



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



PERIOD ENDING: DECEMBER 31, 2016

Investment Performance Review for

Merced County Employees' Retirement Association

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4th quarter summary

THE ECONOMIC CLIMATE

- Economies around the globe experienced higher inflation as the effects of lower energy prices fall out of year-over-year inflation figures. U.S. headline inflation rose to 1.7% YoY and the market's inflation expectations increased sharply, as indicated by TIPS breakeven rates.
- U.S. consumer and business sentiment indicators improved markedly in the fourth quarter based on positive expectations of future economic growth.

MARKET PORTFOLIO IMPACTS

- U.S. interest rates moved higher in Q4, returning the yield curve to levels experienced one year ago. The Federal Reserve is not likely to increase rates drastically because of lower yields and economic growth around the globe, and due to an already strong U.S. dollar.
- The U.S. dollar rose 6.4% in Q4 on a trade-weighted basis. Currency movement continues to contribute to higher volatility for investors with unhedged currency exposure.

THE INVESTMENT CLIMATE

- The U.S. presidential election results took many investors by surprise. After an initial overnight plunge in the futures market, U.S. equities rallied on expectations of a more pro-business regulatory environment and the possibility of large-scale fiscal stimulus. U.S. equities may possess greater upside potential post-election.
- Fourth quarter earnings for the S&P 500 are estimated to grow 3.2% YoY, according to FactSet. If this positive growth comes to fruition it will mark the second quarter of positive growth and may indicate that the recent oil-driven earnings slump is behind us.

ASSET ALLOCATION ISSUES

- Global inflation rises in Q4 may mark a change in trend from disinflation seen in recent years. Investors should work to understand the degree of inflation protection in their portfolio.

A neutral risk stance seems warranted

Global reflation trends should be watched, and investors should understand the degree of inflation protection in their portfolio

U.S. economics summary

- U.S. real GDP grew 1.7% YoY in Q3, up from 1.3% in Q2. Consumer spending continued to account for the majority of economic growth, and rising sentiment may act as a boon for future growth. Net exports helped boost production, as well as private investment.
- Inflation moved higher during the quarter as headline CPI rose to 1.7% YoY, as of November, while core CPI rose to 2.1%. Increases in energy prices have resulted in a convergence between headline and core inflation figures. If oil prices remain stable, this will act as a tailwind for headline inflation in the future.
- The Fed raised its target federal funds rate to 0.50%-0.75% and forecast three rate hikes in 2017 at its December meeting, citing

continued modest economic growth and a tightening labor market, in addition to firming consumer prices.

- The labor market added 165,000 jobs per month on average during the fourth quarter. This is slightly below the expansion average of 199,000, but still a solid pace of hiring given where we are at in the labor cycle. The unemployment rate fell 0.2% to 4.7% at the end of December.
- While the economy continued to steadily add jobs, wage growth has lagged behind. Real average hourly earnings only increased 0.7% YoY in November. Softer wage growth may be due in part to workers taking on part-time roles who could not find full time work.

| | Most Recent | 12 Months Prior |
|--|-------------------|-------------------|
| GDP (<i>annual YoY</i>) | 1.7% 9/30/16 | 2.2% 9/30/15 |
| Inflation (<i>CPI YoY, Headline</i>) | 1.7% 11/30/16 | 0.4% 11/30/15 |
| Expected Inflation (<i>5yr-5yr forward</i>) | 2.1% 12/31/16 | 1.8% 12/31/15 |
| Fed Funds Rate | 0.50% 12/31/16 | 0.25% 12/31/15 |
| 10 Year Rate | 2.5% 12/31/16 | 2.3% 12/31/15 |
| U-3 Unemployment | 4.7% 12/31/16 | 5.0% 12/31/15 |
| U-6 Unemployment | 9.2% 12/31/16 | 9.9% 12/31/15 |

International economics summary

- The central theme of slow, but positive growth in countries across the globe continued in the third quarter. The U.S., western Europe, and Japan all experienced year-over-year growth rates between 1-2%.
 - The tapering of ECB purchases is likely more a result of mechanical and political obstacles than due to a need for tightening. If the central bank is forced to tighten quicker than desired, it could have an adverse impact on the current economic recovery.
- Developed countries experienced a coordinated pick up in inflation in recent months, suggesting we may be moving into a reflationary environment. Headline CPI was up 1.1% in the Eurozone in December, its highest rate in more than three years.
 - Italy voted against a referendum on constitutional reform on December 4th that would have weakened the power of the Senate in an attempt to make the country easier to govern. The Italian Prime Minister, Matteo Renzi, resigned shortly thereafter. Although Renzi's Democratic party will remain in power, the country's anti-establishment Five Star party has recently gained popularity.
- The ECB announced it would continue its asset purchase program through the initially scheduled end date of March 2017, but at a reduced rate. The program will extend until at least the end of 2017, and monthly bond purchases will fall to €60 billion from €80 billion in April.

| Area | GDP (Real, YoY) | Inflation (CPI, YoY) | Unemployment |
|----------------|--------------------------|-------------------------|--------------------------|
| United States | 1.7% <i>9/30/16</i> | 1.7% <i>11/30/16</i> | 4.7% <i>12/31/16</i> |
| Western Europe | 1.8% <i>9/30/16</i> | 0.9% <i>12/31/16</i> | 8.4% <i>9/30/16</i> |
| Japan | 1.1% <i>9/30/16</i> | 0.5% <i>11/30/16</i> | 3.1% <i>11/30/16</i> |
| BRIC Nations | 5.1% <i>9/30/16</i> | 3.4% <i>6/30/16</i> | 5.5% <i>9/30/16</i> |
| Brazil | (2.9%) <i>9/30/16</i> | 6.3% <i>12/31/16</i> | 11.9% <i>12/31/16</i> |
| Russia | (0.4%) <i>9/30/16</i> | 5.4% <i>12/31/16</i> | 5.2% <i>9/30/16</i> |
| India | 7.3% <i>9/30/16</i> | 3.6% <i>11/30/16</i> | 7.1% <i>12/31/16</i> |
| China | 6.7% <i>9/30/16</i> | 2.1% <i>12/31/16</i> | 4.0% <i>12/30/16</i> |

Equity environment

- We believe the U.S. election results have had a material impact on possible future equity return outcomes. There is likely greater upside potential for U.S. equities, though some of this has already been priced in with higher prices post-election.
- Both consumer and private sector sentiment have risen robustly. This positive shift may provide a tailwind to U.S. economic growth through spending and investment.
- Fourth quarter earnings for the S&P 500 are estimated to grow 3.2% year-over-year, according to FactSet. If this positive growth comes to fruition it will mark the second quarter of positive growth and may mean the recent earnings slump is now behind us.
- Value equities outperformed growth equities in the fourth quarter. The Russell 1000 Value index and Russell 1000 Growth index returned 6.7% and 1.0%, respectively. Energy and financial service companies have contributed to the performance rebound.
- The U.S. dollar rose 6.4% in Q4 on a trade-weighted basis which directly detracts from investment returns of U.S. investors with unhedged currency exposure.
- Japanese equities (Nikkei 225) delivered a 16.1% return on a hedged basis, but 1.2% on an unhedged basis – a 15% swing caused by currency movement.

| | QTD TOTAL RETURN | | YTD TOTAL RETURN | | 1 YEAR TOTAL RETURN | |
|--|------------------|----------|------------------|----------|---------------------|----------|
| | (unhedged) | (hedged) | (unhedged) | (hedged) | (unhedged) | (hedged) |
| US Large Cap (Russell 1000) | 3.8% | | 12.1% | | 12.1% | |
| US Small Cap (Russell 2000) | 8.8% | | 21.3% | | 21.3% | |
| US Large Value (Russell 1000 Value) | 6.7% | | 17.3% | | 17.3% | |
| US Large Growth (Russell 1000 Growth) | 1.0% | | 7.1% | | 7.1% | |
| International Large (MSCI EAFE) | (-0.7%) | 7.3% | 1.5% | 6.2% | 1.5% | 6.2% |
| Eurozone (Euro Stoxx 50) | 3.2% | 10.3% | 0.7% | 5.1% | 0.7% | 5.1% |
| U.K. (FTSE 100) | (0.8%) | 4.4% | (0.2%) | 19.0% | (0.2%) | 19.0% |
| Japan (NIKKEI 225) | 1.2% | 16.1% | 5.8% | 1.3% | 5.8% | 1.3% |
| Emerging Markets (MSCI Emerging Markets) | (4.1%) | (2.0%) | 11.6% | 7.5% | 11.6% | 7.5% |

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/16

Domestic equity

U.S. equity markets fell sharply in futures markets on the night of the election, but then recovered before market open the next morning. After this initial stumble, equities rallied higher to finish the quarter.

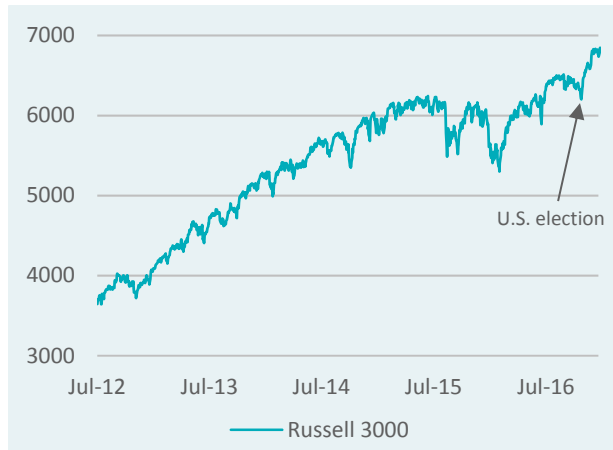
Post-election equity movement was likely driven by an improved economic outlook as well as several proposed policy changes that would benefit corporations, including lower tax rates and deregulation.

The financials sector was responsible for much of the gain in equity prices, likely due to the prospects of higher rates and a steeper curve. The S&P 500 Financials sector was up 16.5% after the election, compared to a 2.8% gain across the rest of the index.

As of December 30th, estimated earnings growth for the fourth quarter was 3.2% from the previous year, according to FactSet. Looking ahead, bottom-up analyst EPS forecasts point toward improving corporate earnings growth.

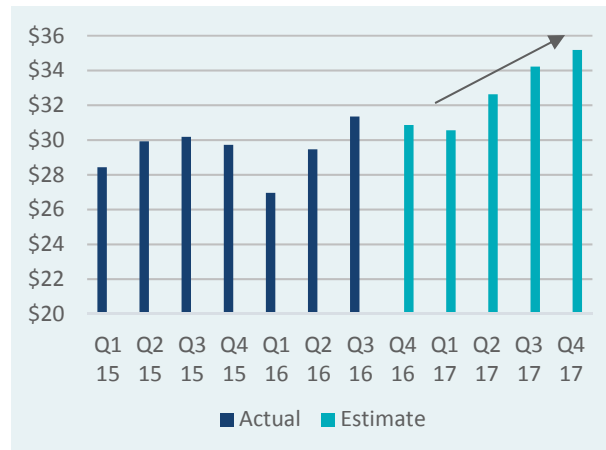
Proposed tax reform and deregulation have helped improve the U.S. earnings outlook

U.S. EQUITIES



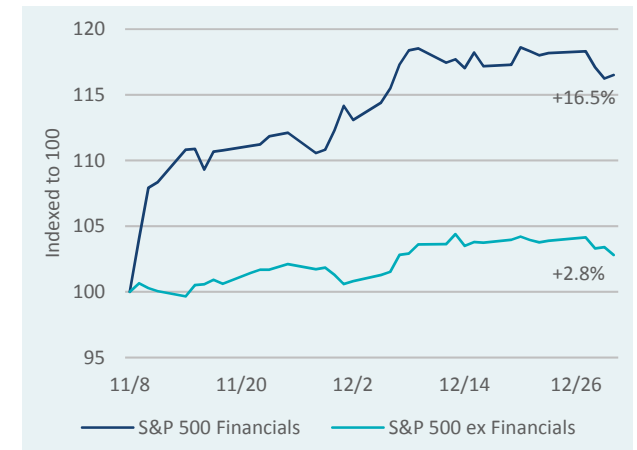
Source: Russell Investments, as of 12/30/16

S&P 500 EPS



Source: FactSet, as of 12/30/16

S&P 500 FINANCIALS



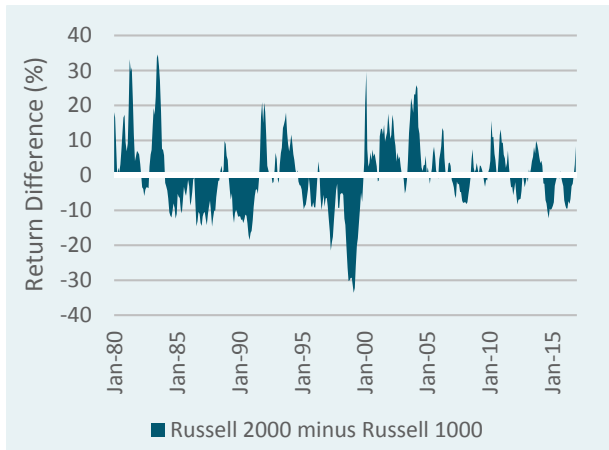
Source: Bloomberg, as of 12/30/16

Domestic equity size and style

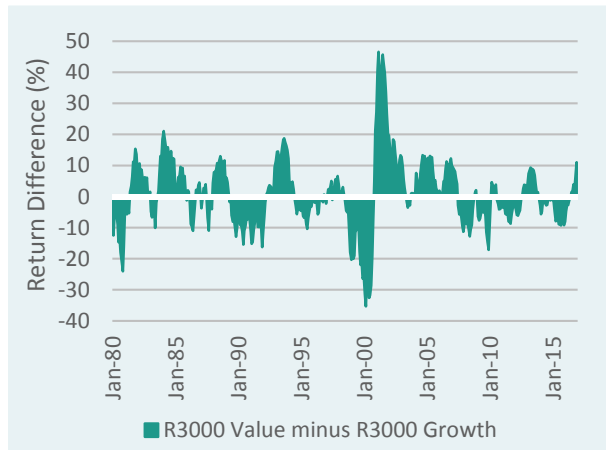
Small cap equities outperformed large cap equities in the fourth quarter as the Russell 2000 Index and Russell 1000 Index returned 8.8% and 3.8%, respectively. Much of this outperformance came after the U.S. presidential election as smaller companies could receive greater marginal benefit from deregulation proposed by Donald Trump. Renewed U.S. dollar strength also benefits smaller companies relative to larger companies due to greater insulation from foreign currency movements.

Value equities outperformed growth equities during the quarter. The Russell 1000 Value Index and Russell 1000 Growth Index returned 6.7% and 1.0%, respectively. This relative outperformance was driven by the Financials and Energy sectors, which are the two largest sectors in the value index. The magnitude of this recent value bounce back has brought the value premium back into positive territory for most trailing windows.

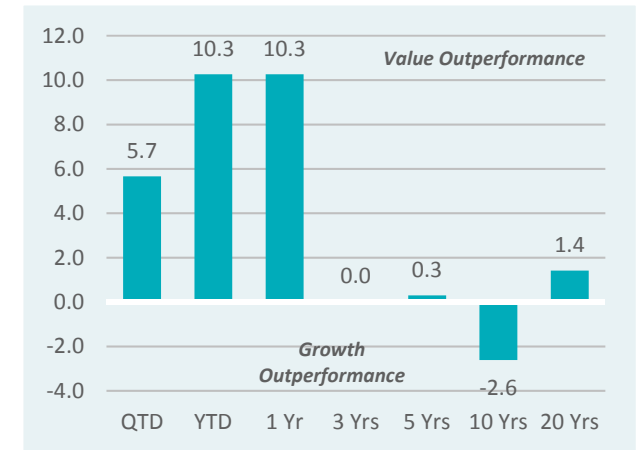
SMALL CAP VS LARGE CAP (YOY)



VALUE VS GROWTH (YOY)



U.S. VALUE VS. GROWTH RELATIVE PERFORMANCE



Source: Russell Investments, as of 12/31/16

Source: Russell Investments, as of 12/31/16

Source: Morningstar, as of 12/31/16

International equity

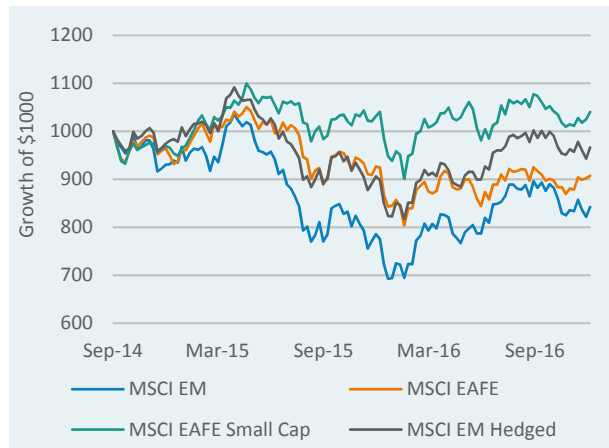
International equity markets narrowly outperformed domestic equities in December (S&P 500 2.0%) as the MSCI ACWI ex U.S. returned 2.2%.

European equity markets remained calm on the back of the announcement that the ECB would continue its asset purchase program through the initially scheduled end date of March 2017, but at a reduced rate. Adjustments to program constraints will be likely, given the mandated rule that the ECB cannot purchase more than 33% of any one country's national debt.

International developed equities delivered a 7.3% total return on a hedged basis over the quarter, but delivered -0.7% on an unhedged basis. Unhedged currency exposure continues to cause higher volatility for investors who choose not to hedge.

Japanese equities delivered a 16.1% return on a hedged basis, but 1.2% on an unhedged basis – a 15% swing caused by currency movement. Expectations of continued loose monetary policy and low interest rates in Japan contributed to yen weakness.

GLOBAL EQUITY PERFORMANCE



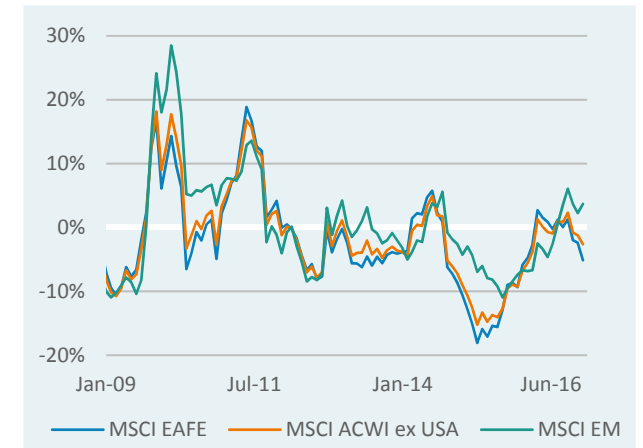
Source: Bloomberg, as of 12/31/16

INTERNATIONAL FORWARD P/E RATIOS



Source: Bloomberg, as of 12/31/16

EFFECT OF CURRENCY (1 YEAR ROLLING)



Source: MSCI, as of 12/31/16

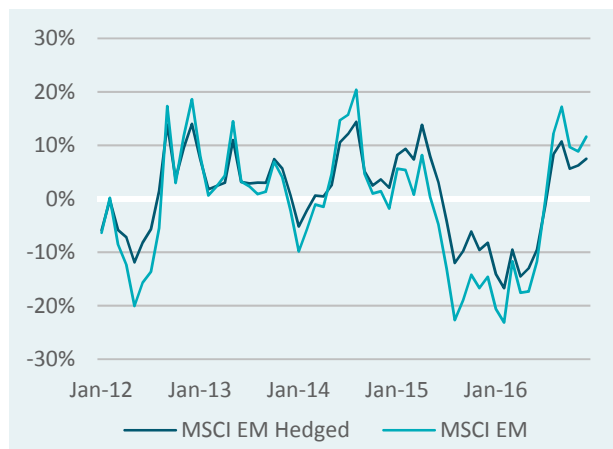
Emerging market equity

Emerging market economic growth has shown recovery as Russia and Brazil begin moving out of severe depressions and as commodity prices improve. Economic growth of the “BRIC” nations continues at a pace materially higher than that of developed nations, consistent with recent decades.

Some renewed investor optimism can be seen as equity valuations move higher. Emerging market equities

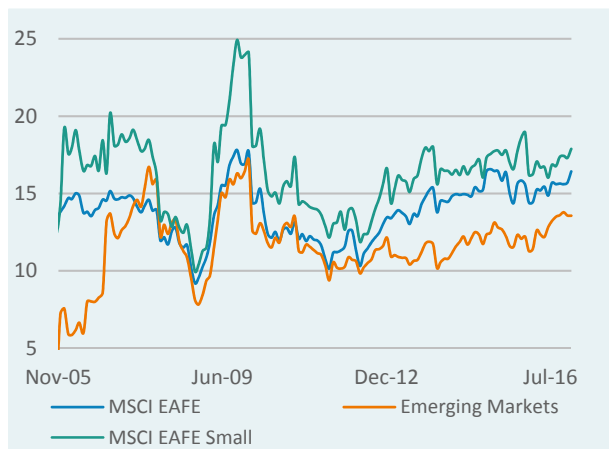
provided a muted quarter with a -2.0% return on a hedged basis, but delivered a positive 7.5% return for the year (MSCI Emerging Markets). Much of the recent performance stability can be attributed to a reversal or flattening of emerging market currency depreciation trends occurring since 2012. Earnings across the broader emerging markets have also reversed their downward trend, though not as quickly as the pace of price improvement as demonstrated in higher equity valuations.

12-MONTH ROLLING PERFORMANCE



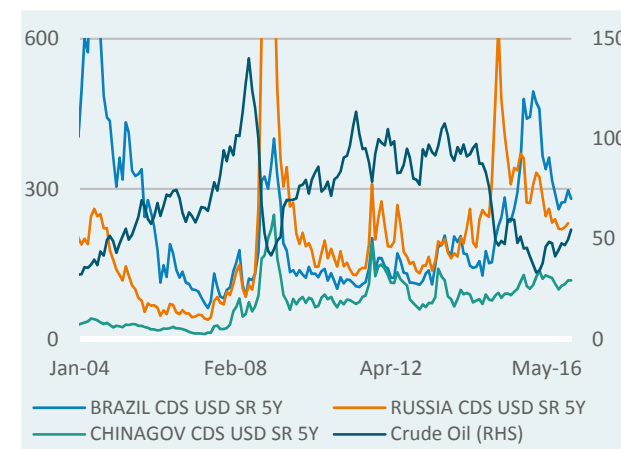
Source: MPI, as of 12/31/16

FORWARD P/E RATIOS



Source: Bloomberg, as of 12/31/16

CDS SPREADS



Source: MSCI, as of 12/31/16

Interest rate environment

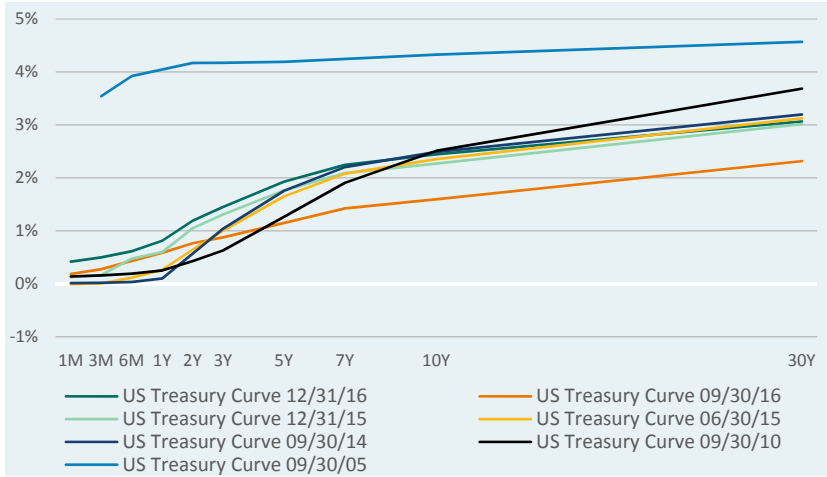
- The Federal Reserve raised interest rates at its December meeting, increasing the federal funds target rate by 0.25%, to a range of 0.50% to 0.75%. The Fed also increased its outlook for the number of 2017 rate hikes from two to three. Lower yields and economic growth outside of the U.S., along with an already strong dollar, reduce the probability of drastic rate rises.
- U.S. Treasury yields moved higher and the curve steepened on the prospects of higher inflation and economic growth. The spread between the 10 and 2-year yields was 1.25% at the end of December, its highest level in more than a year.
- Developed sovereign yields increased along with U.S. rates following the presidential election. The Japanese 10-year bond yield moved out of negative territory to 0.46% at the end of December, while the German 10-year bund yield hit an 11-month high of 0.37% before falling to finish the month at 0.20%.
- The U.S. is much further ahead in the monetary policy cycle than other developed countries, which has led to a widening yield differential between Treasuries and global sovereign bonds. While Treasuries remain expensive compared to history, the higher yield makes them relatively attractive.

| Area | Short Term (3M) | 10 Year |
|---------------|-----------------|---------|
| United States | 0.50% | 2.45% |
| Germany | (0.99%) | 0.20% |
| France | (0.90%) | 0.68% |
| Spain | (0.49%) | 1.38% |
| Italy | (0.50%) | 1.81% |
| Greece | 1.37% | 7.02% |
| U.K. | 0.51% | 1.24% |
| Japan | (0.42%) | 0.04% |
| Australia | 1.70% | 2.77% |
| China | 2.35% | 3.06% |
| Brazil | 12.91% | 10.55% |
| Russia | 8.78% | 8.29% |

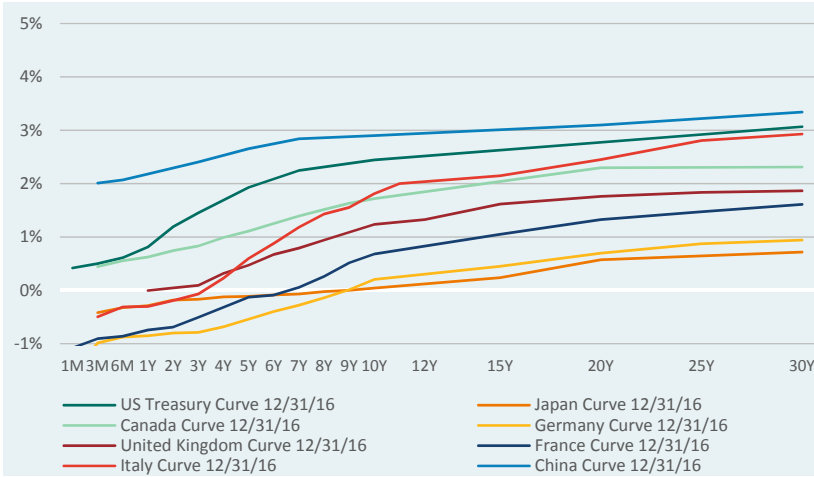
Source: Bloomberg, as of 12/31/16

Yield environment

U.S. YIELD CURVE

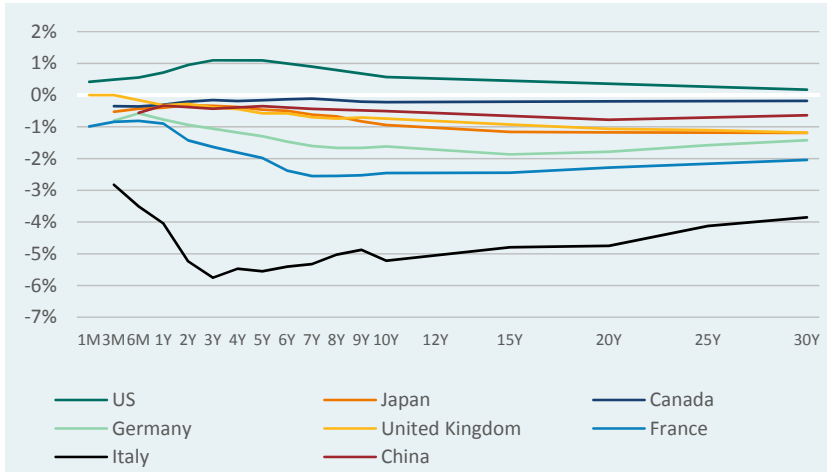


GLOBAL GOVERNMENT YIELD CURVES

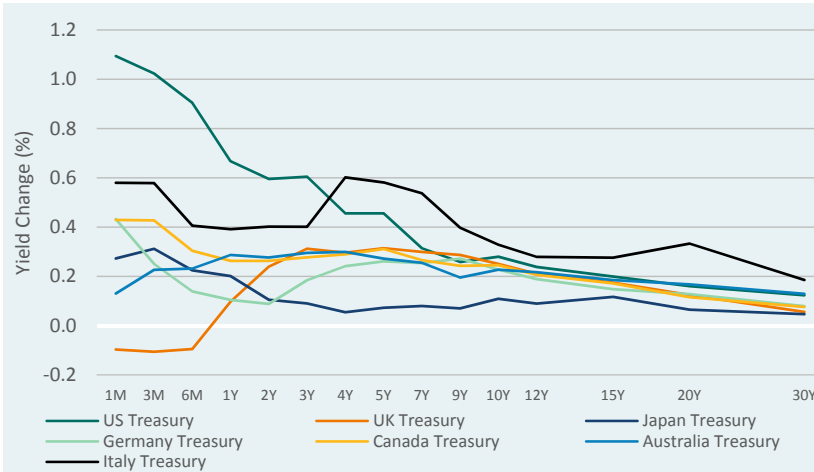


Global investors continue to prefer U.S. Treasuries due to higher relative yields

YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/16

Currency

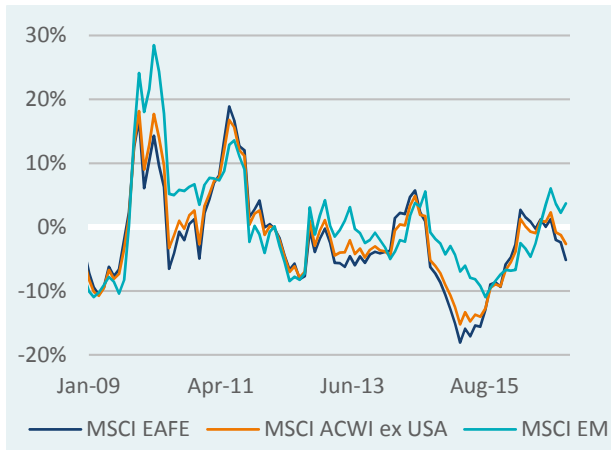
The U.S. dollar rose considerably in the fourth quarter, up 6.4% against a basket of major currencies. The strong dollar created a large gap between hedged and unhedged international exposures, as foreign currency losses eroded unhedged returns.

Renewed dollar strength occurred after the presidential election likely due to increased expectations of U.S. economic growth and higher interest rates. A widening gap between Treasury yields and other developed sovereign bonds could cause greater demand for

Treasuries and provide a tailwind for further dollar appreciation. However, higher inflation at the same time could offset some of the potential strength.

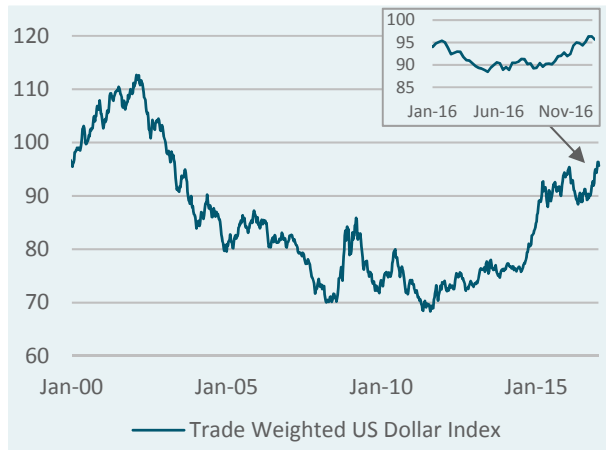
Emerging market currencies were hit hard by the strength in the U.S. dollar, influenced by the Fed pointing towards faster than anticipated interest rates increases and possible protectionist trade policies from the Trump administration. The JPM EM Currency Index was down 4.0% in the fourth quarter.

EFFECT OF CURRENCY (1YR ROLLING)



Source: MPI, as of 12/31/16

LONG-TERM TRADE WEIGHTED DOLLAR



Source: FRED, as of 12/31/16

JPM EM CURRENCY INDEX



Source: Bloomberg, as of 12/31/16

- The composite fund returned 0.7% in the fourth quarter of 2016 and ranked in the 50th percentile among other \$250mm-\$1B public funds (0.7% median). The fund lagged its policy index (1.3%) during this time period. Longer term, the three-year returns of 4.8% ranked above the median among its peer public plans (4.5%).

- Fourth quarter results were enhanced by the following factors:
 1. GSO Energy Opportunities gained 7.6% for the quarter, benefiting from rising energy prices and credit spreads contracting in the energy sector.
 2. Taurus Mining gained 7.3% in the fourth quarter, benefiting from rising thermal coal prices and income generated from several outstanding loans.
 3. DFA Small Cap rose 12.0% in the fourth quarter beating the Russell 2000 return of 8.8%. DFA benefited from a value bias which outperformed growth in the quarter.

- Fourth quarter results were hindered by the following factors:
 1. Copper Rock underperformed the MSCI World ex US Small cap for a second quarter (-7.0% vs -2.7%). The portfolio faced headwinds due to style and outperformance of lower quality stocks in the index which Copper Rock continues to avoid. The portfolio was also positioned towards heavy cyclical, which underperformed due to the markets search for deep value.
 2. Wells Capital lost 6.7% underperforming the MSCI Emerging Market return of -4.1%, and ranked in the bottom quartile of its peers. The sectors that contributed to the underperformance were information technology, consumer discretionary, consumer staples, and financials. Holdings in China/Hong Kong and South Africa also detracted from performance.
 3. Mellon Dynamic US Equity gained 2.0% trailing the S&P 500 by 3.8%. Defensive sectors such as telecom and utilities underperformed in November, but recovered in December. A long position in Treasuries was also a drag on performance.

Total Fund
Performance Summary (Gross of Fees)

Period Ending: December 31, 2016

| | Market Value (\$) | 3 Mo (%) | Rank | YTD (%) | Rank | 3 Yrs (%) | Rank | 5 Yrs (%) | Rank | 7 Yrs (%) | Rank | 10 Yrs (%) | Rank | Return (%) | Since |
|--|----------------------|-------------|-----------|-------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|---------------|-----------|---------------|---------------|
| Total Fund - Gross* | 695,732,699 | 0.7 | 50 | 7.9 | 49 | 4.8 | 28 | 8.5 | 46 | 8.1 | 40 | 4.7 | 74 | 8.0 | Dec-94 |
| <i>Policy Index¹</i> | | 1.3 | 26 | 9.1 | 16 | 5.1 | 12 | 8.9 | 36 | 8.3 | 30 | 5.1 | 53 | 5.7 | Dec-94 |
| <i>InvestorForce Public DB \$250mm-\$1B Gross Median</i> | | 0.7 | | 7.8 | | 4.5 | | 8.4 | | 8.0 | | 5.1 | | 8.1 | Dec-94 |
| US Equity - Gross | 211,089,072 | 4.7 | 39 | 16.0 | 8 | 9.8 | 3 | 15.7 | 6 | 13.3 | 21 | 7.5 | 24 | 9.7 | Dec-94 |
| <i>80% R1000/ 20% R2000¹</i> | | 4.9 | 34 | 13.9 | 28 | 8.4 | 32 | 14.7 | 36 | 12.9 | 41 | 7.1 | 47 | 9.6 | Dec-94 |
| <i>InvestorForce All DB US Eq Gross Median</i> | | 4.3 | | 12.7 | | 7.9 | | 14.4 | | 12.8 | | 7.0 | | 9.7 | Dec-94 |
| Mellon Dynamic US Equity - Gross | 65,637,961 | 2.0 | 84 | 14.8 | 9 | 11.4 | 3 | -- | -- | -- | -- | -- | -- | 17.7 | Dec-12 |
| <i>S&P 500</i> | | 3.8 | 50 | 12.0 | 31 | 8.9 | 33 | 14.7 | 35 | 12.8 | 45 | 6.9 | 70 | 14.3 | Dec-12 |
| <i>eA US Large Cap Core Equity Gross Median</i> | | 3.8 | | 10.4 | | 8.1 | | 14.2 | | 12.6 | | 7.4 | | 14.0 | Dec-12 |
| Mellon Large Cap - Gross² | 105,510,053 | 3.8 | 48 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10.8 | Mar-16 |
| <i>Russell 1000</i> | | 3.8 | 48 | 12.1 | 39 | 8.6 | 33 | 14.7 | 37 | 12.9 | 37 | 7.1 | 61 | 10.8 | Mar-16 |
| <i>eA US Large Cap Equity Gross Median</i> | | 3.7 | | 10.4 | | 7.8 | | 14.1 | | 12.4 | | 7.4 | | 9.6 | Mar-16 |
| DFA Small Cap - Gross | 20,383,660 | 12.0 | 26 | 24.9 | 31 | -- | -- | -- | -- | -- | -- | -- | -- | 9.3 | Jun-14 |
| <i>Russell 2000</i> | | 8.8 | 52 | 21.3 | 47 | 6.7 | 57 | 14.5 | 63 | 13.2 | 72 | 7.1 | 80 | 6.8 | Jun-14 |
| <i>eA US Small Cap Equity Gross Median</i> | | 9.1 | | 20.7 | | 7.4 | | 15.4 | | 14.5 | | 8.5 | | 7.5 | Jun-14 |
| PanAgora - Gross | 19,557,398 | 9.0 | 51 | 21.3 | 47 | 8.9 | 32 | -- | -- | -- | -- | -- | -- | 11.4 | Sep-13 |
| <i>Russell 2000</i> | | 8.8 | 52 | 21.3 | 47 | 6.7 | 57 | 14.5 | 63 | 13.2 | 72 | 7.1 | 80 | 9.0 | Sep-13 |
| <i>eA US Small Cap Equity Gross Median</i> | | 9.1 | | 20.7 | | 7.4 | | 15.4 | | 14.5 | | 8.5 | | 9.8 | Sep-13 |
| International Equity - Gross | 164,393,278 | -3.1 | 75 | 2.8 | 70 | -1.8 | 77 | 5.6 | 70 | 4.5 | 34 | 1.9 | 35 | 4.8 | Dec-98 |
| <i>MSCI ACWI ex US¹</i> | | -1.2 | 29 | 5.0 | 35 | -1.3 | 64 | 5.9 | 63 | 3.5 | 70 | 0.7 | 69 | 3.6 | Dec-98 |
| <i>InvestorForce All DB ex-US Eq Gross Median</i> | | -2.2 | | 4.1 | | -1.0 | | 6.4 | | 4.0 | | 1.4 | | 5.0 | Dec-98 |

* Managers are ranked against the eInvestment Alliance (eA) style universes. Asset class composites are ranked against the InvestorForce universes.

** Since inception returns are based on the first full quarter of performance.

*** Since inception date denotes last day of the month.

1 See Benchmark History.

2 Funded on 3/15/2016.

Total Fund
Performance Summary (Gross of Fees)

Period Ending: December 31, 2016

| | Market Value (\$) | 3 Mo (%) | Rank | YTD (%) | Rank | 3 Yrs (%) | Rank | 5 Yrs (%) | Rank | 7 Yrs (%) | Rank | 10 Yrs (%) | Rank | Return (%) | Since |
|---|--------------------|-------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|---------------|
| Copper Rock - Gross | 24,034,323 | -7.0 | 93 | -7.3 | 99 | 1.3 | 83 | -- | -- | -- | -- | -- | -- | 3.8 | Sep-13 |
| MSCI World ex US Small Cap GD | | -2.7 | 50 | 4.7 | 23 | 1.7 | 72 | 9.4 | 93 | 7.4 | 94 | -- | -- | 3.3 | Sep-13 |
| eA EAFE Small Cap Equity Gross Median | | -2.9 | | 1.1 | | 2.9 | | 12.3 | | 9.6 | | 4.5 | | 5.0 | Sep-13 |
| EARNEST Partners - Gross ³ | 153,417 | | | | | | | | | | | | | | |
| Mellon International - Gross ² | 101,326,424 | -0.7 | 34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 | Mar-16 |
| MSCI EAFE Gross | | -0.7 | 33 | 1.5 | 47 | -1.2 | 71 | 7.0 | 75 | 4.3 | 82 | 1.2 | 78 | 4.5 | Mar-16 |
| eA All EAFE Equity Gross Median | | -1.8 | | 1.3 | | 0.1 | | 8.1 | | 5.6 | | 2.4 | | 3.6 | Mar-16 |
| Wells Capital - Gross | 38,879,114 | -6.7 | 79 | 13.4 | 28 | -1.2 | 52 | -- | -- | -- | -- | -- | -- | -0.2 | Mar-12 |
| MSCI Emerging Markets Gross | | -4.1 | 42 | 11.6 | 40 | -2.2 | 69 | 1.6 | 81 | 0.8 | 80 | 2.2 | 76 | -1.1 | Mar-12 |
| eA Emg Mkts Equity Gross Median | | -4.5 | | 10.4 | | -1.2 | | 3.3 | | 2.2 | | 3.1 | | 0.5 | Mar-12 |
| US Fixed Income - Gross | 178,032,641 | -1.2 | 21 | 5.9 | 40 | 3.5 | 53 | 3.7 | 49 | 4.8 | 50 | 3.9 | 90 | 5.7 | Dec-94 |
| US Fixed Custom ¹ | | -1.6 | 29 | 5.9 | 40 | 3.4 | 55 | 2.6 | 79 | 3.9 | 77 | 4.5 | 73 | 5.9 | Dec-94 |
| InvestorForce All DB US Fix Inc Gross Median | | -2.2 | | 4.9 | | 3.6 | | 3.6 | | 4.8 | | 5.2 | | 6.4 | Dec-94 |
| AXA - Gross | 36,885,478 | 2.7 | 18 | 14.9 | 38 | 3.9 | 71 | 7.5 | 35 | -- | -- | -- | -- | 8.0 | Mar-10 |
| BofA Merrill Lynch US High Yield Master II TR | | 1.9 | 39 | 17.5 | 14 | 4.7 | 41 | 7.4 | 40 | 8.0 | 51 | 7.3 | 50 | 7.6 | Mar-10 |
| eA US High Yield Fixed Inc Gross Median | | 1.6 | | 14.0 | | 4.5 | | 7.2 | | 8.0 | | 7.3 | | 7.6 | Mar-10 |
| Barrow Hanley - Gross | 112,197,467 | -2.9 | 73 | 2.9 | 65 | 3.2 | 69 | 2.7 | 67 | 3.9 | 78 | -- | -- | 3.9 | Mar-10 |
| BBgBarc Aggregate ¹ | | -3.0 | 75 | 2.6 | 77 | 3.0 | 82 | 2.2 | 92 | -- | -- | -- | -- | 3.6 | Mar-10 |
| eA US Core Fixed Inc Gross Median | | -2.7 | | 3.2 | | 3.4 | | 2.9 | | 4.2 | | 4.9 | | 4.1 | Mar-10 |
| Guggenheim Loan - Gross | 28,949,696 | 1.5 | 95 | 7.6 | 86 | -- | -- | -- | -- | -- | -- | -- | -- | 3.9 | Aug-14 |
| Credit Suisse Leveraged Loans | | 2.3 | 34 | 9.9 | 39 | 3.8 | 66 | 5.3 | 63 | 5.5 | 74 | 4.3 | 87 | 3.6 | Aug-14 |
| eA Float-Rate Bank Loan Gross Median | | 2.0 | | 9.2 | | 4.0 | | 5.6 | | 5.8 | | 5.0 | | 4.4 | Aug-14 |

³ Liquidating as of 9/14/2016.

Total Fund
Performance Summary (Gross of Fees)

Period Ending: December 31, 2016

| | Market Value (\$) | 3 Mo (%) | Rank | YTD (%) | Rank | 3 Yrs (%) | Rank | 5 Yrs (%) | Rank | 7 Yrs (%) | Rank | 10 Yrs (%) | Rank | Return (%) | Since |
|---|-------------------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|------------|-----------|-------------|---------------|
| Hedge Fund - Net | 28,965,124 | 2.3 | 33 | 0.2 | 80 | -- | -- | -- | -- | -- | -- | -- | -- | 1.4 | Jun-14 |
| <i>Hedge Fund Custom¹</i> | | 1.2 | 66 | 3.3 | 41 | -- | -- | -- | -- | -- | -- | -- | -- | 1.9 | Jun-14 |
| <i>InvestorForce All DB Hedge Funds Gross Median</i> | | 1.6 | | 2.5 | | 1.9 | | 4.9 | | 4.0 | | 2.8 | | 1.0 | Jun-14 |
| OZ Domestic II - Net | 15,160,219 | 2.8 | 28 | 4.2 | 53 | -- | -- | -- | -- | -- | -- | -- | -- | 3.2 | Jun-14 |
| <i>HFRI RV: Multi-Strategy Index</i> | | 1.5 | 43 | 6.3 | 43 | 3.4 | 53 | 5.2 | 54 | 5.2 | 51 | 3.7 | 80 | 2.8 | Jun-14 |
| <i>eV Alt All Multi-Strategy Median</i> | | 0.9 | | 4.8 | | 3.7 | | 5.7 | | 5.3 | | 6.1 | | 2.8 | Jun-14 |
| Titan - Net | 13,804,905 | 1.6 | 39 | -3.8 | 88 | -- | -- | -- | -- | -- | -- | -- | -- | -0.6 | Jun-14 |
| <i>HFRI Fund of Funds Composite Index</i> | | 0.9 | 60 | 0.5 | 59 | 1.2 | 57 | 3.4 | 77 | 2.4 | 81 | 1.3 | 92 | 0.6 | Jun-14 |
| <i>eV Alt Fund of Funds - Multi-Strategy Median</i> | | 1.2 | | 1.3 | | 1.6 | | 4.9 | | 3.9 | | 3.3 | | 0.8 | Jun-14 |
| Real Estate - Gross | 57,268,764 | 1.7 | 44 | 7.7 | 62 | 9.5 | 88 | 10.2 | 79 | 11.0 | 69 | 5.8 | 30 | 8.8 | Mar-99 |
| <i>NCREIF ODCE net¹</i> | | 1.9 | 40 | 7.8 | 62 | 11.2 | 72 | 12.1 | 42 | 11.7 | 63 | 6.9 | 6 | 8.9 | Mar-99 |
| <i>InvestorForce All DB Real Estate Pub+Priv Gross Median</i> | | 1.6 | | 8.4 | | 11.8 | | 11.9 | | 12.6 | | 5.1 | | 8.4 | Mar-99 |
| BlackRock RE - Gross | 3,926,446 | -8.1 | 96 | 1.4 | 38 | -- | -- | -- | -- | -- | -- | -- | -- | -2.8 | Jul-14 |
| <i>FTSE NAREIT Developed ex US Gross</i> | | -7.7 | 70 | 2.0 | 15 | 0.6 | 49 | 8.4 | 65 | 5.7 | 33 | 0.1 | 50 | -2.4 | Jul-14 |
| <i>eA EAFE REIT Gross Median</i> | | -7.5 | | 0.7 | | 0.6 | | 8.7 | | 5.6 | | 0.1 | | 0.2 | Jul-14 |
| Greenfield Gap VII - Gross | 10,630,267 | 8.0 | -- | 13.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.6 | Dec-14 |
| <i>NCREIF CEVA 1Q Lag - NET</i> | | 2.5 | -- | 13.1 | -- | 15.1 | -- | -- | -- | -- | -- | -- | -- | 15.0 | Dec-14 |
| Patron Capital V - Gross⁴ | 1,267,698 | 0.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -7.5 | Jan-16 |
| <i>NCREIF CEVA 1Q Lag - NET</i> | | 2.5 | -- | 13.1 | -- | 15.1 | -- | -- | -- | -- | -- | -- | -- | 13.1 | Jan-16 |
| UBS Trumbull Property - Gross | 41,444,353 | 1.5 | -- | 7.2 | -- | 10.6 | -- | 10.5 | -- | 11.7 | -- | 5.9 | -- | 8.9 | Mar-99 |
| <i>NCREIF ODCE net</i> | | 1.9 | -- | 7.8 | -- | 11.4 | -- | 11.8 | -- | 13.0 | -- | 7.8 | -- | 10.3 | Mar-99 |

⁴ Funded 1/22/2016.

