





PERIOD ENDING: JUNE 30, 2018

Investment Performance Review for

**Imperial County Employees' Retirement System** 

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**VERUSINVESTMENTS.COM** 

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# 2<sup>nd</sup> quarter summary

### THE ECONOMIC CLIMATE

- U.S. economic data generally surprised to the upside in Q2, leading to a strong quarterly GDP growth estimate of 3.4%.
   Economic growth in the second and third quarters will likely see the biggest boost from fiscal stimulus. The U.S. is currently outshining other developed economies. p. 7, 18
- The synchronized global growth story of the past year has shifted somewhat as economies have displayed more disparate performance. The change has not been too dramatic – growth continues to be positive, but at a more moderate pace. p. 17

### PORTFOLIO IMPACTS

- Emerging market equity and local debt delivered losses of 8.0% and 10.4% in Q2 (MSCI Emerging Markets Index, JPM GBI-EM Global Diversified). Much of the losses were due to currency movement. We believe emerging market assets offer attractive value – recent movements appear to have been driven by a shift in short-term sentiment and currency depreciation. p. 27, 34
- The U.S. implemented a first round of tariffs on Chinese imports on July 6<sup>th</sup>, which impacted \$34 billion worth of goods. So far, only a small portion of the discussed tariffs have been enacted. p. 8, 9

### THE INVESTMENT CLIMATE

- Strong corporate earnings growth is expected again in the second quarter. According to FactSet, the bottom-up analyst forecast for the S&P 500 is 20.0% YoY. p. 31
- Short-term U.S. Treasury yields rose, resulting in a flatter yield curve. The spread between the 10- and 2-year yield was 27 bps, a new cycle low. p. 23
- Fears were raised over Italy's role in the European Union after a coalition of the anti-establishment Five Star Movement and League Party formed a new government. Italian sovereign bond yields spiked severely during the move, but have since moderated somewhat. p. 19

# **ASSET ALLOCATION ISSUES**

- Following the February selloff equity markets have been range bound. As corporate earnings rise further equity valuations have been pushed down to more attractive levels closer to the long-term historical average. p. 31, 37
- While we believe trade negotiations and geopolitical uncertainty are potential causes for concern, the backdrop of positive global growth and strong corporate earnings may allow for healthy risk-asset performance. p. 18, 31

A neutral to mild risk overweight may be warranted in today's environment

# What drove the market in Q2?

# "Trade tariff worries keep stocks under pressure"

# TOTAL PROPOSED GOODS SUBJECT TO U.S. TARIFFS (\$BILLIONS)

Jan	Feb	Mar	Apr	May	Jun
10	10	106	206	481	881

Article Source: Financial Times, June 21<sup>st</sup>, 2018

# "Economic growth in U.S. leaves world behind"

# **U.S. Q2 GDP CONSENSUS EXPECTATION (%)**

Jan	Feb	Mar	Apr	May	Jun
2.6	2.7	3.0	3.1	3.1	3.4
4 / 6	14/61 1 4	ath 2040			

Article Source: WSJ, June 14th, 2018

# "Rising dollar sparks tumult in emerging markets"

### MSCI EMERGING MARKETS MONTHLY CURRENCY IMPACT

Jan	Feb	Mar	Apr	May	Jun
1.6%	-0.7%	0.0%	-1.6%	-1.3%	-1.7%

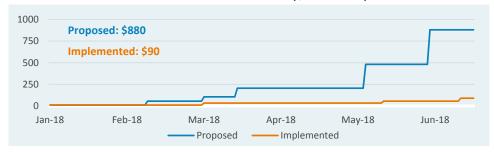
Article Source: WSJ, May 21st, 2018

# "Investors are getting worried about an inverted yield curve"

# U.S. 10- MINUS 2-YEAR YIELD SPREAD (BPS)

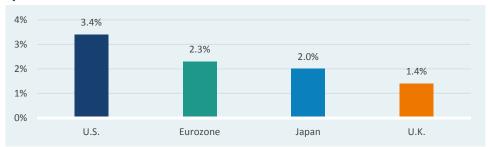
Jan	Feb	Mar	Apr	May	Jun
56	61	47	46	42	33
Article Source	e: Bloombera.	Anril 18 <sup>th</sup> . 2018			

# PROPOSED VS. IMPLEMENTED U.S. TARIFFS (\$BILLIONS)



Source: Verus, as of 7/6/18

# **Q2 GDP EXPECTATIONS**



Source: Bloomberg, as of 7/11/18

### MSCI EMERGING MARKETS USD VS. LOCAL



Source: Bloomberg, as of 6/30/18



# Economic environment



# U.S. economics summary

- GDP growth was 2.8% year-overyear in the first quarter (2.0% quarterly annualized rate). The slightly slower pace of expansion was influenced by more conservative consumer spending than in previous quarters.
- The rate of inflation picked up moderately throughout the quarter. Core CPI rose 2.3% over the past year, reaching the upper end of its range during the current cycle. The year-over-year rate was impacted by a low base effect – the 3-month annualized core inflation rate was only 1.7%.
- Job gains during the quarter were strong, despite traditional employment measures indicating a tight labor market. Additions to nonfarm payrolls averaged 211,000 per month and the U-3 unemployment rate fell slightly from 4.1% to 4.0%.

- The broadest measure of labor market health, the ratio of employed individuals to the total population, indicates there may still be room for further improvement. More narrow indicators, such as the U-3 unemployment rate, may be overstating labor market tightness.
- The back and forth on trade between the U.S. and much of the rest of the world intensified. The White House has threatened to enact tariffs on up to \$550 billion of Chinese goods over unfair trade practices and intellectual property theft. To this point, tariffs have only been implemented on around \$40 billion of Chinese goods.
- The Fed raised interest rates for a second time this year in June to a target rate of 1.8% to 2.0%. Two more rate hikes are expected by the end of the year based on the Fed dot plot.

	Most Recent	12 Months Prior
GDP (YoY)	<b>2.8%</b> 3/31/18	2.0% 3/31/17
Inflation (CPI YoY, Core)	2.3% 6/30/18	1.7% 6/30/17
Expected Inflation (5yr-5yr forward)	2.2% 6/30/18	1.8% 6/30/17
Fed Funds Target Range	1.75 – 2.00% 6/30/18	1.00 – 1.25% 6/30/17
10 Year Rate	<b>2.9%</b> 6/30/18	2.3% 6/30/17
U-3 Unemployment	<b>4.0%</b> 6/30/18	<b>4.3%</b> <i>6/30/17</i>
U-6 Unemployment	<b>7.8%</b> 6/30/18	8.5% 6/30/17



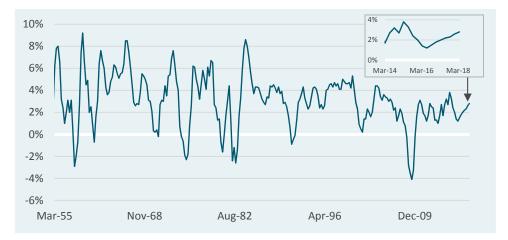
# GDP growth

Real GDP growth rose 2.8% from the previous year in the first quarter (2.0% quarterly annualized rate). After a strong fourth quarter, consumers were more conservative with their purchases. Consumer spending contributed only 0.6% to the first quarter growth rate, compared to a 2.8% contribution in the previous quarter. Corporate capital investment was the biggest contributor to growth at 1.2%.

Strong growth is expected throughout the rest of the year as the benefits of fiscal stimulus begin to flow through to the economy. According to the Bloomberg consensus estimate, real GDP growth is expected to be 3.4% in the second quarter. The big question is whether the economic benefits from fiscal stimulus are a one-off or whether they will have a more lasting impact on the economy that will help counter the headwind from monetary tightening.

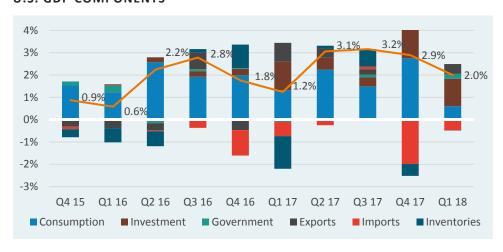
While much of the tax cut windfall has been returned to shareholders via share buybacks there has been a meaningful pick up in corporate fixed investment to more normal levels, which may help sustain growth in the coming quarters.

# U.S. REAL GDP GROWTH (YOY)



Source: Bloomberg, as of 3/31/18

### **U.S. GDP COMPONENTS**



Source: Bloomberg, annualized quarterly rate, as of 3/31/18



# Global trade

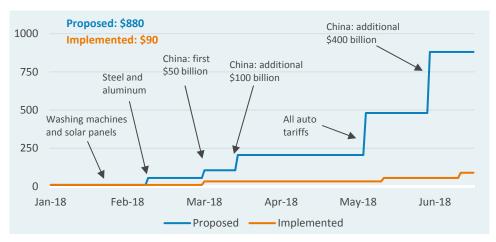
The war of words over trade between the U.S. and much of the rest of the world intensified in recent months, particularly with China. A first round of 10% tariffs on \$34 billion of Chinese goods was implemented on July 6<sup>th</sup>.

Thus far, there has been a large discrepancy between tariffs that have been proposed and tariffs that have been implemented. The U.S. has only enacted tariffs on \$90 billion of global imports. In comparison, the White House has proposed placing tariffs on a total of \$880 billion of imported goods. It is important to remember that tariffs are an avoidable tax on corporations conducting business in the U.S. Assuming a 10%

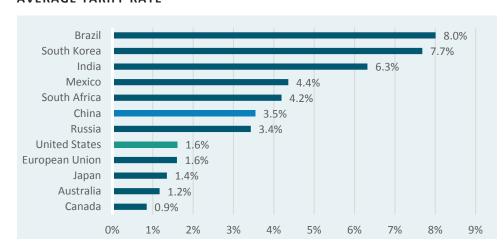
tariff rate on all proposed goods would result in a maximum tax of \$88 billion, a relatively small amount when thinking about the U.S. economy as a whole.

Tariffs in place so far are likely to have a minimal impact on the global economy. We believe that financial markets may be more sensitive to an escalation in the trade conflict than the actual economic impact. Much of the discussion on trade has ignored the fact that the U.S. has upheld less protectionist trade policies than many of its trading partners. While the trade conflict creates potential market downside risks, it also creates potential benefits if the end result is freer trade.

# PROPOSED VS. IMPLEMENTED U.S. TARIFFS (\$BILLIONS)



### **AVERAGE TARIFF RATE**



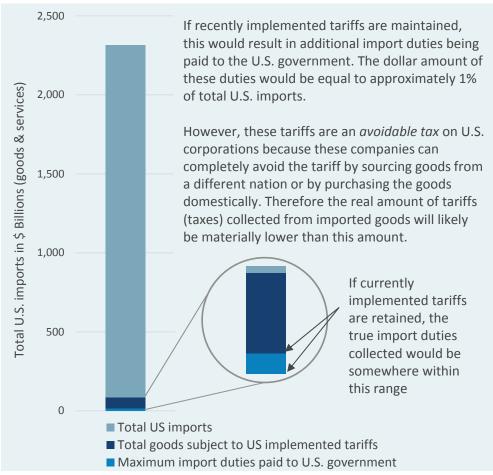
Source: WTO, 2016

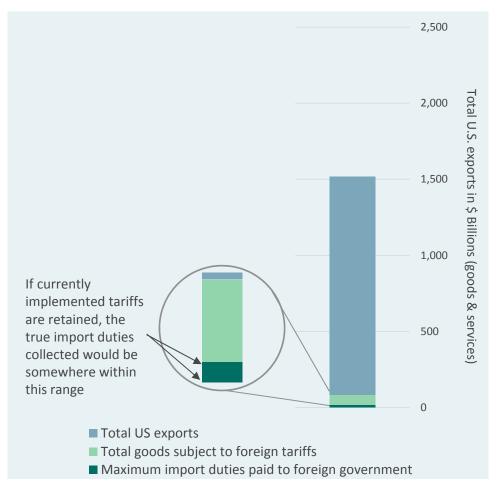


Source: Verus, as of 7/6/18

# Putting tariffs into perspective

Tariff duties are better thought of as an avoidable tax. The impact of recently enacted tariffs is small, especially once substitution effects are accounted for.





Source: U.S. Census Bureau, Verus

Analysis conservatively assumes a 25% tariff rate for an estimated \$90 billion of tariffs on both imports and exports, both goods and services are included



# Inflation

The year-over-year core CPI inflation rate was 2.3% in June, up from 2.1% three months prior. The increase in the yearly rate slightly overstates the size of the move because it was impacted by a low base effect – the annualized 3-month core inflation rate was only 1.7%.

While investors' concerns over inflation have bubbled up occasionally throughout the year, we have yet to see a material increase in price levels. Consumer price inflation

has been held back by a lack of wage growth as well as structural factors such as globalization and automation which have weighed down the prices of goods.

The Fed's response to inflation data is potentially more important to investors than actual changes in inflation, barring an unforeseen shock to the upside. To this point, the central bank appears to be tolerant of inflation slightly higher than the stated 2% target.

Core inflation remained modest

# U.S. CPI (YOY)



# INFLATION BY PRODUCT TYPE (YOY)



# Source: Bloomberg, as of 5/31/18

### INFLATION EXPECTATIONS



Source: Bloomberg, as of 6/30/18



Source: FRED, as of 5/31/18

# Labor market

Conditions in the U.S. labor market tightened further in Q2 as unemployment moved from 4.1% to 4.0%. The unemployment rate that includes discouraged and part time workers fell from 8.0% to 7.8%. Despite these headline readings, we believe there may be considerable slack in the U.S. labor force which is not captured in traditional unemployment measures. This suggests further labor market gains in the U.S. expansion may be reflected in higher participation rates rather than solely through a decline in the unemployment rate.

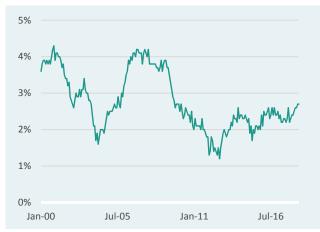
Perhaps the greatest question mark in today's labor market is the degree to which long-term unemployed workers decide to resume their job search. This decision to return to work may be influenced by greater job prospects that come handin-hand with a strong economy, or may be influenced purely by necessity (many Americans are not adequately prepared for retirement). Traditional unemployment metrics may understate labor market slack

Average hourly earnings growth ticked up to 2.7%, continuing a mild positive trend since the bottom of the U.S. recession.

### UNEMPLOYMENT RATE

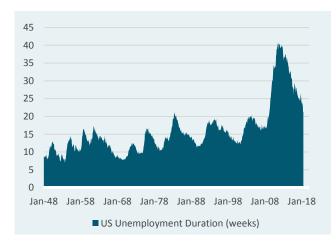


# **AVERAGE HOURLY EARNINGS (YOY)**



# Source: Bloomberg, as 5/31/18

# UNEMPLOYMENT DURATION



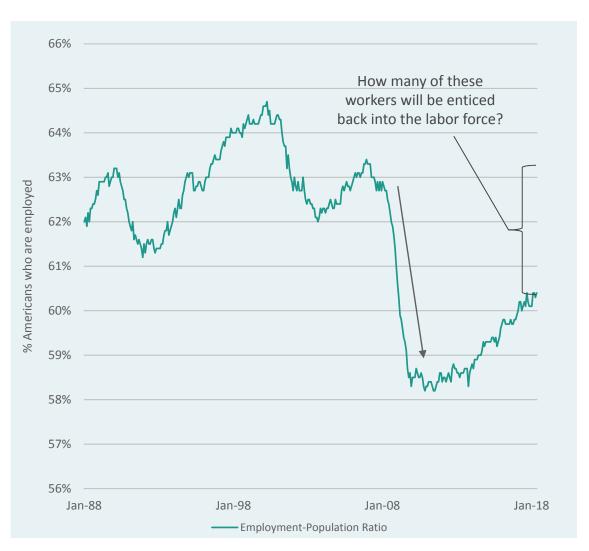
Source: FRED, as of 6/30/18



Source: FRED, as of 6/30/18

# How tight is the job market?

- According to the most frequently touted measures of unemployment, the U.S. job market is at the strongest level seen in nearly 50 years. But looking at unemployment through a different lens the number of Americans employed paints a very different picture. A significant portion of America remains unemployed relative to 10 years ago.
- During past U.S. economic downturns, between 2% and 3% of Americans lost their jobs, though most or all of those jobs were recovered throughout the subsequent economic recovery. In comparison, 5% of Americans exited the workforce during the latest recession, and less than half of these lost jobs have been regained.
- Some of this shortfall has been fueled by demographic shifts, and some by workers giving up and permanently leaving the workforce. But the remainder of the shortfall is comprised of very discouraged workers who will eventually seek employment. If it turns out that this third category is large, the current U.S. job market may not be as tight as commonly believed, which implies more potential upside to the U.S. economic expansion.



Source: FRED, Verus, as of 6/30/18



# The consumer

Economic conditions such as low unemployment, moderate wage gains, and restrained inflation remain broadly supportive of the U.S. consumer. Personal spending growth was 4.6% year-over-year in May, in line with the conservative spending habits seen throughout this expansion.

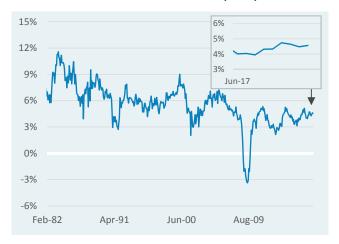
Consumers have also been timid with credit use during the current cycle. Households deleveraged following the financial crisis primarily through less mortgage debt, although this trend has flattened out more recently. Despite this

deleveraging, household debt levels are still high relative to history at 91.5% of disposable income.

Given the more conservative use of credit, dissaving has been an important driver of consumer spending. The personal savings rate was only 3.2% in May, near historical lows. Low interest rates and high asset prices likely helped push down the savings rate. If these conditions were to moderate, it would lead to a more normal balance between spending and savings.

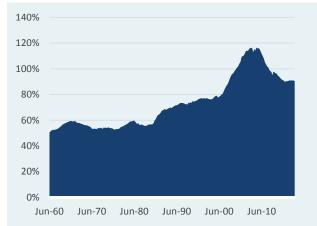
Economic conditions are still supportive of consumer spending

# CONSUMER SPENDING GROWTH (YOY)



6 01 1 62/24/4

# HOUSEHOLD DEBT (% OF DISPOSABLE INCOME)



Source: Bloomberg, as of 3/31/18

### PERSONAL SAVINGS RATE



Source: FRED, as of 5/31/18

Source: Bloomberg, as of 5/31/18

# Sentiment

Consumer and business sentiment readings are impressively high. The Bloomberg U.S. Weekly Consumer Confidence Index is in the 90<sup>th</sup> percentile, since 1985. The University of Michigan Consumer Sentiment Survey is in the 87<sup>th</sup> percentile, since 1978. Survey respondents provided favorable views on jobs and wages, and broadly expect modest gains in U.S. employment. Cited concerns included rising inflation, higher energy prices, and the economic risks posed by tariffs.

The NFIB Small Business Optimism Index was 107.2 at the end of the quarter – its 6<sup>th</sup> highest reading in survey history. NFIB noted that "small business owners continue to report astounding optimism as they celebrate strong sales, the creation of jobs, and more profits." Business owners are concerned about the inability to find qualified employees for open positions, consistent with the historically high number of unfilled job openings reported by the Bureau of Labor Services.

### CONSUMER COMFORT INDEX



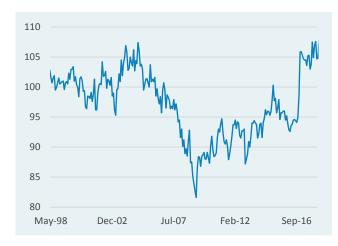
Source: Bloomberg, as of 6/30/18 (see Appendix)

### **CONSUMER SENTIMENT**



Source: University of Michigan, as of 6/30/18 (see Appendix)

### NFIB SMALL BUSINESS OPTIMISM INDEX



Source: NFIB, as of 6/30/18 (see Appendix)



# Housing

Single-family home prices have risen steadily thus far this year. As of April, the Case-Shiller National Home Price Index was up 6.4% from the previous year, and was 8.8% above the pre-crisis peak. Since the housing market bottomed in February of 2012, home prices have jumped by nearly 50% while personal incomes were up only 24% during the same period. Despite the outsized gain in home prices, demand for single-family housing has been strong, aided by low mortgage interest rates. Rising mortgage rates may make it difficult for many potential home buyers to enter the market at current prices. However, mortgage rates are still low and home affordability is high

relative to history – the median income is over 1.5 times the amount required to qualify for a mortgage on a median priced home.

