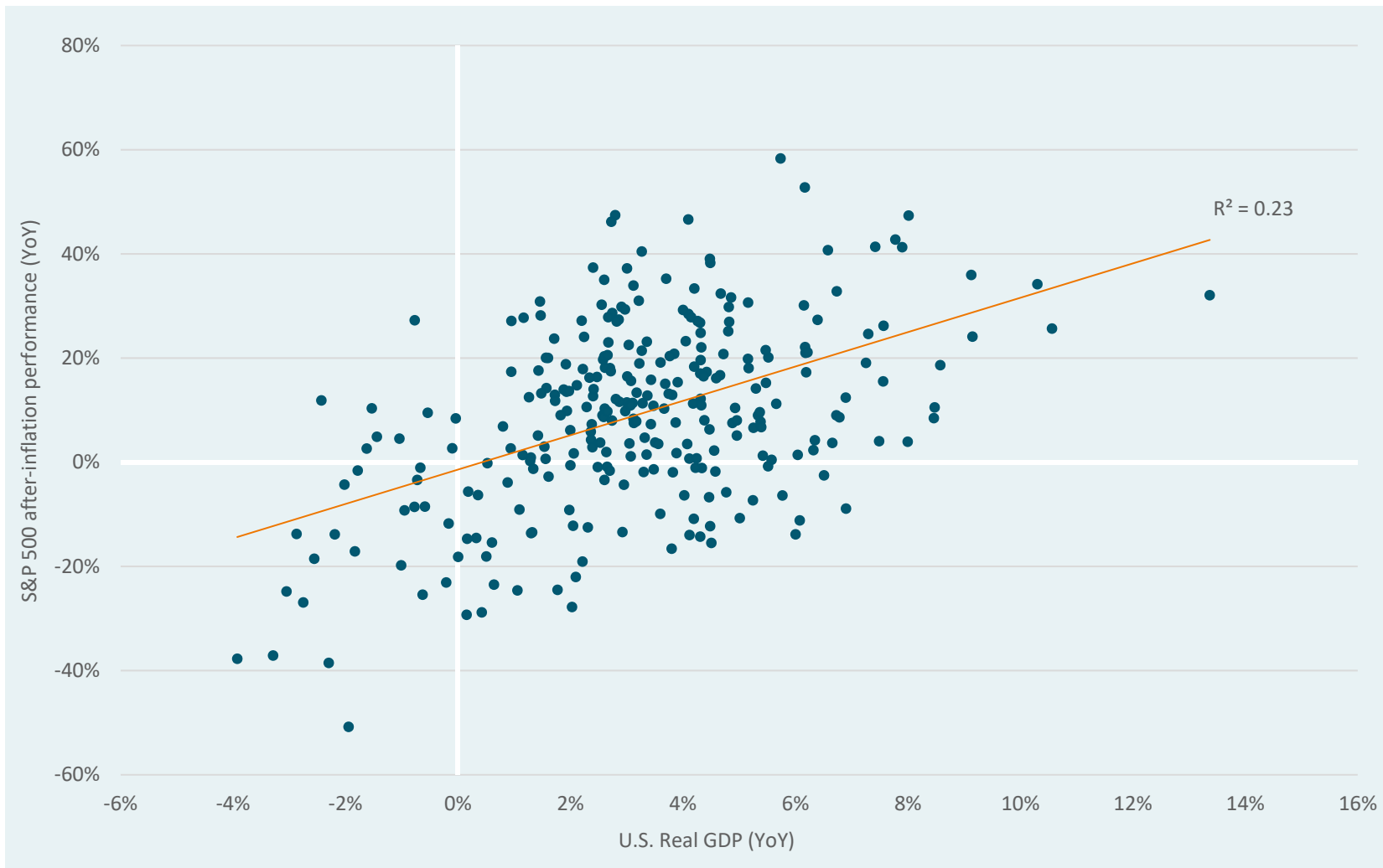
EQUITY PERFORMANCE AROUND CURVE INVERSIONS



Equity performance has varied widely following yield curve inversion

Source: Bloomberg, Verus, as of 3/31/19 – equities are represented by the S&P 500 Index and the yield curve is defined as the difference between the 10-year and 3-month Treasury yield; see page 23 for the dates of yield curve inversion

# U.S. equity & the economic cycle



A material short-term relationship exists between equity performance and economic growth

An investor's views on the economy cycle should therefore impact equity positioning

Source: Standard & Poor's, data since 1948

# Domestic equity size & style

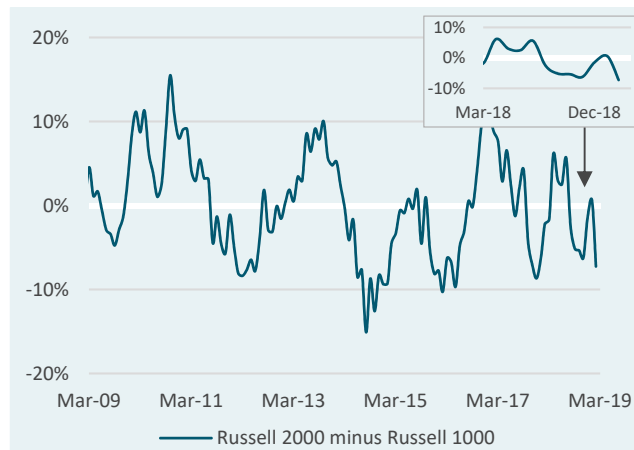
Small cap equities (Russell 2000 +14.6%) slightly outperformed large cap equities (Russell 1000 +14.0%) during the quarter. Meanwhile, growth stocks outperformed value stocks by a wide margin (Russell 1000 Growth +16.1% vs. Russell 1000 Value +11.9%).

The impact of sector performance on the value premium was more nuanced in Q1, as Materials (+10.3%) and Financials (+8.6%) underperformed the overall index (S&P 500 +13.6%), but Energy (+16.4%) outperformed. Information Technology,

the top performing sector, continued to deliver outsized returns (+19.9%).

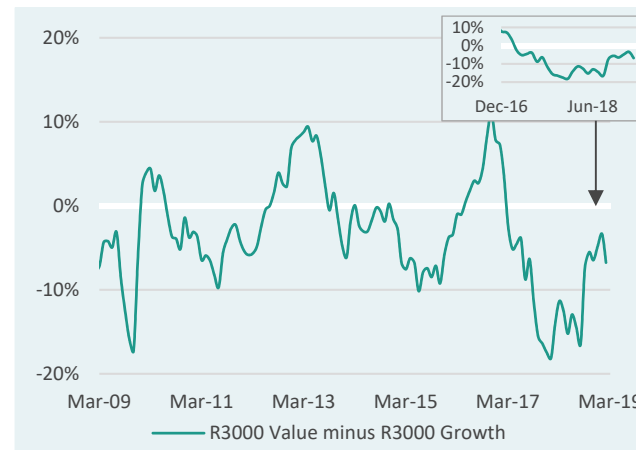
Both the small cap premium and value premium have struggled to deliver positive risk premiums over the past 10 years. It can be difficult to endure longer periods of factor underperformance, but similar to the equity premium in general, these periods do exist and investors should expect this on occasion.

**SMALL CAP VS LARGE CAP (YOY)**



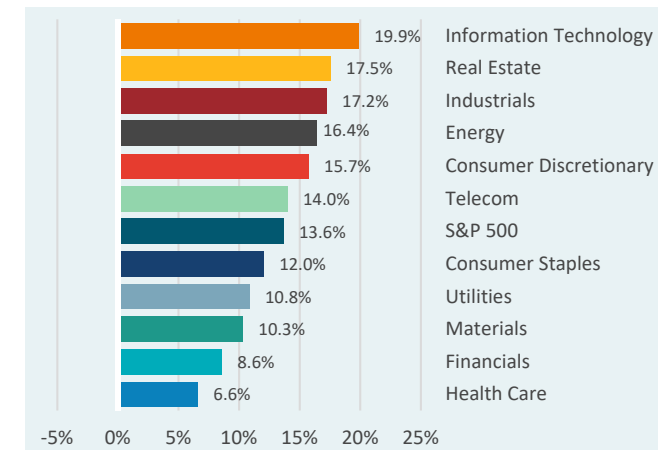
Source: FTSE, as of 3/31/19

**VALUE VS GROWTH (YOY)**



Source: FTSE, as of 3/31/19

**Q1 S&P 500 SECTOR RETURNS**



Source: Morningstar, as of 3/31/19

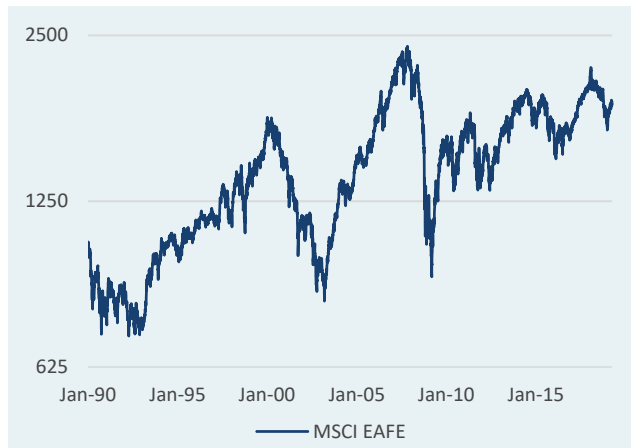
# International developed equity

Like U.S. equities, international developed equities erased most of the losses they suffered in the prior quarter. After posting a return of -12.5% in Q4, the MSCI EAFE Index returned +10.2% in Q1. Currency losses were a mild detractor from unhedged U.S. dollar performance. On a currency hedged basis, EAFE equities returned 11.3%. From a country perspective, Swiss, French and UK equities outperformed, while Japanese and German equities lagged the overall index. While most markets are back near record highs, German equities (MSCI Germany) finished the quarter 17% below the previous high watermark. Underperformance in German equities has likely been influenced by a greater

sensitivity to global growth and trade as well as concerns over a slowing domestic economy.

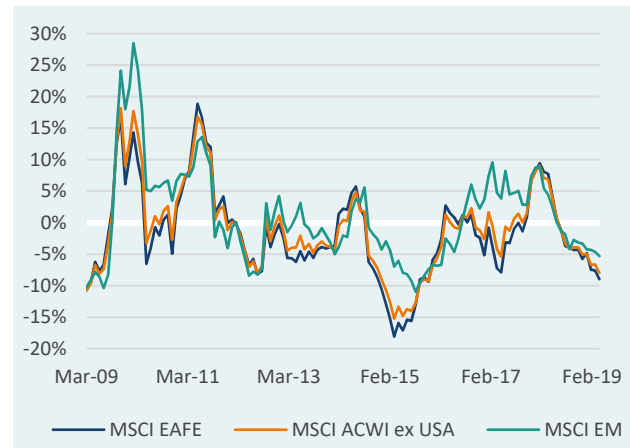
International developed equity markets are still cheap on both an absolute and relative basis at 13.3x forward earnings, but we believe there are good reasons for this pricing in certain markets. Within equity allocations, we are pessimistic on EAFE equities primarily due to a negative view on the Eurozone. We believe slowing economic growth, rising political risks, and the lacking ability of the ECB to meaningfully ease policy presents material headwinds to equity performance.

## INTERNATIONAL DEVELOPED EQUITIES



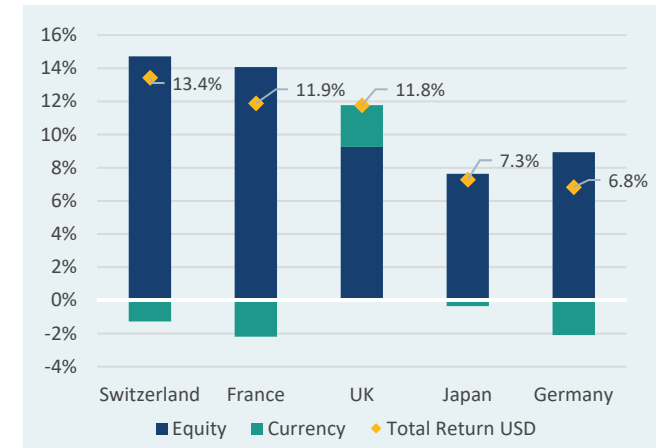
Source: MSCI, as of 3/31/19

## EFFECT OF CURRENCY (1-YEAR ROLLING)



Source: MSCI, as of 3/31/19

## Q1 COUNTRY PERFORMANCE



Source: MSCI, largest five country exposures shown above

# Emerging market equity

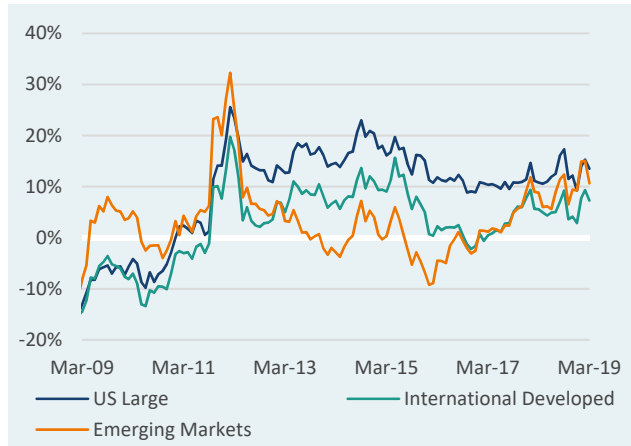
Emerging market equity performance was in-line with international developed markets in the first quarter, while U.S. equities outperformed. Currencies in these markets continued to show stability (MSCI EM +9.9%, MSCI EM Hedged +9.8%). Business sentiment across emerging market economies indicates expanding conditions, and fears of a sharp China slowdown have subsided. Moderating conditions may bolster emerging market returns throughout the year.

Equity multiples rebounded in the first quarter and are near

the long-term average. The divide between domestic and emerging equities remains wide.

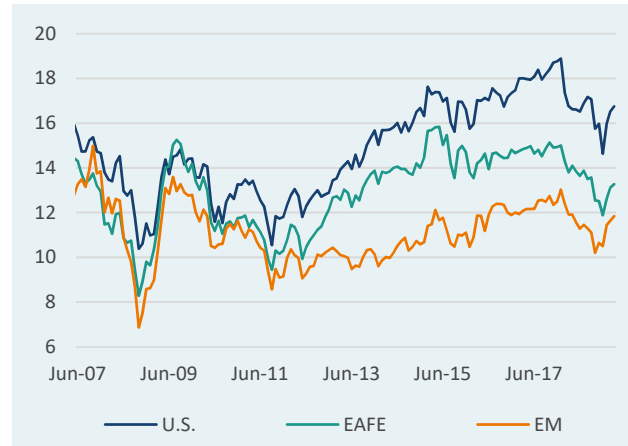
Decelerating global growth and rising probability of recession do present unique risks to emerging markets, as these markets typically exhibit a higher beta during market downside and upside moves. However, emerging markets can also deliver robust performance in times of moderate growth and easy monetary policy when investors seek growth and higher yields.

**EQUITY PERFORMANCE (3-YR ROLLING)**



Source: Standard & Poor's, MSCI, as of 3/31/19

**FORWARD P/E**



Source: MSCI, as of 3/31/19

**PURCHASING MANAGERS' INDEX (PMI)**

	18-Dec	19-Jan	19-Feb	19-Mar
<b>Manufacturing</b>				
Global	51.4	50.8	50.6	50.6
Developed	52.3	51.8	50.4	50.0
US	54.3	56.6	54.2	55.3
EM	50.3	49.5	50.6	51.0
<b>Services</b>				
Global	53.0	52.6	53.3	53.7
Developed	52.8	52.5	53.7	53.7
US	58.0	56.7	59.7	56.1
EM	53.6	52.9	52.1	53.6

Source: Markit, Institute for Supply Management (ISM)

# Equity valuations

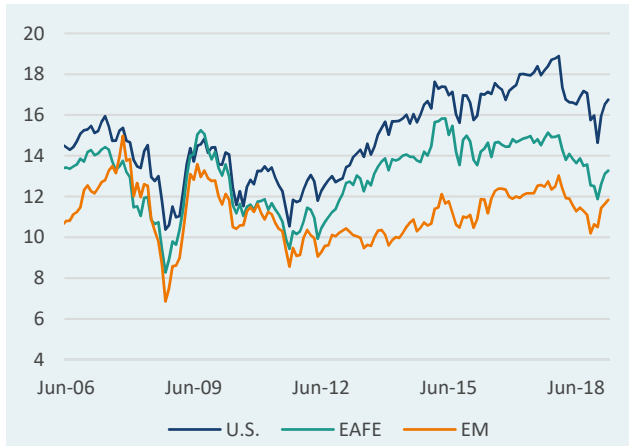
The fall and subsequent rise in global equity prices was primarily driven by changes in valuations. The recovery in Q1 brought most broad equity market valuations back to September 2018 levels, but below recent cycle highs. In the U.S., equities commanded a forward P/E multiple of 16.7x after hitting a multi-year low in December at 14.6x.

International equity valuations also recovered, but are still cheap on a relative basis, particularly when compared to the U.S. At the end of March, the MSCI EAFE and EM Indexes had forward P/E multiples of 13.3x and 11.8x, respectively. U.S. equities currently trade at a 25% forward premium to EAFE

equities, which is the largest gap over the past 15 years. While we believe there are reasons that EAFE equity markets command cheap valuations, particularly in Europe, it is worth noting that barring a significant change in the earnings environment, these markets should have a strong valuation support.

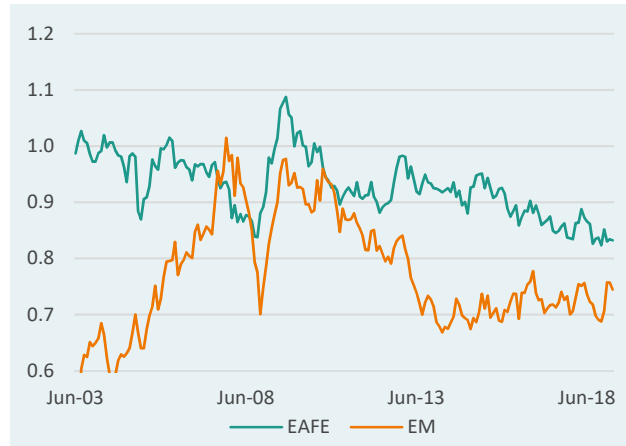
Over the long-term, valuations have had a material relationship with forward equity returns. Given this relationship, we are wary of extrapolating out the recent strong outperformance in U.S. equities.

**FORWARD P/E RATIOS**



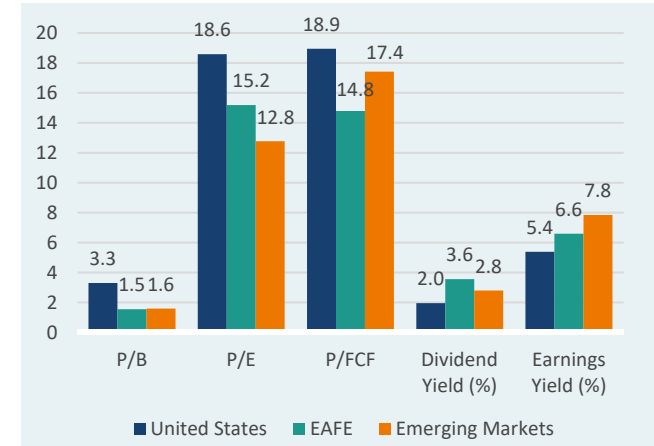
Source: MSCI, as of 3/31/19

**P/E MULTIPLES RELATIVE TO U.S. EQUITIES**



Source: Verus, MSCI, as of 3/31/19

**VALUATION METRICS (3-MONTH AVERAGE)**



Source: Bloomberg, MSCI as of 3/31/19 - trailing P/E

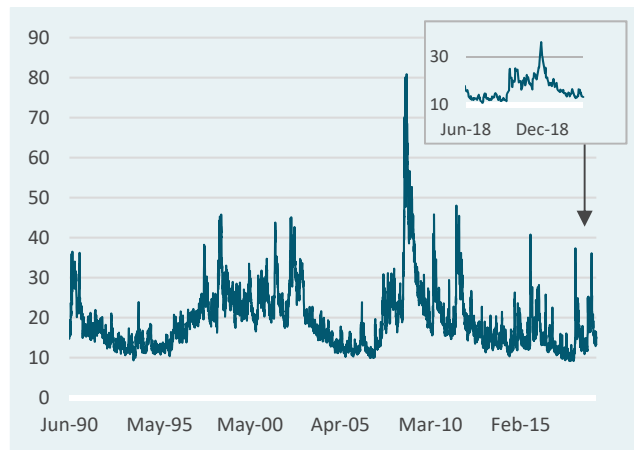
# Equity volatility

Equity volatility spiked in the fourth quarter of 2018 but returned to low levels in Q1. The VIX Index ended March at 13.7, which ranked in the 26<sup>th</sup> percentile dating back to 1990 (volatility was this low 26% of the time). Low volatility is somewhat normal during later stages of the market cycle as the economy expands and business conditions hold steady. However, some investors have questioned the lack of price movement, given seemingly heightened geopolitical and economic risks present around the world today.

One-year volatility picked up after a tumultuous fourth quarter. U.S. markets have shown higher volatility than international markets for the first time since 2008, with a trailing 1 year volatility of 16%.

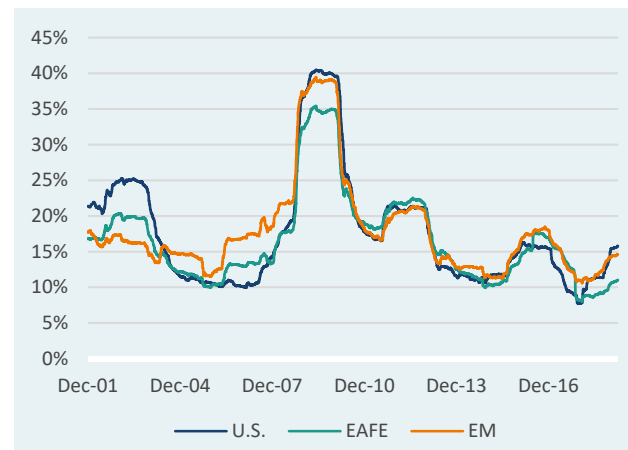
Equity performance around the world in Q1 was nearly a mirror image of 2018 Q4. The first quarter has indeed been one of the strongest quarters of recent decades, but this was mostly a bounceback in lost performance from the prior quarter.

**U.S. IMPLIED VOLATILITY (VIX)**



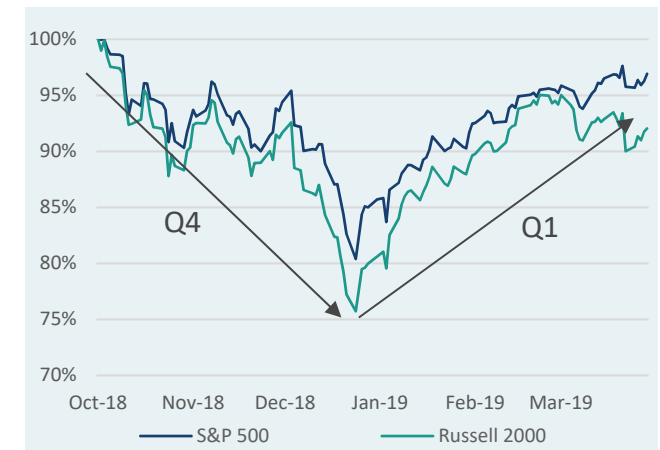
Source: CBOE, as of 3/31/19

**REALIZED 1-YEAR ROLLING VOLATILITY**



Source: Bloomberg, as of 3/31/19

**2019 Q1 PERFORMANCE BOUNCE BACK**



Source: Bloomberg, as of 3/31/19

# Private equity

Venture capital fundraising and deal volumes continued to set records. \$55 billion of venture capital was raised in the U.S. in 2018, an increase of 63% over the previous year. Similarly, the amount of venture deals were up 58%. Venture deal volume in 2018 of \$131 billion exceeded the record of \$82 billion that was set in 2017.

Buyout activity continued to increase in 2018. Through the fourth quarter, buyouts were up 29% and 5% when measured by dollar value and number of transactions, respectively. The size of the average buyout, \$155 million, increased from \$133 million in 2017. Unlike deal flow, fund capital raising has slowed from the peaks of 2017. Only 186

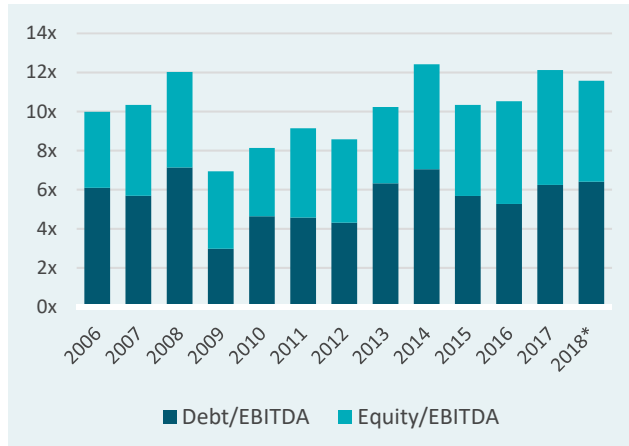
buyout funds representing \$166 billion closed in 2018, down from 235 funds representing a record \$225 billion in 2017.

Buyout multiples decreased slightly from 2017. Average EV/EBITDA was 11.6x through December 31, 2018 (down from 11.9x in 2017) with debt multiples averaging 6.2x through the fourth quarter. Debt as a percentage of transaction value hovered around 54%.

Balancing high deal multiples and a growing number of deals against a slowdown in fundraising, we advocate selectivity in fund investments.

Deals increased in buyouts and venture; multiples are steady; buyout fundraising has slowed

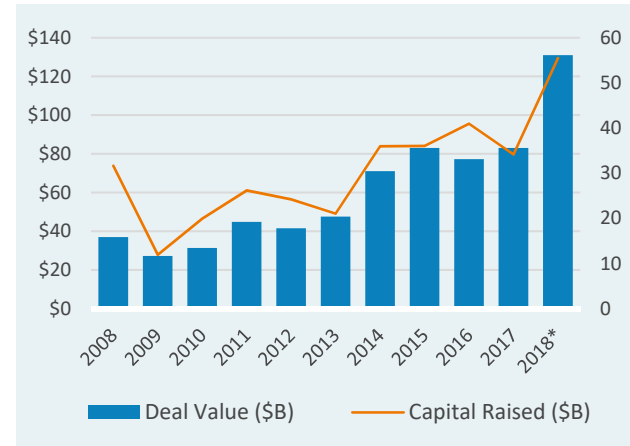
## TRANSACTION MULTIPLES



Source: PitchBook, as of 12/31/18

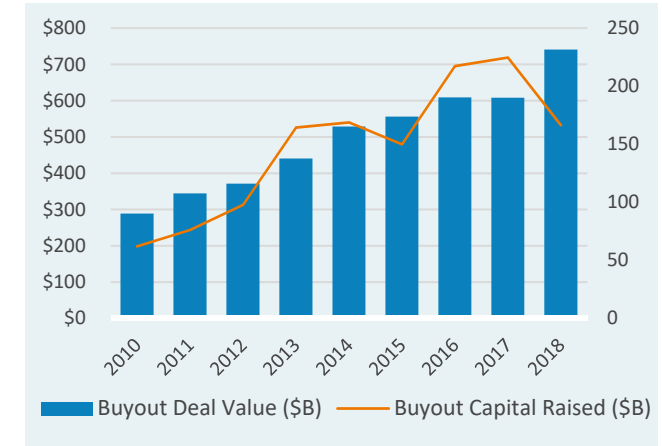
\*2018 figures are estimates and are subject to change

## VENTURE DEAL VOLUME & FUNDRAISING



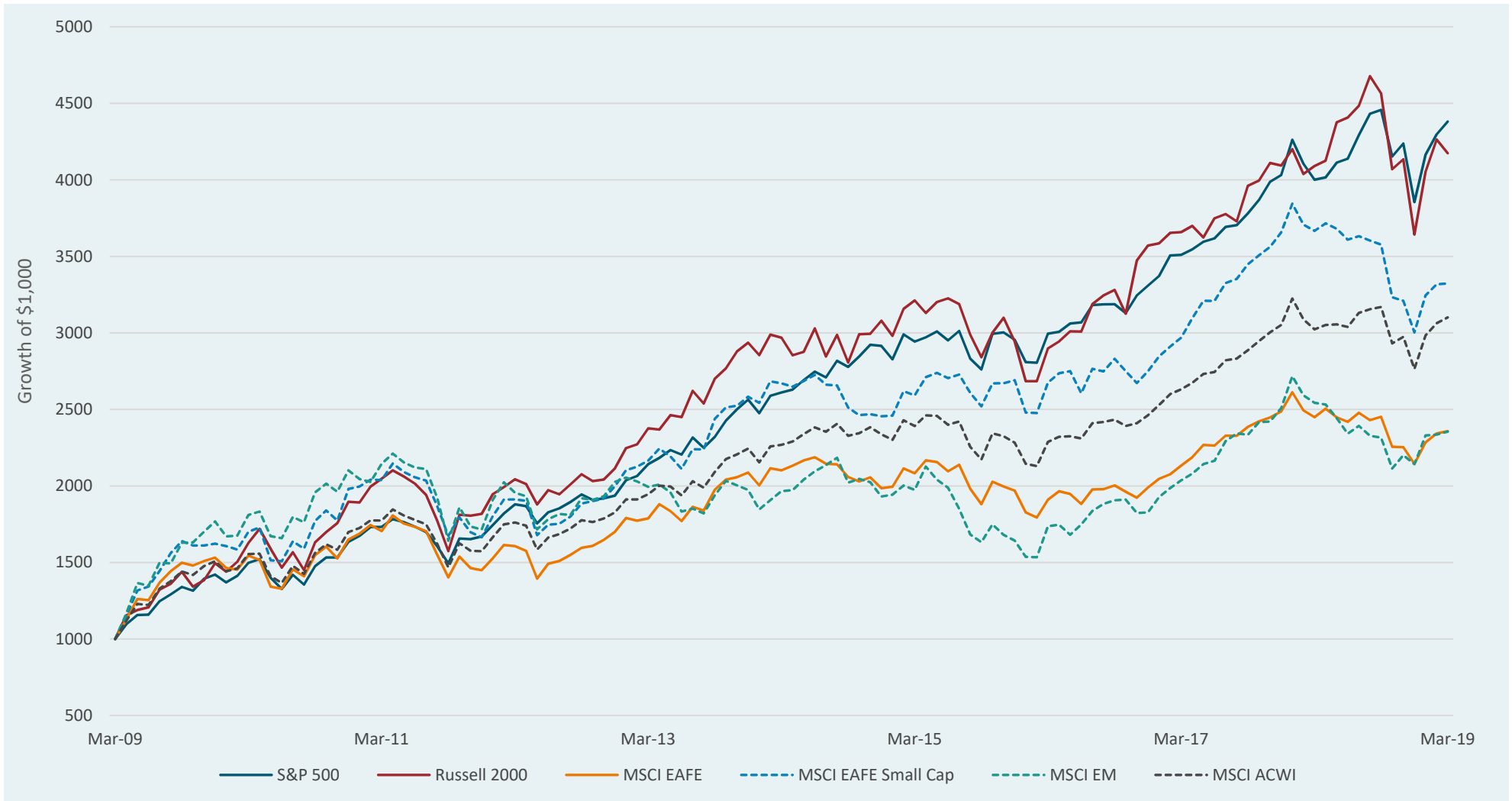
Source: PitchBook, as of 12/31/18

## BUYOUTS DEAL VOLUME & CAPITAL RAISED



Source: PitchBook, as of 12/31/18

# Long-term equity performance



Source: Morningstar, as of 3/31/19

# Other assets

# Currency

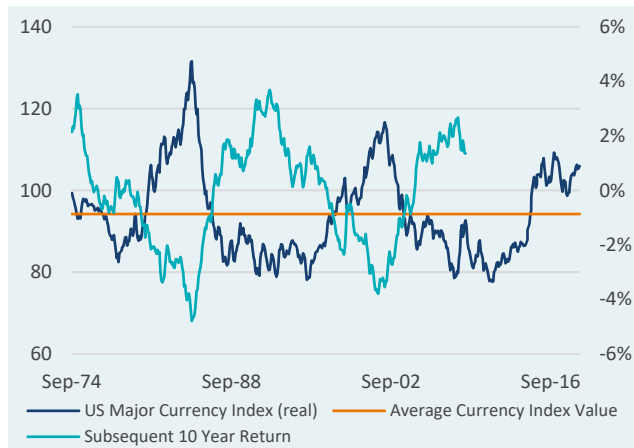
The U.S. dollar failed to gain traction in either direction during the first quarter, and remained near cycle highs. The Major Trade Weighted U.S. Dollar Index fell 0.3% over the period, but was 12.5% above its long-term average dating back to 1974 at the end of March. Expectations for a more accommodative Fed and weaker relative U.S. economic growth (from strong levels in 2018) has led many investors to call for U.S. dollar depreciation, but this has not occurred thus far. This may in part be because other developed central banks have followed the Fed's lead in moving away from monetary tightening.