Total Fund
Performance Summary (Gross of Fees)

Period Ending: December 31, 2016

| | Market Value (\$) | 3 Mo (%) | Rank | YTD (%) | Rank | 3 Yrs (%) | Rank | 5 Yrs (%) | Rank | 7 Yrs (%) | Rank | 10 Yrs (%) | Rank | Return (%) | Since |
|---|----------------------|-------------|-----------|-------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|---------------|-----------|---------------|---------------|
| Private Equity - Net | 36,138,778 | 2.2 | 54 | 3.7 | 74 | 9.2 | 53 | 5.3 | 92 | 9.6 | 62 | 7.6 | 52 | 7.0 | Jun-05 |
| <i>Russell 3000 +3% 1Q Lag</i> | | 5.5 | 7 | 18.0 | 1 | 13.4 | 21 | 19.7 | 1 | 17.9 | 1 | 11.9 | 5 | 13.0 | Jun-05 |
| <i>InvestorForce All DB Private Eq Net Median</i> | | 2.4 | | 7.4 | | 9.4 | | 10.0 | | 10.2 | | 7.7 | | 8.8 | Jun-05 |
| Adams Street - Net | 8,882,124 | 4.1 | -- | 9.1 | -- | 13.3 | -- | 11.2 | -- | 12.9 | -- | 7.7 | -- | 5.8 | Sep-05 |
| Invesco IV - Net | 3,028,820 | 5.6 | -- | 6.9 | -- | 13.8 | -- | 5.6 | -- | 11.9 | -- | 9.6 | -- | 8.8 | Jun-05 |
| Invesco VI - Net | 4,578,998 | 3.6 | -- | 3.7 | -- | 14.4 | -- | -- | -- | -- | -- | -- | -- | 10.4 | Jun-13 |
| Ocean Avenue II - Net | 5,521,943 | -2.1 | -- | 0.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -1.6 | Jun-14 |
| Pantheon I - Net | 1,884,164 | 1.8 | -- | 1.4 | -- | 4.6 | -- | 3.7 | -- | 8.0 | -- | 5.0 | -- | 2.8 | Dec-05 |
| Pantheon II - Net | 3,562,286 | 1.7 | -- | 9.7 | -- | 13.5 | -- | 9.8 | -- | -- | -- | -- | -- | 9.8 | Dec-11 |
| Pantheon Secondary - Net | 2,228,852 | 1.9 | -- | -1.1 | -- | 1.2 | -- | -1.3 | -- | 2.5 | -- | -- | -- | 2.9 | Jun-07 |
| Raven Asset Fund II - Net | 6,451,591 | 1.5 | -- | -0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -1.6 | Aug-14 |
| Infrastructure - Net | 5,440,381 | -1.5 | -- | -0.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -0.3 | Dec-14 |
| <i>CPI-U Headline +5%</i> | | 2.0 | -- | 7.1 | -- | 5.8 | -- | 6.0 | -- | -- | -- | -- | -- | 5.9 | Dec-14 |
| KKR Global II - Net | 3,140,624 | -2.4 | -- | -2.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.7 | Dec-14 |
| North Haven Infrastructure II - Net | 2,299,757 | -0.5 | -- | 4.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -2.8 | May-15 |
| <i>CPI-U Headline +5%</i> | | 2.0 | -- | 7.1 | -- | 5.8 | -- | 6.0 | -- | -- | -- | -- | -- | 6.5 | May-15 |
| Natural Resources - Net | 2,125,798 | 7.3 | -- | 42.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 31.5 | Sep-15 |
| <i>CPI-U Headline +5%</i> | | 2.0 | -- | 7.1 | -- | 5.8 | -- | 6.0 | -- | -- | -- | -- | -- | 6.7 | Sep-15 |
| GSO Energy Opportunities - Net | 887,949 | 7.6 | -- | 35.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 32.3 | Nov-15 |
| Taurus Mining - Net | 1,237,849 | 7.3 | -- | 48.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 35.1 | Sep-15 |
| <i>CPI-U Headline +5%</i> | | 2.0 | -- | 7.1 | -- | 5.8 | -- | 6.0 | -- | -- | -- | -- | -- | 6.7 | Sep-15 |
| Cash - Gross | 7,872,657 | 0.1 | -- | 0.4 | -- | 0.4 | -- | 0.5 | -- | 1.0 | -- | 4.9 | -- | 4.4 | Sep-03 |
| Treasury Cash - Gross | 4,406,205 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Sep-11 |

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2016

| | Market Value (\$) | 3 Mo (%) | YTD (%) | 3 Yrs (%) | 5 Yrs (%) | 7 Yrs (%) | 10 Yrs (%) |
|--|----------------------|-------------|-------------|--------------|--------------|--------------|---------------|
| Total Fund - Net | 695,732,699 | 0.6 | 7.5 | 4.4 | 8.1 | -- | -- |
| <i>Policy Index</i> ¹ | | 1.3 | 9.1 | 5.1 | 8.9 | -- | -- |
| US Equity - Net | 211,089,072 | 4.6 | 15.7 | 9.6 | 15.5 | -- | -- |
| <i>80% R1000/ 20% R2000</i> ¹ | | 4.9 | 13.9 | 8.4 | 14.7 | 12.9 | 7.1 |
| Mellon Dynamic US Equity - Net | 65,637,961 | 1.9 | 14.5 | 11.1 | -- | -- | -- |
| <i>S&P 500</i> | | 3.8 | 12.0 | 8.9 | 14.7 | 12.8 | 6.9 |
| Mellon Large Cap - Net ² | 105,510,053 | 3.8 | -- | -- | -- | -- | -- |
| <i>Russell 1000</i> | | 3.8 | 12.1 | 8.6 | 14.7 | 12.9 | 7.1 |
| DFA Small Cap - Net | 20,383,660 | 11.9 | 24.4 | -- | -- | -- | -- |
| <i>Russell 2000</i> | | 8.8 | 21.3 | 6.7 | 14.5 | 13.2 | 7.1 |
| PanAgora - Net | 19,557,398 | 8.8 | 20.4 | 8.1 | -- | -- | -- |
| <i>Russell 2000</i> | | 8.8 | 21.3 | 6.7 | 14.5 | 13.2 | 7.1 |
| International Equity - Net | 164,393,278 | -3.2 | 2.2 | -2.4 | 4.8 | -- | -- |
| <i>MSCI ACWI ex US</i> ¹ | | -1.2 | 5.0 | -1.3 | 5.9 | 3.5 | 0.7 |
| Copper Rock - Net | 24,034,323 | -7.2 | -8.1 | 0.4 | -- | -- | -- |
| <i>MSCI World ex US Small Cap GD</i> | | -2.7 | 4.7 | 1.7 | 9.4 | 7.4 | -- |
| EARNEST Partners - Net ³ | 153,417 | | | | | | |
| Mellon International - Net ² | 101,326,424 | -0.7 | -- | -- | -- | -- | -- |
| <i>MSCI EAFE Gross</i> | | -0.7 | 1.5 | -1.2 | 7.0 | 4.3 | 1.2 |
| Wells Capital - Net | 38,879,114 | -6.9 | 12.3 | -2.1 | -- | -- | -- |
| <i>MSCI Emerging Markets Gross</i> | | -4.1 | 11.6 | -2.2 | 1.6 | 0.8 | 2.2 |

¹ See Benchmark History.

² Funded on 3/15/2016.

³ Liquidating as of 9/14/2016.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2016

| | Market Value (\$) | 3 Mo (%) | YTD (%) | 3 Yrs (%) | 5 Yrs (%) | 7 Yrs (%) | 10 Yrs (%) |
|--|----------------------|-------------|-------------|--------------|--------------|--------------|---------------|
| US Fixed Income - Net | 178,032,641 | -1.3 | 5.6 | 3.3 | 3.5 | -- | -- |
| <i>US Fixed Custom</i> ¹ | | -1.6 | 5.9 | 3.4 | 2.6 | 3.9 | 4.5 |
| AXA - Net | 36,885,478 | 2.6 | 14.6 | 3.6 | 7.2 | -- | -- |
| <i>BofA Merrill Lynch US High Yield Master II TR</i> | | 1.9 | 17.5 | 4.7 | 7.4 | 8.0 | 7.3 |
| Barrow Hanley - Net | 112,197,467 | -3.0 | 2.7 | 3.0 | 2.4 | -- | -- |
| <i>BBgBarc Aggregate</i> ¹ | | -3.0 | 2.6 | 3.0 | 2.2 | -- | -- |
| Guggenheim Loan - Net | 28,949,696 | 1.5 | 7.6 | -- | -- | -- | -- |
| <i>Credit Suisse Leveraged Loans</i> | | 2.3 | 9.9 | 3.8 | 5.3 | 5.5 | 4.3 |
| Hedge Fund - Net | 28,965,124 | 2.3 | 0.2 | -- | -- | -- | -- |
| <i>Hedge Fund Custom</i> ¹ | | 1.2 | 3.3 | -- | -- | -- | -- |
| OZ Domestic II - Net | 15,160,219 | 2.8 | 4.2 | -- | -- | -- | -- |
| <i>HFRI RV: Multi-Strategy Index</i> | | 1.5 | 6.3 | 3.4 | 5.2 | 5.2 | 3.7 |
| Titan - Net | 13,804,905 | 1.6 | -3.8 | -- | -- | -- | -- |
| <i>HFRI Fund of Funds Composite Index</i> | | 0.9 | 0.5 | 1.2 | 3.4 | 2.4 | 1.3 |
| Real Estate - Net | 57,268,764 | 1.5 | 6.2 | 8.1 | 9.0 | -- | -- |
| <i>NCREIF ODCE net</i> ¹ | | 1.9 | 7.8 | 11.2 | 12.1 | 12.7 | -- |
| BlackRock RE - Net | 3,926,446 | -8.1 | 1.2 | -- | -- | -- | -- |
| <i>FTSE NAREIT Developed ex US Gross</i> | | -7.7 | 2.0 | 0.6 | 8.4 | 5.7 | 0.1 |
| Greenfield Gap VII - Net | 10,630,267 | 8.0 | 12.5 | -- | -- | -- | -- |
| <i>NCREIF CEVA 1Q Lag - NET</i> | | 2.5 | 13.1 | 15.1 | -- | -- | -- |
| Patron Capital V - Net⁴ | 1,267,698 | 0.0 | -- | -- | -- | -- | -- |
| <i>NCREIF CEVA 1Q Lag - NET</i> | | 2.5 | 13.1 | 15.1 | -- | -- | -- |

⁴ Funded 1/22/2016.

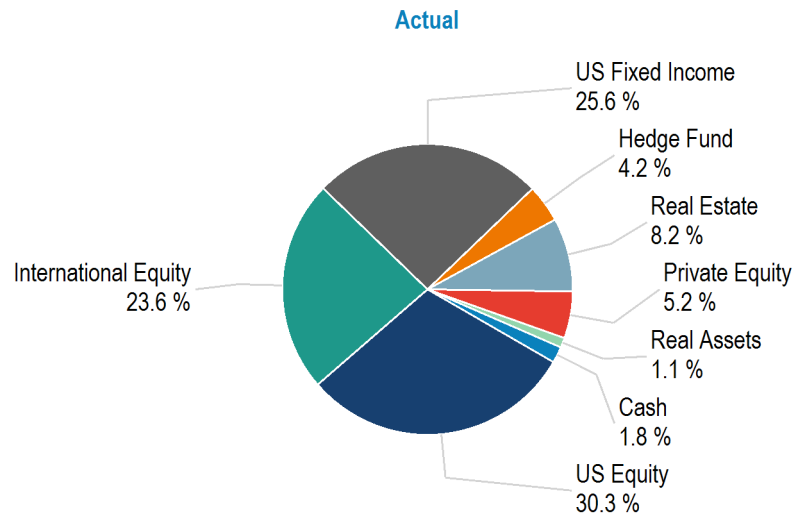
Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2016

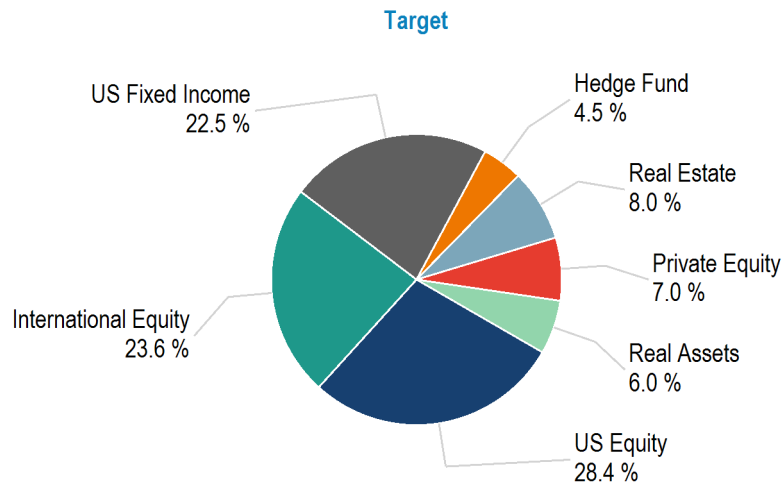
| | Market Value (\$) | 3 Mo (%) | YTD (%) | 3 Yrs (%) | 5 Yrs (%) | 7 Yrs (%) | 10 Yrs (%) |
|-------------------------------------|----------------------|-------------|-------------|--------------|--------------|--------------|---------------|
| UBS Trumbull Property - Net | 41,444,353 | 1.2 | 6.0 | 9.4 | 9.4 | -- | -- |
| <i>NCREIF ODCE net</i> | | 1.9 | 7.8 | 11.4 | 11.8 | 13.0 | 7.8 |
| Private Equity - Net | 36,138,778 | 2.2 | 3.7 | 9.2 | 5.3 | 9.6 | 7.6 |
| <i>Russell 3000 +3% 1Q Lag</i> | | 5.5 | 18.0 | 13.4 | 19.7 | -- | -- |
| Adams Street - Net | 8,882,124 | 4.1 | 9.1 | 13.3 | 11.2 | 12.9 | 7.7 |
| Invesco IV - Net | 3,028,820 | 5.6 | 6.9 | 13.8 | 5.6 | -- | -- |
| Invesco VI - Net | 4,578,998 | 3.6 | 3.7 | 14.4 | -- | -- | -- |
| Ocean Avenue II - Net | 5,521,943 | -2.1 | 0.2 | -- | -- | -- | -- |
| Pantheon I - Net | 1,884,164 | 1.8 | 1.4 | 4.6 | 3.7 | -- | -- |
| Pantheon II - Net | 3,562,286 | 1.7 | 9.7 | 13.5 | 9.8 | -- | -- |
| Pantheon Secondary - Net | 2,228,852 | 1.9 | -1.1 | 1.2 | -1.3 | -- | -- |
| Raven Asset Fund II - Net | 6,451,591 | 1.5 | -0.1 | -- | -- | -- | -- |
| Infrastructure - Net | 5,440,381 | -1.5 | -0.6 | -- | -- | -- | -- |
| <i>CPI-U Headline +5%</i> | | 2.0 | 7.1 | 5.8 | 6.0 | -- | -- |
| KKR Global II - Net | 3,140,624 | -2.4 | -2.8 | -- | -- | -- | -- |
| North Haven Infrastructure II - Net | 2,299,757 | -0.5 | 4.3 | -- | -- | -- | -- |
| <i>CPI-U Headline +5%</i> | | 2.0 | 7.1 | 5.8 | 6.0 | -- | -- |
| Natural Resources - Net | 2,125,798 | 7.3 | 42.4 | -- | -- | -- | -- |
| <i>CPI-U Headline +5%</i> | | 2.0 | 7.1 | 5.8 | 6.0 | -- | -- |
| GSO Energy Opportunities - Net | 887,949 | 7.6 | 35.4 | -- | -- | -- | -- |
| Taurus Mining - Net | 1,237,849 | 7.3 | 48.2 | -- | -- | -- | -- |
| <i>CPI-U Headline +5%</i> | | 2.0 | 7.1 | 5.8 | 6.0 | -- | -- |
| Cash - Net | 7,872,657 | 0.1 | 0.4 | 0.4 | 0.5 | -- | -- |
| Treasury Cash - Net | 4,406,205 | -- | -- | -- | -- | -- | -- |

Total Fund
Asset Allocation Analysis

Period Ending: December 31, 2016



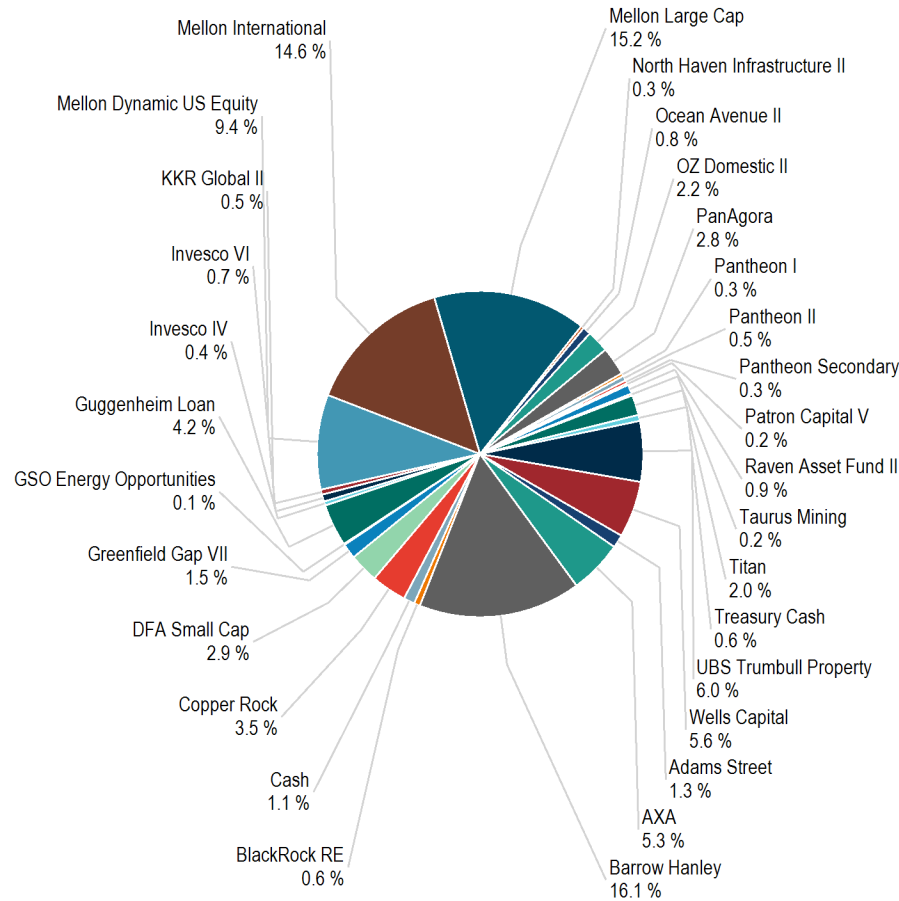
| | Current | % |
|----------------------|----------------------|---------------|
| US Equity | \$211,089,072 | 30.3% |
| International Equity | \$164,393,278 | 23.6% |
| US Fixed Income | \$178,032,641 | 25.6% |
| Hedge Fund | \$28,965,124 | 4.2% |
| Real Estate | \$57,268,764 | 8.2% |
| Private Equity | \$36,138,778 | 5.2% |
| Real Assets | \$7,566,179 | 1.1% |
| Cash | \$12,278,862 | 1.8% |
| Total | \$695,732,699 | 100.0% |



| | Actual | Target | Difference |
|----------------------|---------------|---------------|------------|
| US Equity | 30.3% | 28.4% | 1.9% |
| International Equity | 23.6% | 23.6% | 0.0% |
| US Fixed Income | 25.6% | 22.5% | 3.1% |
| Hedge Fund | 4.2% | 4.5% | -0.3% |
| Real Estate | 8.2% | 8.0% | 0.2% |
| Private Equity | 5.2% | 7.0% | -1.8% |
| Real Assets | 1.1% | 6.0% | -4.9% |
| Cash | 1.8% | 0.0% | 1.8% |
| Total | 100.0% | 100.0% | |

Total Fund Manager Allocation Analysis

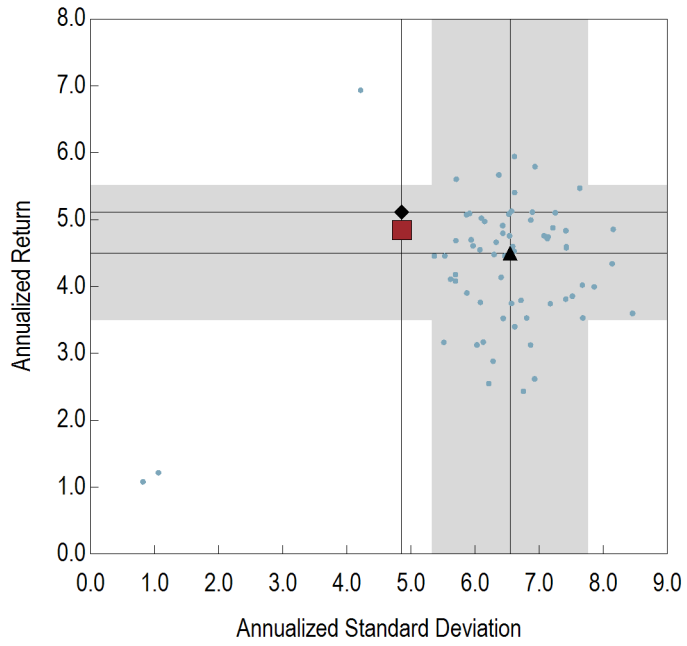
Period Ending: December 31, 2016



| | Actual (\$) | Actual % |
|-------------------------------|----------------------|---------------|
| Adams Street | \$8,882,124 | 1.3% |
| AXA | \$36,885,478 | 5.3% |
| Barrow Hanley | \$112,197,467 | 16.1% |
| BlackRock RE | \$3,926,446 | 0.6% |
| Cash | \$7,872,657 | 1.1% |
| Copper Rock | \$24,034,323 | 3.5% |
| DFA Small Cap | \$20,383,660 | 2.9% |
| EARNEST Partners | \$153,417 | 0.0% |
| Greenfield Gap VII | \$10,630,267 | 1.5% |
| GSO Energy Opportunities | \$887,949 | 0.1% |
| Guggenheim Loan | \$28,949,696 | 4.2% |
| Invesco IV | \$3,028,820 | 0.4% |
| Invesco VI | \$4,578,998 | 0.7% |
| KKR Global II | \$3,140,624 | 0.5% |
| Mellon Dynamic US Equity | \$65,637,961 | 9.4% |
| Mellon International | \$101,326,424 | 14.6% |
| Mellon Large Cap | \$105,510,053 | 15.2% |
| North Haven Infrastructure II | \$2,299,757 | 0.3% |
| Ocean Avenue II | \$5,521,943 | 0.8% |
| OZ Domestic II | \$15,160,219 | 2.2% |
| PanAgora | \$19,557,398 | 2.8% |
| Pantheon I | \$1,884,164 | 0.3% |
| Pantheon II | \$3,562,286 | 0.5% |
| Pantheon Secondary | \$2,228,852 | 0.3% |
| Patron Capital V | \$1,267,698 | 0.2% |
| Raven Asset Fund II | \$6,451,591 | 0.9% |
| Taurus Mining | \$1,237,849 | 0.2% |
| Titan | \$13,804,905 | 2.0% |
| Treasury Cash | \$4,406,205 | 0.6% |
| UBS Trumbull Property | \$41,444,353 | 6.0% |
| Wells Capital | \$38,879,114 | 5.6% |
| Total | \$695,732,699 | 100.0% |

Total Fund
Risk vs. Return (3 Years)

Period Ending: December 31, 2016

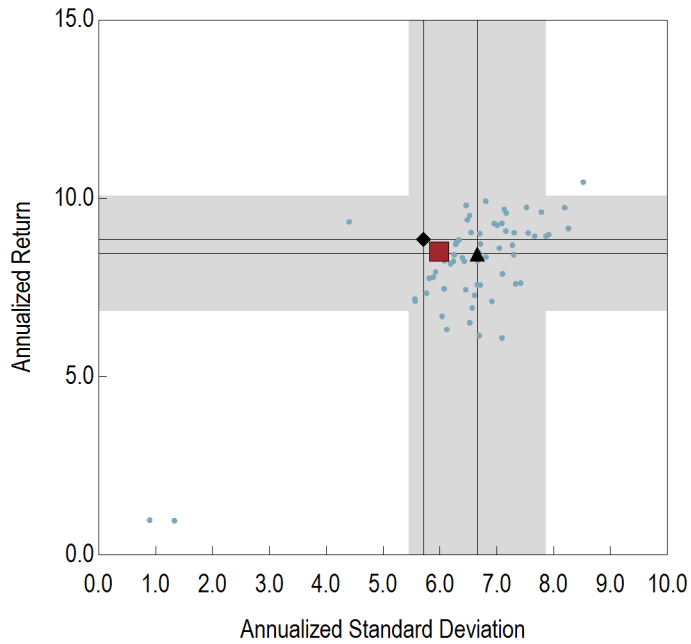


- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB \$250mm-\$1B Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|---|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| Total Fund | 4.8% | 28 | 4.9% | 4 | 1.0 | 5 |
| Policy Index | 5.1% | 12 | 4.9% | 4 | 1.0 | 4 |
| InvestorForce Public DB \$250mm-\$1B Gross Median | 4.5% | -- | 6.5% | -- | 0.7 | -- |

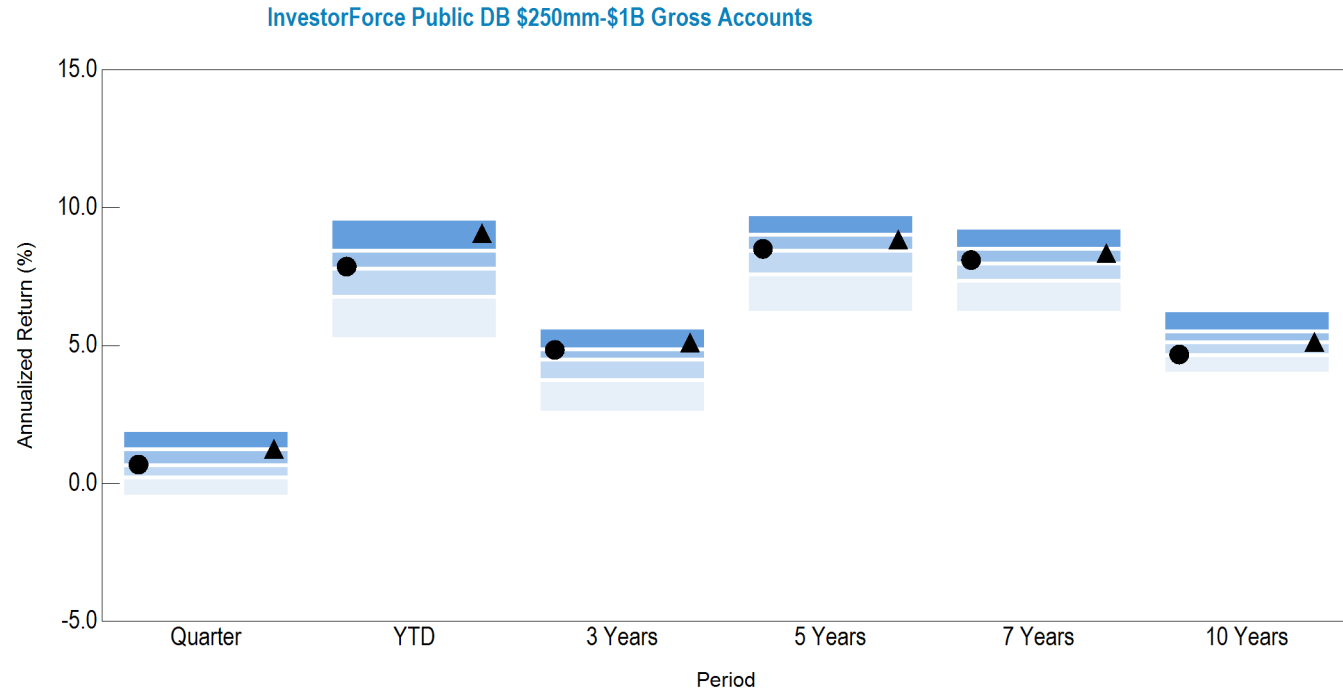
Total Fund
Risk vs. Return (5 Years)

Period Ending: December 31, 2016



- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB \$250mm-\$1B Gross

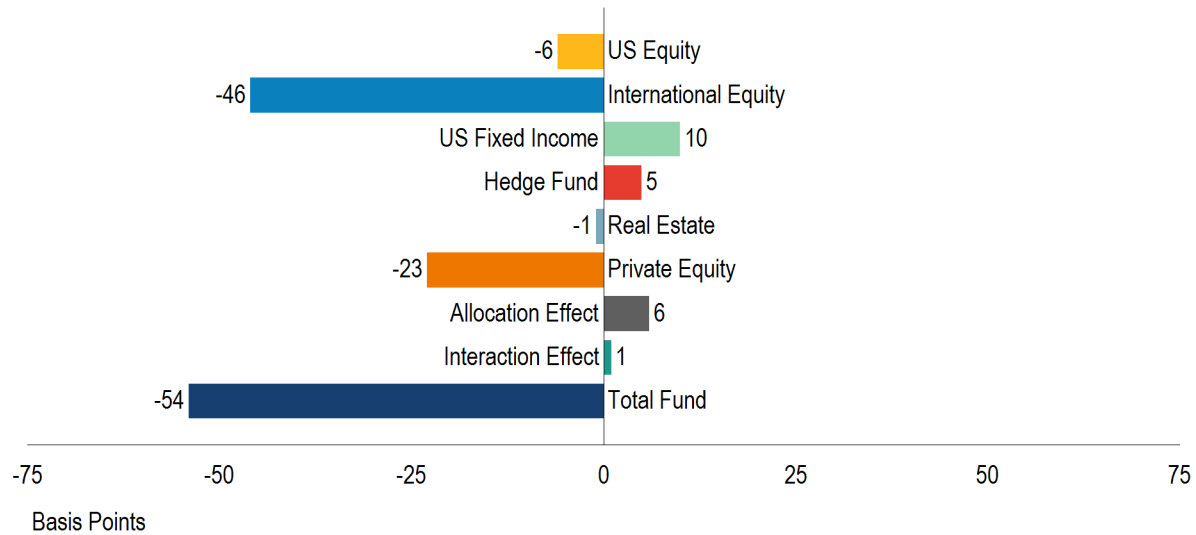
| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|---|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| Total Fund | 8.5% | 46 | 6.0% | 16 | 1.4 | 9 |
| Policy Index | 8.9% | 36 | 5.7% | 8 | 1.5 | 2 |
| InvestorForce Public DB \$250mm-\$1B Gross Median | 8.4% | -- | 6.7% | -- | 1.3 | -- |



| | Return (Rank) | | | | | |
|-----------------|---------------|----------|----------|----------|----------|----------|
| | Quarter | YTD | 3 Years | 5 Years | 7 Years | 10 Years |
| 5th Percentile | 1.9 | 9.6 | 5.6 | 9.7 | 9.3 | 6.3 |
| 25th Percentile | 1.3 | 8.5 | 4.9 | 9.0 | 8.5 | 5.5 |
| Median | 0.7 | 7.8 | 4.5 | 8.4 | 8.0 | 5.1 |
| 75th Percentile | 0.2 | 6.8 | 3.8 | 7.6 | 7.3 | 4.7 |
| 95th Percentile | -0.5 | 5.2 | 2.6 | 6.2 | 6.2 | 4.0 |
| # of Portfolios | 68 | 68 | 68 | 66 | 63 | 55 |
| ● Total Fund | 0.7 (50) | 7.9 (49) | 4.8 (28) | 8.5 (46) | 8.1 (40) | 4.7 (74) |
| ▲ Policy Index | 1.3 (26) | 9.1 (16) | 5.1 (12) | 8.9 (36) | 8.3 (30) | 5.1 (53) |

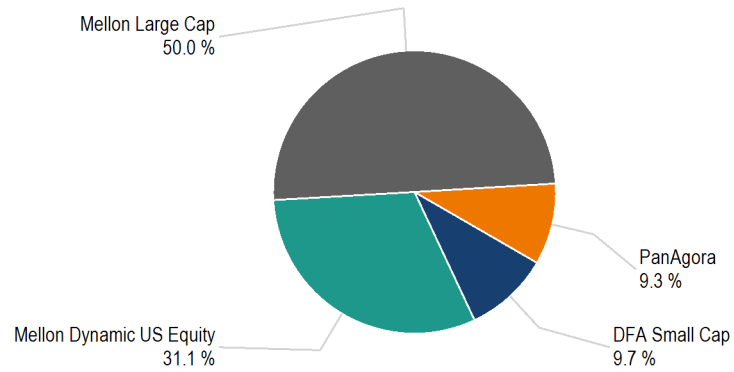
Total Fund
Performance Attribution

Period Ending: December 31, 2016



Attribution Summary

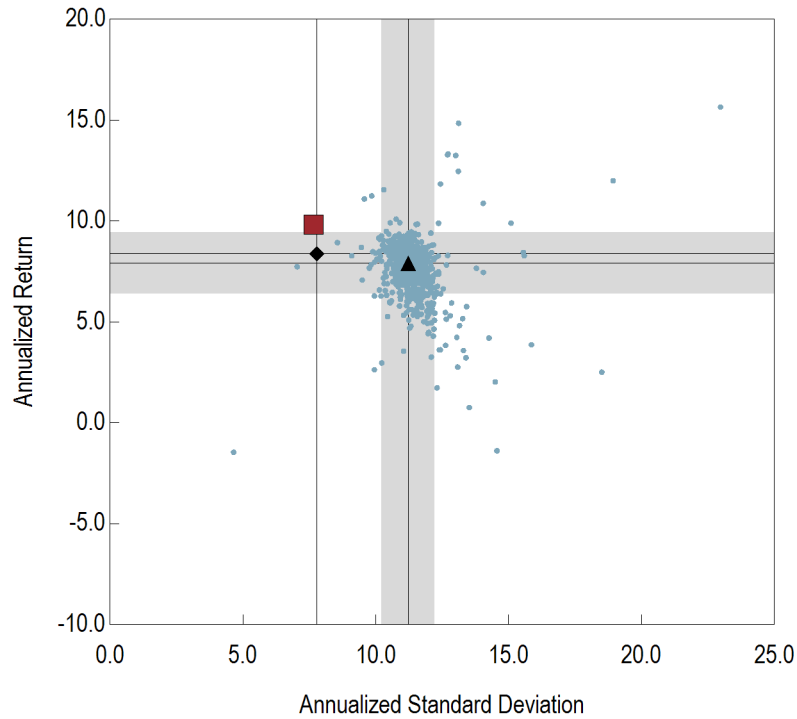
| | Wtd. Actual Return | Wtd. Index Return | Excess Return | Selection Effect | Allocation Effect | Interaction Effects | Total Effects |
|----------------------|-----------------------|----------------------|------------------|---------------------|----------------------|------------------------|------------------|
| US Equity | 4.66% | 4.86% | -0.20% | -0.06% | 0.09% | -0.01% | 0.03% |
| International Equity | -3.14% | -1.20% | -1.94% | -0.46% | -0.04% | -0.03% | -0.53% |
| US Fixed Income | -1.24% | -1.59% | 0.35% | 0.10% | 0.07% | -0.01% | 0.17% |
| Hedge Fund | 2.25% | 1.21% | 1.05% | 0.05% | 0.00% | 0.00% | 0.04% |
| Real Estate | 1.74% | 1.88% | -0.14% | -0.01% | 0.00% | 0.00% | -0.01% |
| Private Equity | 2.19% | 5.46% | -3.27% | -0.23% | -0.07% | 0.05% | -0.24% |
| Total | 0.69% | 1.23% | -0.54% | -0.61% | 0.06% | 0.01% | -0.54% |



| | Actual (\$) | Actual % |
|--------------------------|----------------------|---------------|
| DFA Small Cap | \$20,383,660 | 9.7% |
| Mellon Dynamic US Equity | \$65,637,961 | 31.1% |
| Mellon Large Cap | \$105,510,053 | 50.0% |
| PanAgora | \$19,557,398 | 9.3% |
| Total | \$211,089,072 | 100.0% |

US Equity
Risk vs. Return (3 Years)

Period Ending: December 31, 2016

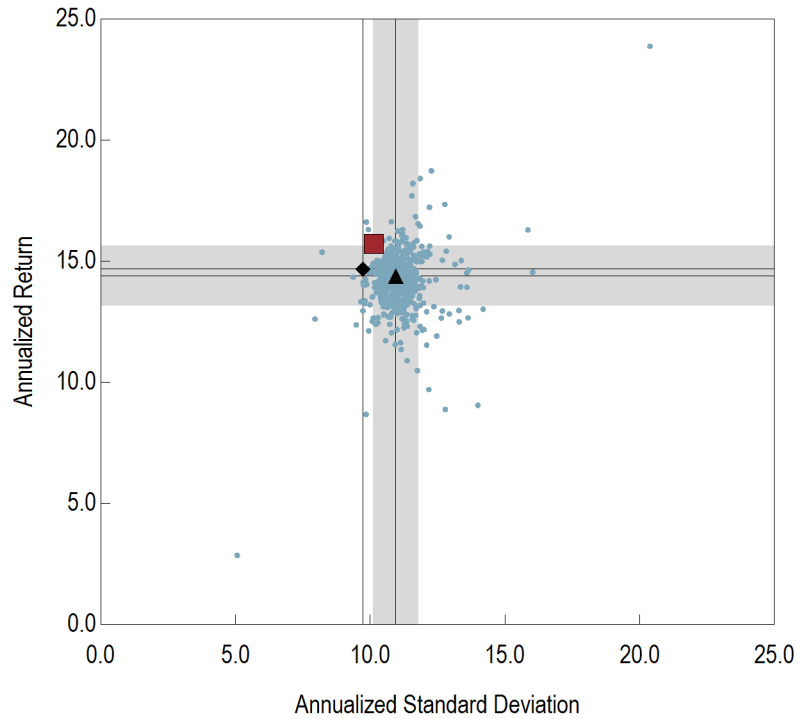


- US Equity
- ◆ 80% R1000/ 20% R2000
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Eq Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|---|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| US Equity | 9.8% | 3 | 7.7% | 1 | 1.3 | 1 |
| 80% R1000/ 20% R2000 | 8.4% | 32 | 7.8% | 1 | 1.1 | 1 |
| InvestorForce All DB US Eq Gross Median | 7.9% | -- | 11.2% | -- | 0.7 | -- |

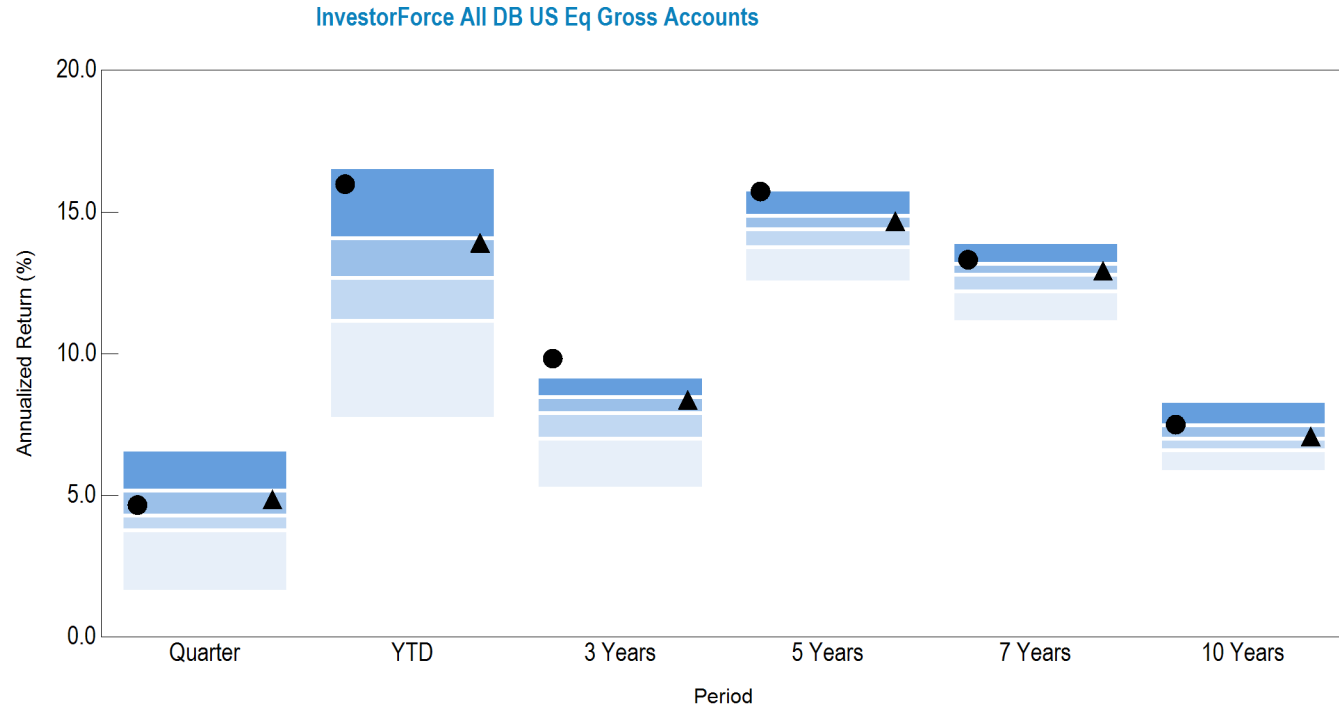
US Equity
Risk vs. Return (5 Years)

Period Ending: December 31, 2016



- US Equity
- ◆ 80% R1000/ 20% R2000
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Eq Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|---|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| US Equity | 15.7% | 6 | 10.1% | 5 | 1.5 | 1 |
| 80% R1000/ 20% R2000 | 14.7% | 36 | 9.7% | 2 | 1.5 | 3 |
| InvestorForce All DB US Eq Gross Median | 14.4% | -- | 10.9% | -- | 1.3 | -- |



Return (Rank)

| | | | | | | |
|------------------------|----------|-----------|----------|-----------|-----------|----------|
| 5th Percentile | 6.6 | 16.6 | 9.2 | 15.8 | 13.9 | 8.3 |
| 25th Percentile | 5.2 | 14.1 | 8.5 | 14.9 | 13.2 | 7.5 |
| Median | 4.3 | 12.7 | 7.9 | 14.4 | 12.8 | 7.0 |
| 75th Percentile | 3.8 | 11.2 | 7.0 | 13.8 | 12.2 | 6.6 |
| 95th Percentile | 1.6 | 7.7 | 5.3 | 12.5 | 11.1 | 5.8 |
| # of Portfolios | 757 | 738 | 696 | 614 | 482 | 424 |
| ● US Equity | 4.7 (39) | 16.0 (8) | 9.8 (3) | 15.7 (6) | 13.3 (21) | 7.5 (24) |
| ▲ 80% R1000/ 20% R2000 | 4.9 (34) | 13.9 (28) | 8.4 (32) | 14.7 (36) | 12.9 (41) | 7.1 (47) |

Characteristics

| | Portfolio | Russell 3000 |
|---------------------------------|-----------|--------------|
| Number of Holdings | 2,816 | 2,976 |
| Weighted Avg. Market Cap. (\$B) | 105.1 | 115.4 |
| Median Market Cap. (\$B) | 2.2 | 1.5 |
| Price To Earnings | 23.9 | 22.7 |
| Price To Book | 4.3 | 3.7 |
| Price To Sales | 3.3 | 3.2 |
| Return on Equity (%) | 19.3 | 16.4 |
| Yield (%) | 1.9 | 2.0 |
| Beta (holdings; domestic) | 1.1 | 1.0 |

Top Holdings

| | |
|------------------------|------|
| APPLE | 2.4% |
| MICROSOFT | 1.9% |
| EXXON MOBIL | 1.5% |
| JOHNSON & JOHNSON | 1.2% |
| JP MORGAN CHASE & CO. | 1.2% |
| BERKSHIRE HATHAWAY 'B' | 1.2% |
| AMAZON.COM | 1.1% |
| GENERAL ELECTRIC | 1.1% |
| FACEBOOK CLASS A | 1.0% |
| AT&T | 1.0% |

Best Performers

| | Return % |
|-----------------------|----------|
| ALTISOURCE ASSET MAN. | 189.2% |
| PDI (IDXG) | 175.0% |
| SIEBERT FINANCIAL | 150.5% |
| INTERSECTIONS | 120.4% |
| AK STEEL HLDG. (AKS) | 111.4% |
| ERA GROUP (ERA) | 110.8% |
| NL INDUSTRIES | 107.4% |
| FRED'S 'A' (FRED) | 106.1% |
| PIER 1 IMPORTS | 104.8% |
| REP.FIRST BANC. | 103.2% |

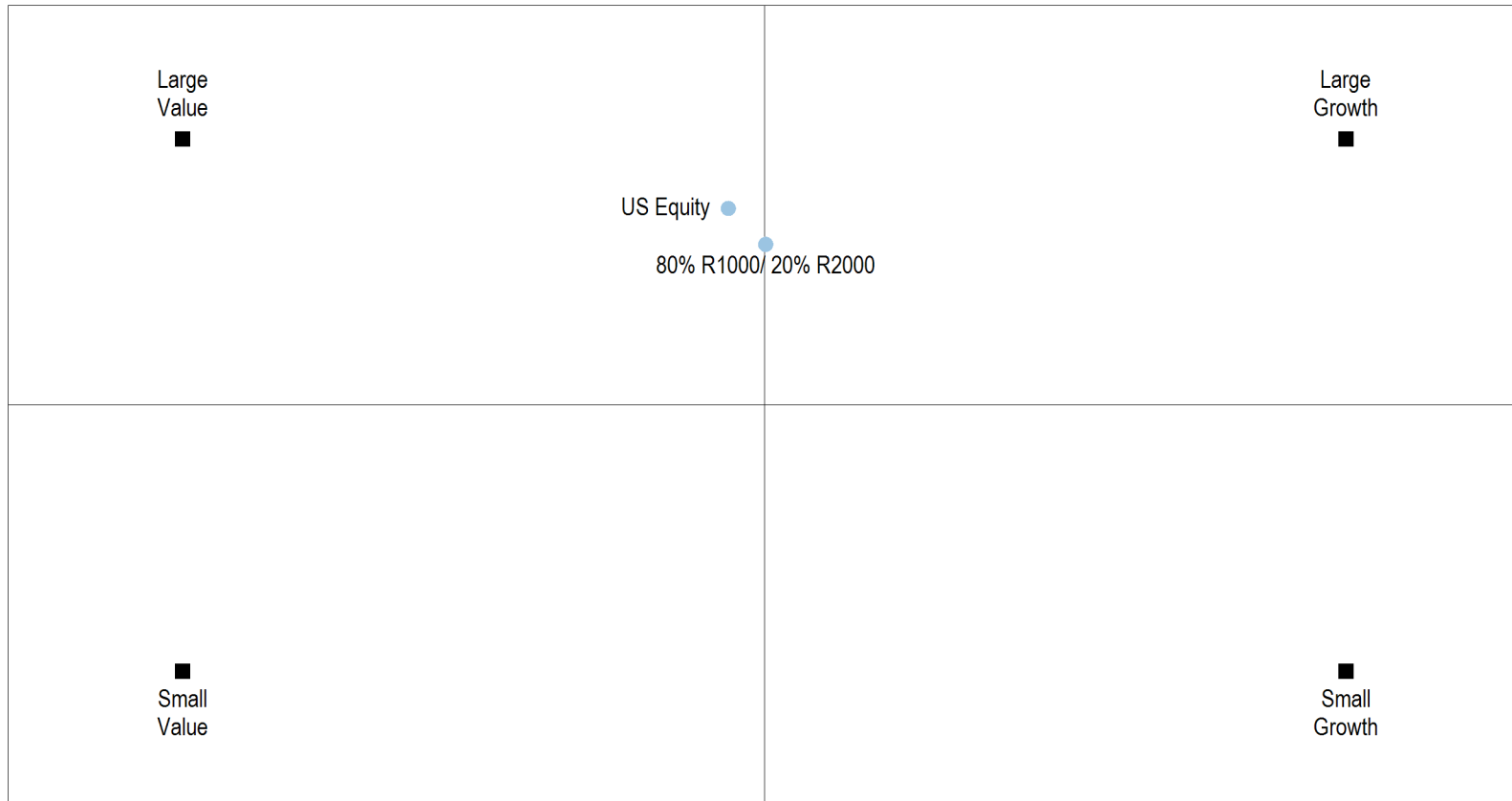
Worst Performers

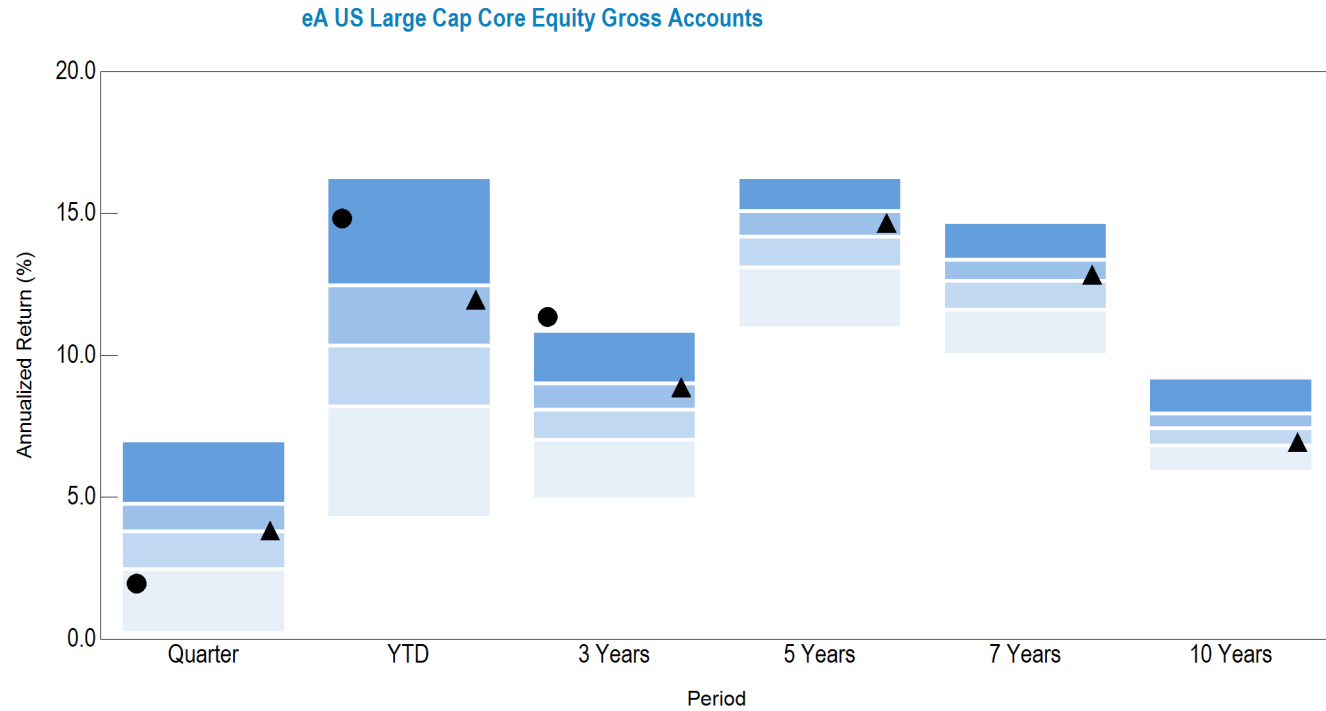
| | Return % |
|-----------------------------|----------|
| ADEPTUS HEALTH CL.A | -82.3% |
| CELSION (CLSN) | -75.1% |
| CASTLE A M & CO. (CASL) | -68.5% |
| BIOSCRIP (BIOS) | -64.0% |
| RETRACTABLE TECHS. (RVP) | -63.7% |
| DYNAVAX TECHNOLOGIES | -62.3% |
| CUMULUS MDA.'A' (CMLS) | -61.4% |
| EMERGENT CAPITAL (EMGC) | -58.7% |
| PACIFIC BSCS.OF CAL. (PACB) | -57.6% |
| FALCONSTOR SFTW. (FALC) | -56.7% |