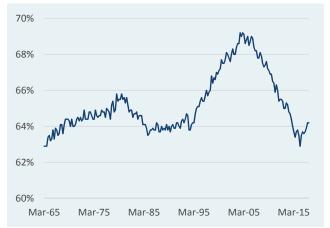
The homeownership rate rose in 2017 for the first time in 13 years. This rate bottomed at 62.9% in the middle of 2016 and sits at 64.2% as of the end of the March. The rise in homeownership has been driven by younger, first time owners (i.e. Millennials). Mortgage lending standards have moderated after years of very tight standards following the financial crisis, which has helped younger buyers enter the market.

Home ownership rose for the first time in 13 years

### HOUSING AFFORDABILITY INDEX

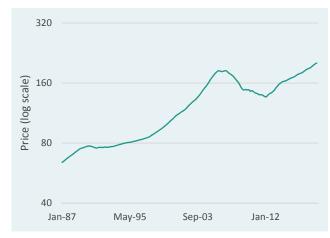


### HOME OWNERSHIP RATE



Source: FRED, as of 3/31/18

### **U.S. HOME PRICE INDEX**



Source: Case-Shiller National Home Price Index, as of 4/30/18



Source: Bloomberg, as of 3/31/18

# International economics summary

- The synchronized global growth story of the past year has shifted somewhat as greater performance disparity is visible across global economies. Growth continues to be positive but is more moderate in places.
- Developed market economies are expected to grow less quickly in the coming years while emerging economy growth rates are expected to rise.
- The U.S. implemented a first round of tariffs on Chinese imports on July 6th, which impacted \$34 billion of goods. So far, only a small portion of the discussed tariffs have been enacted.
- In June, Mario Draghi officially announced the end of Europe's bond buying program. Asset purchases are scheduled to end in December, and it was promised that interest rates will remain unchanged through the summer of

- 2019. This message was seen by markets as more dovish than expected.
- Fears were raised over Italy's uncertain role in the EU, following a new coalition of the antiestablishment Five Star Movement and League Party taking over the government. Italian bond yields spiked severely during the move, but have since moderated.
- The Eurozone Composite PMI rose for the first time in five months to 54.8 in June. PMIs in most developed and emerging markets remain above 50, indicating expansion.
- The U.S. dollar appreciated 5% during the quarter. Certain emerging market currencies have devalued sharply, such as the Argentine peso, which is down more than 35% against the USD on the year.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	2.8% 3/31/18	2.8% 5/31/18	4.0% 6/30/18
Eurozone	<b>2.5%</b> 3/31/18	2.0% 6/30/18	8.6% 3/31/18
Japan	1.1% 3/31/18	<b>0.7%</b> 5/31/18	2.2% 5/31/18
BRICS Nations	5.8% 3/31/18	2.5% 6/30/18	5.6% 3/31/18
Brazil	1.2% 3/31/18	<b>4.4%</b> 6/30/18	12.8% 6/30/18
Russia	1.3% 3/31/18	2.3% 6/30/18	<b>4.7%</b> 5/31/18
India	<b>7.7%</b> 3/31/18	5.0% 6/30/18	8.8% 12/31/17
China	6.8% 3/31/18	1.9% 6/30/18	3.9% 3/31/18



# International economics

The synchronized global growth story of the past year has shifted as economies display more disparate economic performance. The change has not been too dramatic - growth continues to be positive but more moderate in places. Since 2016 we have been discussing political and economic risks which exist in Europe. These fears were confirmed in recent quarters as Eurozone economies missed expectations in a variety of areas including GDP growth, retail sales, and industrial production – casting some doubt over the European recovery story.

The Eurozone and Japan exhibited inflation well below central bank targets in the second quarter, while the U.S. delivered a moderate rise. Overall, inflation conditions remain benign which has allowed (or necessitated) easier central bank policy.

Synchronized global growth has moderated

Labor markets tightened broadly, in line with an environment of positive economic expansion. However, joblessness remains stubbornly high in some Eurozone countries such as Italy, Spain, and Greece.

# REAL GDP GROWTH (YOY)

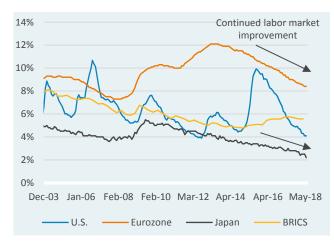


# **INFLATION (CPI YOY)**



# Source: Bloomberg, as of 5/31/18

### **UNEMPLOYMENT RATE**



Source: Bloomberg, as of 5/31/18 or most recent release



Source: Bloomberg, as of 3/31/18

# GDP growth expectations

Economic growth expectations for the rest of 2018 and 2019 have begun to show widening differentials between the U.S. and the rest of the developed world. GDP expectations for the U.S. have been revised upward over the past six months partly due to an expected boost from fiscal stimulus, while growth expectations for other developed countries have been revised slightly lower. This disparity has led to skepticism regarding the story of accelerating synchronized global growth which economies experienced towards the second half of 2017.

In 2019, growth is expected to moderate in every major developed country as risks develop further, such as tighter monetary conditions. Achieving the right balance of monetary tightening at this stage of the economic cycle becomes increasingly difficult, and the risk of a policy mistake is greater. However, cyclical conditions in most economies (i.e. moderate inflation, wage gains) may allow central banks to be patient, extending the cycle even further. Emerging market economy growth premiums are expected to increase – these markets are earlier in their economic and monetary policy cycles than developed markets.

# **GDP GROWTH EXPECTATIONS (%)**



# YTD NET CHANGES IN GDP EXPECTATIONS



Source: Bloomberg, as of 7/5/18 Source: Bloomberg, as of 7/5/18



# Political shakeup in Italy

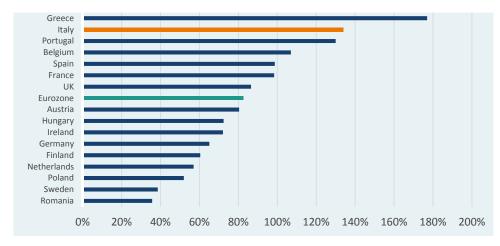
Fears were raised over Italy's possible exit from the Eurozone following a coalition of the anti-establishment Five Star Movement and League Party. Italian bond yields spiked severely during the move, but have since moderated.

The greatest immediate risk seems to be coalition talks of significant spending increases. Per the Maastricht Treaty – the founding document of the European Union (EU) – member nation fiscal budgets are limited to a debt-to-GDP level of 60% and a budget deficit of 3% of GDP. Italy's debt-to-GDP is over 130%, while for now the country is running a more reasonable budget deficit of 1.6%. If Italy forges ahead

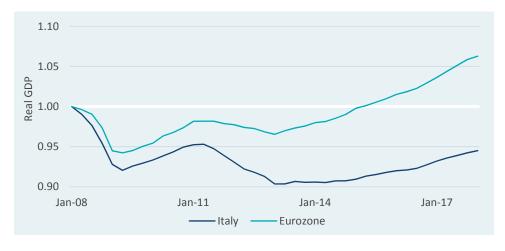
with fiscal stimulus, this may result in further conflict with Maastricht Treaty guidelines and may place the new emboldened leaders head-to-head with the EU.

The political events in Italy tie into a broader European trend – the growing power and influence of populism. Populist movements have been fueled by severe economic disparity between some Eurozone economies as well as controversial EU policies relating open borders and immigration. This populist trend will likely pose an ongoing threat to the stability of European economies and the EU as a whole.

### **DEBT-TO-GDP**



### **EUROZONE VS. ITALY REAL GDP**



Source: ec.europa.eu, as of 2017 Q3

Source: Bloomberg, as of 3/31/18



# Fixed income rates & credit



# Interest rate environment

- The Fed raised interest rates in June for the second time this year to a target range of 1.8-2.0%. The balance sheet unwind continued as planned with approximately \$18 billion in Treasuries and \$12 billion in MBS coming off each month during the quarter.
- According to the Fed dot plot, officials are expecting two additional rate hikes this year, while market pricing suggests only one more hike. Quicker than expected Fed tightening would represent a key risk to the economy and asset prices.
- The 10-year U.S. Treasury yield ticked up modestly during the quarter to 2.9% while the short-end of the curve rose further. The spread between the 2- and 10-year yields fell to a cycle low of 33 bps at quarter end. By another measure of curve shape, the 10-year yield minus 3-month yield, the curve remains at a level of steepness closer to the longer-term average (92 bps vs. 184 bps average).
- Historically, an inverted yield curve has preceded recessions, but the timing between inversion and recession has

- been anywhere from one to three years.
- In June, Mario Draghi officially announced the end of the Eurozone's bond buying program. The ECB stated that purchases will end in December, and interest rates will remain unchanged through summer of 2019. The markets interpreted this as dovish and yields fell on the news.
- Italian sovereign yields spiked after it appeared the country was headed for new elections later in the year. The 2year yield jumped 186 bps in one day to 2.8% as risk premiums rose. In the end, a coalition government was formed between the Five Star and League parties and the country avoided going back to the polls.
- Emerging market local and hard yields moved higher, influenced by a general risk-off sentiment towards EM as well as idiosyncratic risks in several vulnerable countries, such as Turkey and Argentina.

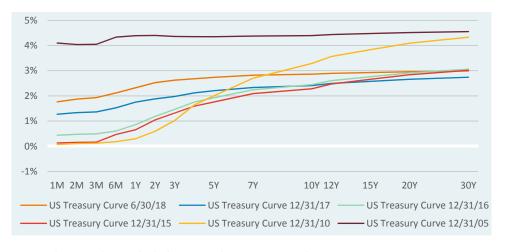
Area	Short Term (3M)	10 Year
United States	1.91%	2.86%
Germany	(0.59%)	0.30%
France	(0.63%)	0.67%
Spain	(0.42%)	1.32%
Italy	(0.12%)	2.68%
Greece	1.04%	3.96%
U.K.	0.61%	1.28%
Japan	(0.14%)	0.04%
Australia	1.92%	2.63%
China	3.01%	3.48%
Brazil	6.45%	11.68%
Russia	6.62%	7.81%

Source: Bloomberg, as of 6/30/18

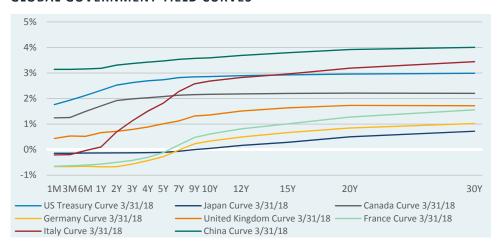


# Yield environment

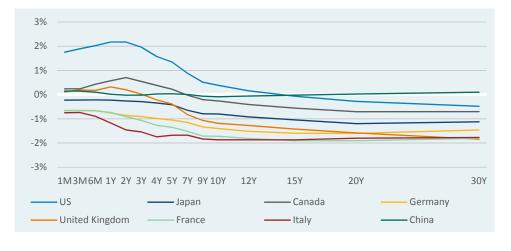
# **U.S. YIELD CURVE**



### **GLOBAL GOVERNMENT YIELD CURVES**



### YIELD CURVE CHANGES OVER LAST FIVE YEARS



# **IMPLIED CHANGES OVER NEXT YEAR**



Source: Bloomberg, as of 6/30/18



# What does an inverted curve indicate?



Yield curve inversions often occur during the late-cycle

Recession and equity market peaks typically do not occur immediately after an inversion

Source: FRED, Verus – time that passed between initial yield curve inversion and the next technical recession, and time that passed between initial yield curve inversion and next equity market peak

Note: There was not a clear equity market peak during the early 1980's expansion. A "time before equity market peak" was therefore not calculated.



# ECB bond buying program



European
Central Bank
bond
purchases are
expected to
end in
December

These
purchases
have acted as
a major
support to
bond prices in
recent years

Country	Debt Purchased by ECB	% of Total Sovereign Purchases	% of Total Country Debt
Germany	€ 485.6	26.6%	23.2%
France	€ 396.7	21.8%	17.9%
Italy	€ 344.8	18.9%	15.0%
Spain	€ 244.4	13.4%	21.4%
Netherlands	€ 108.5	5.9%	26.1%
Belgium	€ 69.2	3.8%	15.3%
Austria	€ 54.9	3.0%	18.9%
Portugal	€ 33.7	1.8%	13.9%



# Credit environment

Credit spreads in both leveraged loans and high yield have widened slightly since the beginning of the year, but are still sitting well below their historical averages. Loans outperformed high yield bonds during eight of the past nine months. LIBOR has steadily risen since 2016, surpassing the LIBOR floors which exist in senior loans, causing them to be fully floating-rate instruments.

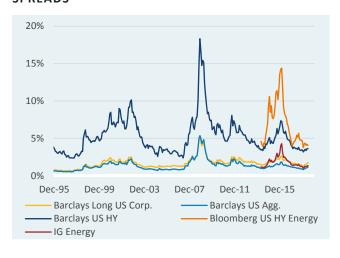
U.S. high yield option-adjusted spreads widened slightly in the second quarter to 3.6% – the asset class generated a

1.0% total return. Tight credit spreads in both high yield bonds and loans have been driven by strong corporate fundamentals, manageable debt maturities and general macroeconomic improvement. Credit spreads have historically been a good indicator of future performance relative to Treasuries.

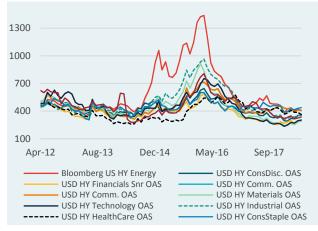
Based on low interest rates and tight spreads, we recommend an underweight to U.S. investment and high yield credit.

Credit spreads are tight across the capital structure

### **SPREADS**



# HIGH YIELD SECTOR SPREADS (BPS)



Market	Credit Spread (6/30/18)	Credit Spread (1 Year Ago)
Long US Corporate	1.8%	1.6%
US Aggregate	1.2%	1.0%
US High Yield	3.6%	3.6%
US Bank Loans	3.5%	3.7%

Source: Bloomberg, as of 6/30/18

Source: Barclays, Credit Suisse, Bloomberg, as of 6/30/18



Source: Barclays, Bloomberg, as of 6/30/18

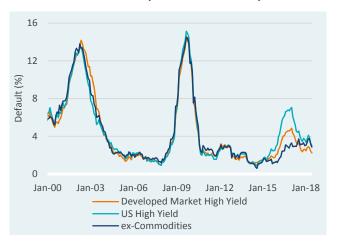
# Issuance and default

Default activity has been low and stable in the U.S. and international credit markets. The par-weighted U.S. default rate remains below its long-term average of 3.0-3.5% and is currently at 2.0%. In the second quarter, \$1.5 billion of defaults occurred - the lowest quarterly total since Q4 2013.

Senior loan and high yield markets are recovering from a wave of defaults seen in 2015-2016, generated from energy and metals/mining sectors. Recovery rates for high yield bonds have vastly improved since that time.

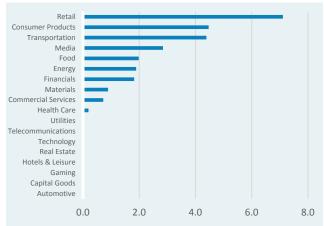
Issuance in high yield bonds totaled \$126 billion compared with \$176 billion across the first half of 2017. Similarly, issuance in leveraged loans totaled \$501 billion, compared with over \$577 billion in the first half of 2017. New issue spreads continue to compress with strong demand supported by significant retail and institutional inflows into both high yield and senior loan asset classes, as well as CLO formation.

# HY DEFAULT TRENDS (ROLLING 1 YEAR)



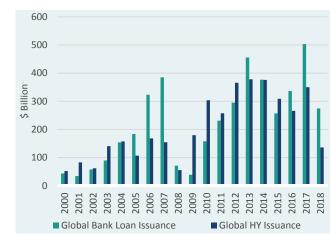
Source: BofA Merrill Lynch, as of 6/30/18

# **HY SECTOR DEFAULTS (LAST 12 MONTHS)**



Source: BofA Merrill Lynch, as of 6/30/18 - par weighted

# **GLOBAL ISSUANCE (BILLIONS)**



Source: Bloomberg, BofA Merrill Lynch, as of 6/30/18



# Emerging market debt

Emerging market debt experienced a difficult quarter, particularly in local currency bonds. The JPM EMBI Index (hard) and JPM GBI-EM Index (local) returned -3.5% and -10.4%, respectively. Much of the negative performance in local debt was driven by currency depreciation and rising risk premiums in several vulnerable countries. Excluding Venezuela, there has not yet been any defaults, delayed payments or credit downgrades in this space – Argentina narrowly avoided defaulting after securing a \$50 billion bailout from the IMF.

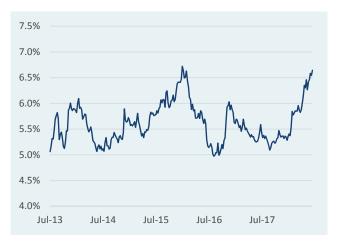
Currency movement in local debt accounted for approximately 80% of the losses in the second quarter. While many currencies

moved due to broad strengthening of the U.S. dollar, several countries with high external debt loads and current account deficits, including Brazil, Argentina, and Turkey, saw their currencies depreciate sharply.

Outside of a few countries, we believe the economic backdrop remains positive for emerging market debt. Most markets have come a considerable way in trimming external debt over the past few years which has made them less reliant on dollar funding. The recent sell-off has created value opportunities that might be taken advantage of – active management is preferred in this asset class.

We maintain a positive outlook on emerging market debt

### **EMD HARD YIELDS**



# EMD LOCAL YIELDS



### Source: Bloomberg, as of 6/30/18

### YTD CURRENCY LOSSES VS USD



Source: Bloomberg, as of 6/30/18



Source: Bloomberg, as of 6/30/18

# Equity



# Equity environment

- We maintain an overweight position to equities through a positive tilt to emerging markets.
   We do not believe recent price swings reflect any major fundamental change to the trajectory of emerging markets.
   Equity bull runs in these markets have typically incurred a 10% or larger drawdown sometime during the rally.
- Outside of emerging markets, equities have remained fairly range bound following the February selloff. As corporate earnings rise and prices stay flat, equity valuations have been pushed down to more attractive levels closer in line with the historical average.
- Concerns over global trade contributed to a choppy month for equities, although no major breakthroughs or setbacks occurred. Global equities were up +2.9% on a hedged basis but currency depreciation acted as a drag (+0.5% unhedged).

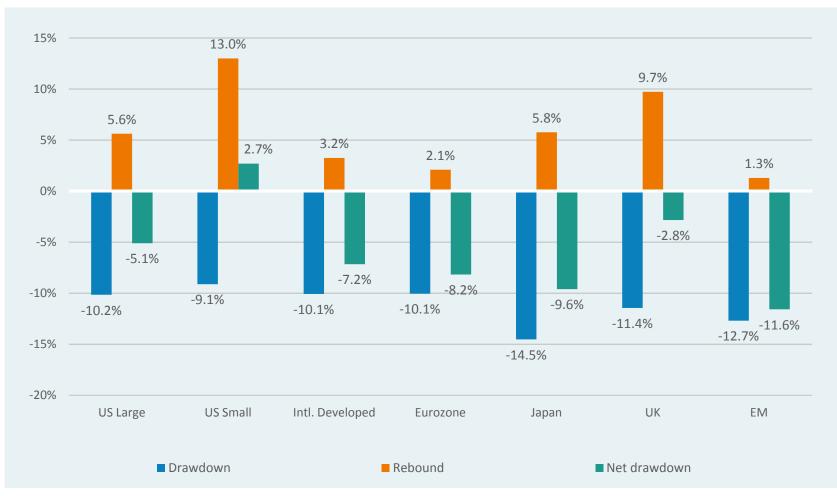
- The value premium has delivered anomalously poor performance the worst 10-year return on record (since 1926). However, because performance differences were due to earnings growth disparity rather than moves in valuation, the price difference between value and growth stocks has remained fairly normal. A tactical opportunity to overweight value is not yet apparent we believe investors should stay the course.
- Equity volatility moved to belowaverage levels once again, following February's spike. The VIX averaged 15.3 during Q2.
- Currency volatility has frequently been greater than equity market volatility in recent years, causing return disparity for investors with unhedged international assets. A hedging program could allow investors to significantly reduce or eliminate this uncompensated risk.