Emerging market currencies were relatively stable versus the dollar for a second consecutive quarter. The JPMorgan Emerging Market Currency Index gained 0.4%. EM currencies have yet to stage a major comeback after falling more than 15% in the middle of last year.

**The U.S. dollar remained near a cycle high**

Despite some high-profile Brexit related volatility in the British pound, the global FX market has been relatively quiet. The trailing 1-year volatility of the Bloomberg Dollar Spot Index was 5.2% at the end of the quarter, the lowest level since 2014.

**U.S. DOLLAR TRADE WEIGHTED INDEX**



Source: Federal Reserve, Verus, as of 3/31/19

**JPM EMERGING MARKET CURRENCY INDEX**



Source: Bloomberg, JPMorgan, as of 3/31/19

**BLOOMBERG DOLLAR SPOT INDEX VOLATILITY**



Source: Bloomberg, as of 3/31/19, trailing 12-month vol shown

# Hedge funds

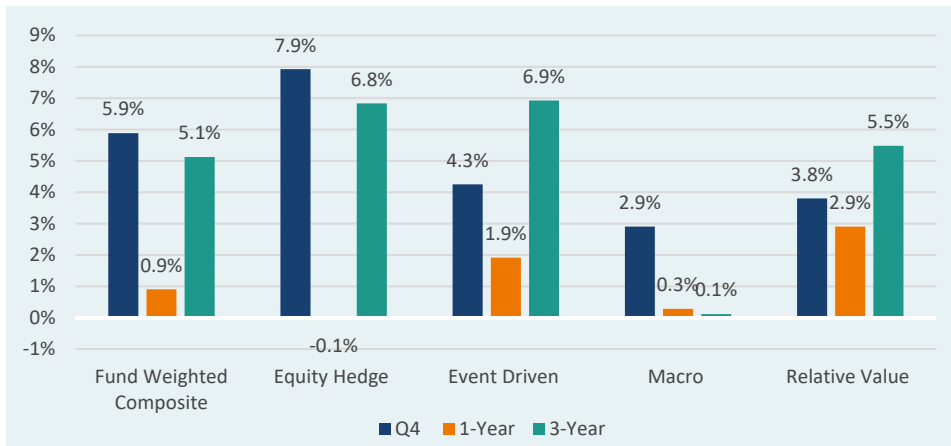
Hedge funds consistently advanced alongside the broad markets and enjoyed the best first calendar quarter result since 2006 (Hedge Fund Weighted Composite (FWC) +5.9% in 2019Q1; +0.9% trailing 12-months). While gains were broad based across strategy types, funds with greater equity market sensitivity earned the highest results. Within the equity hedge strategy set, funds with higher beta exposure rallied strongly.

According to Hedge Fund Research, growth-oriented managers (+9.3%) narrowly outperformed value-oriented (9%) peers. Healthcare focused funds (+13.2%) also stood out as winners. Activists (+8.3%) largely rebounded from a dismal Q4 last year.

For managers trading fixed income securities, funds focused on convertible arbitrage (+5.5%) and credit arbitrage (+5.1%) fared well as those markets bounced back this quarter. Asset backed (+1.7%) and fixed income multi-strategy managers (+2%) posted more muted gains.

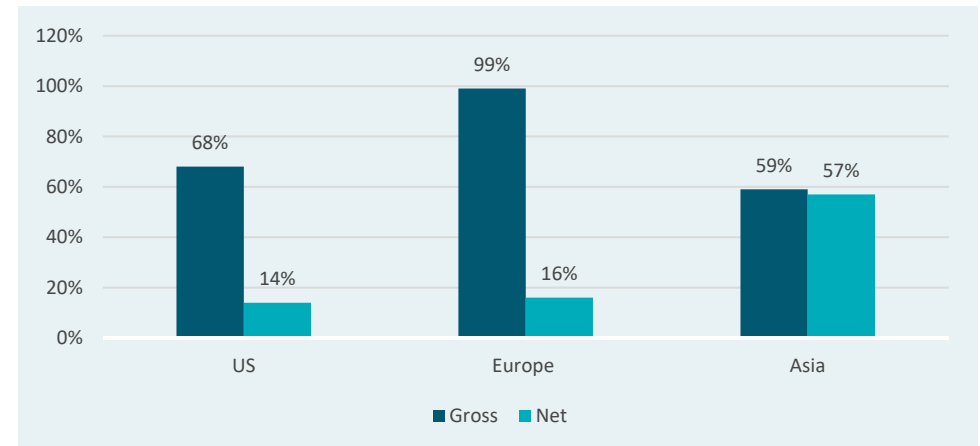
Hedge funds responded to the Q4 sell-off last year by cutting gross and net exposure levels to relatively low levels by year end. Gross leverage has since largely rebounded while net exposure, with the exception of Asia, remains below pre-sell off levels.

## HFRI HEDGE FUND STYLE PERFORMANCE



Source: HFRI, as of 3/31/19

## HEDGE FUND LEVERAGE LEVELS BY REGION



Source: Morgan Stanley, as of 3/31/19

# Appendix

# Periodic table of returns

BEST

↑

↓

WORST

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD	5-Year	10-Year
Small Cap Growth	38.7	66.4	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	17.1	13.5	17.5
Large Cap Growth	27.0	43.1	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	1.9	16.1	10.6	16.5
Small Cap Equity	20.3	33.2	12.2	7.3	6.7	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	0.0	14.6	8.7	16.0
Large Cap Equity	19.3	27.3	11.6	3.3	1.6	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	-1.5	14.0	8.4	15.4
Large Cap Value	16.2	26.5	7.0	2.8	1.0	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	11.9	7.7	14.5
Small Cap Value	15.6	24.3	6.0	2.5	-5.9	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	-4.8	11.9	7.1	14.1
International Equity	8.7	21.3	4.1	-2.4	-6.0	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	-6.0	10.0	5.6	9.0
Emerging Markets Equity	4.9	20.9	-3.0	-5.6	-11.4	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	9.9	4.4	8.9
60/40 Global Portfolio	1.2	13.2	-7.3	-9.1	-15.5	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	-9.3	8.1	3.7	8.5
Commodities	-2.5	11.4	-7.8	-9.2	-15.7	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	-11.0	6.3	2.7	8.3
Hedge Funds of Funds	-5.1	7.3	-14.0	-12.4	-20.5	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	7.0	-11.2	5.0	2.3	3.8
US Bonds	-6.5	4.8	-22.4	-19.5	-21.7	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	2.9	2.3	3.6
Cash	-25.3	-0.8	-22.4	-20.4	-27.9	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-13.8	0.6	0.8	0.4
Real Estate	-27.0	-1.5	-30.6	-21.2	-30.3	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-14.6	0.0	-8.9	-2.6

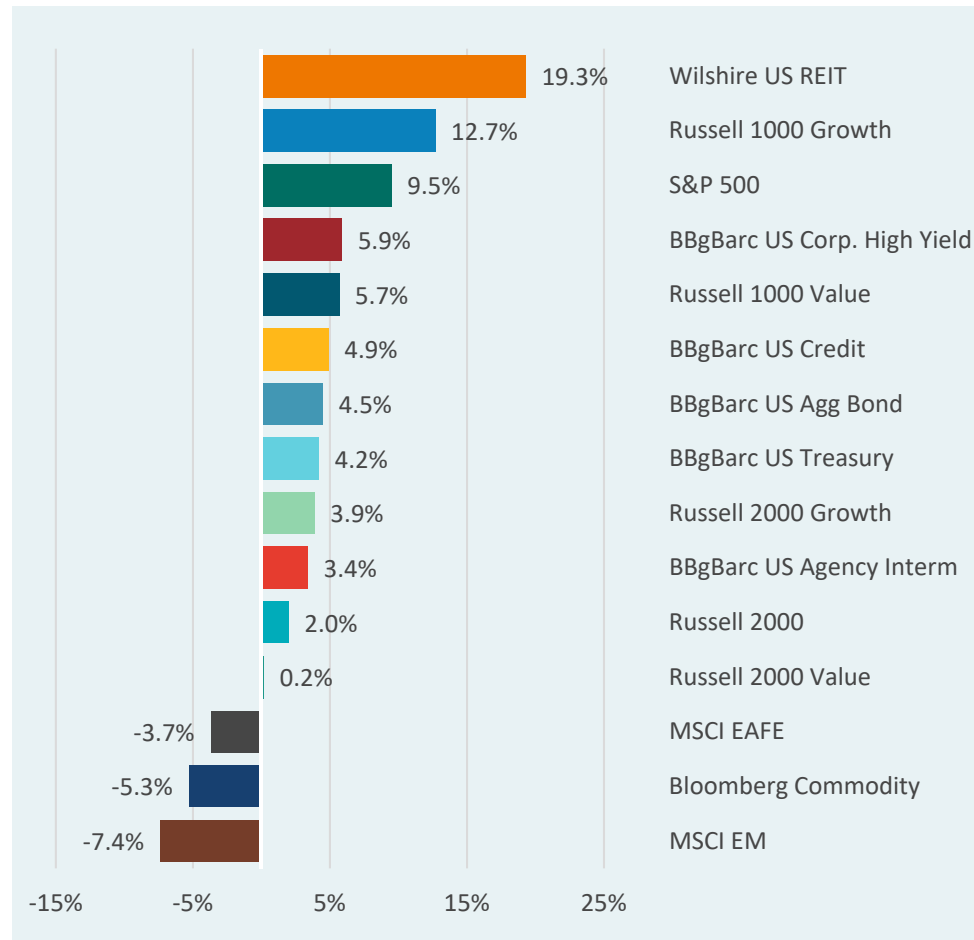
Legend:

- Large Cap Equity
- Large Cap Value
- Large Cap Growth
- Small Cap Equity
- Small Cap Value
- Small Cap Growth
- International Equity
- Emerging Markets Equity
- US Bonds
- Cash
- Commodities
- Real Estate
- Hedge Funds of Funds
- 60% MSCI ACWI/40% BBgBarc Global Bond

Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 12/31/18.

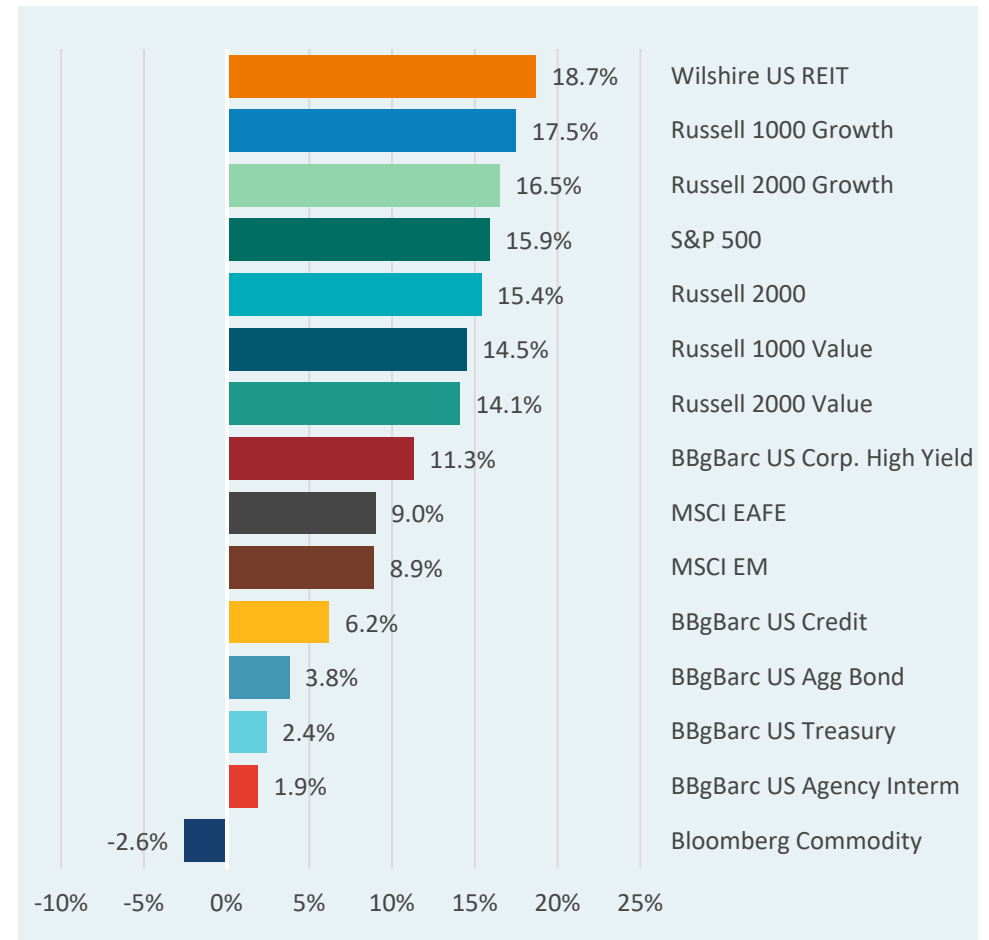
# Major asset class returns

ONE YEAR ENDING MARCH



Source: Morningstar, as of 3/31/19

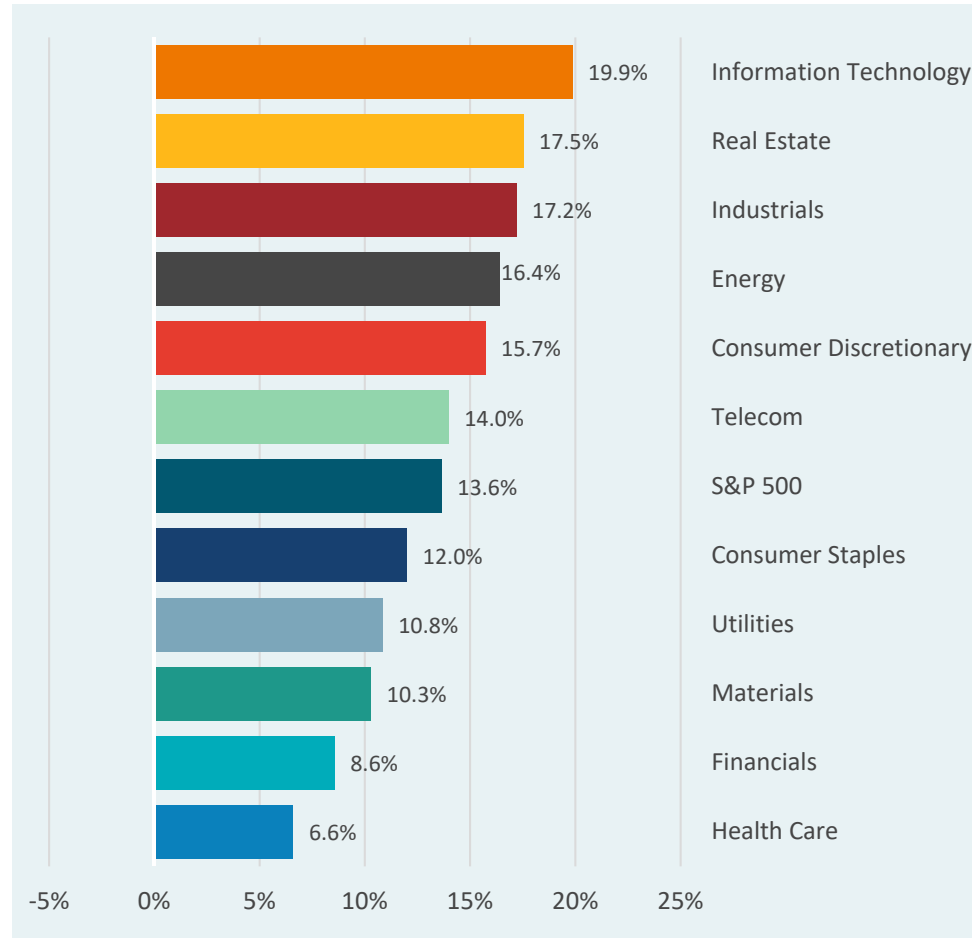
TEN YEARS ENDING MARCH



Source: Morningstar, as of 3/31/19

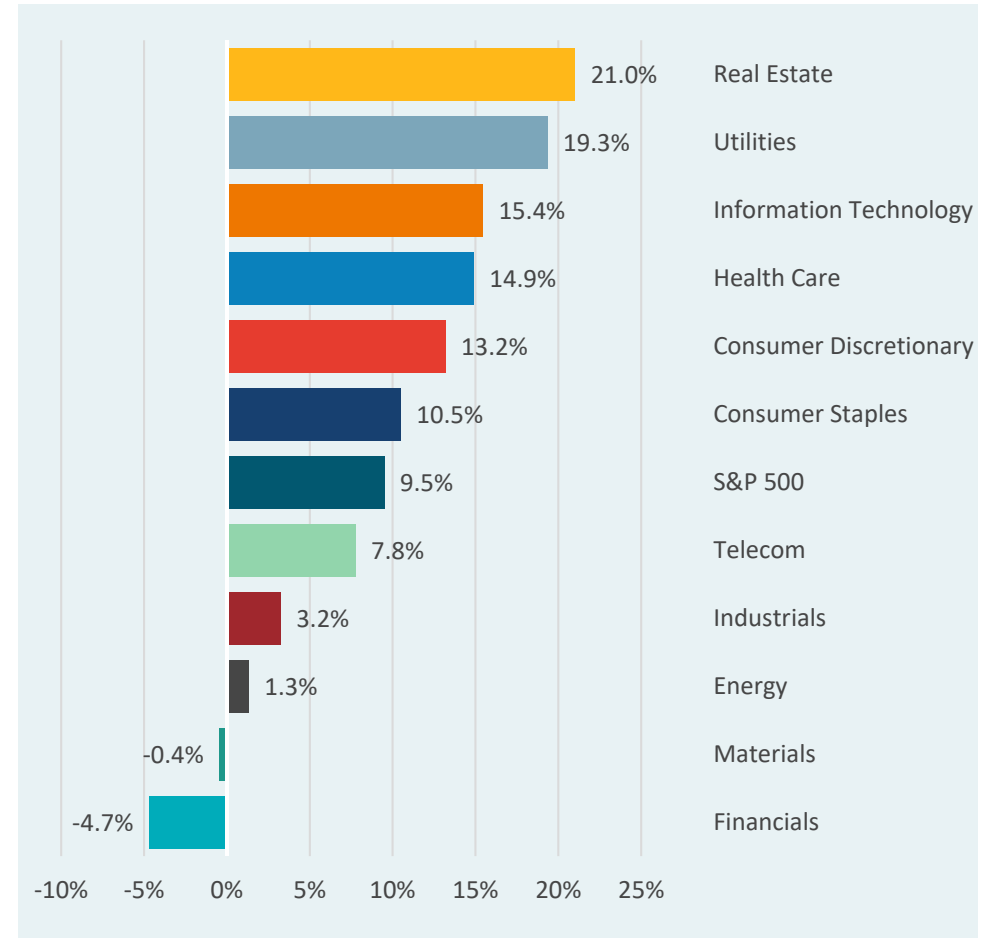
# S&P 500 sector returns

QTD



Source: Morningstar, as of 3/31/19

ONE YEAR ENDING MARCH



Source: Morningstar, as of 3/31/19

# Detailed index returns

## DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
<b>Core Index</b>							
S&P 500	1.9	13.6	13.6	9.5	13.5	10.9	15.9
S&P 500 Equal Weighted	0.9	14.9	14.9	7.2	12.0	9.5	17.8
DJ Industrial Average	0.2	11.8	11.8	10.1	16.4	12.2	16.0
Russell Top 200	2.1	13.1	13.1	10.4	14.2	11.4	15.7
Russell 1000	1.7	14.0	14.0	9.3	13.5	10.6	16.0
Russell 2000	(2.1)	14.6	14.6	2.0	12.9	7.1	15.4
Russell 3000	1.5	14.0	14.0	8.8	13.5	10.4	16.0
Russell Mid Cap	0.9	16.5	16.5	6.5	11.8	8.8	16.9
<b>Style Index</b>							
Russell 1000 Growth	2.8	16.1	16.1	12.7	16.5	13.5	17.5
Russell 1000 Value	0.6	11.9	11.9	5.7	10.5	7.7	14.5
Russell 2000 Growth	(1.4)	17.1	17.1	3.9	14.9	8.4	16.5
Russell 2000 Value	(2.9)	11.9	11.9	0.2	10.9	5.6	14.1

## INTERNATIONAL EQUITY

<b>Broad Index</b>							
MSCI ACWI	1.3	12.2	12.2	2.6	10.7	6.5	12.0
MSCI ACWI ex US	0.6	10.3	10.3	(4.2)	8.1	2.6	8.8
MSCI EAFE	0.6	10.0	10.0	(3.7)	7.3	2.3	9.0
MSCI EM	0.8	9.9	9.9	(7.4)	10.7	3.7	8.9
MSCI EAFE Small Cap	0.2	10.7	10.7	(9.4)	7.5	4.5	12.8
<b>Style Index</b>							
MSCI EAFE Growth	1.8	12.0	12.0	(1.3)	7.6	3.9	9.7
MSCI EAFE Value	(0.5)	7.9	7.9	(6.1)	6.9	0.7	8.1
<b>Regional Index</b>							
MSCI UK	1.1	11.9	11.9	(0.1)	6.3	0.7	9.3
MSCI Japan	0.6	6.7	6.7	(7.8)	8.1	5.6	8.0
MSCI Euro	0.0	9.8	9.8	(7.8)	6.5	0.6	7.5
MSCI EM Asia	1.8	11.1	11.1	(6.8)	11.8	6.2	10.8
MSCI EM Latin American	(2.5)	7.9	7.9	(6.7)	11.1	(0.3)	5.3

## FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
<b>Broad Index</b>							
BBgBarc US TIPS	1.8	3.2	3.2	2.7	1.7	1.9	3.4
BBgBarc US Treasury Bills	0.2	0.6	0.6	2.2	1.2	0.8	0.5
BBgBarc US Agg Bond	1.9	2.9	2.9	4.5	2.0	2.7	3.8
<b>Duration</b>							
BBgBarc US Treasury 1-3 Yr	0.6	1.0	1.0	2.7	1.0	1.0	1.0
BBgBarc US Treasury Long	5.3	4.7	4.7	6.2	1.5	5.4	5.1
BBgBarc US Treasury	1.9	2.1	2.1	4.2	1.0	2.2	2.4
<b>Issuer</b>							
BBgBarc US MBS	1.5	2.2	2.2	4.4	1.8	2.6	3.1
BBgBarc US Corp. High Yield	0.9	7.3	7.3	5.9	8.6	4.7	11.3
BBgBarc US Agency Interim	0.9	1.4	1.4	3.4	1.2	1.6	1.9
BBgBarc US Credit	2.4	4.9	4.9	4.9	3.5	3.6	6.2

## OTHER

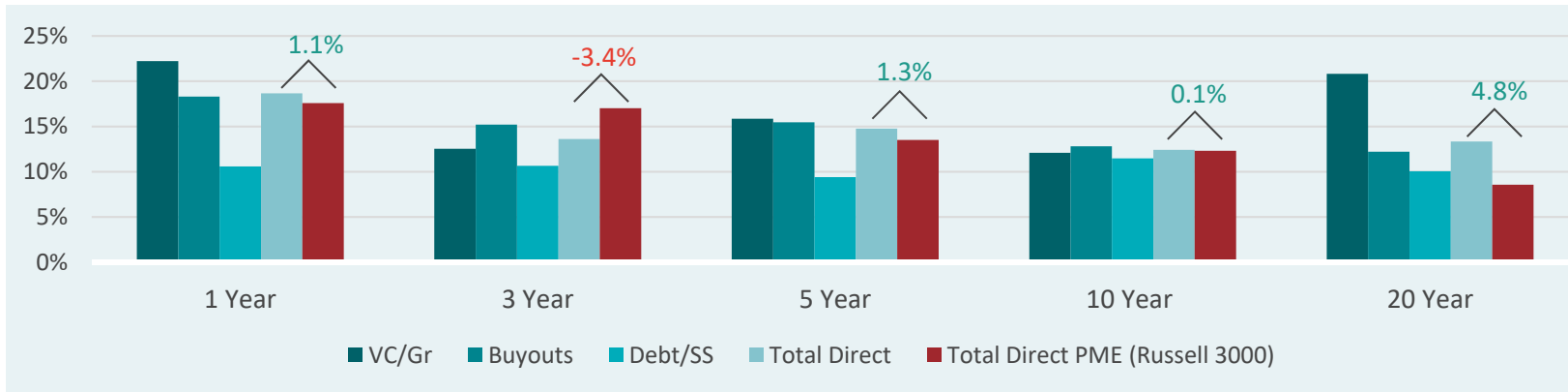
<b>Index</b>							
Bloomberg Commodity	(0.2)	6.3	6.3	(5.3)	2.2	(8.9)	(2.6)
Wilshire US REIT	3.2	16.0	16.0	19.3	5.5	9.0	18.7
CS Leveraged Loans	(0.1)	3.8	3.8	3.3	5.9	3.8	8.0
Alerian MLP	3.8	17.4	17.4	16.8	5.9	(4.2)	11.1
<b>Regional Index</b>							
JPM EMBI Global Div	1.4	7.0	7.0	4.2	5.8	5.4	8.5
JPM GBI-EM Global Div	(1.3)	2.9	2.9	(7.6)	3.3	(0.8)	4.4
<b>Hedge Funds</b>							
HFRI Composite	1.0	5.9	5.9	0.9	5.1	3.1	5.5
HFRI FOF Composite	1.3	5.0	5.0	0.5	4.1	2.3	3.6
<b>Currency (Spot)</b>							
Euro	(1.4)	(1.8)	(1.8)	(8.7)	(0.5)	(4.0)	(1.7)
Pound	(2.0)	2.3	2.3	(7.1)	(3.2)	(4.8)	(0.9)
Yen	0.6	(0.9)	(0.9)	(3.9)	0.5	(1.4)	(1.1)

Source: Morningstar, HFR, as of 3/31/19

# Private equity vs. public performance

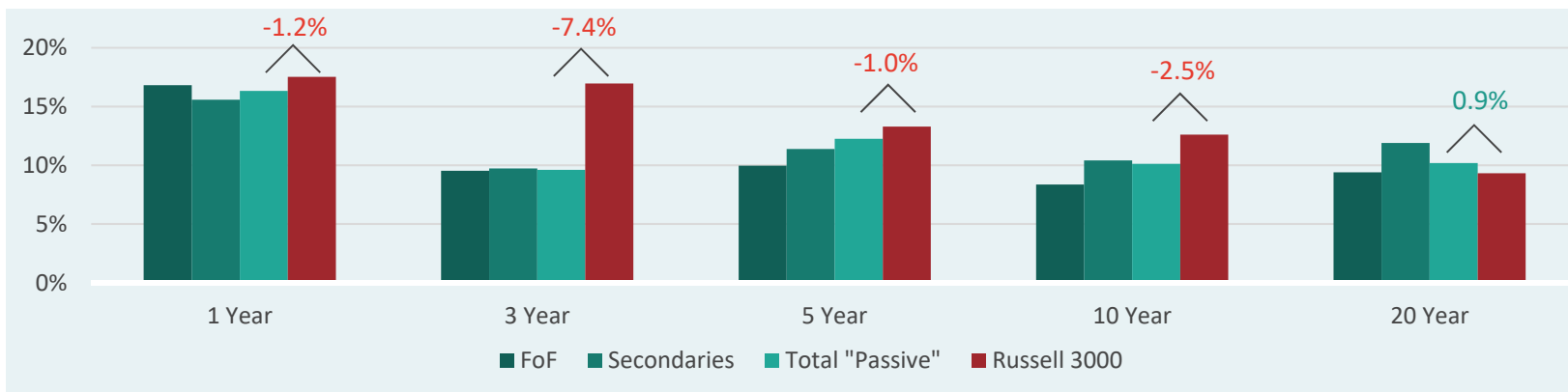
As of 9/30/2018

## PUBLIC MARKET EQUIVALENT (PME) ANALYSIS - DIRECT PRIVATE EQUITY



Public market equivalent (PME) analysis shows that direct private equity has outperformed public equity over most periods

## PUBLIC MARKET EQUIVALENT (PME) ANALYSIS - "PASSIVE" PRIVATE EQUITY



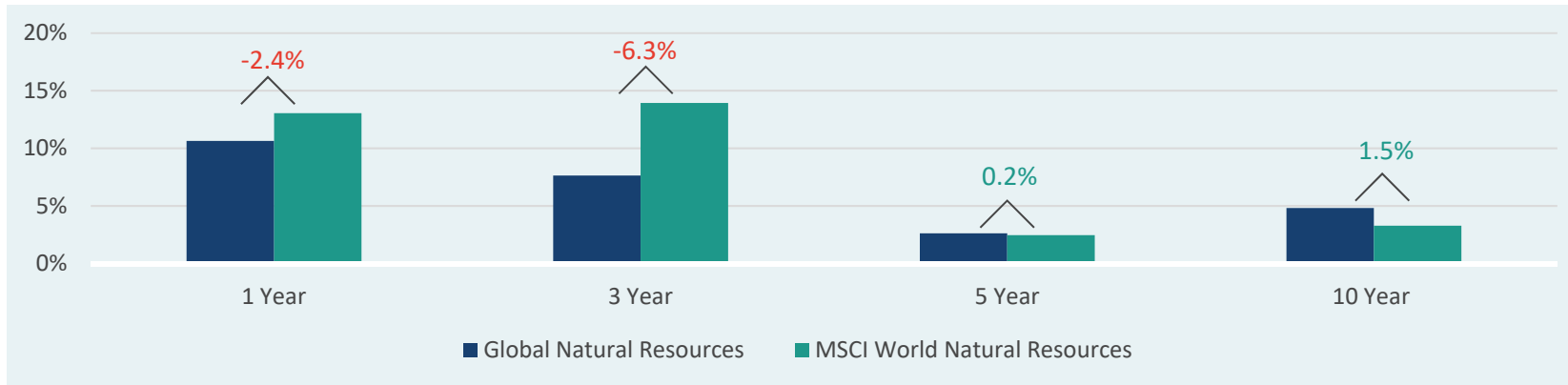
Fund-of-fund & secondary private equity investments have lagged public equities

Sources: Thomson Reuters Cambridge Universe's PME Module: U.S. Private Equity Funds sub asset classes as of September 30, 2018. Public Market Equivalent returns resulted from "Total Passive" and Total Direct's identical cash flows invested into and distributed from respective traditional asset comparable.