US Equity Performance Attribution vs. Russell 3000

| | Total Effects | Attribution Effects | | | Returns | | Sector Weights | | | | |
|----------------------------|------------------|---------------------|----------------------|------------------------|--------------|-----------|----------------|-------------|-------------|---------------|---------------|
| | | Selection Effect | Allocation Effect | Interaction Effects | Portfolio | Benchmark | Portfolio | Benchmark | | | |
| Energy | 0.0% | 0.0% | 0.0% | 0.0% | 8.1% | 7.4% | 5.8% | 6.8% | | | |
| Materials | 0.1% | 0.1% | 0.0% | 0.0% | 7.6% | 5.2% | 3.5% | 3.3% | | | |
| Industrials | 0.1% | 0.1% | 0.0% | 0.0% | 9.0% | 8.2% | 10.6% | 10.5% | | | |
| Consumer Discretionary | 0.2% | 0.2% | 0.0% | 0.0% | 4.9% | 3.0% | 12.0% | 12.6% | | | |
| Consumer Staples | 0.1% | 0.1% | 0.1% | 0.0% | -0.9% | -1.6% | 7.6% | 8.8% | | | |
| Health Care | 0.1% | 0.0% | 0.1% | 0.0% | -4.1% | -4.2% | 12.6% | 14.1% | | | |
| Financials | 0.0% | 0.2% | -0.1% | 0.0% | 21.8% | 20.6% | 12.7% | 13.4% | | | |
| Information Technology | 0.2% | 0.1% | 0.1% | 0.0% | 1.9% | 1.2% | 18.1% | 20.5% | | | |
| Telecommunication Services | 0.0% | 0.0% | 0.0% | 0.0% | 5.4% | 5.3% | 2.0% | 2.4% | | | |
| Utilities | 0.0% | 0.0% | 0.0% | 0.0% | 1.5% | 0.8% | 3.0% | 3.3% | | | |
| Real Estate | 0.1% | 0.0% | 0.0% | 0.0% | -2.7% | -3.0% | 3.7% | 4.3% | | | |
| Cash | -0.3% | 0.0% | -0.3% | 0.0% | 0.1% | -- | 8.4% | 0.0% | | | |
| Portfolio | 0.7% | = | 0.9% | + | -0.2% | + | -0.1% | 4.9% | 4.2% | 100.0% | 100.0% |

US Effective Style Map





| | Return (Rank) | | | | | | | | | | | |
|----------------------------|---------------|------|------|------|------|------|------|------|------|------|-----|------|
| 5th Percentile | 7.0 | | 16.3 | | 10.9 | | 16.3 | | 14.7 | | 9.2 | |
| 25th Percentile | 4.8 | | 12.5 | | 9.0 | | 15.1 | | 13.4 | | 8.0 | |
| Median | 3.8 | | 10.4 | | 8.1 | | 14.2 | | 12.6 | | 7.4 | |
| 75th Percentile | 2.5 | | 8.2 | | 7.0 | | 13.1 | | 11.6 | | 6.8 | |
| 95th Percentile | 0.2 | | 4.3 | | 4.9 | | 11.0 | | 10.0 | | 5.9 | |
| # of Portfolios | 308 | | 308 | | 301 | | 277 | | 253 | | 226 | |
| ● Mellon Dynamic US Equity | 2.0 | (84) | 14.8 | (9) | 11.4 | (3) | -- | (--) | -- | (--) | -- | (--) |
| ▲ S&P 500 | 3.8 | (50) | 12.0 | (31) | 8.9 | (33) | 14.7 | (35) | 12.8 | (45) | 6.9 | (70) |

Characteristics

| | Portfolio | S&P 500 |
|---------------------------------|-----------|---------|
| Number of Holdings | 509 | 505 |
| Weighted Avg. Market Cap. (\$B) | 138.5 | 138.5 |
| Median Market Cap. (\$B) | 18.8 | 18.8 |
| Price To Earnings | 23.1 | 22.3 |
| Price To Book | 4.7 | 4.4 |
| Price To Sales | 3.5 | 3.3 |
| Return on Equity (%) | 20.8 | 18.5 |
| Yield (%) | 2.1 | 2.1 |
| Beta (holdings; domestic) | 1.0 | 1.0 |

Top Holdings

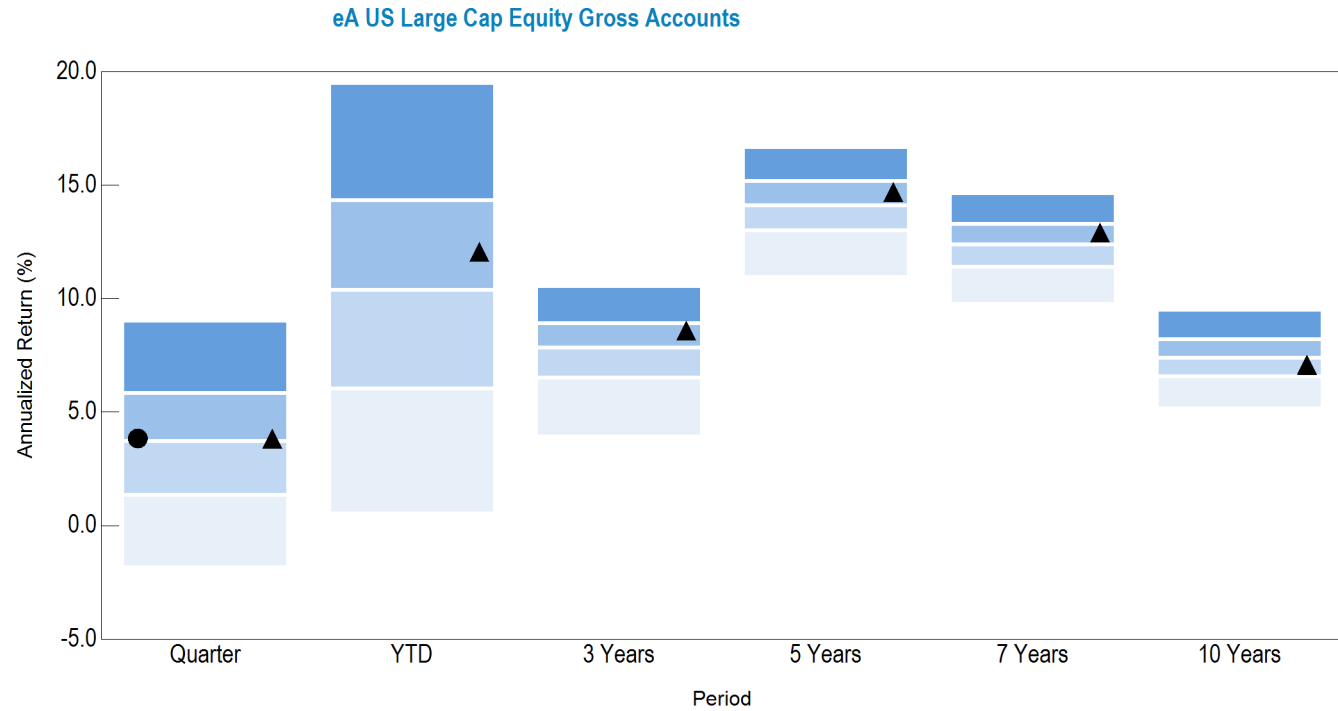
| | |
|------------------------|------|
| APPLE | 3.2% |
| MICROSOFT | 2.5% |
| EXXON MOBIL | 1.9% |
| JOHNSON & JOHNSON | 1.6% |
| BERKSHIRE HATHAWAY 'B' | 1.6% |
| JP MORGAN CHASE & CO. | 1.6% |
| AMAZON.COM | 1.5% |
| GENERAL ELECTRIC | 1.4% |
| FACEBOOK CLASS A | 1.4% |
| AT&T | 1.4% |

Best Performers

| | Return % |
|-------------------------------|----------|
| NVIDIA (NVDA) | 56.0% |
| KEYCORP (KEY) | 50.9% |
| GOLDMAN SACHS GP. | 48.9% |
| REGIONS FINL.NEW | 46.1% |
| CITIZENS FINANCIAL GROUP | 44.8% |
| COMERICA | 44.4% |
| LINCOLN NATIONAL | 41.8% |
| BANK OF AMERICA | 41.7% |
| ZIONS BANCORP. | 39.0% |
| UNITED CONTINENTAL HDG. (UAL) | 38.9% |

Worst Performers

| | Return % |
|---------------------------|----------|
| ILLUMINA | -29.5% |
| MALLINCKRODT | -28.6% |
| TRIPADVISOR 'A' | -26.6% |
| UNDER ARMOUR CL C ORD | -25.7% |
| UNDER ARMOUR 'A' (UAA) | -24.9% |
| CERNER (CERN) | -23.3% |
| EDWARDS LIFESCIENCES | -22.3% |
| SOUTHWESTERN ENERGY (SWN) | -21.8% |
| COTY CL.A | -21.6% |
| NIelsen | -21.1% |



Return (Rank)

| | | | | | | |
|--------------------|----------|-----------|----------|-----------|-----------|----------|
| 5th Percentile | 9.0 | 19.5 | 10.5 | 16.7 | 14.6 | 9.5 |
| 25th Percentile | 5.9 | 14.3 | 8.9 | 15.2 | 13.3 | 8.2 |
| Median | 3.7 | 10.4 | 7.8 | 14.1 | 12.4 | 7.4 |
| 75th Percentile | 1.4 | 6.1 | 6.5 | 13.0 | 11.4 | 6.6 |
| 95th Percentile | -1.8 | 0.6 | 3.9 | 11.0 | 9.8 | 5.2 |
| # of Portfolios | 936 | 936 | 919 | 860 | 806 | 717 |
| ● Mellon Large Cap | 3.8 (48) | -- (--) | -- (--) | -- (--) | -- (--) | -- (--) |
| ▲ Russell 1000 | 3.8 (48) | 12.1 (39) | 8.6 (33) | 14.7 (37) | 12.9 (37) | 7.1 (61) |

Characteristics

| | Portfolio | Russell 1000 |
|---------------------------------|-----------|--------------|
| Number of Holdings | 1,001 | 999 |
| Weighted Avg. Market Cap. (\$B) | 125.1 | 125.2 |
| Median Market Cap. (\$B) | 8.3 | 8.3 |
| Price To Earnings | 23.3 | 22.4 |
| Price To Book | 4.5 | 4.1 |
| Price To Sales | 3.5 | 3.3 |
| Return on Equity (%) | 20.3 | 18.0 |
| Yield (%) | 2.0 | 2.0 |
| Beta (holdings; domestic) | 1.0 | 1.0 |

Top Holdings

| | |
|------------------------|------|
| APPLE | 2.9% |
| MICROSOFT | 2.2% |
| EXXON MOBIL | 1.7% |
| JOHNSON & JOHNSON | 1.5% |
| JP MORGAN CHASE & CO. | 1.5% |
| BERKSHIRE HATHAWAY 'B' | 1.4% |
| GENERAL ELECTRIC | 1.4% |
| AMAZON.COM | 1.4% |
| AT&T | 1.2% |
| FACEBOOK CLASS A | 1.2% |

Best Performers

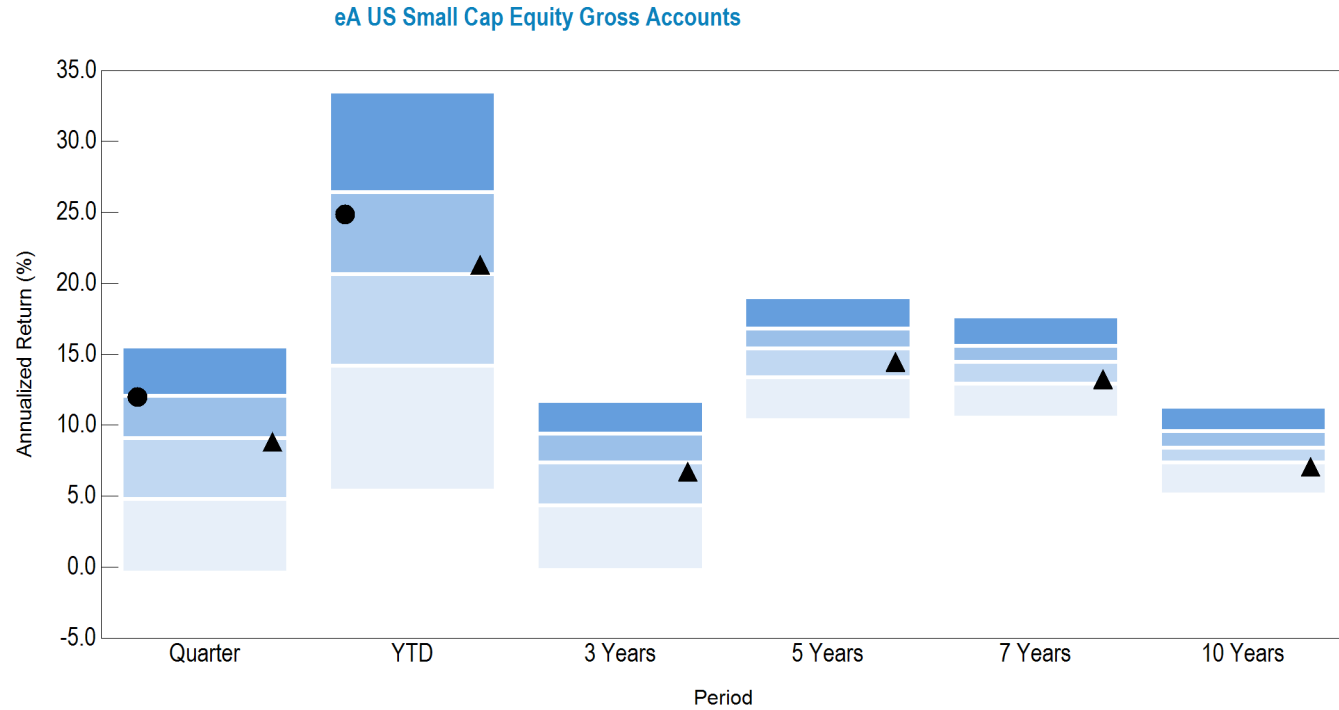
| | Return % |
|--------------------------------|----------|
| CORRECTIONS AMER NEW (CXW) | 79.4% |
| UNITED STATES STEEL (X) | 75.4% |
| NVIDIA (NVDA) | 56.0% |
| SVB FINANCIAL GROUP (SIVB) | 55.3% |
| KEYCORP | 50.9% |
| GOLDMAN SACHS GP. (GS) | 48.9% |
| SLM | 47.5% |
| REGIONS FINL.NEW (RF) | 46.1% |
| CITIZENS FINANCIAL GROUP (CFG) | 44.8% |
| COMERICA (CMA) | 44.4% |

Worst Performers

| | Return % |
|-----------------------------------|----------|
| TWILIO CL A ORD | -55.2% |
| FITBIT CL.A (FIT) | -50.7% |
| HERTZ RENTAL CAR HLDG. WNI. (HTZ) | -46.3% |
| ALNYLAM PHARMACEUTICALS | -44.8% |
| JUNO THERAPEUTICS | -37.2% |
| GROUPON (GRPN) | -35.5% |
| TENET HEALTHCARE (THC) | -34.5% |
| INTERCEPT PHARMS. | -34.0% |
| ACADIA HEALTHCARE CO. (ACHC) | -33.2% |
| DEXCOM | -31.9% |

Mellon Large Cap Performance Attribution vs. Russell 1000

| | Total Effects | Attribution Effects | | | Returns | | Sector Weights | | | | |
|----------------------------|------------------|---------------------|----------------------|------------------------|-------------|-----------|----------------|-------------|-------------|---------------|---------------|
| | | Selection Effect | Allocation Effect | Interaction Effects | Portfolio | Benchmark | Portfolio | Benchmark | | | |
| Energy | 0.0% | 0.0% | 0.0% | 0.0% | 7.0% | 7.0% | 7.0% | 7.0% | | | |
| Materials | 0.0% | 0.0% | 0.0% | 0.0% | 4.5% | 4.5% | 3.2% | 3.2% | | | |
| Industrials | 0.0% | 0.0% | 0.0% | 0.0% | 7.7% | 7.7% | 10.2% | 10.2% | | | |
| Consumer Discretionary | 0.0% | 0.0% | 0.0% | 0.0% | 2.5% | 2.5% | 12.6% | 12.6% | | | |
| Consumer Staples | 0.0% | 0.0% | 0.0% | 0.0% | -1.9% | -1.8% | 9.3% | 9.3% | | | |
| Health Care | 0.0% | 0.0% | 0.0% | 0.0% | -4.1% | -4.1% | 14.1% | 14.1% | | | |
| Financials | 0.0% | 0.0% | 0.0% | 0.0% | 20.4% | 20.4% | 13.1% | 13.1% | | | |
| Information Technology | 0.0% | 0.0% | 0.0% | 0.0% | 0.9% | 1.0% | 20.7% | 20.7% | | | |
| Telecommunication Services | 0.0% | 0.0% | 0.0% | 0.0% | 5.2% | 5.2% | 2.6% | 2.6% | | | |
| Utilities | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.3% | 3.2% | 3.2% | | | |
| Real Estate | 0.0% | 0.0% | 0.0% | 0.0% | -4.2% | -4.2% | 4.0% | 4.0% | | | |
| Cash | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | -- | 0.0% | 0.0% | | | |
| Portfolio | 0.0% | = | 0.0% | + | 0.0% | + | 0.0% | 3.8% | 3.8% | 100.0% | 100.0% |



Return (Rank)

| | | | | | | | | | | | | |
|-----------------|------|------|------|------|------|------|------|------|------|------|-----|------|
| 5th Percentile | 15.5 | 33.5 | 11.7 | 19.0 | 17.7 | 11.3 | | | | | | |
| 25th Percentile | 12.1 | 26.4 | 9.4 | 16.8 | 15.6 | 9.6 | | | | | | |
| Median | 9.1 | 20.7 | 7.4 | 15.4 | 14.5 | 8.5 | | | | | | |
| 75th Percentile | 4.8 | 14.2 | 4.4 | 13.4 | 13.0 | 7.4 | | | | | | |
| 95th Percentile | -0.4 | 5.4 | -0.2 | 10.4 | 10.5 | 5.1 | | | | | | |
| # of Portfolios | 560 | 560 | 542 | 513 | 480 | 407 | | | | | | |
| ● DFA Small Cap | 12.0 | (26) | 24.9 | (31) | -- | (--) | -- | (--) | | | | |
| ▲ Russell 2000 | 8.8 | (52) | 21.3 | (47) | 6.7 | (57) | 14.5 | (63) | 13.2 | (72) | 7.1 | (80) |

Characteristics

| | Portfolio | Russell 2000 |
|---------------------------------|-----------|--------------|
| Number of Holdings | 1,857 | 1,978 |
| Weighted Avg. Market Cap. (\$B) | 2.0 | 2.1 |
| Median Market Cap. (\$B) | 0.7 | 0.8 |
| Price To Earnings | 25.6 | 25.1 |
| Price To Book | 3.2 | 3.0 |
| Price To Sales | 2.0 | 2.1 |
| Return on Equity (%) | 13.2 | 10.1 |
| Yield (%) | 1.2 | 1.1 |
| Beta (holdings; domestic) | 1.2 | 1.3 |

Top Holdings

| | |
|---------------------|------|
| UNITED STATES STEEL | 0.3% |
| THOR INDUSTRIES | 0.3% |
| NABORS INDUSTRIES | 0.3% |
| SEABOARD | 0.3% |
| MENTOR GRAPHICS | 0.3% |
| PRIVATEBANCORP | 0.3% |
| PAPA JOHNS INTL. | 0.3% |
| EMCOR GROUP | 0.3% |
| BANK OF HAWAII | 0.3% |
| WGL HOLDINGS | 0.2% |

Best Performers

| | Return % |
|------------------------------|----------|
| ALTISOURCE ASSET MAN. (AAMC) | 189.2% |
| PDI (IDXG) | 175.0% |
| SIEBERT FINANCIAL (SIEB) | 150.5% |
| INTERSECTIONS | 120.4% |
| AK STEEL HLDG. (AKS) | 111.4% |
| ERA GROUP | 110.8% |
| NL INDUSTRIES (NL) | 107.4% |
| FRED'S 'A' | 106.1% |
| PIER 1 IMPORTS (PIR) | 104.8% |
| REP.FIRST BANC. | 103.2% |

Worst Performers

| | Return % |
|---------------------------|----------|
| ADEPTUS HEALTH CL.A | -82.3% |
| CELSION (CLSN) | -75.1% |
| CASTLE A M & CO. (CASL) | -68.5% |
| BIOSCRIP | -64.0% |
| RETRACTABLE TECHS. (RVP) | -63.7% |
| CUMULUS MDA.'A' (CMLS) | -61.4% |
| EMERGENT CAPITAL | -58.7% |
| FALCONSTOR SFTW. | -56.7% |
| DIPLOMAT PHARMACY | -55.0% |
| OHR PHARMACEUTICAL (OHRP) | -47.0% |

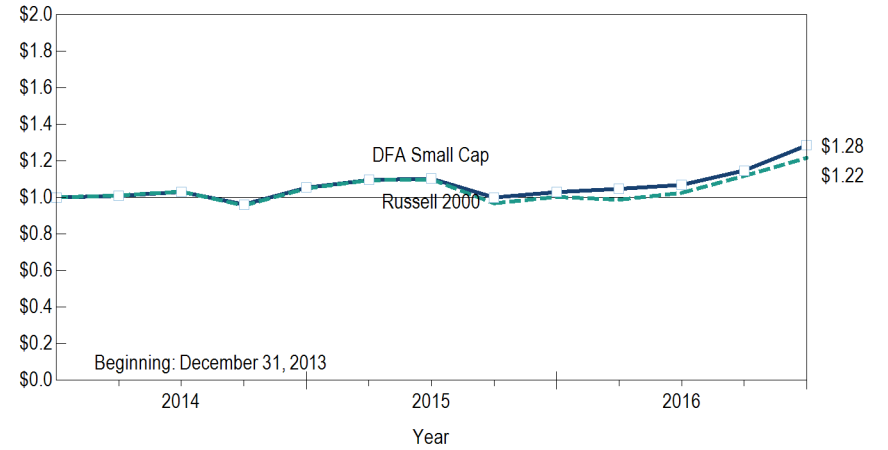
DFA Small Cap Performance Attribution vs. Russell 2000

| | Total Effects | Attribution Effects | | | Returns | | Sector Weights | | | | |
|----------------------------|------------------|---------------------|----------------------|------------------------|-------------|-----------|----------------|--------------|-------------|---------------|---------------|
| | | Selection Effect | Allocation Effect | Interaction Effects | Portfolio | Benchmark | Portfolio | Benchmark | | | |
| Energy | -0.1% | -0.1% | 0.1% | 0.0% | 13.3% | 17.7% | 4.3% | 3.2% | | | |
| Materials | 0.1% | 0.0% | 0.0% | 0.0% | 12.2% | 11.4% | 5.5% | 4.7% | | | |
| Industrials | 0.3% | 0.1% | 0.2% | 0.0% | 13.1% | 12.5% | 19.4% | 14.2% | | | |
| Consumer Discretionary | 0.3% | 0.2% | 0.0% | 0.1% | 9.7% | 7.9% | 15.8% | 12.7% | | | |
| Consumer Staples | -0.1% | 0.0% | 0.0% | 0.0% | 5.7% | 6.4% | 5.1% | 3.0% | | | |
| Health Care | 1.4% | 1.0% | 0.8% | -0.4% | 0.5% | -6.3% | 8.6% | 14.0% | | | |
| Financials | 0.4% | 0.2% | 0.2% | 0.0% | 23.9% | 22.9% | 19.3% | 18.0% | | | |
| Information Technology | 0.5% | 0.5% | 0.1% | 0.0% | 7.4% | 4.7% | 16.1% | 17.7% | | | |
| Telecommunication Services | 0.0% | 0.0% | 0.0% | 0.0% | 11.8% | 9.1% | 1.0% | 0.8% | | | |
| Utilities | 0.1% | 0.1% | 0.0% | 0.0% | 7.1% | 5.3% | 4.1% | 3.8% | | | |
| Real Estate | 0.4% | 0.3% | 0.3% | -0.2% | 7.6% | 4.1% | 0.7% | 7.9% | | | |
| Cash | 0.0% | -- | -- | -- | -- | -- | 0.0% | 0.0% | | | |
| Portfolio | 3.2% | = | 2.2% | + | 1.6% | + | -0.6% | 11.9% | 8.7% | 100.0% | 100.0% |

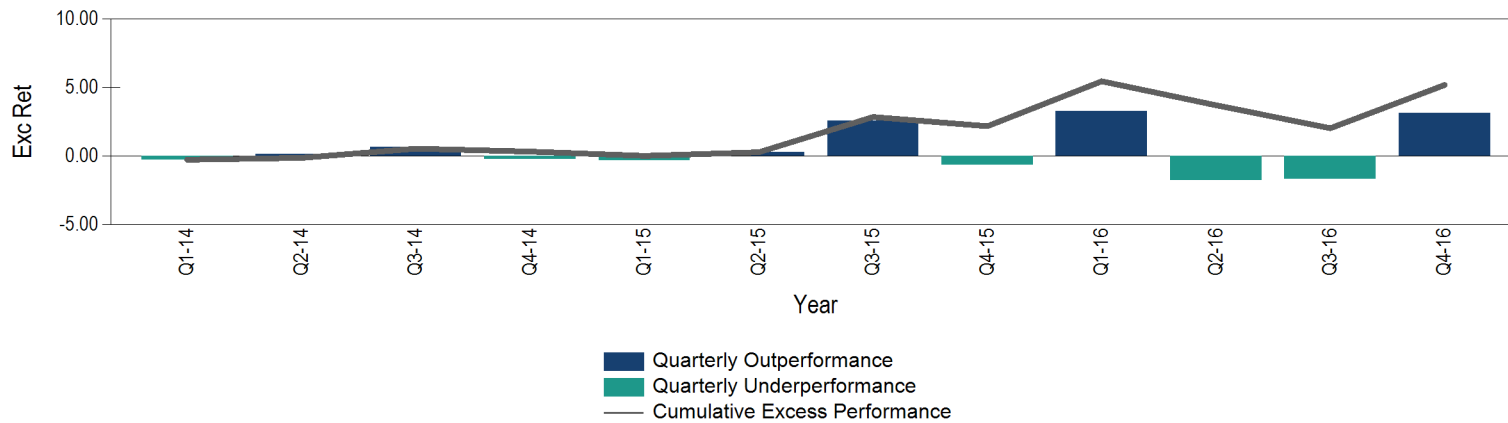
US Effective Style Map

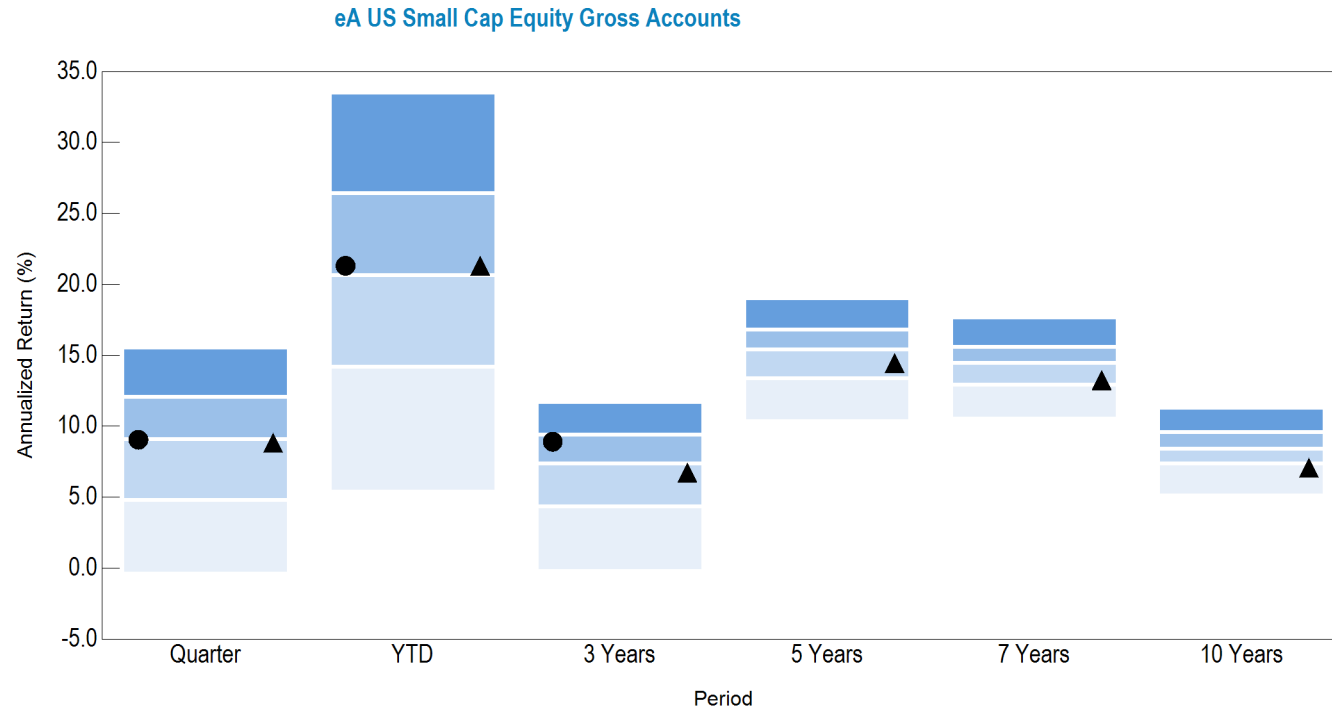


Growth of a Dollar



Quarterly and Cumulative Excess Performance





| | Return (Rank) | | | | | | | | | | | |
|-----------------|---------------|------|------|------|---------|------|---------|------|---------|------|----------|------|
| | Quarter | | YTD | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
| 5th Percentile | 15.5 | | 33.5 | | 11.7 | | 19.0 | | 17.7 | | 11.3 | |
| 25th Percentile | 12.1 | | 26.4 | | 9.4 | | 16.8 | | 15.6 | | 9.6 | |
| Median | 9.1 | | 20.7 | | 7.4 | | 15.4 | | 14.5 | | 8.5 | |
| 75th Percentile | 4.8 | | 14.2 | | 4.4 | | 13.4 | | 13.0 | | 7.4 | |
| 95th Percentile | -0.4 | | 5.4 | | -0.2 | | 10.4 | | 10.5 | | 5.1 | |
| # of Portfolios | 560 | | 560 | | 542 | | 513 | | 480 | | 407 | |
| ● PanAgora | 9.0 | (51) | 21.3 | (47) | 8.9 | (32) | -- | (--) | -- | (--) | -- | (--) |
| ▲ Russell 2000 | 8.8 | (52) | 21.3 | (47) | 6.7 | (57) | 14.5 | (63) | 13.2 | (72) | 7.1 | (80) |

Characteristics

| | Portfolio | Russell 2000 |
|---------------------------------|-----------|--------------|
| Number of Holdings | 311 | 1,978 |
| Weighted Avg. Market Cap. (\$B) | 2.2 | 2.1 |
| Median Market Cap. (\$B) | 0.8 | 0.8 |
| Price To Earnings | 27.9 | 25.1 |
| Price To Book | 3.3 | 3.0 |
| Price To Sales | 2.9 | 2.1 |
| Return on Equity (%) | 14.8 | 10.1 |
| Yield (%) | 1.2 | 1.1 |
| Beta (holdings; domestic) | 1.3 | 1.3 |

Top Holdings

| | |
|------------------------|------|
| FINISAR | 1.6% |
| JACK IN THE BOX | 1.4% |
| TENNECO | 1.4% |
| COHERENT | 1.4% |
| BLACK HILLS | 1.3% |
| FIRST CTZN.BCSH.A | 1.2% |
| NATIONAL HEALTH INVRS. | 1.2% |
| EVERCORE PARTNERS 'A' | 1.1% |
| ISHARES RUSSELL 2000 | 1.1% |
| CHEMOURS | 1.1% |

Best Performers

| | Return % |
|------------------------------|----------|
| ERA GROUP | 110.8% |
| INVENSENSE (INVN) | 72.4% |
| CALIFORNIA RESOURCES (CRC) | 70.3% |
| META FINANCIAL GROUP (CASH) | 70.0% |
| PIONEER ENERGY SERVICES | 69.6% |
| GENESIS HEALTHCARE 'A' (GEN) | 59.2% |
| CU BANCORP (CA) (CUNB) | 56.9% |
| VECTRUS (VEC) | 56.6% |
| EMCORE | 52.6% |
| EXTERRAN WNI. (EXTN) | 52.4% |

Worst Performers

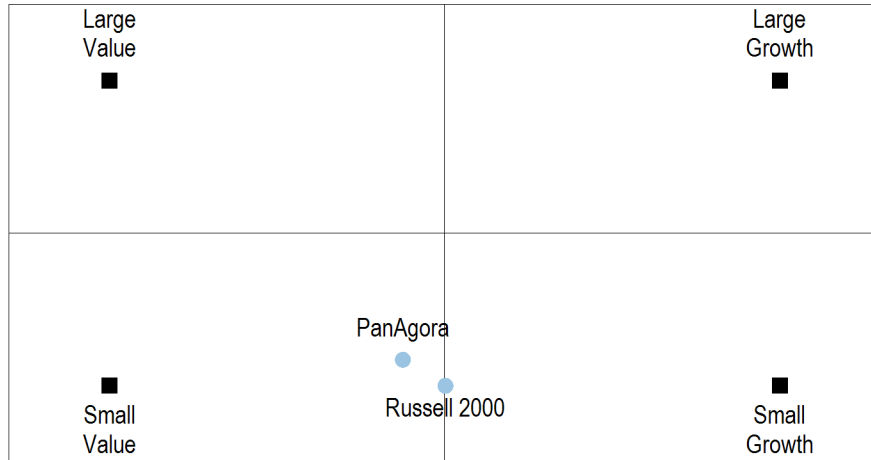
| | Return % |
|----------------------------------|----------|
| DYNAVAX TECHNOLOGIES (DVAX) | -62.3% |
| PACIFIC BSCS.OF CAL. | -57.6% |
| IMPAX LABORATORIES (IPXL) | -44.1% |
| GOLD RESOURCE (GORO) | -41.2% |
| ACACIA COMMUNICATIONS ORD (ACIA) | -40.2% |
| EVOLENT HEALTH CL.A | -39.9% |
| NOVAVAX (NVAX) | -39.4% |
| BRIGHTCOVE | -38.3% |
| PAYLOCITY HOLDING (PCTY) | -32.5% |
| AVALANCHE BIOTCHS. | -29.4% |

Note: Data provided is based on 11/31 holdings. PanAgora provides holdings on a 45-day lag, this 12/31 holdings are not yet available.

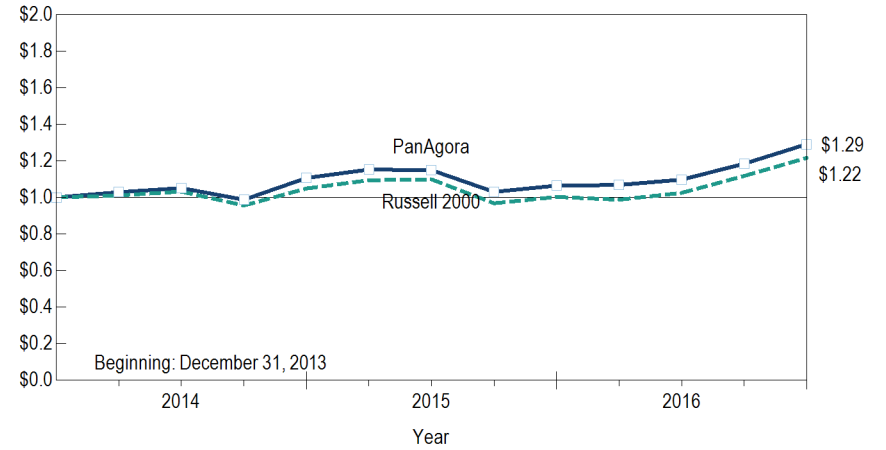
PanAgora Performance Attribution vs. Russell 2000

| | Total Effects | Attribution Effects | | | Returns | | Sector Weights | | | | |
|----------------------------|------------------|---------------------|----------------------|------------------------|--------------|-----------|----------------|-------------|-------------|---------------|---------------|
| | | Selection Effect | Allocation Effect | Interaction Effects | Portfolio | Benchmark | Portfolio | Benchmark | | | |
| Energy | 0.0% | 0.0% | 0.0% | 0.0% | 19.4% | 17.7% | 2.7% | 3.2% | | | |
| Materials | 0.3% | 0.1% | 0.1% | 0.1% | 14.3% | 11.4% | 7.3% | 4.7% | | | |
| Industrials | -0.3% | -0.3% | 0.0% | 0.0% | 10.7% | 12.5% | 13.8% | 14.2% | | | |
| Consumer Discretionary | 1.0% | 0.9% | 0.0% | 0.1% | 14.9% | 7.9% | 14.6% | 12.7% | | | |
| Consumer Staples | 0.2% | 0.2% | 0.0% | 0.0% | 13.3% | 6.4% | 2.5% | 3.0% | | | |
| Health Care | -0.3% | -0.1% | -0.2% | 0.0% | -7.3% | -6.3% | 15.2% | 14.0% | | | |
| Financials | 0.1% | 0.7% | -0.5% | -0.1% | 26.6% | 22.9% | 14.6% | 18.0% | | | |
| Information Technology | 0.1% | 0.0% | 0.1% | 0.0% | 4.7% | 4.7% | 15.7% | 17.7% | | | |
| Telecommunication Services | 0.0% | 0.0% | 0.0% | 0.0% | 4.8% | 9.1% | 0.7% | 0.8% | | | |
| Utilities | 0.0% | -0.1% | 0.0% | 0.0% | 3.5% | 5.3% | 2.4% | 3.8% | | | |
| Real Estate | -0.5% | -0.3% | -0.1% | -0.1% | 0.6% | 4.1% | 10.4% | 7.9% | | | |
| Cash | 0.0% | -- | -- | -- | -- | -- | 0.0% | 0.0% | | | |
| Portfolio | 0.5% | = | 1.2% | + | -0.6% | + | 0.0% | 9.3% | 8.7% | 100.0% | 100.0% |

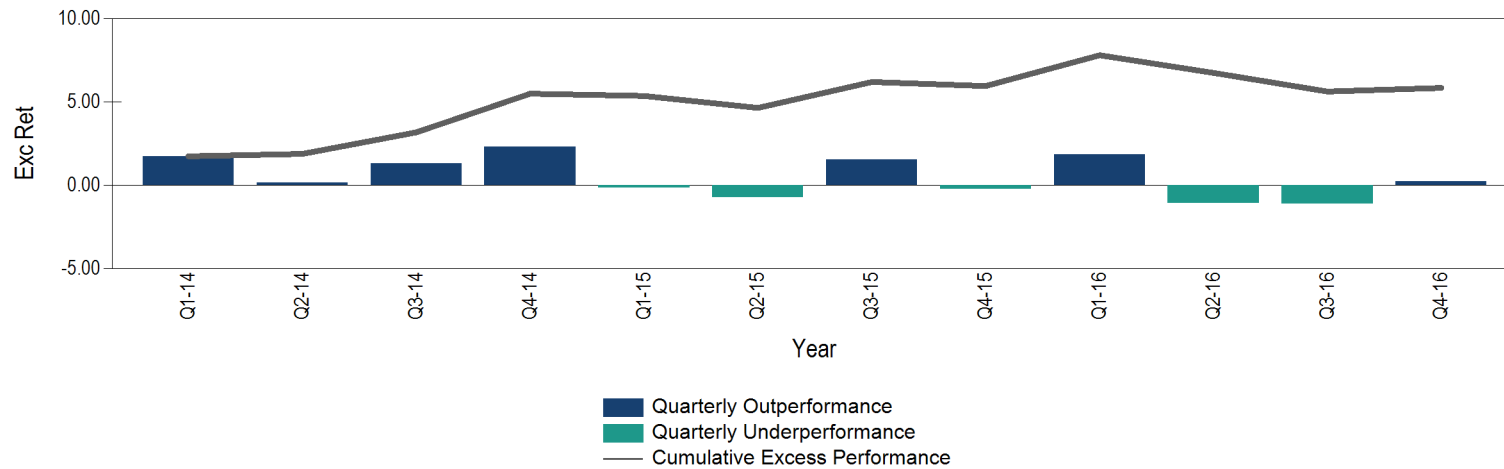
US Effective Style Map



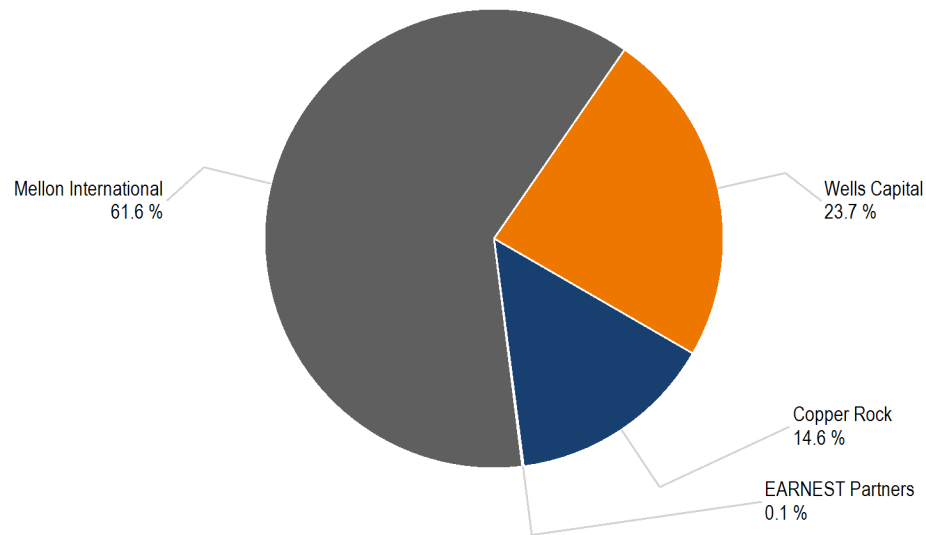
Growth of a Dollar



Quarterly and Cumulative Excess Performance

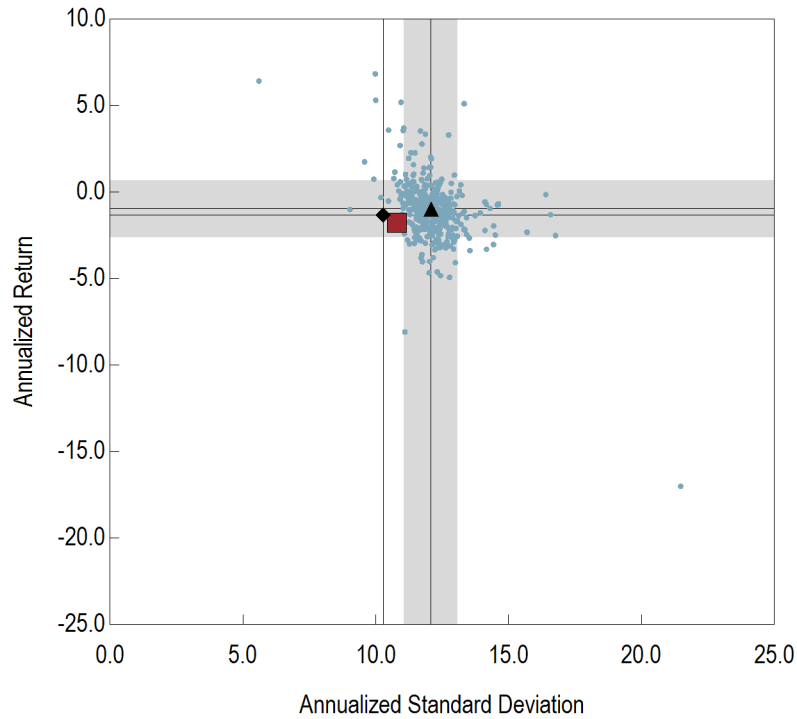


| | Actual (\$) | Actual % |
|----------------------|----------------------|---------------|
| Copper Rock | \$24,034,323 | 14.6% |
| EARNEST Partners | \$153,417 | 0.1% |
| Mellon International | \$101,326,424 | 61.6% |
| Wells Capital | \$38,879,114 | 23.7% |
| Total | \$164,393,278 | 100.0% |



International Equity
Risk vs. Return (3 Years)

Period Ending: December 31, 2016

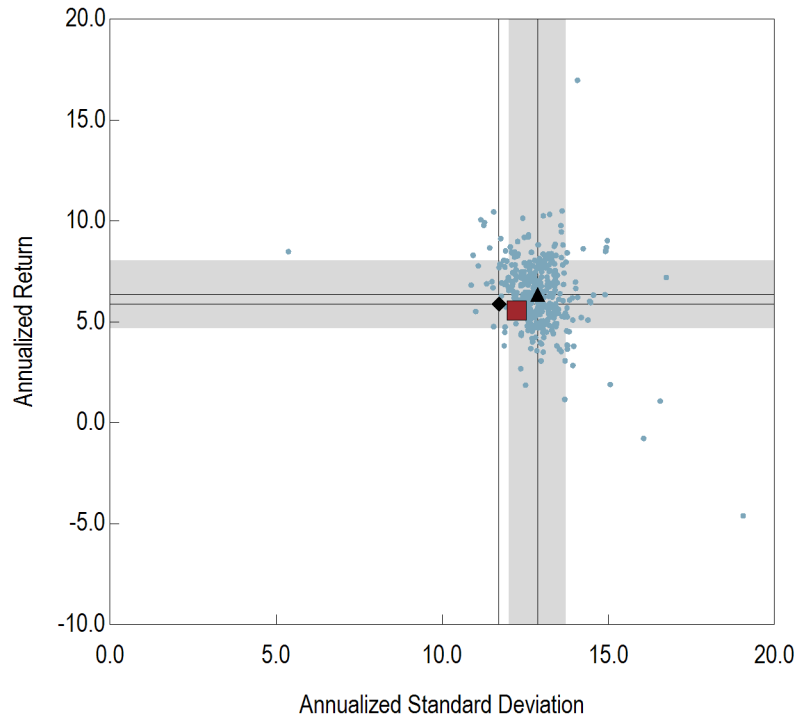


- International Equity
- ◆ MSCI ACWI ex US
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB ex-US Eq Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|--|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| International Equity | -1.8% | 77 | 10.8% | 3 | -0.2 | 83 |
| MSCI ACWI ex US | -1.3% | 64 | 10.3% | 2 | -0.1 | 74 |
| InvestorForce All DB ex-US Eq Gross Median | -1.0% | -- | 12.1% | -- | -0.1 | -- |

International Equity
Risk vs. Return (5 Years)