	QTD TOTAL	L RETURN	YTD TOTAL	. RETURN	1 YEAR RETU	
	(unhedged)	(hedged)	(unhedged)	(hedged)	(unhedged)	(hedged)
US Large Cap (Russell 1000)	3.6	%	2.9	%	14.5%	
US Small Cap (Russell 2000)	7.8	%	7.7%		17.6%	
US Large Value (Russell 1000 Value)	1.0%		-2.0	)%	6.0	%
US Large Growth (Russell 1000 Growth)	5.8%		7.3%		22.5%	
International Large (MSCI EAFE)	(1.2%)	3.9%	(2.7%)	0.0%	6.8%	7.9%
Eurozone (Euro Stoxx 50)	(2.3%)	3.6%	(3.7%)	0.5%	3.7%	3.7%
U.K. (FTSE 100)	(3.1%)	9.8%	(0.9%)	2.2%	10.2%	9.9%
Japan (NIKKEI 225)	0.2%	4.4%	0.5%	(1.1%)	15.1%	13.2%
Emerging Markets (MSCI Emerging Markets)	(8.0%)	(3.6%)	(6.7%)	(3.0%)	8.2%	9.5%

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 6/30/18

# 2018 peak to trough

# **PEAK TO TROUGH**



Most equity markets remain range bound since the February selloff

U.S. small caps have fully recovered while E.M. has stayed depressed

2018 peak to trough, local returns, as of 7/2/18 - the trough (market bottom) date for each market is as follows: US Large (2/8), US Small (2/8), Intl. Dev. (3/26), Eurozone (3/23), Japan (3/23), UK (3/26), EM (6/28)



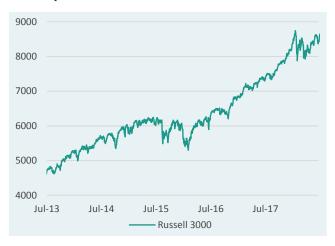
# Domestic equity

U.S. equities were range bound over the quarter – the S&P 500 Index posted a positive return of 3.4% and traded within a tight range between 2600 and 2800. The ups and downs of trade negotiations, particularly those between the U.S. and China, impacted equity markets during the quarter. However, considerable uncertainty surrounding the outcome of these negotiations likely helped keep equities from breaking out of their range in either direction.

Strong year-over-year earnings growth is expected to continue for the second quarter. According to FactSet, the bottom-up analyst earnings growth forecast for the S&P 500 is 19.9%. Forward 12-month earnings growth expectations were revised higher throughout the quarter while equity prices leveled out. Given that prices tend to following earnings, there may be potential upside to prices if the expected high growth is realized. Alternatively, higher discount rates from Fed tightening may offset the impact of strong earnings growth.

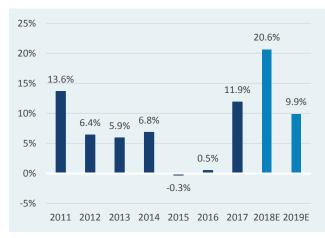
Fundamentals appear unchanged despite falling prices

### **U.S. EQUITIES**



# Source: Russell Investments, as of 6/30/18

### CALENDAR YEAR EARNINGS GROWTH



Source: FactSet, as of 7/6/18

### **S&P 500 PRICE & EARNINGS**



Source: Bloomberg, as of 6/30/18



# Domestic equity size & style

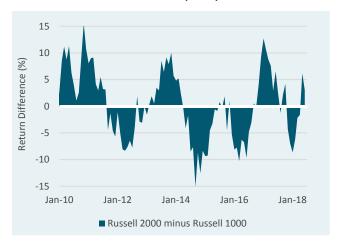
Large cap equities (Russell 1000 3.6%) underperformed small cap (Russell 2000 7.8%) during the quarter. Value stocks continued to lag growth (Russell 1000 Value 1.2% vs. Russell 1000 Growth 5.8%).

Value has delivered anomalously negative returns – the worst 10-year run on record (since 1926). Because performance differences were due to earnings growth disparity rather than moves in valuation, the price difference between value and growth stocks has remained normal. Earnings trends can be somewhat attributed to the global financial crisis where financials lagged considerably, followed by a bull market for

technology stocks (value is concentrated in financials while growth is concentrated in tech). In other words, much of value's underperformance was macroeconomic in nature.

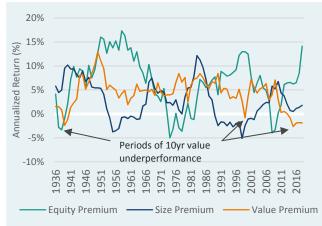
We do not yet see a catalyst for a value comeback, and it is possible that when value bounces back there will not be obvious signals beforehand. Poor recent performance is not always a solid standalone indicator of future reversal. Relative valuations are fairly in line with history, and the economic environment is positive (growth often performs well during later stages of economic cycles). We recommend that value investors stay the course.

# SMALL CAP VS LARGE CAP (YOY)



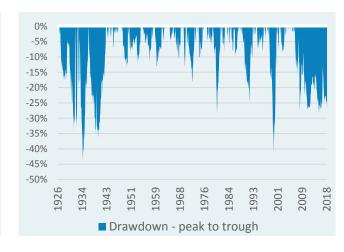
Source: FTSE, as of 6/30/18

# **FACTOR PERFORMANCE (10YR ROLLING)**



Source: Kenneth French Library, as of 5/30/18

**VALUE - PEAK TO TROUGH** 



Source: Kenneth French Library, as of 5/30/18



# International developed equity

Unhedged international equities underperformed U.S. equities during Q1 (MSCI EAFE -1.2% vs. S&P 500 +3.4%). On a hedged basis, international equities delivered returns of 3.9%, outpacing the U.S. market. Currency volatility has frequently been greater than equity market volatility in recent years, causing considerable return disparity for investors with unhedged investments in international assets. Equity returns in most markets have been positive year-to-date on an ex-currency basis.

Earnings growth remains strong and will likely be supportive of equity prices going forward. The U.S. has taken back the lead in year-over-year earnings growth, alongside a large boost from U.S. tax reform and a relatively strong economy.

P/E multiples have moved lower as equity prices remain range bound and earnings grow at a brisk pace. Equity valuations are now closer to the longer-term average – a notable change from recent years.

# **EFFECT OF CURRENCY (1-YEAR ROLLING)**



# **EARNINGS GROWTH (YOY)**



# Source: MSCI, as of 6/30/18 – YoY growth in forward earnings

# FORWARD P/E



Source: MSCI, as of 6/30/18



Source: MSCI, as of 6/30/18

# Emerging market equity

Emerging market equities delivered losses of -8.0% in Q2, but remain up +8.2% on a year-over-year basis. Currency movement caused -4.4% of losses during the quarter.

We maintain an overweight position to equities through a positive tilt to emerging markets. Equity bull runs in these markets through history typically incur at least a 10% drawdown sometime during the rally (see next page). Recent price swings were driven by valuation changes rather than by a fundamental change in earnings.

Developed markets are expected to grow less quickly in the coming years while emerging economic growth is expected to rise. A positive growth premium of emerging economies relative to developed economies has historically acted as a tailwind for EM outperformance.

We believe positive emerging economy growth trends, attractive valuations, a strong earnings environment, and depressed currencies should provide an environment of strong equity performance across these markets.

Conditions remain positive for EM equity

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



Source: Standard & Poor's, MSCI, as of 6/30/18 Sou

### **EM GROWTH PREMIUM**



Source: IMF

# **EARNINGS GROWTH (YOY)**

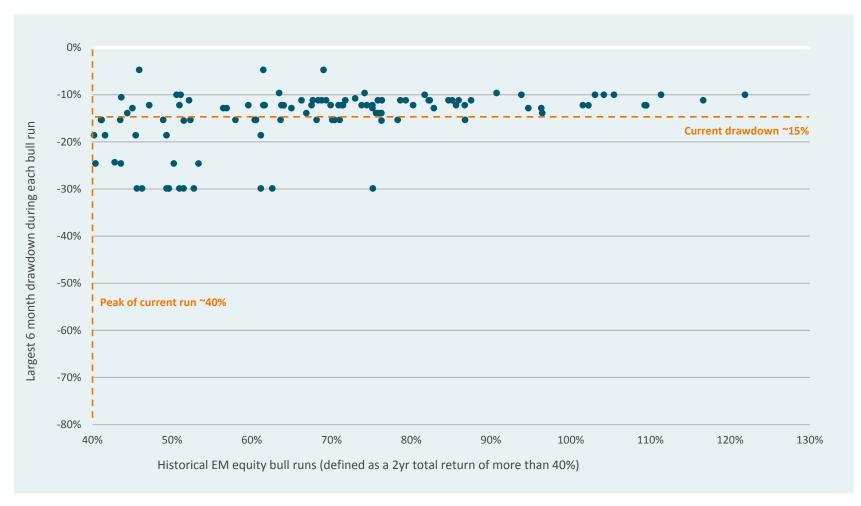


Source: MSCI, as of 6/30/18



# Emerging market volatility

Drawdowns of 10% or more are typical during EM bull runs

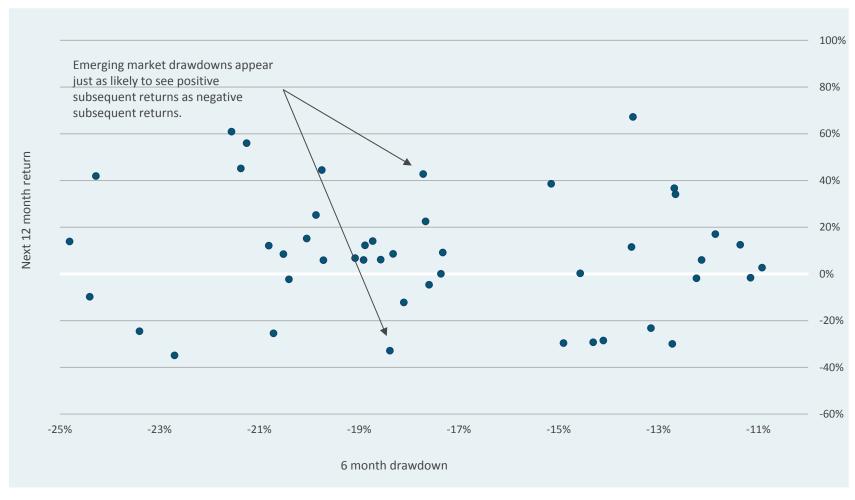


The average drawdown experienced during all 2 year periods of 40%+ returns was -14.8%



# Emerging market volatility

The recent drawdown does not imply heightened risk of further losses







# Equity valuations

Equity valuations have moved lower year-to-date as prices fell and earnings increased at a strong pace. U.S. equity valuations have fallen the most as domestic earnings growth recently took the lead year-over-year against other markets.

The trailing P/E ratio of the S&P 500 is notably high, but as we have seen throughout the expansion more expensive markets may deliver consistent outperformance if fundamentally driven by robust earnings. On a forward P/E basis, the U.S. is now only slightly rich relative to valuations of the past 15 years (16.5 today vs. an average of 15.1). Price is an important component of equity investing, but higher prices may be indicative of

greater future earnings, which suggests investors cannot rely on price alone when forming expectations.

When examining equity markets through our carry, value, trend, and macro lens, carry has improved through lower prices (higher dividend and earnings yields), value has improved through lower equity multiples (range bound prices with rising earnings has pushed multiples downward), trend has flattened on a short-term basis but remains positive on a 12-month basis, and the macro environment has moderated a bit (notable weakness in Europe but strength in the U.S.)

### **FORWARD P/E RATIOS**



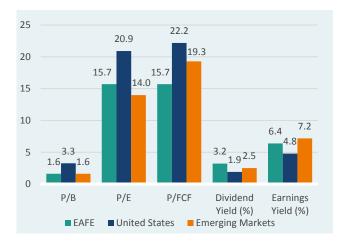
### Source: MSCI, as of 6/30/18

### **MOMENTUM (1YR)**



Source: Standard & Poor's, MSCI, as of 6/30/18

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



Source: Bloomberg, as of 6/30/18 - trailing P/E



# Equity volatility

U.S. equity volatility retreated in the second quarter after a period of elevated risk following the February volatility spike. The VIX Index of implied volatility declined steadily throughout the quarter and averaged 15.3, compared to an average of 17.4 in the first quarter.

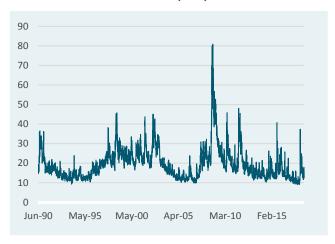
Realized volatility was below average in domestic and international equity markets in the second quarter, despite the concerns over a global trade war. Emerging markets experienced the greatest volatility, although the annualized standard deviation of daily returns in Q2 were

only 13.4% (MSCI Emerging Markets). International developed markets (MSCI EAFE) had a standard deviation of only 9.0%.

The implied volatility curve (i.e. skew), which looks at the differences in implied volatility at various option strike prices, has recently steepened. A steeper volatility curve means that investors are paying a higher premium for equity downside protection.

Equity volatility subsided back to below average levels

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



### **REALIZED 1-YEAR ROLLING VOLATILITY**



Source: Bloomberg, as of 6/30/18

### U.S. IMPLIED VOLATILITY CURVE



Source: Bloomberg, as of 6/30/18



Source: CBOE, as of 6/30/18

# Long-term equity performance





# Other assets



# Currency

The U.S. dollar appreciated 5% during the guarter, which erased the positive equity returns of many international markets. Relative strength of the U.S. economy, paired with Federal Reserve tightening, likely helped lead the U.S. dollar higher.

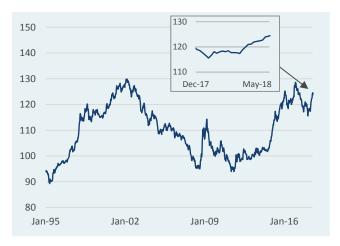
Interest rate differentials between the U.S. and the rest of the developed world have been steadily widening over the past 10 months. The spread between the U.S. 10-year Treasury yield and the yield on a basket of developed sovereign debt rose approximately 80 bps to 2.3% during this

time. Higher relative interest rates has historically been a shortterm driver of currencies.

Emerging market currencies fell 9.1% in Q2, based on the JPM EM Currency Index. The performance of most currencies were in line with expectations based on U.S. dollar appreciation against developed market currencies. Several countries with large current account deficits that are heavily reliant on dollar funding, such as Argentina and Turkey, saw their currencies fall sharply. As a whole, emerging market currencies are significantly undervalued based on purchasing power parity.

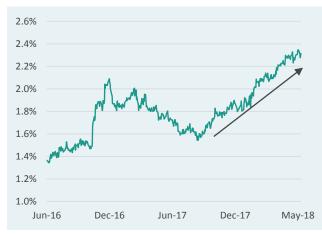
The U.S. dollar materially appreciated, reversing a multi-year downtrend

### U.S. DOLLAR TRADE WEIGHTED INDEX



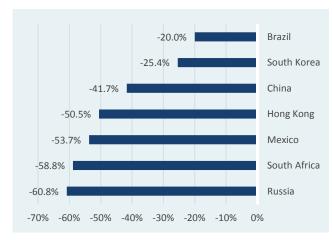
Source: Federal Reserve, as of 6/30/18

### U.S. VS. DEVELOPED INTEREST RATE SPREAD



Source: Verus, Bloomberg, as of 6/30/18

### PURCHASING POWER PARITY VALUATIONS VS. U.S. DOLLAR (BIG MAC INDEX)



Source: Bloomberg, as of 6/30/18

# Alternative beta

Alternative beta strategies have posted losses in Q2 and year-to-date. Equity value exposures accounted for the largest component of strategy losses in Q2 and year-to-date. Short volatility, a strong performing strategy over the past 10 years, also suffered a severe drawdown in Q1 and affected returns.

Correlation characteristics often benefit strategies with diversified factor exposure (some factors provide losses while others provide gains), but several factors including momentum and carry have not counterbalanced losses in value as they have often done historically.

We do not believe that alternative beta strategies are "broken" per se, but instead have reflected coinciding factor drawdowns as well as muted equity market returns more broadly.

Attribution analyses on the Alt Beta strategies we follow confirm that recent performance is in line with 8-12% target volatility levels of each strategy. We are closely monitoring these funds through an environment of heightened volatility and are continuing discussions with managers. These losses are significant but are within the range we would expect, given the underlying factor exposure.

### SHORT VOLATILITY PERFORMANCE



Source: CBOE, HFRI, as of 6/30/18

### **VALUE - PEAK TO TROUGH**



Source: Kenneth French Library, Verus, as of May 2018 – shows value factor peak to trough drawdowns through time



# Appendix



# Periodic table of returns

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	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	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	9.7	16.4	11.8
Small Cap Equity	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	7.7	13.6	11.2
Large Cap Growth	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	7.3	13.4	10.6
Small Cap Value	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	5.4	12.5	10.2
Large Cap Equity	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	2.9	11.2	9.9
Real Estate	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	1.7	10.3	8.5
Hedge Funds of Funds	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	1.2	10.0	6.1
Cash	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	0.8	6.4	4.8
Commodities	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	0.0	6.3	3.7
60/40 Global Portfolio	-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	-0.8	5.0	2.8
US Bonds	-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	5.1	-1.6	3.6	2.3
Large Cap Value	-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	-1.7	2.3	1.5
International Equity	-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	-2.7	0.4	0.4
Emerging Markets Equity	-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	-6.7	-6.4	-9.0



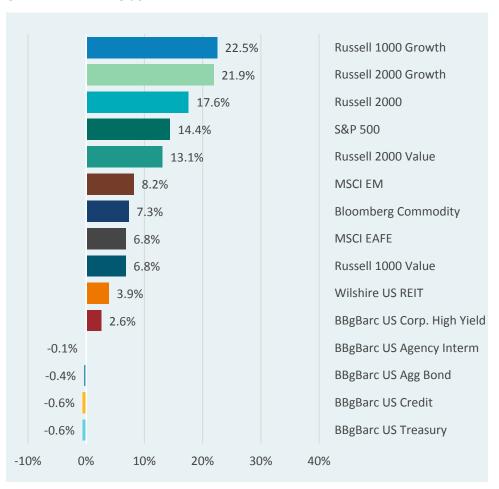


Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 3/31/18.