# Private vs. liquid real assets performance

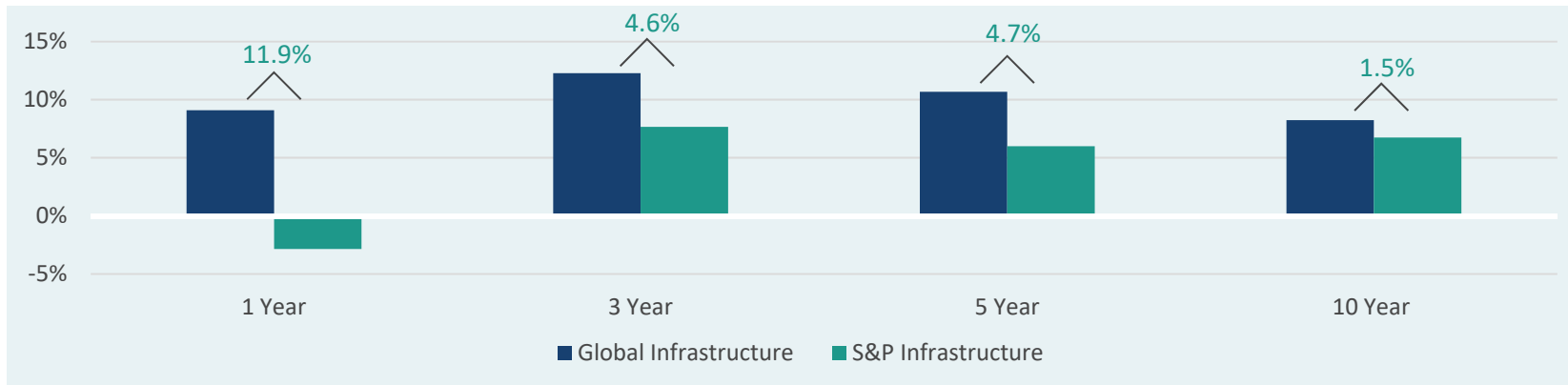
As of 9/30/2018

## PUBLIC MARKET EQUIVALENT (PME) ANALYSIS - GLOBAL NATURAL RESOURCES FUNDS



Public market equivalent (PME) analysis shows that private infrastructure has recently underperformed publicly listed infrastructure

## PUBLIC MARKET EQUIVALENT (PME) ANALYSIS - GLOBAL INFRASTRUCTURE FUNDS



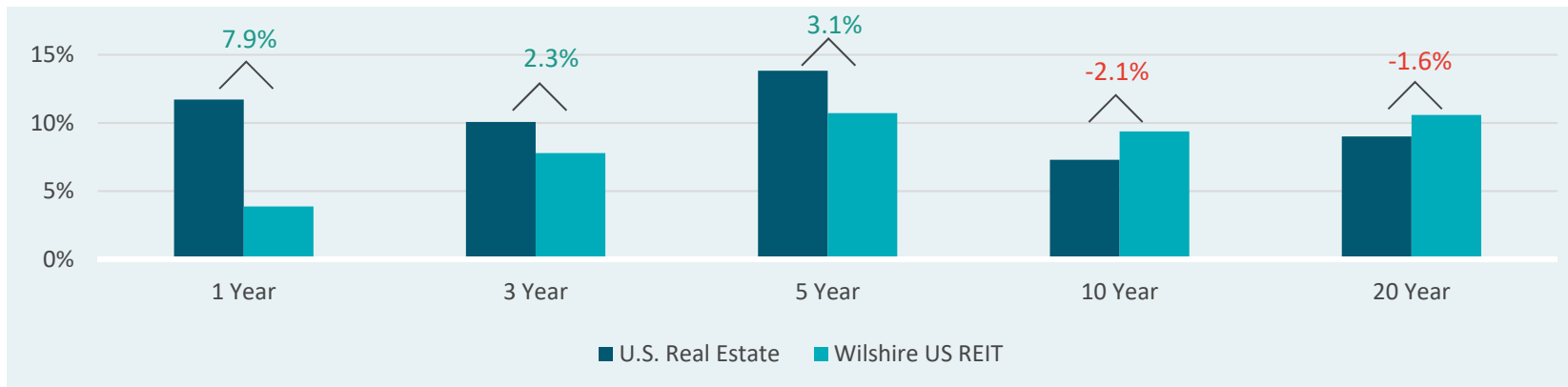
Private infrastructure has materially outperformed publicly listed infrastructure

Sources: Thomson Reuters C/A PME: Global Natural Resources (vintage 1996 and later, inception of MSCI ACWI Energy benchmark) and Global Infrastructure (vintage 2002 and later, inception of S&P Infrastructure benchmark) universes as of September 30, 2018. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

# Private vs. liquid & core real estate performance

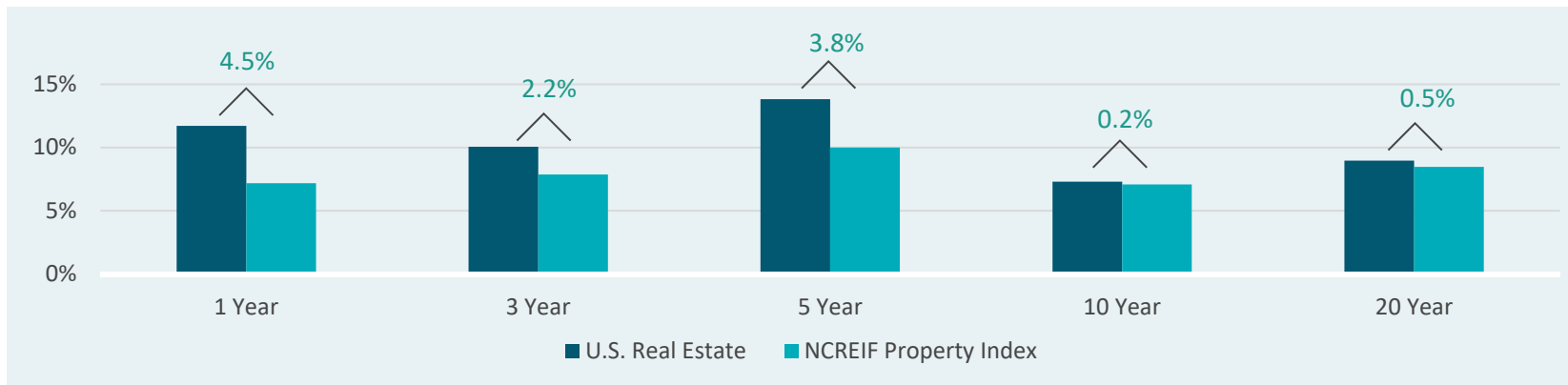
As of 9/30/2018

## PUBLIC MARKET EQUIVALENT (PME) ANALYSIS - U.S. PRIVATE REAL ESTATE VS. LIQUID UNIVERSE



Public market equivalent (PME) analysis shows that U.S. private R.E. has underperformed liquid real estate over the long-term

## PUBLIC MARKET EQUIVALENT (PME) ANALYSIS - U.S. PRIVATE REAL ESTATE FUNDS VS. CORE FUNDS



U.S. private R.E. has outperformed the NCREIF Property Index over each time period

Sources: Thomson Reuters C/A PME: Global and U.S. Real Estate universes as of September 30, 2018. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.

# Definitions

**Bloomberg US Weekly Consumer Comfort Index** - tracks the public's economic attitudes each week, providing a high-frequency read on consumer sentiment. The index, based on cell and landline telephone interviews with a random, representative national sample of U.S. adults, tracks Americans' ratings of the national economy, their personal finances and the buying climate on a weekly basis, with views of the economy's direction measured separately each month. ([www.langerresearch.com](http://www.langerresearch.com))

**University of Michigan Consumer Sentiment Index** - A survey of consumer attitudes concerning both the present situation as well as expectations regarding economic conditions conducted by the University of Michigan. For the preliminary release approximately three hundred consumers are surveyed while five hundred are interviewed for the final figure. The level of consumer sentiment is related to the strength of consumer spending. ([www.Bloomberg.com](http://www.Bloomberg.com))

**NFIB Small Business Outlook** - Small Business Economic Trends (SBET) is a monthly assessment of the U.S. small-business economy and its near-term prospects. Its data are collected through mail surveys to random samples of the National Federal of Independent Business (NFIB) membership. The survey contains three broad question types: recent performance, near-term forecasts, and demographics. The topics addressed include: outlook, sales, earnings, employment, employee compensation, investment, inventories, credit conditions, and single most important problem. (<http://www.nfib-sbet.org/about/>)

**NAHB Housing Market Index** - the housing market index is a weighted average of separate diffusion indices for three key single-family indices: market conditions for the sale of new homes at the present time, market conditions for the sale of new homes in the next six months, and the traffic of prospective buyers of new homes. The first two series are rated on a scale of Good, Fair, and Poor and the last is rated on a scale of High/Very High, Average, and Low/Very Low. A diffusion index is calculated for each series by applying the formula  $\frac{(\text{Good-Poor} + 100)}{2}$  to the present and future sales series and  $\frac{(\text{High/Very High-Low/Very Low} + 100)}{2}$  to the traffic series. Each resulting index is then seasonally adjusted and weighted to produce the HMI. Based on this calculation, the HMI can range between 0 and 100.

# Notices & disclosures

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# Imperial County Employees' Retirement System

Investment Performance Review

Period Ending: March 31, 2019



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SEATTLE 206-622-3700

LOS ANGELES 310-297-1777

SAN FRANCISCO 415-362-3484



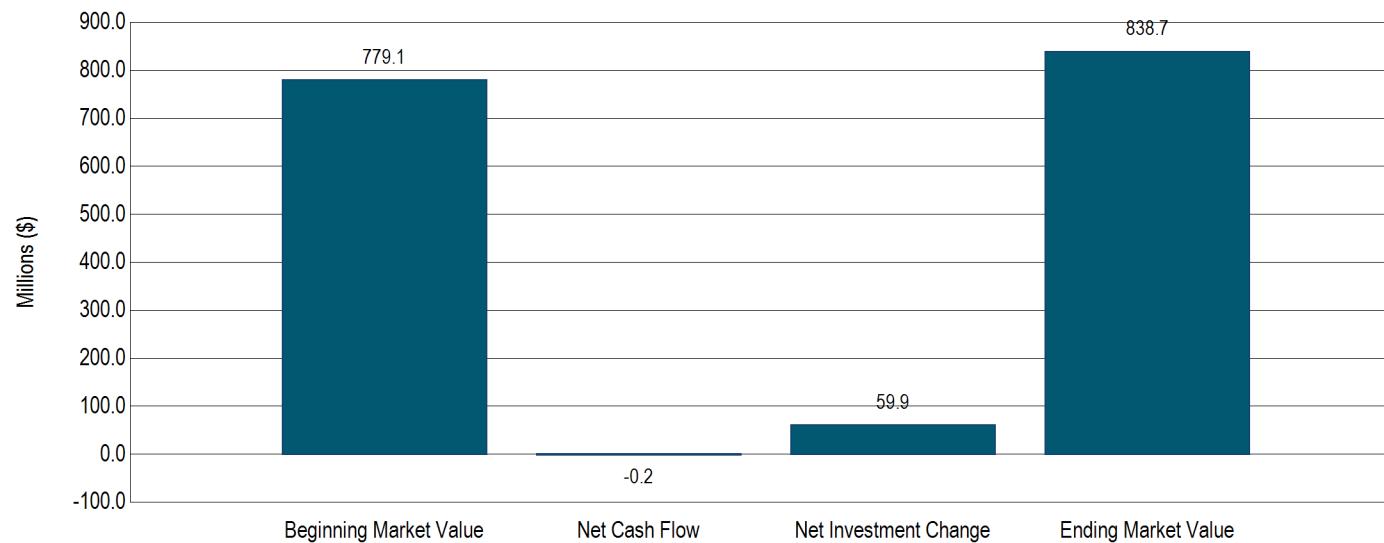
Total Fund  
Portfolio Reconciliation

Period Ending: March 31, 2019

Portfolio Reconciliation

	Last Three Months	Fiscal Year-To-Date	One Year
Beginning Market Value	\$779,063,871	\$820,270,584	\$819,861,910
Net Cash Flow	-\$207,631	-\$5,211,996	-\$10,170,504
Net Investment Change	\$59,853,561	\$23,651,213	\$29,018,395
Ending Market Value	\$838,709,801	\$838,709,801	\$838,709,801

Change in Market Value  
Last Three Months

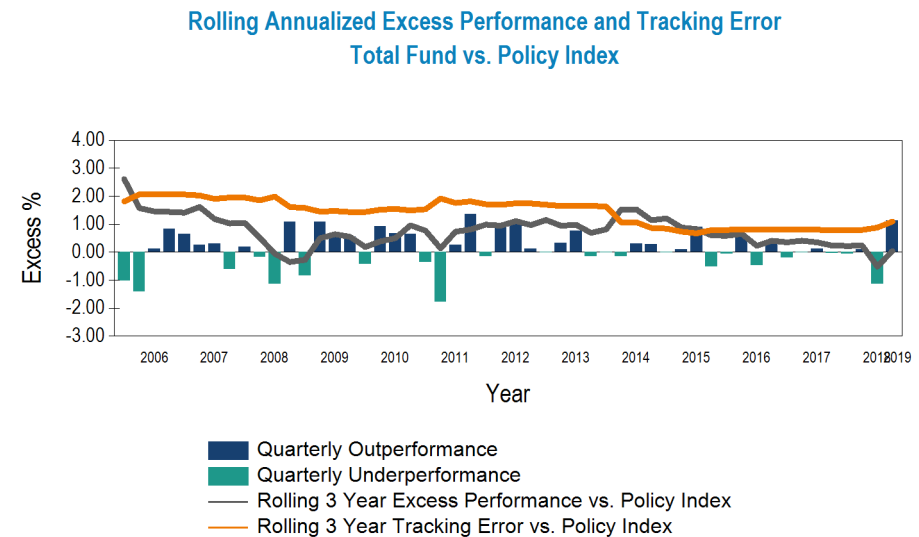
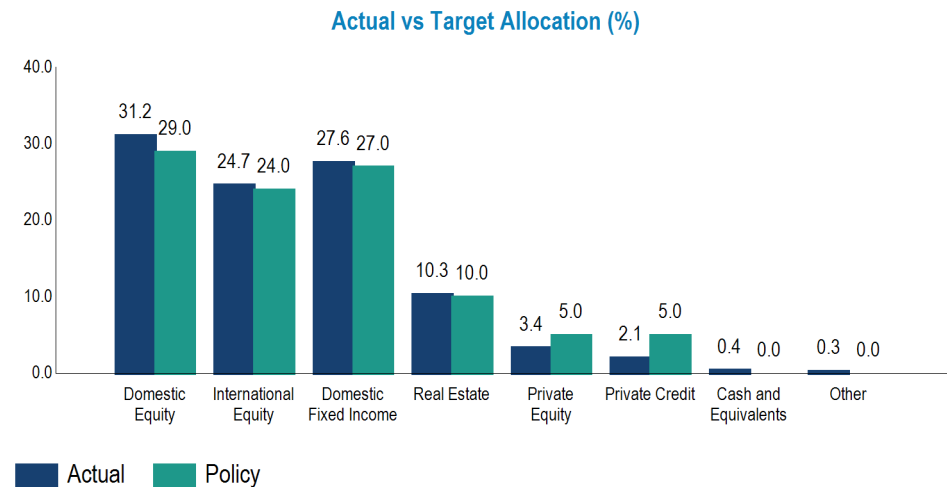


Contributions and withdrawals may include intra-account transfers between managers/funds. Fee transactions are excluded from Portfolio Reconciliation.

# Total Fund Executive Summary (Gross of Fees)

Period Ending: March 31, 2019

	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
<b>Total Fund</b>	<b>7.7</b>	<b>3.0</b>	<b>3.7</b>	<b>8.6</b>	<b>5.9</b>	<b>10.4</b>
Total Fund ex Parametric	7.7	3.0	3.7	8.6	5.9	10.4
Policy Index	6.6	3.0	3.8	8.5	5.7	9.8
InvestorForce Public DB Gross Rank	69	51	65	44	58	27
<b>Total Domestic Equity</b>	<b>14.1</b>	<b>4.8</b>	<b>8.8</b>	<b>13.6</b>	<b>9.9</b>	<b>16.2</b>
Russell 3000	14.0	4.7	8.8	13.5	10.4	16.0
InvestorForce Public DB US Eq Gross Rank	49	29	24	26	46	23
<b>Total International Equity</b>	<b>10.2</b>	<b>-1.8</b>	<b>-5.0</b>	<b>8.7</b>	<b>3.1</b>	<b>9.5</b>
MSCI ACWI ex USA Gross	10.4	-1.4	-3.7	8.6	3.0	9.3
InvestorForce Public DB ex-US Eq Gross Rank	76	32	36	32	55	58
<b>Total Fixed Income</b>	<b>3.5</b>	<b>4.3</b>	<b>4.2</b>	<b>3.2</b>	<b>3.2</b>	<b>5.3</b>
BBgBarc US Aggregate TR	2.9	4.6	4.5	2.0	2.7	3.8
InvestorForce Public DB Total Fix Inc Gross Rank	33	48	49	47	26	38
<b>Total Real Estate</b>	<b>1.5</b>	<b>4.8</b>	<b>6.9</b>	<b>6.6</b>	<b>9.7</b>	<b>8.4</b>
NCREIF-ODCE	1.4	5.4	7.5	8.0	10.2	8.7
<b>Total Private Equity</b>	<b>-2.8</b>	<b>7.3</b>	<b>10.5</b>	<b>15.0</b>	<b>16.4</b>	<b>--</b>
Russell 3000 +3% (Lagged)	-13.6	-2.5	-2.4	12.2	11.1	--
<b>Total Private Credit</b>	<b>2.2</b>	<b>7.0</b>	<b>7.8</b>	<b>--</b>	<b>--</b>	<b>--</b>
BBgBarc High Yield +2% (Lagged)	-4.1	0.2	-0.1	--	--	--
<b>Total Opportunistic</b>	<b>-6.6</b>	<b>-0.8</b>	<b>19.5</b>	<b>12.2</b>	<b>10.3</b>	<b>22.7</b>
Assumption Rate + 1%	2.0	6.1	8.3	8.4	8.4	8.8

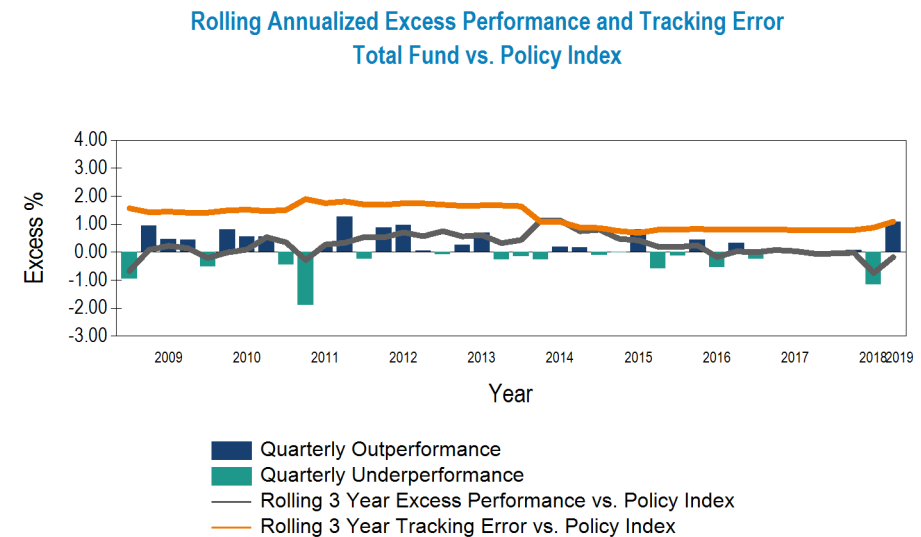
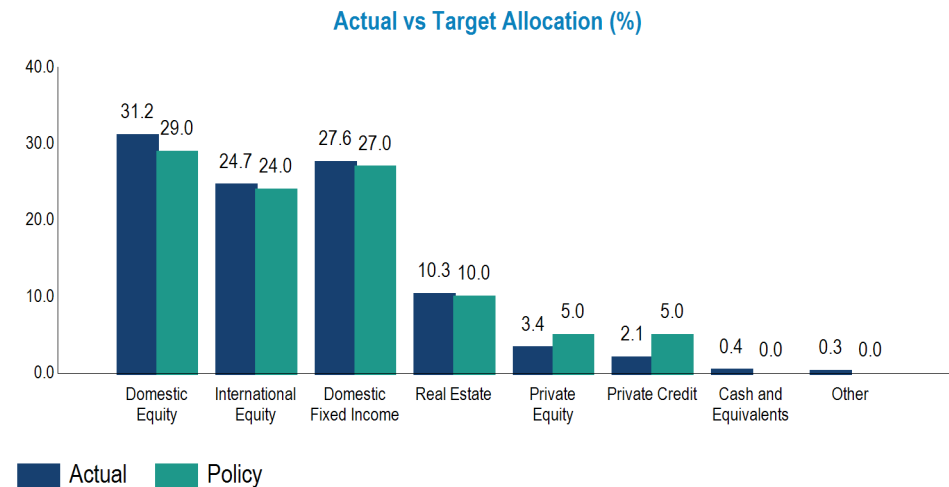


New Policy Index (as of 10/1/2018): 29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc US Aggregate, 10% NCREIF Property Index, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior Policy Index (10/1/2016 to 9/30/2018): 29% Russell 3000, 24% MSCI ACWI Ex USA Gross, 27% BBgBarc Aggregate, 5% NCREIF Property Index, 5% NCREIF Property Index +2%, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior quarter Private Equity returns and index data are used. All returns are (G) gross of fees. Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

# Total Fund Executive Summary (Net of Fees)

Period Ending: March 31, 2019

	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
<b>Total Fund</b>	<b>7.6</b>	<b>2.9</b>	<b>3.5</b>	<b>8.3</b>	<b>5.6</b>	<b>10.1</b>
<i>Total Fund ex Parametric</i>	7.6	2.9	3.5	8.3	5.6	10.0
<i>Policy Index</i>	6.6	3.0	3.8	8.5	5.7	9.8
<b>Total Domestic Equity</b>	<b>14.1</b>	<b>4.7</b>	<b>8.8</b>	<b>13.5</b>	<b>9.9</b>	<b>16.0</b>
<i>Russell 3000</i>	14.0	4.7	8.8	13.5	10.4	16.0
<b>Total International Equity</b>	<b>10.2</b>	<b>-2.0</b>	<b>-5.3</b>	<b>8.4</b>	<b>2.7</b>	<b>9.0</b>
<i>MSCI ACWI ex USA Gross</i>	10.4	-1.4	-3.7	8.6	3.0	9.3
<b>Total Fixed Income</b>	<b>3.5</b>	<b>4.1</b>	<b>3.9</b>	<b>2.9</b>	<b>2.9</b>	<b>5.0</b>
<i>BBgBarc US Aggregate TR</i>	2.9	4.6	4.5	2.0	2.7	3.8
<b>Total Real Estate</b>	<b>1.5</b>	<b>4.8</b>	<b>6.9</b>	<b>6.4</b>	<b>9.1</b>	<b>7.8</b>
<i>NCREIF-ODCE</i>	1.4	5.4	7.5	8.0	10.2	8.7
<b>Total Private Equity</b>	<b>-2.8</b>	<b>7.3</b>	<b>10.5</b>	<b>14.6</b>	<b>15.0</b>	<b>--</b>
<i>Russell 3000 +3% (Lagged)</i>	-13.6	-2.5	-2.4	12.2	11.1	--
<b>Total Private Credit</b>	<b>2.2</b>	<b>7.0</b>	<b>7.8</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>BBgBarc High Yield +2% (Lagged)</i>	-4.1	0.2	-0.1	--	--	--
<b>Total Opportunistic</b>	<b>-6.6</b>	<b>-0.8</b>	<b>19.5</b>	<b>11.6</b>	<b>9.2</b>	<b>21.3</b>
<i>Assumption Rate + 1%</i>	2.0	6.1	8.3	8.4	8.4	8.8



New Policy Index (as of 10/1/2018): 29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc US Aggregate, 10% NCREIF Property Index, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior Policy Index (10/1/2016 to 9/30/2018): 29% Russell 3000, 24% MSCI ACWI Ex USA Gross, 27% BBgBarc Aggregate, 5% NCREIF Property Index, 5% NCREIF Property Index +2%, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior quarter Private Equity returns and index data are used. All returns are (G) gross of fees. Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

## Total Fund

## Attribution Analysis - Asset Class Level (Gross of Fees)

Period Ending: March 31, 2019

## Attribution Effects



## Performance Attribution

	Quarter	YTD
Wtd. Actual Return	7.74%	7.74%
Wtd. Index Return *	6.56%	6.56%
<b>Excess Return</b>	<b>1.18%</b>	<b>1.18%</b>
Selection Effect	1.00%	1.00%
Allocation Effect	0.56%	0.56%
Interaction Effect	-0.38%	-0.38%

\*Calculated from benchmark returns and weightings of each component.

Attribution Summary  
Last Three Months

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Total Domestic Equity	14.1%	14.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Total International Equity	10.2%	10.4%	-0.2%	0.0%	0.0%	0.0%	0.0%
Total Fixed Income	3.5%	2.9%	0.6%	0.2%	-0.1%	0.0%	0.1%
Total Real Estate	1.5%	1.8%	-0.3%	0.0%	0.0%	0.0%	-0.1%
Total Private Equity	-2.8%	-13.6%	10.8%	0.6%	0.3%	-0.2%	0.7%
Total Private Credit	2.2%	-4.1%	6.2%	0.3%	0.3%	-0.2%	0.5%
Total Opportunistic	-6.6%	2.0%	-8.6%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>7.7%</b>	<b>6.6%</b>	<b>1.2%</b>	<b>1.0%</b>	<b>0.6%</b>	<b>-0.4%</b>	<b>1.2%</b>

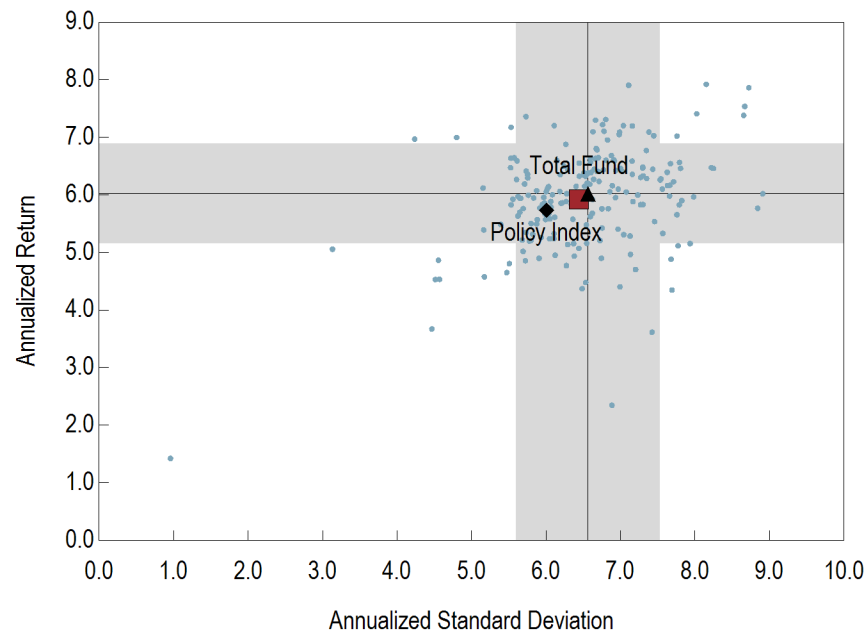
Weighted returns shown in attribution analysis may differ from actual returns.

Total Fund  
Risk Analysis - 5 Years (Gross of Fees)

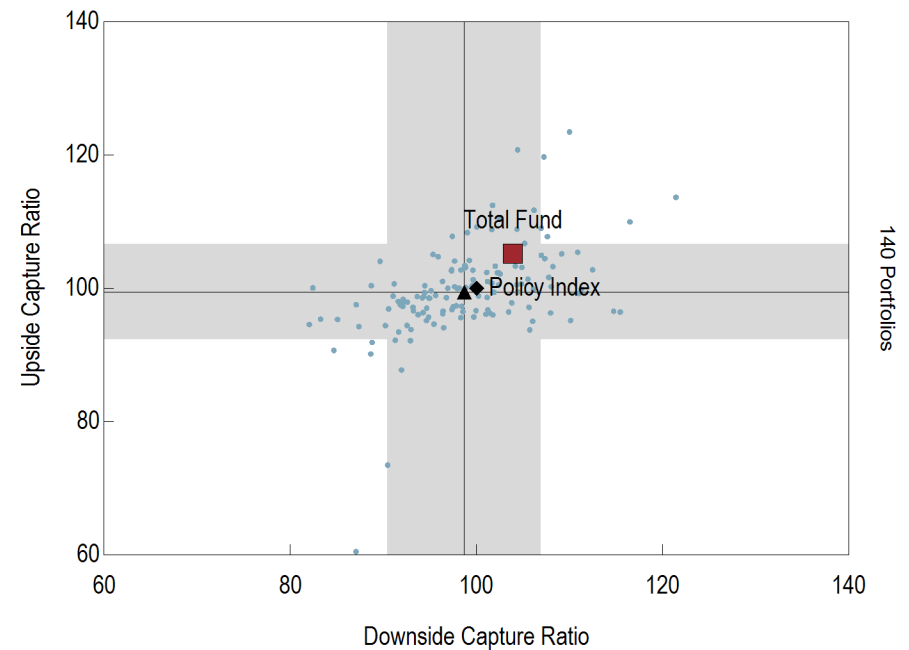
Period Ending: March 31, 2019

	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Total Fund	5.92%	0.19%	6.44%	-0.18%	1.06	0.90%	0.98	0.81	0.21	105.15%	103.93%

Risk vs. Return



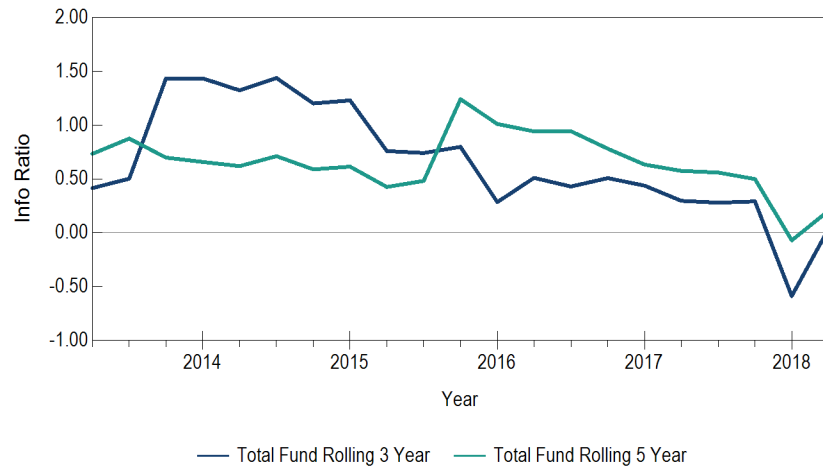
Up Markets vs. Down Markets



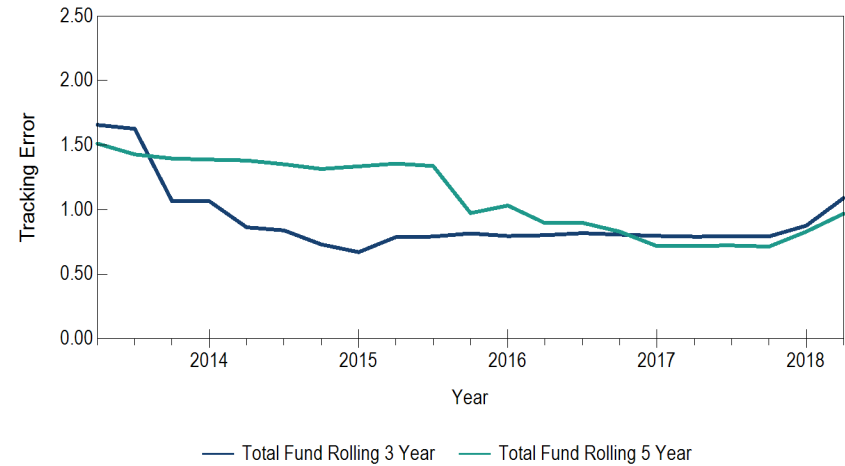
Total Fund  
Rolling Risk Statistics (Gross of Fees)

Period Ending: March 31, 2019

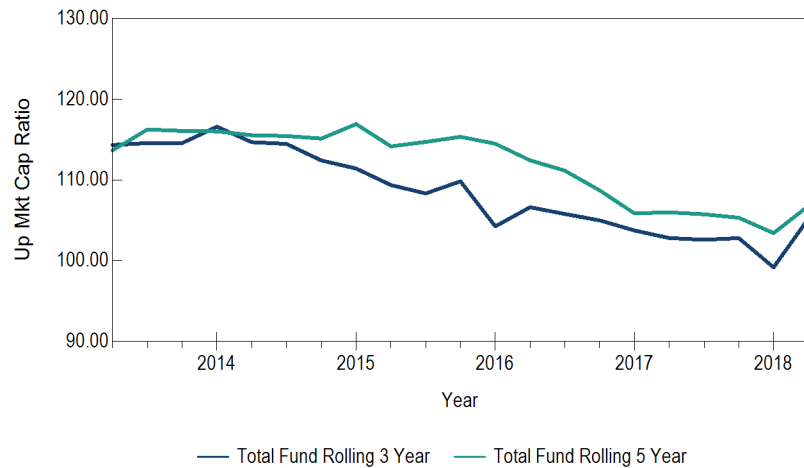
Rolling Information Ratio



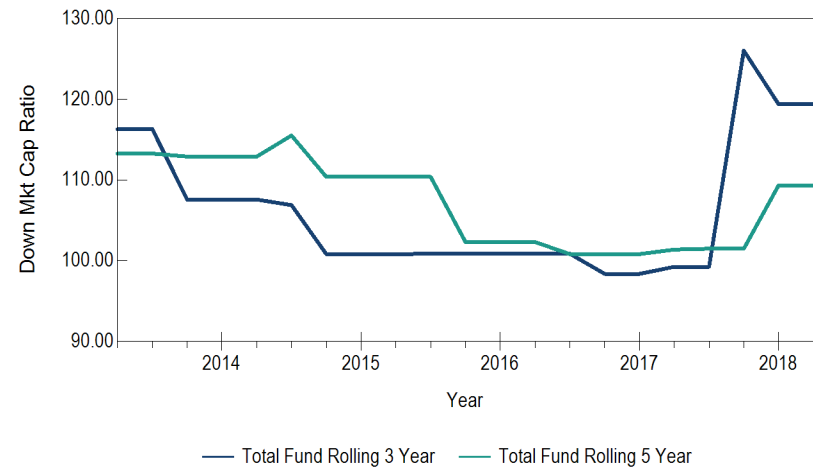
Rolling Tracking Error



Rolling Up Market Capture Ratio (%)