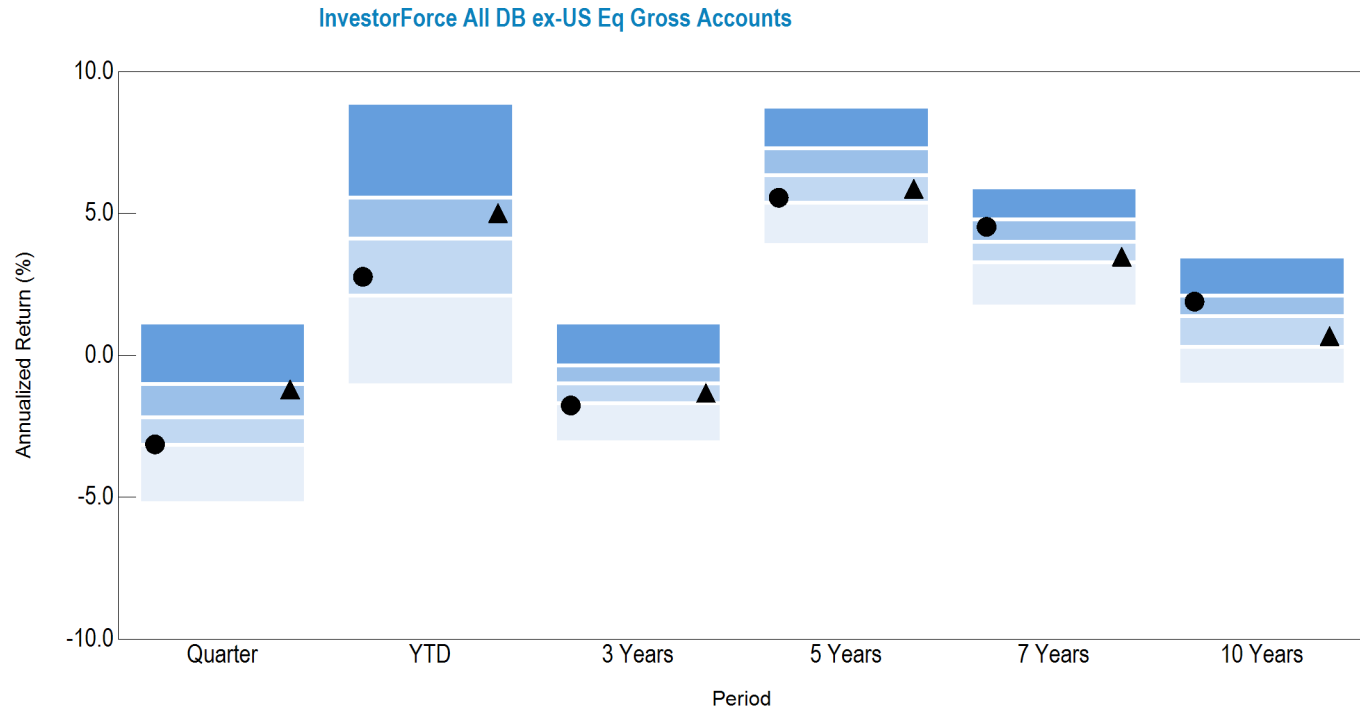
Period Ending: December 31, 2016



419 Portfolios

- International Equity
- ◆ MSCI ACWI ex US
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB ex-US Eq Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|--|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| International Equity | 5.6% | 70 | 12.2% | 16 | 0.4 | 62 |
| MSCI ACWI ex US | 5.9% | 63 | 11.7% | 4 | 0.5 | 49 |
| InvestorForce All DB ex-US Eq Gross Median | 6.4% | -- | 12.9% | -- | 0.5 | -- |



| | Return (Rank) | | | | | |
|------------------------|---------------|----------|-----------|----------|----------|----------|
| | Quarter | YTD | 3 Years | 5 Years | 7 Years | 10 Years |
| 5th Percentile | 1.1 | 8.9 | 1.1 | 8.8 | 5.9 | 3.5 |
| 25th Percentile | -1.0 | 5.6 | -0.4 | 7.3 | 4.8 | 2.1 |
| Median | -2.2 | 4.1 | -1.0 | 6.4 | 4.0 | 1.4 |
| 75th Percentile | -3.2 | 2.1 | -1.7 | 5.4 | 3.3 | 0.3 |
| 95th Percentile | -5.2 | -1.0 | -3.1 | 3.9 | 1.7 | -1.0 |
| # of Portfolios | 543 | 523 | 486 | 419 | 314 | 260 |
| ● International Equity | -3.1 (75) | 2.8 (70) | -1.8 (77) | 5.6 (70) | 4.5 (34) | 1.9 (35) |
| ▲ MSCI ACWI ex US | -1.2 (29) | 5.0 (35) | -1.3 (64) | 5.9 (63) | 3.5 (70) | 0.7 (69) |

Characteristics

| | Portfolio | MSCI ACWI ex USA Gross |
|---------------------------------|-----------|---------------------------|
| Number of Holdings | 1,131 | 1,856 |
| Weighted Avg. Market Cap. (\$B) | 43.0 | 49.2 |
| Median Market Cap. (\$B) | 8.0 | 6.7 |
| Price To Earnings | 22.1 | 20.2 |
| Price To Book | 3.3 | 2.5 |
| Price To Sales | 2.5 | 1.9 |
| Return on Equity (%) | 15.2 | 13.2 |
| Yield (%) | 2.7 | 2.9 |
| Beta (holdings; global) | 1.1 | 1.1 |

Top Holdings

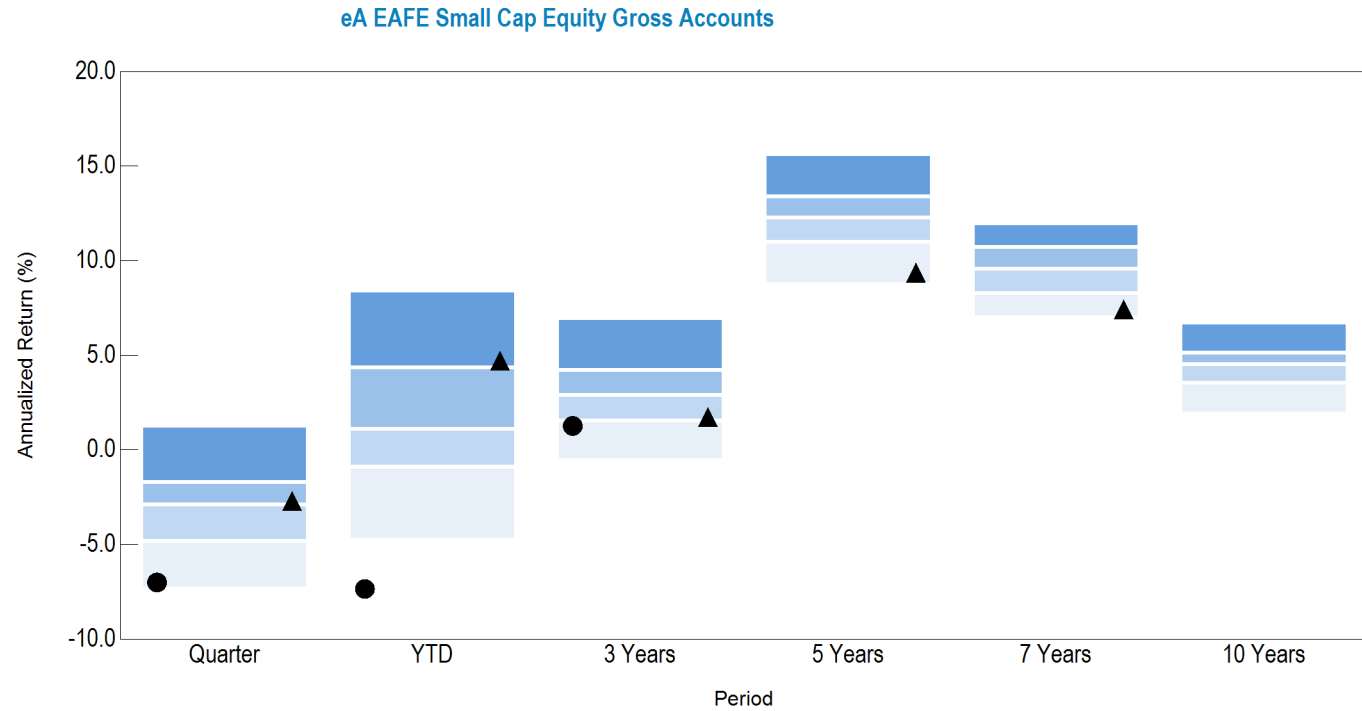
| | |
|----------------------------|------|
| SAMSUNG ELECTRONICS | 1.3% |
| NESTLE 'R' | 1.1% |
| NOVARTIS 'R' | 0.8% |
| HSBC HDG. (ORD \$0.50) | 0.8% |
| ROCHE HOLDING | 0.8% |
| TOYOTA MOTOR | 0.8% |
| AIA GROUP | 0.8% |
| CHINA MOBILE | 0.8% |
| TAIWAN SEMICON.SPN.ADR 1:5 | 0.7% |
| ROYAL DUTCH SHELL A(LON) | 0.6% |

Best Performers

| | Return % |
|----------------------------------|----------|
| SHARP | 73.6% |
| FIAT CHRYSLER AUTOS. (I:FCA) | 43.9% |
| AEGON | 43.9% |
| SOCIETE GENERALE (F:SGE) | 42.5% |
| STMICROELECTRONICS (PAR) (F:SGS) | 39.8% |
| DEUTSCHE BANK | 38.4% |
| NOMURA HDG. (J:NM@N) | 34.1% |
| SAIPEM | 33.3% |
| CAIXABANK | 32.9% |
| SUMITOMO HEAVY INDS. | 32.3% |

Worst Performers

| | Return % |
|--------------------------------|----------|
| VOCUS COMMUNICATIONS | -41.2% |
| GRIDSUM HOLDING ADR (GSUM) | -39.5% |
| DENA | -39.3% |
| IMPALA PLATINUM (R:IMPJ) | -38.2% |
| B2W COMPANHIA DIGITAL ON | -36.2% |
| FRESNILLO | -36.0% |
| ANGLOGOLD ASHANTI SPN. ADR.1:1 | -34.0% |
| BERENDSEN (UKIR:BRNS) | -33.4% |
| HUGEL (KO:HGL) | -31.3% |
| HEALTHSCOPE | -29.4% |



| | Quarter | | YTD | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
|--|---------|------|------|------|---------|------|---------|------|---------|------|----------|------|
| 5th Percentile | 1.3 | 8.4 | 7.0 | 15.6 | 12.0 | 6.7 | | | | | | |
| 25th Percentile | -1.7 | 4.4 | 4.2 | 13.4 | 10.8 | 5.2 | | | | | | |
| Median | -2.9 | 1.1 | 2.9 | 12.3 | 9.6 | 4.5 | | | | | | |
| 75th Percentile | -4.8 | -0.9 | 1.6 | 11.0 | 8.3 | 3.6 | | | | | | |
| 95th Percentile | -7.3 | -4.7 | -0.5 | 8.8 | 7.0 | 1.9 | | | | | | |
| # of Portfolios | 65 | 65 | 62 | 55 | 45 | 37 | | | | | | |
| ● Copper Rock | -7.0 | (93) | -7.3 | (99) | 1.3 | (83) | -- | (--) | -- | (--) | -- | (--) |
| ▲ MSCI World ex US Small Cap GD | -2.7 | (50) | 4.7 | (23) | 1.7 | (72) | 9.4 | (93) | 7.4 | (94) | -- | (--) |

Characteristics

| | Portfolio | MSCI World ex USA Small Cap |
|---------------------------------|-----------|--------------------------------|
| Number of Holdings | 88 | 2,454 |
| Weighted Avg. Market Cap. (\$B) | 2.6 | 2.1 |
| Median Market Cap. (\$B) | 2.2 | 1.0 |
| Price To Earnings | 23.9 | 19.5 |
| Price To Book | 3.0 | 2.4 |
| Price To Sales | 2.4 | 1.3 |
| Return on Equity (%) | 19.1 | 12.1 |
| Yield (%) | 1.8 | 2.2 |
| Beta (holdings; global) | 1.0 | 1.0 |

Top Holdings

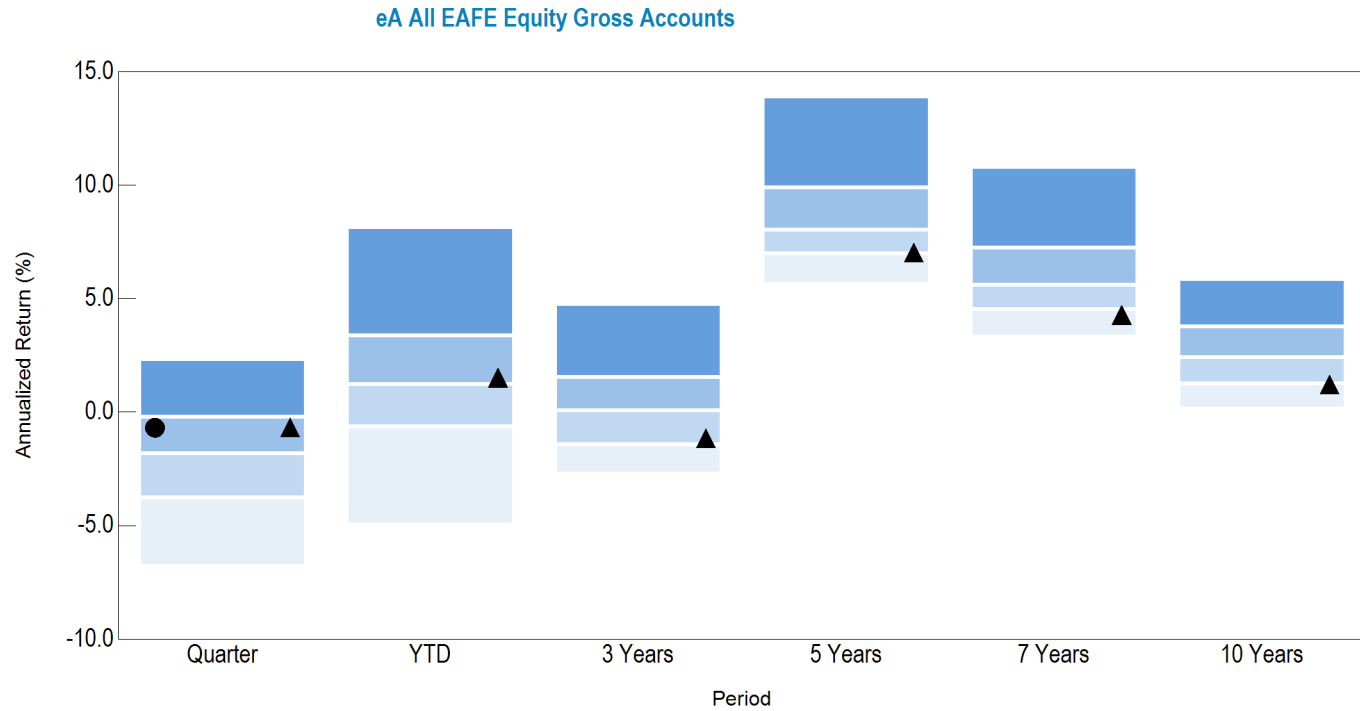
| | |
|--------------------------|------|
| CEMBRA MONEY BANK N ORD | 2.3% |
| WHITECAP RESOURCES | 2.0% |
| RECORDATI INDUA.CHIMICA | 1.7% |
| IPSEN | 1.7% |
| RAGING RIVER EXPLORATION | 1.6% |
| HITACHI CHEMICAL | 1.6% |
| OPEN HOUSE | 1.5% |
| SALMAR | 1.5% |
| AZBIL | 1.5% |
| TARKETT | 1.5% |

Best Performers

| | Return % |
|-----------------------------|----------|
| SIMS METAL MANAGEMENT | 32.2% |
| KULICKE & SOFFA INDS. | 23.4% |
| DELTA LLOYD GROUP (H:DL) | 22.1% |
| BANCA IFIS | 21.6% |
| CAIRN HOMES (WI) (UKIR:CRN) | 17.9% |
| SSP GROUP (UKIR:SSPG) | 15.1% |
| ADASTRIA (J:POIT) | 13.7% |
| NH FOODS | 12.4% |
| OPEN HOUSE (J:OPEN) | 12.3% |
| HITACHI CHEMICAL | 10.1% |

Worst Performers

| | Return % |
|--------------------------------|----------|
| BERENDSEN (UKIR:BRSN) | -33.4% |
| HUGEL (KO:HGL) | -31.3% |
| PANTHEON RESOURCES (UKIR:PANR) | -25.4% |
| SQUARE ENIX HOLDINGS | -24.8% |
| FASTIGHETS BALDER 'B' (W:BALB) | -23.9% |
| EZAKI GLICO (J:BQ@N) | -22.3% |
| ZENKOKU HOSHO (J:ZENH) | -21.7% |
| ASHMORE GROUP (UKIR:ASHM) | -21.2% |
| OPTIMAL PAYMENTS (UKIR:PAYS) | -20.8% |
| NISHIMATSUYA CHAIN (J:TSUY) | -20.5% |



| | Return (Rank) | | | | | | | | | | | |
|------------------------|---------------|------|------|------|------|------|------|------|------|------|-----|------|
| 5th Percentile | 2.3 | | 8.1 | | 4.8 | | 13.9 | | 10.8 | | 5.9 | |
| 25th Percentile | -0.2 | | 3.4 | | 1.6 | | 9.9 | | 7.3 | | 3.8 | |
| Median | -1.8 | | 1.3 | | 0.1 | | 8.1 | | 5.6 | | 2.4 | |
| 75th Percentile | -3.8 | | -0.6 | | -1.4 | | 7.0 | | 4.6 | | 1.3 | |
| 95th Percentile | -6.8 | | -4.9 | | -2.7 | | 5.7 | | 3.3 | | 0.2 | |
| # of Portfolios | 350 | | 350 | | 333 | | 303 | | 279 | | 229 | |
| ● Mellon International | -0.7 | (34) | -- | (--) | -- | (--) | -- | (--) | -- | (--) | -- | (--) |
| ▲ MSCI EAFE Gross | -0.7 | (33) | 1.5 | (47) | -1.2 | (71) | 7.0 | (75) | 4.3 | (82) | 1.2 | (78) |

Characteristics

| | Portfolio | MSCI EAFE Gross |
|---------------------------------|-----------|-----------------|
| Number of Holdings | 945 | 930 |
| Weighted Avg. Market Cap. (\$B) | 50.7 | 50.6 |
| Median Market Cap. (\$B) | 8.6 | 8.6 |
| Price To Earnings | 21.9 | 21.3 |
| Price To Book | 3.1 | 2.4 |
| Price To Sales | 2.3 | 1.7 |
| Return on Equity (%) | 13.8 | 11.8 |
| Yield (%) | 3.1 | 3.1 |
| Beta (holdings; global) | 1.1 | 1.1 |

Top Holdings

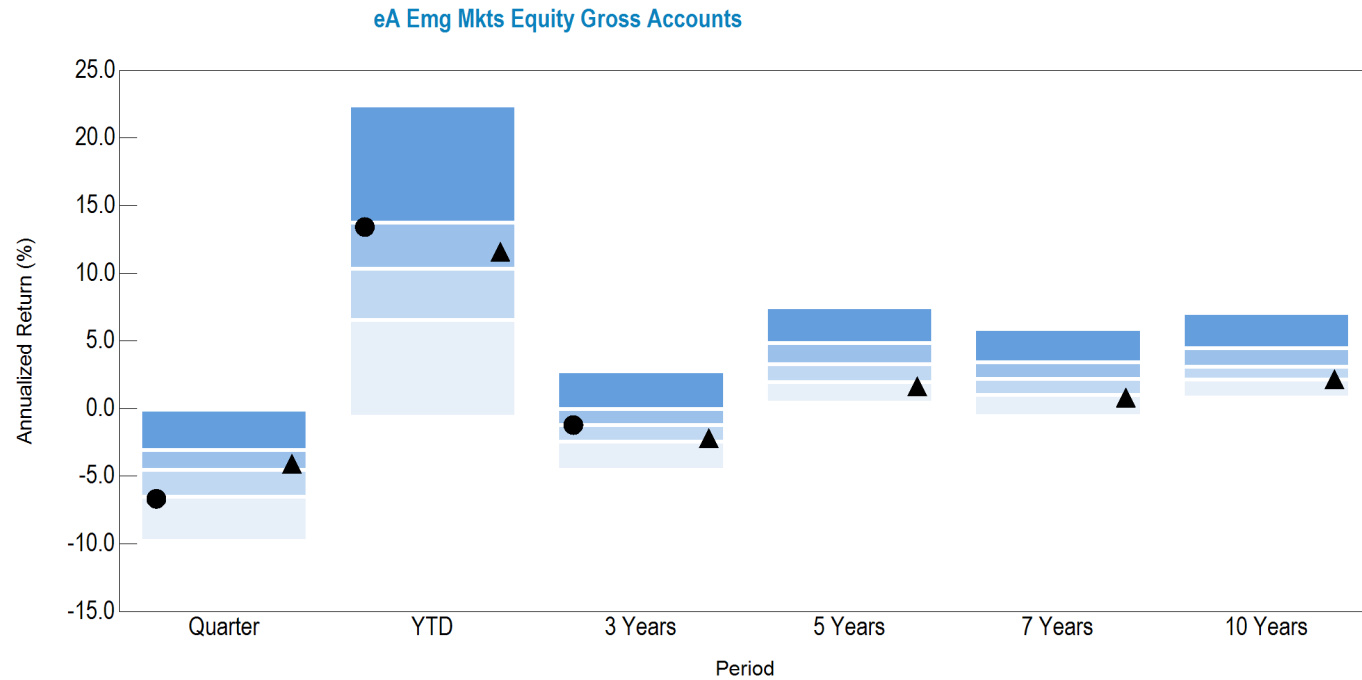
| | |
|--------------------------|------|
| NESTLE 'R' | 1.8% |
| NOVARTIS 'R' | 1.3% |
| HSBC HDG. (ORD \$0.50) | 1.3% |
| ROCHE HOLDING | 1.3% |
| TOYOTA MOTOR | 1.3% |
| ROYAL DUTCH SHELL A(LON) | 1.0% |
| BP | 1.0% |
| TOTAL | 0.9% |
| ROYAL DUTCH SHELL B | 0.9% |
| BRITISH AMERICAN TOBACCO | 0.9% |

Best Performers

| | Return % |
|-------------------------------|----------|
| SHARP (J:SH@N) | 73.6% |
| FIAT CHRYSLER AUTOS. (I:FCA) | 43.9% |
| AEGON | 43.9% |
| SOCIETE GENERALE (F:SGE) | 42.5% |
| STMICROELECTRONICS (PAR) | 39.8% |
| DEUTSCHE BANK | 38.4% |
| NOMURA HDG. (J:NM@N) | 34.1% |
| SAIPEM | 33.3% |
| CAIXABANK (E:CABK) | 32.9% |
| SUMITOMO HEAVY INDS. (J:OZ@N) | 32.3% |

Worst Performers

| | Return % |
|-------------------------------|----------|
| VOCUS COMMUNICATIONS (A:VOCX) | -41.2% |
| DENA | -39.3% |
| FRESNILLO (UKIR:FRES) | -36.0% |
| HEALTHSCOPE (A:HSOX) | -29.4% |
| LINE ORD | -28.4% |
| RWE (D:RWE) | -28.0% |
| SOHGO SECURITIES | -27.7% |
| GEA GROUP | -27.7% |
| TOSHIBA (J:TS@N) | -26.6% |
| VEOLIA ENVIRONNEMENT (F:VIE) | -25.9% |



| | Return (Rank) | | | | | | | | | | | |
|-------------------------------|---------------|------|------|------|---------|------|---------|------|---------|------|----------|------|
| | Quarter | | YTD | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
| 5th Percentile | -0.1 | | 22.4 | | 2.7 | | 7.5 | | 5.8 | | 7.0 | |
| 25th Percentile | -3.0 | | 13.7 | | 0.0 | | 4.9 | | 3.5 | | 4.5 | |
| Median | -4.5 | | 10.4 | | -1.2 | | 3.3 | | 2.2 | | 3.1 | |
| 75th Percentile | -6.5 | | 6.6 | | -2.4 | | 2.0 | | 1.1 | | 2.2 | |
| 95th Percentile | -9.8 | | -0.6 | | -4.5 | | 0.4 | | -0.5 | | 0.8 | |
| # of Portfolios | 337 | | 337 | | 307 | | 241 | | 170 | | 117 | |
| ● Wells Capital | -6.7 | (79) | 13.4 | (28) | -1.2 | (52) | -- | (--) | -- | (--) | -- | (--) |
| ▲ MSCI Emerging Markets Gross | -4.1 | (42) | 11.6 | (40) | -2.2 | (69) | 1.6 | (81) | 0.8 | (80) | 2.2 | (76) |

Characteristics

| | Portfolio | MSCI Emerging Markets Gross |
|---------------------------------|-----------|--------------------------------|
| Number of Holdings | 105 | 832 |
| Weighted Avg. Market Cap. (\$B) | 48.0 | 48.4 |
| Median Market Cap. (\$B) | 9.0 | 4.6 |
| Price To Earnings | 21.6 | 18.3 |
| Price To Book | 3.7 | 2.6 |
| Price To Sales | 2.9 | 5.2 |
| Return on Equity (%) | 16.4 | 16.3 |
| Yield (%) | 2.1 | 2.6 |
| Beta (holdings; global) | 1.1 | 1.0 |

Top Holdings

| | |
|--------------------------------------|------|
| SAMSUNG ELECTRONICS | 5.7% |
| CHINA MOBILE | 3.3% |
| TAIWAN SEMICON.SPN.ADR 1:5 | 3.2% |
| FOM.ECO.MEXNO.SAB DE CV SPN.ADR 1:10 | 2.3% |
| CHINA LIFE INSURANCE 'H' | 2.3% |
| HDFC BANK ADR 1:3 | 2.2% |
| UNI-PRESIDENT ENTS. | 2.0% |
| SINA | 2.0% |
| RELIANCE INDS.GDR 144A | 2.0% |
| WH GROUP | 2.0% |

Best Performers

| | Return % |
|--|----------|
| SUN ART RETAIL GROUP | 27.1% |
| MOBL.TELSMS.OJSC SPN.ADR 1:2 (MBT) | 25.3% |
| SBERBANK RUSSIA ADR 1:4 | 22.9% |
| LUKOIL OAO SPN.ADR 1:1 (LUKOY) | 17.6% |
| LINK NET PT (ID:LIN) | 14.4% |
| PETROCHINA 'H' | 13.6% |
| AMERICA MOVIL SAB DE CV SPN.ADR 'L' 1:20 (AMX) | 11.1% |
| MAGNIT | 10.6% |
| FALABELLA SACI | 8.7% |
| AES GENER | 8.5% |

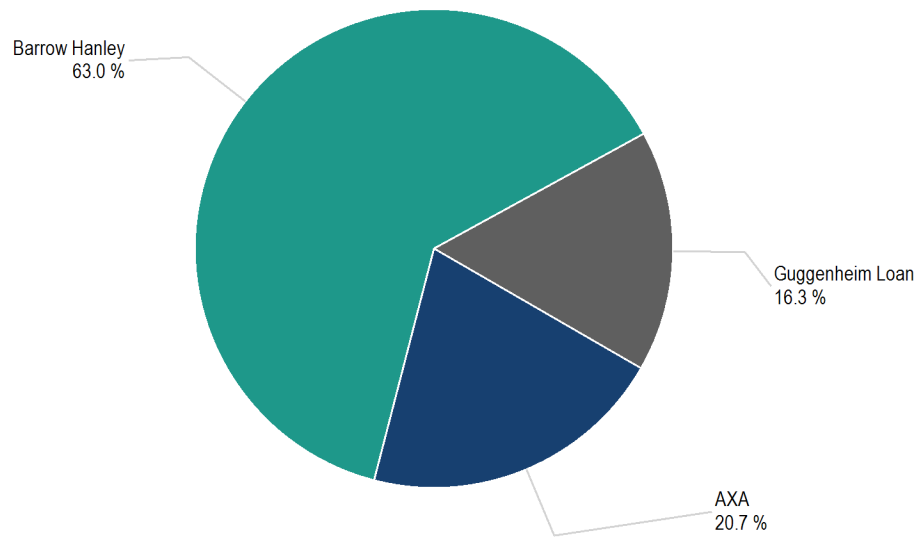
Worst Performers

| | Return % |
|-------------------------------------|----------|
| GRIDSUM HOLDING ADR (GSUM) | -39.5% |
| IMPALA PLATINUM | -38.2% |
| B2W COMPANHIA DIGITAL ON (BR:B2W) | -36.2% |
| ANGLOGOLD ASHANTI SPN. ADR.1:1 (AU) | -34.0% |
| KT & G (KO:KTB) | -26.3% |
| VIPSHOP HOLDINGS ADR 5:1 | -24.9% |
| AMOREPACIFIC | -24.6% |
| MATAHARI DEPARTMENT SOE. | -20.7% |
| NAVER (KO:NHN) | -20.0% |
| WEIBO CLASS 'A' ADR (WB) | -19.0% |

US Fixed Income
Manager Allocation Analysis

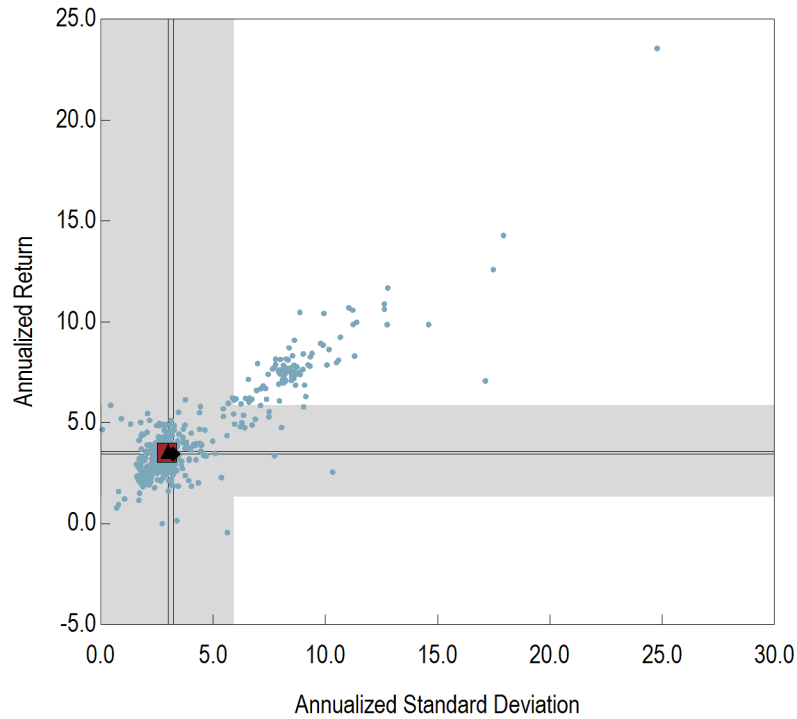
Period Ending: December 31, 2016

| | Actual (\$) | Actual % |
|-----------------|----------------------|---------------|
| AXA | \$36,885,478 | 20.7% |
| Barrow Hanley | \$112,197,467 | 63.0% |
| Guggenheim Loan | \$28,949,696 | 16.3% |
| Total | \$178,032,641 | 100.0% |



US Fixed Income
Risk vs. Return (3 Years)

Period Ending: December 31, 2016

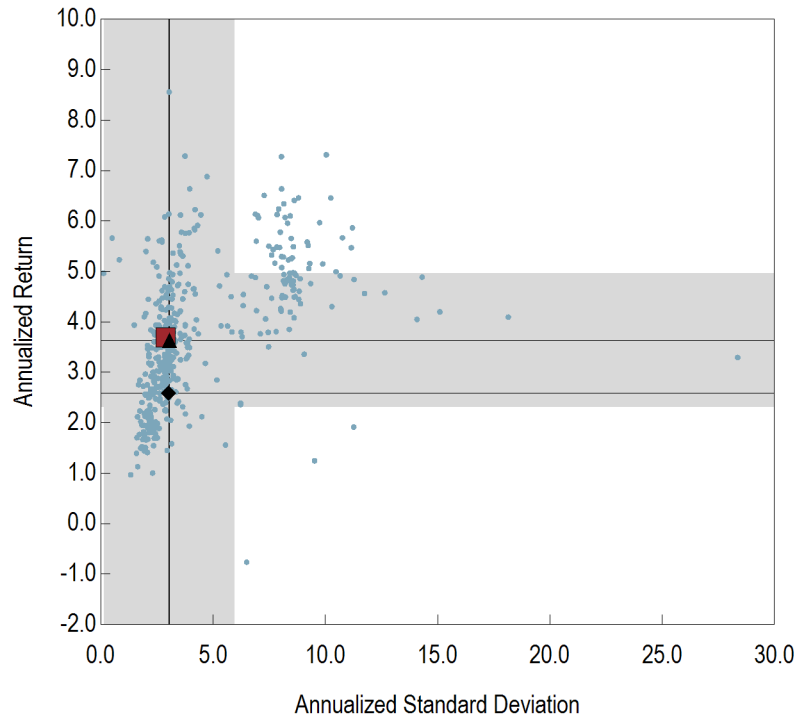


- US Fixed Income
- ◆ US Fixed Custom
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Fix Inc Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|--|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| US Fixed Income | 3.5% | 53 | 2.9% | 48 | 1.2 | 33 |
| US Fixed Custom | 3.4% | 55 | 3.2% | 61 | 1.0 | 49 |
| InvestorForce All DB US Fix Inc Gross Median | 3.6% | -- | 3.0% | -- | 1.0 | -- |

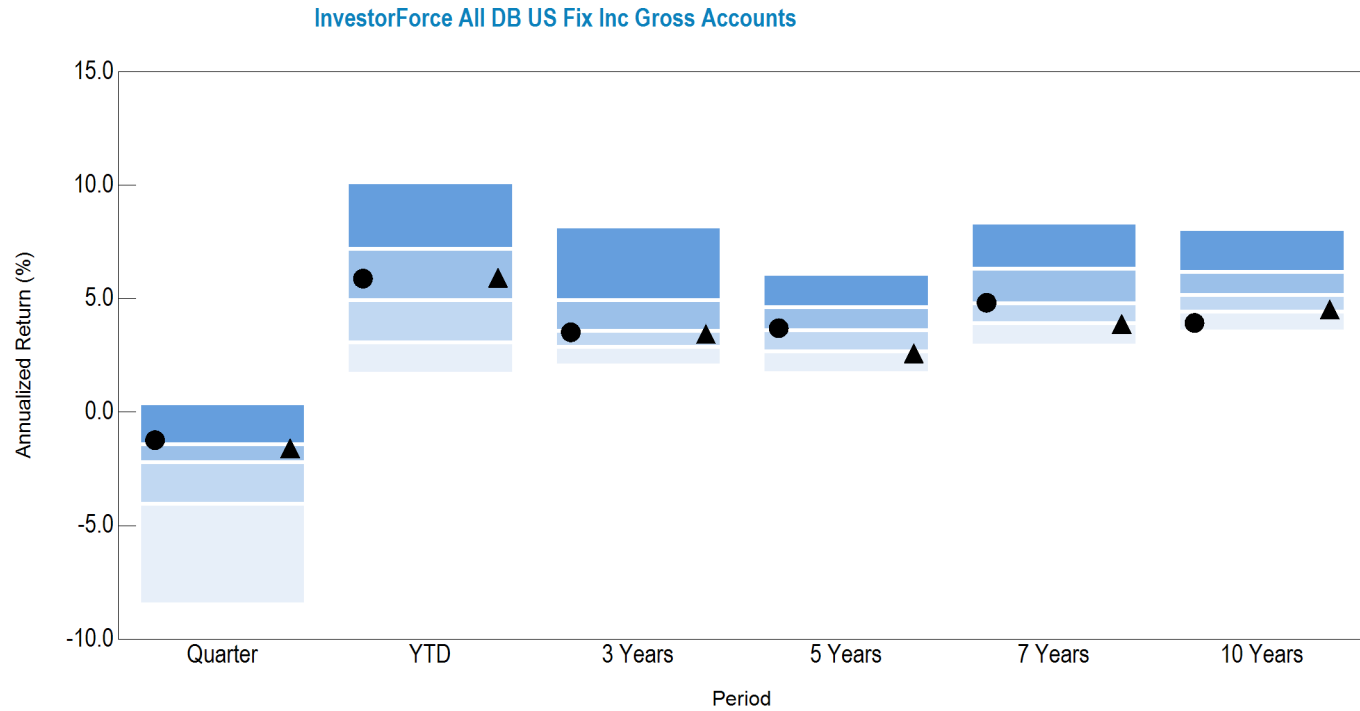
US Fixed Income
Risk vs. Return (5 Years)

Period Ending: December 31, 2016



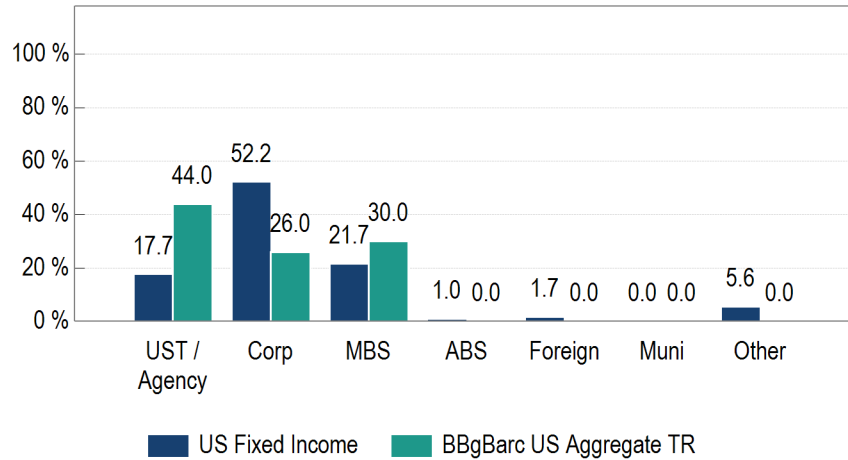
- US Fixed Income
- ◆ US Fixed Custom
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Fix Inc Gross

| | Anlzd Return | Anlzd Return Rank | Anlzd Standard Deviation | Anlzd Standard Deviation Rank | Sharpe Ratio | Sharpe Ratio Rank |
|--|--------------|-------------------|--------------------------|-------------------------------|--------------|-------------------|
| US Fixed Income | 3.7% | 49 | 2.9% | 42 | 1.2 | 26 |
| US Fixed Custom | 2.6% | 79 | 3.0% | 49 | 0.8 | 64 |
| InvestorForce All DB US Fix Inc Gross Median | 3.6% | -- | 3.1% | -- | 1.0 | -- |

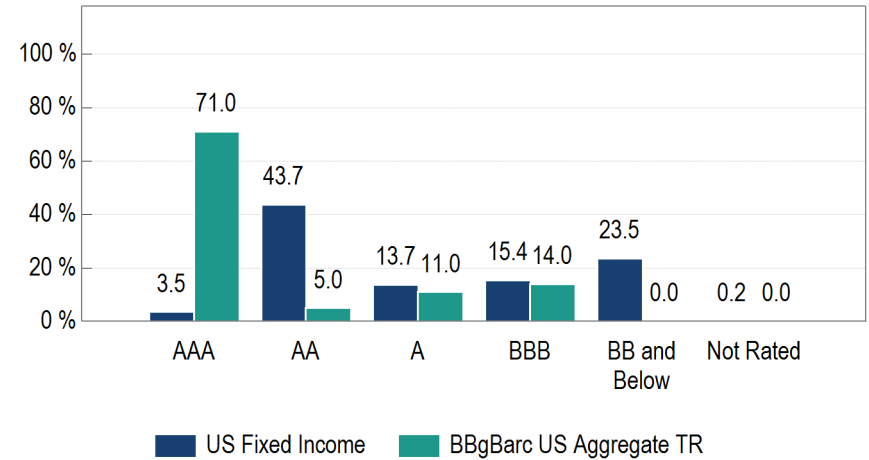


| | Return (Rank) | | | | | |
|-------------------|---------------|----------|----------|----------|----------|----------|
| | Quarter | YTD | 3 Years | 5 Years | 7 Years | 10 Years |
| 5th Percentile | 0.4 | 10.1 | 8.2 | 6.1 | 8.3 | 8.0 |
| 25th Percentile | -1.4 | 7.2 | 5.0 | 4.6 | 6.3 | 6.2 |
| Median | -2.2 | 4.9 | 3.6 | 3.6 | 4.8 | 5.2 |
| 75th Percentile | -4.0 | 3.1 | 2.9 | 2.7 | 3.9 | 4.4 |
| 95th Percentile | -8.5 | 1.7 | 2.1 | 1.7 | 2.9 | 3.6 |
| # of Portfolios | 559 | 542 | 522 | 459 | 340 | 285 |
| ● US Fixed Income | -1.2 (21) | 5.9 (40) | 3.5 (53) | 3.7 (49) | 4.8 (50) | 3.9 (90) |
| ▲ US Fixed Custom | -1.6 (29) | 5.9 (40) | 3.4 (55) | 2.6 (79) | 3.9 (77) | 4.5 (73) |

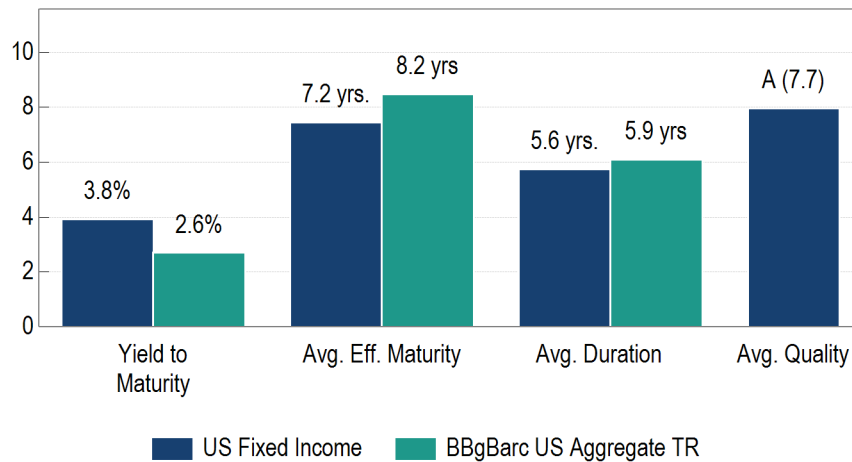
Sectors
US Fixed Income



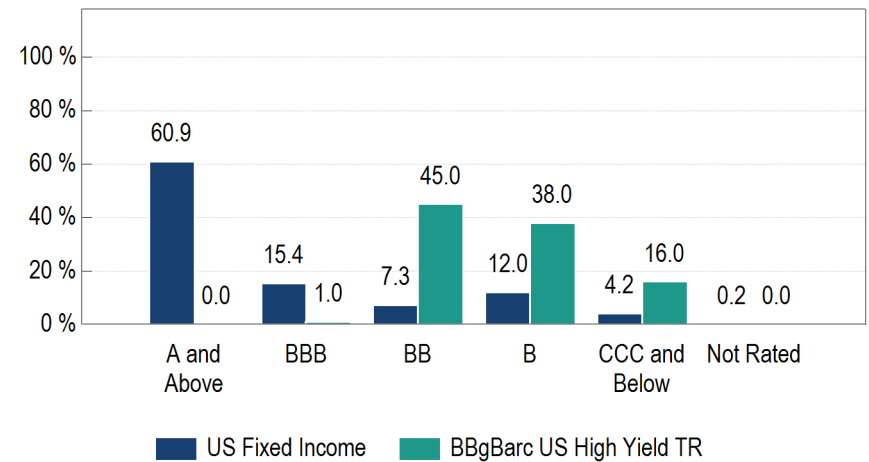
Quality Ratings
US Fixed Income

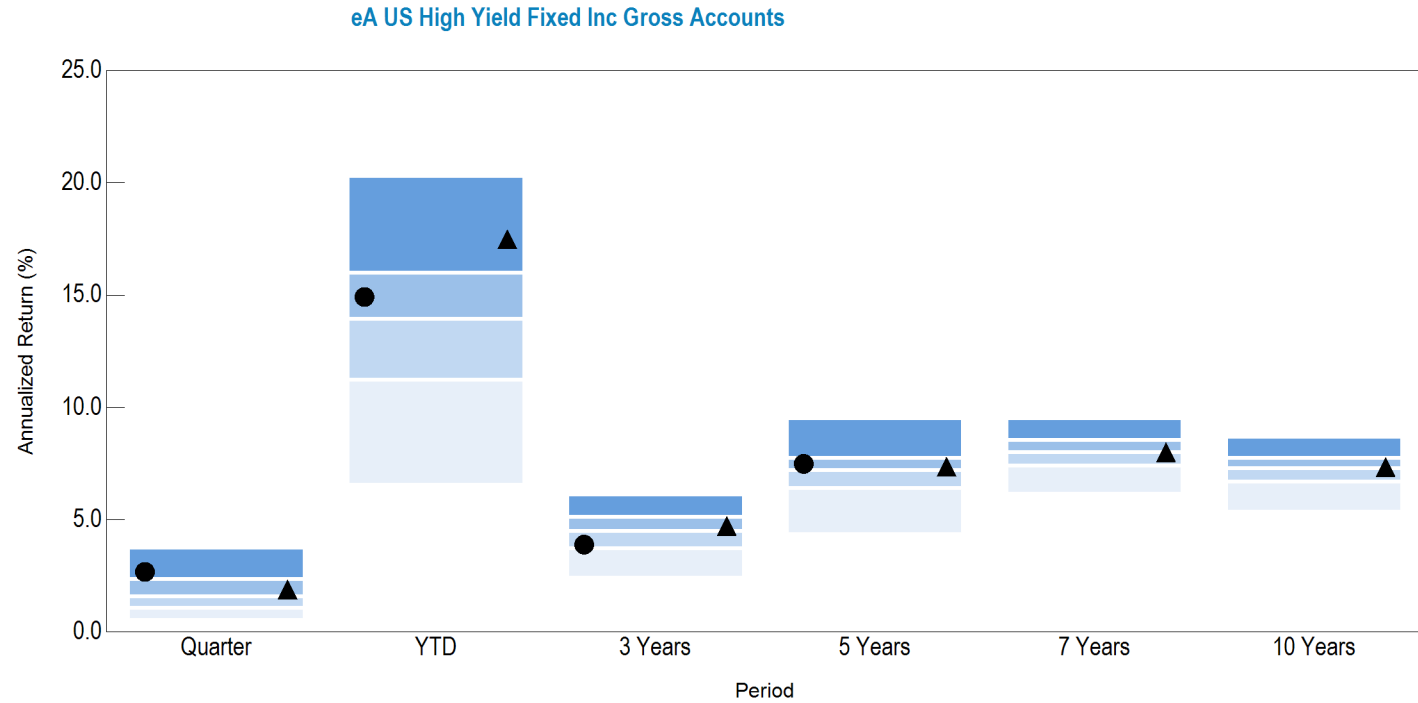


Characteristics
US Fixed Income



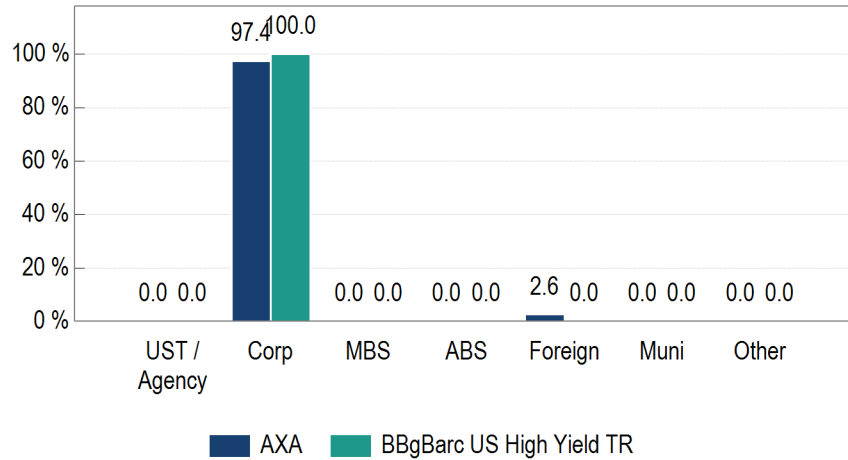
High Yield Quality Ratings
US Fixed Income



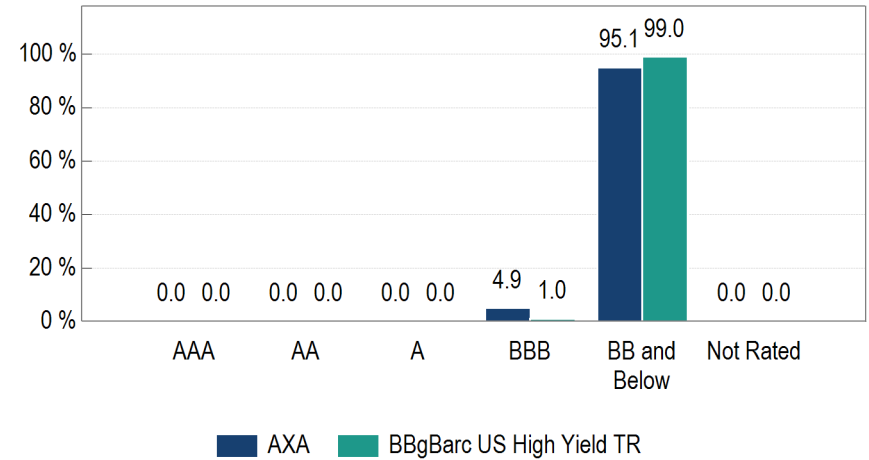


| | Return (Rank) | | | | | | | | | | | |
|---|---------------|------|------|------|-----|------|-----|------|-----|------|-----|------|
| 5th Percentile | 3.7 | 20.3 | 6.1 | 9.5 | 9.5 | 8.7 | | | | | | |
| 25th Percentile | 2.4 | 16.0 | 5.1 | 7.8 | 8.6 | 7.8 | | | | | | |
| Median | 1.6 | 14.0 | 4.5 | 7.2 | 8.0 | 7.3 | | | | | | |
| 75th Percentile | 1.1 | 11.3 | 3.7 | 6.4 | 7.4 | 6.7 | | | | | | |
| 95th Percentile | 0.5 | 6.6 | 2.4 | 4.4 | 6.1 | 5.4 | | | | | | |
| # of Portfolios | 183 | 183 | 171 | 155 | 135 | 116 | | | | | | |
| ● AXA | 2.7 | (18) | 14.9 | (38) | 3.9 | (71) | 7.5 | (35) | -- | (--) | -- | (--) |
| ▲ BofA Merrill Lynch US High Yield Master II TR | 1.9 | (39) | 17.5 | (14) | 4.7 | (41) | 7.4 | (40) | 8.0 | (51) | 7.3 | (50) |