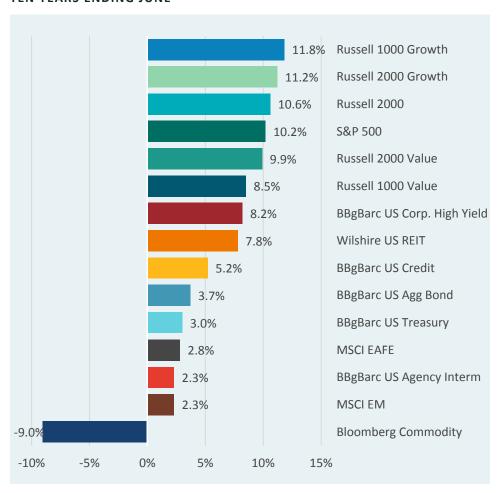


# Major asset class returns

### ONE YEAR ENDING JUNE



### TEN YEARS ENDING JUNE

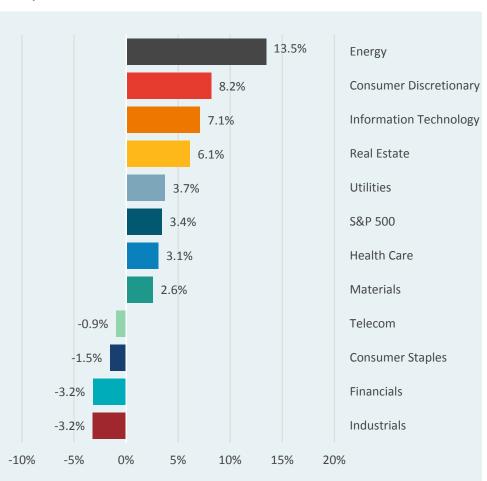


Source: Morningstar, as of 6/30/18

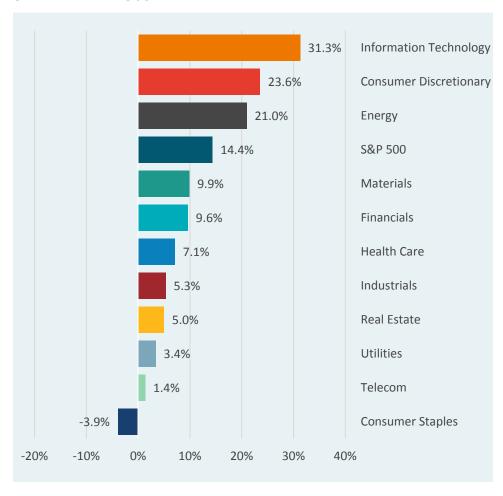


# S&P 500 sector returns

# 2<sup>ND</sup> QUARTER



### ONE YEAR ENDING JUNE



Source: Morningstar, as of 6/30/18



# Detailed index returns

DOMESTIC	EQUITY
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### FIXED INCOME

•	June	Q2	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	0.6	3.4	2.6	14.4	11.9	13.4	10.2
S&P 500 Equal Weighted	0.9	2.8	1.8	12.0	10.5	12.8	11.6
DJ Industrial Average	(0.5)	1.3	(0.7)	16.3	14.1	13.0	10.8
Russell Top 200	0.6	3.9	3.1	15.4	12.5	13.8	10.2
Russell 1000	0.6	3.6	2.9	14.5	11.6	13.4	10.2
Russell 2000	0.7	7.8	7.7	17.6	11.0	12.5	10.6
Russell 3000	0.7	3.9	3.2	14.8	11.6	13.3	10.2
Russell Mid Cap	0.7	2.8	2.3	12.3	9.6	12.2	10.2
Style Index							
Russell 1000 Growth	1.0	5.8	7.3	22.5	15.0	16.4	11.8
Russell 1000 Value	0.2	1.2	(1.7)	6.8	8.3	10.3	8.5
Russell 2000 Growth	0.8	7.2	9.7	21.9	10.6	13.6	11.2
Russell 2000 Value	0.6	8.3	5.4	13.1	11.2	11.2	9.9

	June	Q2	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
BBgBarc US TIPS	0.4	0.8	(0.0)	2.1	1.9	1.7	3.0
BBgBarc US Treasury Bills	0.2	0.5	0.8	1.3	0.7	0.4	0.4
BBgBarc US Agg Bond	(0.1)	(0.2)	(1.6)	(0.4)	1.7	2.3	3.7
Duration							
BBgBarc US Treasury 1-3 Yr	0.0	0.2	0.1	0.0	0.4	0.6	1.3
BBgBarc US Treasury Long	0.2	0.3	(3.0)	(0.1)	3.4	4.5	6.1
BBgBarc US Treasury	0.0	0.1	(1.1)	(0.6)	1.0	1.5	3.0
Issuer							
BBgBarc US MBS	0.0	0.2	(1.0)	0.1	1.5	2.3	3.5
BBgBarc US Corp. High Yield	0.4	1.0	0.2	2.6	5.5	5.5	8.2
BBgBarc US Agency Interm	0.0	0.2	(0.2)	(0.1)	0.8	1.1	2.3
BBgBarc US Credit	(0.5)	(0.9)	(3.0)	(0.6)	2.9	3.4	5.2

INTERNATIONAL EQUITY							
Broad Index							
MSCI ACWI	(0.5)	0.5	(0.4)	10.7	8.2	9.4	5.8
MSCI ACWI ex US	(1.9)	(2.6)	(3.8)	7.3	5.1	6.0	2.5
MSCI EAFE	(1.2)	(1.2)	(2.7)	6.8	4.9	6.4	2.8
MSCI EM	(4.2)	(8.0)	(6.7)	8.2	5.6	5.0	2.3
MSCI EAFE Small Cap	(1.9)	(1.6)	(1.3)	12.4	10.1	11.3	6.8
Style Index							
MSCI EAFE Growth	(1.2)	0.1	(0.9)	9.4	6.4	7.4	3.5
MSCI EAFE Value	(1.3)	(2.6)	(4.6)	4.3	3.3	5.4	2.2
Regional Index							
MSCI UK	(1.0)	2.9	(1.0)	10.0	3.1	4.9	2.7
MSCI Japan	(2.5)	(2.8)	(2.0)	10.5	6.2	7.4	3.5
MSCI Euro	(0.7)	(2.8)	(3.2)	5.0	5.3	7.1	1.1
MSCI EM Asia	(4.7)	(5.8)	(5.1)	10.1	7.3	8.3	5.6
MSCI EM Latin American	(3.1)	(17.8)	(11.2)	(0.2)	2.0	(2.4)	(3.7)

OTHER							
Index							
Bloomberg Commodity	(3.5)	0.4	(0.0)	7.3	(4.5)	(6.4)	(9.0)
Wilshire US REIT	4.5	9.7	1.5	3.9	7.8	8.4	7.8
CS Leveraged Loans	0.2	1.0	2.3	4.5	4.2	4.1	5.0
Alerian MLP	(1.5)	11.8	(0.6)	(4.6)	(5.9)	(4.1)	6.5
Regional Index							
JPM EMBI Global Div	(1.2)	(3.5)	(5.2)	(1.6)	4.6	5.1	6.7
JPM GBI-EM Global Div	(2.9)	(10.4)	(6.4)	(2.3)	2.0	(1.4)	2.6
Hedge Funds							
HFRI Composite	(0.1)	0.8	1.2	5.2	2.6	4.2	3.5
HFRI FOF Composite	(0.2)	0.9	1.2	5.6	2.1	3.6	1.5
Currency (Spot)							
Euro	0.0	(5.1)	(2.8)	2.4	1.6	(2.1)	(3.0)
Pound	(0.8)	(5.9)	(2.4)	1.6	(5.7)	(2.7)	(4.0)
Yen	(1.9)	(4.0)	1.7	1.4	(3.4)	(2.2)	(0.3)



# **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. (<a href="https://www.langerresearch.com">www.langerresearch.com</a>)

**University of Michigan Consumer Sentiment Index** - A survey of consumer attitudes concerning both the present situation as well as expectations regarding economic 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)

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/)

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# **Imperial County Employees' Retirement System**

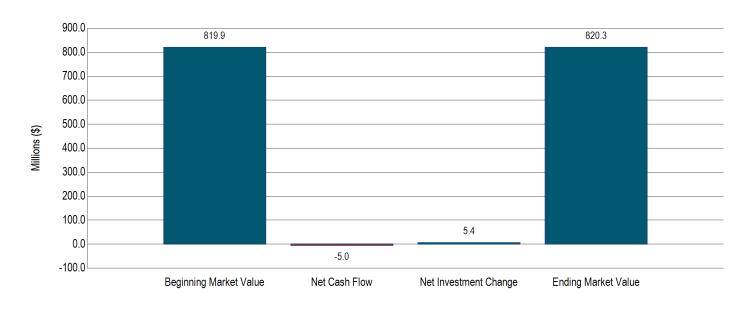
**Investment Performance Review Period Ending: June 30, 2018** 



# **Portfolio Reconciliation**

	Last Three Months	Fiscal Year-To-Date	One Year
Beginning Market Value	\$819,861,910	\$768,928,009	\$768,928,009
Net Cash Flow	-\$4,960,419	-\$9,828,980	-\$9,828,980
Net Investment Change	\$5,367,182	\$61,169,645	\$61,169,645
Ending Market Value	\$820,268,673	\$820,268,673	\$820,268,673

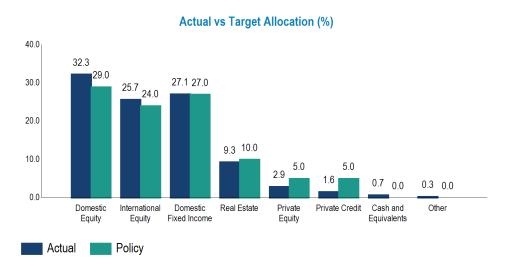
# Change in Market Value Last Three Months



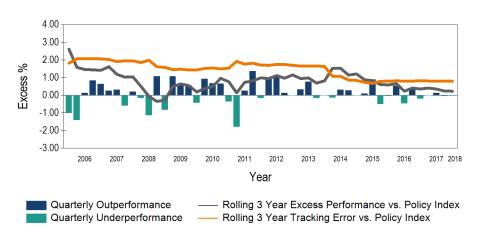
Contributions and withdrawals may include intra-account transfers between managers/funds. Fee transactions are excluded from Portfolio Reconciliation.



	QTD	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	0.7	0.4	8.0	8.0	7.0	7.8	6.8
Total Fund ex Parametric	0.7	0.4	8.0	8.0	7.0	7.9	6.8
Policy Index	0.7	0.5	8.0	8.0	6.7	7.4	6.2
InvestorForce Public DB Gross Rank	65	63	51	51	44	51	35
Total Domestic Equity	3.9	3.2	14.8	14.8	11.5	12.9	10.3
Russell 3000	3.9	3.2	14.8	14.8	11.6	13.3	10.2
InvestorForce Public DB US Eq Gross Rank	40	54	45	45	40	58	44
Total International Equity	-3.3	-3.5	7.2	7.2	6.1	6.7	3.2
MSCI ACWI ex USA Gross	-2.4	-3.4	7.8	7.8	5.6	6.5	3.0
InvestorForce Public DB ex-US Eq Gross Rank	61	57	62	62	50	58	64
Total Fixed Income	-0.1	-1.2	0.6	0.6	2.6	3.0	5.3
BBgBarc US Aggregate TR	-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7
InvestorForce Public DB Total Fix Inc Gross Rank	51	70	53	53	49	32	31
Total Real Estate	2.1	4.1	7.2	7.2	8.4	10.7	4.5
NCREIF Property Index	1.7	3.4	7.1	7.1	8.2	9.7	6.2
NCREIF-ODCE	2.0	4.3	8.4	8.4	9.4	11.0	5.3
Total Private Equity	3.0	9.8	20.1	20.1	16.4	18.6	
Russell 3000 +3% Lagged	0.1	7.2	17.2	17.2	13.5	16.4	
Total Opportunistic	20.4	24.4	28.0	28.0	11.9	14.3	17.1
Assumption Rate + 1%	2.0	4.0	8.3	8.3	8.4	8.6	8.8



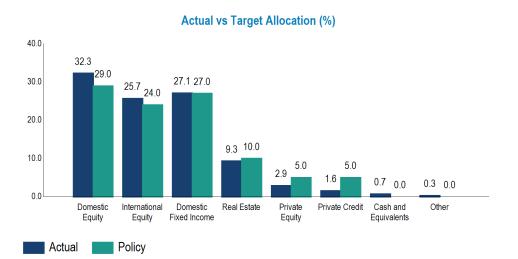
# Rolling Annualized Excess Performance and Tracking Error Total Fund vs. Policy Index



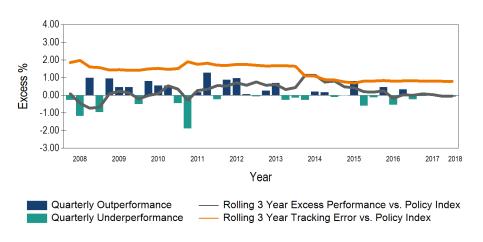
New Policy Index (as of 10/1/2016): 29% Russell 3000, 24% MSCI ACWI Free Ex US, 27% BBgBarc US Aggregate, 5% NCREIF Property, 5% NCREIF Property +2%, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior Policy Index (7/1/2014 to 9/30/2016): 29% Russell 3000, 25% MSCI ACWI Free Ex US, 30% BBgBarc Aggregate, 6% NCREIF Property, 5% Bloomberg Commodity Index, 5% Russell 3000 +3%. (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.



	QTD	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	0.6	0.3	7.8	7.8	6.7	7.5	6.4
Total Fund ex Parametric	0.6	0.3	7.8	7.8	6.7	7.5	6.4
Policy Index	0.7	0.5	8.0	8.0	6.7	7.4	6.2
Total Domestic Equity	3.9	3.2	14.8	14.8	11.4	12.8	10.1
Russell 3000	3.9	3.2	14.8	14.8	11.6	13.3	10.2
Total International Equity	-3.3	-3.6	6.9	6.9	5.7	6.3	2.7
MSCI ACWI ex USA Gross	-2.4	-3.4	7.8	7.8	5.6	6.5	3.0
Total Fixed Income	-0.2	-1.3	0.3	0.3	2.3	2.7	5.0
BBgBarc US Aggregate TR	-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7
Total Real Estate	2.1	4.1	7.2	7.2	7.8	9.9	3.9
NCREIF Property Index	1.7	3.4	7.1	7.1	8.2	9.7	6.2
NCREIF-ODCE	2.0	4.3	8.4	8.4	9.4	11.0	5.3
Total Private Equity	3.0	9.8	20.1	20.1	15.5	16.4	
Russell 3000 +3% Lagged	0.1	7.2	17.2	17.2	13.5	16.4	
Total Opportunistic	20.4	24.4	28.0	28.0	10.9	13.0	15.5
Assumption Rate + 1%	2.0	4.0	8.3	8.3	8.4	8.6	8.8



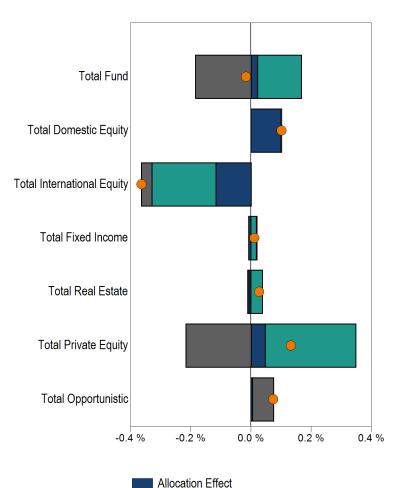
Rolling Annualized Excess Performance and Tracking Error
Total Fund vs. Policy Index



New Policy Index (as of 10/1/2016): 29% Russell 3000, 24% MSCI ACWI Free Ex US, 27% BBgBarc US Aggregate, 5% NCREIF Property, 5% NCREIF Property +2%, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior Policy Index (7/1/2014 to 9/30/2016): 29% Russell 3000, 25% MSCI ACWI Free Ex US, 30% BBgBarc Aggregate, 6% NCREIF Property, 5% Bloomberg Commodity Index, 5% Russell 3000 +3%. (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.



### **Attribution Effects**



Selection Effect
Interaction Effects
Total Effect

# **Performance Attribution**

	Quarter	YTD
Wtd. Actual Return	0.66%	0.41%
Wtd. Index Return *	0.68%	0.47%
Excess Return	-0.02%	-0.06%
Selection Effect	0.14%	0.72%
Allocation Effect	0.02%	-0.44%
Interaction Effect	-0.18%	-0.33%

<sup>\*</sup>Calculated from benchmark returns and weightings of each component.

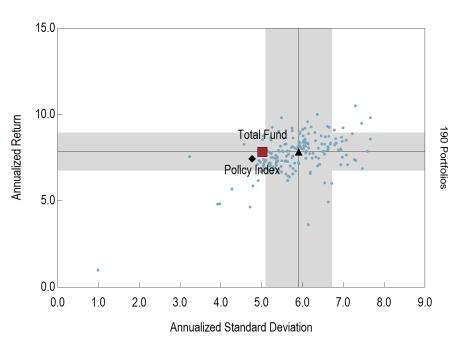
# Attribution Summary Last Three Months

	Wtd. Actual	Wtd. Index	Excess	Selection	Allocation	Interaction	Total
	Return	Return	Return	Effect	Effect	Effects	Effects
Total Domestic Equity	3.9%	3.9%	0.0%	0.0%	0.1%	0.0%	0.1%
Total International Equity	-3.3%	-2.4%	-0.9%	-0.2%	-0.1%	0.0%	-0.4%
Total Fixed Income	-0.1%	-0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
Total Real Estate	2.1%	1.7%	0.4%	0.0%	0.0%	0.0%	0.0%
Total Private Equity	3.0%	-0.1%	3.1%	0.3%	0.0%	-0.2%	0.1%
Total Opportunistic	20.4%	2.0%	18.4%	0.0%	0.0%	0.1%	0.1%
Total	0.7%	0.7%	0.0%	0.1%	0.0%	-0.2%	0.0%

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

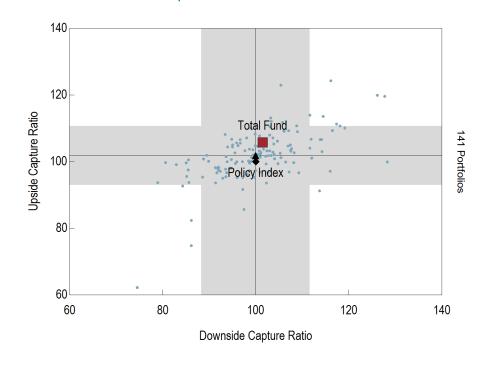
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Total Fund	7.83%	0.41%	5.02%	0.08%	1.04	0.72%	0.98	1.48	0.56	105.77%	101.47%

### Risk vs. Return



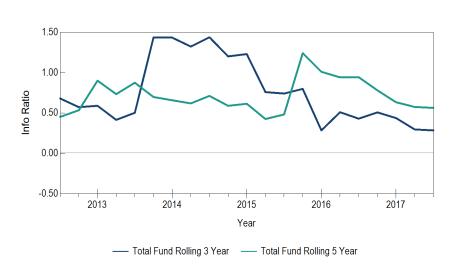
- Total Fund
- Policy Index
- Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

# **Up Markets vs. Down Markets**

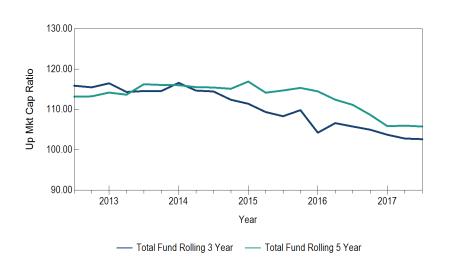


- Total Fund
- Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

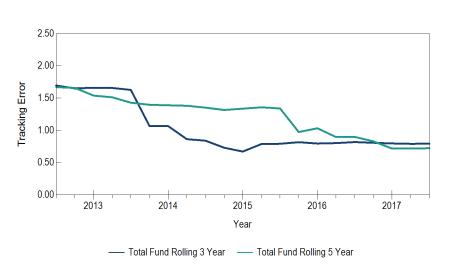
# **Rolling Information Ratio**



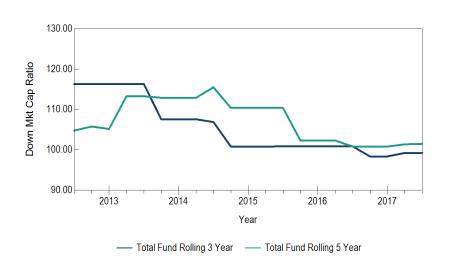
### Rolling Up Market Capture Ratio (%)