Rolling Down Market Capture Ratio (%)



## Total Fund

## Performance Summary (Gross of Fees)

Period Ending: March 31, 2019

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>Total Fund</b>	<b>838,709,801</b>	<b>100.0</b>	<b>7.7</b>	<b>3.0</b>	<b>3.7</b>	<b>8.6</b>	<b>5.9</b>	<b>10.4</b>	<b>-4.0</b>	<b>16.2</b>	<b>7.8</b>	<b>0.0</b>	<b>4.8</b>	<b>9.2</b>	<b>Mar-89</b>
Policy Index			6.6	3.0	3.8	8.5	5.7	9.8	-2.8	15.9	8.3	-1.2	4.9	--	Mar-89
InvestorForce Public DB Gross Rank			69	51	65	44	58	27	50	30	49	53	74	3	Mar-89
<b>Total Fund ex Parametric</b>			<b>7.7</b>	<b>3.0</b>	<b>3.7</b>	<b>8.6</b>	<b>5.9</b>	<b>10.4</b>	<b>-4.0</b>	<b>16.2</b>	<b>7.8</b>	<b>0.0</b>	<b>4.9</b>	<b>9.2</b>	<b>Mar-89</b>
Policy Index			6.6	3.0	3.8	8.5	5.7	9.8	-2.8	15.9	8.3	-1.2	4.9	--	Mar-89
InvestorForce Public DB Gross Rank			69	51	65	44	57	28	50	30	49	53	72	4	Mar-89
<b>Total Domestic Equity</b>	<b>261,335,937</b>	<b>31.2</b>	<b>14.1</b>	<b>4.8</b>	<b>8.8</b>	<b>13.6</b>	<b>9.9</b>	<b>16.2</b>	<b>-5.2</b>	<b>21.2</b>	<b>12.9</b>	<b>0.3</b>	<b>10.2</b>		
Russell 3000			14.0	4.7	8.8	13.5	10.4	16.0	-5.2	21.1	12.7	0.5	12.6		
InvestorForce Public DB US Eq Gross Rank			49	29	24	26	46	23	35	35	51	44	73		
BlackRock Russell 3000	261,335,937	31.2	14.1	4.8	8.8	13.6	--	--	-5.2	21.2	12.9	--	--	12.0	Dec-15
Russell 3000			14.0	4.7	8.8	13.5	--	--	-5.2	21.1	12.7	--	--	11.7	Dec-15
eV US All Cap Core Equity Gross Rank			38	46	37	29	--	--	49	49	35	--	--	43	Dec-15
<b>Total International Equity</b>	<b>206,803,982</b>	<b>24.7</b>	<b>10.2</b>	<b>-1.8</b>	<b>-5.0</b>	<b>8.7</b>	<b>3.1</b>	<b>9.5</b>	<b>-14.0</b>	<b>28.3</b>	<b>4.7</b>	<b>-3.5</b>	<b>-4.4</b>		
MSCI ACWI ex USA Gross			10.4	-1.4	-3.7	8.6	3.0	9.3	-13.8	27.8	5.0	-5.3	-3.4		
InvestorForce Public DB ex-US Eq Gross Rank			76	32	36	32	55	58	35	59	40	57	74		
BlackRock International Equity	140,998,352	16.8	10.1	-2.4	-3.2	7.7	2.7	9.4	-13.4	25.5	1.5	-0.5	-4.7	7.1	Jul-03
MSCI EAFE Gross			10.1	-2.3	-3.2	7.8	2.8	9.5	-13.4	25.6	1.5	-0.4	-4.5	7.2	Jul-03
eV All EAFE Equity Gross Rank			58	33	33	46	71	79	35	65	47	67	64	70	Jul-03
DFA Emerging Markets Value	31,654,761	3.8	7.3	2.1	-7.2	12.2	4.0	9.8	-11.4	34.5	20.5	-18.3	-3.9	4.5	Jan-07
MSCI Emerging Markets Gross			10.0	0.9	-7.1	11.1	4.1	9.3	-14.2	37.8	11.6	-14.6	-1.8	4.5	Jan-07
eV Emg Mkts Equity Gross Rank			89	30	42	31	66	72	16	70	7	92	84	58	Jan-07
Harding Loevner Emerging Markets	34,150,869	4.1	13.8	-2.8	-10.3	--	--	--	-18.6	35.0	--	--	--	8.2	Jul-16
MSCI Emerging Markets Gross			10.0	0.9	-7.1	--	--	--	-14.2	37.8	--	--	--	10.2	Jul-16
eV Emg Mkts Equity Gross Rank			15	81	78	--	--	--	84	68	--	--	--	60	Jul-16
<b>Total Fixed Income</b>	<b>231,794,819</b>	<b>27.6</b>	<b>3.5</b>	<b>4.3</b>	<b>4.2</b>	<b>3.2</b>	<b>3.2</b>	<b>5.3</b>	<b>-0.5</b>	<b>4.6</b>	<b>5.1</b>	<b>-0.3</b>	<b>5.9</b>		
BBgBarc US Aggregate TR			2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0		
InvestorForce Public DB Total Fix Inc Gross Rank			33	48	49	47	26	38	58	59	41	55	15		
Tortoise Capital	96,095,440	11.5	3.7	5.0	4.8	3.5	3.8	5.9	0.2	4.5	5.1	1.2	7.0	6.4	Dec-92
BBgBarc US Aggregate TR			2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0	5.4	Dec-92
eV US Core Plus Fixed Inc Gross Rank			53	42	41	48	15	52	24	70	45	15	16	43	Dec-92
MackKay Shields Core Plus Opportunities	93,190,132	11.1	3.5	4.5	4.3	3.3	--	--	-0.7	4.9	5.1	--	--	2.3	Mar-15
BBgBarc US Aggregate TR			2.9	4.6	4.5	2.0	--	--	0.0	3.5	2.6	--	--	2.1	Mar-15
eV US Core Plus Fixed Inc Gross Rank			63	82	80	57	--	--	69	54	46	--	--	88	Mar-15

Since Inception ranking is from the beginning of the first complete month. Templeton Foreign Equity liquidated 10/27/2015. TimesSquare, BlackRock Russell 1000 and T. Rowe liquidated 12/10/2015. BlackRock Russell 3000 funded 12/10/2015. Harding Loevner funded 7/5/2016. Parametric liquidated 7/5/2016. Vontobel liquidated 7/13/2016. Gresham MTAP liquidated 8/22/2016. BlackRock Commodities liquidated 9/2/2016. ARA American Strategic Value Realty funded 1/4/2018.

# Total Fund Performance Summary (Gross of Fees)

Period Ending: March 31, 2019

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
BlackRock US TIPS	42,509,247	5.1	3.2	2.0	2.9	1.9	2.1	3.5	-1.1	3.2	4.8	-1.2	3.6	4.0	Apr-07
BBgBarc US TIPS TR			3.2	1.9	2.7	1.7	1.9	3.4	-1.3	3.0	4.7	-1.4	3.6	3.9	Apr-07
eV US TIPS / Inflation Fixed Inc Gross Rank			58	51	34	46	33	58	47	46	37	43	45	63	Apr-07
<b>Total Real Estate</b>	<b>86,682,171</b>	<b>10.3</b>	<b>1.5</b>	<b>4.8</b>	<b>6.9</b>	<b>6.6</b>	<b>9.7</b>	<b>8.4</b>	<b>7.5</b>	<b>5.8</b>	<b>7.5</b>	<b>16.1</b>	<b>13.0</b>		
NCREIF ODCE			1.4	4.9	6.8	7.1	9.1	8.5	7.1	7.0	8.0	13.3	11.8		
ASB Real Estate	35,981,713	4.3	1.8	4.8	6.7	5.5	9.1	--	6.6	4.0	5.6	17.3	13.5	9.9	Dec-12
NCREIF-ODCE			1.4	5.4	7.5	8.0	10.2	--	8.3	7.6	8.8	15.0	12.5	10.8	Dec-12
NCREIF Property Index			1.8	4.9	6.8	7.1	9.1	--	6.7	7.0	8.0	13.3	11.8	9.5	Dec-12
Clarion Lion	36,524,454	4.4	1.7	5.4	8.0	8.0	10.8	8.4	8.6	7.9	9.1	15.7	13.2	5.4	Dec-06
NCREIF-ODCE			1.4	5.4	7.5	8.0	10.2	8.7	8.3	7.6	8.8	15.0	12.5	6.2	Dec-06
NCREIF Property Index			1.8	4.9	6.8	7.1	9.1	8.5	6.7	7.0	8.0	13.3	11.8	6.9	Dec-06
ARA American Strategic Value Realty	12,395,303	1.5	0.0	3.3	6.3	--	--	--	--	--	--	--	--	6.8	Jan-18
NCREIF ODCE +2%			0.5	4.9	7.1	--	--	--	--	--	--	--	--	7.5	Jan-18
1221 State St. Corp	1,780,700	0.2	0.0	0.0	0.0	5.5	3.3	1.1	0.0	0.0	17.5	0.0	0.0	1.2	Sep-08
<b>Total Private Equity</b>															
Harbourvest Buyout IX	6,434,866	0.8	0.0	-1.3	5.1	16.2	16.5	--	8.7	28.5	13.9	14.2	20.9	13.1	Jun-11
Harbourvest Credit Opps IX	1,197,560	0.1	0.0	2.0	5.3	12.9	12.6	--	8.0	15.0	18.1	7.8	20.6	14.1	Jun-11
Harbourvest International PE VI	2,858,212	0.3	0.0	-2.3	0.4	11.5	12.8	--	4.7	27.5	7.4	11.9	18.0	7.1	Mar-10
Harbourvest Venture IX	4,035,723	0.5	0.0	0.5	7.1	10.7	14.8	--	12.2	14.9	4.9	17.6	31.0	13.0	Jun-11
Harbourvest 2017 Global Fund	12,382,710	1.5	0.0	2.0	10.6	--	--	--	11.5	--	--	--	--	13.4	Sep-17
Harbourvest 2018 Global Fund	1,361,992	0.2	0.0	--	--	--	--	--	--	--	--	--	--	-2.7	Dec-18
Russell 3000 + 3%			14.9	--	--	--	--	--	--	--	--	--	--	4.4	Dec-18
<b>Total Private Credit</b>															
Portfolio Advisors	17,574,452	2.1	2.2	7.0	7.8	--	--	--	6.7	--	--	--	--	6.3	Oct-17
BBgBarc High Yield +2% (Lagged)			-4.1	0.2	-0.1	--	--	--	5.1	--	--	--	--	1.4	Oct-17
<b>Total Opportunistic</b>															
KKR Mezzanine Partners	2,248,609	0.3	-4.1	5.0	15.7	11.0	9.4	--	25.3	8.7	5.6	5.9	12.7	12.4	Apr-11
PIMCO BRAVO	290,271	0.0	-19.2	-25.4	43.7	15.3	10.5	--	77.8	-12.4	12.5	2.2	20.0	17.4	May-11
<b>Total Cash</b>															
Cash Account	3,708,497	0.4	0.0	0.0	0.0	0.0	0.0	--	0.0	0.0	0.0	0.0	0.0		
91 Day T-Bills			0.6	1.7	2.1	1.2	0.8	--	1.9	0.9	0.3	0.0	0.0		

Since Inception ranking is from the beginning of the first complete month. Templeton Foreign Equity liquidated 10/27/2015. TimesSquare, BlackRock Russell 1000 and T. Rowe liquidated 12/10/2015. BlackRock Russell 3000 funded 12/10/2015. Harding Loevner funded 7/5/2016. Parametric liquidated 7/5/2016. Vontobel liquidated 7/13/2016. Gresham MTAP liquidated 8/22/2016. BlackRock Commodities liquidated 9/2/2016. ARA American Strategic Value Realty funded 1/4/2018.

# Total Fund Performance Summary (Net of Fees)

Period Ending: March 31, 2019

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>Total Fund</b>	<b>838,709,801</b>	<b>100.0</b>	<b>7.6</b>	<b>2.9</b>	<b>3.5</b>	<b>8.3</b>	<b>5.6</b>	<b>10.1</b>	<b>-4.1</b>	<b>16.0</b>	<b>7.4</b>	<b>-0.4</b>	<b>4.4</b>	<b>8.8</b>	<b>Mar-89</b>
Policy Index			6.6	3.0	3.8	8.5	5.7	9.8	-2.8	15.9	8.3	-1.2	4.9	--	Mar-89
Total Fund ex Parametric			7.6	2.9	3.5	8.3	5.6	10.0	-4.1	16.0	7.5	-0.4	4.4	8.7	Mar-89
Policy Index			6.6	3.0	3.8	8.5	5.7	9.8	-2.8	15.9	8.3	-1.2	4.9	--	Mar-89
<b>Total Domestic Equity</b>	<b>261,335,937</b>	<b>31.2</b>	<b>14.1</b>	<b>4.7</b>	<b>8.8</b>	<b>13.5</b>	<b>9.9</b>	<b>16.0</b>	<b>-5.2</b>	<b>21.2</b>	<b>12.8</b>	<b>0.1</b>	<b>10.0</b>		
Russell 3000			14.0	4.7	8.8	13.5	10.4	16.0	-5.2	21.1	12.7	0.5	12.6		
BlackRock Russell 3000	261,335,937	31.2	14.1	4.7	8.8	13.5	--	--	-5.2	21.2	12.8	--	--	12.0	Dec-15
Russell 3000			14.0	4.7	8.8	13.5	--	--	-5.2	21.1	12.7	--	--	11.7	Dec-15
<b>Total International Equity</b>	<b>206,803,982</b>	<b>24.7</b>	<b>10.2</b>	<b>-2.0</b>	<b>-5.3</b>	<b>8.4</b>	<b>2.7</b>	<b>9.0</b>	<b>-14.3</b>	<b>27.9</b>	<b>4.4</b>	<b>-4.0</b>	<b>-4.9</b>		
MSCI ACWI ex USA Gross			10.4	-1.4	-3.7	8.6	3.0	9.3	-13.8	27.8	5.0	-5.3	-3.4		
BlackRock International Equity	140,998,352	16.8	10.1	-2.4	-3.3	7.6	2.6	9.2	-13.5	25.4	1.3	-0.6	-4.8	7.0	Jul-03
MSCI EAFE Gross			10.1	-2.3	-3.2	7.8	2.8	9.5	-13.4	25.6	1.5	-0.4	-4.5	7.2	Jul-03
DFA Emerging Markets Value	31,654,761	3.8	7.2	1.7	-7.7	11.6	3.4	9.2	-11.9	33.8	19.8	-18.8	-4.4	3.9	Jan-07
MSCI Emerging Markets Gross			10.0	0.9	-7.1	11.1	4.1	9.3	-14.2	37.8	11.6	-14.6	-1.8	4.5	Jan-07
Harding Loevner Emerging Markets	34,150,869	4.1	13.5	-3.6	-11.2	--	--	--	-19.5	33.6	--	--	--	7.1	Jul-16
MSCI Emerging Markets Gross			10.0	0.9	-7.1	--	--	--	-14.2	37.8	--	--	--	10.2	Jul-16
<b>Total Fixed Income</b>	<b>231,794,819</b>	<b>27.6</b>	<b>3.5</b>	<b>4.1</b>	<b>3.9</b>	<b>2.9</b>	<b>2.9</b>	<b>5.0</b>	<b>-0.8</b>	<b>4.3</b>	<b>4.8</b>	<b>-0.6</b>	<b>5.6</b>		
BBgBarc US Aggregate TR			2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0		
Tortoise Capital	96,095,440	11.5	3.6	4.8	4.5	3.2	3.5	5.5	-0.1	4.3	4.8	0.9	6.7	6.1	Dec-92
BBgBarc US Aggregate TR			2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0	5.4	Dec-92
MacKay Shields Core Plus Opportunities	93,190,132	11.1	3.4	4.2	4.0	2.9	--	--	-1.0	4.5	4.7	--	--	2.0	Mar-15
BBgBarc US Aggregate TR			2.9	4.6	4.5	2.0	--	--	0.0	3.5	2.6	--	--	2.1	Mar-15
BlackRock US TIPS	42,509,247	5.1	3.2	2.0	2.8	1.8	2.0	3.5	-1.2	3.2	4.8	-1.3	3.6	3.9	Apr-07
BBgBarc US TIPS TR			3.2	1.9	2.7	1.7	1.9	3.4	-1.3	3.0	4.7	-1.4	3.6	3.9	Apr-07

# Total Fund Performance Summary (Net of Fees)

Period Ending: March 31, 2019

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>Total Real Estate</b>	<b>86,682,171</b>	<b>10.3</b>	<b>1.5</b>	<b>4.8</b>	<b>6.9</b>	<b>6.4</b>	<b>9.1</b>	<b>7.8</b>	<b>7.5</b>	<b>5.8</b>	<b>6.5</b>	<b>15.0</b>	<b>11.6</b>		
NCREIF ODCE			1.4	4.9	6.8	7.1	9.1	8.5	7.1	7.0	8.0	13.3	11.8		
ASB Real Estate	35,981,713	4.3	1.8	4.8	6.7	5.2	8.5	--	6.6	4.0	4.6	16.2	12.5	9.2	Dec-12
NCREIF-ODCE			1.4	5.4	7.5	8.0	10.2	--	8.3	7.6	8.8	15.0	12.5	10.8	Dec-12
NCREIF Property Index			1.8	4.9	6.8	7.1	9.1	--	6.7	7.0	8.0	13.3	11.8	9.5	Dec-12
Clarion Lion	36,524,454	4.4	1.7	5.4	8.0	7.7	10.2	7.6	8.6	7.9	8.0	14.6	12.2	4.5	Dec-06
NCREIF-ODCE			1.4	5.4	7.5	8.0	10.2	8.7	8.3	7.6	8.8	15.0	12.5	6.2	Dec-06
NCREIF Property Index			1.8	4.9	6.8	7.1	9.1	8.5	6.7	7.0	8.0	13.3	11.8	6.9	Dec-06
ARA American Strategic Value Realty	12,395,303	1.5	0.0	3.3	6.3	--	--	--	--	--	--	--	--	6.8	Jan-18
NCREIF ODCE +2%			0.5	4.9	7.1	--	--	--	--	--	--	--	--	7.5	Jan-18
1221 State St. Corp	1,780,700	0.2	0.0	0.0	0.0	5.5	3.3	1.1	0.0	0.0	17.5	0.0	0.0	1.2	Sep-08
<b>Total Private Equity</b>															
Harbourvest Buyout IX	6,434,866	0.8	0.0	-1.3	5.1	16.2	16.5	--	8.7	28.5	13.9	14.2	20.9	13.1	Jun-11
Harbourvest Credit Opps IX	1,197,560	0.1	0.0	2.0	5.3	12.9	12.6	--	8.0	15.0	18.1	7.8	20.6	14.1	Jun-11
Harbourvest International PE VI	2,858,212	0.3	0.0	-2.3	0.4	11.5	12.8	--	4.7	27.5	7.4	11.9	18.0	6.9	Mar-10
Harbourvest Venture IX	4,035,723	0.5	0.0	0.5	7.1	10.7	14.8	--	12.2	14.9	4.9	17.6	31.0	13.0	Jun-11
Harbourvest 2017 Global Fund	12,382,710	1.5	0.0	2.0	10.6	--	--	--	11.5	--	--	--	--	13.4	Sep-17
Harbourvest 2018 Global Fund	1,361,992	0.2	0.0	--	--	--	--	--	--	--	--	--	--	-2.7	Dec-18
Russell 3000 + 3%			14.9	--	--	--	--	--	--	--	--	--	--	4.4	Dec-18
<b>Total Private Credit</b>															
Portfolio Advisors	17,574,452	2.1	2.2	7.0	7.8	--	--	--	6.7	--	--	--	--	6.3	Oct-17
BBgBarc High Yield +2% (Lagged)			-4.1	0.2	-0.1	--	--	--	5.1	--	--	--	--	1.4	Oct-17
<b>Total Opportunistic</b>															
KKR Mezzanine Partners	2,248,609	0.3	-4.1	5.0	15.7	10.6	8.5	--	25.3	8.7	4.0	4.1	11.3	11.4	Apr-11
PIMCO BRAVO	290,271	0.0	-19.2	-25.4	43.7	14.4	9.9	--	77.8	-12.4	11.2	1.0	18.9	16.3	May-11
<b>Total Cash</b>															
Cash Account	3,708,497	0.4	0.0	0.0	0.0	0.0	0.0	--	0.0	0.0	0.0	0.0	0.0		
91 Day T-Bills			0.6	1.7	2.1	1.2	0.8	--	1.9	0.9	0.3	0.0	0.0		

## Investment Manager

## Performance Analysis - 3 &amp; 5 Years (Net of Fees)

Period Ending: March 31, 2019

## 3 Years

	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
BlackRock Russell 3000	13.53%	0.04%	11.09%	0.04%	1.00	0.04%	1.00	1.11	1.00	100.22%	99.97%
BlackRock International Equity	7.62%	-0.19%	10.50%	-0.20%	1.00	0.15%	1.00	0.61	-1.20	99.71%	100.99%
DFA Emerging Markets Value	11.57%	0.49%	13.89%	0.24%	1.02	3.95%	0.92	0.75	0.12	109.02%	106.56%
Tortoise Capital	3.20%	1.18%	2.80%	1.38%	0.90	0.85%	0.92	0.73	1.38	109.26%	75.27%
Mackay Shields Core Plus Opportunities	2.89%	0.87%	2.82%	1.06%	0.90	0.90%	0.91	0.59	0.96	106.42%	81.15%
BlackRock US TIPS	1.81%	0.11%	3.05%	0.11%	1.01	0.05%	1.00	0.21	2.53	101.70%	99.08%
ASB Real Estate	5.22%	-2.75%	2.44%	-0.27%	0.69	1.42%	0.83	1.66	-1.94	65.81%	--
Clarion Lion	7.70%	-0.27%	3.27%	-0.17%	0.99	0.67%	0.96	2.00	-0.40	98.92%	--

## 5 Years

	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
BlackRock International Equity	2.60%	-0.21%	11.80%	-0.22%	1.00	0.12%	1.00	0.16	-1.74	99.41%	100.63%
DFA Emerging Markets Value	3.41%	-0.65%	16.46%	-0.87%	1.05	3.63%	0.95	0.16	-0.18	107.87%	105.23%
Tortoise Capital	3.54%	0.80%	2.77%	1.01%	0.92	0.87%	0.91	1.02	0.92	107.96%	84.97%
BlackRock US TIPS	2.02%	0.08%	3.62%	0.06%	1.01	0.13%	1.00	0.36	0.62	101.59%	100.00%
ASB Real Estate	8.51%	-1.66%	4.56%	-1.41%	0.98	1.80%	0.84	1.71	-0.92	85.15%	--
Clarion Lion	10.20%	0.03%	4.62%	-0.53%	1.05	0.96%	0.96	2.05	0.03	104.63%	--

# Private Equity Non Marketable Securities Overview

Period Ending: March 31, 2019

Vintage	Manager & Fund Name	Estimated 3/31 Market Value <sup>3</sup>	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) <sup>1</sup>	Tot. Value/ Paid-In (TVPI) <sup>2</sup>	Net IRR Since Inception <sup>4</sup>	IRR Date	
2011	HarbourVest IX-Buyout	\$6,434,866	\$10,000,000	\$8,025,000	80%	\$1,975,000	\$5,588,853	\$7,282,197	69.6%	149.8%	18.0%	9/30/18	
2011	HarbourVest IX-Credit	\$1,197,560	\$2,000,000	\$1,450,000	73%	\$550,000	\$869,207	\$1,235,080	59.9%	142.5%	14.7%	9/30/18	
2008	HarbourVest Int'l VI <sup>5</sup>	\$2,858,212	\$3,712,930	\$2,605,981	70%	\$1,106,949	\$1,680,440	\$2,728,273	64.5%	174.2%	15.1%	9/30/18	
2011	HarbourVest IX-Venture	\$4,035,723	\$4,000,000	\$3,800,000	95%	\$200,000	\$1,985,700	\$4,651,709	52.3%	158.5%	17.0%	9/30/18	
2017	HarbourVest 2017 Global	\$12,382,710	\$30,000,000	\$12,000,000	40%	\$18,000,000	\$1,187,853	\$9,440,860	9.9%	113.1%	32.0%	9/30/18	
2018	HarbourVest 2018 Global	\$1,361,992	\$20,000,000	\$1,400,000	7%	\$18,600,000	\$0	N/A	0.0%	97.3%	N/A	N/A	
Total Illiquid Private Equity		\$28,271,063	\$69,712,930	\$29,280,981	42%	\$40,431,949	\$11,312,053	\$25,338,119	86.5%	125.2%			
% of Portfolio (Market Value)		3.4%						Management Fee	Admin Fee	Interest Expense	Other Expense	Total Expense <sup>6</sup>	
								HarbourVest IX-Buyout	\$24,924	\$0	\$0	\$0	\$24,924
								HarbourVest IX-Credit	\$4,980	\$0	\$0	\$0	\$4,980
								HarbourVest Int'l VI	\$6,728	\$0	\$0	\$36	\$6,764
								HarbourVest IX-Venture	\$9,987	\$0	\$0	\$0	\$9,987
								HarbourVest 2017 Global	\$49,500	\$0	\$0	\$0	\$49,500
								HarbourVest 2018 Global	\$67,500	\$0	\$0	\$32,149	\$99,649
									\$163,619	\$0	\$0	\$32,185	\$195,804

<sup>1</sup>(DPI) is equal to (capital returned / capital called)

<sup>2</sup>(TVPI) is equal to (market value + capital returned) / capital called

<sup>3</sup>Last known market value + capital calls - distributions (preliminary MV's as of 12/31/18)

<sup>4</sup>Net IRR is calculated on the cash flows of all the limited partners of the fund and is net of all fees. Each IRR figure is provided by its respective manager.

<sup>5</sup>HarbourVest International Private Equity Partners VI-Partnership Fund L.P. values are originally presented in euros and are calculated to dollars using XE™.

<sup>6</sup>All fees and expenses are for 4Q 2018

HarbourVest 2017 Global Fund first capital call issued 9/21/2017. Portfolio Advisors first capital call issued 10/5/2017. HarbourVest 2018 Global Fund first capital call issued 12/13/2018.

# Private Credit Non Marketable Securities Overview

Period Ending: March 31, 2019

Vintage	Manager & Fund Name	Estimated 3/31 Market Value <sup>3</sup>	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) <sup>1</sup>	Tot. Value/ Paid-In (TVPI) <sup>2</sup>	Net IRR Since Inception <sup>4</sup>	IRR Date
2013	Portfolio Advisors Credit Strategies Fund	\$12,227,783	\$11,250,000	\$11,250,000	100%	\$0	\$0	\$11,989,831	0.0%	108.7%	8.7%	9/30/18
2017	Crescent Direct Lending Levered Fund II	\$2,563,926	\$7,000,000	\$2,440,506	35%	\$4,559,494	\$48,772	\$2,563,926	2.0%	107.1%	11.9%	12/31/18
2017	Audax Direct Lending Fund A	\$547,083	\$7,000,000	\$550,703	8%	\$6,449,297	\$32,053	\$579,136	5.8%	105.2%	NM <sup>6</sup>	NM <sup>6</sup>
2018	Ares Capital Europe IV	\$2,235,660	\$8,000,000	\$2,185,060	27%	\$5,814,940	\$13,737	\$1,416,827	0.6%	102.9%	NM <sup>7</sup>	NM <sup>7</sup>
Total Illiquid Private Credit		\$17,574,452	\$33,250,000	\$16,426,269	49%	\$16,823,731	\$94,562	\$16,549,720	100.8%	101.3%		
% of Portfolio (Market Value)		2.1%										
							Management Fee	Accrued Carried Interest	Admin Fee	Interest Expense	Other Expense	Total Expense <sup>5</sup>
							\$0	\$68,574	\$0	\$0	\$0	\$68,574
							\$42,814	\$6,169	\$3,412	\$0	\$1,037	\$53,432
							\$5,907	\$0	\$0	\$0	\$21,920	\$27,827
							\$5,250	\$7,411	\$10,806	\$0	\$0	\$23,467

# Opportunistic Non Marketable Securities Overview

Period Ending: March 31, 2019

Vintage	Manager & Fund Name	Estimated 3/31 Market Value <sup>3</sup>	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) <sup>1</sup>	Tot. Value/ Paid-In (TVPI) <sup>2</sup>	Net IRR Since Inception <sup>5</sup>	IRR Date	
2010	KKR Mezzanine <sup>6</sup>	\$2,248,609	\$10,000,000	\$10,000,000	100%	\$0	\$13,137,486	\$2,345,703	131.4%	153.9%	8.5%	12/31/18	
2011	PIMCO BRAVO <sup>4</sup>	\$290,271	\$10,000,000	\$10,000,000	100%	\$0	\$18,054,734	\$374,948	180.5%	183.5%	22.4%	12/31/18	
Total Illiquid Opportunistic		\$2,538,880	\$20,000,000	\$20,000,000	100%	\$0	\$31,192,220	\$2,720,651	13.6%	169.6%			
% of Portfolio (Market Value)		0.3%											
							Management Fee	Accrued Carried Interest	Admin Fee	Interest Expense	Other Expense	Total Expense <sup>7</sup>	
							KKR Mezzanine	\$7,844	\$24,274	\$0	\$0	\$1,132	\$33,250
							PIMCO BRAVO	\$0	-\$22,044	\$130	\$0	\$238	-\$21,676
								\$7,844	\$2,230	\$130	\$0	\$1,370	\$11,574

<sup>1</sup>(DPI) is equal to (capital returned / capital called)

<sup>2</sup>(TVPI) is equal to (market value + capital returned) / capital called

<sup>3</sup>Last known market value + capital calls - distributions (MV's as of 12/31/18)

<sup>4</sup>Investment period ended, no further capital to be called.

<sup>5</sup>Net IRR is calculated on the cash flows of all the limited partners of the fund and is net of all fees. Each IRR figure is provided by its respective manager.