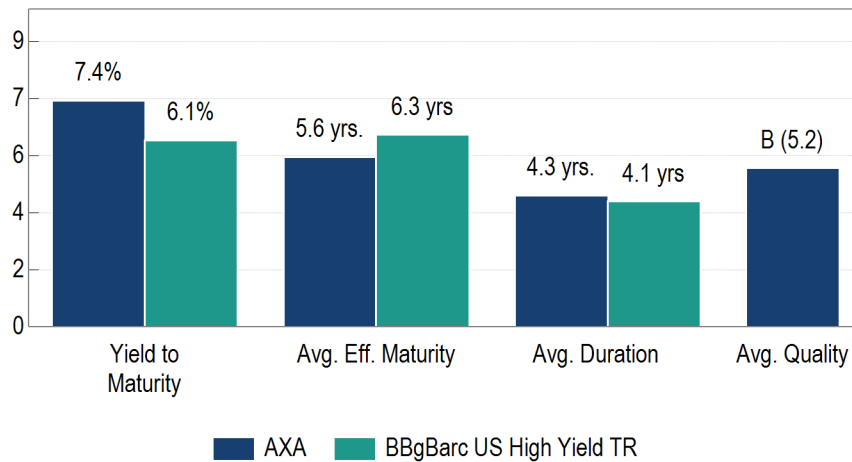
Sectors
AXA



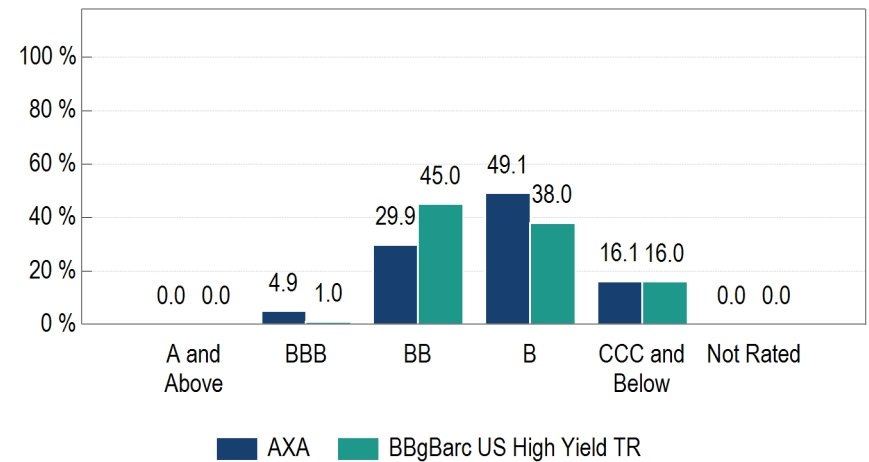
Quality Ratings
AXA

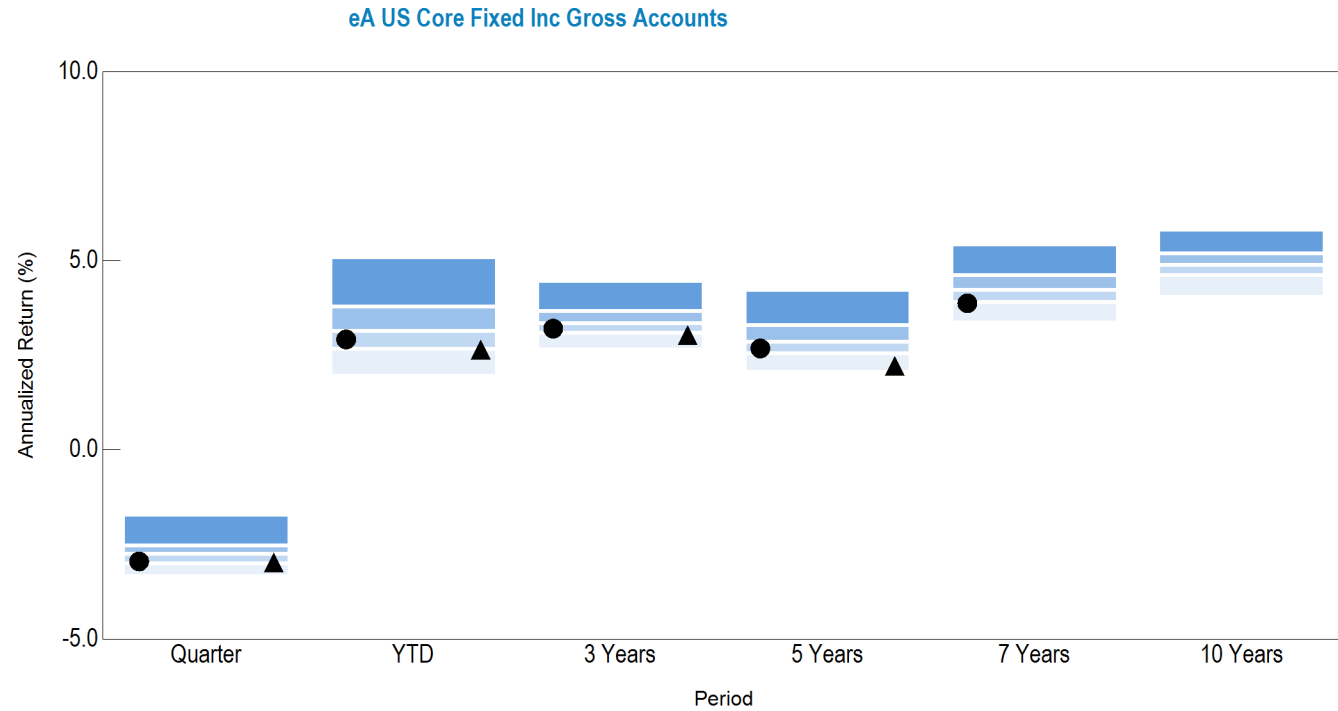


Characteristics
AXA



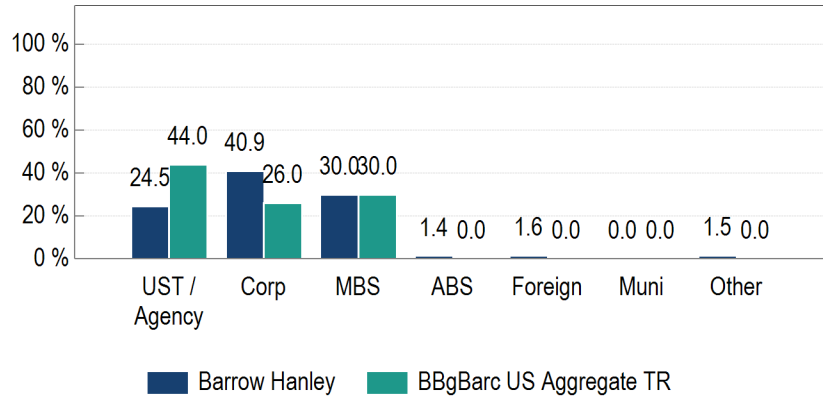
High Yield Quality Ratings
AXA



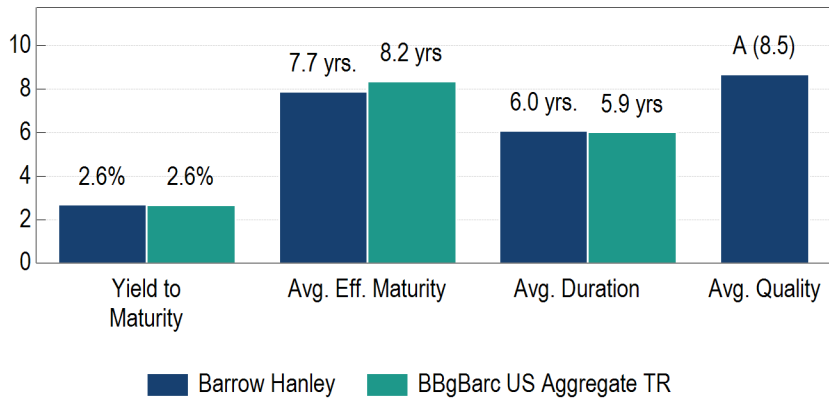


| | Return (Rank) | | | | | | | | | | | |
|---------------------|---------------|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| 5th Percentile | -1.7 | | 5.1 | | 4.5 | | 4.2 | | 5.4 | | 5.8 | |
| 25th Percentile | -2.5 | | 3.8 | | 3.7 | | 3.3 | | 4.6 | | 5.2 | |
| Median | -2.7 | | 3.2 | | 3.4 | | 2.9 | | 4.2 | | 4.9 | |
| 75th Percentile | -3.0 | | 2.7 | | 3.1 | | 2.6 | | 3.9 | | 4.6 | |
| 95th Percentile | -3.3 | | 2.0 | | 2.7 | | 2.1 | | 3.4 | | 4.1 | |
| # of Portfolios | 223 | | 223 | | 221 | | 219 | | 211 | | 197 | |
| ● Barrow Hanley | -2.9 | (73) | 2.9 | (65) | 3.2 | (69) | 2.7 | (67) | 3.9 | (78) | -- | (--) |
| ▲ BBgBarc Aggregate | -3.0 | (75) | 2.6 | (77) | 3.0 | (82) | 2.2 | (92) | -- | (--) | -- | (--) |

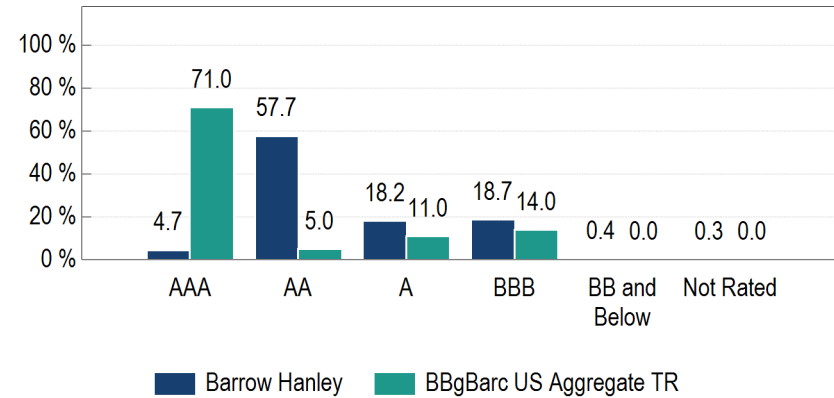
Sectors
Barrow Hanley

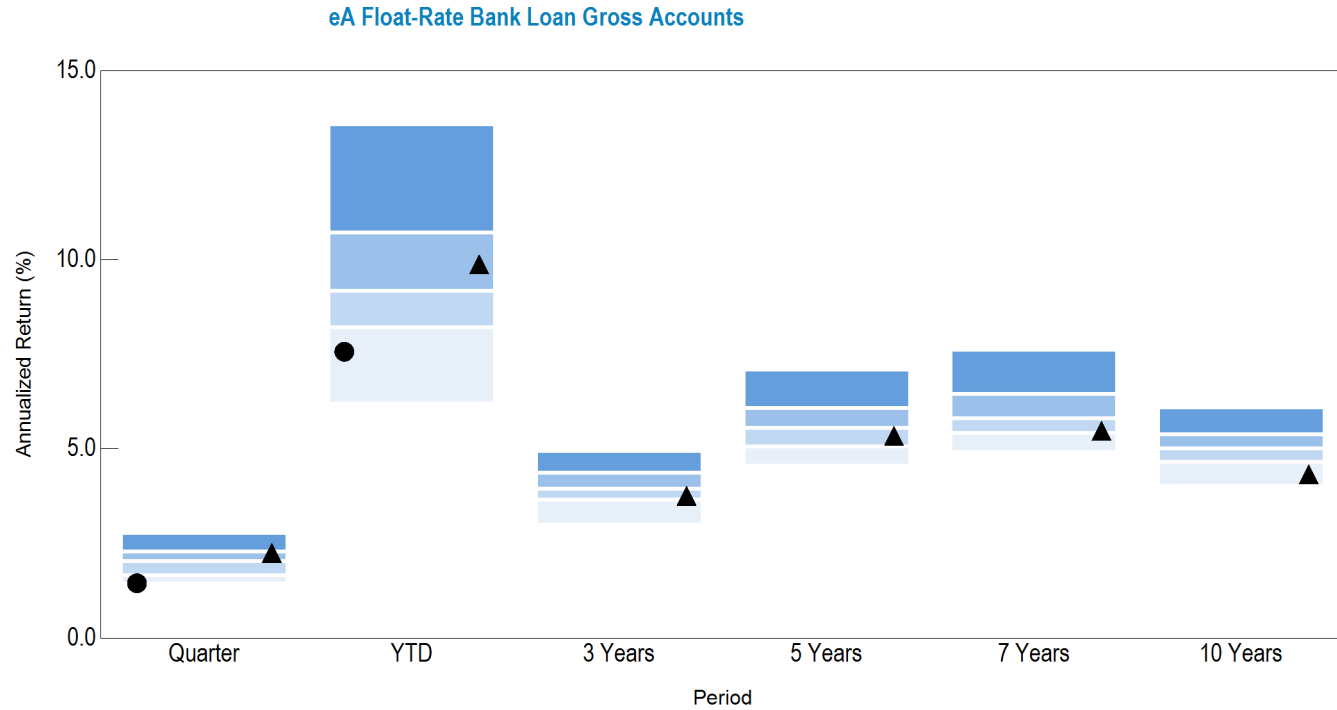


Characteristics
Barrow Hanley



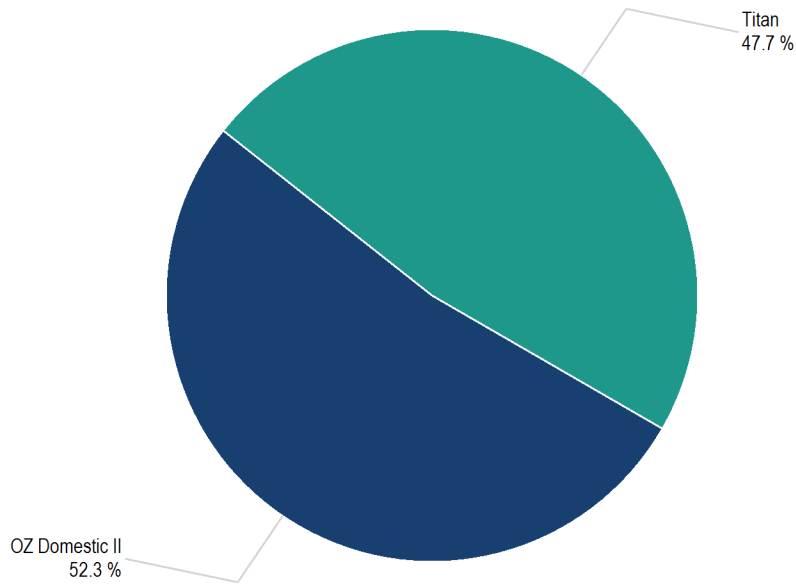
Quality Ratings
Barrow Hanley

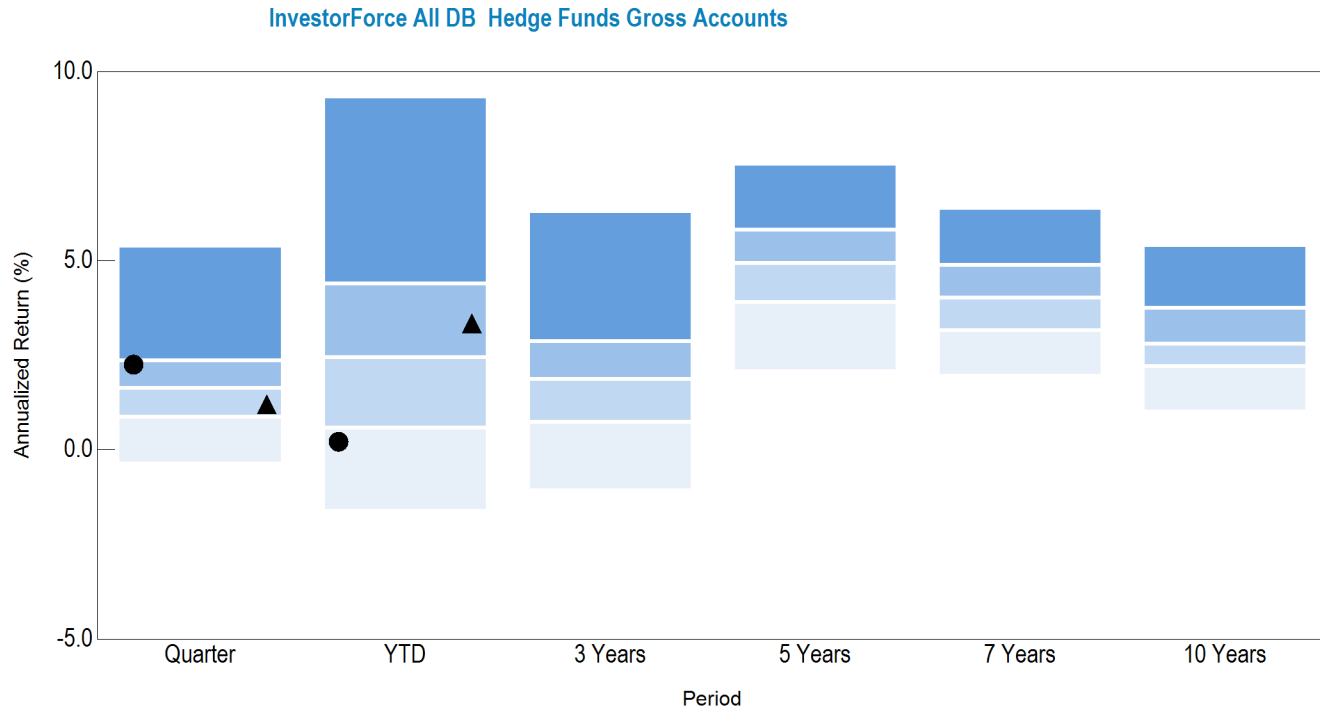




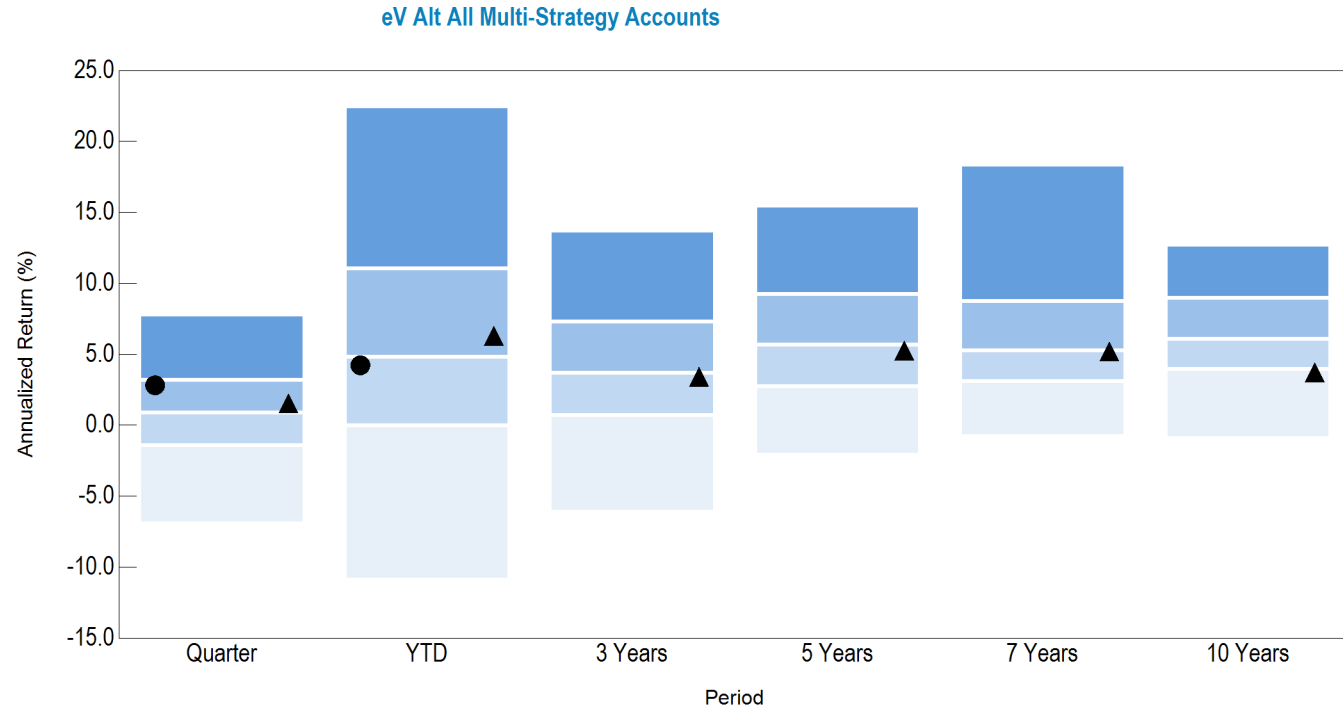
| | Return (Rank) | | | | | | | | | | | |
|---------------------------------|---------------|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| 5th Percentile | 2.8 | 13.6 | 4.9 | 7.1 | 7.6 | 6.1 | | | | | | |
| 25th Percentile | 2.3 | 10.7 | 4.4 | 6.1 | 6.5 | 5.4 | | | | | | |
| Median | 2.0 | 9.2 | 4.0 | 5.6 | 5.8 | 5.0 | | | | | | |
| 75th Percentile | 1.7 | 8.2 | 3.7 | 5.1 | 5.4 | 4.7 | | | | | | |
| 95th Percentile | 1.4 | 6.2 | 3.0 | 4.6 | 4.9 | 4.0 | | | | | | |
| # of Portfolios | 69 | 69 | 69 | 59 | 47 | 30 | | | | | | |
| ● Guggenheim Loan | 1.5 | (95) | 7.6 | (86) | -- | (--) | -- | (--) | -- | (--) | -- | (--) |
| ▲ Credit Suisse Leveraged Loans | 2.3 | (34) | 9.9 | (39) | 3.8 | (66) | 5.3 | (63) | 5.5 | (74) | 4.3 | (87) |

| | Actual (\$) | Actual % |
|----------------|---------------------|---------------|
| OZ Domestic II | \$15,160,219 | 52.3% |
| Titan | \$13,804,905 | 47.7% |
| Total | \$28,965,124 | 100.0% |

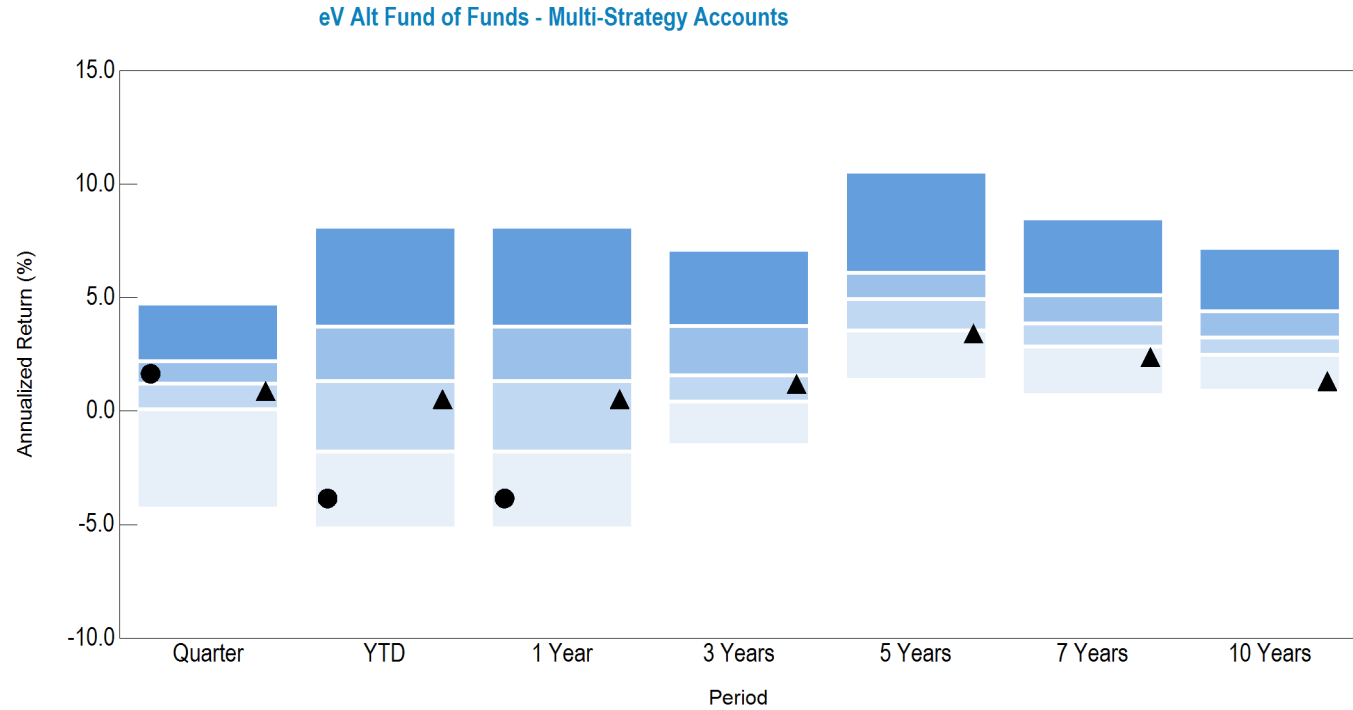




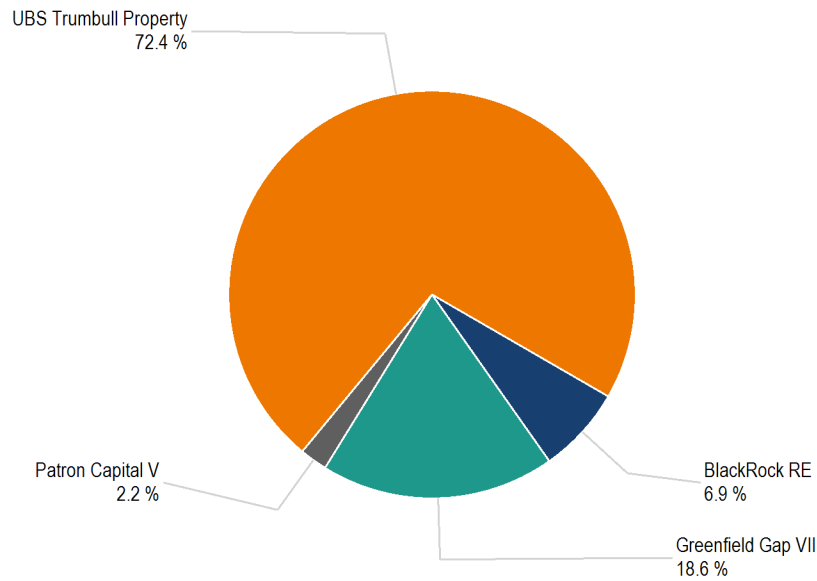
| | Return (Rank) | | | | | | | | | | | |
|---------------------|---------------|------|------|------|-----|------|----|------|----|------|----|------|
| 5th Percentile | 5.4 | 9.3 | 6.3 | 7.6 | 6.4 | 5.4 | | | | | | |
| 25th Percentile | 2.4 | 4.4 | 2.9 | 5.8 | 4.9 | 3.8 | | | | | | |
| Median | 1.6 | 2.5 | 1.9 | 4.9 | 4.0 | 2.8 | | | | | | |
| 75th Percentile | 0.9 | 0.6 | 0.8 | 3.9 | 3.2 | 2.2 | | | | | | |
| 95th Percentile | -0.3 | -1.6 | -1.1 | 2.1 | 2.0 | 1.0 | | | | | | |
| # of Portfolios | 271 | 263 | 249 | 220 | 150 | 82 | | | | | | |
| ● Hedge Fund | 2.3 | (33) | 0.2 | (80) | -- | (--) | -- | (--) | -- | (--) | -- | (--) |
| ▲ Hedge Fund Custom | 1.2 | (66) | 3.3 | (41) | -- | (--) | -- | (--) | -- | (--) | -- | (--) |



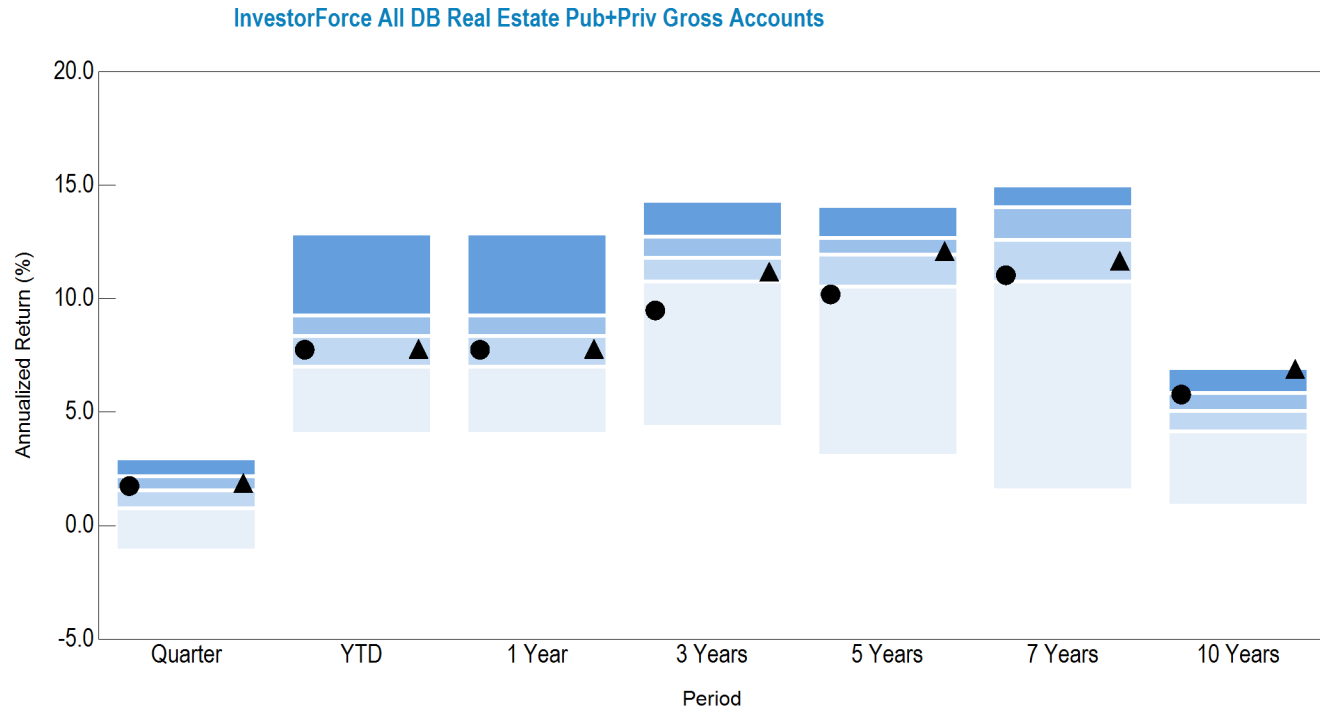
| | Return (Rank) | | | | | | | | | | | |
|---------------------------------|---------------|-------|------|------|------|------|-----|------|-----|------|-----|------|
| 5th Percentile | 7.8 | 22.5 | 13.7 | 15.5 | 18.4 | 12.7 | | | | | | |
| 25th Percentile | 3.2 | 11.1 | 7.3 | 9.3 | 8.8 | 9.0 | | | | | | |
| Median | 0.9 | 4.8 | 3.7 | 5.7 | 5.3 | 6.1 | | | | | | |
| 75th Percentile | -1.4 | 0.0 | 0.7 | 2.8 | 3.1 | 4.0 | | | | | | |
| 95th Percentile | -6.9 | -10.8 | -6.1 | -2.0 | -0.8 | -0.9 | | | | | | |
| # of Portfolios | 316 | 308 | 264 | 197 | 165 | 103 | | | | | | |
| ● OZ Domestic II | 2.8 | (28) | 4.2 | (53) | -- | (--) | -- | (--) | -- | (--) | -- | (--) |
| ▲ HFRI RV: Multi-Strategy Index | 1.5 | (43) | 6.3 | (43) | 3.4 | (53) | 5.2 | (54) | 5.2 | (51) | 3.7 | (80) |



| | Return (Rank) | | | | | | | | | | | | | |
|--------------------------------------|---------------|------|------|------|--------|------|---------|------|---------|------|---------|------|----------|------|
| | Quarter | | YTD | | 1 Year | | 3 Years | | 5 Years | | 7 Years | | 10 Years | |
| 5th Percentile | 4.7 | | 8.1 | | 8.1 | | 7.1 | | 10.5 | | 8.5 | | 7.2 | |
| 25th Percentile | 2.2 | | 3.7 | | 3.7 | | 3.8 | | 6.1 | | 5.1 | | 4.4 | |
| Median | 1.2 | | 1.3 | | 1.3 | | 1.6 | | 4.9 | | 3.9 | | 3.3 | |
| 75th Percentile | 0.1 | | -1.8 | | -1.8 | | 0.4 | | 3.6 | | 2.9 | | 2.5 | |
| 95th Percentile | -4.3 | | -5.2 | | -5.2 | | -1.5 | | 1.4 | | 0.7 | | 0.9 | |
| # of Portfolios | 273 | | 272 | | 272 | | 257 | | 238 | | 216 | | 182 | |
| ● Titan | 1.6 | (39) | -3.8 | (88) | -3.8 | (88) | -- | (--) | -- | (--) | -- | (--) | -- | (--) |
| ▲ HFRI Fund of Funds Composite Index | 0.9 | (60) | 0.5 | (59) | 0.5 | (59) | 1.2 | (57) | 3.4 | (77) | 2.4 | (81) | 1.3 | (92) |



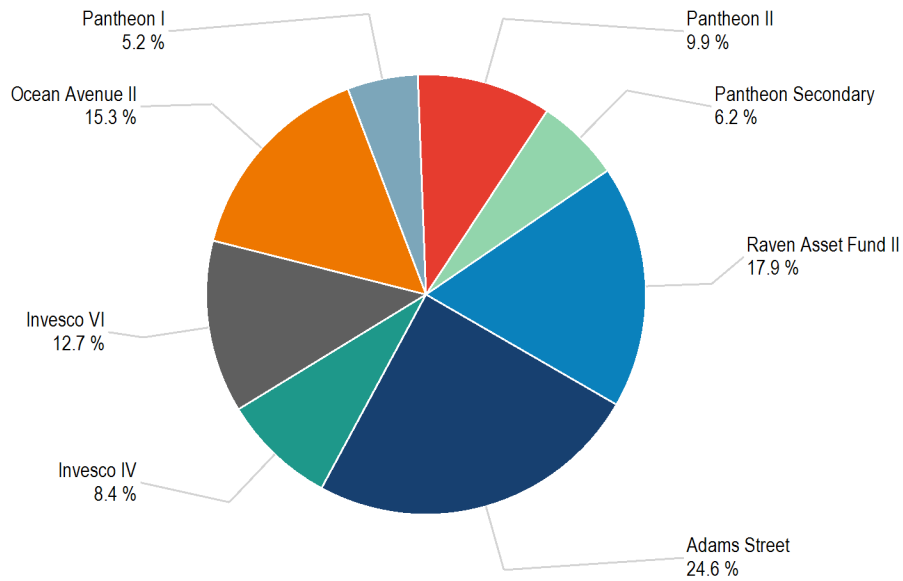
| | Actual (\$) | Actual % |
|-----------------------|---------------------|---------------|
| BlackRock RE | \$3,926,446 | 6.9% |
| Greenfield Gap VII | \$10,630,267 | 18.6% |
| Patron Capital V | \$1,267,698 | 2.2% |
| UBS Trumbull Property | \$41,444,353 | 72.4% |
| Total | \$57,268,764 | 100.0% |



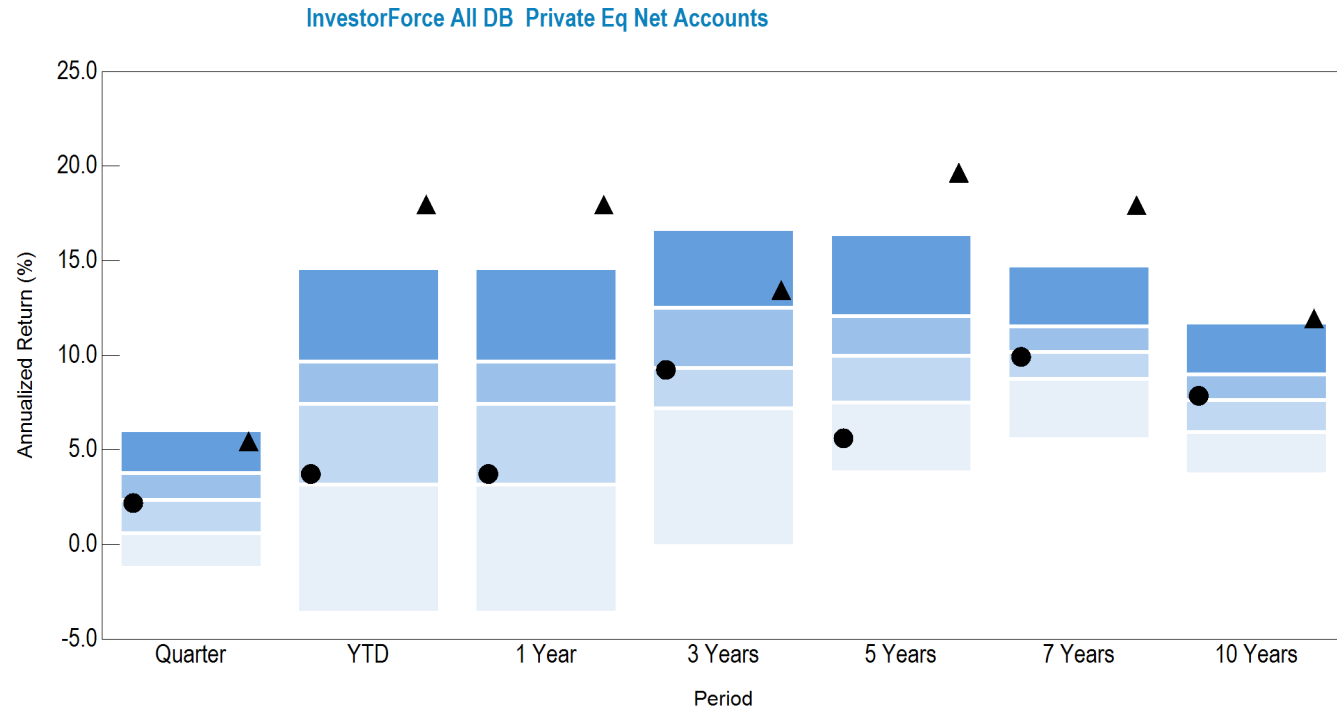
| | Return (Rank) | | | | | | |
|-------------------|---------------|----------|----------|-----------|-----------|-----------|----------|
| | Quarter | YTD | 1 Year | 3 Years | 5 Years | 7 Years | 10 Years |
| 5th Percentile | 3.0 | 12.8 | 12.8 | 14.3 | 14.1 | 15.0 | 6.9 |
| 25th Percentile | 2.2 | 9.3 | 9.3 | 12.7 | 12.7 | 14.0 | 5.9 |
| Median | 1.6 | 8.4 | 8.4 | 11.8 | 11.9 | 12.6 | 5.1 |
| 75th Percentile | 0.8 | 7.0 | 7.0 | 10.8 | 10.5 | 10.8 | 4.1 |
| 95th Percentile | -1.1 | 4.0 | 4.0 | 4.4 | 3.1 | 1.6 | 0.9 |
| # of Portfolios | 196 | 179 | 179 | 163 | 126 | 78 | 68 |
| ● Real Estate | 1.7 (44) | 7.7 (62) | 7.7 (62) | 9.5 (88) | 10.2 (79) | 11.0 (69) | 5.8 (30) |
| ▲ NCREIF ODCE net | 1.9 (40) | 7.8 (62) | 7.8 (62) | 11.2 (72) | 12.1 (42) | 11.7 (63) | 6.9 (6) |

Private Equity Manager Allocation Analysis

Period Ending: December 31, 2016



| | Actual (\$) | Actual % |
|---------------------|---------------------|---------------|
| Adams Street | \$8,882,124 | 24.6% |
| Invesco IV | \$3,028,820 | 8.4% |
| Invesco VI | \$4,578,998 | 12.7% |
| Ocean Avenue II | \$5,521,943 | 15.3% |
| Pantheon I | \$1,884,164 | 5.2% |
| Pantheon II | \$3,562,286 | 9.9% |
| Pantheon Secondary | \$2,228,852 | 6.2% |
| Raven Asset Fund II | \$6,451,591 | 17.9% |
| Total | \$36,138,778 | 100.0% |



Return (Rank)

| | | | | | | | |
|---------------------------|----------|----------|----------|-----------|----------|----------|----------|
| 5th Percentile | 6.0 | 14.6 | 14.6 | 16.7 | 16.4 | 14.7 | 11.7 |
| 25th Percentile | 3.8 | 9.7 | 9.7 | 12.5 | 12.1 | 11.5 | 9.0 |
| Median | 2.4 | 7.4 | 7.4 | 9.4 | 10.0 | 10.2 | 7.7 |
| 75th Percentile | 0.6 | 3.2 | 3.2 | 7.2 | 7.5 | 8.8 | 6.0 |
| 95th Percentile | -1.2 | -3.6 | -3.6 | -0.1 | 3.8 | 5.6 | 3.7 |
| # of Portfolios | 128 | 127 | 127 | 121 | 100 | 79 | 47 |
| ● Private Equity | 2.2 (54) | 3.7 (74) | 3.7 (74) | 9.2 (53) | 5.6 (88) | 9.9 (55) | 7.9 (45) |
| ▲ Russell 3000 +3% 1Q Lag | 5.5 (7) | 18.0 (1) | 18.0 (1) | 13.4 (21) | 19.7 (1) | 17.9 (1) | 11.9 (5) |

| Total Plan Policy Index | As of: | | | | | | | |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1/1/15 | 8/1/14 | 7/1/14 | 7/1/13 | 6/1/13 | 4/1/13 | 4/1/12 | 1/1/10 |
| 91-day US T Bill | | | | | | | | |
| BBgBarc Aggregate | 20.50% | 20.5% | 23.5% | 29% | 29% | 24% | 24% | 24% |
| BBgBarc US TIPS | | | | | | 5% | 5% | 5% |
| BofA ML High Yield II | 5.00% | 5.0% | 5.0% | 5% | 5% | 5% | 5% | 5% |
| CPI +4% | | | | | | | | |
| Credit Suisse Leveraged Loan | 3.00% | 3.0% | | | | | | |
| FTSE NAREIT Developed | | 1.4% | 1.4% | 2% | 2% | 2% | 2% | 2% |
| FTSE NAREIT Developed ex US | | 1.3% | 1.3% | | | | | |
| HFRI Fund of Funds Composite | 2.25% | 4.5% | 4.5% | | | | | |
| HFRI RV Multi-strategy | 2.25% | | | | | | | |
| MSCI ACWI ex US | 23.60% | 23.6% | 23.6% | 24% | | | | |
| MSCI EAFE | | | | | 20% | 20% | 20% | 24% |
| MSCI Emerging Markets | | | | | 4% | 4% | 4% | |
| NCREIF | | | | | | | | |
| NCREIF ODCE | | 5.3% | 5.3% | 6% | 6% | 6% | 6% | 6% |
| NCREIF ODCE net | 8.00% | | | | | | | |
| Russell 1000 | 22.70% | 22.7% | 22.7% | 25% | 25% | | | |
| Russell 2000 | 5.70% | 5.7% | 5.7% | 4% | 4% | 6% | 6% | 4% |
| Russell 3000 +3% 1QL (PE) | 7.00% | 7.0% | 7.0% | 5% | 5% | 5% | | |
| S&P 400 | | | | | | 4% | 4% | |
| S&P 500 | | | | | | 19% | 19% | 25% |
| S&P 500 +5% (PE) | | | | | | | 5% | 5% |
| Wilshire RE | | | | | | | | |
| | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

| Total Plan Policy Index | As of: | | | | | | | | |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1/1/09 | 10/1/08 | 7/1/08 | 1/1/08 | 4/1/07 | 4/1/05 | 1/1/02 | 1/1/99 | 1/1/95 |
| 91-day US T Bill | | | | | | | | | |
| BBgBarc Aggregate | | | | 1% | 1% | 1% | 1% | 1% | |
| BBgBarc US TIPS | 23% | 23% | 23% | 30% | 30% | 30% | 38% | 38% | |
| BofA ML High Yield II | | | | | | | | | |
| CPI +4% | | | | | | | | | |
| Credit Suisse Leveraged Loan | | | | | | | | | 100% |
| FTSE NAREIT Developed | | | | | | | | | |
| FTSE NAREIT Developed ex US | | | | | | | | | |
| HFRI Fund of Funds Composite | | | | | | | | | |
| HFRI RV Multi-strategy | | | | | | | | | |
| MSCI ACWI ex US | | | | | | | | | |
| MSCI EAFE | | | | | | | | | |
| MSCI Emerging Markets | 18% | 18% | 18% | 7% | 7% | 7% | 6% | 6% | |
| NCREIF | | | | | | | | | |
| NCREIF ODCE | 6% | 6% | 6% | 6% | 6% | 6% | 5% | | |
| NCREIF ODCE net | | | | | | | | | |
| Russell 1000 | | | | | | | | | |
| Russell 2000 | | | | | | | | | |
| Russell 3000 +3% 1QL (PE) | 6% | 6% | 6.25% | 7.65% | 7.9% | 7.7% | 8% | 8% | |
| S&P 400 | | | | | | | | | |
| S&P 500 | | | | | | | | | |
| S&P 500 +5% (PE) | 42% | 43% | 43.75% | 46.35% | 47.1% | 48.3% | 42% | 42% | |
| Wilshire RE | 5% | 4% | 3% | 2% | 1% | | | | |
| | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

| US Equity Benchmark | As of: | | |
|---------------------|---------------|---------------|---------------|
| | 7/1/14 | 6/1/13 | 1/1/95 |
| Russell 1000 | 80% | 86% | |
| Russell 2000 | 20% | 14% | |
| Russell 3000 | | | 100% |
| | 100.0% | 100.0% | 100.0% |

| International Equity Benchmark | As of: | | |
|--------------------------------|---------------|---------------|---------------|
| | 7/1/13 | 4/1/12 | 1/1/99 |
| MSCI ACWI ex US | 100% | | |
| MSCI EAFE | | 83.33% | 100% |
| MSCI Emerging Markets | | 16.67% | |
| | 100.0% | 100.0% | 100.0% |

| Fixed Income Benchmark | As of: | | | | |
|------------------------------|---------------|---------------|---------------|---------------|---------------|
| | 8/1/14 | 7/1/14 | 6/1/13 | 4/1/13 | 1/1/95 |
| BBgBarc Aggregate | 71.93% | 82.46% | 85.29% | 70.588% | 100% |
| BBgBarc US TIPS | | | | 14.706% | |
| BofA ML High Yield II | 17.54% | 17.54% | 14.71% | 14.706% | |
| Credit Suisse Leveraged Loan | 10.53% | | | | |
| | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

| Hedge Fund Benchmark | As of: | |
|------------------------------|---------------|---------------|
| | 1/1/15 | 7/1/14 |
| HFRI Fund of Funds Composite | 50% | 100% |
| HFRI RV Multi-strategy | 50% | |
| | 100.0% | 100.0% |

| Real Estate Benchmark | As of: | | | | |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|
| | 1/1/15 | 7/1/14 | 1/1/10 | 1/1/02 | 4/1/99 |
| FTSE NAREIT Developed | | 17.50% | 25% | | |
| FTSE NAREIT Developed ex US | | 16.25% | | | |
| NCREIF | | | | 100% | |
| NCREIF ODCE | | 66.25% | 75% | | |
| NCREIF ODCE net | 100% | | | | |
| Wilshire RE | | | | | 100% |
| | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

| Private Equity Benchmark | As of: | |
|--------------------------|---------------|---------------|
| | 4/1/13 | 7/1/05 |
| Russell 3000 +3% 1QL | 100% | |
| S&P 500 +5% | | 100% |
| | 100.0% | 100.0% |

| Barrow Hanley Benchmark | As of: | | | | |
|-------------------------|---------------|---------------|--|--|--|
| | 6/1/13 | 4/1/10 | | | |
| BBgBarc Aggregate | 100% | 82.8% | | | |
| BBgBarc US TIPS | | 17.2% | | | |
| | 100.0% | 100.0% | | | |

| UBS Trumbull Benchmark | As of: | | | |
|------------------------|---------------|---------------|---------------|---------------|
| | 1/1/15 | 1/1/10 | 1/1/02 | 4/1/99 |
| NCREIF | | | 100% | |
| NCREIF ODCE | | 100% | | |
| NCREIF ODCE net | 100% | | | |
| Wilshire RE | | | | 100% |
| | 100.0% | 100.0% | 100.0% | 100.0% |

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: $\text{Portfolio Return} - [\text{Risk-free Rate} + \text{Portfolio Beta} \times (\text{Market Return} - \text{Risk-free Rate})]$.

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

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

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

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

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

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

Information Ratio: A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: $\text{excess return} / \text{tracking error}$.

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

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

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

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

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

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

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

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

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

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

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Verus receives universe data from InvestorForce, eVestment Alliance, and Morningstar. We believe this data to be robust and appropriate for peer comparison. Nevertheless, these universes may not be comprehensive of all peer investors/managers but rather of the investors/managers that comprise that database. The resulting universe composition is not static and will change over time. Returns are annualized when they cover more than one year. Investment managers may revise their data after report distribution. Verus will make the appropriate correction to the client account but may or may not disclose the change to the client based on the materiality of the change.