# **Rolling Tracking Error**



# Rolling Down Market Capture Ratio (%)



	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013	Inception I	nception Date
Total Fund	820,268,673	100.0	0.7	0.4	8.0	8.0	7.0	7.8	6.8	16.2	7.8	0.0	4.8	14.8	9.3	Mar-89
Policy Index			0.7	0.5	8.0	8.0	6.7	7.4	6.2	15.9	8.3	-1.2	4.9	13.5	-	Mar-89
InvestorForce Public DB Gross Rank			65	63	51	51	44	51	35	30	49	53	74	59	7	Mar-89
Total Fund ex Parametric			0.7	0.4	8.0	8.0	7.0	7.9	6.8	16.2	7.8	0.0	4.9	14.7	9.3	Mar-89
Policy Index			0.7	0.5	8.0	8.0	6.7	7.4	6.2	15.9	8.3	-1.2	4.9	13.5		Mar-89
InvestorForce Public DB Gross Rank			65	63	51	51	44	50	36	30	49	53	72	59	7	Mar-89
Total Domestic Equity	264,717,808	32.3	3.9	3.2	14.8	14.8	11.5	12.9	10.3	21.2	12.9	0.3	10.2	33.9		
Russell 3000			3.9	3.2	14.8	14.8	11.6	13.3	10.2	21.1	12.7	0.5	12.6	33.6		
InvestorForce Public DB US Eq Gross Rank			40	54	45	45	40	58	44	35	51	44	73	64		
BlackRock Russell 3000	264,717,808	32.3	3.9	3.2	14.8	14.8				21.2	12.9				13.7	Dec-15
Russell 3000			3.9	3.2	14.8	14.8				21.1	12.7				13.3	Dec-15
eV US All Cap Core Equity Gross Rank			34	38	40	40				49	35				45	Dec-15
Total International Equity	210,691,397	25.7	-3.3	-3.5	7.2	7.2	6.1	6.7	3.2	28.3	4.7	-3.5	-4.4	14.0		
MSCI ACWI ex USA Gross			-2.4	-3.4	7.8	7.8	5.6	6.5	3.0	27.8	5.0	-5.3	-3.4	15.8		
InvestorForce Public DB ex-US Eq Gross Rank			61	57	62	62	50	58	64	59	40	57	74	83		
BlackRock International Equity	144,408,890	17.6	-0.8	-2.4	7.3	7.3	5.3	6.8	3.2	25.5	1.5	-0.5	-4.7	23.2	7.6	Jul-03
MSCI EAFE Gross			-1.0	-2.4	7.4	7.4	5.4	6.9	3.3	25.6	1.5	-0.4	-4.5	23.3	7.7	Jul-03
eV All EAFE Equity Gross Rank			37	53	60	60	70	75	82	65	47	67	64	61	74	Jul-03
DFA Emerging Markets Value	31,138,055	3.8	-9.1	-6.9	6.3	6.3	6.6	5.2	2.7	34.5	20.5	-18.3	-3.9	-3.2	4.7	Jan-07
MSCI Emerging Markets Gross			-7.9	-6.5	8.6	8.6	6.0	5.4	2.6	37.8	11.6	-14.6	-1.8	-2.3	4.2	Jan-07
eV Emg Mkts Equity Gross Rank			71	55	65	65	52	67	78	70	7	92	84	84	64	Jan-07
Harding Loevner Emerging Markets	35,144,452	4.3	-7.7	-4.7	7.9	7.9				35.0					13.3	Jul-16
MSCI Emerging Markets Gross			-7.9	-6.5	8.6	8.6				37.8					13.9	Jul-16
eV Emg Mkts Equity Gross Rank			36	20	51	51				68					43	Jul-16
Total Fixed Income	222,550,750	27.1	-0.1	-1.2	0.6	0.6	2.6	3.0	5.3	4.6	5.1	-0.3	5.9	-1.7		
BBgBarc US Aggregate TR			-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0		
InvestorForce Public DB Total Fix Inc Gross Rank			51	70	53	53	49	32	31	59	41	55	15	69		
Tortoise Capital	111,472,737	13.6	-0.2	-1.1	0.6	0.6	3.0	3.7	5.9	4.5	5.1	1.2	7.0	-0.4	6.4	Dec-92
BBgBarc US Aggregate TR			-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0	5.3	Dec-92
eV US Core Plus Fixed Inc Gross Rank			51	22	33	33	27	20	16	70	45	15	16	52	36	Dec-92
MacKay Shields Core Plus Opportunities	89,398,519	10.9	-0.2	-1.6	0.1	0.1	2.2			4.9	5.1				1.5	Mar-15
BBgBarc US Aggregate TR			-0.2	-1.6	-0.4	-0.4	1.7		-	3.5	2.6				1.2	Mar-15
eV US Core Plus Fixed Inc Gross Rank			48	67	67	67	79			54	46				82	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: June 30, 2018

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013	Inception I	nception Date
BlackRock US TIPS	21,679,493	2.6	0.8	0.1	2.3	2.3	2.1	1.8	3.2	3.2	4.8	-1.2	3.6	-8.5	4.1	Apr-07
BBgBarc US TIPS TR			0.8	0.0	2.1	2.1	1.9	1.7	3.0	3.0	4.7	-1.4	3.6	-8.6	3.9	Apr-07
eV US TIPS / Inflation Fixed Inc Gross Rank			23	54	39	39	33	35	49	46	37	43	45	62	64	Apr-07
Total Real Estate	76,495,528	9.3	2.1	4.1	7.2	7.2	8.4	10.7	4.5	5.8	7.5	16.1	13.0	12.6		
NCREIF Property Index			1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0		
NCREIF-ODCE			2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9		
ASB Real Estate	34,098,127	4.2	1.8	3.6	6.0	6.0	7.2	10.4		4.0	5.6	17.3	13.5	13.7	10.4	Dec-12
NCREIF Property Index			1.7	3.4	7.1	7.1	8.2	9.7		7.0	8.0	13.3	11.8	11.0	9.9	Dec-12
NCREIF-ODCE			2.0	4.3	8.4	8.4	9.4	11.0		7.6	8.8	15.0	12.5	13.9	11.3	Dec-12
Clarion Lion	34,638,781	4.2	2.4	4.8	8.6	8.6	9.6	11.4	4.0	7.9	9.1	15.7	13.2	12.8	5.2	Dec-06
NCREIF Property Index			1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0	6.9	Dec-06
NCREIF-ODCE			2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9	6.1	Dec-06
ARA American Strategic Value Realty	6,044,035	0.7	2.9												5.1	Jan-18
NCREIF Property Index			1.7												3.4	Jan-18
NCREIF-ODCE			2.0												4.3	Jan-18
1221 State St. Corp	1,714,584	0.2	0.0	0.0	0.0	0.0	5.5	3.3	1.2	0.0	17.5	0.0	0.0	0.0	1.3	Sep-08
Total Cash																
Cash Account	6,004,136	0.7	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
91 Day T-Bills			0.5	0.8	1.4	1.4	0.7	0.4		0.9	0.3	0.0	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: June 30, 2018

	Market Value	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013	Inception I	nception Date
Total Fund	820,268,673	100.0	0.6	0.3	7.8	7.8	6.7	7.5	6.4	16.0	7.4	-0.4	4.4	14.5	8.9	Mar-89
Policy Index			0.7	0.5	8.0	8.0	6.7	7.4	6.2	15.9	8.3	-1.2	4.9	13.5		Mar-89
Total Fund ex Parametric			0.6	0.3	7.8	7.8	6.7	7.5	6.4	16.0	7.5	-0.4	4.4	14.4	8.9	Mar-89
Policy Index			0.7	0.5	8.0	8.0	6.7	7.4	6.2	15.9	8.3	-1.2	4.9	13.5		Mar-89
Total Domestic Equity	264,717,808	32.3	3.9	3.2	14.8	14.8	11.4	12.8	10.1	21.2	12.8	0.1	10.0	33.6		
Russell 3000			3.9	3.2	14.8	14.8	11.6	13.3	10.2	21.1	12.7	0.5	12.6	33.6		
BlackRock Russell 3000	264,717,808	32.3	3.9	3.2	14.8	14.8				21.2	12.8				13.7	Dec-15
Russell 3000			3.9	3.2	14.8	14.8				21.1	12.7				13.3	Dec-15
Total International Equity	210,691,397	25.7	-3.3	-3.6	6.9	6.9	5.7	6.3	2.7	27.9	4.4	-4.0	-4.9	13.4		
MSCI ACWI ex USA Gross			-2.4	-3.4	7.8	7.8	5.6	6.5	3.0	27.8	5.0	-5.3	-3.4	15.8		
BlackRock International Equity	144,408,890	17.6	-0.9	-2.5	7.2	7.2	5.2	6.7	3.1	25.4	1.3	-0.6	-4.8	22.9	7.5	Jul-03
MSCI EAFE Gross			-1.0	-2.4	7.4	7.4	5.4	6.9	3.3	25.6	1.5	-0.4	-4.5	23.3	7.7	Jul-03
DFA Emerging Markets Value	31,138,055	3.8	-9.2	-7.2	5.7	5.7	6.0	4.6	2.1	33.8	19.8	-18.8	-4.4	-3.8	4.1	Jan-07
MSCI Emerging Markets Gross			-7.9	-6.5	8.6	8.6	6.0	5.4	2.6	37.8	11.6	-14.6	-1.8	-2.3	4.2	Jan-07
Harding Loevner Emerging Markets	35,144,452	4.3	-7.9	-5.2	6.8	6.8				33.6					12.1	Jul-16
MSCI Emerging Markets Gross			-7.9	-6.5	8.6	8.6				37.8					13.9	Jul-16
Total Fixed Income	222,550,750	27.1	-0.2	-1.3	0.3	0.3	2.3	2.7	5.0	4.3	4.8	-0.6	5.6	-2.0		
BBgBarc US Aggregate TR			-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0		
Tortoise Capital	111,472,737	13.6	-0.3	-1.2	0.3	0.3	2.7	3.4	5.6	4.3	4.8	0.9	6.7	-0.8	6.1	Dec-92
BBgBarc US Aggregate TR			-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0	5.3	Dec-92
MacKay Shields Core Plus Opportunities	89,398,519	10.9	-0.3	-1.8	-0.2	-0.2	1.8			4.5	4.7				1.1	Mar-15
BBgBarc US Aggregate TR			-0.2	-1.6	-0.4	-0.4	1.7			3.5	2.6				1.2	Mar-15
BlackRock US TIPS	21,679,493	2.6	0.8	0.0	2.2	2.2	2.0	1.8	3.1	3.2	4.8	-1.3	3.6	-8.6	4.0	Apr-07
BBgBarc US TIPS TR			0.8	0.0	2.1	2.1	1.9	1.7	3.0	3.0	4.7	-1.4	3.6	-8.6	3.9	Apr-07

# Total Fund Performance Summary (Net of Fees)

# Period Ending: June 30, 2018

	Market Value F	% of Portfolio	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013	Inception I	nception Date
Total Real Estate	76,495,528	9.3	2.1	4.1	7.2	7.2	7.8	9.9	3.9	5.8	6.5	15.0	11.6	12.1		
NCREIF Property Index			1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0		
NCREIF-ODCE			2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9		
ASB Real Estate	34,098,127	4.2	1.8	3.6	6.0	6.0	6.7	9.7		4.0	4.6	16.2	12.5	12.5	9.6	Dec-12
NCREIF Property Index			1.7	3.4	7.1	7.1	8.2	9.7		7.0	8.0	13.3	11.8	11.0	9.9	Dec-12
NCREIF-ODCE			2.0	4.3	8.4	8.4	9.4	11.0		7.6	8.8	15.0	12.5	13.9	11.3	Dec-12
Clarion Lion	34,638,781	4.2	2.4	4.8	8.6	8.6	9.0	10.6	3.2	7.9	8.0	14.6	12.2	11.8	4.4	Dec-06
NCREIF Property Index			1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0	6.9	Dec-06
NCREIF-ODCE			2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9	6.1	Dec-06
ARA American Strategic Value Realty	6,044,035	0.7	2.9												5.1	Jan-18
NCREIF Property Index			1.7												3.4	Jan-18
NCREIF-ODCE			2.0												4.3	Jan-18
1221 State St. Corp	1,714,584	0.2	0.0	0.0	0.0	0.0	5.5	3.3	1.2	0.0	17.5	0.0	0.0	0.0	1.3	Sep-08
Total Cash																
Cash Account	6,004,136	0.7	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
91 Day T-Bills			0.5	0.8	1.4	1.4	0.7	0.4		0.9	0.3	0.0	0.0	0.0		

Performance Anal	ysis - $3\epsilon$	$\&~5~{ m Years}$ (	(Net of Fees)

				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 International Equity	5.23%	-0.18%	10.45%	-0.18%	1.00	0.14%	1.00	0.44	-1.32	99.16%	101.40%
DFA Emerging Markets Value	5.99%	0.00%	18.05%	-0.28%	1.05	4.42%	0.94	0.30	0.00	99.96%	99.94%
Tortoise Capital	2.73%	1.01%	3.16%	1.10%	0.95	0.82%	0.93	0.66	1.23	119.98%	80.62%
MacKay Shields Core Plus Opportunities	1.84%	0.12%	3.36%	0.25%	0.93	1.59%	0.78	0.34	0.08	103.42%	99.39%
BlackRock US TIPS	2.03%	0.10%	3.49%	0.11%	1.00	0.07%	1.00	0.40	1.54	101.81%	97.93%
ASB Real Estate	6.74%	-1.48%	2.65%	-8.99%	1.91	2.04%	0.53	2.30	-0.72	80.82%	
Clarion Lion	9.05%	0.83%	1.23%	1.84%	0.88	0.87%	0.51	6.82	0.95	111.00%	

				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	6.69%	-0.24%	10.44%	-0.23%	1.00	0.11%	1.00	0.60	-2.10	98.48%	101.29%
DFA Emerging Markets Value	4.56%	-0.82%	15.00%	-1.19%	1.07	3.78%	0.94	0.28	-0.22	98.87%	106.70%
Tortoise Capital	3.44%	1.17%	3.05%	1.18%	1.00	0.89%	0.92	1.00	1.32	121.85%	71.25%
BlackRock US TIPS	1.76%	0.08%	3.66%	0.07%	1.00	0.09%	1.00	0.37	0.89	102.30%	99.88%
ASB Real Estate	9.65%	-0.10%	2.93%	-6.43%	1.65	2.22%	0.50	3.16	-0.04	98.81%	
Clarion Lion	10.62%	0.87%	1.73%	1.15%	0.97	1.23%	0.50	5.91	0.71	110.80%	

Vintage	Manager & Fund Name	Estimated 6/30 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
2011	HarbourVest IX-Buyout	\$6,754,443	\$10,000,000	\$7,073,699	71%	\$2,926,301	\$3,926,069	\$6,923,377	55.5%	151.0%	17.4%	3/31/18
2011	HarbourVest IX-Credit	\$1,205,017	\$2,000,000	\$1,304,466	65%	\$695,534	\$652,922	\$1,172,110	50.1%	142.4%	14.9%	3/31/18
2008	HarbourVest Int'l VI <sup>6</sup>	\$3,096,311	\$3,712,930	\$2,605,981	70%	\$1,106,949	\$1,422,664	\$3,094,652	54.6%	173.4%	14.3%	3/31/18
2011	HarbourVest IX-Venture	\$4,173,586	\$4,000,000	\$3,608,566	90%	\$391,434	\$1,352,226	\$3,969,615	37.5%	153.1%	15.8%	3/31/18
2017	HarbourVest 2017 Global	\$8,834,467	\$30,000,000	\$8,190,920	27%	\$21,809,080	\$0	\$0	0.0%	107.9%	N/A	N/A
2010	KKR Mezzanine <sup>7</sup>	\$2,160,072	\$10,000,000	\$10,000,000	100%	\$0	\$13,118,471	\$2,641,312	131.2%	152.8%	8.6%	3/31/18
2011	PIMCO BRAVO <sup>4</sup>	\$502,605	\$10,000,000	\$10,000,000	100%	\$0	\$17,970,057	\$372,374	179.7%	184.7%	22.4%	3/31/18
2017	Portfolio Advisors	\$13,082,554	\$45,000,000	\$12,868,246	29%	\$32,131,754	\$0	\$0	0.0%	101.7%	N/A	N/A
	Total Alternative Illiquids % of Portfolio (Market Value)	\$39,809,054 4.9%	\$114,712,930	\$55,651,878	49%	\$59,061,052	\$38,442,409	\$18,173,439  Management	32.7% Admin	101.7%	Other	Total
	76 OF FOILIOID (Market Value)	4.5 /0						Fee	Fee	Expense	Expense	Expense <sup>8</sup>
								100	1 00	Expense	Ехрепос	Ехрепос
						HarbourVest I	X-Buyout	\$24,920	\$0	\$0	\$9,104	\$34,024
						HarbourVest I	X-Credit	\$4,972	\$0	\$0	\$1,513	\$6,485
						HarbourVest I	nt'l VI	\$8,277	\$0	\$0	\$7	\$8,285
						HarbourVest I	X-Venture	\$9,974	\$0	\$0	\$1,632	\$11,606
						HarbourVest 2	017 Global	\$33,750	\$0	\$0	\$29,280	\$63,030
						KKR Mezzanir	ne	\$12,147	\$0	\$0	\$0	\$12,147
						PIMCO BRAV	0	\$1,663	\$367	\$1	\$1,208	\$3,239

Portfolio Advisors



\$15,754

\$111,457

\$0

\$367

\$0

\$15,754

\$42,744 **\$154,570** 

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

<sup>&</sup>lt;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 3/31/18)

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

<sup>&</sup>lt;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>&</sup>lt;sup>6</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>7</sup>KKR: Total capital called is \$11,796,786, which includes recycled distributions. Unused capital commitment is \$976,501 after including distribution proceeds available for reinvestment

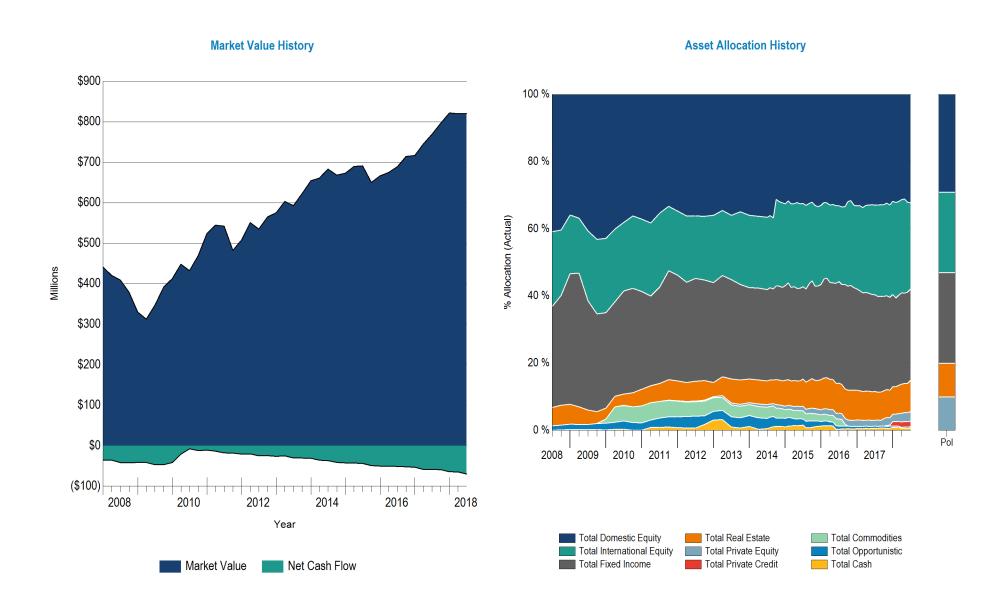
<sup>&</sup>lt;sup>8</sup>All fees and expenses are for 1Q 2018