<sup>6</sup>KKR: Total capital called is \$11,796,786, which includes recycled distributions. Unused capital commitment is \$1,054,718 after including distribution proceeds available for reinvestment

<sup>7</sup>All fees and expenses are for 4Q 2018

Total Fund  
Financial Reconciliation (Last Three Months)

Period Ending: March 31, 2019

Manager	Beginning Market Value	Contributions	Disbursements	Fees <sup>2</sup>	Net Cash Flow	Investment Income	Capital Gain/ Loss	Total Gains/Earnings/ Losses	Ending Market Value
Blackrock Russell 3000 Index	\$229,108,690	\$0	\$0	\$0	\$0	\$0	\$32,227,247	\$32,227,247	\$261,335,937
DFA Emerging Markets	\$29,535,093	\$7,150	\$0	\$0	\$7,150	\$0	\$2,112,518	\$2,112,518	\$31,654,761
Harding Loevner Emerging Markets	\$30,006,208	\$0	\$0	\$0	\$0	\$0	\$4,144,661	\$4,144,661	\$34,150,869
Blackrock International Equity	\$128,087,562	\$0	\$0	\$0	\$0	\$0	\$12,910,790	\$12,910,790	\$140,998,352
Tortoise Capital	\$92,656,399	\$0	\$0	\$0	\$0	\$0	\$3,439,041	\$3,439,041	\$96,095,440
MacKay Shields Core Plus Opp.	\$90,116,700	\$0	\$0	\$0	\$0	\$0	\$3,073,432	\$3,073,432	\$93,190,132
Blackrock US TIPS	\$41,175,224	\$0	\$0	\$0	\$0	\$0	\$1,334,022	\$1,334,022	\$42,509,247
Clarion Lion Properties	\$35,899,303	\$353,356	(\$359,140)	(\$91,022)	(\$96,806)	\$355,797	\$366,160	\$721,957	\$36,524,454
ICERS State Street Real Estate	\$1,757,549	\$33,422	(\$10,281)	\$0	\$23,141	\$10	\$0	\$10	\$1,780,700
ASB Allegiance Real Estate	\$35,271,488	\$79,966	\$0	(\$79,966)	\$0	\$254,074	\$456,151	\$710,225	\$35,981,713
ARA American Strategic Value Realty <sup>1</sup>	\$10,995,303	\$1,400,000	\$0	\$0	\$1,400,000	\$0	\$0	\$0	\$12,395,303
Portfolio Advisors Credit Strategies Fund	\$11,989,831	\$0	\$0	(\$68,574)	(\$68,574)	\$49,989	\$256,537	\$306,526	\$12,227,783
Crescent Direct Lending II	\$2,507,597	\$0	\$0	(\$56,348)	(\$56,348)	\$111,871	\$806	\$112,677	\$2,563,926
Audax Direct Lending A	\$555,539	\$0	\$0	(\$27,827)	(\$27,827)	\$41,579	(\$22,208)	\$19,371	\$547,083
Ares Capital Europe IV	\$1,375,308	\$831,755	(\$12,922)	(\$16,056)	\$802,777	\$29,377	\$28,198	\$57,575	\$2,235,660
PIMCO BRAVO <sup>1</sup>	\$463,934	\$0	(\$84,677)	(\$130)	(\$84,807)	\$1,092	(\$89,948)	(\$88,856)	\$290,271
KKR Mezzanine I <sup>1</sup>	\$2,345,703	\$0	\$0	(\$7,844)	(\$7,844)	\$70,025	(\$159,276)	(\$89,251)	\$2,248,609
HarbourVest International VI <sup>1</sup>	\$3,030,307	\$0	(\$42,521)	(\$7,626)	(\$50,147)	\$0	(\$121,949)	(\$121,949)	\$2,858,212
HarbourVest Buyout IX <sup>1</sup>	\$6,533,595	\$500,000	(\$213,887)	(\$24,924)	\$261,189	\$0	(\$359,918)	(\$359,918)	\$6,434,866
HarbourVest Credit Opportunities IX <sup>1</sup>	\$1,170,032	\$100,000	(\$65,048)	(\$4,980)	\$29,972	\$1,259	(\$3,703)	(\$2,444)	\$1,197,560
HarbourVest Venture IX <sup>1</sup>	\$4,522,926	\$0	(\$243,645)	(\$9,987)	(\$253,632)	\$0	(\$233,571)	(\$233,571)	\$4,035,723
HarbourVest 2017 Global <sup>1</sup>	\$12,401,474	\$0	\$0	(\$49,500)	(\$49,500)	\$29,491	\$1,245	\$30,736	\$12,382,710
HarbourVest 2018 Global <sup>1</sup>	\$1,400,000	\$0	\$0	(\$99,649)	(\$99,649)	\$0	\$61,641	\$61,641	\$1,361,992
Cash	\$6,157,604	\$283,221	(\$2,732,328)	\$0	(\$2,449,107)	\$0	\$0	\$0	\$3,708,497
<b>Totals</b>	<b>\$779,063,371</b>	<b>\$3,588,870</b>	<b>(\$3,764,448)</b>	<b>(\$544,432)</b>	<b>(\$720,010)</b>	<b>\$944,563</b>	<b>\$59,421,877</b>	<b>\$60,366,440</b>	<b>\$838,709,801</b>

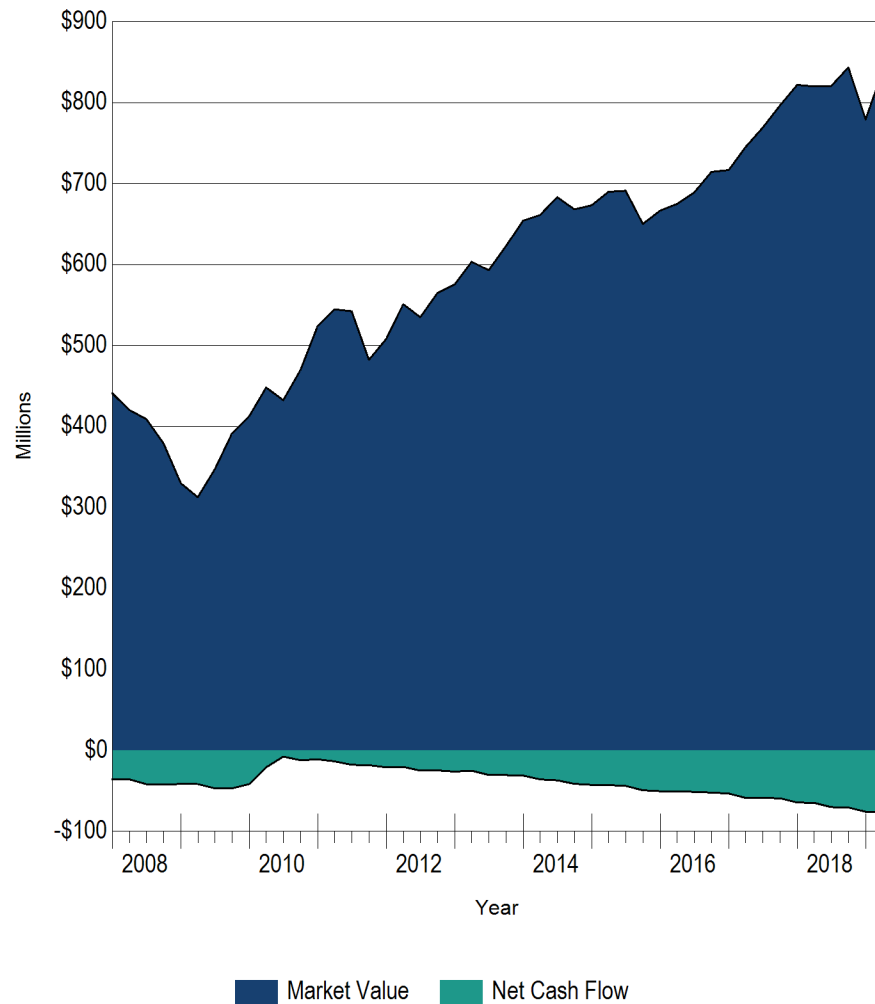
<sup>1</sup>Market value as of 12/31/2018/ +/- 1Q19 calls and distributions

<sup>2</sup>Fee transactions not included in the Portfolio Reconciliation page at beginning of report

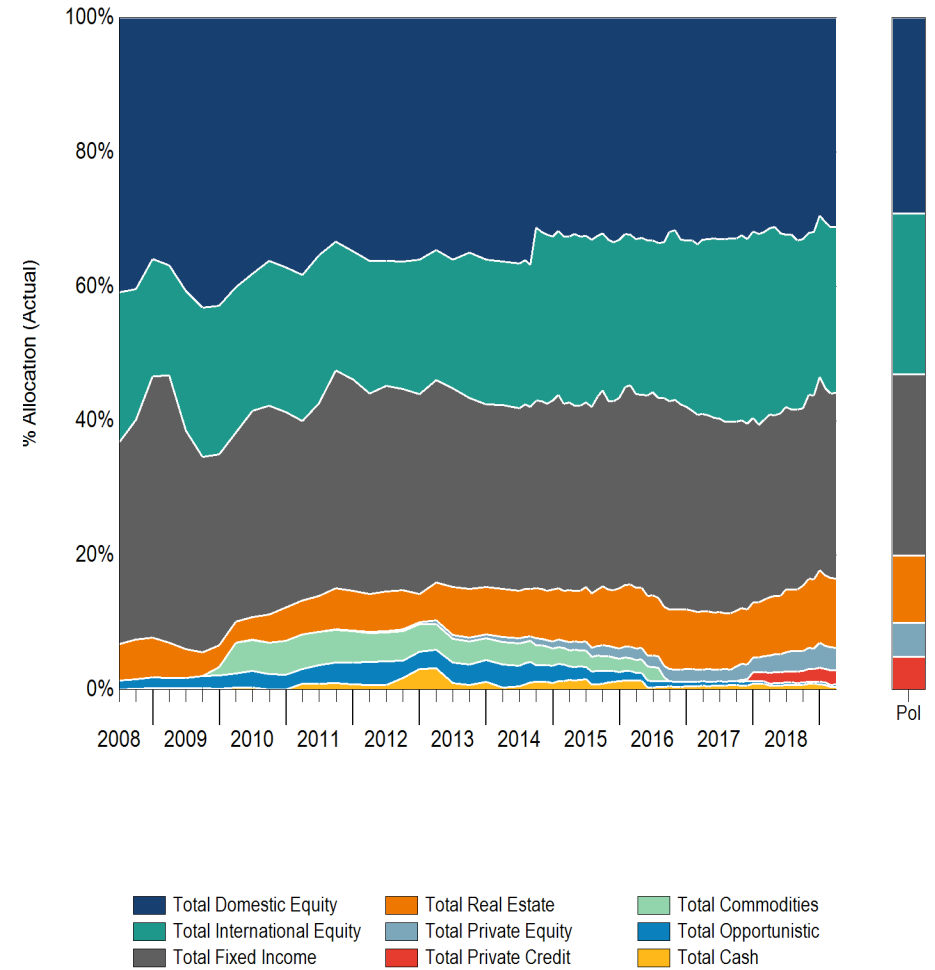
# Total Fund Asset Allocation History

Period Ending: March 31, 2019

Market Value History

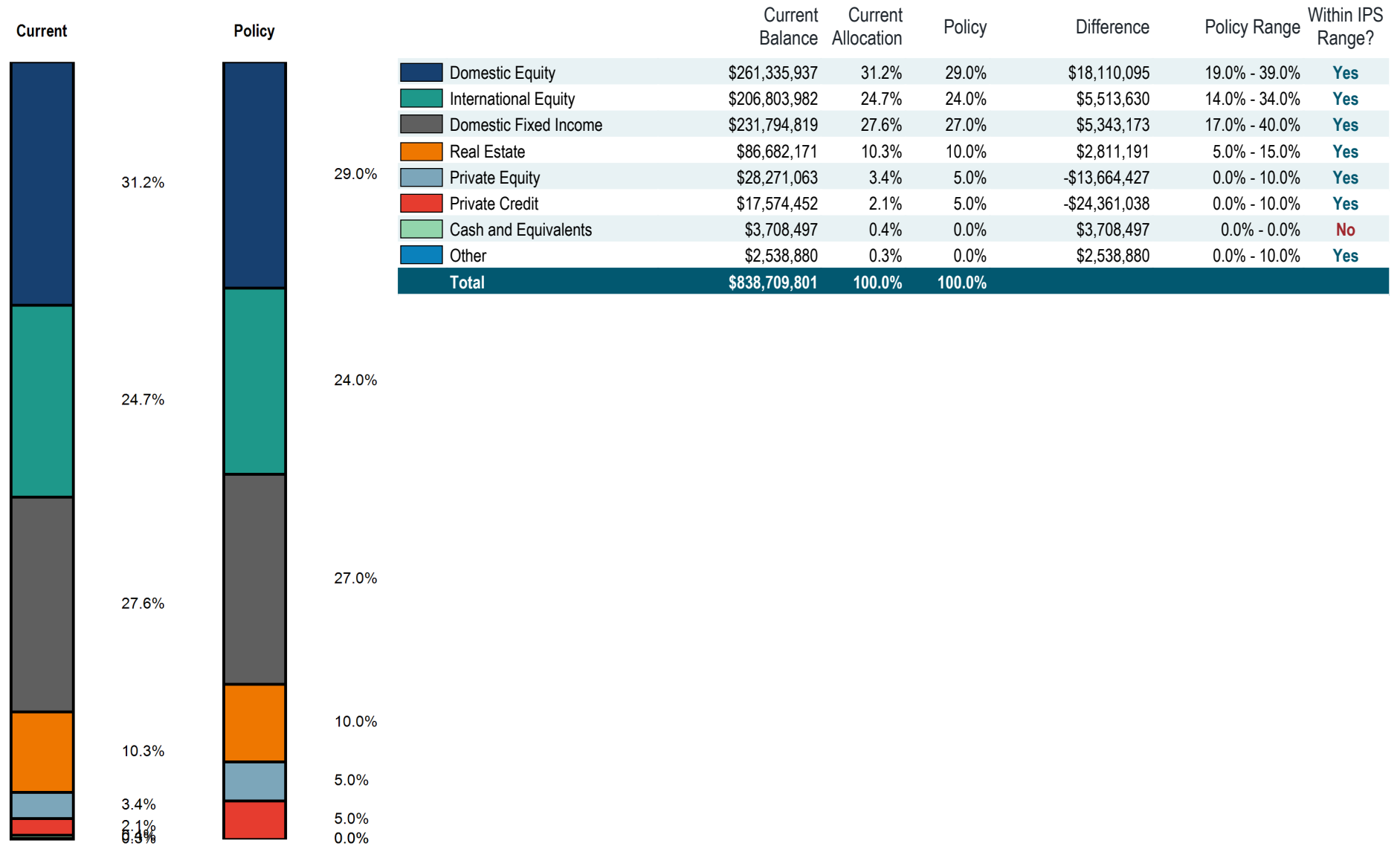


Asset Allocation History



Total Fund  
Asset Allocation vs. Policy

Period Ending: March 31, 2019



# Total Fund Investment Fee Analysis

Period Ending: March 31, 2019

Account	Fee Schedule	Market Value As of 3/31/2019	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
1221 State St. Corp	No Fee	\$1,780,700	0.2%	--	--
ARA American Strategic Value Realty	1.25% of First 10.0 Mil, 1.20% of Next 15.0 Mil, 1.10% of Next 25.0 Mil, 1.00% Thereafter	\$12,395,303	1.5%	\$153,744	1.24%
ASB Real Estate	1.25% of First 5.0 Mil, 1.00% of Next 10.0 Mil, 0.75% Thereafter	\$35,981,713	4.3%	\$319,863	0.89%
BlackRock International Equity	0.15% of First 50.0 Mil, 0.10% of Next 50.0 Mil	\$140,998,352	16.9%	\$125,000	0.09%
BlackRock Russell 3000	0.03% of Assets	\$261,335,937	31.4%	\$78,401	0.03%
BlackRock US TIPS	0.07% of Assets	\$42,509,247	5.1%	\$29,756	0.07%
Cash Account	No Fee	\$3,708,497	0.4%	--	--
Clarion Lion	1.25% of First 10.0 Mil, 1.00% of Next 15.0 Mil, 0.85% Thereafter	\$36,524,454	4.4%	\$372,958	1.02%
DFA Emerging Markets Value	0.57% of Assets	\$31,654,761	3.8%	\$180,432	0.57%
Harbourvest 2017 Global Fund	262,500 Annually	\$12,382,710	1.5%	\$262,500	2.12%
Harbourvest 2018 Global Fund	138,000 Annually	\$1,361,992	0.2%	\$138,000	10.13%
Harbourvest Buyout IX	100,000 Annually	\$6,434,866	0.8%	\$100,000	1.55%
Harbourvest Credit Ops IX	20,000 Annually	\$1,197,560	0.1%	\$20,000	1.67%
Harbourvest International PE VI	35,000 Annually	\$2,858,212	0.3%	\$35,000	1.22%
Harbourvest Venture IX	40,000 Annually	\$4,035,723	0.5%	\$40,000	0.99%
Harding Loevner Emerging Markets	1.05% of Assets	\$34,150,869	4.1%	\$358,584	1.05%
KKR Mezzanine Partners	150,000 Annually	\$2,248,609	0.3%	\$150,000	6.67%
MacKay Shields Core Plus Opportunities	0.35% of Assets	\$93,190,132	11.2%	\$326,165	0.35%
PIMCO BRAVO	1.90% of Assets	\$290,271	0.0%	\$5,515	1.90%
Portfolio Advisors Credit Strategies Fund	180,000 Annually	\$12,227,783	1.5%	\$180,000	1.47%
Tortoise Capital	0.29% of First 100.0 Mil, 0.25% of Next 100.0 Mil	\$96,095,440	11.5%	\$273,872	0.28%
<b>Investment Management Fee</b>		<b>\$833,363,132</b>	<b>100.0%</b>	<b>\$3,149,790</b>	<b>0.38%</b>

\*HarbourVest, KKR and PIMCO BRAVO fees are estimated gross management fees only and do not include incentive allocations or offsetting cash flows received by the fund.

\*HarbourVest International Private Equity VI fees are based on committed Euros, actual US Dollar amount will fluctuate based on exchange rates.

\*Verus advisory fee shown for disclosure purposes only and is not included in total investment management fee calculations.

\*Portfolio Advisors fee is 0.20% on committed capital and 1.00% on invested capital.

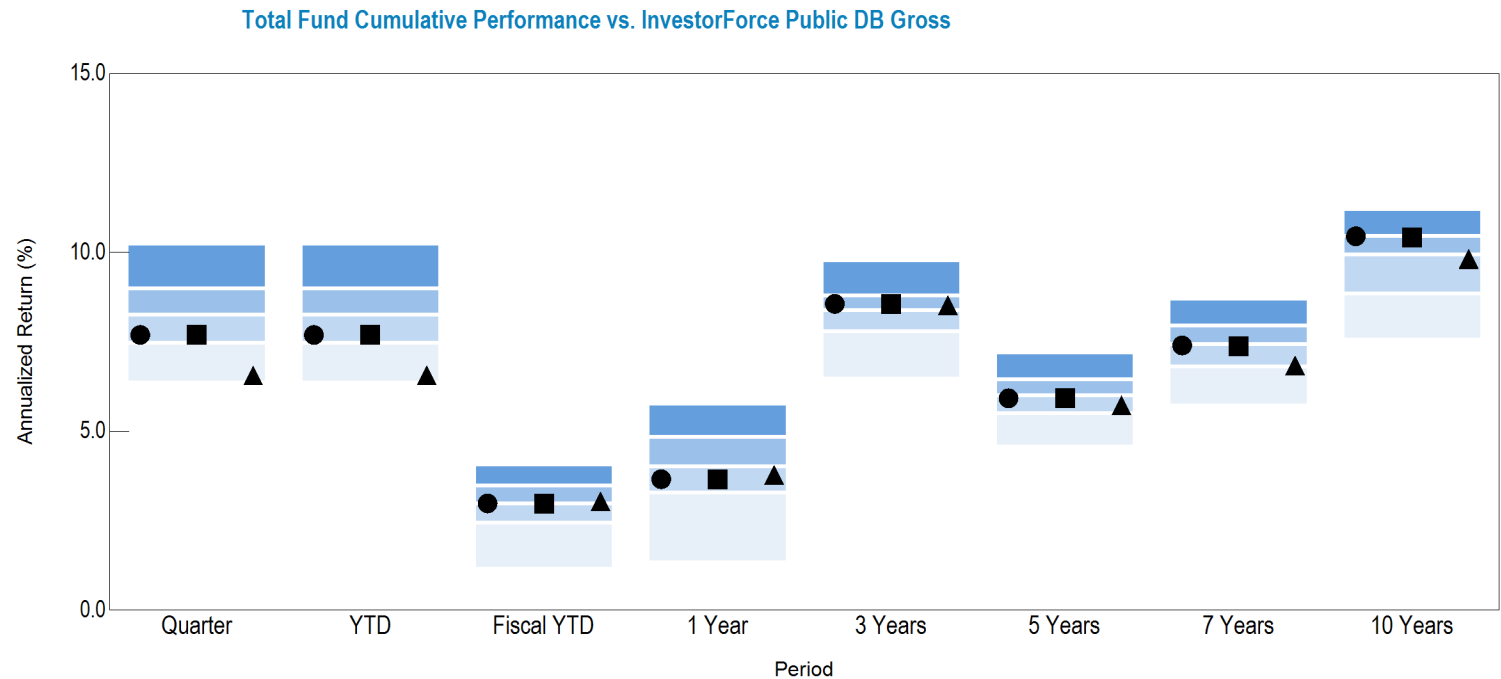
\*Total fund market value excludes other investments managed by Portfolio Advisors.

\*HarbourVest funds annual fee amounts calculated by applying the average annual fee charged to each fund over its expected lifecycle by its respective capital commitment.

## Total Fund

## Peer Universe Comparison: Cumulative Performance (Gross of Fees)

Period Ending: March 31, 2019

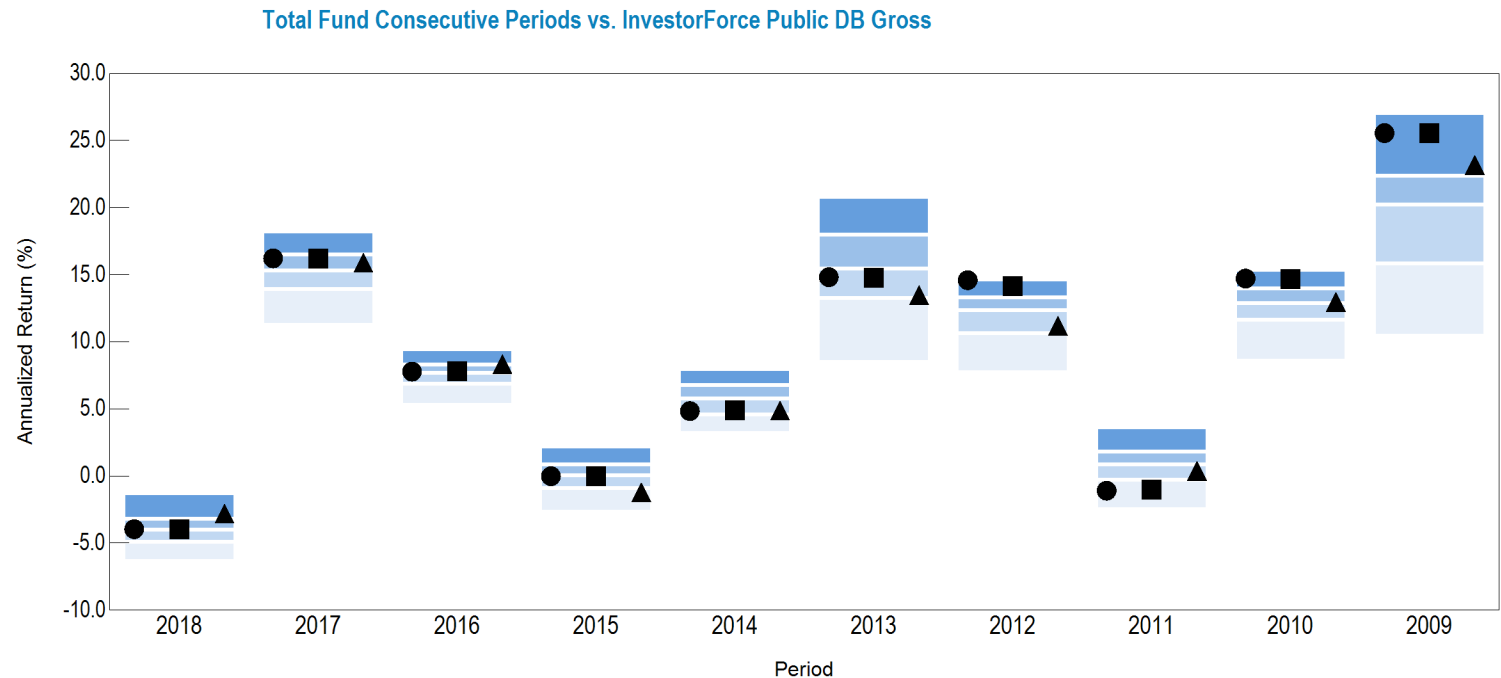


	Return (Rank)							
5th Percentile	10.2	10.2	4.1	5.8	9.8	7.2	8.7	11.2
25th Percentile	9.0	9.0	3.5	4.8	8.8	6.5	8.0	10.5
Median	8.3	8.3	3.0	4.0	8.4	6.0	7.4	10.0
75th Percentile	7.5	7.5	2.4	3.3	7.8	5.5	6.8	8.9
95th Percentile	6.4	6.4	1.2	1.4	6.5	4.6	5.7	7.6
# of Portfolios	224	224	220	220	211	203	195	172
● Total Fund	7.7 (69)	7.7 (69)	3.0 (51)	3.7 (65)	8.6 (44)	5.9 (58)	7.4 (53)	10.4 (27)
■ Total Fund ex Parametric	7.7 (69)	7.7 (69)	3.0 (51)	3.7 (65)	8.6 (44)	5.9 (57)	7.4 (54)	10.4 (28)
▲ Policy Index	6.6 (93)	6.6 (93)	3.0 (47)	3.8 (59)	8.5 (45)	5.7 (69)	6.8 (75)	9.8 (53)

## Total Fund

## Peer Universe Comparison: Consecutive Periods (Gross of Fees)

Period Ending: March 31, 2019

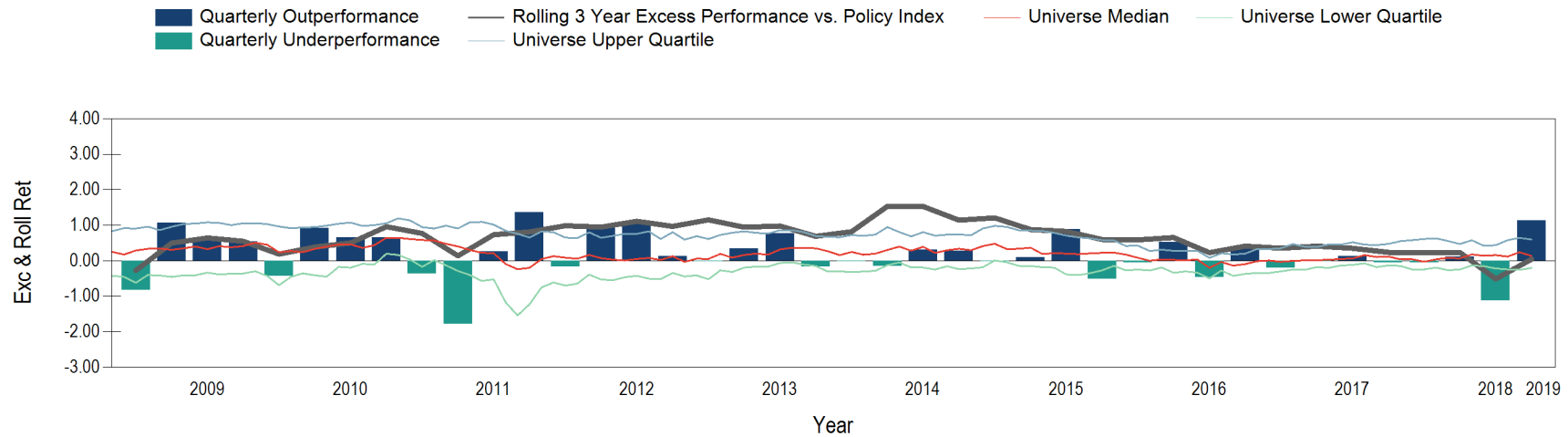


	Return (Rank)									
5th Percentile	-1.3	18.2	9.4	2.2	8.0	20.8	14.6	3.6	15.4	27.0
25th Percentile	-3.1	16.5	8.4	0.9	6.8	18.0	13.4	1.9	14.0	22.4
Median	-4.0	15.3	7.7	0.1	5.8	15.5	12.4	0.9	12.9	20.2
75th Percentile	-4.9	14.0	6.9	-0.9	4.6	13.3	10.7	-0.3	11.7	15.9
95th Percentile	-6.3	11.3	5.3	-2.6	3.2	8.5	7.8	-2.5	8.6	10.5
# of Portfolios	319	304	305	316	248	231	236	206	188	184
● Total Fund	-4.0 (50)	16.2 (30)	7.8 (49)	0.0 (53)	4.8 (74)	14.8 (59)	14.6 (6)	-1.1 (89)	14.7 (13)	25.6 (11)
■ Total Fund ex Parametric	-4.0 (50)	16.2 (30)	7.8 (49)	0.0 (53)	4.9 (72)	14.7 (59)	14.2 (11)	-1.0 (88)	14.7 (15)	25.6 (11)
▲ Policy Index	-2.8 (18)	15.9 (40)	8.3 (26)	-1.2 (81)	4.9 (72)	13.5 (74)	11.2 (72)	0.4 (63)	13.0 (49)	23.2 (23)

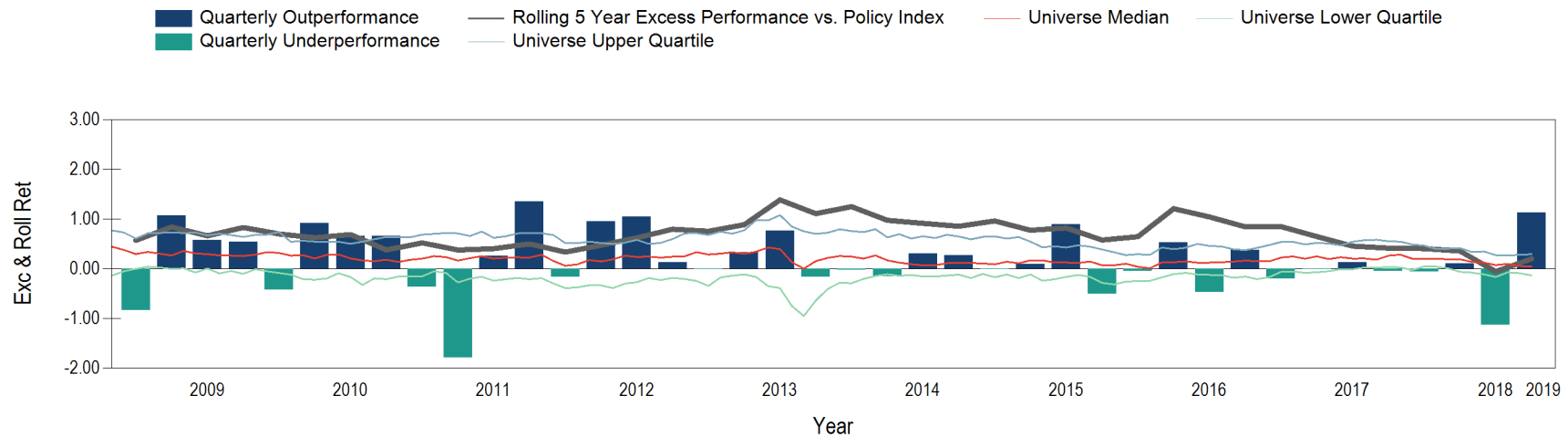
Total Fund  
Rolling Return Analysis (Gross of Fees)

Period Ending: March 31, 2019

Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance



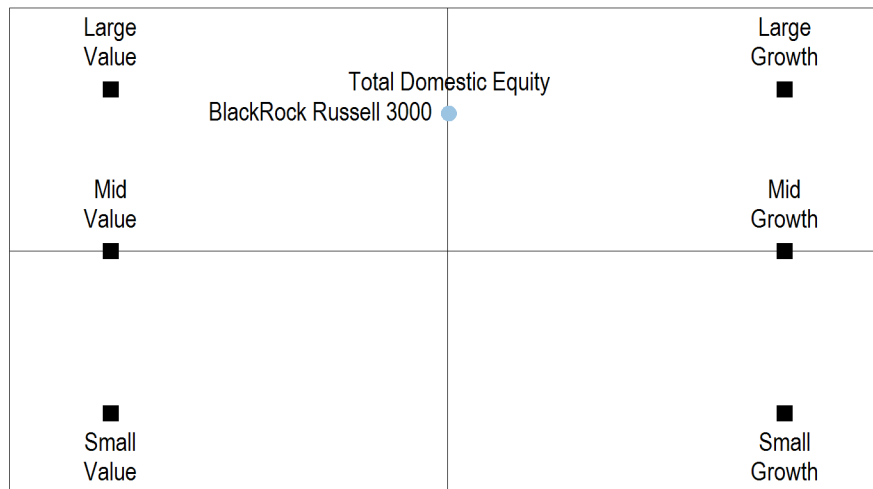
# Total Domestic Equity

## Asset Class Overview (Gross of Fees)

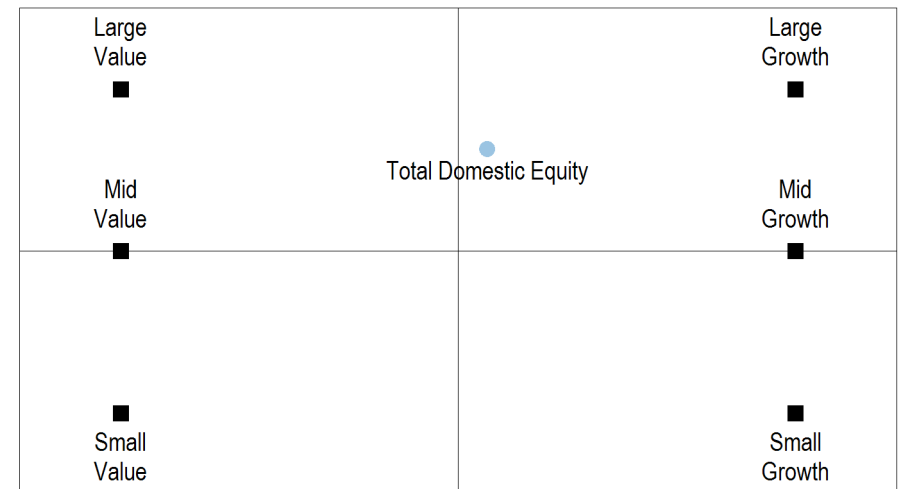
Period Ending: March 31, 2019

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total Domestic Equity</b>	<b>261,335,937</b>	<b>14.1</b>	<b>4.8</b>	<b>8.8</b>	<b>13.6</b>	<b>9.9</b>	<b>16.2</b>	<b>-5.2</b>	<b>21.2</b>	<b>12.9</b>	<b>0.3</b>	<b>10.2</b>
<i>Russell 3000</i>		14.0	4.7	8.8	13.5	10.4	16.0	-5.2	21.1	12.7	0.5	12.6
<i>InvestorForce Public DB US Eq Gross Rank</i>		49	29	24	26	46	23	35	35	51	44	73
<b>BlackRock Russell 3000</b>	<b>261,335,937</b>	<b>14.1</b>	<b>4.8</b>	<b>8.8</b>	<b>13.6</b>	--	--	<b>-5.2</b>	<b>21.2</b>	<b>12.9</b>	--	--
<i>Russell 3000</i>		14.0	4.7	8.8	13.5	--	--	-5.2	21.1	12.7	--	--
<i>eV US All Cap Core Equity Gross Rank</i>		38	46	37	29	--	--	49	49	35	--	--