A large, semi-transparent geometric overlay is positioned on the left side of the page. It features a grid of blue and white triangles, with a prominent white triangle pointing upwards and a blue triangle pointing downwards in the center. The background of the entire page is a scenic photograph of a snow-capped mountain range reflected in a calm lake, with a dense forest of evergreen trees in the foreground.

**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**

JANUARY 2017
Active Management Environment

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The active management environment

Our work on active management addresses some shortfalls of the traditional analysis, which uses the median product to describe the active management universe as a whole. For the 2017 release of this document we have worked to expand our analysis and have dug deeper to test qualities such as product persistency and universe stability through time.

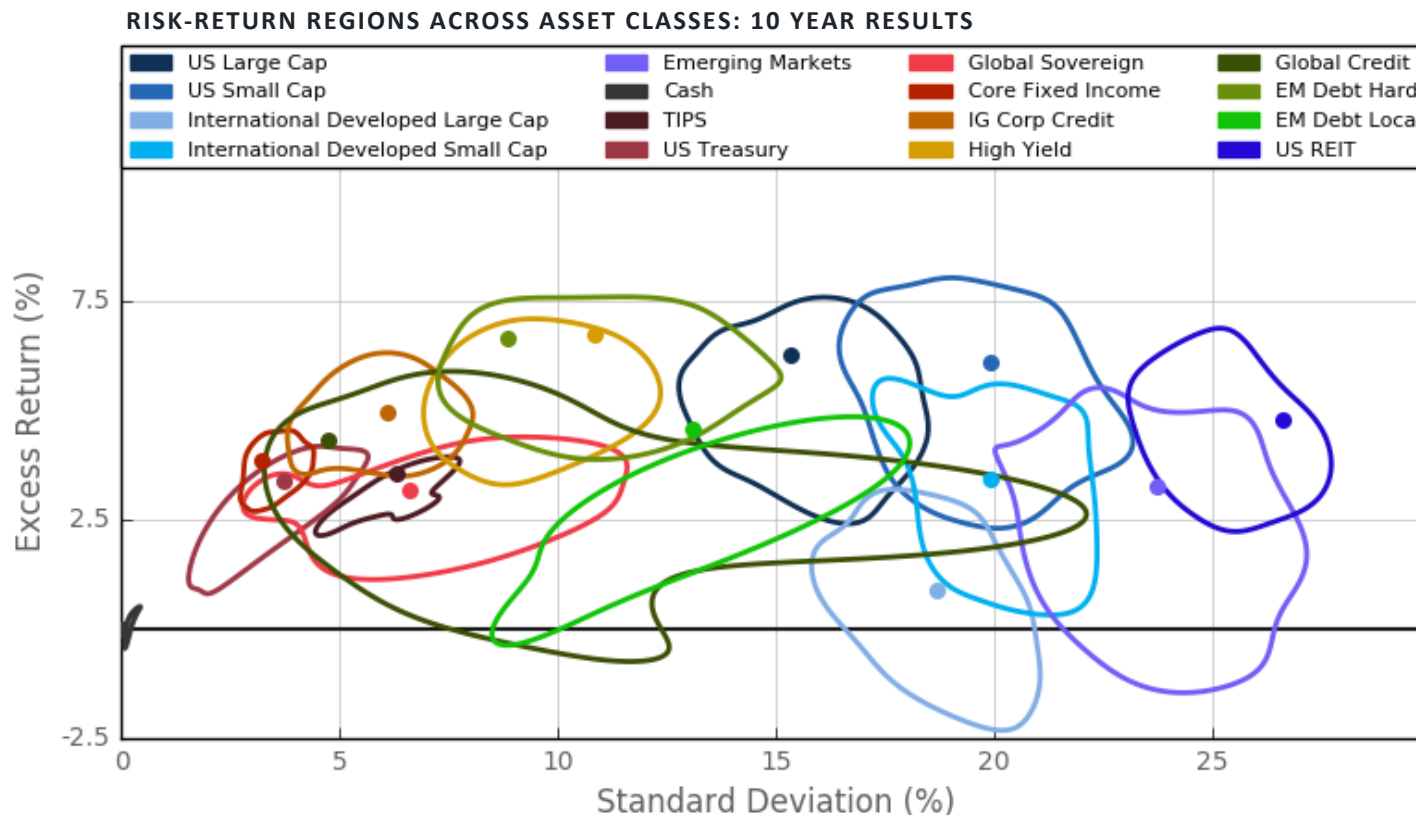
These improvements and insights have allowed us to better understand product behavior and may allow for more informed selection in the future. **For first time readers, extensive supporting material has been included in Appendix 2.** For those familiar with the new approach, please read on.

- Even without skilled selection there are many cases where active management can help investors achieve better portfolio outcomes in risk and return terms.
- Those better portfolio outcomes may come from additional return or lower risk. Not all investors have the same definition of better outcomes, and the trade-offs facing them vary by universe.
- Adding skilled selection to the process can add additional value in portfolio construction.
- Fees remain an important part of the active management conversation. Fees and survivorship bias should be taken into account when analyzing active universes.

Using median product (median manager) performance to decide whether active management is appropriate can be misleading. This new tool can help investors make more informed decisions.

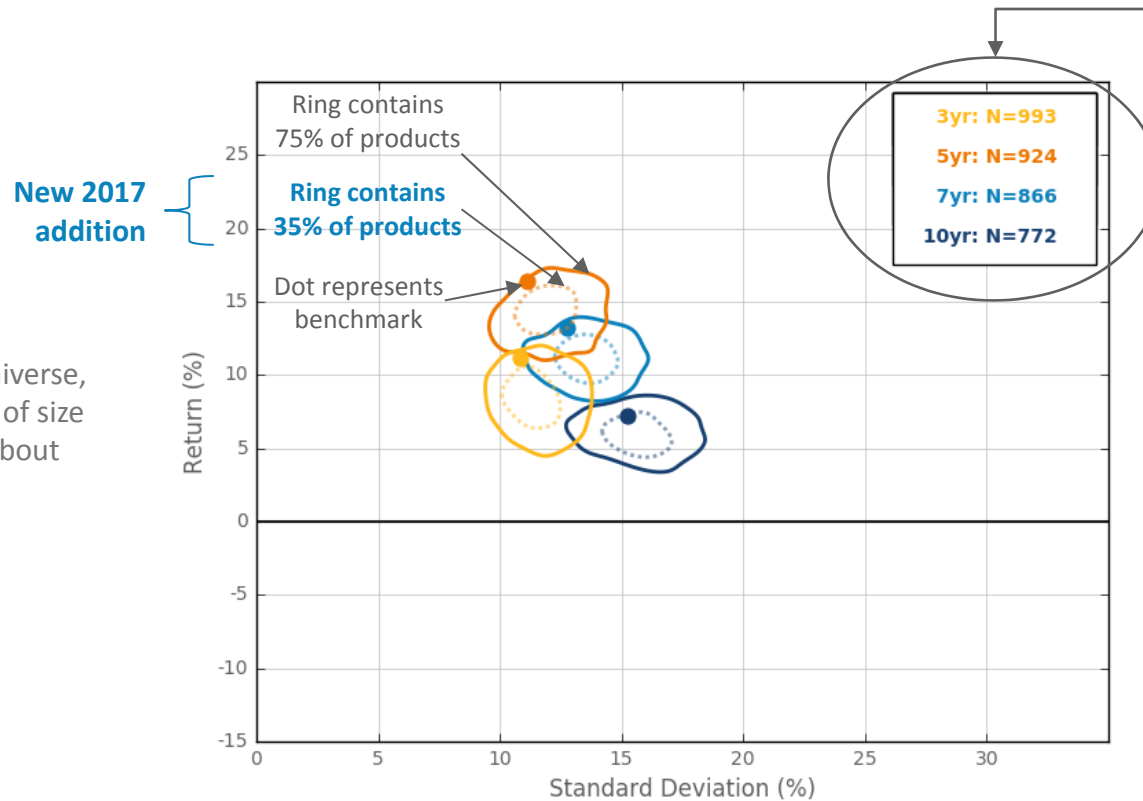
The true investment opportunity set

Investors often think of the investment opportunity set as a risk-return chart, in the form of single-point (dot) benchmark risk and return, and possibly single-point median product to represent active management. However, active management universes in each asset class are extensive and this sort of analysis misses the true universe characteristics. Much of the risk-return surface between 1% and 9% return and between 2% and 28% volatility is covered by various asset class options, and many parts of this space are covered by multiple active management universes.



*This represents 10-year product performance data and 75% contour areas
Source: eVestment, as of 9/30/16. Universe returns have been adjusted for fees and survivorship bias*

How to read a universe chart



The movement of the universe, the change in shape and of size all provide information about product behavior.

The number of products included in the analysis provides insight into the robustness of the analysis.

The position of the benchmark relative to the universe may also change through time, representing dynamic structure changes.

Throughout this report each asset class universe chart is placed at the same position on the page, at the same size and with the scales of the axes identical. This allows for easy comparison between universes.

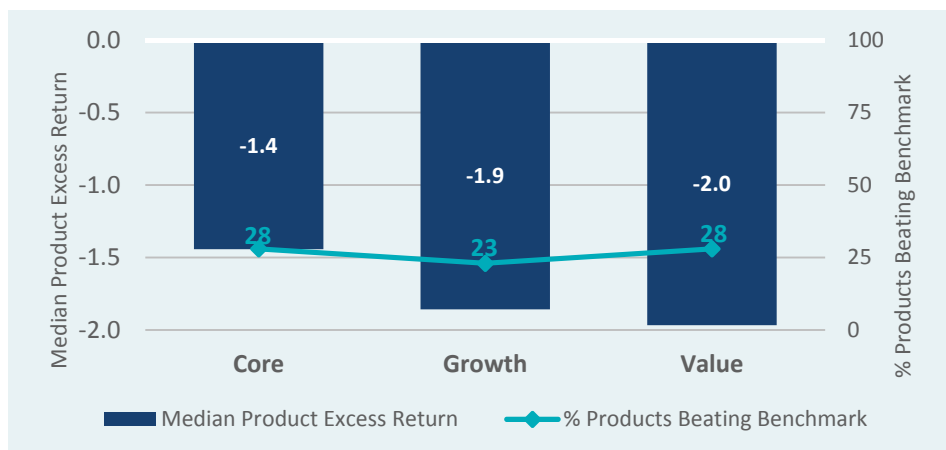
Asset class environments

Note: Universes are defined at the broadest level. Products vary in terms of style and/or treatment of currency exposure. Equity universe include both value and growth styles. International universes may include both products that hedge currency exposure and products that do not hedge currency exposure.

Equities – U.S. large cap

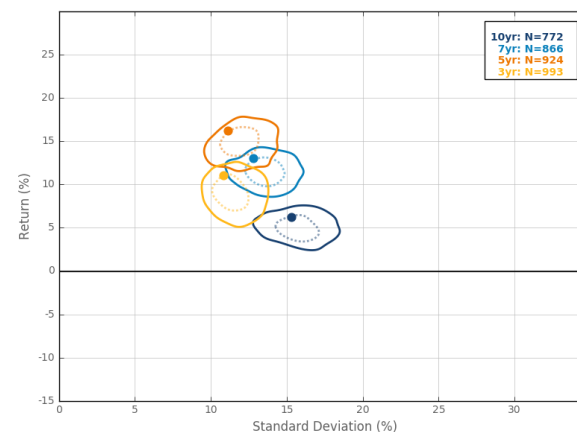
- The evidence suggests that U.S. large cap equity has been a fairly efficient asset class over the trailing 3-, 5-, 7- and 10-year time periods. The benchmark tends to exhibit less volatility than the universe. Some products have been able to produce better returns even at this lower level of volatility, but most active products have simply increased volatility exposure. There seems to be a weak relationship between additional volatility and achieving additional return.
- In a positive absolute year for large cap U.S. equity markets (through September 30th), regardless of style, the median large cap product failed to generate a positive excess return. In addition, whether in core, growth or value, nearly three-quarters of active large cap products failed to surpass their respective benchmark year-to-date.
- Similar to the small cap space, the median large cap value product generated the least favorable excess return year-to-date (a reversal from last year).

U.S. LARGE CAP ACTIVE PRODUCT PERFORMANCE YTD



Source: eVestment, as of 9/30/16, gross of fees

U.S. LARGE

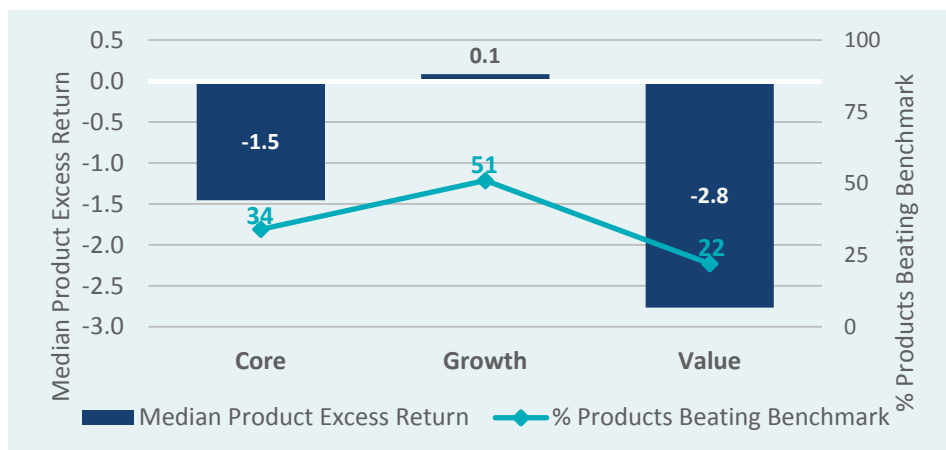


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is S&P 500

Equities – U.S. small cap

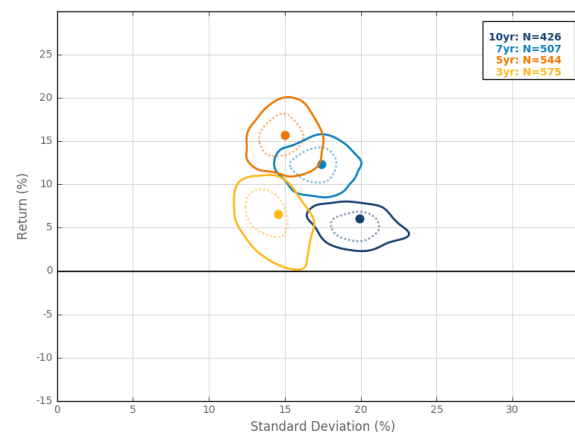
- Over the long term it seems clear that there is little relationship between the amount of risk that U.S. small cap products take relative to the benchmark and their ability to outperform that benchmark. This can be seen in particular over the 10-year period, where the distribution of product outcomes is essentially flat, similar to that seen in the large cap U.S. equity space.
- Over longer term time periods fewer products than in the large cap U.S. space choose to take on greater risk relative to the benchmark. At the same time there appears to be some evidence that products have been able to produce excess return over most time periods, and to be able to do so more effectively than in the large cap U.S. space.
- Similar to the large cap space, the median small cap value product generated the least favorable excess return year-to-date (a reversal from last year).

U.S. SMALL CAP ACTIVE PRODUCT PERFORMANCE YTD



Source: eVestment, as of 9/30/16, gross of fees

U.S. SMALL



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Russell 2000

Equities – International developed

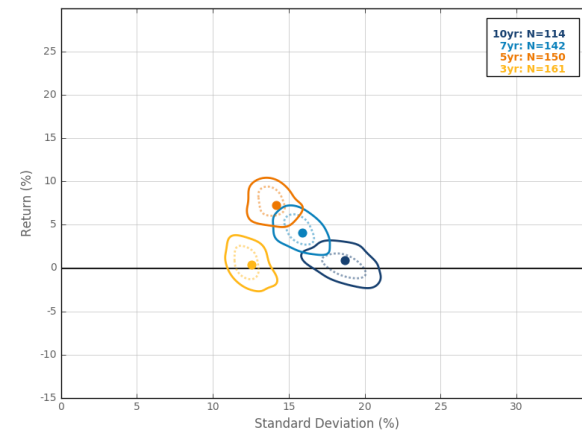
- In the most recent 3 years, active management was as likely to outperform the benchmark as to underperform, and volatility was less than in longer periods. However, international active products struggled to add value in an absolute sense, with a significant portion of the universe delivering negative returns. Also, the most recent 3 years displayed less volatility dispersion than observed over 5-, 7- and 10-year periods. We see a much broader range of volatility during these periods, the longest of which includes the global financial crisis.
- The value style has been out of favor relative to growth for long periods. More recently, the gap between value and growth has narrowed as value has shown a more recent resurgence in the latest year.

INTERNATIONAL DEVELOPED – VALUE VS. GROWTH



Source: MSCI, as of 11/30/16

INTERNATIONAL LARGE

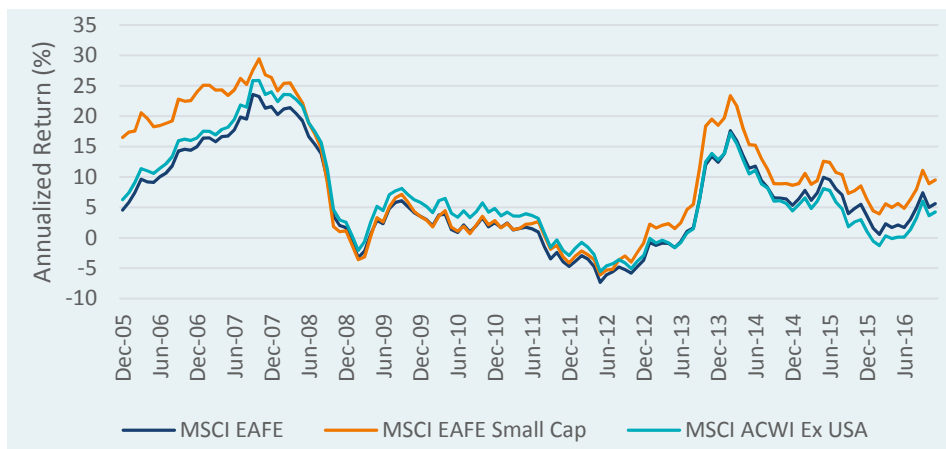


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is MSCI EAFE

Equities – International developed small cap

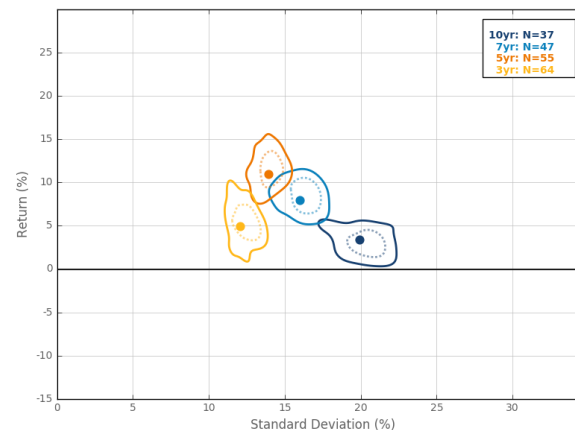
- During most periods, active management in international small cap was as likely to add value over the benchmark as to underperform. As would be expected, during the shortest period the range of performance was wider than in longer periods. During both short and long periods, there appears to be a negligible relationship between return and the level of excess risk taken.
- International Small Cap remains an inefficient space and continues to attract new entrants. The size of the universe of actively managed products has increased considerably over time, although successful products often close, which limits availability for new clients.
- Many active international small cap products allocate a portion of the portfolio to emerging markets, which historically has influenced return. In the recent period, the MSCI EAFE Small Cap index has outperformed MSCI EAFE. However, the MSCI ACWI ex US Small Cap index underperformed both EAFE and EAFE Small Cap during the most recent 5-year period.

INTERNATIONAL SMALL CAP – EAFE & ACWI EX-US



Source: MSCI, as of 11/30/16

INTERNATIONAL SMALL



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is MSCI EAFE Small

Equities – Emerging markets

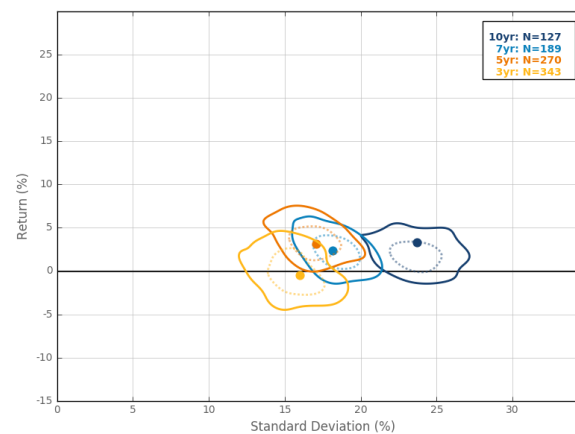
- A major portion of emerging market equity products underperformed the index over the most recent 3-, 5-, 7- and 10-year periods. During the latest 3 years in particular, a large portion of active products exhibited both negative absolute and relative performance. In the 3-, 5- and 7-year periods, products taking less risk than the benchmark were more likely to have outperformed.
- Performance of active products with significant country bets was influenced by the degree of under- or overweighting of countries exposed to the commodities complex. Latin American and emerging European companies tend to have a greater portion of commodity producers, while Asian markets have a greater portion of commodity consumers. The swings of commodity prices in the recent period had a significant impact on returns. In addition, countries with large current account deficits were more vulnerable to U.S. monetary policy and potential increases in interest rates.
- During the latest ten years, performance of actively managed emerging markets products appears to show a weak but positive relationship between tracking error and excess return. During this period, this relationship has held whether the product has a value or a growth orientation, though growth displayed more outliers. We note that there are fewer value products exhibiting an extremely high level of tracking error that also have a 10-year track record.

TRACKING ERROR & EXCESS RETURN



Source: eVestment, Verus

EMERGING MARKETS



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is MSCI EM

Fixed income – U.S. TIPS

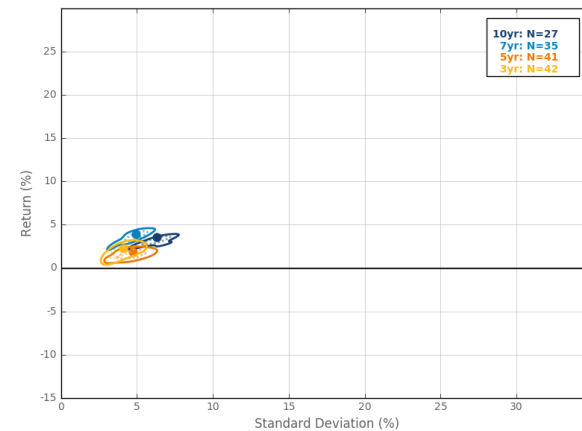
- Over each time period examined the TIPS asset class has been highly efficient, with active products producing minimal added value relative to the benchmark, and with a tight distribution of outcomes relative to the benchmark. In most time periods there appears to be a modest upward tilt to the universe, suggesting some small amount of compensation for products that take extra risk relative to the benchmark. This relationship appears to have reversed over the most recent three years, however.
- U.S. TIPS 10-year inflation breakeven spreads, while still below their long-term average, have recently increased based on the expectation of higher future inflation.
- The expectation of rising inflation has contributed to increased investor demand for TIPS and other inflation sensitive assets.
- While active management in TIPS has provided little excess return relative to the benchmark, TIPS exposure may still provide some diversification and risk management benefits.

10 YR U.S. TIPS BREAKEVEN



Source: Federal Reserve Bank of St Louis, as of 11/30/16

U.S. TIPS

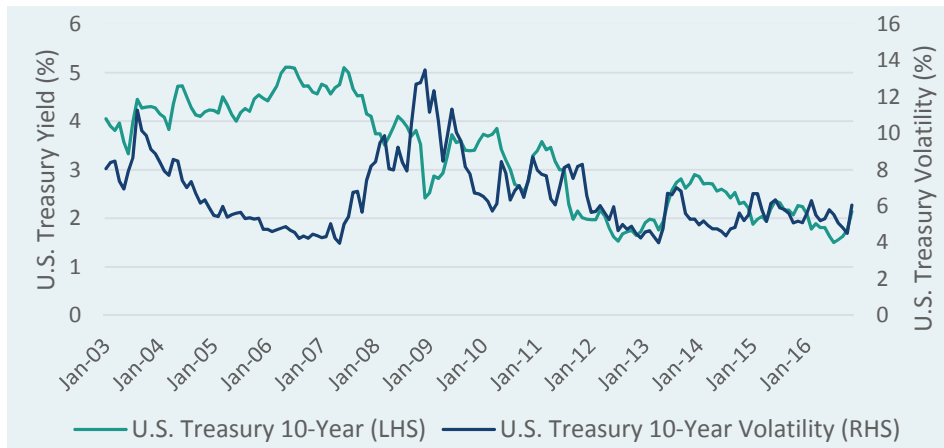


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays US TIPS 5-10

Fixed income – U.S. treasury

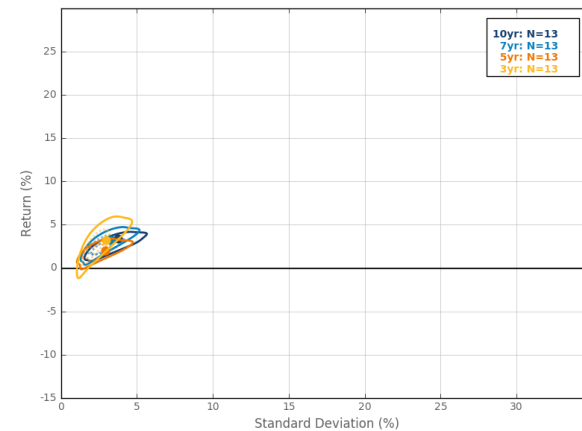
- While the active management universe for U.S. Treasury securities has shown a higher degree of dispersion relative to TIPS, the risk-reward tradeoff remains mostly consistent across time periods examined. Active product returns are highly correlated to volatility. Active products typically produce lower returns than the benchmark but with less volatility, and there appears to be a positive relationship between volatility and return.
- The Federal Reserve increased interest rates by 25 basis points in December and guided for additional rate increases in 2017; however, long-term rates remain well below their historical average. Concerns over future economic growth and the potential for increasing inflation will continue to influence the path of rates.
- Products with biases towards remaining underweight duration in anticipation of higher interest rates have recently been rewarded as both rates and volatility have increased.
- Active management in this space is directly related to the risk environment. The very clear relationship between risk and return over multiple time periods, unlike most other asset classes, leaves the investor with a relatively clear risk management payoff decision to make.

U.S. TREASURY YIELDS & VOLATILITY



Source: Federal Reserve Bank of St Louis, as of 11/30/16

U.S. TREASURY

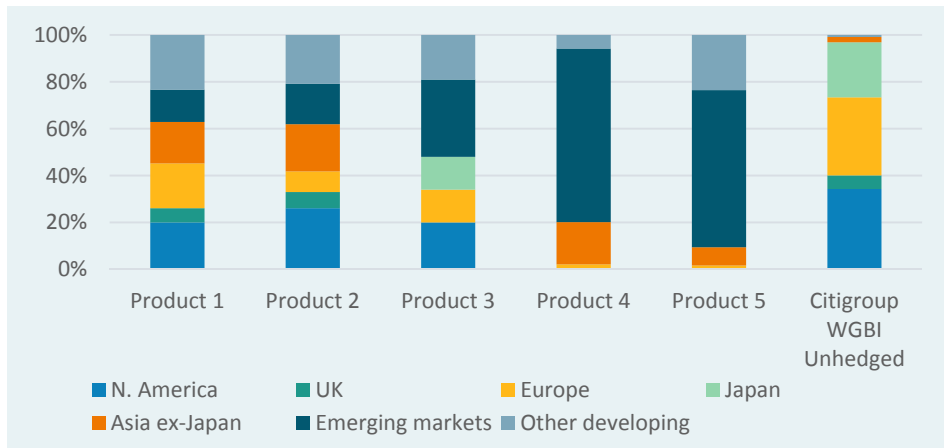


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays Treasury 7-10 year

Fixed income – Global sovereign

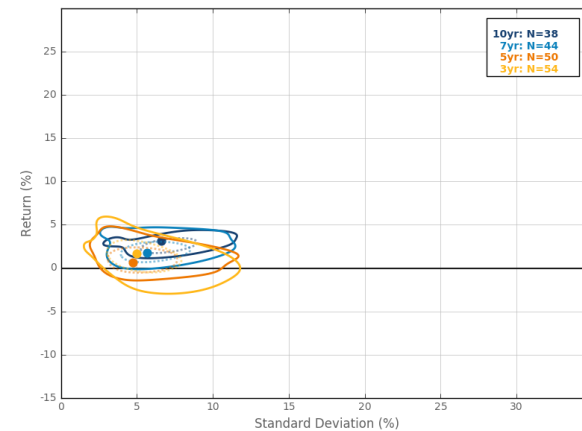
- Evidence suggests that dispersion of global sovereign active product returns has recently increased due to rising idiosyncratic risks, divergent global central bank policies and increased currency volatility. Over longer time periods active products have produced returns similar to the benchmark but with less volatility, and there has been little or no relationship between the level of risk taken and the level of return achieved. Over more recent periods these products have produced excess returns while taking more risk than the benchmark.
- Global bonds have historically provided interest rate diversification benefits within diversified fixed income portfolios. Developed market yields (ex: Europe & Japan) have remained low due to continued bond purchases by the ECB and Bank of Japan. U.S. interest rates have begun to rise on higher expected GDP growth and accelerating inflation.
- Many products use off-benchmark securities, such as credit and currency, in an attempt to add value relative to a sovereign-only benchmark. It remains unclear whether the results of these exposures should truly be attributed to benchmark-relative performance, or should be thought of differently.

GLOBAL BOND PRODUCT COUNTRY EXPOSURES



Source: sample products

GLOBAL SOVEREIGN

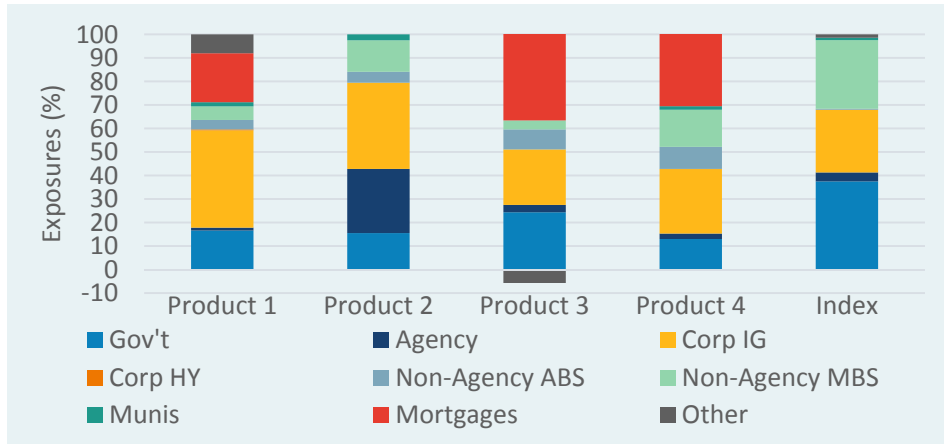


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays Global Treasury ex US

Fixed income – U.S. core

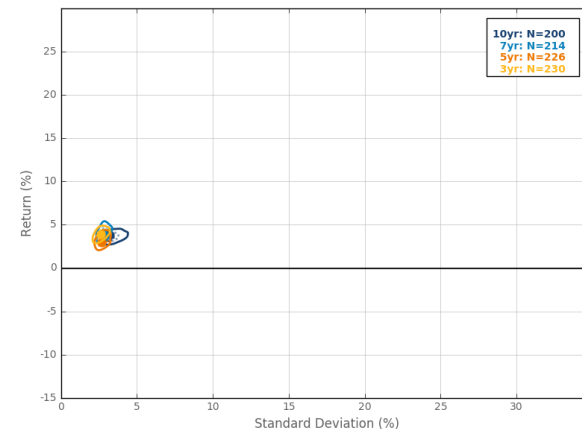
- Over all time periods examined the core fixed income asset class appears to be highly efficient and shows little dispersion between active products and the benchmark.
- Core bond portfolios are designed to provide income and return while delivering low correlation to equities. While interest rate volatility has increased recently, products continue to maintain exposures to off-benchmark sectors (ex: high yield, municipal bonds, ABS, and private placement bonds) with the goal of increasing returns. Products have generally taken on these exposures with the intent to achieve excess returns relative to the benchmark.
- Despite active management, return dispersion remains tight suggesting there seems to be little differentiation in outcomes within the universe.

CORE BOND PRODUCT SECTOR EXPOSURES



Source: eVestment sample products as of 9/30/16

U.S. CORE

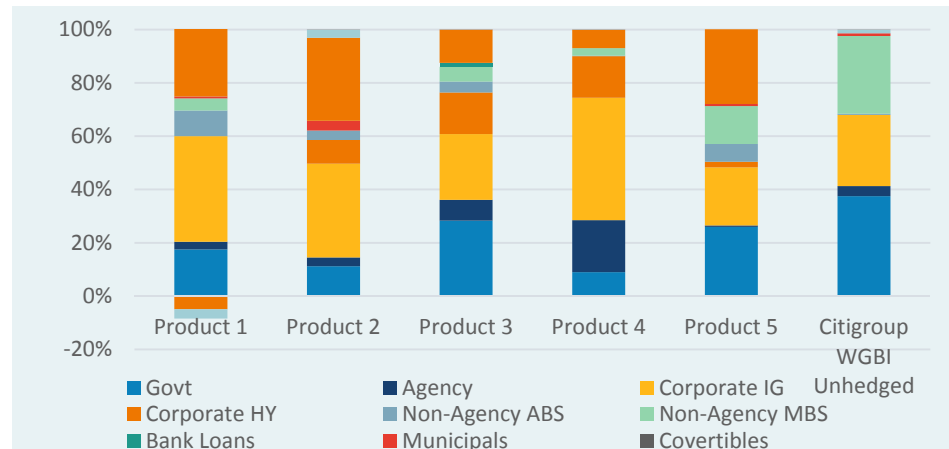


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays US Aggregate Bond

Fixed income – U.S. core plus

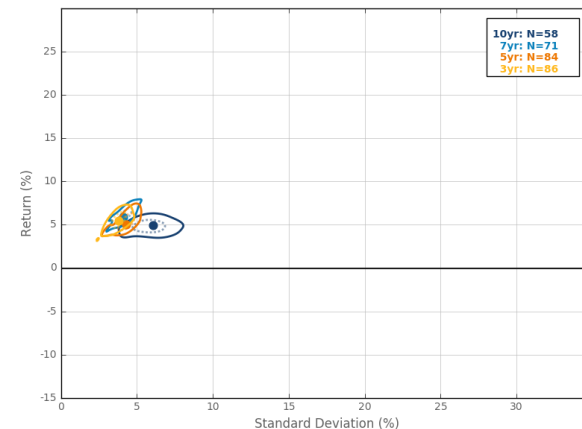
- Over the long-term, the core plus fixed income product universe demonstrated higher dispersion than the core bond universe. More recently, as developed market interest rates have declined, dispersion has decreased. Products are increasingly underweight to U.S. Treasury and Gov't bonds relative to the benchmark and have increased exposures to both IG credit and off-benchmark allocations to lower quality and non-U.S. dollar denominated bonds.
- Over the long-term, there seems to be a positive trade-off between risk and return within the space.
- More recently, as market volatility has increased, products with exposures to higher beta assets have reallocated to higher quality securities in order to minimize potential drawdowns.
- The role of active management in the core plus fixed income space, while generally limited, is predicated on the belief that products can add value through security selection and sector rotation while minimizing volatility.

CORE PLUS PRODUCT ASSET ALLOCATION SHIFTS



Source: eVestment, sample products

U.S. CORE PLUS

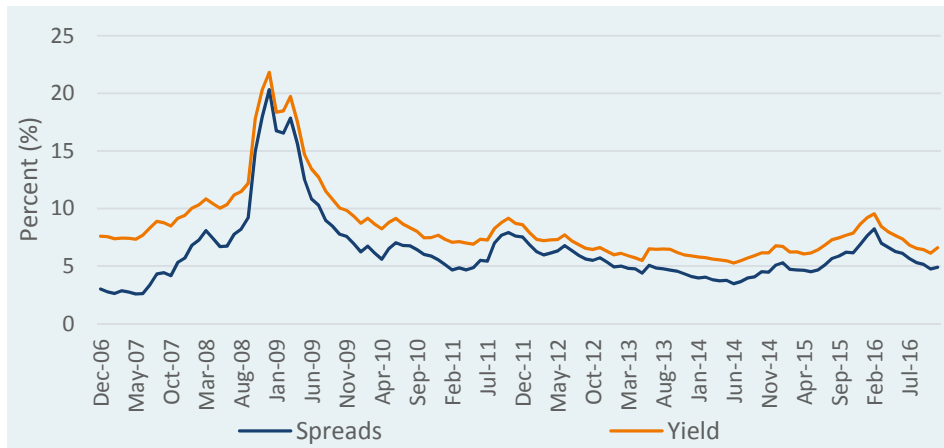


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays US Corporate IG

Fixed income – High yield

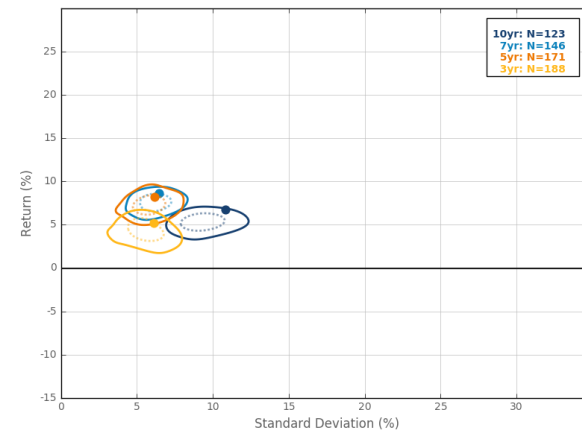
- Over most periods examined active products in the high yield space have demonstrated greater dispersion around the benchmark compared to Core and Core Plus products. Over longer periods greater volatility appears to be associated with slightly higher return, though more recently this seems to have reversed. However, it should be noted that over longer time periods little of the universe remains above the benchmark return level and the amount of compensation for risk taken is fairly small.
- More recently, high yield bond spreads have narrowed as commodity prices have stabilized and investors' appetites for yield have remained strong. U.S. corporate balance sheets remain generally healthy and there is increasing optimism over the potential for increasing U.S. GDP and higher interest rates which signal improving business conditions.
- High yield bond market volatility is highly correlated to the economic business cycle. Avoiding idiosyncratic risks resulting from ratings downgrades or defaults is an important consideration for active management.

U.S. HIGH YIELD



Source: Federal Reserve Bank, Bank of Merrill Lynch, as of 11/30/16

HIGH YIELD

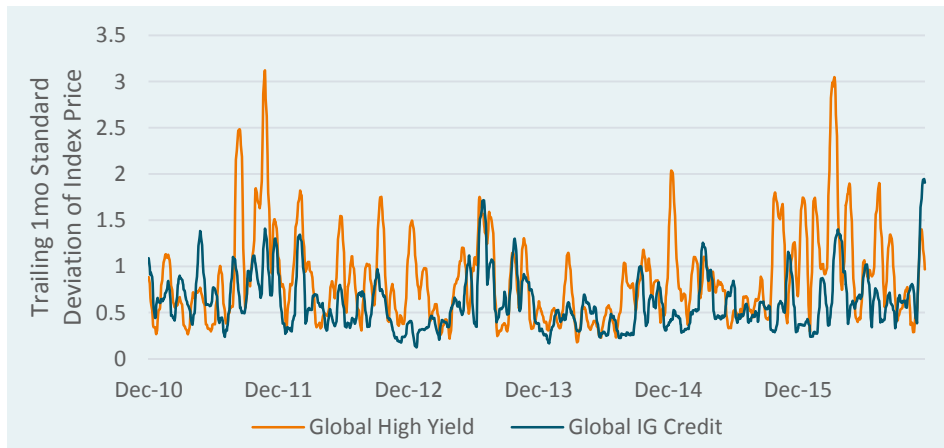


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays High Yield

Fixed income – Global credit

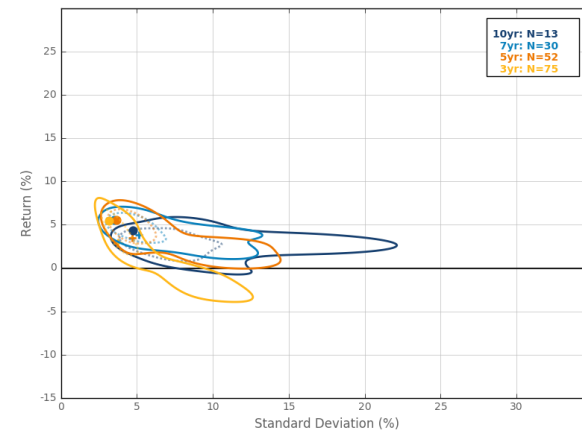
- Over all time periods examined the global credit active product universe has demonstrated a high degree of dispersion relative to the benchmark. Over longer periods few products have provided excess returns with lower volatility than the benchmark. More recently, as volatility has increased, there has been a negative correlation between additional risk taken and excess returns generated. Over longer time periods there appears to be little to no relationship between risk and return.
- Interest rates in developed markets remain below their long-term historical average due primarily to continued global central bank monetary policy. In an effort to provide excess returns, active products continue to take off-benchmark exposures.
- During periods of heightened market volatility, products with flexible investment mandates often take on exposure to lower quality bonds providing liquidity to the market with the goal of benefiting as markets and spreads normalize.

GLOBAL CREDIT VOLATILITY



Source: Bloomberg, as of 11/30/16

GLOBAL CREDIT

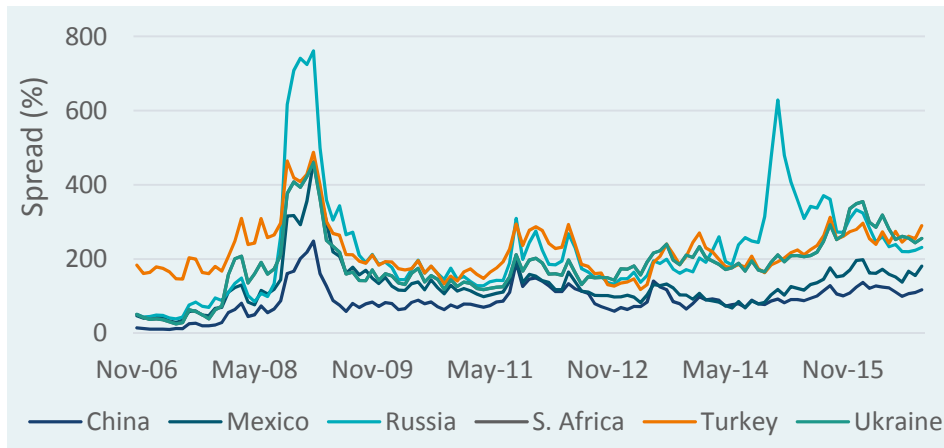


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Barclays Global Credit

Fixed income – Emerging market debt (hard)

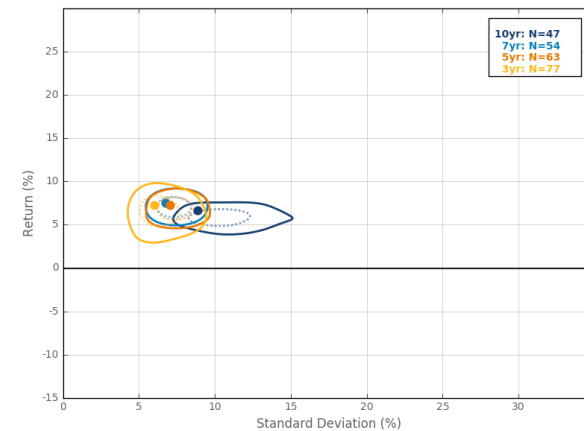
- Products in the emerging market debt (EMD) hard currency universe have struggled to produce excess returns relative to the benchmark. While over short time periods there has been a slightly positive relationship between risk and return, over longer periods this relationship has flattened out, with little apparent relationship between the returns generated and the risk taken.
- Products in the universe have historically included off-benchmark exposures to quasi-sovereign and hard currency corporate credits in an effort to increase returns.
- EMD hard currency spread volatility has in most cases stabilized as commodity prices have rebounded from their lows and concerns about future global economic growth is mitigated. While concerns over geopolitical and idiosyncratic risks remain, the primary driver of EM debt volatility remains the Federal Reserve and continued U.S. dollar strength.

EMERGING MARKET DEBT CDS SPREADS



Source: Bloomberg as of 11/30/16

EMERGING MARKET DEBT (HARD)



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is JP Morgan EMBI Global Diversified

Fixed income – Emerging market debt (local)

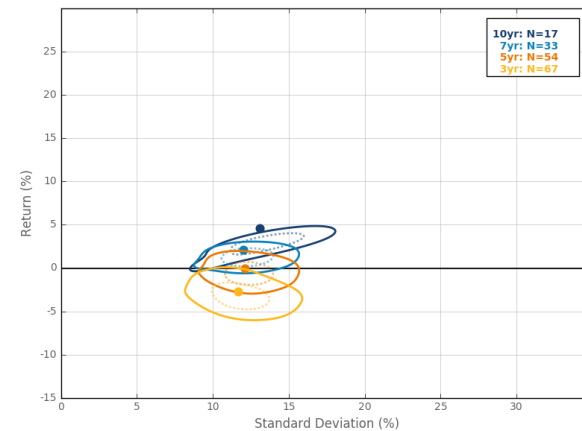
- Over longer time periods there has been a slightly positive relationship between risk and return in the emerging market debt (EMD) local universe. However, over recent periods dispersion between products appears to have increased and the risk-reward proposition has turned negative.
- There remain concerns in this marketplace over rising default risk, the recent appreciation of the U.S. dollar, and timing of future Federal Reserve rate hikes.
- Recent performance of the sector has been negatively impacted by the relative weakness in emerging market currencies as a result of U.S. dollar strength. Stable commodity prices and the expectation of accelerating U.S. GDP growth and inflation should provide a tailwind for the space.
- Products in the space that have in the past benefited from taking large exposures to off-benchmark allocations have been negatively impacted as EMD spreads widen.

EMERGING MARKET DEBT COUNTRY RETURNS YTD



Source: JPMorgan, GBI-EM Global Diversified Index, as of 11/30/16

EMERGING MARKET DEBT (LOCAL)



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is JP Morgan GBI EM Global Diversified

U.S. REITs

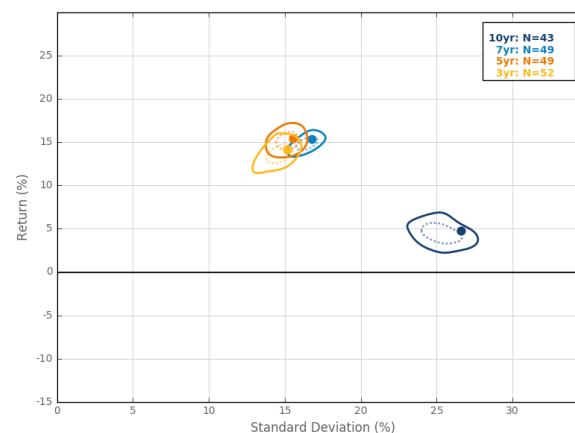
- Active products have been able to add value over the long term, primarily through the reduction of volatility. There is little evidence that increased risk has generated excess return. In some cases (over the longest time periods) the relationship is in fact inverted. Over shorter time periods however, active management appears to have primarily reduced volatility.
- Sector dispersion within REIT sub sectors has been very high in recent years. Macro forces have been a major driver of performance while fundamentals remain generally positive. Uncertainty surrounding the potential of rising U.S. interest rates has fueled volatility. Over long periods of time it appears products have been able to take advantage of high volatility in REIT valuations, which tend to fluctuate rapidly. Differentiating factors among REIT sectors include lease durations, economic drivers and construction cycles.
- REITs became a standalone sector within the GICS classification standard, when they were carved out from Financials in September 2016. In the months leading up the change, more and more generalist investors, who as a whole have historically underweighted REITs, were increasing attention to the sector, which should be a marginal positive.

SHARE PRICE PREMIUM TO NAV

| 2011 | 2012 | 2013 | 2014 | 2015 | 2016 YTD |
|------------------------|------------------------|-----------------------|------------------------|------------------------|-----------------------|
| Self Storage 35% | Industrial 31% | Hotel 27% | Apartment 15% | Self Storage 35% | Industrial 25% |
| Regional Mall 22% | Regional Mall 28% | Self Storage 9% | Health Care 14% | Apartment 15% | Hotel 14% |
| Apartment 15% | Shopping Center 25% | Industrial 7% | Regional Mall 22% | Shopping Center -1% | Office 9% |
| Health Care 14% | Health Care 20% | Office 6% | Hotel -14% | Regional Mall 22% | Diversified 4% |
| Diversified 3% | Self Storage 20% | Shopping Center 5% | Self Storage 35% | Industrial -5% | Shopping Center 2% |
| Shopping Center -1% | Office 14% | Diversified 4% | Shopping Center -1% | Office -1% | Health Care 2% |
| Office -1% | Hotel 13% | Regional Mall -1% | Diversified 3% | Diversified 3% | Apartment -4% |
| Industrial -5% | Diversified 12% | Apartment -6% | Office -1% | Health Care 14% | Regional Mall -5% |
| Hotel -14% | Apartment 7% | Health Care -7% | Industrial -5% | Hotel -14% | Self Storage -15% |
| -14% to 35% | | 7% to 31% | | -7% to 27% | |
| 21% to 40% | | -24% to 41% | | -15% to 24% | |

Source: Cohen & Steers, Morningstar, NAREIT, as of 11/20/16

U.S. REITS



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias. Benchmark displayed is Wilshire REIT

Product persistency & universe shape stability

Product persistency & universe shape stability

In the 2017 active management environment we expanded our analysis to work towards a deeper understanding of universe characteristics, and of the active products within those universes. To further adopt this research into our views on active management, we seek answers to the following questions related to **product persistency** and **universe shape stability**:

- Do active products show persistency in terms of return relative to the benchmark?
- Do active products show persistency in terms of risk relative to the benchmark?
- Do active products show persistency in terms of risk-adjusted performance relative to the benchmark?
- Once we know the shape of an active universe, can we make any assumptions as to whether this shape will continue into the future?