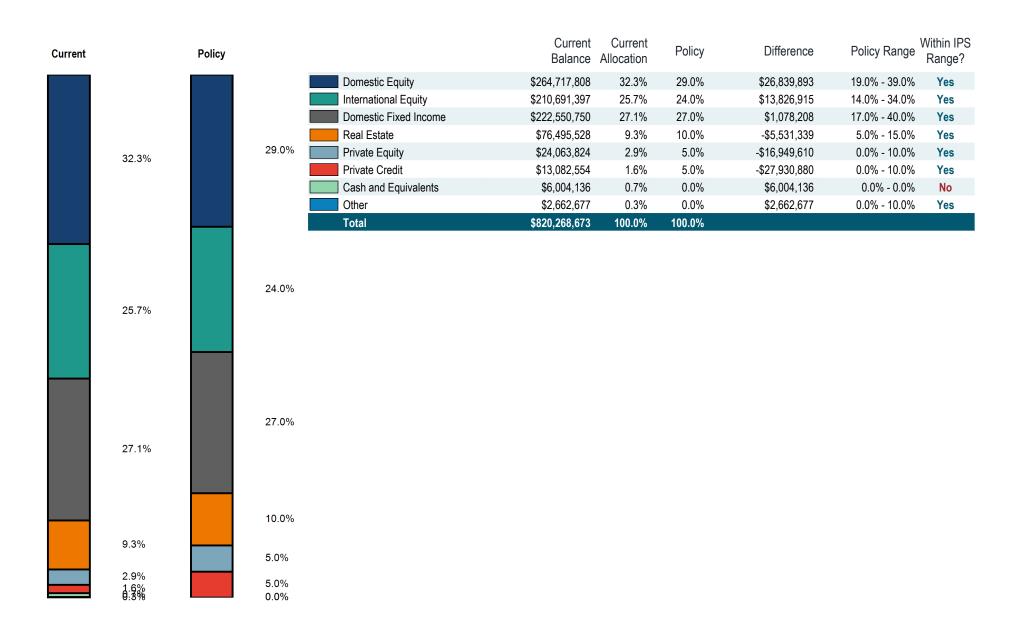
_Manager	Beginning Market Value	Contributions	Disbursements	Fees <sup>2</sup>	Net Cash Flow	Investment Income	Capital Gain/ Loss	Total Gains/Earnings/ Losses	Ending Market Value
Blackrock Russell 3000 Index	\$257,143,281	\$0	(\$2,362,500)	\$0	(\$2,362,500)	\$0	\$9,937,026	\$9,937,026	\$264,717,808
DFA Emerging Markets	\$34,296,988	\$0	\$0	\$0	\$0	\$0	(\$3,158,933)	(\$3,158,933)	\$31,138,055
Harding Loevner Emerging Markets	\$38,068,425	\$0	\$0	\$0	\$0	\$0	(\$2,923,973)	(\$2,923,973)	\$35,144,452
Blackrock International Equity	\$154,823,237	\$0	(\$9,344,387)	\$0	(\$9,344,387)	\$0	(\$1,069,960)	(\$1,069,960)	\$144,408,890
Tortoise Capital	\$111,689,198	\$0	\$0	\$0	\$0	\$0	(\$216,461)	(\$216,461)	\$111,472,737
MacKay Shields Core Plus Opp.	\$89,637,076	\$0	\$0	\$0	\$0	\$0	(\$238,557)	(\$238,557)	\$89,398,519
Blackrock US TIPS	\$21,501,940	\$0	\$0	\$0	\$0	\$0	\$177,554	\$177,554	\$21,679,493
Clarion Lion Properties	\$33,823,520	\$336,548	(\$338,945)	(\$87,398)	(\$89,795)	\$358,918	\$546,138	\$905,056	\$34,638,781
ICERS State Street Real Estate	\$1,742,247	\$35,537	(\$53,556)	\$0	(\$18,019)	\$9	(\$9,653)	(\$9,644)	\$1,714,584
ASB Allegiance Real Estate	\$33,431,944	\$76,434	\$0	(\$76,434)	\$0	\$274,167	\$392,016	\$666,183	\$34,098,127
ARA American Strategic Value Realty	\$1,787,262	\$4,147,500	\$0	(\$22,681)	\$4,124,819	\$0	\$131,955	\$131,955	\$6,044,035
Portfolio Advisors	\$12,628,379	\$368,467	\$0	\$0	\$368,467	\$0	\$85,708	\$85,708	\$13,082,554
PIMCO BRAVO 1	\$372,374	\$0	(\$214,533)	(\$1,663)	(\$216,196)	(\$7,021)	\$353,449	\$346,427	\$502,605
KKR Mezzanine I <sup>1</sup>	\$2,641,312	\$13,800	(\$751,123)	(\$13,800)	(\$751,123)	(\$7,021)	\$276,905	\$269,883	\$2,160,072
HarbourVest International VI <sup>1</sup>	\$3,094,652	\$0	(\$130,599)	(\$7,833)	(\$138,432)	\$0	\$140,091	\$140,091	\$3,096,311
HarbourVest Buyout IX <sup>1</sup>	\$6,923,377	\$91,290	(\$499,609)	(\$24,920)	(\$433,239)	\$0	\$264,305	\$264,305	\$6,754,443
HarbourVest Credit Opportunities IX <sup>1</sup>	\$1,172,110	\$2,597	\$0	(\$4,972)	(\$2,375)	\$0	\$35,282	\$35,282	\$1,205,017
HarbourVest Venture IX <sup>1</sup>	\$3,969,615	\$15,582	\$0	(\$9,974)	\$5,608	\$0	\$198,363	\$198,363	\$4,173,586
HarbourVest 2017 Global <sup>1</sup>	\$6,590,449	\$2,190,920	\$0	(\$33,750)	\$2,157,170	\$0	\$86,848	\$86,848	\$8,834,467
Cash	\$4,524,525	\$1,589,080	(\$109,469)	\$0	\$1,479,611	\$0	\$0	\$0	\$6,004,136
Totals	\$819,861,910	\$8,867,756	(\$13,804,722)	(\$283,425)	(\$5,220,390)	\$619,051	\$5,008,103	\$5,627,154	\$820,268,673

<sup>&</sup>lt;sup>1</sup>Market value as of 03/31/2018/ +/- 2Q18 calls and distributions



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





# Total Fund Investment Fee Analysis

# Period Ending: June 30, 2018

Account	Fee Schedule	Market Value As of 6/30/2018	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
1221 State St. Corp	No Fee	\$1,714,584	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	\$6,044,035	0.7%	\$75,550	1.25%
ASB Real Estate	1.25% of First 5.0 Mil, 1.00% of Next 10.0 Mil, 0.75% Thereafter	\$34,098,127	4.2%	\$305,736	0.90%
BlackRock International Equity	0.15% of First 50.0 Mil, 0.10% of Next 50.0 Mil	\$144,408,890	17.6%	\$125,000	0.09%
BlackRock Russell 3000	0.03% of Assets	\$264,717,808	32.3%	\$79,415	0.03%
BlackRock US TIPS	0.07% of Assets	\$21,679,493	2.6%	\$15,176	0.07%
Cash Account	No Fee	\$6,004,136	0.7%		
Clarion Lion	1.25% of First 10.0 Mil, 1.00% of Next 15.0 Mil, 0.85% Thereafter	\$34,638,781	4.2%	\$356,930	1.03%
DFA Emerging Markets Value	0.57% of Assets	\$31,138,055	3.8%	\$177,487	0.57%
Harbourvest 2017 Global Fund	262,500 Annually	\$8,834,467	1.1%	\$262,500	2.97%
Harbourvest Buyout IX	100,000 Annually	\$6,754,443	0.8%	\$100,000	1.48%
Harbourvest Credit Ops IX	20,000 Annually	\$1,205,017	0.1%	\$20,000	1.66%
Harbourvest International PE VI	35,000 Annually	\$3,096,311	0.4%	\$35,000	1.13%
Harbourvest Venture IX	40,000 Annually	\$4,173,586	0.5%	\$40,000	0.96%
Harding Loevner Emerging Markets	1.05% of Assets	\$35,144,452	4.3%	\$369,017	1.05%
KKR Mezzanine Partners	150,000 Annually	\$2,160,072	0.3%	\$150,000	6.94%
MacKay Shields Core Plus Opportunities	0.35% of Assets	\$89,398,519	10.9%	\$312,895	0.35%
PIMCO BRAVO	1.90% of Assets	\$502,605	0.1%	\$9,549	1.90%
Portfolio Advisors Credit Strategies Fund	180,000 Annually	\$11,455,695	1.4%	\$180,000	1.57%
Tortoise Capital	0.29% of First 100.0 Mil, 0.25% of Next 100.0 Mil	\$111,472,737	13.6%	\$313,682	0.28%
Verus Advisory Fee	\$175,000 Annually	\$0	0.0%		
Investment Management Fee		\$818,641,814	100.0%	\$2,927,937	0.36%

<sup>\*</sup>Total fund market value excludes other investments managed by Portfolio Advisors.

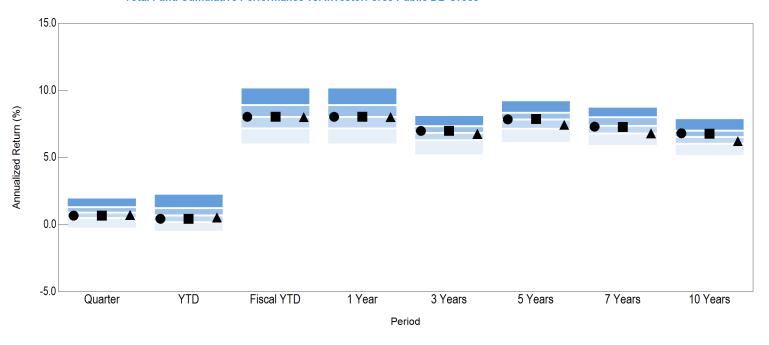


<sup>\*</sup>HarbourVest, KKR and PIMCO BRAVO fees are estimated gross management fees only and do not include incentive allocations or offsetting cash flows received by the fund.

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

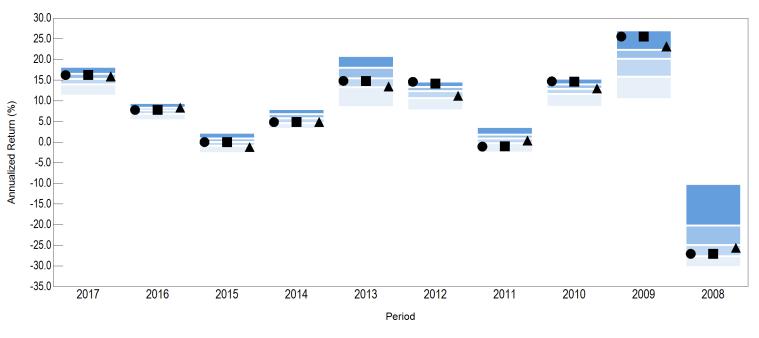
<sup>\*</sup>Verus advisory fee shown for disclosure purposes only and is not included in total investment management fee calculations. \*Portfolio Advisors fee is 0.20% on committed capital and 1.00% on invested capital.

# Total Fund Cumulative Performance vs. InvestorForce Public DB Gross



	Return (Ra	ank)														
5th Percentile	2.0		2.3		10.2		10.2		8.1		9.2		8.8		7.9	
25th Percentile	1.3		1.2		8.9		8.9		7.3		8.3		8.0		7.0	
Median	0.9		0.7		8.0		8.0		6.8		7.8		7.4		6.5	
75th Percentile	0.5		0.2		7.2		7.2		6.3		7.1		6.8		6.0	
95th Percentile	-0.3		-0.5		6.0		6.0		5.2		6.1		5.9		5.1	
# of Portfolios	211		211		209		209		204		190		179		162	
Total Fund	0.7	(65)	0.4	(63)	8.0	(51)	8.0	(51)	7.0	(44)	7.8	(51)	7.3	(53)	6.8	(35)
Total Fund ex Parametric	0.7	(65)	0.4	(63)	8.0	(51)	8.0	(51)	7.0	(44)	7.9	(50)	7.3	(55)	6.8	(36)
▲ Policy Index	0.7	(62)	0.5	(60)	8.0	(52)	8.0	(52)	6.7	(55)	7.4	(65)	6.8	(75)	6.2	(67)

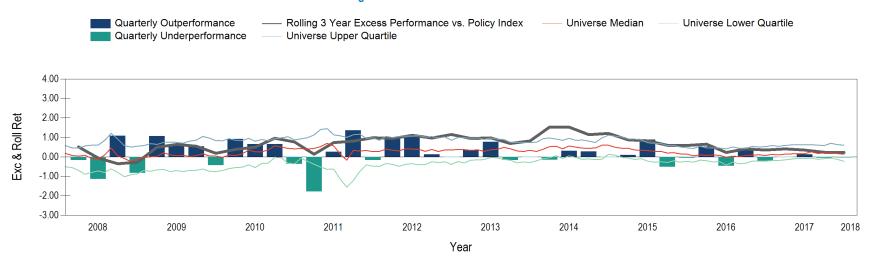




	Return (Rank)									
5th Percentile	18.2	9.4	2.2	8.0	20.8	14.6	3.6	15.4	27.0	-10.1
25th Percentile	16.5	8.4	0.9	6.8	18.0	13.4	1.9	14.0	22.4	-20.1
Median	15.3	7.7	0.1	5.8	15.5	12.4	0.9	12.9	20.2	-24.9
75th Percentile	14.0	6.9	-0.9	4.6	13.3	10.7	-0.3	11.7	15.9	-27.6
95th Percentile	11.3	5.3	-2.6	3.2	8.5	7.8	-2.5	8.6	10.5	-30.3
# of Portfolios	304	305	316	248	231	236	206	188	184	181
Total Fund	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)	-27.1 (68)
■ Total Fund ex Parametric	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)	-27.1 (68)
▲ Policy Index	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)	-25.6 (58)

Quarterly Outperformance

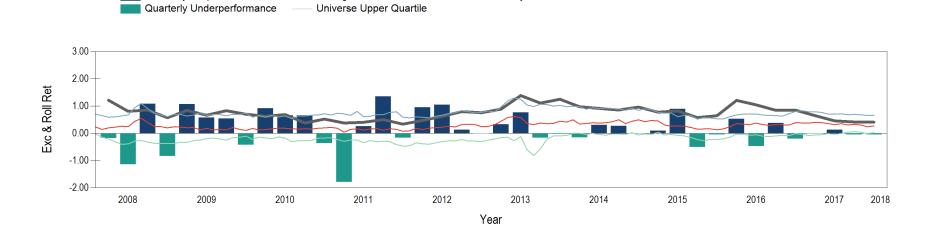
# **Rolling 3 Year Annualized Excess Performance**



# **Rolling 5 Year Annualized Excess Performance**

Universe Median

- Rolling 5 Year Excess Performance vs. Policy Index



Universe Lower Quartile

	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
Total Domestic Equity	264,717,808	3.9	3.2	14.8	14.8	11.5	12.9	10.3	21.2	12.9	0.3	10.2	33.9
Russell 3000		3.9	3.2	14.8	14.8	11.6	13.3	10.2	21.1	12.7	0.5	12.6	33.6
InvestorForce Public DB US Eq Gross Rank		40	54	45	45	40	58	44	35	51	44	73	64
BlackRock Russell 3000	264,717,808	3.9	3.2	14.8	14.8				21.2	12.9			
Russell 3000		3.9	3.2	14.8	14.8				21.1	12.7			
eV US All Cap Core Equity Gross Rank		34	38	40	40				49	35			

U.S. Effective Style Map 3 Years Ending June 30, 2018

Large
Value

Total Domestic Equity

Mid
Value

Small
Value

Small
Value

Large
Growth

Mid
Growth

Small
Growth

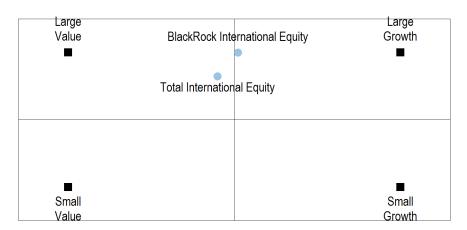
U.S. Effective Style Map 5 Years Ending June 30, 2018



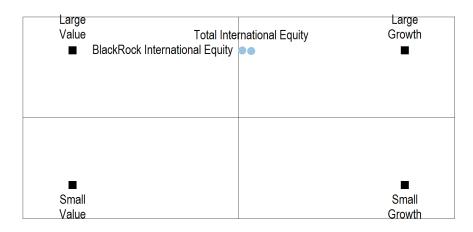
	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
Total Domestic Equity	264,717,808	3.9	3.2	14.8	14.8	11.4	12.8	10.1	21.2	12.8	0.1	10.0	33.6
Russell 3000		3.9	3.2	14.8	14.8	11.6	13.3	10.2	21.1	12.7	0.5	12.6	33.6
BlackRock Russell 3000	264,717,808	3.9	3.2	14.8	14.8				21.2	12.8			
Russell 3000		3.9	3.2	14.8	14.8				21.1	12.7			

	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
Total International Equity	210,691,397	-3.3	-3.5	7.2	7.2	6.1	6.7	3.2	28.3	4.7	-3.5	-4.4	14.0
MSCI ACWI ex USA Gross		-2.4	-3.4	7.8	7.8	5.6	6.5	3.0	27.8	5.0	-5.3	-3.4	15.8
InvestorForce Public DB ex-US Eq Gross Rank		61	57	62	62	50	58	64	59	40	57	74	83
BlackRock International Equity	144,408,890	-0.8	-2.4	7.3	7.3	5.3	6.8	3.2	25.5	1.5	-0.5	-4.7	23.2
MSCI EAFE Gross		-1.0	-2.4	7.4	7.4	5.4	6.9	3.3	25.6	1.5	-0.4	-4.5	23.3
eV All EAFE Equity Gross Rank		37	53	60	60	70	75	82	65	47	67	64	61
DFA Emerging Markets Value	31,138,055	-9.1	-6.9	6.3	6.3	6.6	5.2	2.7	34.5	20.5	-18.3	-3.9	-3.2
MSCI Emerging Markets Gross		-7.9	-6.5	8.6	8.6	6.0	5.4	2.6	37.8	11.6	-14.6	-1.8	-2.3
eV Emg Mkts Equity Gross Rank		71	55	65	65	52	67	78	70	7	92	84	84
Harding Loevner Emerging Markets	35,144,452	-7.7	-4.7	7.9	7.9				35.0				
MSCI Emerging Markets Gross		-7.9	-6.5	8.6	8.6				37.8				-
eV Emg Mkts Equity Gross Rank		36	20	51	51				68				

EAFE Effective Style Map 3 Years Ending June 30, 2018



EAFE Effective Style Map 5 Years Ending June 30, 2018



	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
Total International Equity	210,691,397	-3.3	-3.6	6.9	6.9	5.7	6.3	2.7	27.9	4.4	-4.0	-4.9	13.4
MSCI ACWI ex USA Gross		-2.4	-3.4	7.8	7.8	5.6	6.5	3.0	27.8	5.0	-5.3	-3.4	15.8
BlackRock International Equity	144,408,890	-0.9	-2.5	7.2	7.2	5.2	6.7	3.1	25.4	1.3	-0.6	-4.8	22.9
MSCI EAFE Gross		-1.0	-2.4	7.4	7.4	5.4	6.9	3.3	25.6	1.5	-0.4	-4.5	23.3
DFA Emerging Markets Value	31,138,055	-9.2	-7.2	5.7	5.7	6.0	4.6	2.1	33.8	19.8	-18.8	-4.4	-3.8
MSCI Emerging Markets Gross		-7.9	-6.5	8.6	8.6	6.0	5.4	2.6	37.8	11.6	-14.6	-1.8	-2.3
Harding Loevner Emerging Markets	35,144,452	-7.9	-5.2	6.8	6.8				33.6				
MSCI Emerging Markets Gross		-7.9	-6.5	8.6	8.6				37.8				

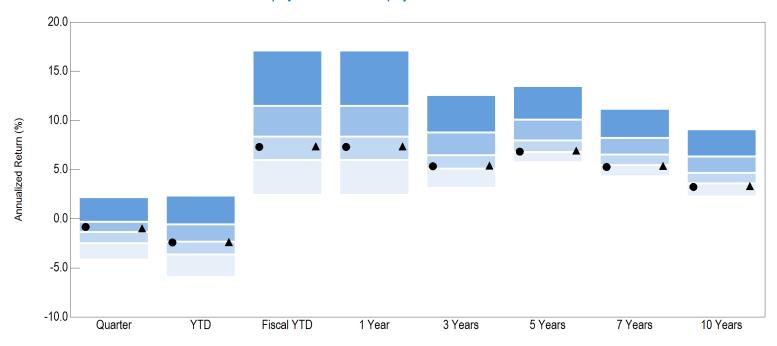
# EM Effective Style Map 3 Years Ending June 30, 2018



# EM Effective Style Map 5 Years Ending June 30, 2018



# BlackRock International Equity vs. eV All EAFE Equity Gross Universe



	Return (Rank)													
5th Percentile	2.2	2.3	17.1		17.1		12.6		13.5		11.2		9.1	
25th Percentile	-0.3	-0.5	11.5		11.5		8.8		10.1		8.2		6.3	
Median	-1.3	-2.3	8.4		8.4		6.5		8.0		6.5		4.7	
75th Percentile	-2.5	-3.6	6.0		6.0		5.1		6.8		5.5		3.6	
95th Percentile	-4.1	-5.9	2.4		2.4		3.2		5.8		4.3		2.3	
# of Portfolios	372	370	370		370		348		317		287		255	
<ul><li>BlackRock International Equity</li><li>MSCI EAFE Gross</li></ul>	-0.8 (37) -1.0 (42)	-2.4 -2.4	(53) 7.3 (52) 7.4	` '	7.3 7.4	(60) (59)	5.3 5.4	(70) (68)	6.8 6.9	(75) (72)	5.3 5.4	(79) (77)	3.2 3.3	(82) (81)