U.S. Effective Style Map  
3 Years Ending March 31, 2019



U.S. Effective Style Map  
5 Years Ending March 31, 2019



Total Domestic Equity  
Asset Class Overview (Net of Fees)

Period Ending: March 31, 2019

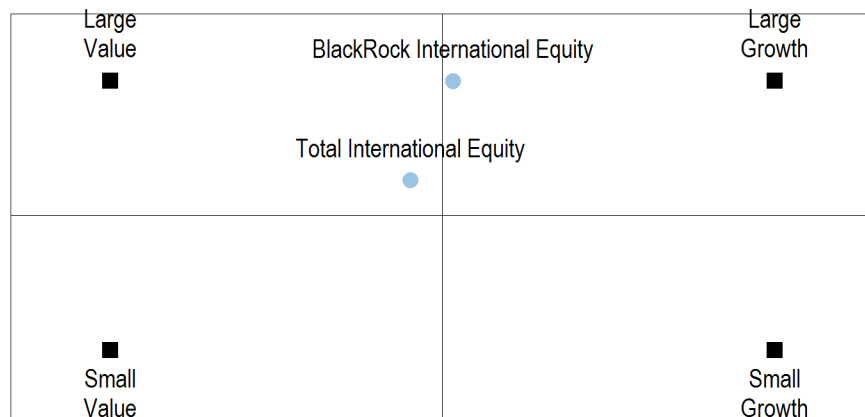
	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total Domestic Equity</b>	<b>261,335,937</b>	<b>14.1</b>	<b>4.7</b>	<b>8.8</b>	<b>13.5</b>	<b>9.9</b>	<b>16.0</b>	<b>-5.2</b>	<b>21.2</b>	<b>12.8</b>	<b>0.1</b>	<b>10.0</b>
<i>Russell 3000</i>		14.0	4.7	8.8	13.5	10.4	16.0	-5.2	21.1	12.7	0.5	12.6
BlackRock Russell 3000	261,335,937	14.1	4.7	8.8	13.5	--	--	-5.2	21.2	12.8	--	--
<i>Russell 3000</i>		14.0	4.7	8.8	13.5	--	--	-5.2	21.1	12.7	--	--

# Total International Equity Asset Class Overview (Gross of Fees)

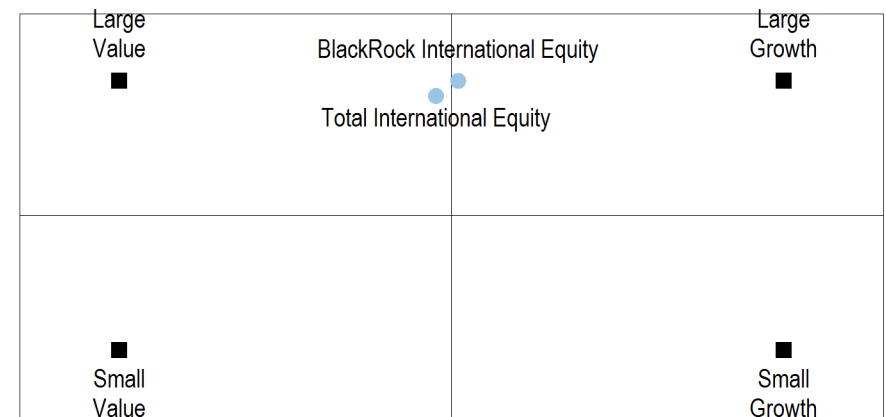
Period Ending: March 31, 2019

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total International Equity</b>	<b>206,803,982</b>	<b>10.2</b>	<b>-1.8</b>	<b>-5.0</b>	<b>8.7</b>	<b>3.1</b>	<b>9.5</b>	<b>-14.0</b>	<b>28.3</b>	<b>4.7</b>	<b>-3.5</b>	<b>-4.4</b>
MSCI ACWI ex USA Gross		10.4	-1.4	-3.7	8.6	3.0	9.3	-13.8	27.8	5.0	-5.3	-3.4
InvestorForce Public DB ex-US Eq Gross Rank		76	32	36	32	55	58	35	59	40	57	74
<b>BlackRock International Equity</b>	<b>140,998,352</b>	<b>10.1</b>	<b>-2.4</b>	<b>-3.2</b>	<b>7.7</b>	<b>2.7</b>	<b>9.4</b>	<b>-13.4</b>	<b>25.5</b>	<b>1.5</b>	<b>-0.5</b>	<b>-4.7</b>
MSCI EAFE Gross		10.1	-2.3	-3.2	7.8	2.8	9.5	-13.4	25.6	1.5	-0.4	-4.5
eV All EAFE Equity Gross Rank		58	33	33	46	71	79	35	65	47	67	64
<b>DFA Emerging Markets Value</b>	<b>31,654,761</b>	<b>7.3</b>	<b>2.1</b>	<b>-7.2</b>	<b>12.2</b>	<b>4.0</b>	<b>9.8</b>	<b>-11.4</b>	<b>34.5</b>	<b>20.5</b>	<b>-18.3</b>	<b>-3.9</b>
MSCI Emerging Markets Gross		10.0	0.9	-7.1	11.1	4.1	9.3	-14.2	37.8	11.6	-14.6	-1.8
eV Emg Mkts Equity Gross Rank		89	30	42	31	66	72	16	70	7	92	84
<b>Harding Loevner Emerging Markets</b>	<b>34,150,869</b>	<b>13.8</b>	<b>-2.8</b>	<b>-10.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-18.6</b>	<b>35.0</b>	<b>--</b>	<b>--</b>	<b>--</b>
MSCI Emerging Markets Gross		10.0	0.9	-7.1	--	--	--	-14.2	37.8	--	--	--
eV Emg Mkts Equity Gross Rank		15	81	78	--	--	--	84	68	--	--	--

EAFE Effective Style Map  
3 Years Ending March 31, 2019



EAFE Effective Style Map  
5 Years Ending March 31, 2019

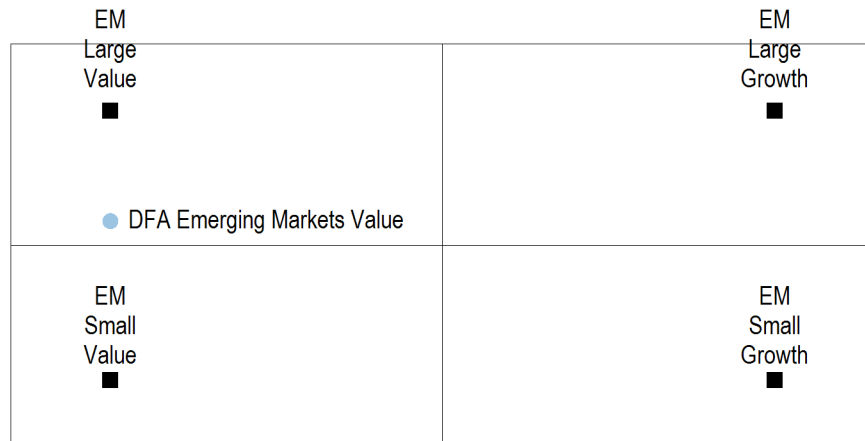


# Total International Equity Asset Class Overview (Net of Fees)

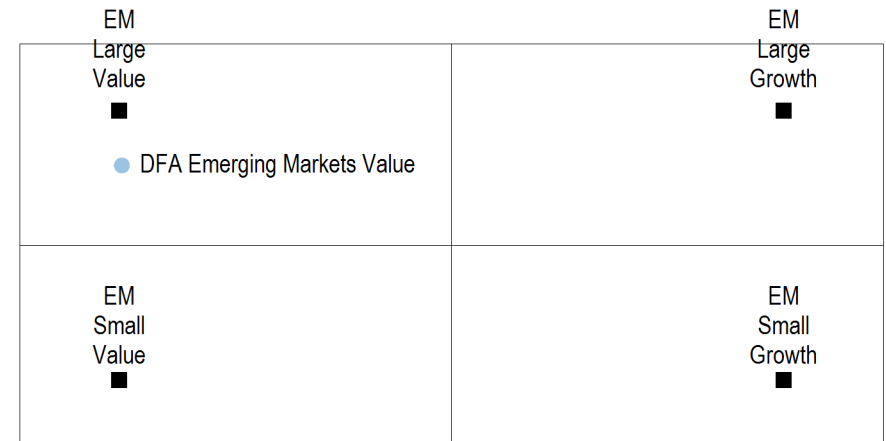
Period Ending: March 31, 2019

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total International Equity</b>	<b>206,803,982</b>	<b>10.2</b>	<b>-2.0</b>	<b>-5.3</b>	<b>8.4</b>	<b>2.7</b>	<b>9.0</b>	<b>-14.3</b>	<b>27.9</b>	<b>4.4</b>	<b>-4.0</b>	<b>-4.9</b>
MSCI ACWI ex USA Gross		10.4	-1.4	-3.7	8.6	3.0	9.3	-13.8	27.8	5.0	-5.3	-3.4
BlackRock International Equity	140,998,352	10.1	-2.4	-3.3	7.6	2.6	9.2	-13.5	25.4	1.3	-0.6	-4.8
MSCI EAFE Gross		10.1	-2.3	-3.2	7.8	2.8	9.5	-13.4	25.6	1.5	-0.4	-4.5
DFA Emerging Markets Value	31,654,761	7.2	1.7	-7.7	11.6	3.4	9.2	-11.9	33.8	19.8	-18.8	-4.4
MSCI Emerging Markets Gross		10.0	0.9	-7.1	11.1	4.1	9.3	-14.2	37.8	11.6	-14.6	-1.8
Harding Loevner Emerging Markets	34,150,869	13.5	-3.6	-11.2	--	--	--	-19.5	33.6	--	--	--
MSCI Emerging Markets Gross		10.0	0.9	-7.1	--	--	--	-14.2	37.8	--	--	--

EM Effective Style Map  
3 Years Ending March 31, 2019

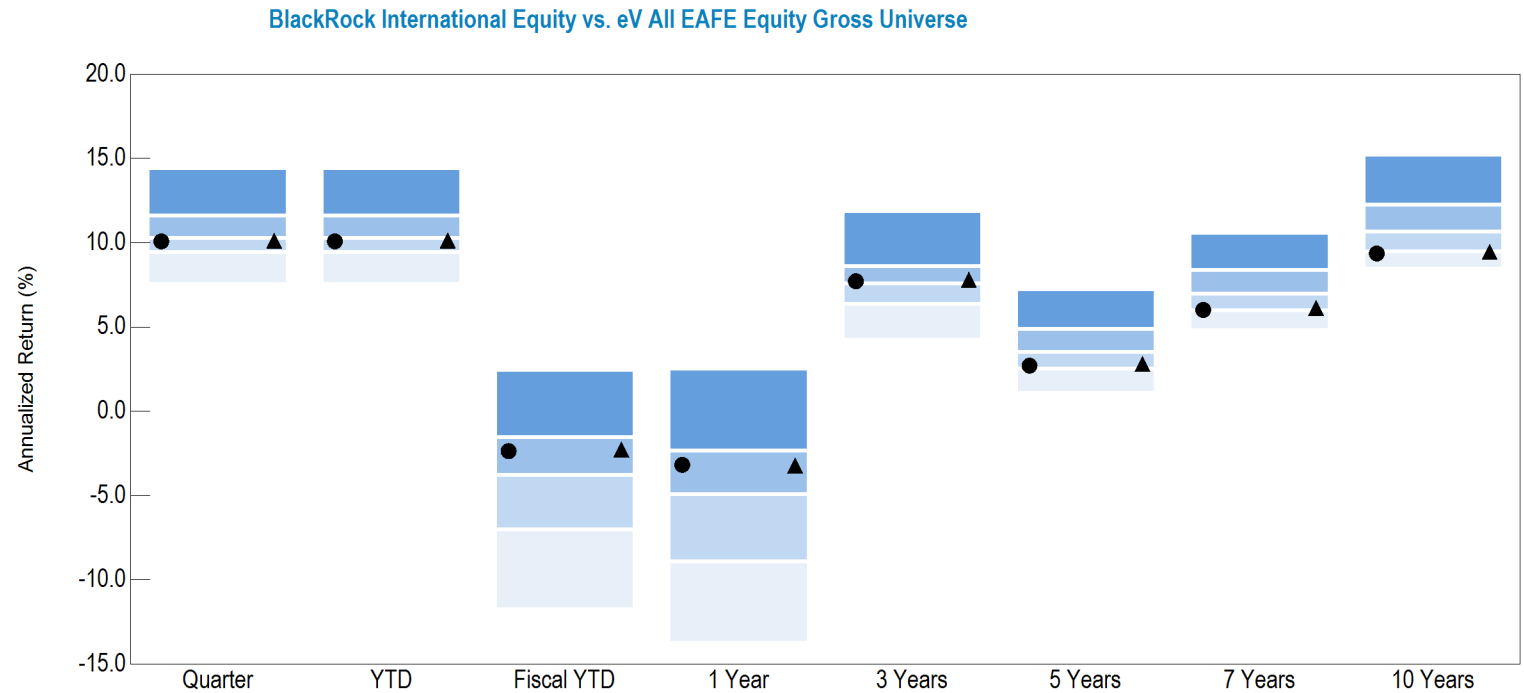


EM Effective Style Map  
5 Years Ending March 31, 2019



BlackRock International Equity  
Cumulative Performance Comparison (Gross of Fees)

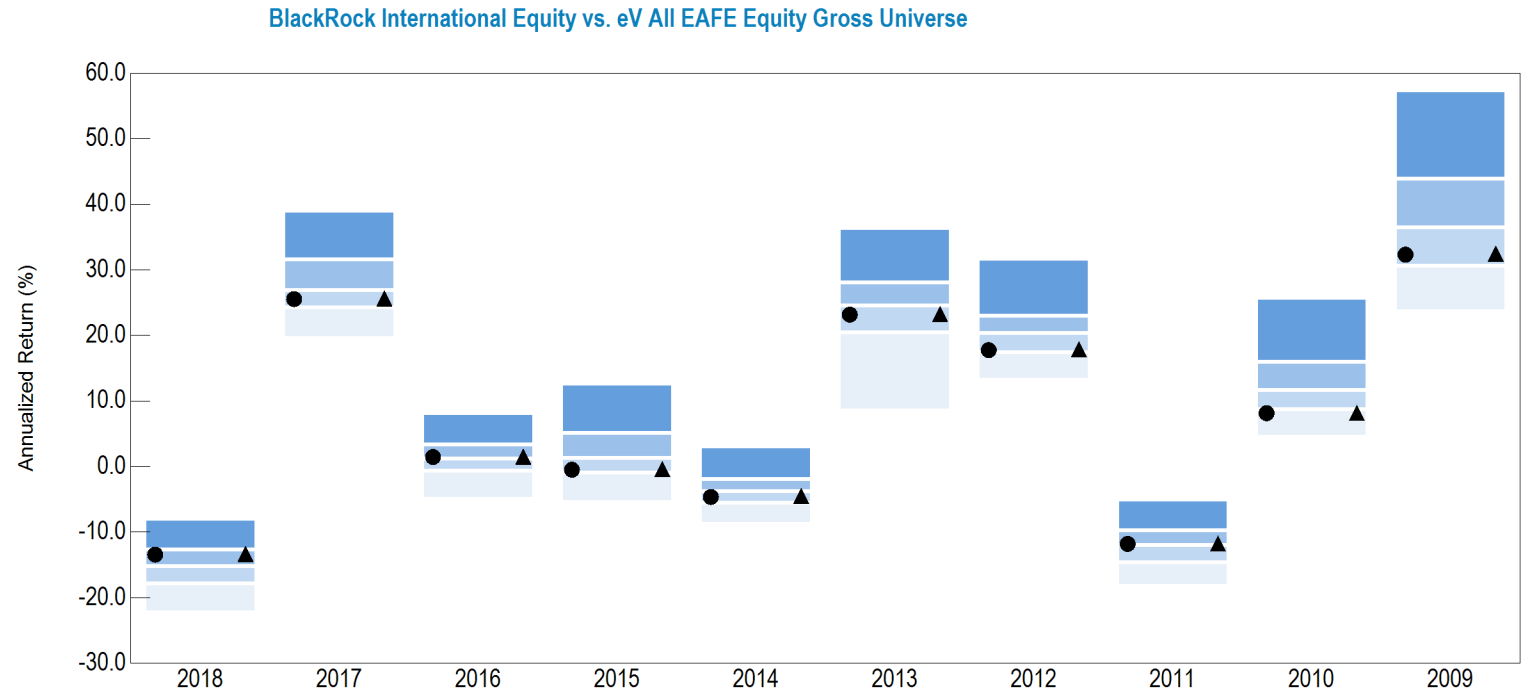
Period Ending: March 31, 2019



	Return (Rank)															
5th Percentile	14.4		14.4		2.4		2.5		11.8		7.2		10.6		15.2	
25th Percentile	11.6		11.6		-1.5		-2.3		8.6		4.9		8.4		12.3	
Median	10.3		10.3		-3.7		-4.9		7.6		3.5		7.0		10.7	
75th Percentile	9.5		9.5		-7.0		-8.9		6.4		2.6		6.0		9.5	
95th Percentile	7.6		7.6		-11.7		-13.7		4.3		1.1		4.8		8.5	
# of Portfolios	384		384		384		384		368		326		289		260	
● BlackRock International Equity	10.1	(58)	10.1	(58)	-2.4	(33)	-3.2	(33)	7.7	(46)	2.7	(71)	6.0	(76)	9.4	(79)
▲ MSCI EAFE Gross	10.1	(57)	10.1	(57)	-2.3	(31)	-3.2	(33)	7.8	(43)	2.8	(69)	6.1	(73)	9.5	(77)

BlackRock International Equity  
Consecutive Performance Comparison (Gross of Fees)

Period Ending: March 31, 2019

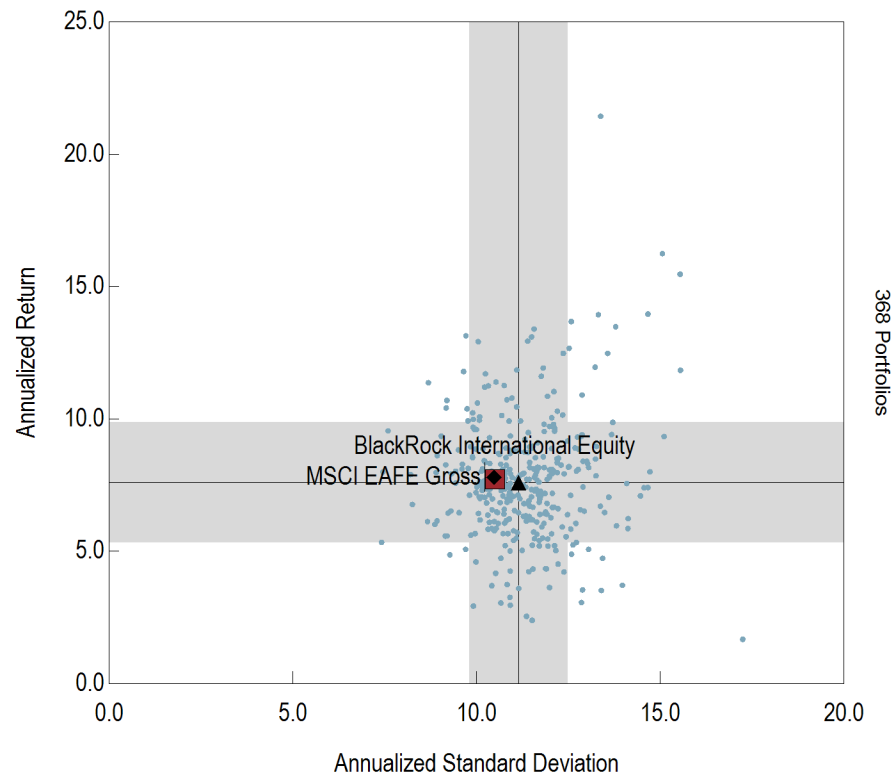


	Return (Rank)									
5th Percentile	-8.0	39.0	8.1	12.6	3.0	36.3	31.7	-5.1	25.7	57.3
25th Percentile	-12.6	31.6	3.4	5.2	-1.9	28.1	23.1	-9.7	16.1	44.0
Median	-15.1	27.0	1.3	1.4	-3.7	24.6	20.4	-12.0	11.7	36.5
75th Percentile	-17.8	24.3	-0.6	-0.9	-5.4	20.5	17.5	-14.5	8.7	30.7
95th Percentile	-22.2	19.7	-4.9	-5.4	-8.6	8.6	13.3	-18.2	4.6	23.7
# of Portfolios	391	370	350	325	314	284	263	278	352	455
● BlackRock International Equity	-13.4 (35)	25.5 (65)	1.5 (47)	-0.5 (67)	-4.7 (64)	23.2 (61)	17.8 (74)	-11.8 (48)	8.1 (79)	32.3 (68)
▲ MSCI EAFE Gross	-13.4 (35)	25.6 (63)	1.5 (47)	-0.4 (66)	-4.5 (60)	23.3 (60)	17.9 (72)	-11.7 (47)	8.2 (78)	32.5 (67)

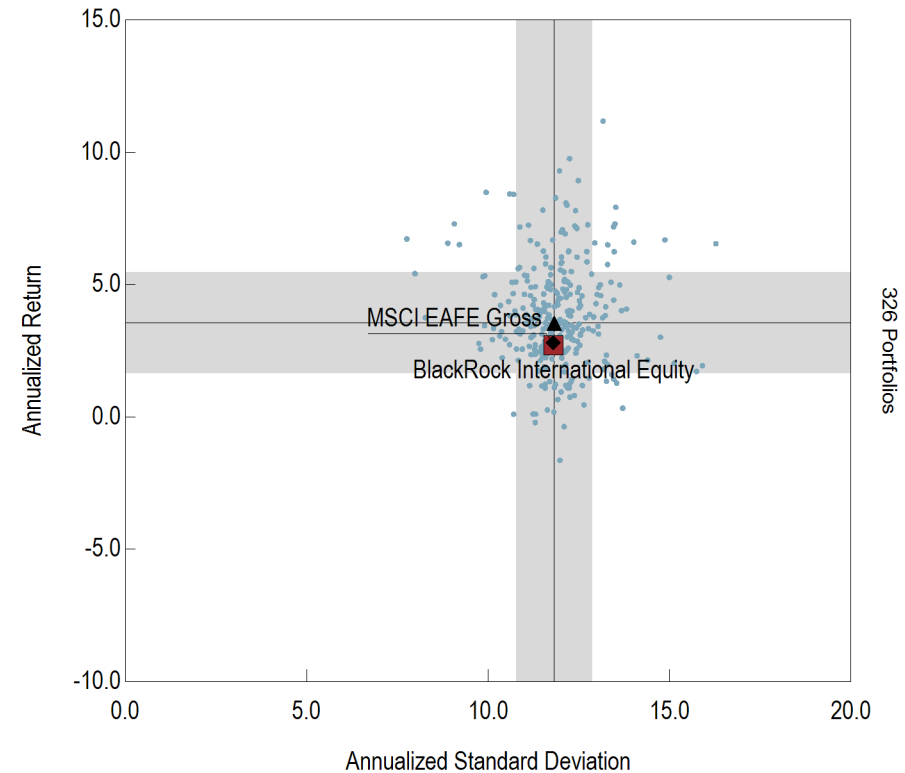
BlackRock International Equity  
Risk vs Return Three & Five Year (Gross of Fees)

Period Ending: March 31, 2019

Annualized Return vs. Annualized Standard Deviation  
3 Years Ending March 31, 2019

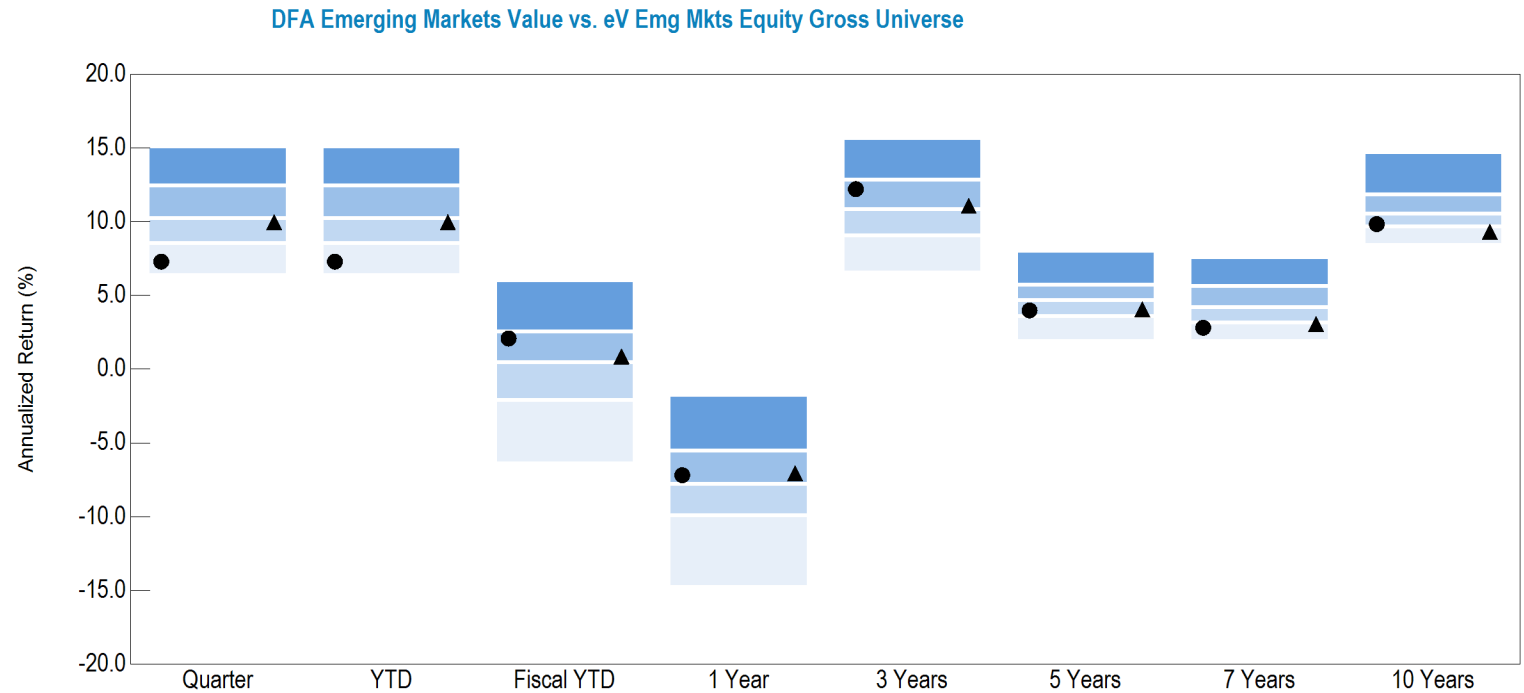


Annualized Return vs. Annualized Standard Deviation  
5 Years Ending March 31, 2019



DFA Emerging Markets Value  
Cumulative Performance Comparison (Gross of Fees)

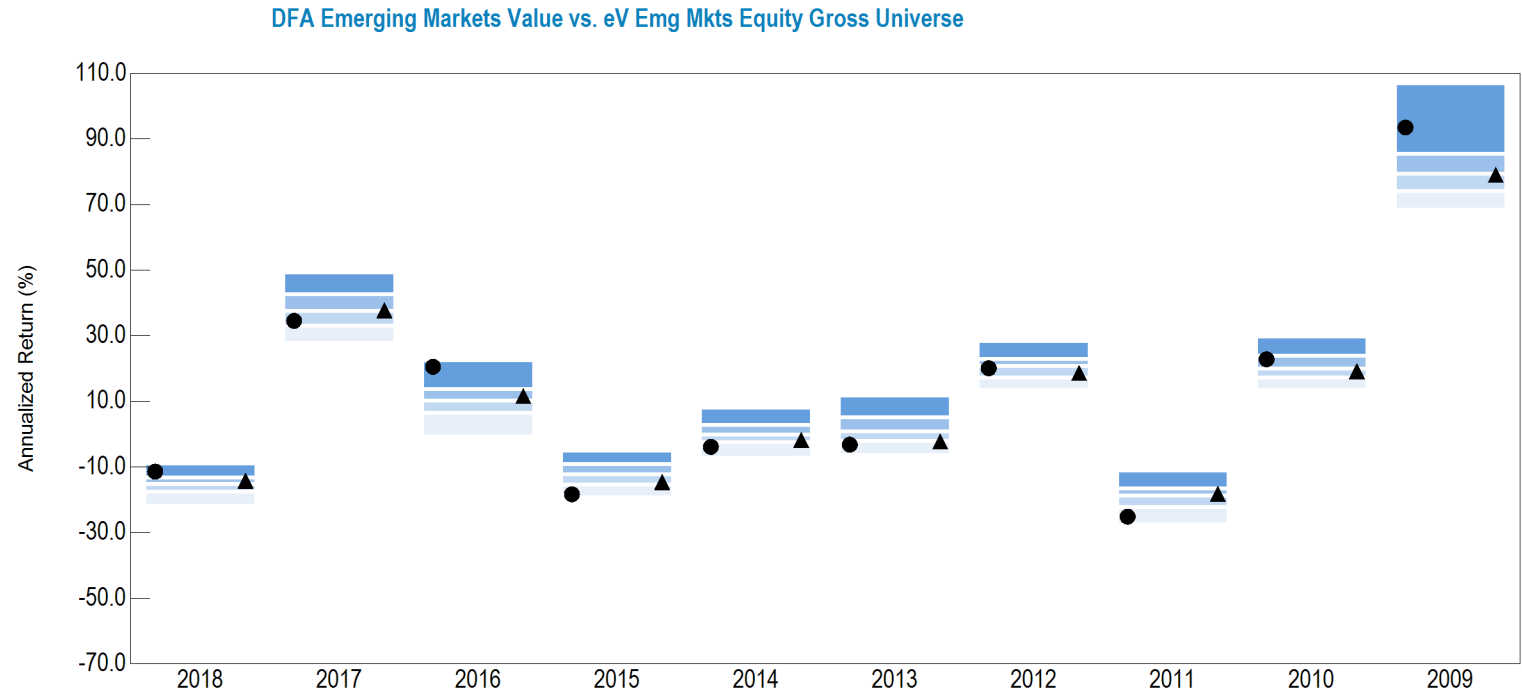
Period Ending: March 31, 2019



	Return (Rank)															
5th Percentile	15.1		15.1		6.0		-1.8		15.7		8.0		7.6		14.7	
25th Percentile	12.5		12.5		2.6		-5.5		12.9		5.7		5.6		11.9	
Median	10.3		10.3		0.5		-7.7		10.9		4.7		4.2		10.6	
75th Percentile	8.6		8.6		-2.0		-9.9		9.1		3.6		3.2		9.7	
95th Percentile	6.4		6.4		-6.4		-14.8		6.6		1.9		1.9		8.4	
# of Portfolios	355		355		354		354		331		291		225		147	
● DFA Emerging Markets Value	7.3	(89)	7.3	(89)	2.1	(30)	-7.2	(42)	12.2	(31)	4.0	(66)	2.8	(83)	9.8	(71)
▲ MSCI Emerging Markets Gross	10.0	(56)	10.0	(56)	0.9	(45)	-7.1	(40)	11.1	(47)	4.1	(64)	3.1	(78)	9.3	(85)

DFA Emerging Markets Value  
Consecutive Performance Comparison (Gross of Fees)