These questions may have important implications for how we select active products, risk/return tradeoffs of broad universes, the ideal degree of diversification across products within individual universes, and perhaps the overall attractiveness of active management within each asset class.

Product persistency

Active products may exhibit persistency in terms of return, risk, or risk-adjusted performance. Persistency in any of these characteristics could be valuable for product selection.

Below are a few possible outcomes:

Active products display persistency in returns

- This is of course useful information, but literature tells us it is not the case.

Active products display persistency in volatility

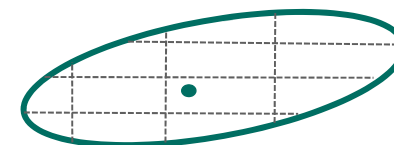
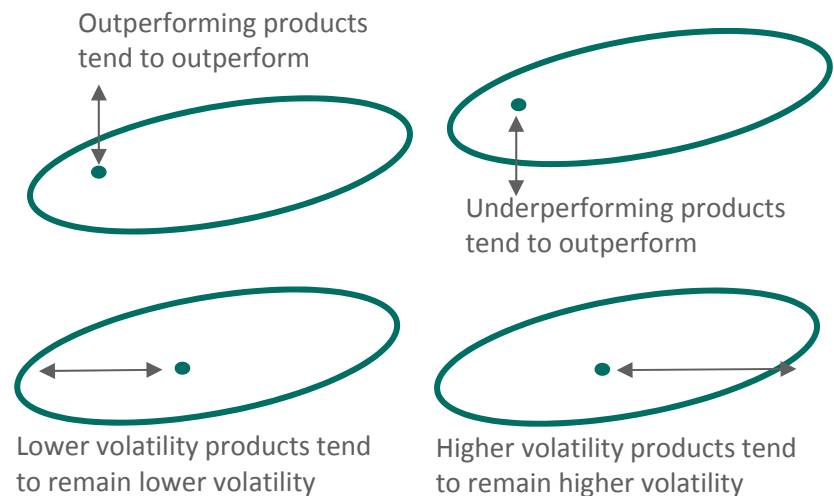
- This is also useful information. If volatility is persistent then active management might add value by reducing volatility without sacrificing return in some universes.

Active products display persistency in risk-adjusted performance

- This is useful information, and might allow investors to improve the risk-adjusted performance of their portfolio.

Certain parts of the universe display persistency.

- Also useful information. Investors may stack the odds in their favor if better able to narrow down the active product opportunity set.



Different portions of the universe display unique persistence characteristics

Product persistency – Findings

Our initial findings are summarized below. Over the coming quarters our team will continue to examine the persistency characteristics of product universes. This research is expected to further shape our understanding of active management.

- **Returns:** In aggregate, active products do not appear to exhibit persistent returns. This suggests that investors should not select active products based on past returns because returns do not persist, in general.
- **Volatility:** In aggregate, active products exhibit persistence in volatility. Investors might reasonably expect lower volatility active products to deliver lower future volatility, and might expect higher volatility products to deliver higher future volatility.
- **Risk-adjusted performance:** In aggregate, there is little evidence of persistence in risk-adjusted performance.

Universe shape stability

Universe behavior relative to the benchmark during a given period helps us to understand our likelihood of success during that period, even if products in this universe displayed purely random relative performance.

If the shape of this active universe is somewhat consistent through time, knowing the shape of the universe can be valuable in product selection, even if individual product performance exhibits randomness in this universe.

Below are a few possible outcomes:

Universe tends to be sloping up to the right, or up to the left

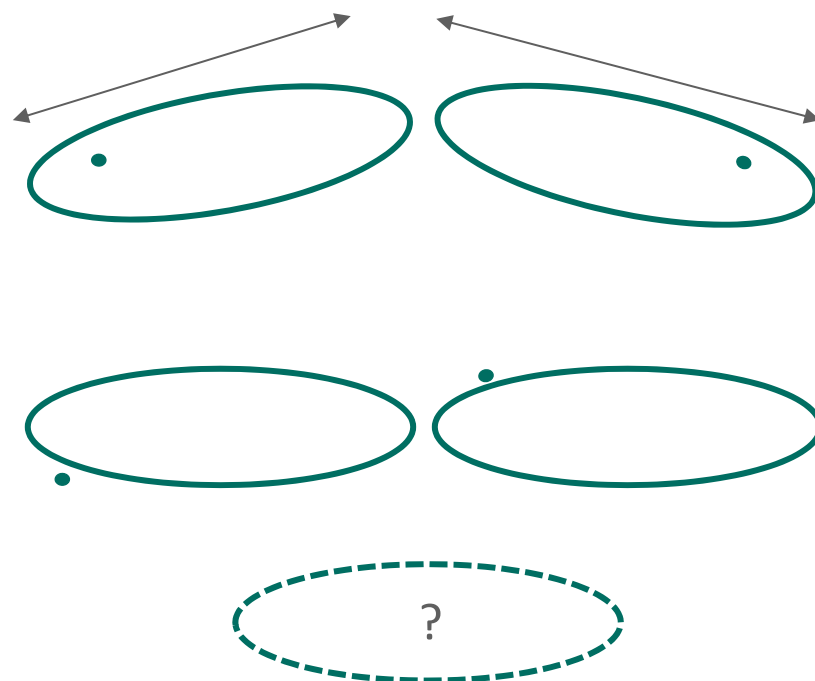
- This is useful information, and potentially suggests value can be created by taking on more risk relative to the benchmark, or value can be created by lowering risk relative to the benchmark

Universe tends to outperform or underperform relative to the benchmark

- This is useful information, and implies active management is more or less attractive in the universe, independent of the investor's selection skill

Universe appears to be random in nature

- May still be useful information. Suggests active management in the universe should not be expected to deliver value without selection skill.



Universe shape stability – Findings

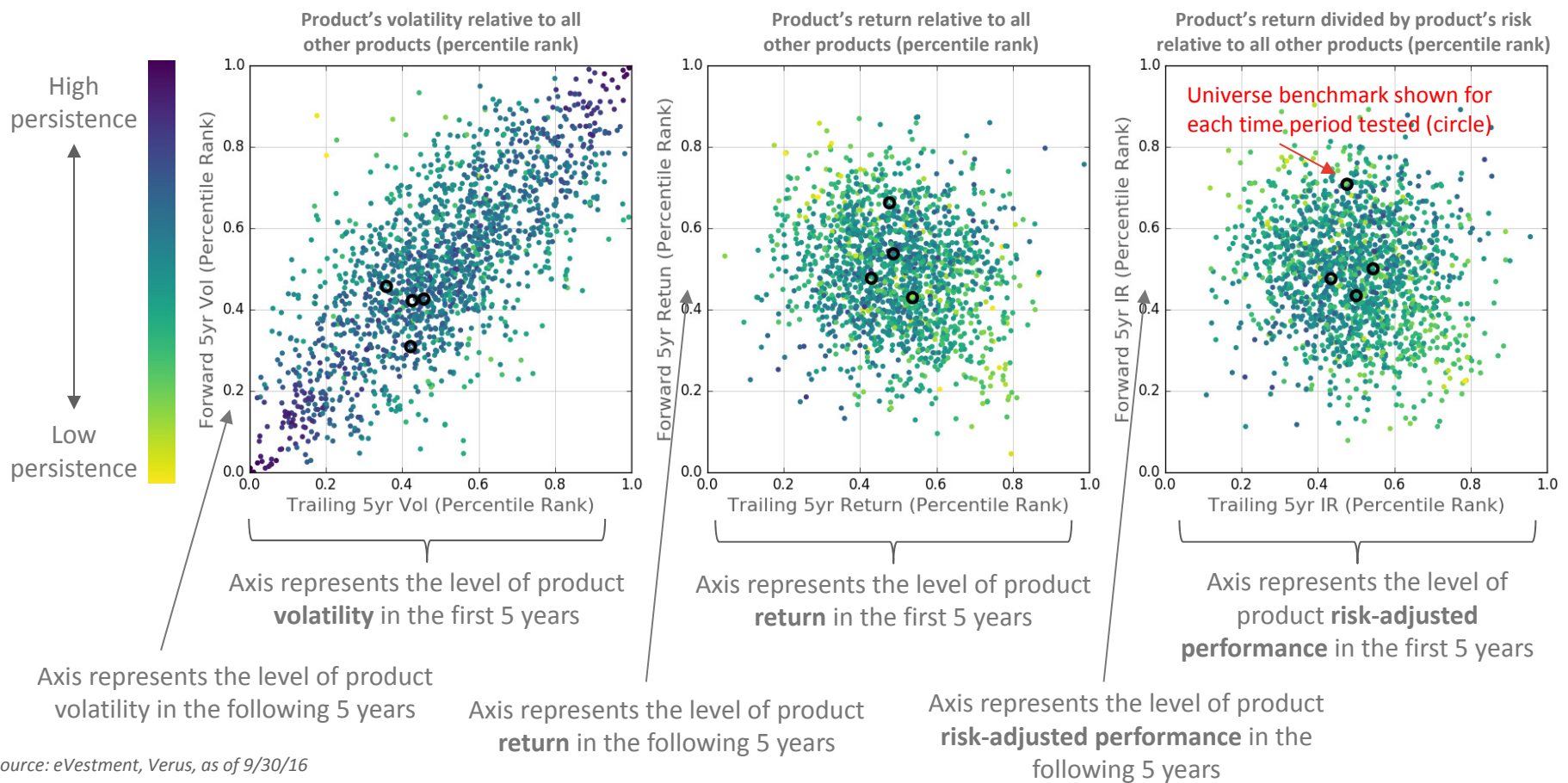
- Interpreting the stability of universe shape through time is a difficult exercise, partly due to lack of data. While investors have access to sometimes thousands of active product track records within each universe, only one track record is available for each universe as a whole.
- Universe shape has been volatile through time across most universes and it is difficult to draw initial conclusions. Verus will be taking a closer look at broad universe characteristics in coming quarters and will provide a summary of findings in the next active management environment research document.

Product persistency charts

Note: Some universes are excluded due to too few active product track records. Universes are defined at the broadest level. Products vary in terms of style and/or treatment of currency exposure. Equity universe include both value and growth styles. International universes include both products that hedge currency exposure and products that do not hedge currency exposure.

How to read product persistency charts

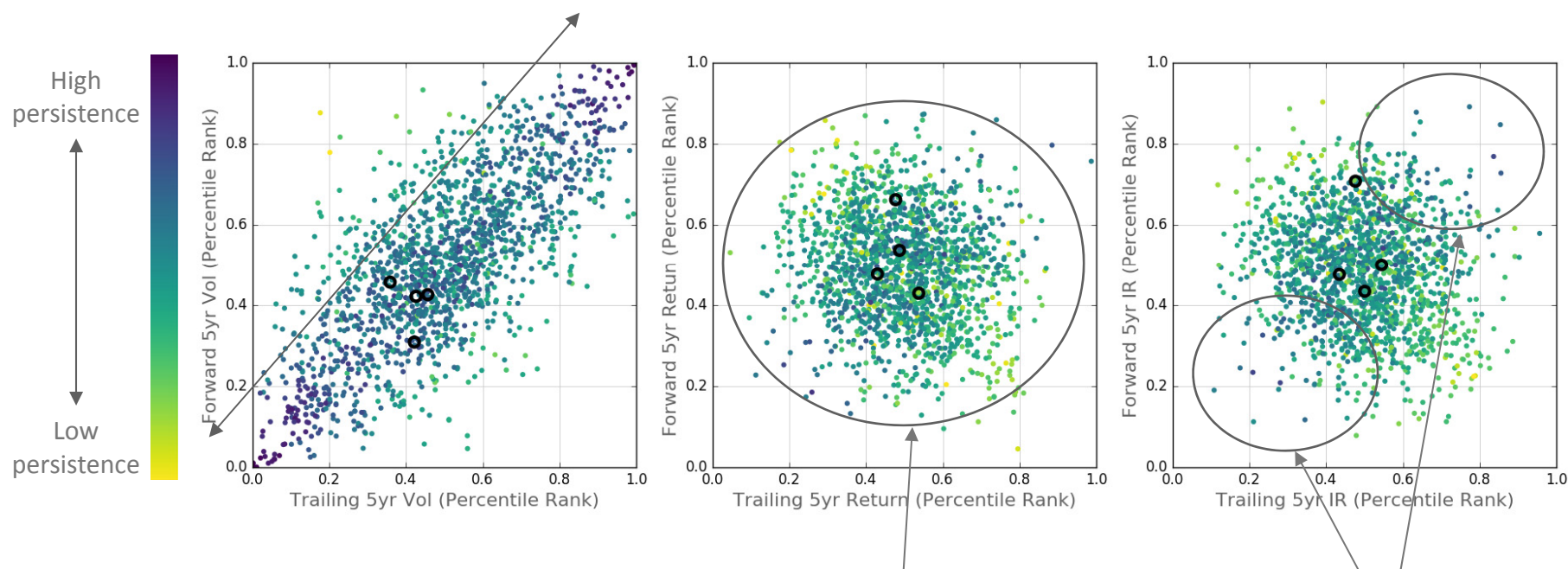
Active products within each universe were tested for persistency in three ways: persistency of volatility (left chart), persistency of return (middle chart), and persistency of risk-adjusted return (right chart). Dots are colored based on their exhibited persistence.



Source: eVestment, Verus, as of 9/30/16

How to read product persistency charts

A perfect diagonal line of purple dots, with no scatter of products, would mean perfect (100%) persistence. Low or high volatility products would continue to exhibit the exact same low or high relative volatility in the following periods. Low or high returning products would continue to exhibit the same level of relative returns, etc.



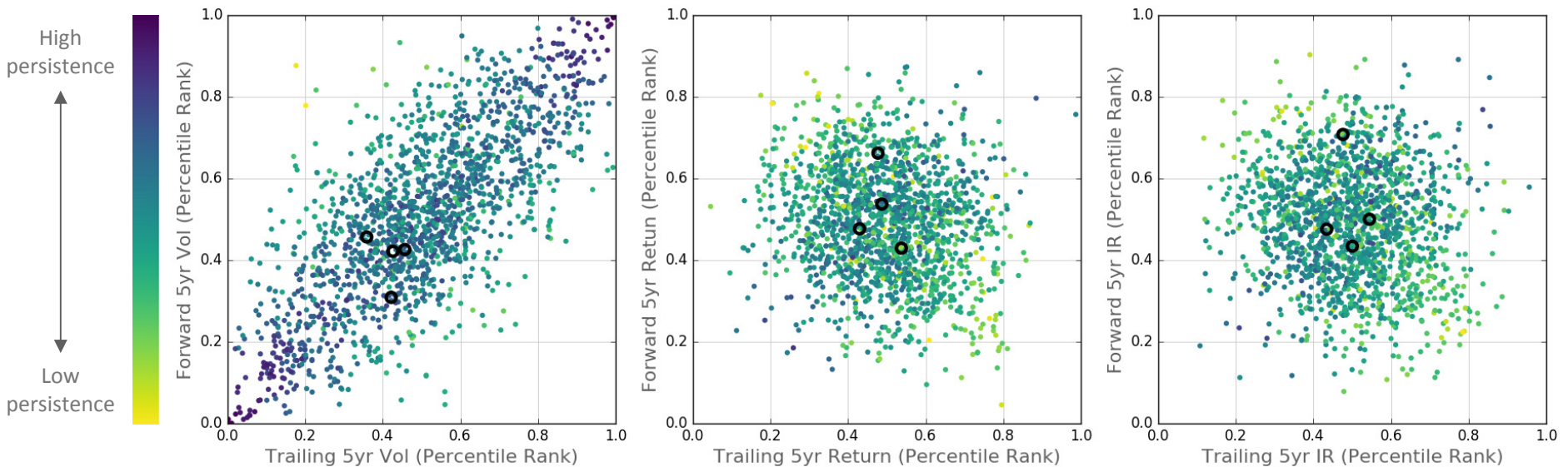
A round shape implies very little or no persistency

More products clumped into top right or bottom left implies either persistency of high performers or persistency of low performers

Source: eVestment, Verus, as of 9/30/16

Equities – U.S. large cap

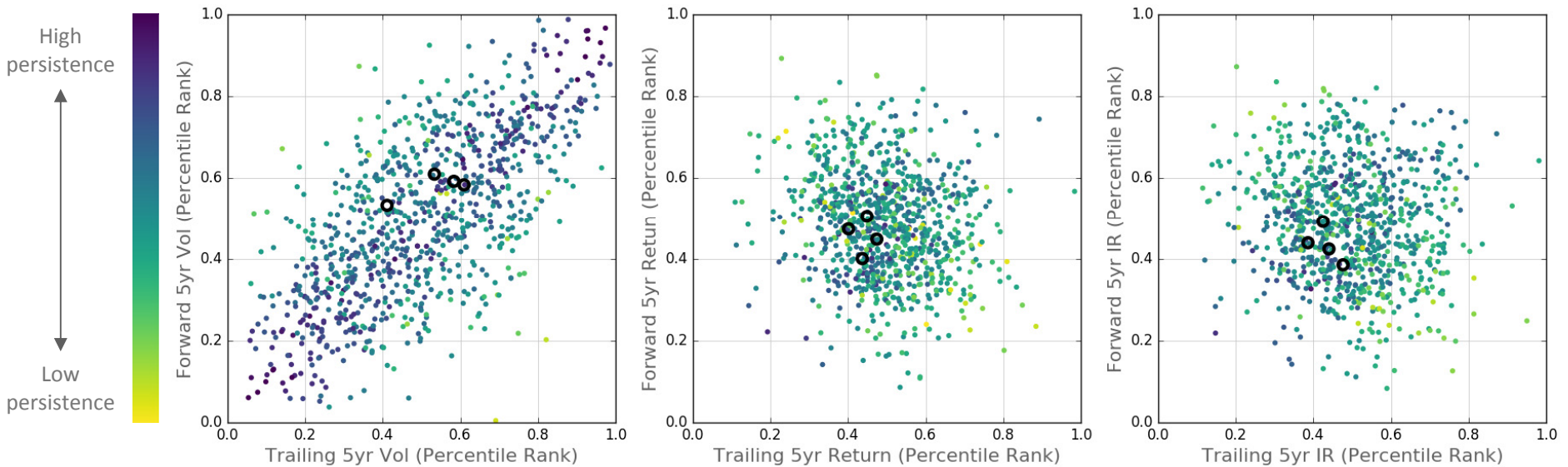
Appears to be high persistency of volatility



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is S&P 500

Equities – U.S. small cap

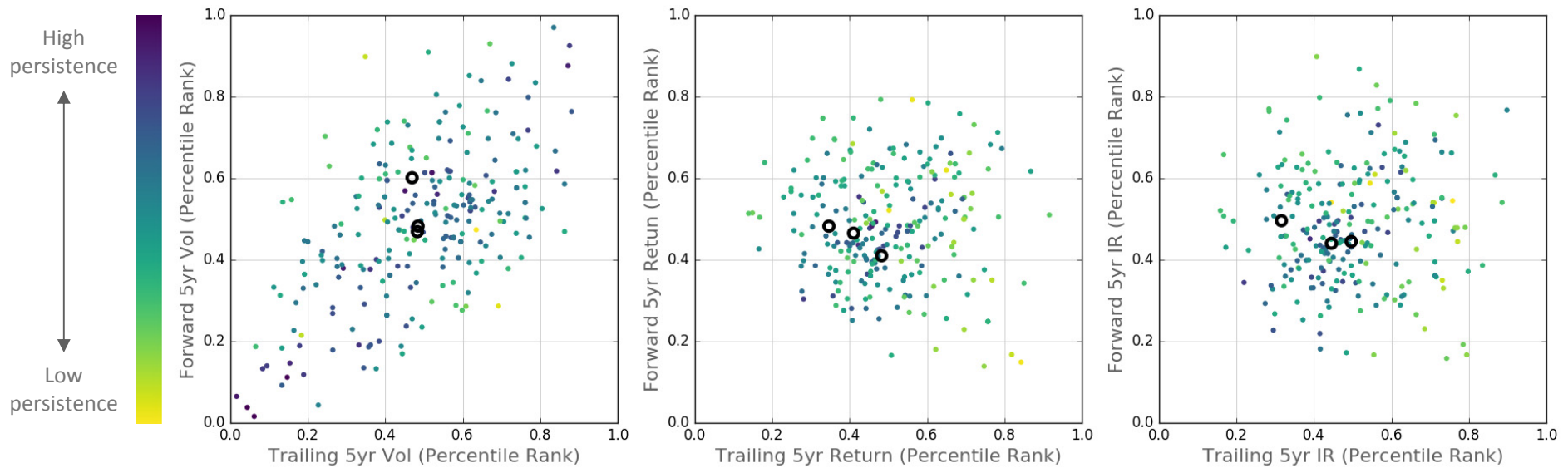
Appears to be high persistency of volatility



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is Russell 2000

Equities – International developed

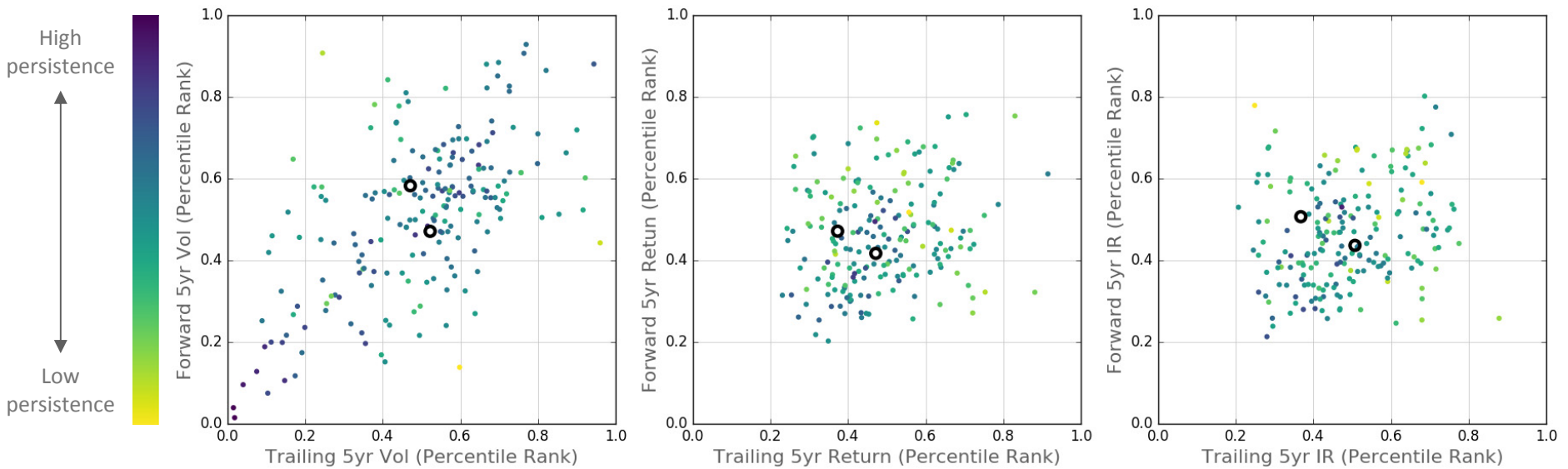
Appears to be high persistency of volatility



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is MSCI EAFE

Equities – Emerging markets

Appears to be persistency of volatility

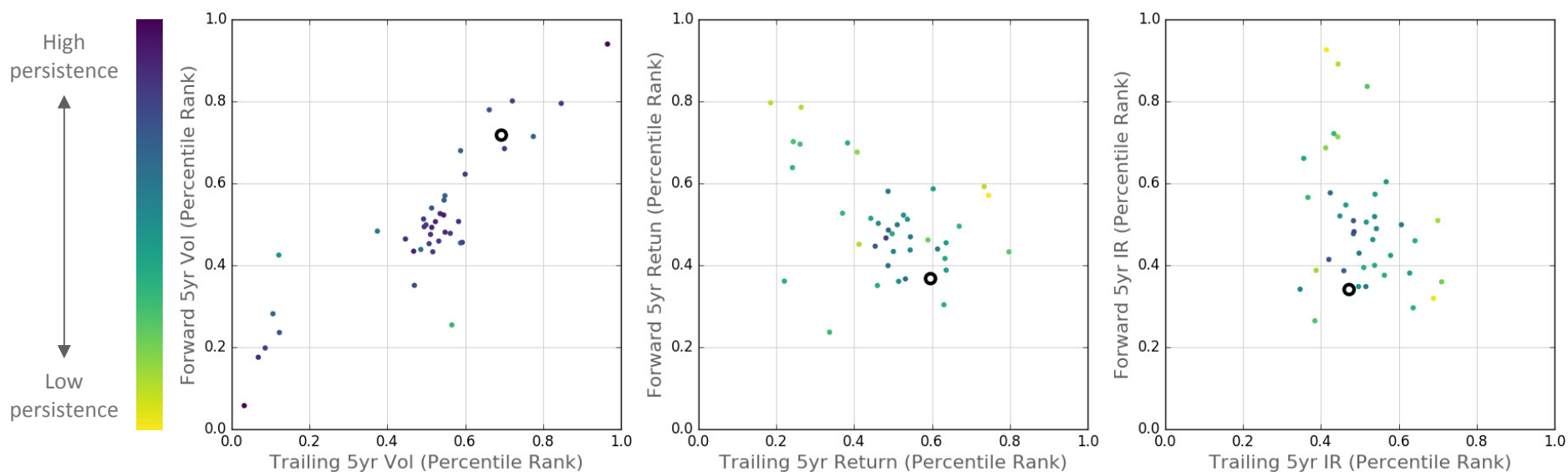


Source: eVestment, Verus, as of 9/30/16

Benchmark displayed is MSCI EM

Fixed income – Global sovereign

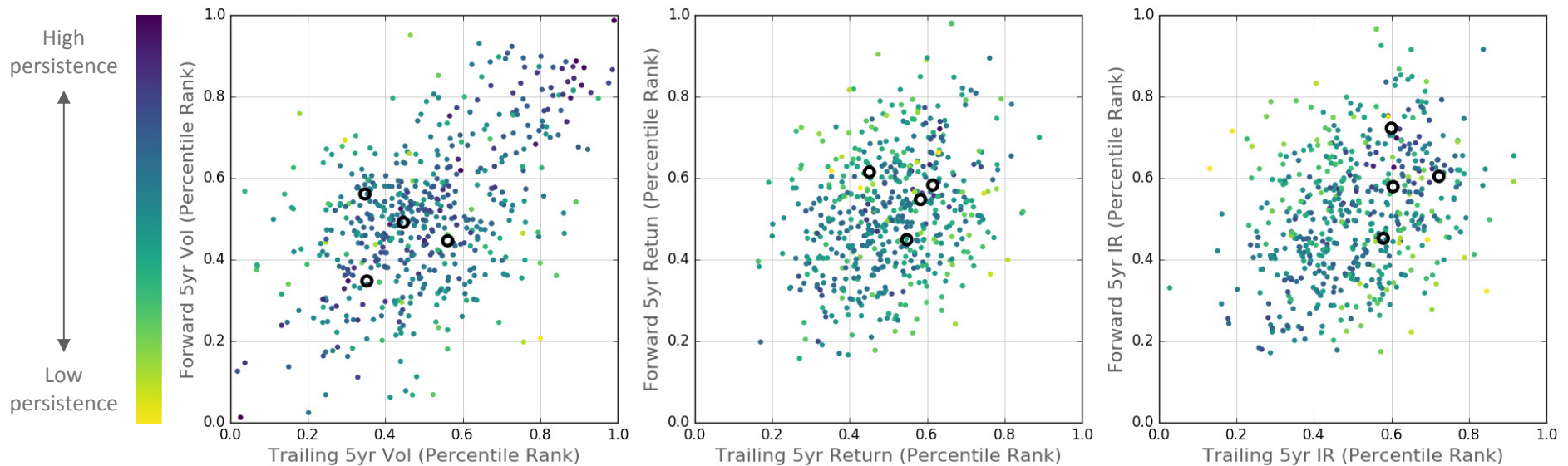
Appears to be high persistency of volatility, though data is limited



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is Barclays Global Treasury ex US

Fixed income – U.S. core

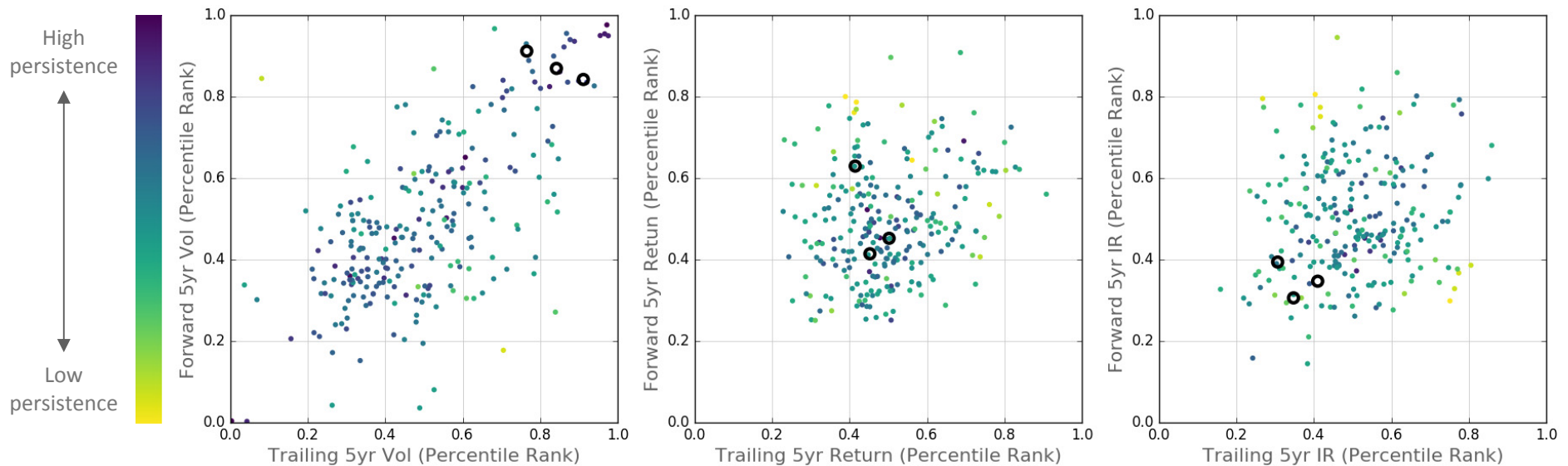
Appears to be some persistency of volatility



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is Barclays US Aggregate Bond

Fixed income – U.S. core plus

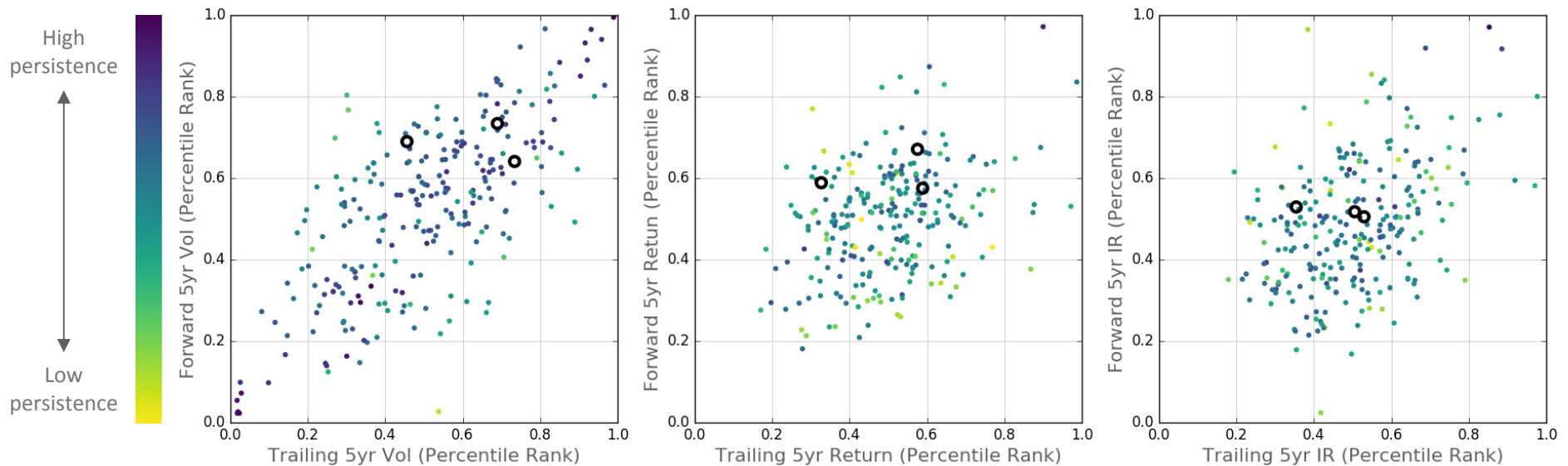
Appears to be high persistency of volatility, though data is limited



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is Barclays US Corporate IG

Fixed income – High yield

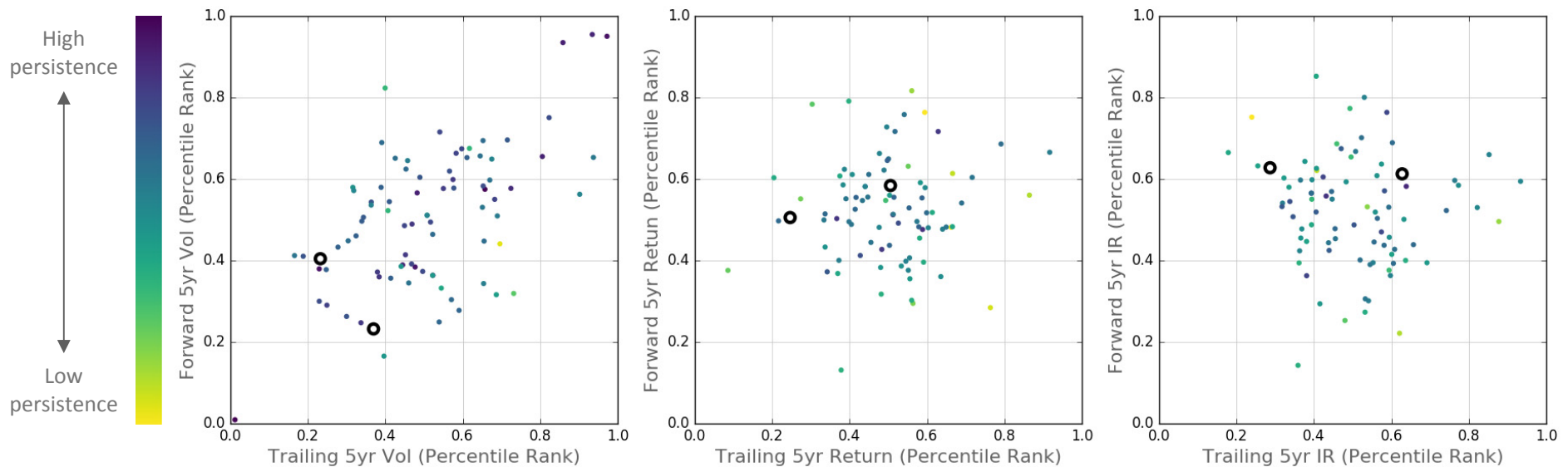
Appears to be high persistency of volatility



Source: eVestment, Verus, as of 9/30/16
Benchmark displayed is Barclays High Yield

Fixed income – Emerging market debt (hard)

Persistence
is less
apparent

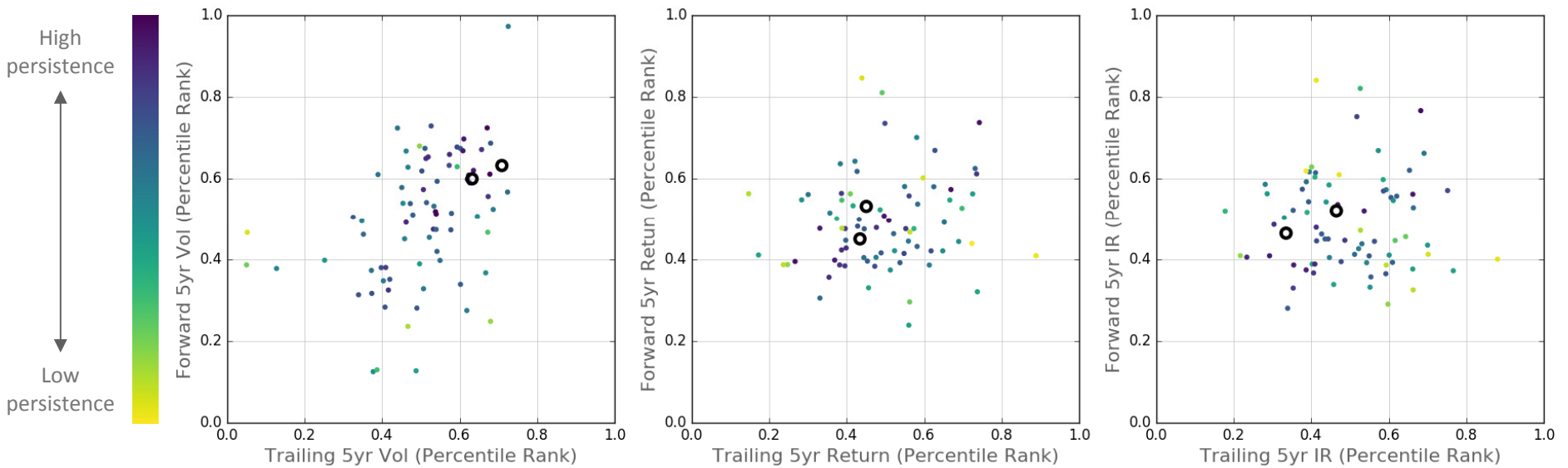


Source: eVestment, Verus, as of 9/30/16

Benchmark displayed is JP Morgan EMBI Global Diversified

U.S. REITs

Persistence is less apparent, though data is limited



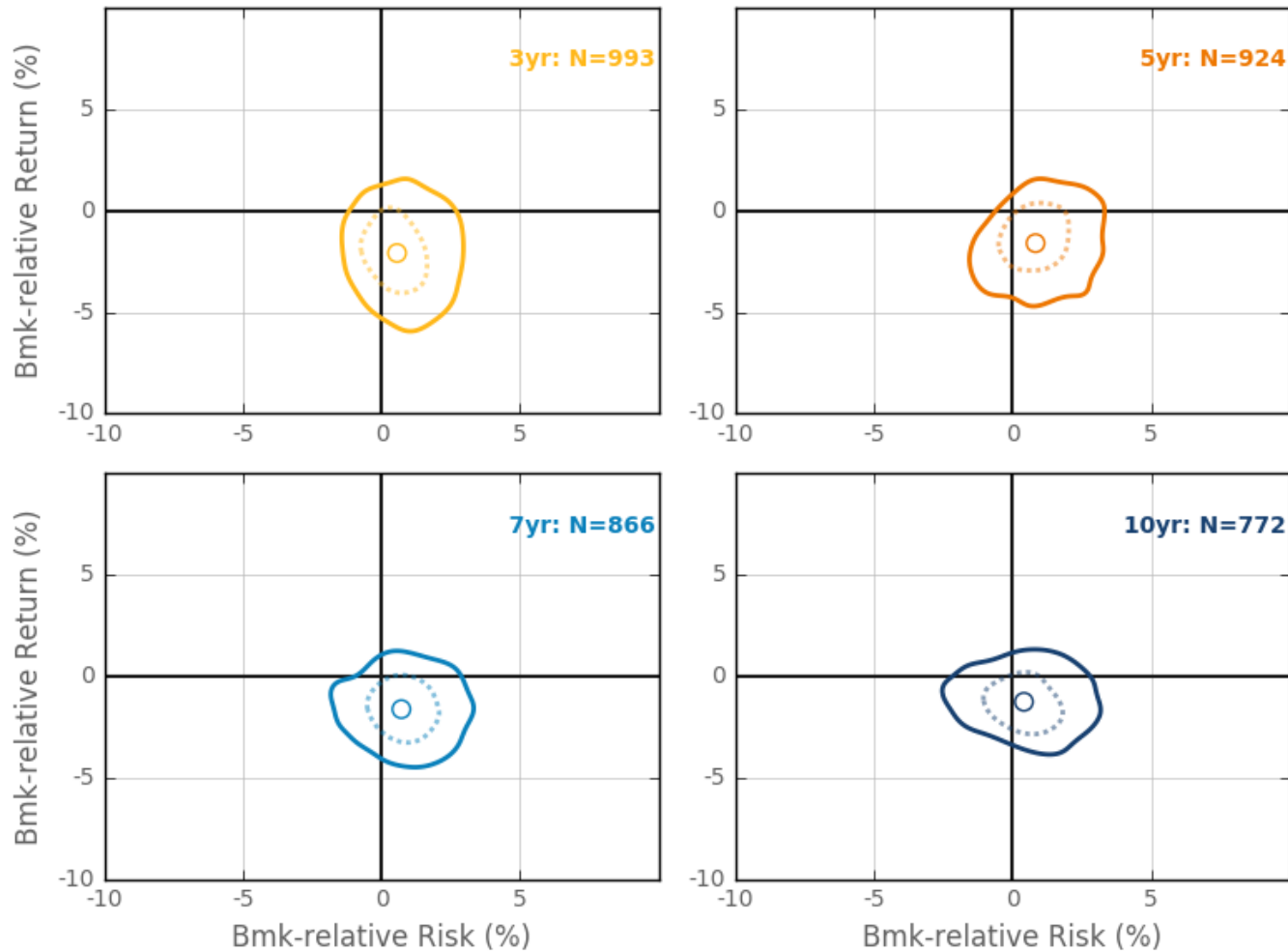
Source: eVestment, Verus, as of 9/30/16

Benchmark displayed is Wilshire REIT

Appendix 1:

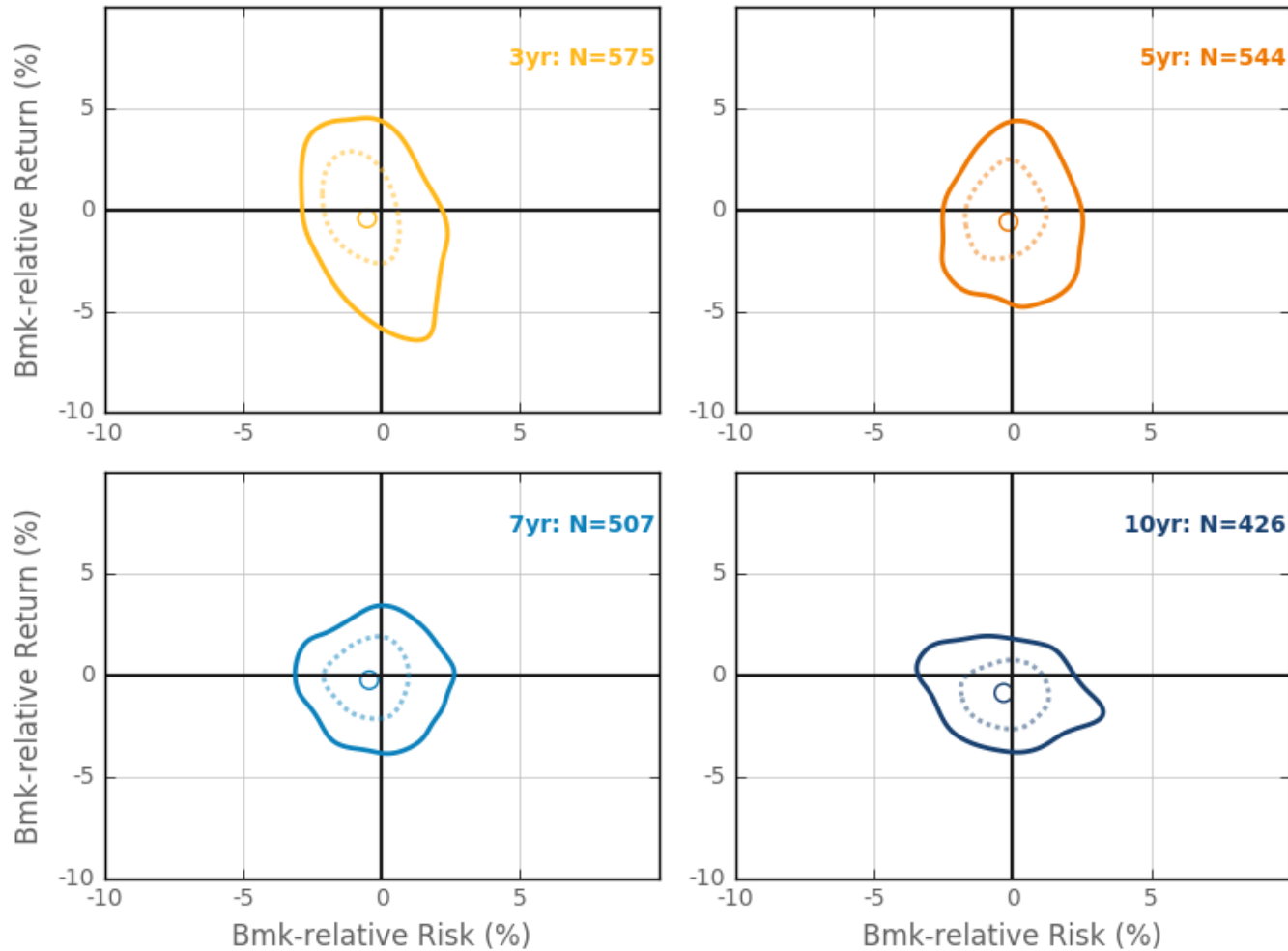
Supplementary universe charts

Equities – U.S. large cap



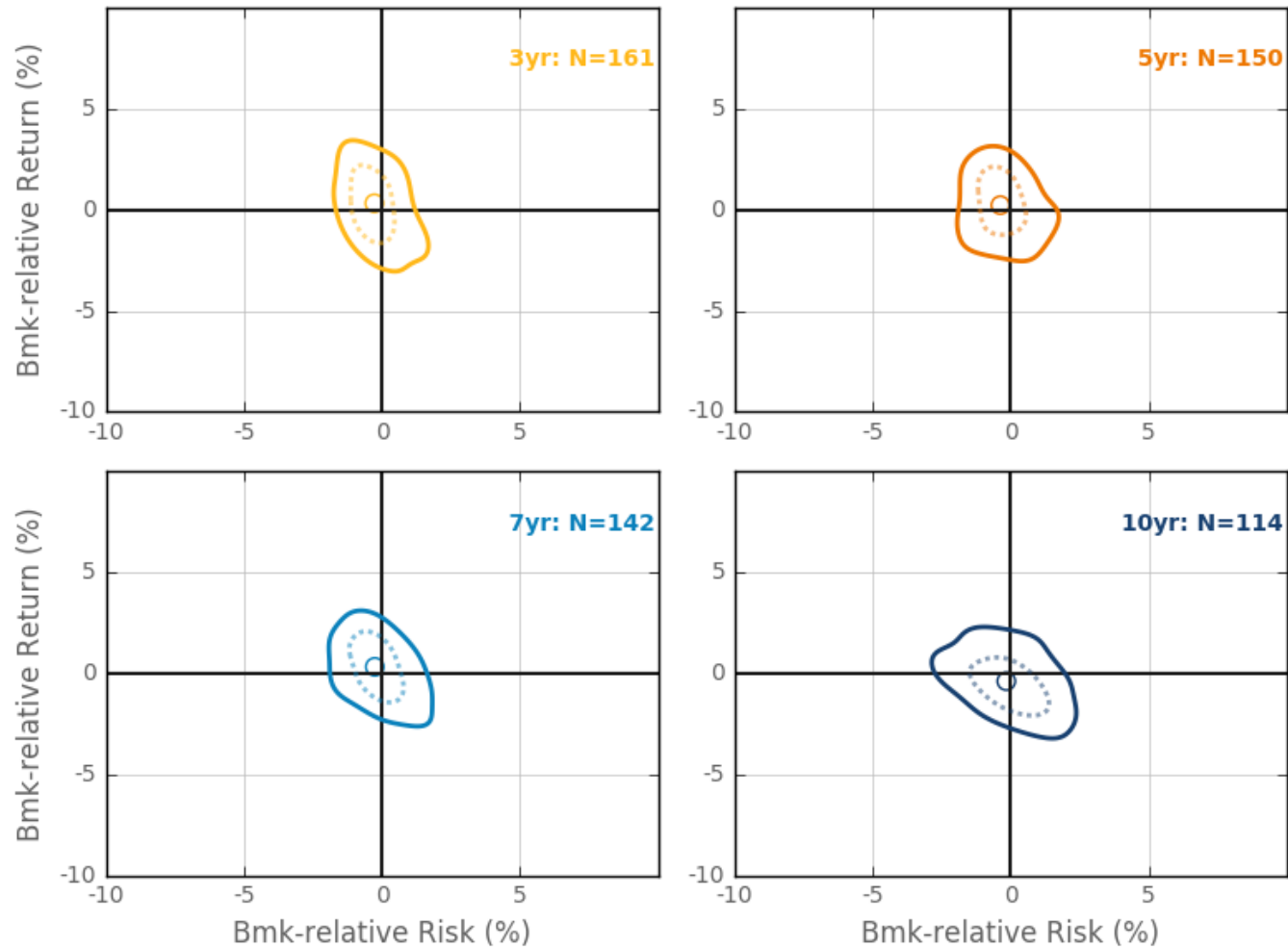
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Equities – U.S. small cap