### BlackRock International Equity vs. eV All EAFE Equity Gross Universe



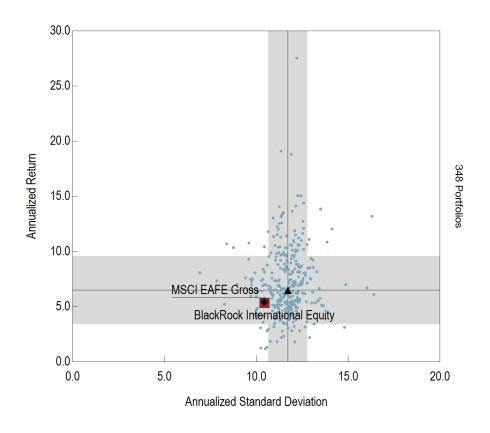
5th Percentile
25th Percentile Median
75th Percentile
95th Percentile
# of Portfolios

BlackRock International Equity

▲ MSCI EAFE Gross

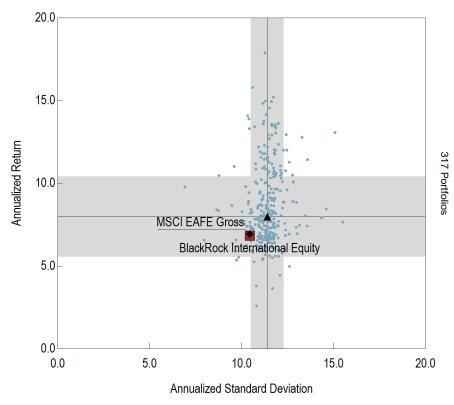
Return (R	ank)									
39.0	8.1	12.6	3.0	36.3	31.7	-5.1	25.7	57.3	-34.5	
31.6	3.4	5.2	-1.9	28.1	23.1	-9.7	16.1	44.0	-40.8	
27.0	1.3	1.4	-3.7	24.6	20.4	-12.0	11.7	36.5	-44.1	
24.3	-0.6	-0.9	-5.4	20.5	17.5	-14.5	8.7	30.7	-47.5	
19.7	-4.9	-5.4	-8.6	8.6	13.3	-18.2	4.6	23.7	-51.5	
370	350	325	314	284	263	278	352	455	477	
•	65) 1.5 63) 1.5	(47) -0.5 (47) -0.4	(67) -4.7 (66) -4.5	(64) 23.2 (60) 23.3	(61) 17.8 (60) 17.9	(74) -11.8 (72) -11.7	(48) 8.1 (47) 8.2	(79) 32.3 (78) 32.5	(68) -43.1 (67) -43.1	(41) (41)

Annualized Return vs. Annualized Standard Deviation 3 Years Ending June 30, 2018



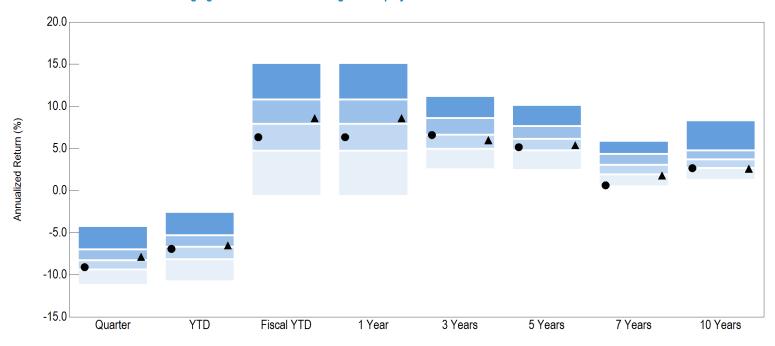
- BlackRock International Equity
- MSCI EAFE Gross
- ▲ Universe Median
- 68% Confidence Interval
- eV All EAFE Equity Gross

# Annualized Return vs. Annualized Standard Deviation 5 Years Ending June 30, 2018



- BlackRock International Equity
- MSCI EAFE Gross
- ▲ Universe Median
- 68% Confidence Interval
- eV All EAFE Equity Gross

# DFA Emerging Markets Value vs. eV Emg Mkts Equity Gross Universe



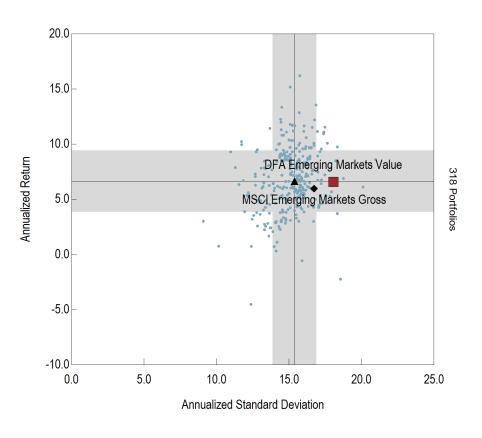
	Return (R	ank)														
5th Percentile	-4.2		-2.5		15.1		15.1		11.2		10.1		5.9		8.3	
25th Percentile	-6.9		-5.3		10.8		10.8		8.6		7.7		4.4		4.8	
Median	-8.3		-6.7		7.9		7.9		6.7		6.2		3.1		3.7	
75th Percentile	-9.4		-8.1		4.8		4.8		5.0		4.8		2.0		2.7	
95th Percentile	-11.2		-10.7		-0.6		-0.6		2.6		2.5		0.6		1.3	
# of Portfolios	334		334		333		333		318		275		201		139	
<ul> <li>DFA Emerging Markets Value</li> <li>MSCI Emerging Markets Gross</li> </ul>	-9.1 -7.9	(71) (41)	-6.9 -6.5	(55) (46)	6.3 8.6	(65) (43)	6.3 8.6	(65) (43)	6.6 6.0	(52) (62)	5.2 5.4	(67) (60)	0.6 1.8	(94) (79)	2.7 2.6	(78) (79)

DFA Emerging Markets Value vs. eV Emg Mkts Equity Gross Universe



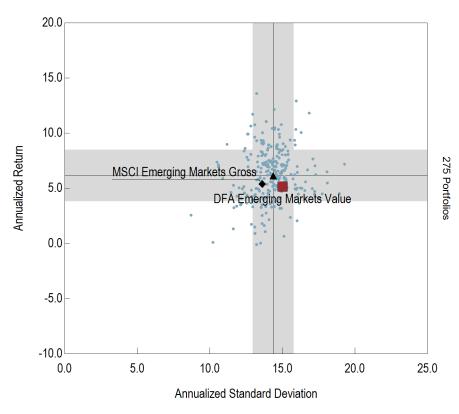
	Return (Ran	k)								
5th Percentile	49.2	22.4	-5.0	8.0	11.7	28.4	-11.1	29.6	106.8	-45.4
25th Percentile	42.8	13.7	-9.0	2.9	5.2	23.0	-16.4	23.9	85.5	-51.3
Median	37.6	10.4	-12.2	-0.1	1.0	20.9	-18.6	20.1	79.5	-54.0
75th Percentile	33.2	6.6	-15.3	-2.4	-2.0	17.3	-22.2	17.3	74.3	-56.3
95th Percentile	27.8	-0.6	-19.2	-7.0	-6.3	13.7	-27.3	13.7	68.5	-60.7
# of Portfolios	343	337	273	251	198	155	139	113	113	118
<ul> <li>DFA Emerging Markets Value</li> <li>MSCI Emerging Markets Gross</li> </ul>	34.5 (70) 37.8 (49)	20.5 (7) 11.6 (40)	-18.3 (92) -14.6 (67)	-3.9 (84) -1.8 (69)	-3.2 (84) -2.3 (78)	20.1 (56) 18.6 (68)	-25.2 (92) -18.2 (45)	22.8 (33) 19.2 (62)	93.3 (12) 79.0 (54)	-53.6 (44) -53.2 (37)

Annualized Return vs. Annualized Standard Deviation 3 Years Ending June 30, 2018



- DFA Emerging Markets Value
- MSCI Emerging Markets Gross
- ▲ Universe Median
- 68% Confidence Interval
- eV Emg Mkts Equity Gross

# Annualized Return vs. Annualized Standard Deviation 5 Years Ending June 30, 2018



- DFA Emerging Markets Value
- MSCI Emerging Markets Gross
- ▲ Universe Median
- 68% Confidence Interval
- eV Emg Mkts Equity Gross

#### **Rolling 3 Year Annualized Excess Performance**

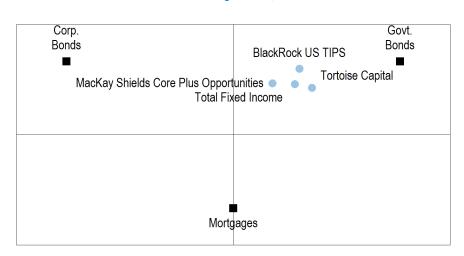


## **Rolling 5 Year Annualized Excess Performance**

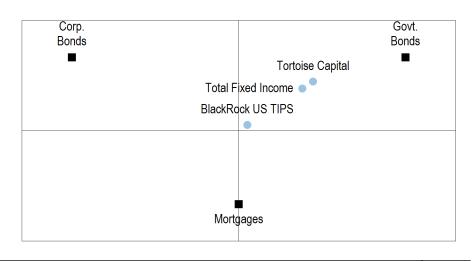


	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
Total Fixed Income	222,550,750	-0.1	-1.2	0.6	0.6	2.6	3.0	5.3	4.6	5.1	-0.3	5.9	-1.7
BBgBarc US Aggregate TR		-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0
InvestorForce Public DB Total Fix Inc Gross Rank		51	70	53	53	49	32	31	59	41	55	15	69
Tortoise Capital	111,472,737	-0.2	-1.1	0.6	0.6	3.0	3.7	5.9	4.5	5.1	1.2	7.0	-0.4
BBgBarc US Aggregate TR		-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0
eV US Core Plus Fixed Inc Gross Rank		51	22	33	33	27	20	16	70	45	15	16	52
MacKay Shields Core Plus Opportunities	89,398,519	-0.2	-1.6	0.1	0.1	2.2			4.9	5.1			
BBgBarc US Aggregate TR		-0.2	-1.6	-0.4	-0.4	1.7			3.5	2.6			
eV US Core Plus Fixed Inc Gross Rank		48	67	67	67	79			54	46			
BlackRock US TIPS	21,679,493	0.8	0.1	2.3	2.3	2.1	1.8	3.2	3.2	4.8	-1.2	3.6	-8.5
BBgBarc US TIPS TR		0.8	0.0	2.1	2.1	1.9	1.7	3.0	3.0	4.7	-1.4	3.6	-8.6
eV US TIPS / Inflation Fixed Inc Gross Rank		23	54	39	39	33	35	49	46	37	43	45	62

Fixed Income Style Map 3 Years Ending June 30, 2018



Fixed Income Style Map 5 Years Ending June 30, 2018

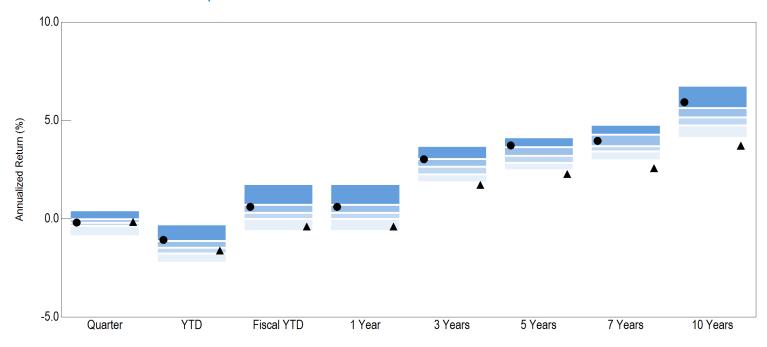


	Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
Total Fixed Income	222,550,750	-0.2	-1.3	0.3	0.3	2.3	2.7	5.0	4.3	4.8	-0.6	5.6	-2.0
BBgBarc US Aggregate TR		-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0
Tortoise Capital	111,472,737	-0.3	-1.2	0.3	0.3	2.7	3.4	5.6	4.3	4.8	0.9	6.7	-0.8
BBgBarc US Aggregate TR		-0.2	-1.6	-0.4	-0.4	1.7	2.3	3.7	3.5	2.6	0.6	6.0	-2.0
MacKay Shields Core Plus Opportunities	89,398,519	-0.3	-1.8	-0.2	-0.2	1.8			4.5	4.7			
BBgBarc US Aggregate TR		-0.2	-1.6	-0.4	-0.4	1.7			3.5	2.6			
BlackRock US TIPS	21,679,493	8.0	0.0	2.2	2.2	2.0	1.8	3.1	3.2	4.8	-1.3	3.6	-8.6
BBgBarc US TIPS TR		0.8	0.0	2.1	2.1	1.9	1.7	3.0	3.0	4.7	-1.4	3.6	-8.6

## Correlation Matrix Last 5 Years

	Total Fixed Income	Tortoise Capital	MacKay Shields Core Plus Opportunities	BlackRock US TIPS	BBgBarc US Aggregate TR	
Total Fixed Income	1.00					
Tortoise Capital	0.98	1.00			-	
MacKay Shields Core Plus Opportunities						
BlackRock US TIPS	0.83	0.75		1.00	<del></del>	
BBgBarc US Aggregate TR	0.94	0.96		0.73	1.00	

# Tortoise Capital vs. eV US Core Plus Fixed Inc Gross Universe



	Return (Rank)							
5th Percentile	0.4	-0.3	1.8	1.8	3.7	4.1	4.8	6.8
25th Percentile	0.0	-1.1	0.7	0.7	3.0	3.6	4.3	5.6
Median	-0.2	-1.5	0.3	0.3	2.7	3.2	3.7	5.2
75th Percentile	-0.4	-1.8	0.0	0.0	2.3	2.9	3.4	4.7
95th Percentile	-0.9	-2.2	-0.6	-0.6	1.9	2.5	3.0	4.1
# of Portfolios	120	120	120	120	117	113	110	98
<ul><li>Tortoise Capital</li><li>BBgBarc US Aggregate TR</li></ul>	-0.2 (51 -0.2 (47	,	0.6 (33 -0.4 (90	` '	3.0 (27) 1.7 (97)	3.7 (20) 2.3 (99)	4.0 (37) 2.6 (99)	5.9 (16) 3.7 (99)



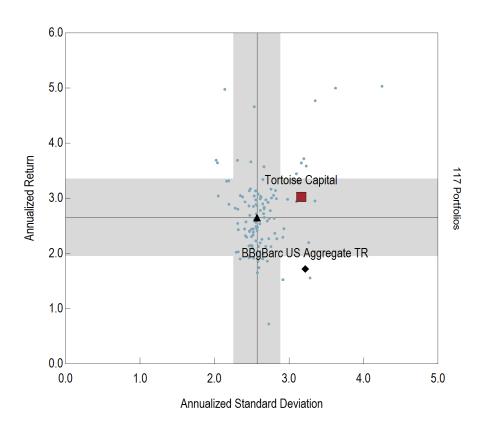
### Tortoise Capital vs. eV US Core Plus Fixed Inc Gross Universe



	Return (Rank)	)								
5th Percentile	7.0	10.1	1.9	7.7	4.6	14.4	8.8	13.6	32.9	6.9
25th Percentile	5.5	6.1	0.9	6.7	1.0	10.2	8.1	10.8	20.6	2.7
Median	5.0	4.9	0.3	5.9	-0.4	8.3	7.4	9.1	14.6	-1.6
75th Percentile	4.5	3.9	-0.2	5.2	-1.0	6.7	6.3	8.0	11.2	-8.9
95th Percentile	3.8	2.9	-2.4	3.6	-2.0	5.1	4.4	7.0	7.8	-16.8
# of Portfolios	122	134	115	118	116	124	118	123	128	136
<ul><li>Tortoise Capital</li><li>BBgBarc US Aggregate TR</li></ul>	4.5 (70) 3.5 (99)	5.1 (45) 2.6 (97)	1.2 (15) 0.6 (42)	7.0 (16) 6.0 (50)	-0.4 (52) -2.0 (96)	8.8 (45) 4.2 (97)	7.4 (51) 7.8 (37)	9.6 (40) 6.5 (97)	13.5 (55) 5.9 (99)	4.6 (17) 5.2 (13)

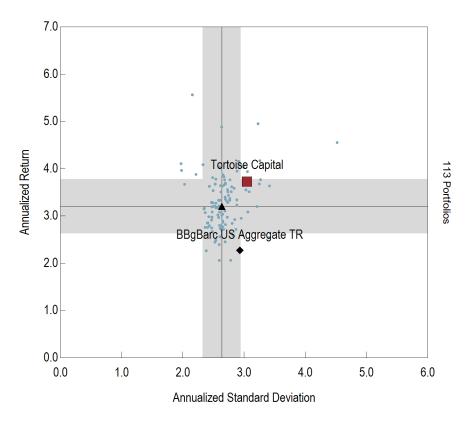


Annualized Return vs. Annualized Standard Deviation 3 Years Ending June 30, 2018



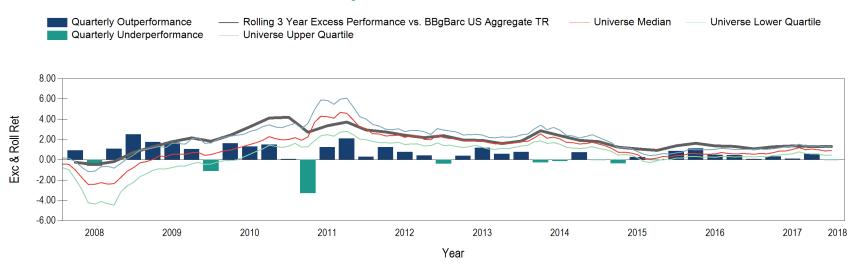
- Tortoise Capital
- BBgBarc US Aggregate TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Core Plus Fixed Inc Gross

# Annualized Return vs. Annualized Standard Deviation 5 Years Ending June 30, 2018

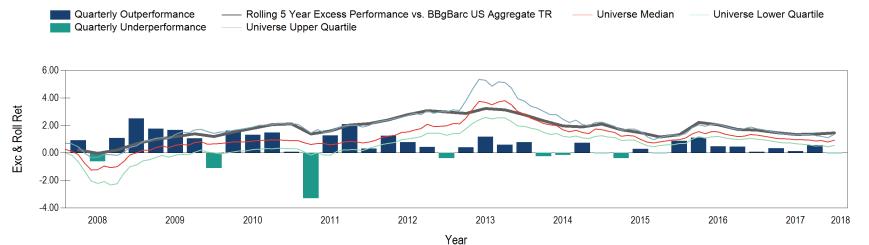


- Tortoise Capital
- BBgBarc US Aggregate TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Core Plus Fixed Inc Gross

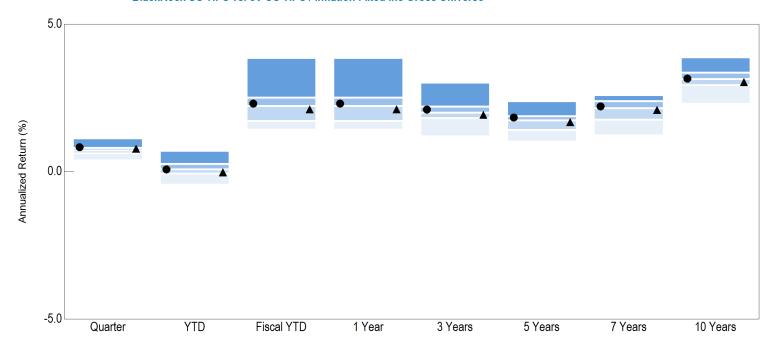
#### **Rolling 3 Year Annualized Excess Performance**



### **Rolling 5 Year Annualized Excess Performance**



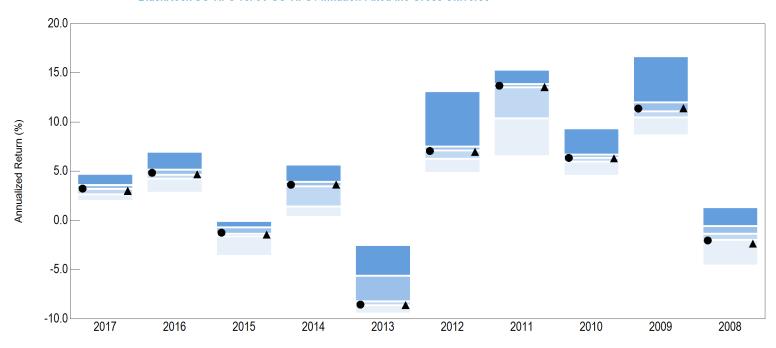
### BlackRock US TIPS vs. eV US TIPS / Inflation Fixed Inc Gross Universe