Period Ending: March 31, 2019

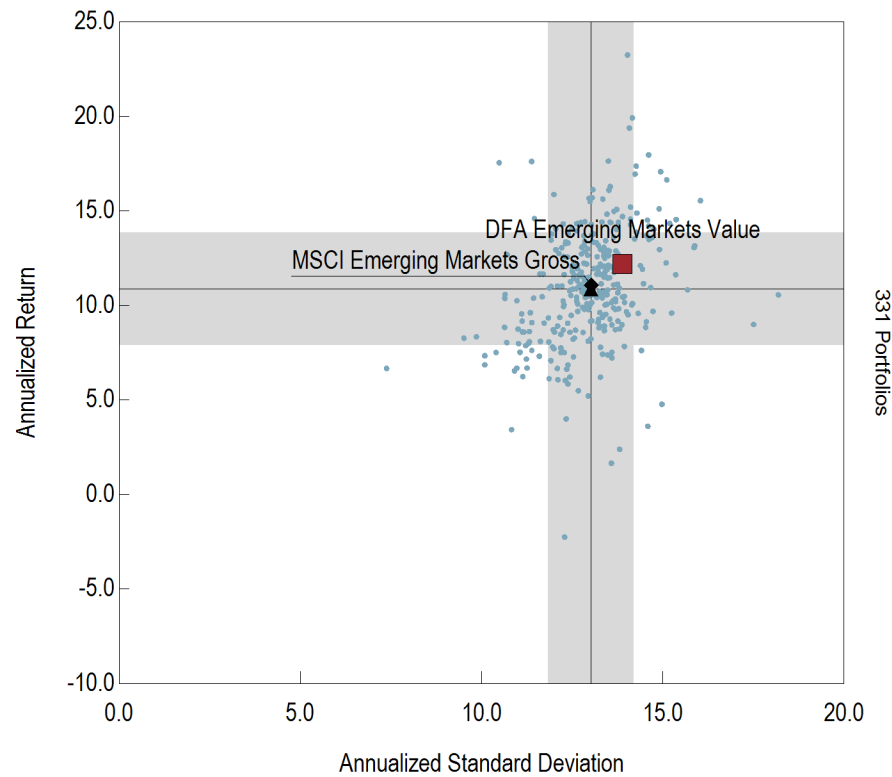


	Return (Rank)									
5th Percentile	-9.0	49.2	22.4	-5.0	8.0	11.7	28.4	-11.1	29.6	106.8
25th Percentile	-13.2	42.8	13.7	-9.0	2.9	5.2	23.0	-16.4	23.9	85.5
Median	-15.2	37.6	10.4	-12.2	-0.1	1.0	20.9	-18.6	20.1	79.5
75th Percentile	-17.4	33.2	6.6	-15.3	-2.4	-2.0	17.3	-22.2	17.3	74.3
95th Percentile	-21.8	27.8	-0.6	-19.2	-7.0	-6.3	13.7	-27.3	13.7	68.5
# of Portfolios	355	343	337	273	251	198	155	139	113	113
● DFA Emerging Markets Value	-11.4 (16)	34.5 (70)	20.5 (7)	-18.3 (92)	-3.9 (84)	-3.2 (84)	20.1 (56)	-25.2 (92)	22.8 (33)	93.5 (12)
▲ MSCI Emerging Markets Gross	-14.2 (37)	37.8 (49)	11.6 (40)	-14.6 (67)	-1.8 (69)	-2.3 (78)	18.6 (68)	-18.2 (45)	19.2 (62)	79.0 (54)

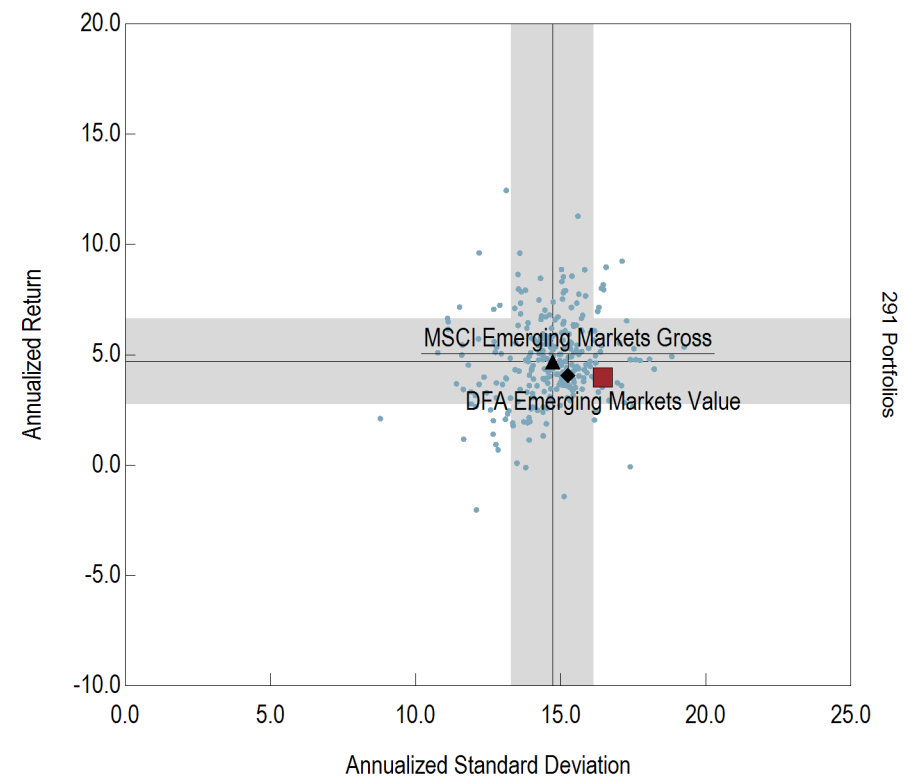
# DFA Emerging Markets Value Risk vs Return Three & Five Year (Gross of Fees)

Period Ending: March 31, 2019

Annualized Return vs. Annualized Standard Deviation  
3 Years Ending March 31, 2019



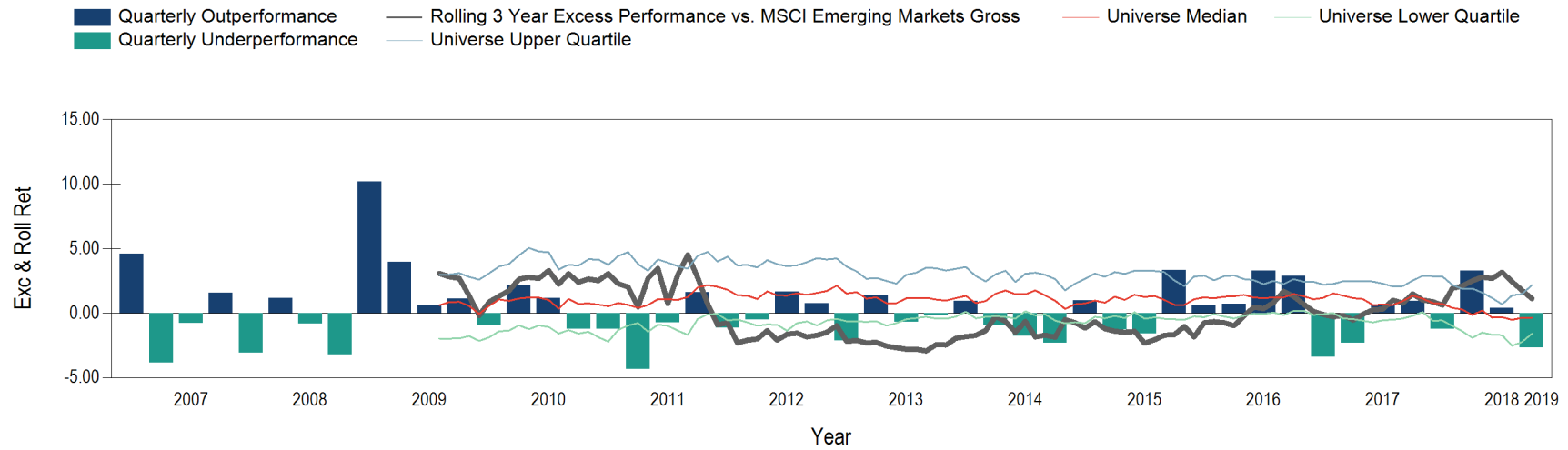
Annualized Return vs. Annualized Standard Deviation  
5 Years Ending March 31, 2019



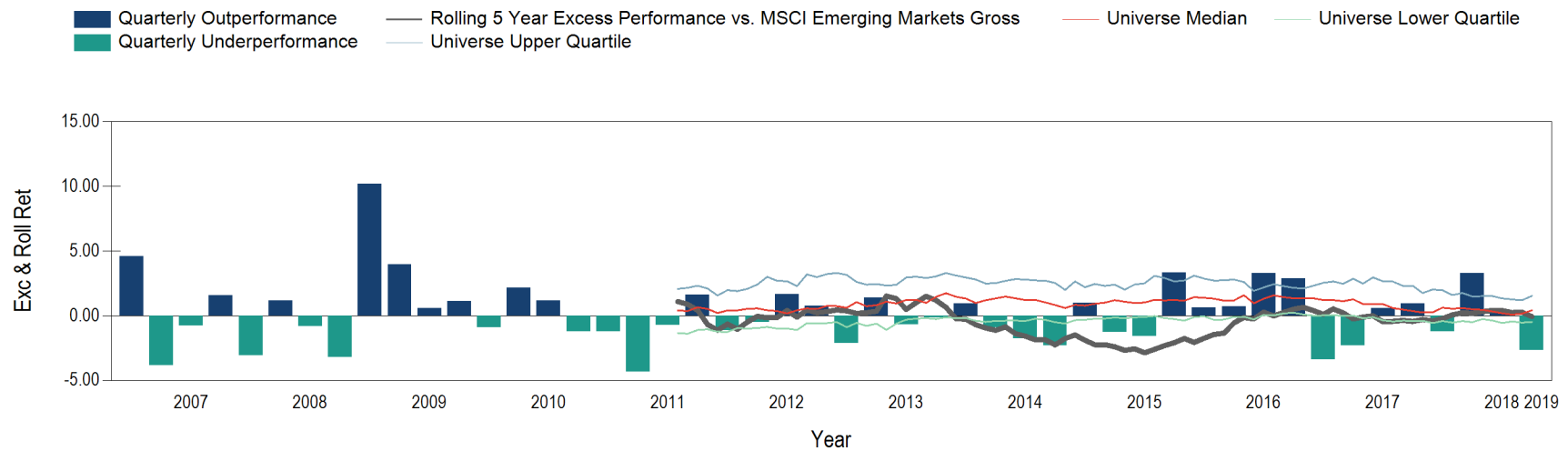
# DFA Emerging Markets Value Rolling Return Analysis (Gross of Fees)

Period Ending: March 31, 2019

## Rolling 3 Year Annualized Excess Performance



## Rolling 5 Year Annualized Excess Performance

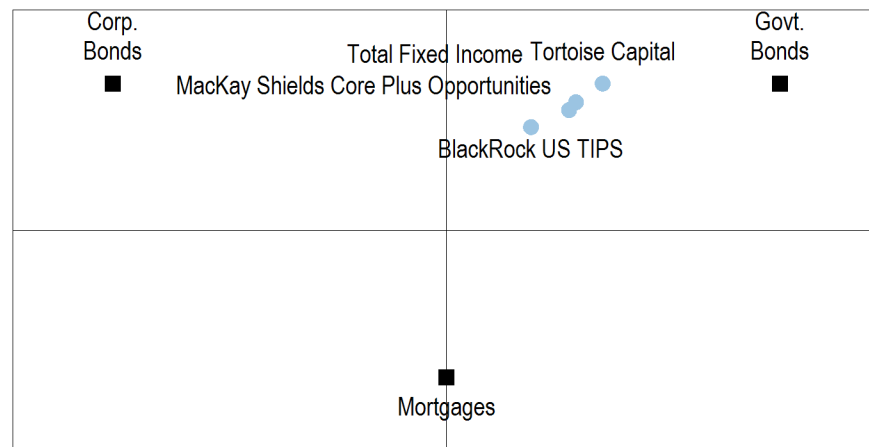


# Total Fixed Income Asset Class Overview (Gross of Fees)

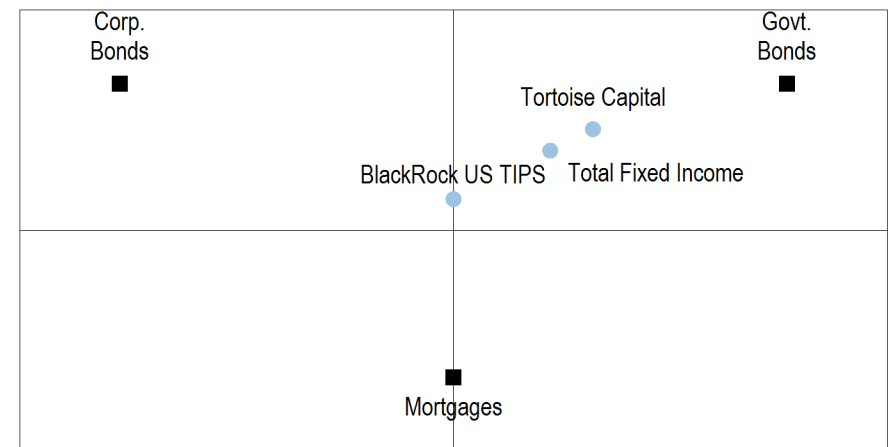
Period Ending: March 31, 2019

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total Fixed Income</b>	<b>231,794,819</b>	<b>3.5</b>	<b>4.3</b>	<b>4.2</b>	<b>3.2</b>	<b>3.2</b>	<b>5.3</b>	<b>-0.5</b>	<b>4.6</b>	<b>5.1</b>	<b>-0.3</b>	<b>5.9</b>
BBgBarc US Aggregate TR		2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0
InvestorForce Public DB Total Fix Inc Gross Rank		33	48	49	47	26	38	58	59	41	55	15
Tortoise Capital	96,095,440	3.7	5.0	4.8	3.5	3.8	5.9	0.2	4.5	5.1	1.2	7.0
BBgBarc US Aggregate TR		2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0
eV US Core Plus Fixed Inc Gross Rank		53	42	41	48	15	52	24	70	45	15	16
MacKay Shields Core Plus Opportunities	93,190,132	3.5	4.5	4.3	3.3	--	--	-0.7	4.9	5.1	--	--
BBgBarc US Aggregate TR		2.9	4.6	4.5	2.0	--	--	0.0	3.5	2.6	--	--
eV US Core Plus Fixed Inc Gross Rank		63	82	80	57	--	--	69	54	46	--	--
BlackRock US TIPS	42,509,247	3.2	2.0	2.9	1.9	2.1	3.5	-1.1	3.2	4.8	-1.2	3.6
BBgBarc US TIPS TR		3.2	1.9	2.7	1.7	1.9	3.4	-1.3	3.0	4.7	-1.4	3.6
eV US TIPS / Inflation Fixed Inc Gross Rank		58	51	34	46	33	58	47	46	37	43	45

Fixed Income Style Map  
3 Years Ending March 31, 2019



Fixed Income Style Map  
5 Years Ending March 31, 2019



## Total Fixed Income

## Asset Class Overview (Net of Fees)

Period Ending: March 31, 2019

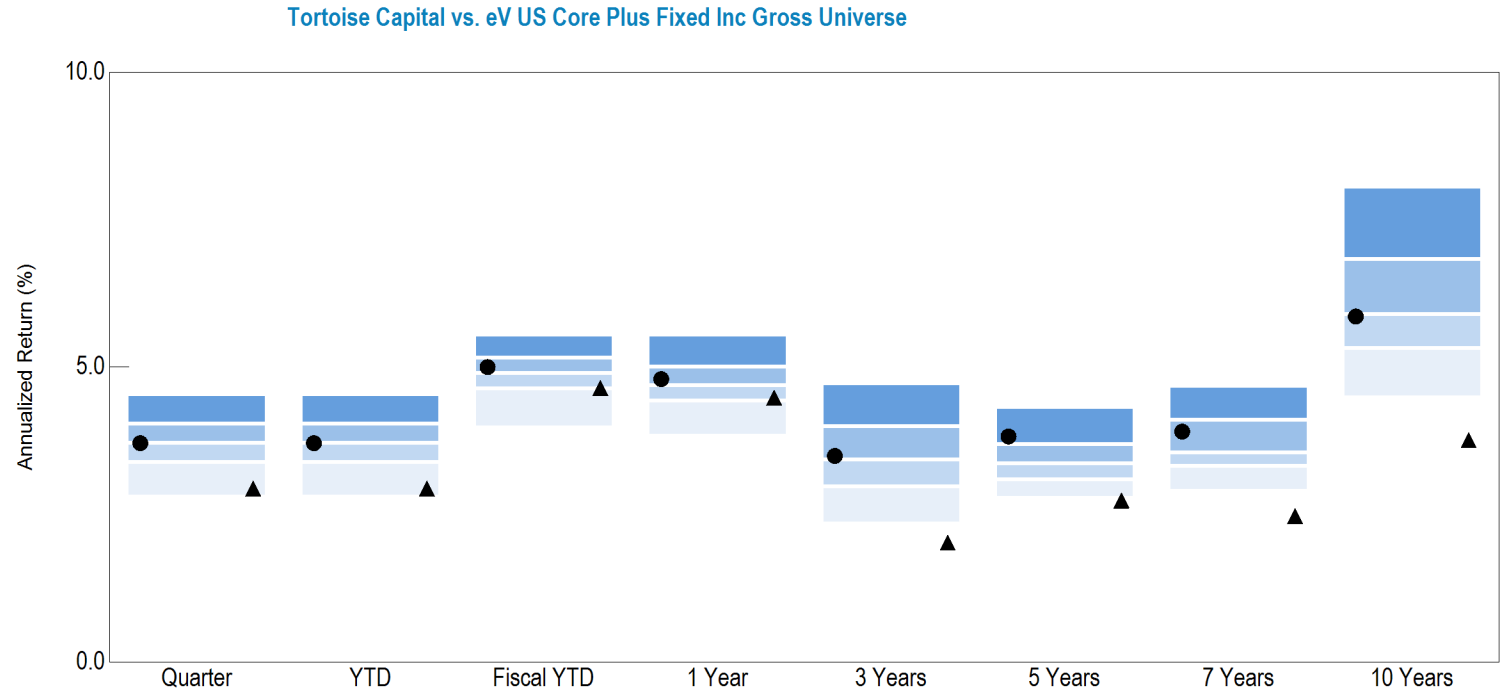
	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total Fixed Income</b>	<b>231,794,819</b>	<b>3.5</b>	<b>4.1</b>	<b>3.9</b>	<b>2.9</b>	<b>2.9</b>	<b>5.0</b>	<b>-0.8</b>	<b>4.3</b>	<b>4.8</b>	<b>-0.6</b>	<b>5.6</b>
<i>BBgBarc US Aggregate TR</i>		2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0
Tortoise Capital	96,095,440	3.6	4.8	4.5	3.2	3.5	5.5	-0.1	4.3	4.8	0.9	6.7
<i>BBgBarc US Aggregate TR</i>		2.9	4.6	4.5	2.0	2.7	3.8	0.0	3.5	2.6	0.6	6.0
MackKay Shields Core Plus Opportunities	93,190,132	3.4	4.2	4.0	2.9	--	--	-1.0	4.5	4.7	--	--
<i>BBgBarc US Aggregate TR</i>		2.9	4.6	4.5	2.0	--	--	0.0	3.5	2.6	--	--
BlackRock US TIPS	42,509,247	3.2	2.0	2.8	1.8	2.0	3.5	-1.2	3.2	4.8	-1.3	3.6
<i>BBgBarc US TIPS TR</i>		3.2	1.9	2.7	1.7	1.9	3.4	-1.3	3.0	4.7	-1.4	3.6

Correlation Matrix  
Last 5 Years

	Total Fixed Income	Tortoise Capital	MackKay Shields Core Plus Opportunities	BlackRock US TIPS	BBgBarc US Aggregate TR
Total Fixed Income	1.00	--	--	--	--
Tortoise Capital	0.99	1.00	--	--	--
MackKay Shields Core Plus Opportunities	--	--	--	--	--
BlackRock US TIPS	0.86	0.81	--	1.00	--
BBgBarc US Aggregate TR	0.93	0.95	--	0.73	1.00

Tortoise Capital  
Cumulative Performance Comparison (Gross of Fees)

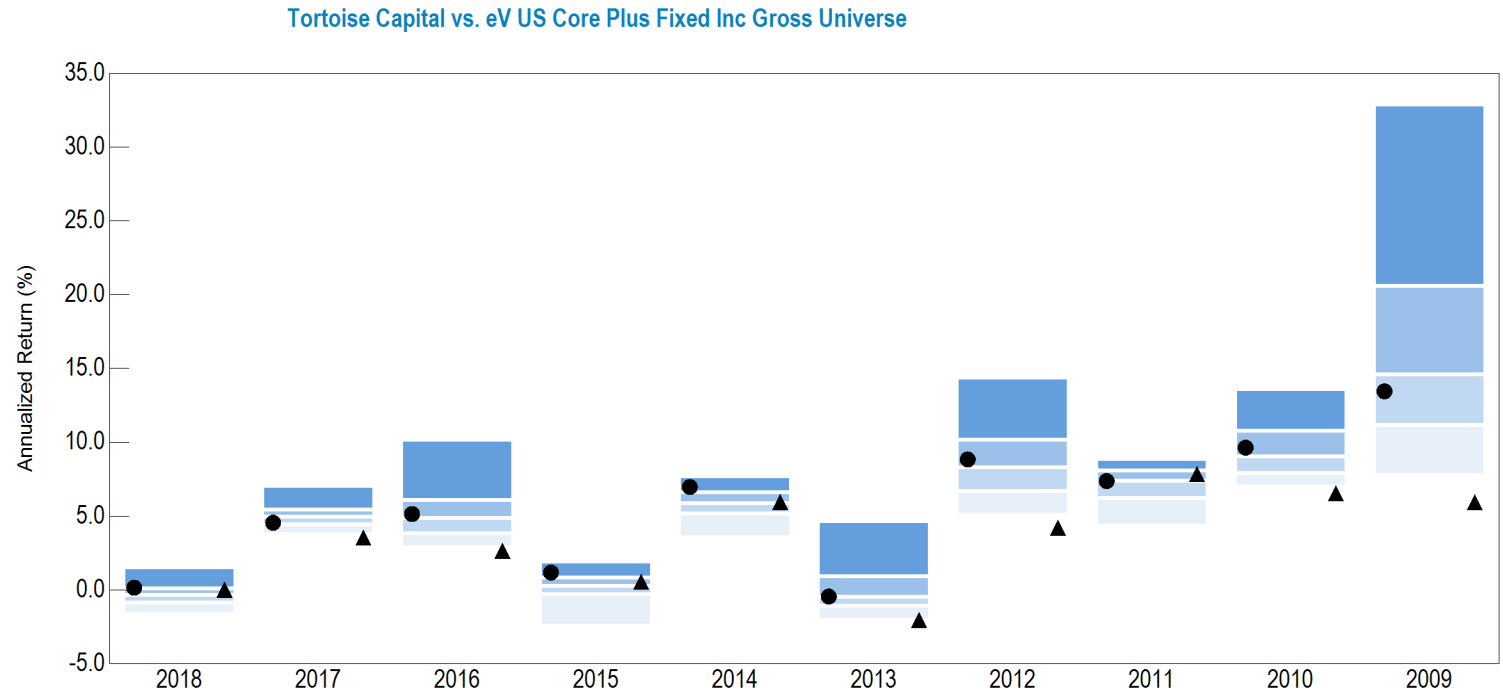
Period Ending: March 31, 2019



	Return (Rank)											
5th Percentile	4.5		4.5		5.5		5.5		4.7		4.3	
25th Percentile	4.1		4.1		5.2		5.0		4.0		3.7	
Median	3.7		3.7		4.9		4.7		3.4		3.4	
75th Percentile	3.4		3.4		4.6		4.4		3.0		3.1	
95th Percentile	2.8		2.8		4.0		3.8		2.4		2.8	
# of Portfolios	112		112		112		111		110		102	
● Tortoise Capital	3.7	(53)	3.7	(53)	5.0	(42)	4.8	(41)	3.5	(48)	3.8	(15)
▲ BBgBarc US Aggregate TR	2.9	(94)	2.9	(94)	4.6	(75)	4.5	(74)	2.0	(99)	2.7	(97)
											3.9	(32)
											2.5	(99)
											5.9	(52)
											3.8	(99)

Tortoise Capital  
Consecutive Performance Comparison (Gross of Fees)

Period Ending: March 31, 2019

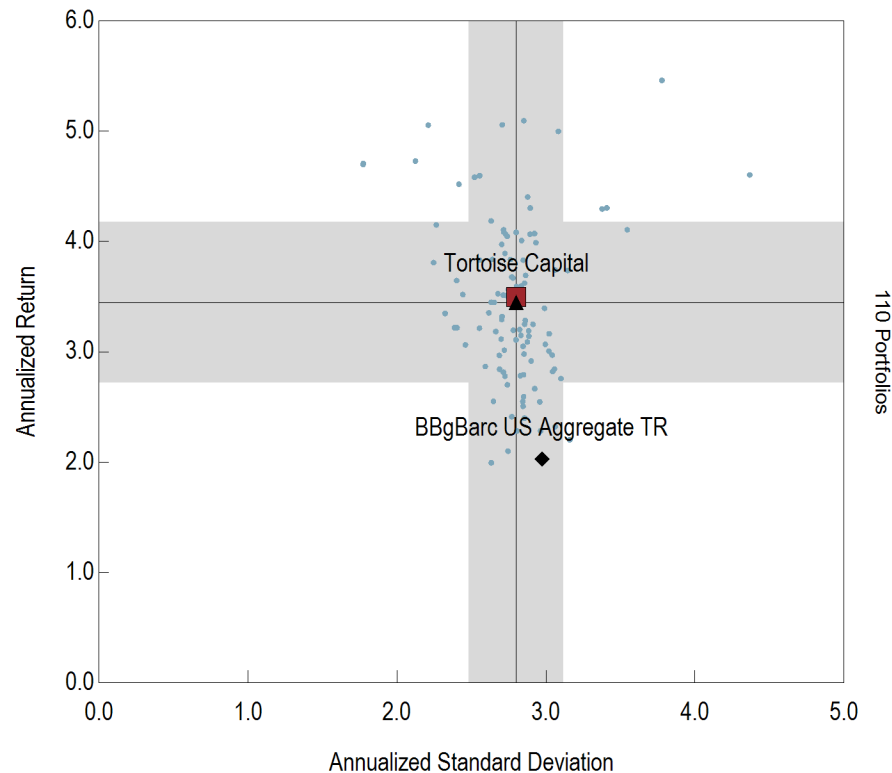


	Return (Rank)									
5th Percentile	1.5	7.0	10.1	1.9	7.7	4.6	14.4	8.8	13.6	32.9
25th Percentile	0.1	5.5	6.1	0.9	6.7	1.0	10.2	8.1	10.8	20.6
Median	-0.3	5.0	4.9	0.3	5.9	-0.4	8.3	7.4	9.1	14.6
75th Percentile	-0.8	4.5	3.9	-0.2	5.2	-1.0	6.7	6.3	8.0	11.2
95th Percentile	-1.6	3.8	2.9	-2.4	3.6	-2.0	5.1	4.4	7.0	7.8
# of Portfolios	120	122	134	115	118	116	124	118	123	128
● Tortoise Capital	0.2 (24)	4.5 (70)	5.1 (45)	1.2 (15)	7.0 (16)	-0.4 (52)	8.8 (45)	7.4 (51)	9.6 (40)	13.5 (55)
▲ BBgBarc US Aggregate TR	0.0 (31)	3.5 (99)	2.6 (97)	0.6 (42)	6.0 (50)	-2.0 (96)	4.2 (97)	7.8 (37)	6.5 (97)	5.9 (99)

Tortoise Capital  
Risk vs Return Three & Five Year (Gross of Fees)

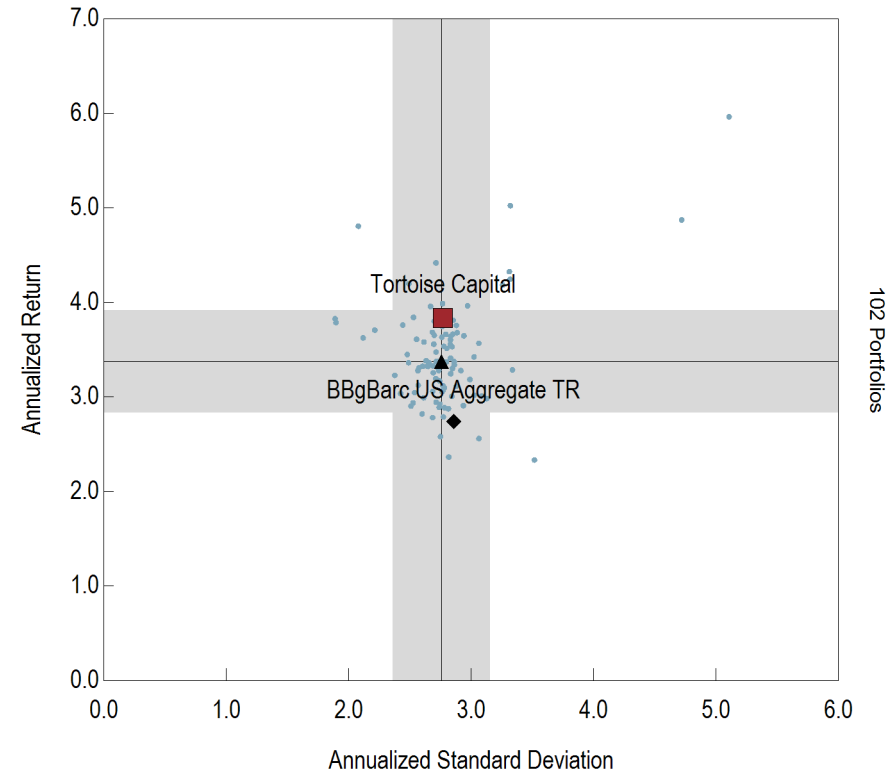
Period Ending: March 31, 2019

Annualized Return vs. Annualized Standard Deviation  
3 Years Ending March 31, 2019



- Tortoise Capital
- ◆ BBgBarc US Aggregate TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Core Plus Fixed Inc Gross

Annualized Return vs. Annualized Standard Deviation  
5 Years Ending March 31, 2019

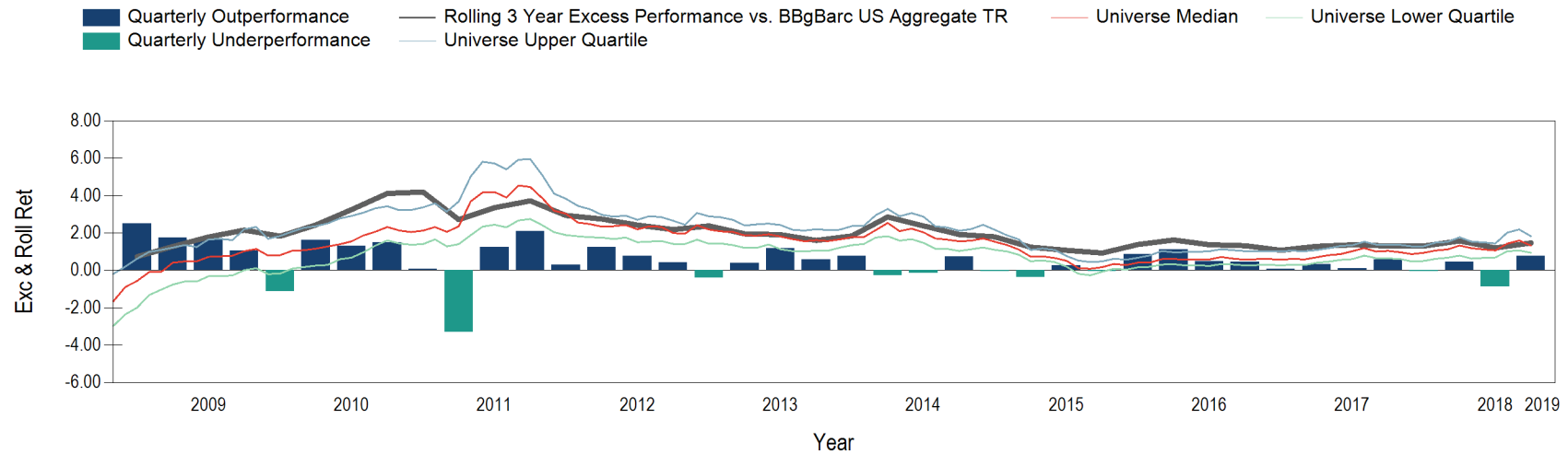


- Tortoise Capital
- ◆ BBgBarc US Aggregate TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Core Plus Fixed Inc Gross