	5th Percentile
	Median
	75th Percentile
	# of Portfolios
•	BlackRock US TIPS BBgBarc US TIPS TF

Return (R	ank)														
1.1		0.7		3.9		3.9		3.0		2.4		2.6		3.9	
0.8		0.3		2.5		2.5		2.2		1.9		2.4		3.4	
0.7		0.1		2.2		2.2		2.0		1.7		2.2		3.1	
0.6		-0.1		1.7		1.7		1.8		1.4		1.8		2.9	
0.4		-0.4		1.4		1.4		1.2		1.0		1.2		2.3	
41		41		41		41		40		40		39		34	
0.8 0.8	(23) (40)	0.1 0.0	(54) (73)	2.3 2.1	(39) (55)	2.3 2.1	(39) (55)	2.1 1.9	(33) (67)	1.8 1.7	(35) (67)	2.2 2.1	(40) (64)	3.2 3.0	(49) (69)

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



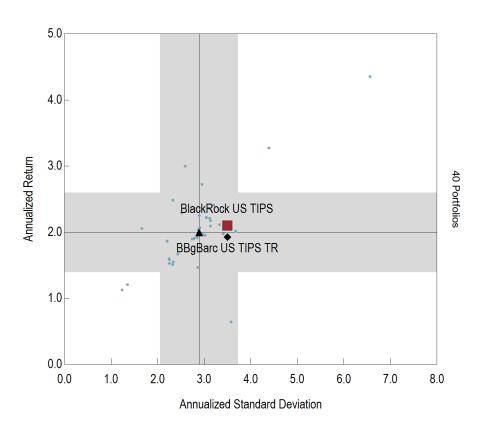
5th Percentile
Median
75th Percentile
95th Percentile
# of Portfolios

BlackRock US TIPSBBgBarc US TIPS TR

Return (F	Rank)																		
4.7	,	7.0		-0.1		5.7		-2.5		13.1		15.3		9.4		16.7		1.3	
3.6		5.2		-0.7		4.0		-5.6		7.5		13.9		6.7		12.0		-0.5	
3.2		4.7		-1.3		3.5		-8.2		7.1		13.5		6.4		11.1		-1.4	
2.7		4.3		-1.6		1.4		-8.6		6.3		10.4		6.0		10.5		-1.9	
2.0		2.8		-3.6		0.4		-9.4		4.9		6.6		4.6		8.7		-4.6	
38		42		44		50		43		43		47		39		37		40	
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)	-2.0	(78)
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)	-2.4	(85)

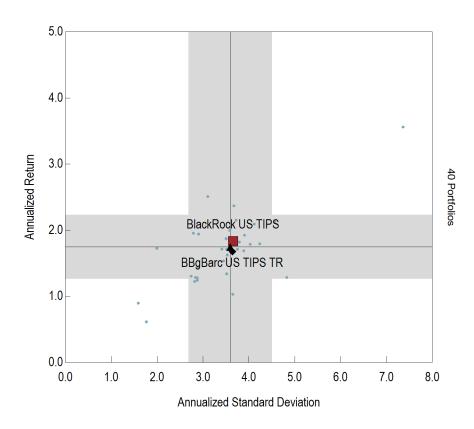


Annualized Return vs. Annualized Standard Deviation 3 Years Ending June 30, 2018



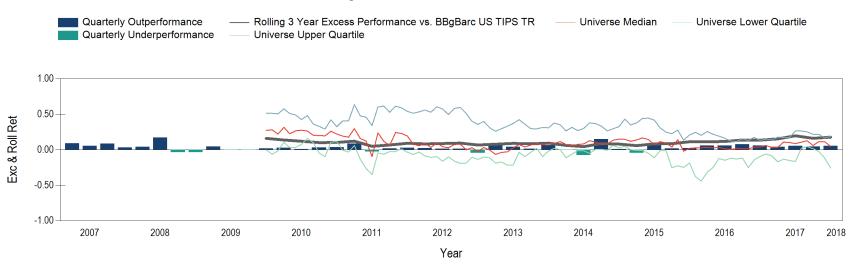
- BlackRock US TIPS
- BBgBarc US TIPS TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US TIPS / Inflation Fixed Inc Gross

# Annualized Return vs. Annualized Standard Deviation 5 Years Ending June 30, 2018

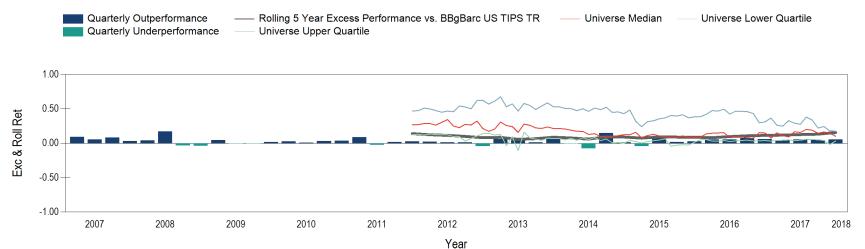


- BlackRock US TIPS
- BBgBarc US TIPS TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US TIPS / Inflation Fixed Inc Gross

#### **Rolling 3 Year Annualized Excess Performance**

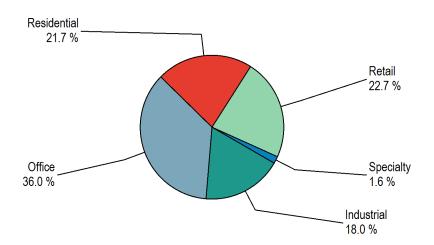


## **Rolling 5 Year Annualized Excess Performance**

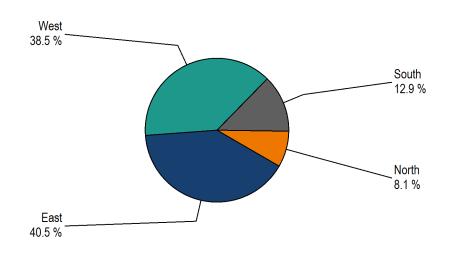


Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
76,495,528	2.1	4.1	7.2	7.2	8.4	10.7	4.5	5.8	7.5	16.1	13.0	12.6
	1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0
	2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9
34,098,127	1.8	3.6	6.0	6.0	7.2	10.4		4.0	5.6	17.3	13.5	13.7
	1.7	3.4	7.1	7.1	8.2	9.7		7.0	8.0	13.3	11.8	11.0
	2.0	4.3	8.4	8.4	9.4	11.0		7.6	8.8	15.0	12.5	13.9
34,638,781	2.4	4.8	8.6	8.6	9.6	11.4	4.0	7.9	9.1	15.7	13.2	12.8
	1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0
	2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9
6,044,035	2.9											
	1.7											
	2.0											
1,714,584	0.0	0.0	0.0	0.0	5.5	3.3	1.2	0.0	17.5	0.0	0.0	0.0
	76,495,528 34,098,127 34,638,781 6,044,035	76,495,528 1.7 2.0 34,098,127 1.8 1.7 2.0 34,638,781 2.4 1.7 2.0 6,044,035 2.9 1.7 2.0	76,495,528 2.1 4.1 1.7 3.4 2.0 4.3 34,098,127 1.8 3.6 1.7 3.4 2.0 4.3 34,638,781 2.4 4.8 1.7 3.4 2.0 4.3 6,044,035 2.9 1.7 2.0	76,495,528 2.1 4.1 7.2 1.7 3.4 7.1 2.0 4.3 8.4 34,098,127 1.8 3.6 6.0 1.7 3.4 7.1 2.0 4.3 8.4 34,638,781 2.4 4.8 8.6 1.7 3.4 7.1 2.0 4.3 8.4 6,044,035 2.9 1.7 2.0	Market Value         3 Mo         YTD         YTD         TYP           76,495,528         2.1         4.1         7.2         7.2           1.7         3.4         7.1         7.1           2.0         4.3         8.4         8.4           34,098,127         1.8         3.6         6.0         6.0           1.7         3.4         7.1         7.1           2.0         4.3         8.4         8.4           34,638,781         2.4         4.8         8.6         8.6           1.7         3.4         7.1         7.1           2.0         4.3         8.4         8.4           6,044,035         2.9             1.7              2.0              2.0              2.0              2.0              2.0              2.0              2.0	Market Value         3 Mo         YTD         YTD         TYT         3 YTS           76,495,528         2.1         4.1         7.2         7.2         8.4           1.7         3.4         7.1         7.1         8.2           2.0         4.3         8.4         8.4         9.4           34,098,127         1.8         3.6         6.0         6.0         7.2           1.7         3.4         7.1         7.1         8.2           2.0         4.3         8.4         8.4         9.4           34,638,781         2.4         4.8         8.6         8.6         9.6           1.7         3.4         7.1         7.1         8.2           2.0         4.3         8.4         8.4         9.4           6,044,035         2.9               1.7                2.0                2.0                2.0 <t< td=""><td>Market Value         3 Mo         Y TD         Y TD         TYT         3 Y IS         5 Y IS           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           6,044,035         2.9                1.7                 1.7            </td><td>Market Value         3 Mo         YTD         YTD         TYT         3 YIS         5 YIS         10 YIS           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4            1.7         3.4         7.1         7.1         8.2         9.7            2.0         4.3         8.4         8.4         9.4         11.0            34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           6,044,035         2.9                 1.7         </td><td>Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0           1.7         3.4         7.1         7.1         8.2         9.7          7.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0         7.9           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           6,044,035         <td< td=""><td>Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8         7.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0         5.6           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0         7.9         9.1           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3</td><td>Market Value         3 Mo         Y ID         YTD         I Y I I I I I I I I I I I I I I I I I I</td><td>Market Value         3 Mo         Y ID         Y TD         I Y I         3 Y IS         5 Y IS         10 Y IS         2017         2016         2015         2014           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8         7.5         16.1         13.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0         12.5           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0         5.6         17.3         13.5           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0         12.5           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4</td></td<></td></t<>	Market Value         3 Mo         Y TD         Y TD         TYT         3 Y IS         5 Y IS           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           6,044,035         2.9                1.7                 1.7	Market Value         3 Mo         YTD         YTD         TYT         3 YIS         5 YIS         10 YIS           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4            1.7         3.4         7.1         7.1         8.2         9.7            2.0         4.3         8.4         8.4         9.4         11.0            34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           6,044,035         2.9                 1.7	Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0           1.7         3.4         7.1         7.1         8.2         9.7          7.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0         7.9           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           6,044,035 <td< td=""><td>Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8         7.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0         5.6           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0         7.9         9.1           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3</td><td>Market Value         3 Mo         Y ID         YTD         I Y I I I I I I I I I I I I I I I I I I</td><td>Market Value         3 Mo         Y ID         Y TD         I Y I         3 Y IS         5 Y IS         10 Y IS         2017         2016         2015         2014           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8         7.5         16.1         13.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0         12.5           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0         5.6         17.3         13.5           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0         12.5           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4</td></td<>	Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8         7.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0         5.6           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4         4.0         7.9         9.1           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3	Market Value         3 Mo         Y ID         YTD         I Y I I I I I I I I I I I I I I I I I I	Market Value         3 Mo         Y ID         Y TD         I Y I         3 Y IS         5 Y IS         10 Y IS         2017         2016         2015         2014           76,495,528         2.1         4.1         7.2         7.2         8.4         10.7         4.5         5.8         7.5         16.1         13.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0         12.5           34,098,127         1.8         3.6         6.0         6.0         7.2         10.4          4.0         5.6         17.3         13.5           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0         12.5           34,638,781         2.4         4.8         8.6         8.6         9.6         11.4

Property Type Allocation Allocation as of June 30, 2018



Geographic Diversification
Allocation as of June 30, 2018

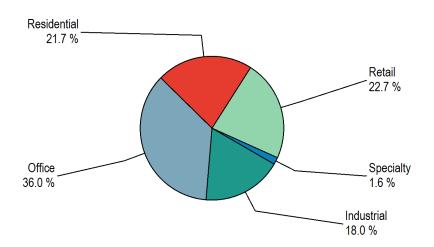


ARA American Strategic Value Realty funded 1/4/2018.

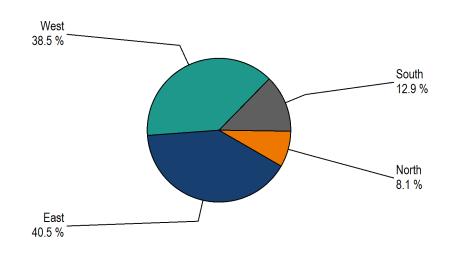


Market Value	3 Mo	YTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2017	2016	2015	2014	2013
76,495,528	2.1	4.1	7.2	7.2	7.8	9.9	3.9	5.8	6.5	15.0	11.6	12.1
	1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0
	2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9
34,098,127	1.8	3.6	6.0	6.0	6.7	9.7		4.0	4.6	16.2	12.5	12.5
	1.7	3.4	7.1	7.1	8.2	9.7		7.0	8.0	13.3	11.8	11.0
	2.0	4.3	8.4	8.4	9.4	11.0		7.6	8.8	15.0	12.5	13.9
34,638,781	2.4	4.8	8.6	8.6	9.0	10.6	3.2	7.9	8.0	14.6	12.2	11.8
	1.7	3.4	7.1	7.1	8.2	9.7	6.2	7.0	8.0	13.3	11.8	11.0
	2.0	4.3	8.4	8.4	9.4	11.0	5.3	7.6	8.8	15.0	12.5	13.9
6,044,035	2.9											
	1.7											
	2.0											-
1,714,584	0.0	0.0	0.0	0.0	5.5	3.3	1.2	0.0	17.5	0.0	0.0	0.0
	76,495,528 34,098,127 34,638,781 6,044,035	76,495,528 1.7 2.0 34,098,127 1.8 1.7 2.0 34,638,781 2.4 1.7 2.0 6,044,035 2.9 1.7 2.0	76,495,528 2.1 4.1 1.7 3.4 2.0 4.3 34,098,127 1.8 3.6 1.7 3.4 2.0 4.3 34,638,781 2.4 4.8 1.7 3.4 2.0 4.3 6,044,035 2.9 1.7 2.0	76,495,528 2.1 4.1 7.2 1.7 3.4 7.1 2.0 4.3 8.4 34,098,127 1.8 3.6 6.0 1.7 3.4 7.1 2.0 4.3 8.4 34,638,781 2.4 4.8 8.6 1.7 3.4 7.1 2.0 4.3 8.4 6,044,035 2.9 1.7 2.0	Market Value         3 Mo         YTD         YTD         TYP           76,495,528         2.1         4.1         7.2         7.2           1.7         3.4         7.1         7.1           2.0         4.3         8.4         8.4           34,098,127         1.8         3.6         6.0         6.0           1.7         3.4         7.1         7.1           2.0         4.3         8.4         8.4           34,638,781         2.4         4.8         8.6         8.6           1.7         3.4         7.1         7.1           2.0         4.3         8.4         8.4           6,044,035         2.9             1.7              2.0              2.0              2.0              2.0              2.0              1.7              2.0	Market Value         3 Mo         YTD         YTD         TYT         3 Yrs           76,495,528         2.1         4.1         7.2         7.2         7.8           1.7         3.4         7.1         7.1         8.2           2.0         4.3         8.4         8.4         9.4           34,098,127         1.8         3.6         6.0         6.0         6.7           1.7         3.4         7.1         7.1         8.2           2.0         4.3         8.4         8.4         9.4           34,638,781         2.4         4.8         8.6         8.6         9.0           1.7         3.4         7.1         7.1         8.2           2.0         4.3         8.4         8.4         9.4           6,044,035         2.9               1.7                2.0                2.0                2.0 <t< td=""><td>Market Value         3 Mo         YTD         YTD         TYT         3 YTS         5 YTS           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           6,044,035         2.9                1.7                 1.7             </td><td>Market Value         3 Mo         YTD         YTD         TYT         3 YIS         5 YIS         10 YIS           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7            1.7         3.4         7.1         7.1         8.2         9.7            2.0         4.3         8.4         8.4         9.4         11.0            34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           6,044,035         2.9                 1.7         </td><td>Market Value         3 Mo         Y1D         YTD         TYF         3 Yrs         5 Yrs         10 Yrs         2017           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0           1.7         3.4         7.1         7.1         8.2         9.7          7.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           6,044,035         2.</td><td>Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9         8.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3<!--</td--><td>Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016         2015           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5         15.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6         16.2           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9         8.0         14.6           1.7         3.4         7.1</td><td>Market Value         3 Mo         Y ID         Y TD         I Y I         3 Y IS         5 Y IS         10 Y IS         2017         2016         2015         2014           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5         15.0         11.6           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0         12.5           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6         16.2         12.5           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0         12.5           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.</td></td></t<>	Market Value         3 Mo         YTD         YTD         TYT         3 YTS         5 YTS           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6           1.7         3.4         7.1         7.1         8.2         9.7           2.0         4.3         8.4         8.4         9.4         11.0           6,044,035         2.9                1.7                 1.7	Market Value         3 Mo         YTD         YTD         TYT         3 YIS         5 YIS         10 YIS           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7            1.7         3.4         7.1         7.1         8.2         9.7            2.0         4.3         8.4         8.4         9.4         11.0            34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2           1.7         3.4         7.1         7.1         8.2         9.7         6.2           2.0         4.3         8.4         8.4         9.4         11.0         5.3           6,044,035         2.9                 1.7	Market Value         3 Mo         Y1D         YTD         TYF         3 Yrs         5 Yrs         10 Yrs         2017           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0           1.7         3.4         7.1         7.1         8.2         9.7          7.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6           6,044,035         2.	Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9         8.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0           2.0         4.3 </td <td>Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016         2015           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5         15.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6         16.2           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9         8.0         14.6           1.7         3.4         7.1</td> <td>Market Value         3 Mo         Y ID         Y TD         I Y I         3 Y IS         5 Y IS         10 Y IS         2017         2016         2015         2014           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5         15.0         11.6           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0         12.5           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6         16.2         12.5           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0         12.5           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.</td>	Market Value         3 Mo         Y1D         YTD         1 Yr         3 Yrs         5 Yrs         10 Yrs         2017         2016         2015           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5         15.0           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6         16.2           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.2         7.9         8.0         14.6           1.7         3.4         7.1	Market Value         3 Mo         Y ID         Y TD         I Y I         3 Y IS         5 Y IS         10 Y IS         2017         2016         2015         2014           76,495,528         2.1         4.1         7.2         7.2         7.8         9.9         3.9         5.8         6.5         15.0         11.6           1.7         3.4         7.1         7.1         8.2         9.7         6.2         7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0         5.3         7.6         8.8         15.0         12.5           34,098,127         1.8         3.6         6.0         6.0         6.7         9.7          4.0         4.6         16.2         12.5           1.7         3.4         7.1         7.1         8.2         9.7          7.0         8.0         13.3         11.8           2.0         4.3         8.4         8.4         9.4         11.0          7.6         8.8         15.0         12.5           34,638,781         2.4         4.8         8.6         8.6         9.0         10.6         3.

Property Type Allocation Allocation as of June 30, 2018



Geographic Diversification
Allocation as of June 30, 2018



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	KKR Mezzanine	2010 <sup>1</sup>	KKR
Clarion Lion	12/31/2006	Clarion Lion	PIMCO BRAVO	2011 <sup>1</sup>	PIMCO
Portfolio Advisors	10/31/2017	Portfolio Advisors	ARA American Strategic Value Realty	1/4/2018	ARA

<sup>&</sup>lt;sup>1</sup>Represents fund vintage year.

#### Policy & Custom Index Composition

Policy Index (10/1/2016-Current) 29% Russell 3000, 24% MSCI ACWI Free Ex US, 27% BBgBarc Aggregate, 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

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: Portfolio Return - [Risk-free Rate + Portfolio Beta x (Market Return - Risk-free Rate)].

**Beachmark 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: Portfolio Excess Return / 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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