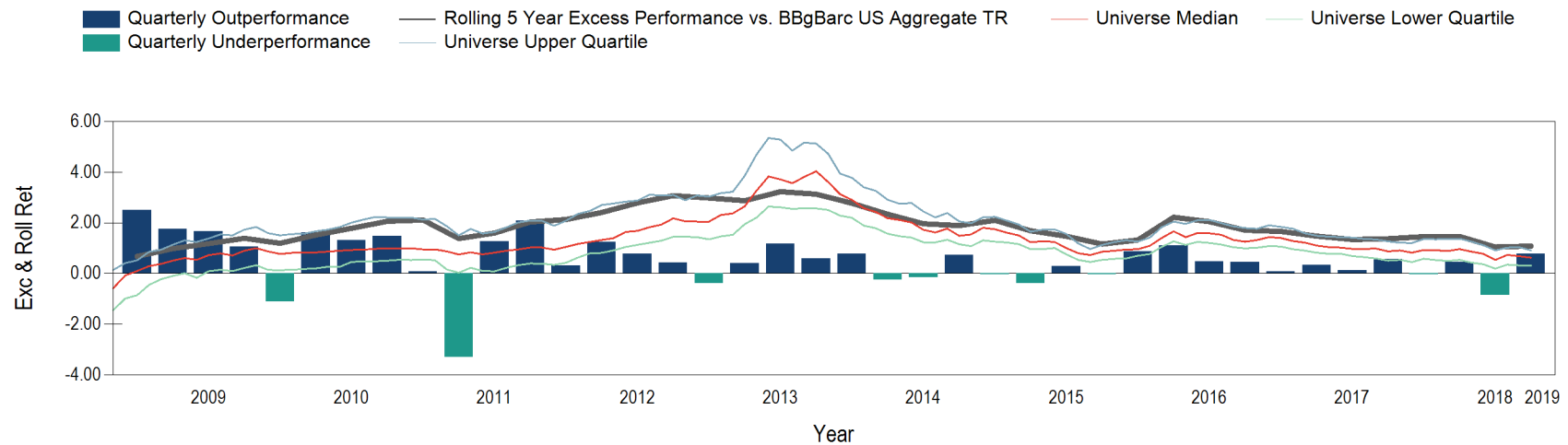
Tortoise Capital  
Rolling Return Analysis (Gross of Fees)

Period Ending: March 31, 2019

Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance

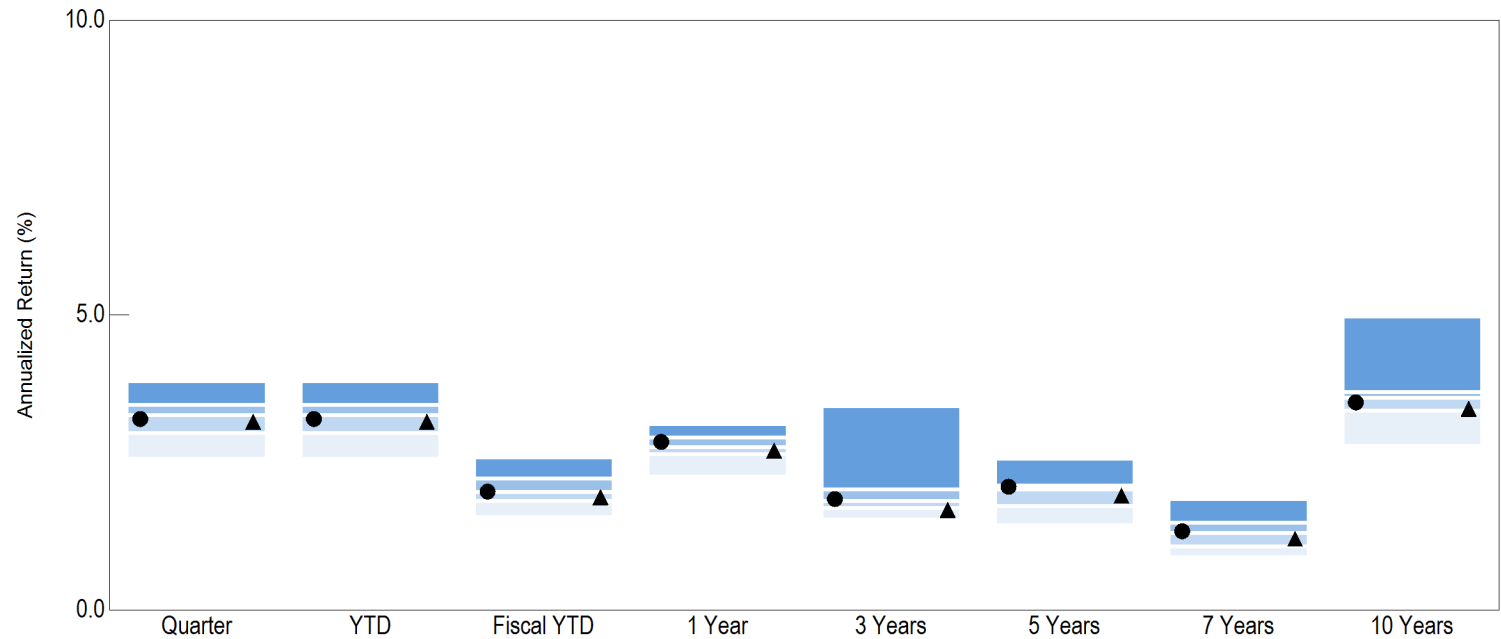


## BlackRock US TIPS

## Cumulative Performance Comparison (Gross of Fees)

Period Ending: March 31, 2019

BlackRock US TIPS vs. eV US TIPS / Inflation Fixed Inc Gross Universe

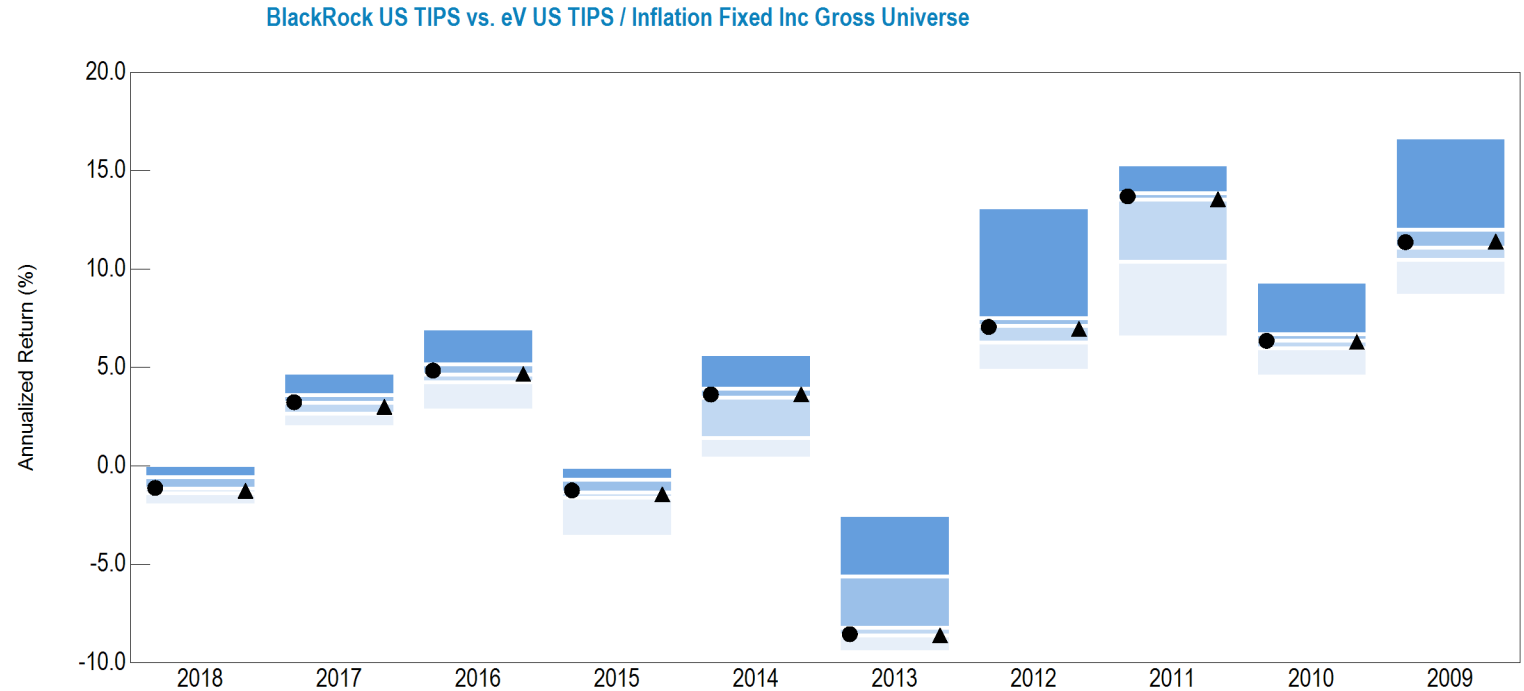


	Return (Rank)							
5th Percentile	3.9	3.9	2.6	3.2	3.5	2.6	1.9	5.0
25th Percentile	3.5	3.5	2.2	2.9	2.0	2.1	1.5	3.7
Median	3.3	3.3	2.0	2.8	1.9	2.1	1.3	3.6
75th Percentile	3.0	3.0	1.9	2.7	1.7	1.8	1.1	3.4
95th Percentile	2.6	2.6	1.6	2.3	1.5	1.4	0.9	2.8
# of Portfolios	39	39	39	39	38	38	37	32
● BlackRock US TIPS	3.2 (58)	3.2 (58)	2.0 (51)	2.9 (34)	1.9 (46)	2.1 (33)	1.3 (47)	3.5 (58)
▲ BBgBarc US TIPS TR	3.2 (67)	3.2 (67)	1.9 (60)	2.7 (68)	1.7 (80)	1.9 (61)	1.2 (69)	3.4 (73)

## BlackRock US TIPS

## Consecutive Performance Comparison (Gross of Fees)

Period Ending: March 31, 2019



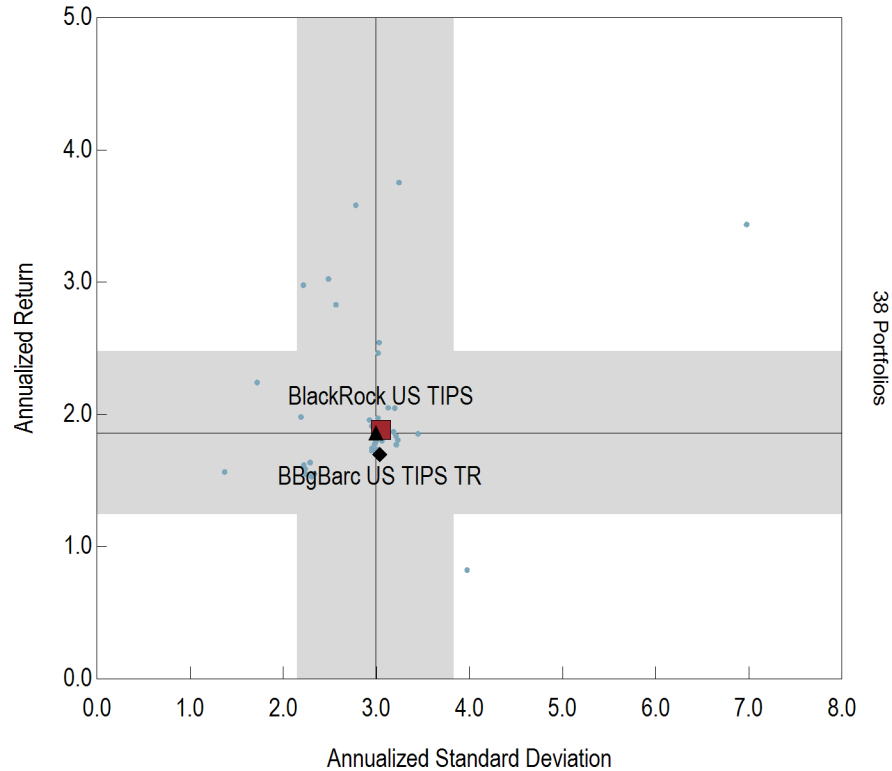
	Return (Rank)									
5th Percentile	0.0	4.7	7.0	-0.1	5.7	-2.5	13.1	15.3	9.4	16.7
25th Percentile	-0.6	3.6	5.2	-0.7	4.0	-5.6	7.5	13.9	6.7	12.0
Median	-1.1	3.2	4.7	-1.3	3.5	-8.2	7.1	13.5	6.4	11.1
75th Percentile	-1.4	2.7	4.3	-1.6	1.4	-8.6	6.3	10.4	6.0	10.5
95th Percentile	-2.0	2.0	2.8	-3.6	0.4	-9.4	4.9	6.6	4.6	8.7
# of Portfolios	41	38	42	44	50	43	43	47	39	37
● BlackRock US TIPS	-1.1 (47)	3.2 (46)	4.8 (37)	-1.2 (43)	3.6 (45)	-8.5 (62)	7.1 (59)	13.7 (37)	6.4 (52)	11.4 (36)
▲ BBgBarc US TIPS TR	-1.3 (65)	3.0 (71)	4.7 (47)	-1.4 (59)	3.6 (44)	-8.6 (76)	7.0 (66)	13.6 (49)	6.3 (57)	11.4 (35)

## BlackRock US TIPS

## Risk vs Return Three &amp; Five Year (Gross of Fees)

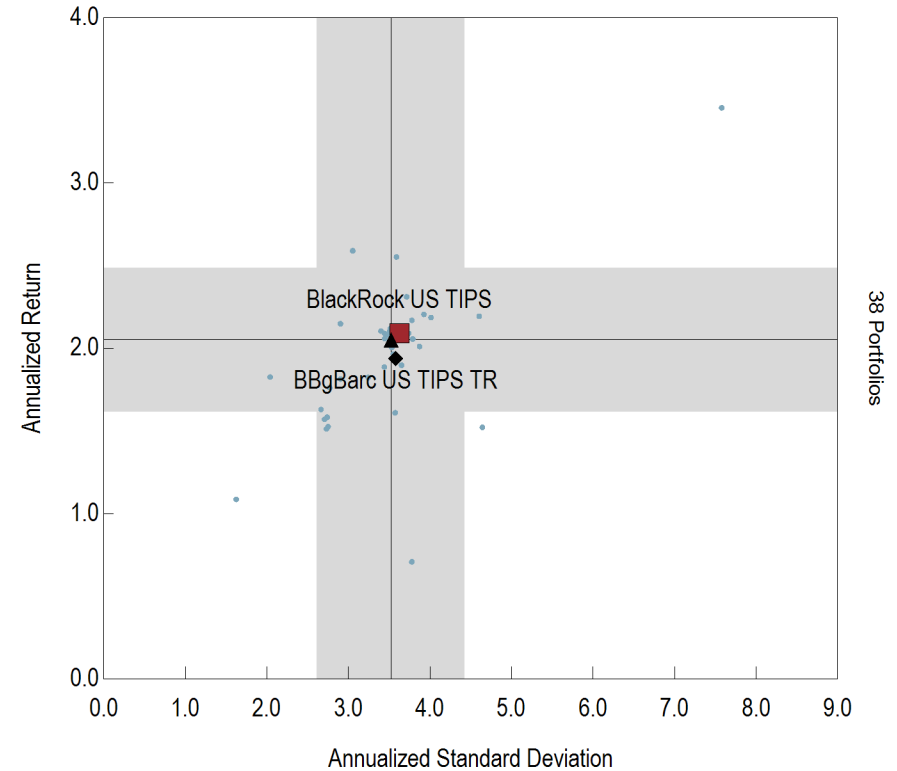
Period Ending: March 31, 2019

Annualized Return vs. Annualized Standard Deviation  
3 Years Ending March 31, 2019



- BlackRock US TIPS
- ◆ BBgBarc US TIPS TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US TIPS / Inflation Fixed Inc Gross

Annualized Return vs. Annualized Standard Deviation  
5 Years Ending March 31, 2019

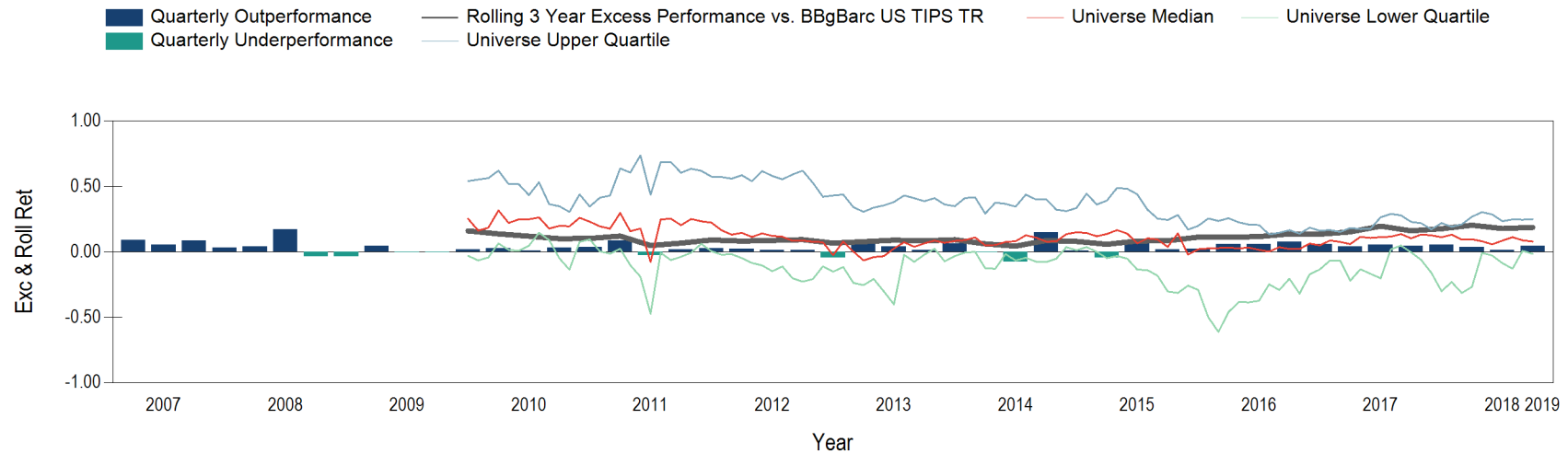


- BlackRock US TIPS
- ◆ BBgBarc US TIPS TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US TIPS / Inflation Fixed Inc Gross

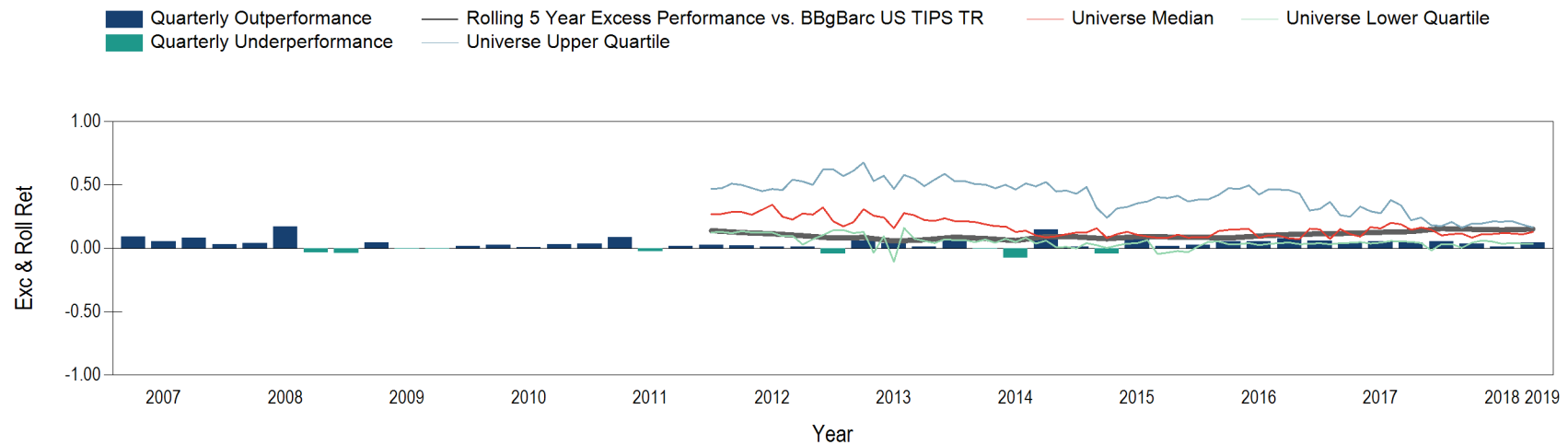
BlackRock US TIPS  
Rolling Return Analysis (Gross of Fees)

Period Ending: March 31, 2019

Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance

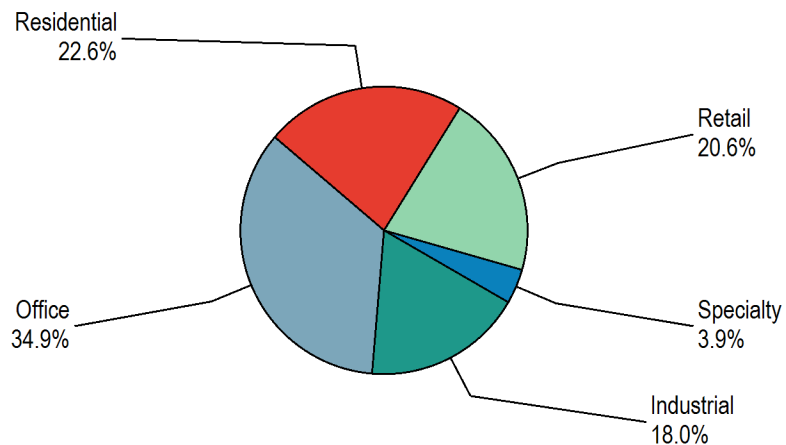


# Total Real Estate Asset Class Overview (Gross of Fees)

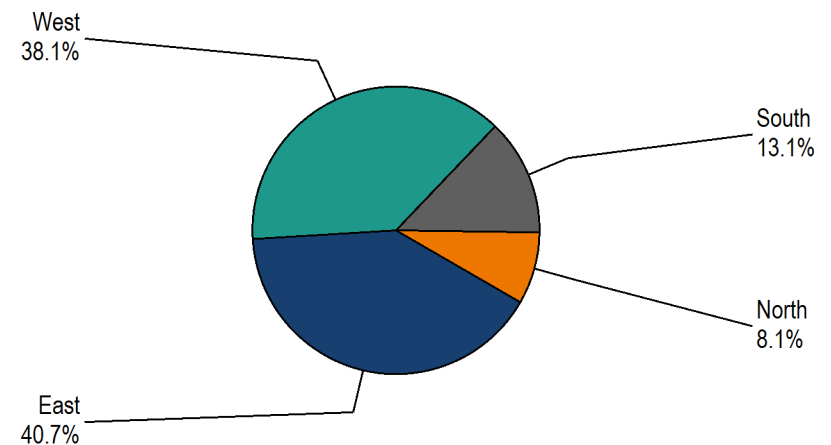
Period Ending: March 31, 2019

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total Real Estate</b>	<b>86,682,171</b>	<b>1.5</b>	<b>4.8</b>	<b>6.9</b>	<b>6.6</b>	<b>9.7</b>	<b>8.4</b>	<b>7.5</b>	<b>5.8</b>	<b>7.5</b>	<b>16.1</b>	<b>13.0</b>
NCREIF ODCE		1.4	4.9	6.8	7.1	9.1	8.5	7.1	7.0	8.0	13.3	11.8
ASB Real Estate	35,981,713	1.8	4.8	6.7	5.5	9.1	--	6.6	4.0	5.6	17.3	13.5
NCREIF-ODCE		1.4	5.4	7.5	8.0	10.2	--	8.3	7.6	8.8	15.0	12.5
NCREIF Property Index		1.8	4.9	6.8	7.1	9.1	--	6.7	7.0	8.0	13.3	11.8
Clarion Lion	36,524,454	1.7	5.4	8.0	8.0	10.8	8.4	8.6	7.9	9.1	15.7	13.2
NCREIF-ODCE		1.4	5.4	7.5	8.0	10.2	8.7	8.3	7.6	8.8	15.0	12.5
NCREIF Property Index		1.8	4.9	6.8	7.1	9.1	8.5	6.7	7.0	8.0	13.3	11.8
ARA American Strategic Value Realty	12,395,303	0.0	3.3	6.3	--	--	--	--	--	--	--	--
NCREIF ODCE +2%		0.5	4.9	7.1	--	--	--	--	--	--	--	--
1221 State St. Corp	1,780,700	0.0	0.0	0.0	5.5	3.3	1.1	0.0	0.0	17.5	0.0	0.0

**Property Type Allocation**  
Allocation as of March 31, 2019



**Geographic Diversification**  
Allocation as of March 31, 2019



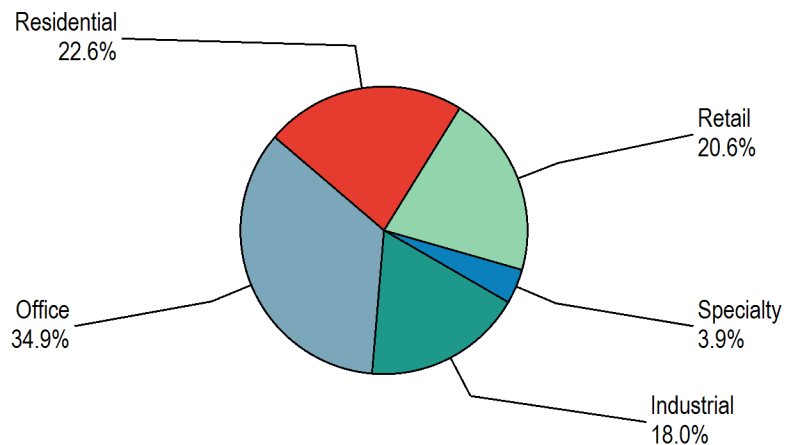
ARA American Strategic Value Realty funded 1/4/2018.

# Total Real Estate Asset Class Overview (Net of Fees)

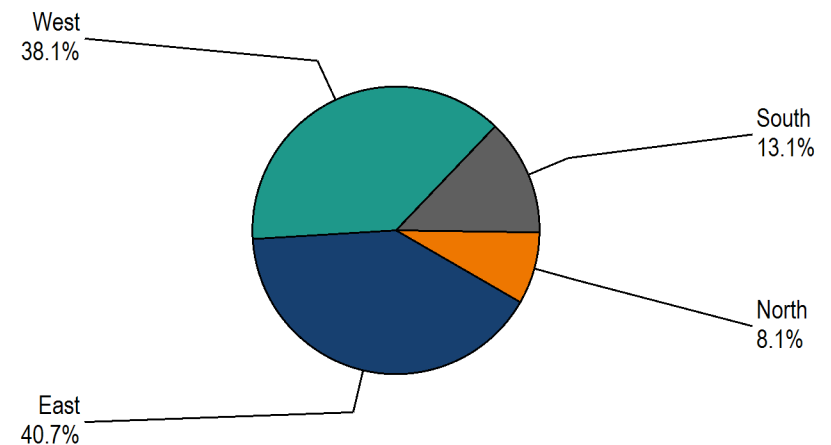
Period Ending: March 31, 2019

	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014
<b>Total Real Estate</b>	<b>86,682,171</b>	<b>1.5</b>	<b>4.8</b>	<b>6.9</b>	<b>6.4</b>	<b>9.1</b>	<b>7.8</b>	<b>7.5</b>	<b>5.8</b>	<b>6.5</b>	<b>15.0</b>	<b>11.6</b>
NCREIF ODCE		1.4	4.9	6.8	7.1	9.1	8.5	7.1	7.0	8.0	13.3	11.8
ASB Real Estate	35,981,713	1.8	4.8	6.7	5.2	8.5	--	6.6	4.0	4.6	16.2	12.5
NCREIF-ODCE		1.4	5.4	7.5	8.0	10.2	--	8.3	7.6	8.8	15.0	12.5
NCREIF Property Index		1.8	4.9	6.8	7.1	9.1	--	6.7	7.0	8.0	13.3	11.8
Clarion Lion	36,524,454	1.7	5.4	8.0	7.7	10.2	7.6	8.6	7.9	8.0	14.6	12.2
NCREIF-ODCE		1.4	5.4	7.5	8.0	10.2	8.7	8.3	7.6	8.8	15.0	12.5
NCREIF Property Index		1.8	4.9	6.8	7.1	9.1	8.5	6.7	7.0	8.0	13.3	11.8
ARA American Strategic Value Realty	12,395,303	0.0	3.3	6.3	--	--	--	--	--	--	--	--
NCREIF ODCE +2%		0.5	4.9	7.1	--	--	--	--	--	--	--	--
1221 State St. Corp	1,780,700	0.0	0.0	0.0	5.5	3.3	1.1	0.0	0.0	17.5	0.0	0.0

**Property Type Allocation**  
Allocation as of March 31, 2019



**Geographic Diversification**  
Allocation as of March 31, 2019



ARA American Strategic Value Realty funded 1/4/2018.

**Performance Return Calculations**

Performance is calculated using Modified Dietz and for time periods with large cash flow (generally greater than 10% of portfolio value), Time Weighted Rates of Return (TWRR) methodologies. Monthly returns are geometrically linked and annualized for periods longer than one year.

**Data Source**

Verus is an independent third party consulting firm and calculates returns from best source book of record data. Returns calculated by Verus may deviate from those shown by the manager in part, but not limited to, differences in prices and market values reported by the custodian and manager, as well as significant cash flows into or out of an account. It is the responsibility of the manager and custodian to provide insight into the pricing methodologies and any difference in valuation.

**Illiquid Alternatives**

Due to the inability to receive final valuation prior to report production, closed end funds (including but are not limited to Real Estate, Hedge Funds, Private Equity, and Private Credit) performance is typically reported at a one-quarter lag. Valuation is reported at a one-quarter lag, adjusted for current quarter flow (cash flows are captured real time). Closed end fund performance is calculated using a time-weighted return methodology consistent with all portfolio and total fund performance calculations. For Private Markets, performance reports also include Verus-calculated multiples based on flows and valuations (e.g. DPI and TVPI) and manager-provided IRRs.

**Manager Line Up**

Manager	Inception Date	Data Source	Manager	Inception Date	Data Source
BlackRock Russell 3000	12/10/2015	J.P. Morgan	1221 State Street Corp	9/30/2008	ICERS/Union Bank
BlackRock International Equity	7/3/2003	J.P. Morgan	Cash	-	J.P. Morgan
DFA Emerging Markets Value	1/11/2007	J.P. Morgan	HarbourVest IX-Buyout	2011 <sup>1</sup>	HarbourVest
Harding Loevner	7/5/2016	Harding Loevner	HarbourVest IX-Credit	2011 <sup>1</sup>	HarbourVest
Bradford & Marzec Fixed (Tortoise Capital)	12/1/1992	J.P. Morgan	HarbourVest International VI	2008 <sup>1</sup>	HarbourVest
MacKay Shields Core Plus Ops	3/2/2015	CITCO	Harbourvest IX-Venture	2011 <sup>1</sup>	HarbourVest
BlackRock US TIPS	4/11/2007	J.P. Morgan	Harbourvest 2017 Global	2017 <sup>1</sup>	HarbourVest
ASB Real Estate	12/31/2012	ASB Real Estate	Harbourvest 2018 Global	2018 <sup>1</sup>	HarbourVest
Clarion Lion	12/31/2006	Clarion Lion	KKR Mezzanine	2010 <sup>1</sup>	KKR
Portfolio Advisors	10/31/2017	Portfolio Advisors	PIMCO BRAVO	2011 <sup>1</sup>	PIMCO
			ARA American Strategic Value Realty	1/4/2018	ARA

<sup>1</sup>Represents fund vintage year.

**Policy & Custom Index Composition**

Policy Index (10/1/2018-Current)	29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc Aggregate, 10% NCREIF Property, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged).
Policy Index (10/1/2016-9/30/2018)	29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc Aggregate, 5% NCREIF Property, 5% NCREIF Property +2%, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged).
Policy Index (7/1/2014-9/30/2016)	29% Russell 3000, 25% MSCI ACWI ex-US (Gross), 30% Barclays U.S. Aggregate, 6% NCREIF Property Index, 5% Bloomberg Commodity Index, 5% Russell 3000 +3% (Lagged).

## Glossary

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**Allocation Effect:** An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

**Alpha:** The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as:  $\text{Portfolio Return} - [\text{Risk-free Rate} + \text{Portfolio Beta} \times (\text{Market Return} - \text{Risk-free Rate})]$ .

**Benchmark R-squared:** Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager.

**Beta:** A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

**Book-to-Market:** The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios.

**Capture Ratio:** A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

**Correlation:** A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

**Excess Return:** A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

**Information Ratio:** A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

**Interaction Effect:** An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

**Portfolio Turnover:** The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

**Price-to-Earnings Ratio (P/E):** Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.

**R-Squared:** Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

**Selection Effect:** An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

**Sharpe Ratio:** A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as:  $\text{Portfolio Excess Return} / \text{Portfolio Standard Deviation}$ .

**Sortino Ratio:** Measures the risk-adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

**Standard Deviation:** A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

**Style Analysis:** A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

**Style Map:** A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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