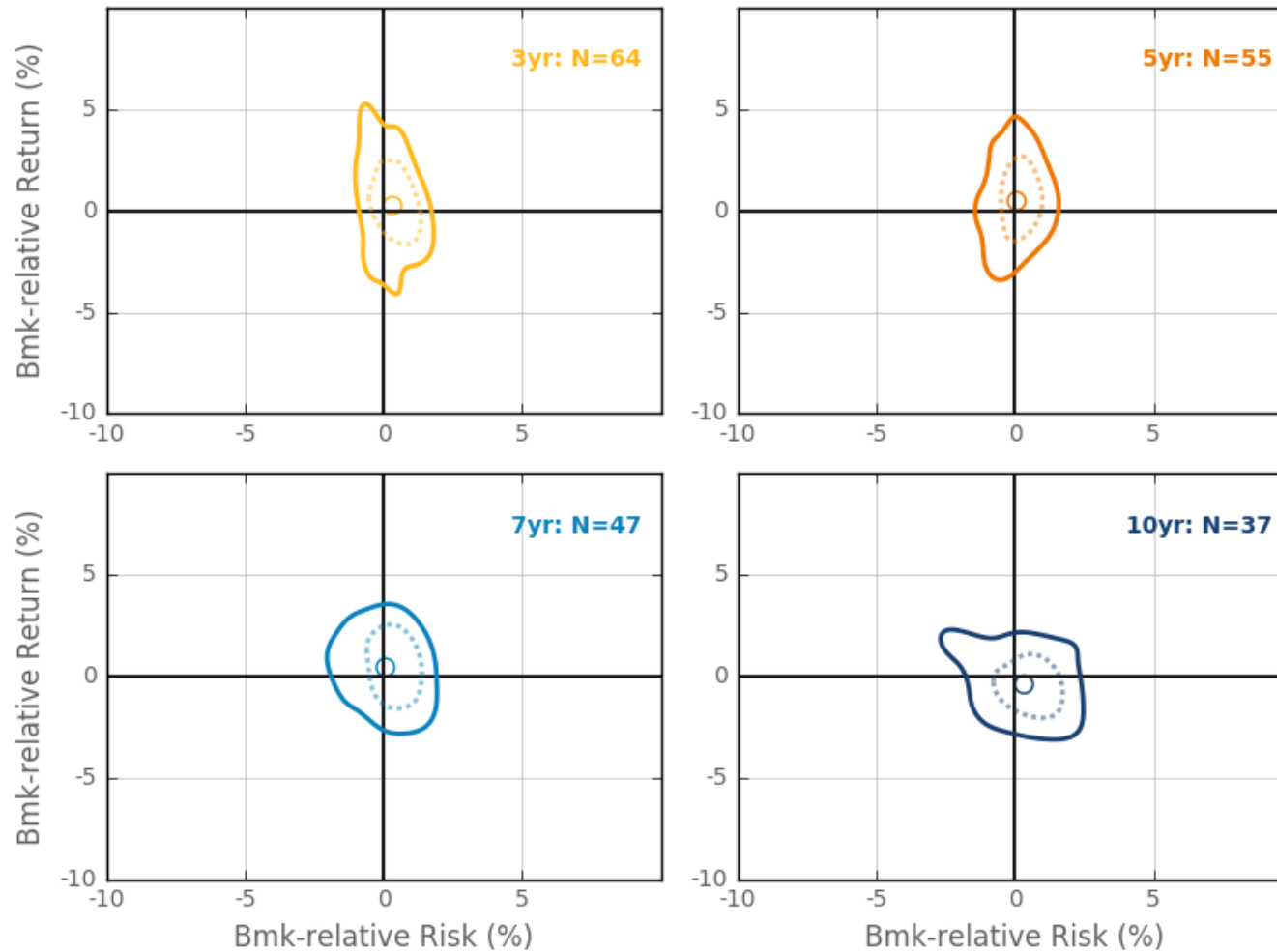
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Equities – International developed



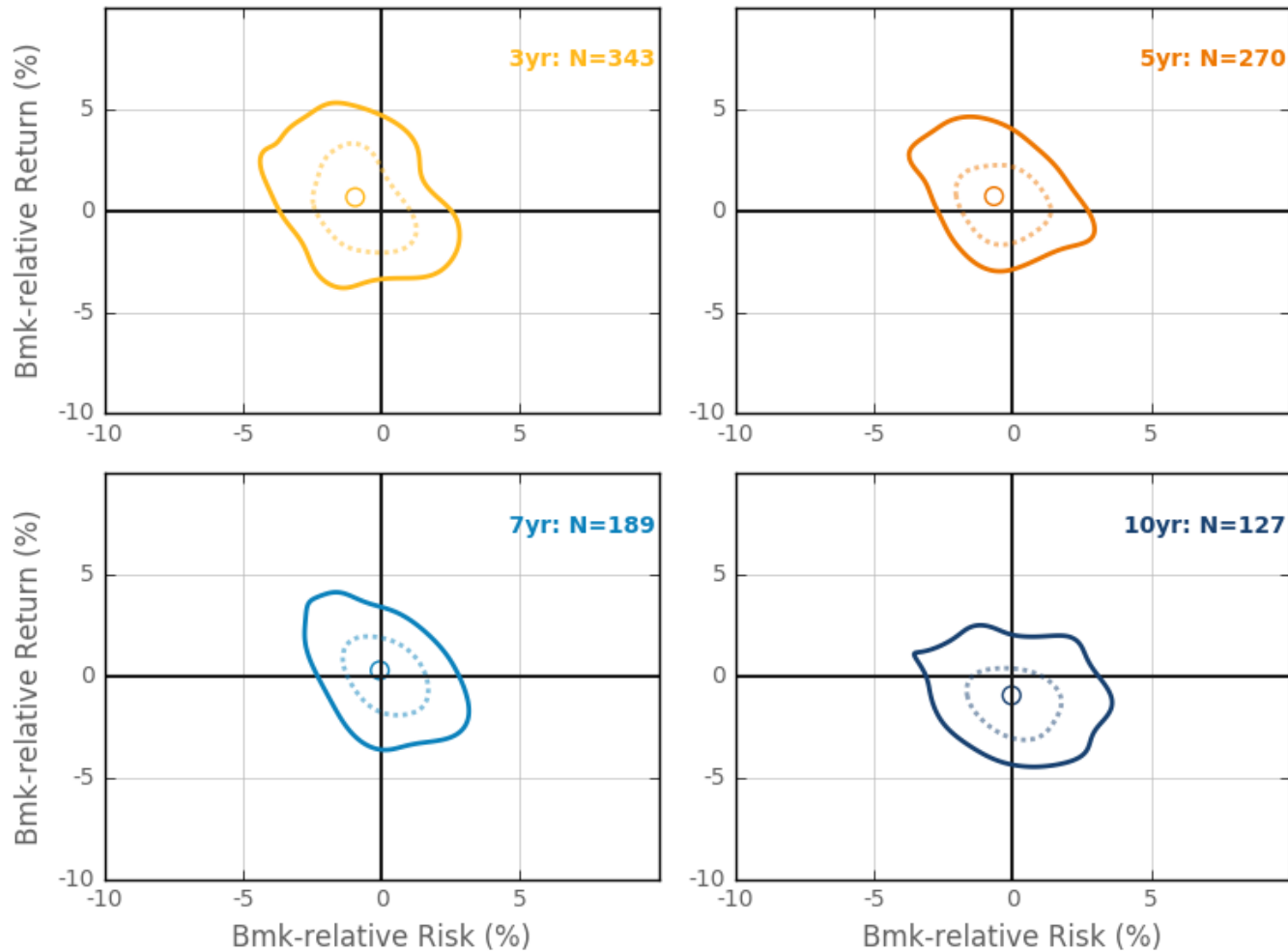
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Equities – International developed small



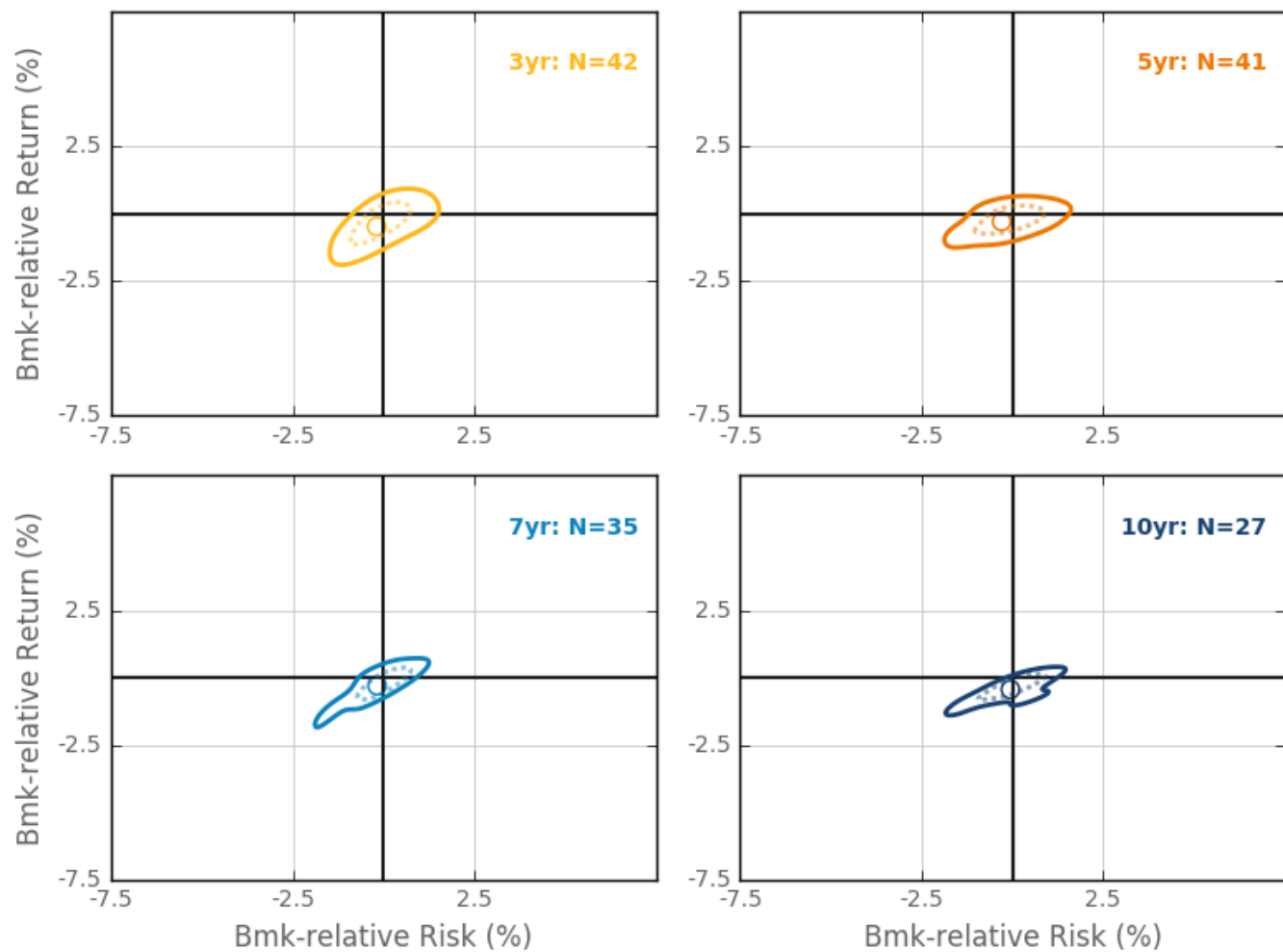
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Equities – Emerging markets



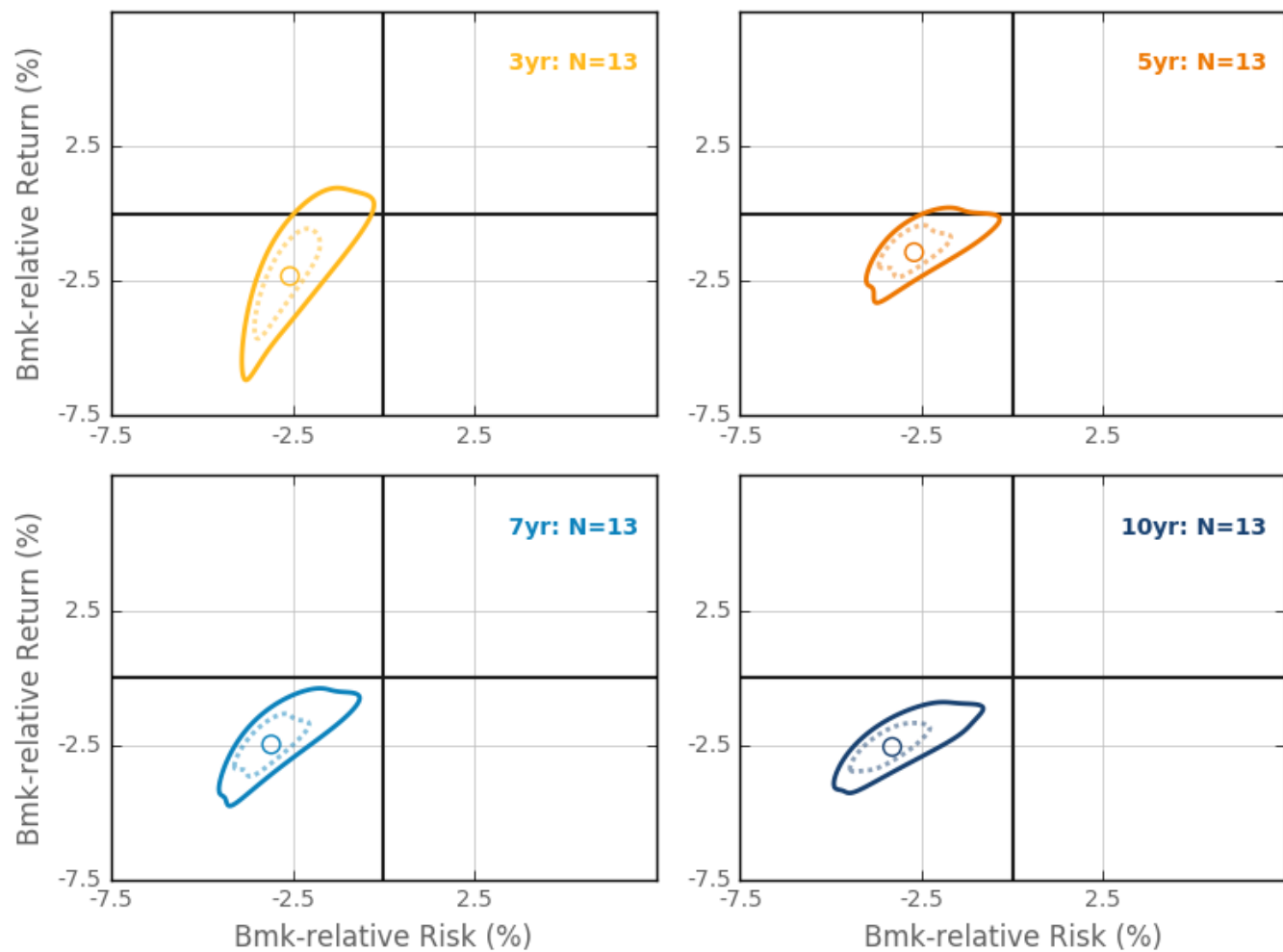
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – U.S. TIPS



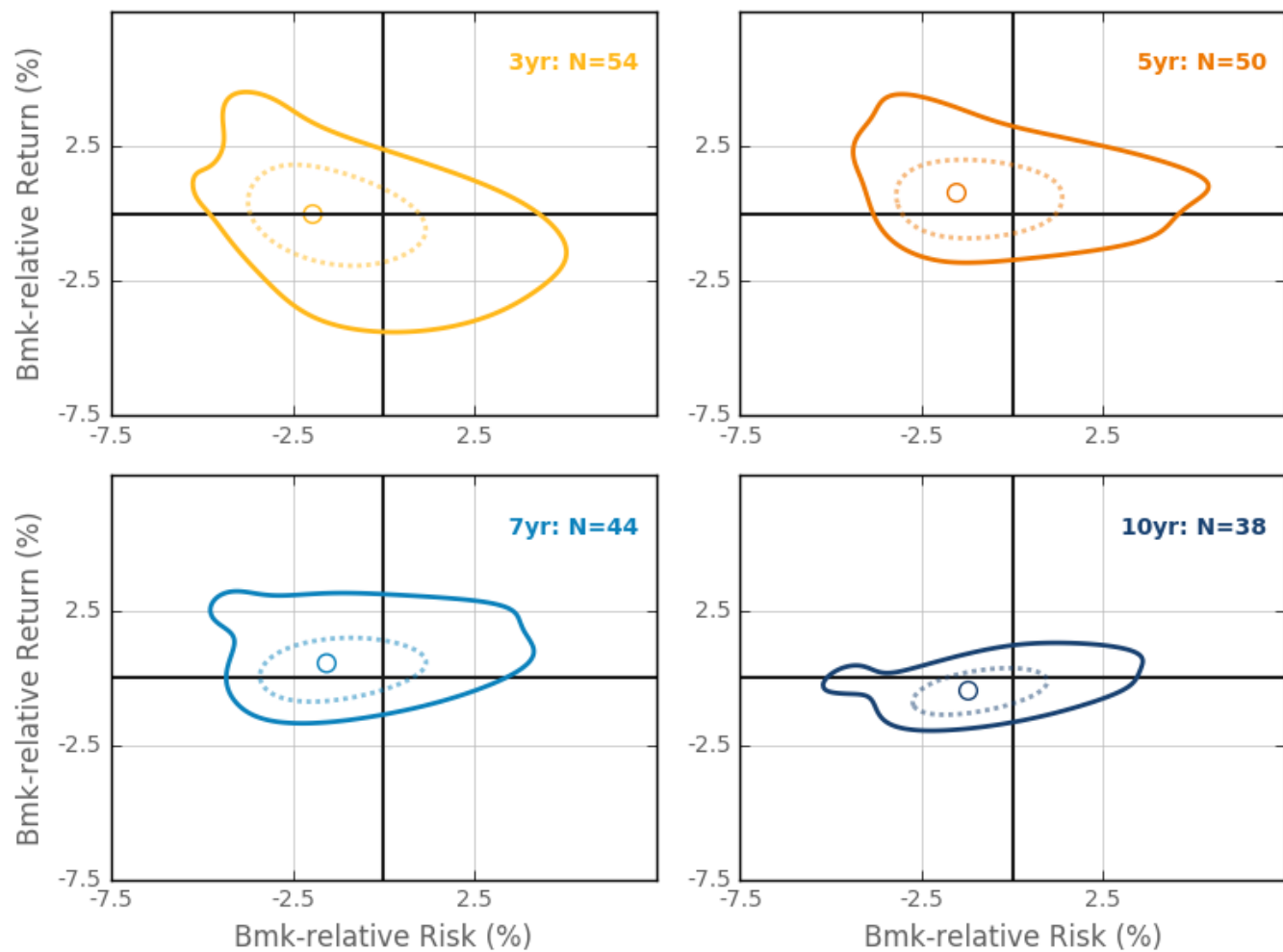
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – U.S. treasury



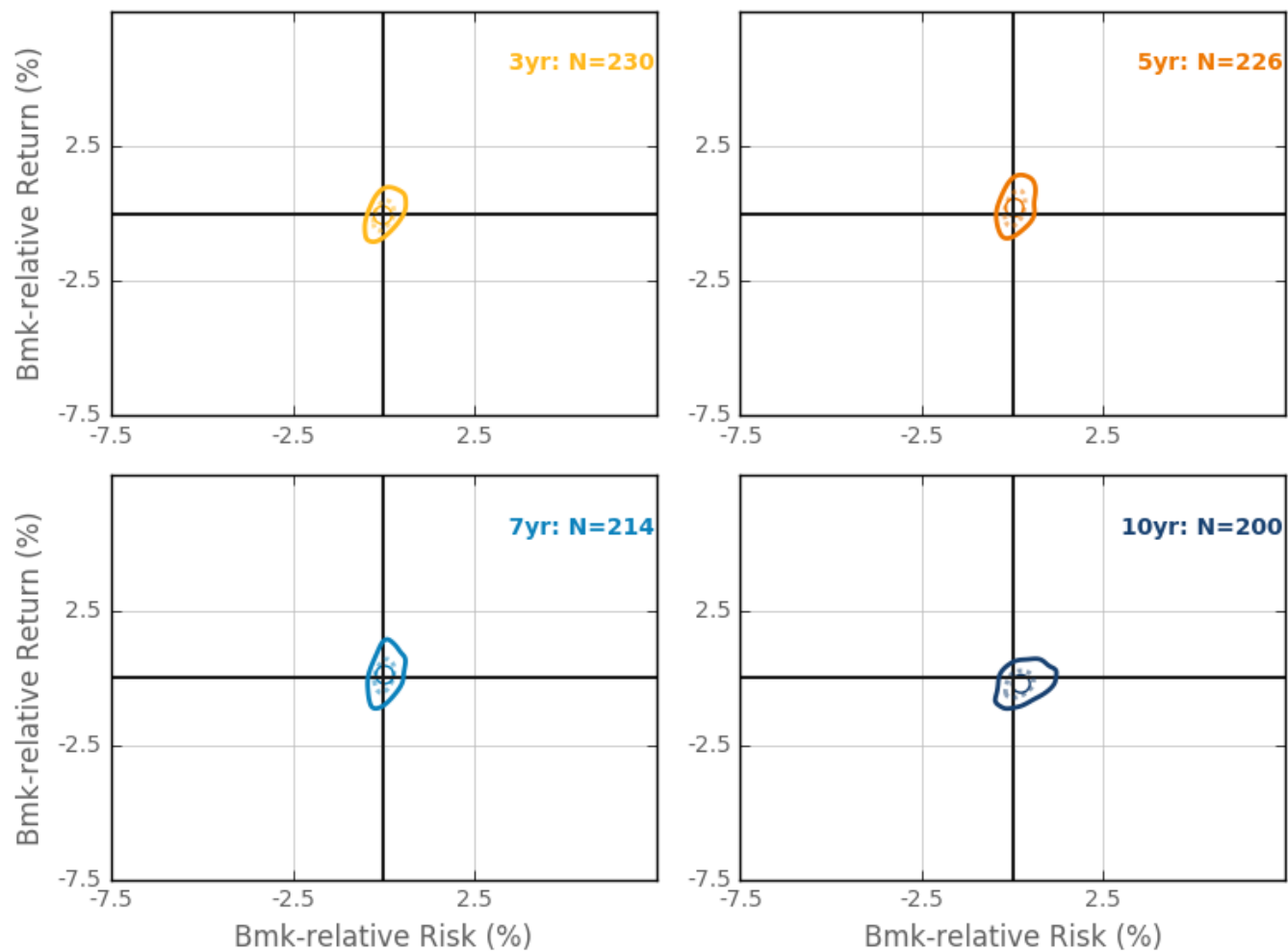
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – Global sovereign



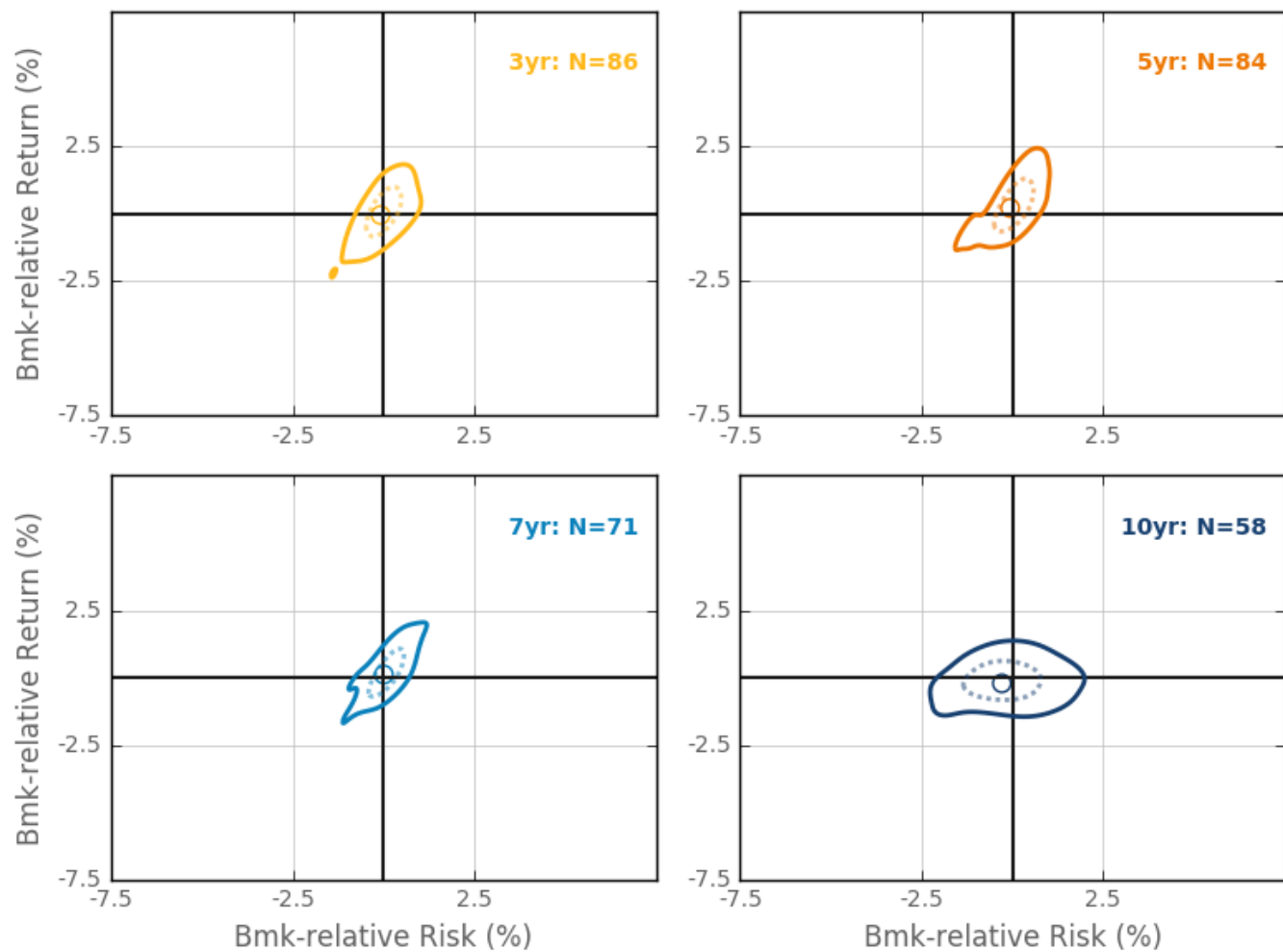
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – U.S. core



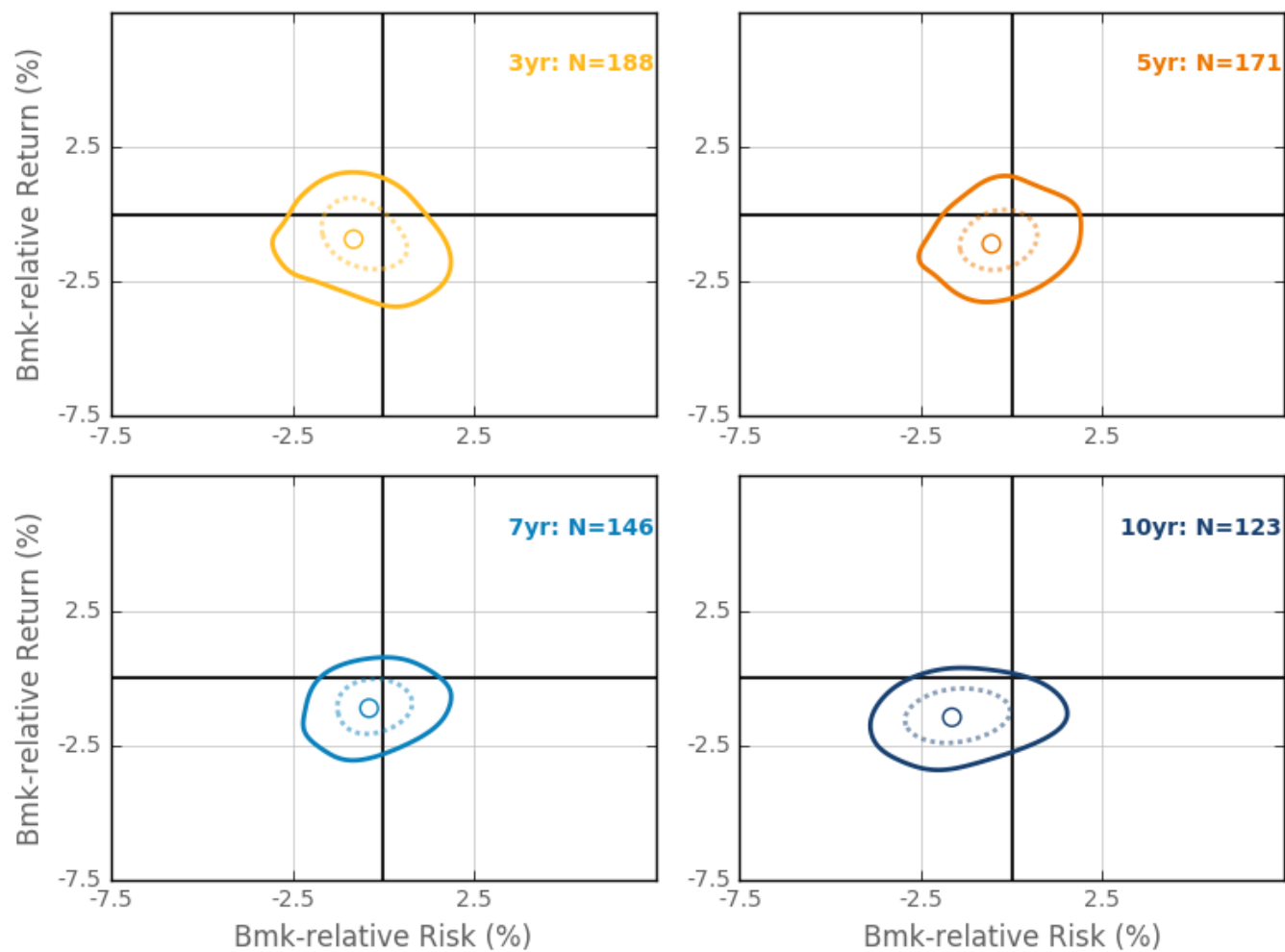
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – U.S. core plus



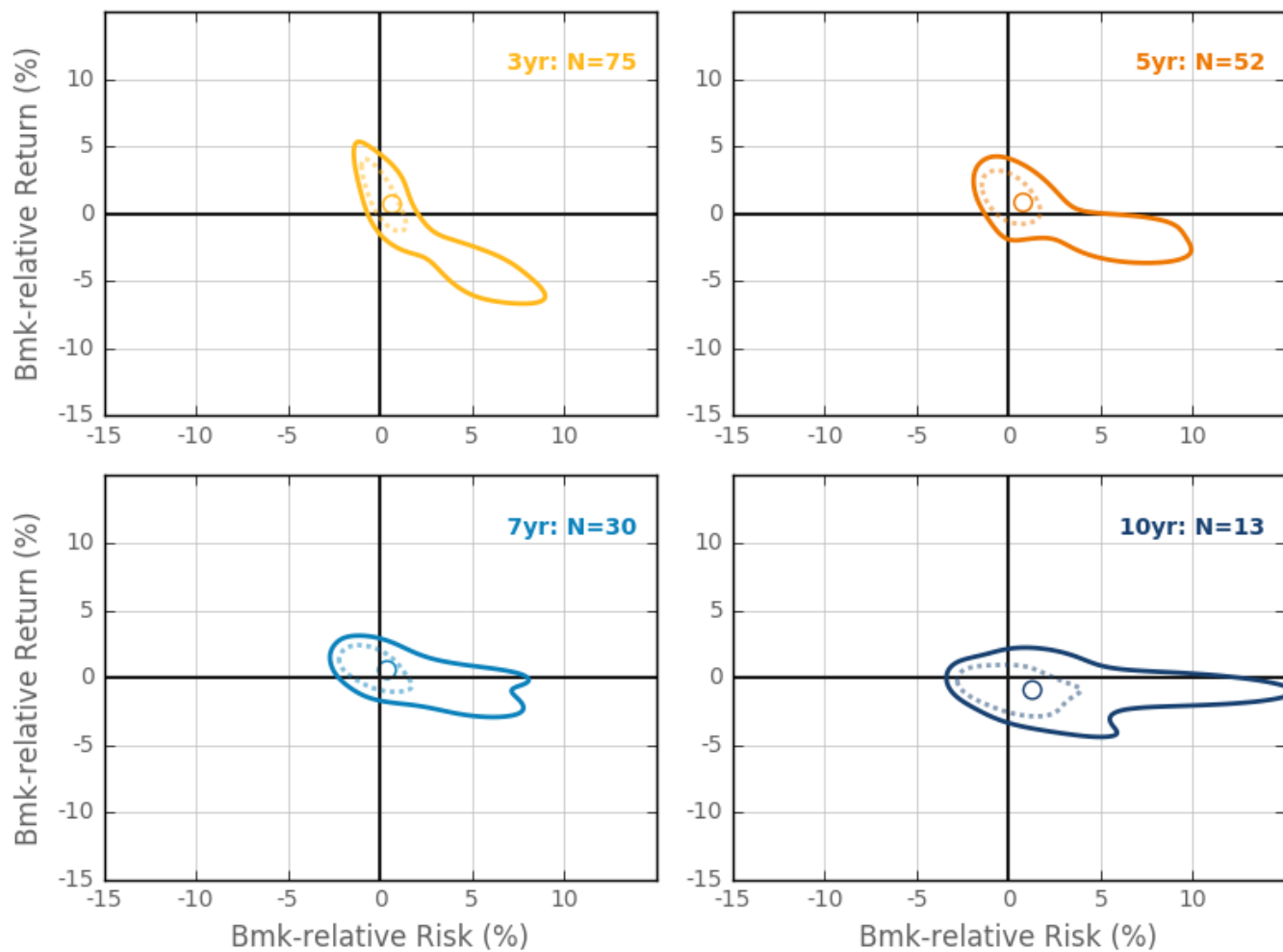
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – High yield



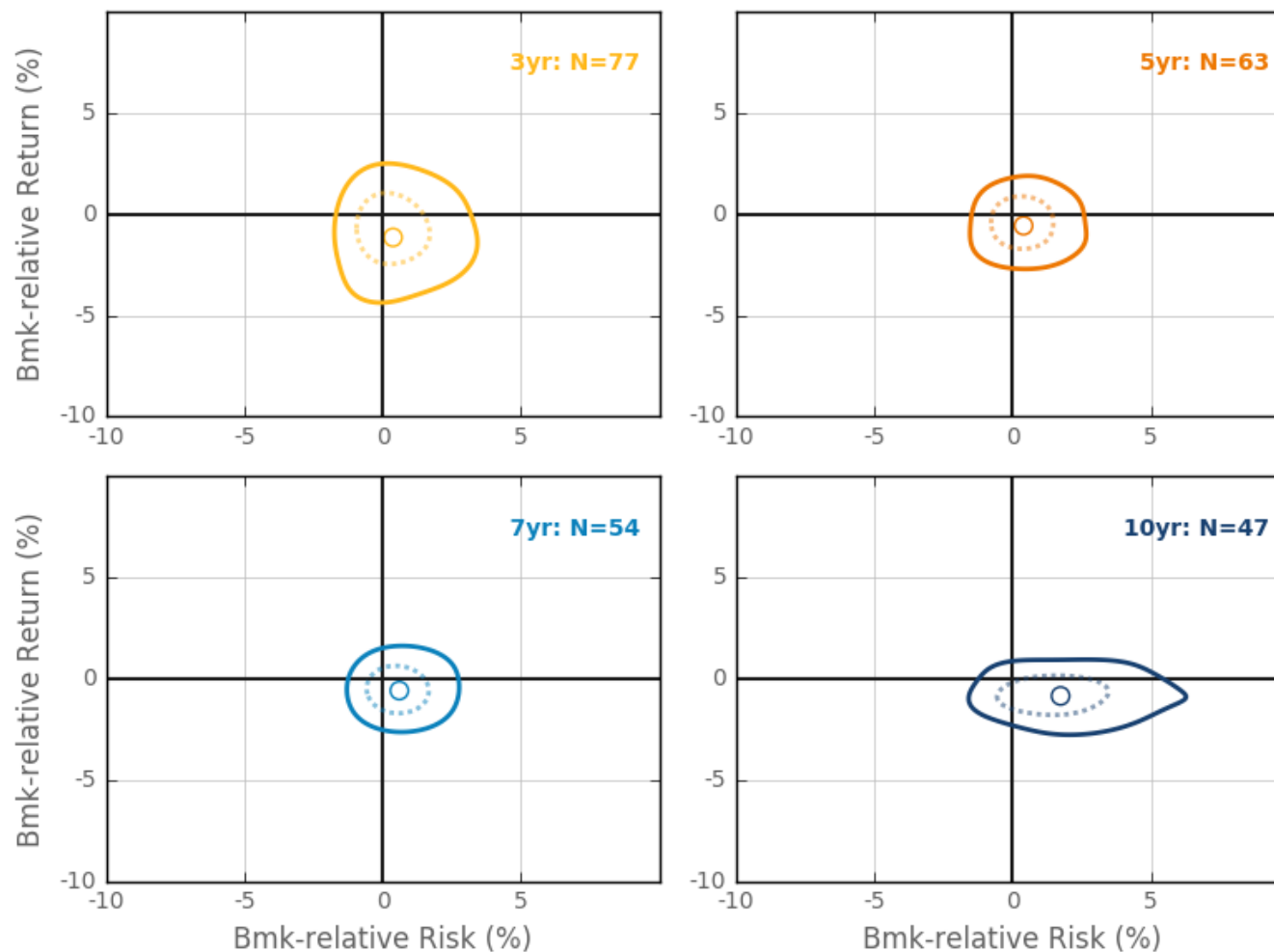
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – Global credit



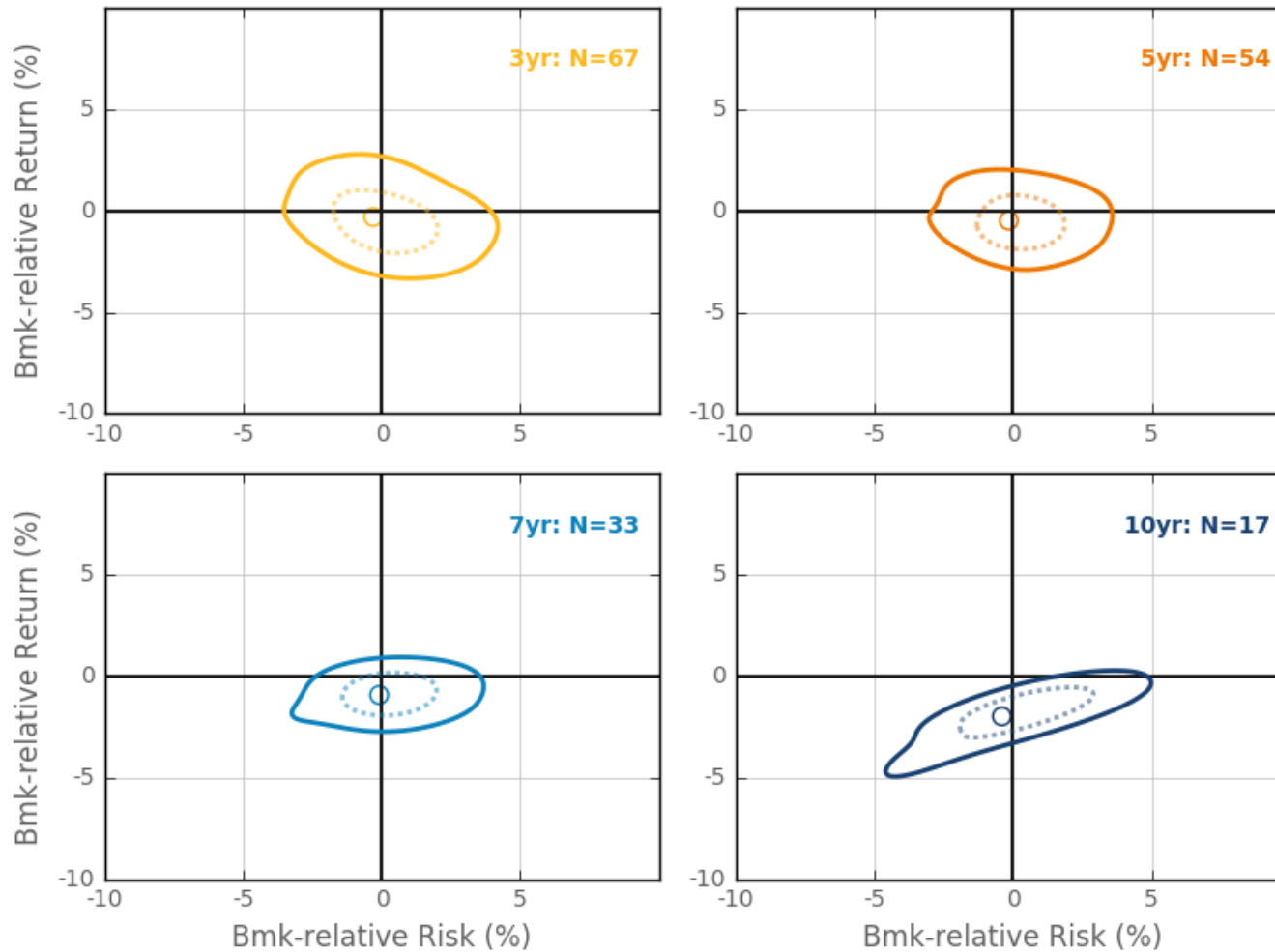
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – Emerging market debt (hard)



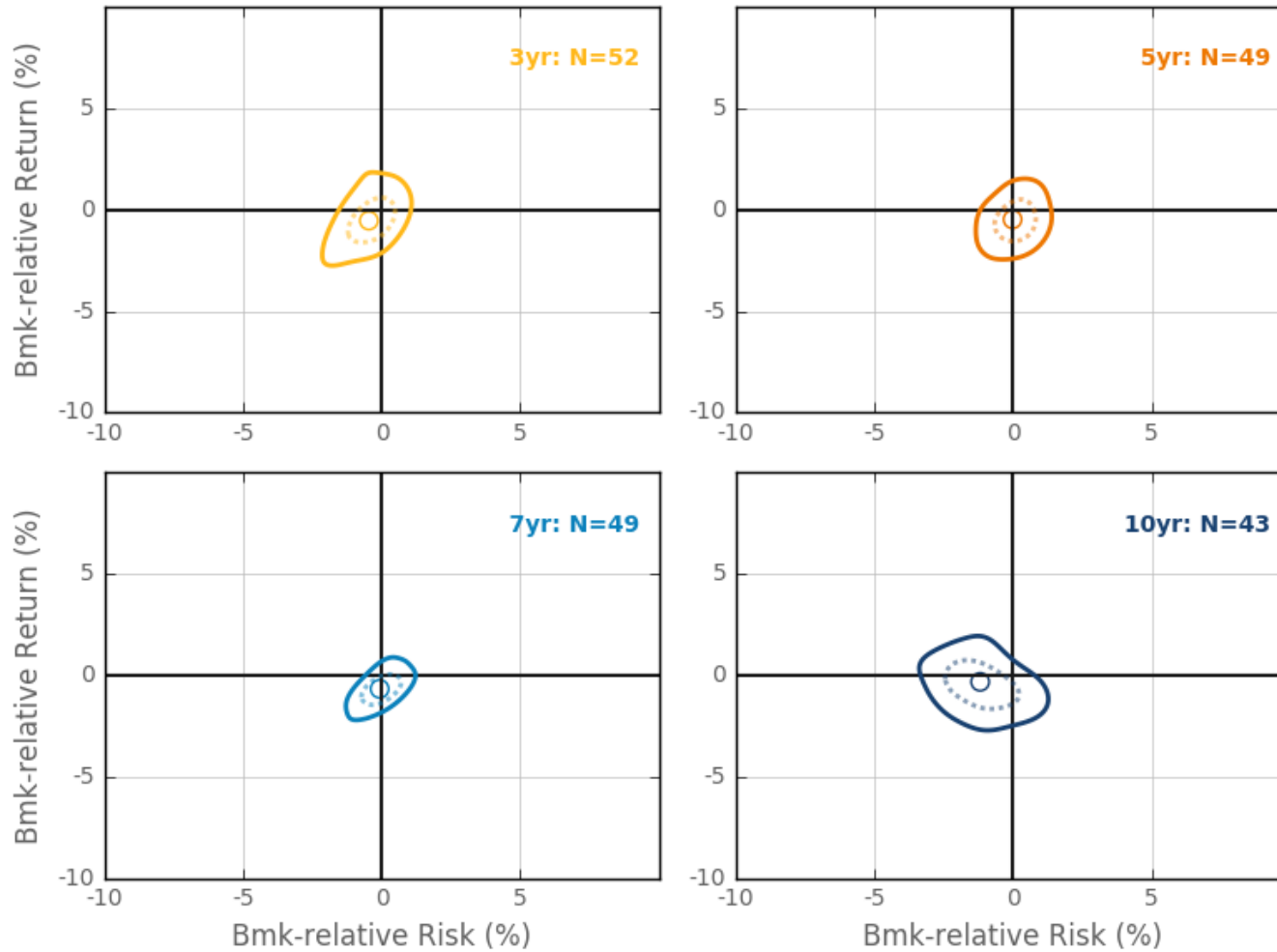
Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Fixed income – Emerging market debt (local)



Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

U.S. REITs



Source: eVestment, Verus, as of 9/30/16, center circle indicates median manager

Appendix 2:

The new approach

The active/passive question

The decision of active or passive management is faced by every investor. This problem is characterized by:

- A desire to boil the question down to a simple yes/no decision
- A desire to quantify where possible
- Lots of data to analyze and limited computing power to use
- Difficulties in determining whether manager outperformance was skill or luck
- Identifying the “best” manager is easy, when looking back through time

Traditional approach to managers

The traditional approach to analyzing active management often involves the following:

- Rank the managers on a single metric (return, for example)
- Pick the manager in the middle of the rank (the median manager)
- Use the properties of that manager to describe the universe

Traditional approach to managers

Median manager excess return minus expected fees is an oversimplified approach to analyzing managers.

| Asset Class | Commingled Fund Fee | Mutual Fund Fee | Median Manager Excess Return | Median Excess Returns NET of Commingled Fund Fees | Median Excess Returns NET of Mutual Fund Fees |
|-------------------------------|---------------------|-----------------|------------------------------|---|---|
| US Large | 0.61 | 0.81 | 0.37 | (0.24) | (0.44) |
| US Small | 0.86 | 1.03 | 1.29 | 0.43 | 0.26 |
| International Developed | 0.73 | 0.93 | 1.26 | 0.53 | 0.33 |
| International Developed Small | 0.94 | 1.03 | 1.03 | 0.08 | 0.00 |
| Emerging Markets | 0.91 | 1.11 | 1.28 | 0.37 | 0.17 |
| Cash | 0.14 | 0.23 | 0.39 | 0.25 | 0.15 |
| TIPS | 0.23 | 0.48 | 0.10 | (0.13) | (0.39) |
| US Treasury | 0.31 | 0.50 | (1.58) | (1.89) | (2.08) |
| Global Sovereign | 0.54 | 0.59 | 0.72 | 0.18 | 0.13 |
| Core Fixed Income | 0.31 | 0.50 | 0.53 | 0.21 | 0.03 |
| IG Corp Credit | 0.26 | 0.59 | 0.73 | 0.47 | 0.14 |
| High Yield | 0.62 | 0.71 | (0.13) | (0.75) | (0.84) |
| Global Credit | 0.48 | 0.59 | 0.31 | (0.17) | (0.28) |
| EM Debt Hard | 0.64 | 0.73 | 0.47 | (0.17) | (0.26) |
| EM Debt Local | 0.73 | 0.81 | 0.08 | (0.65) | (0.73) |
| US REIT | 0.67 | 0.91 | 1.27 | 0.60 | 0.36 |

Source: eVestment, 10 years ending 9/30/16

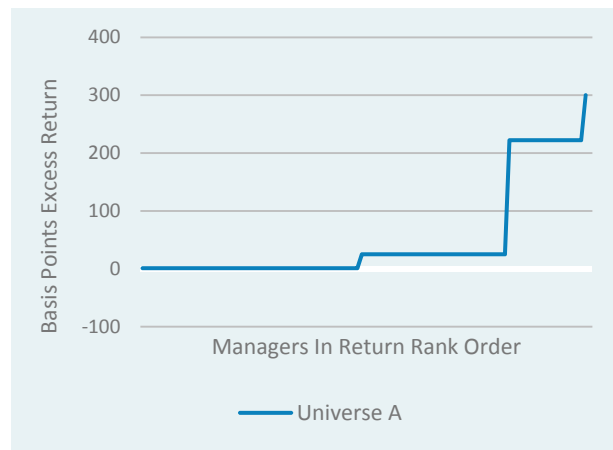
The problem with medians

Using the median manager to describe the universe can be very misleading. To show why we can create three imaginary universes.

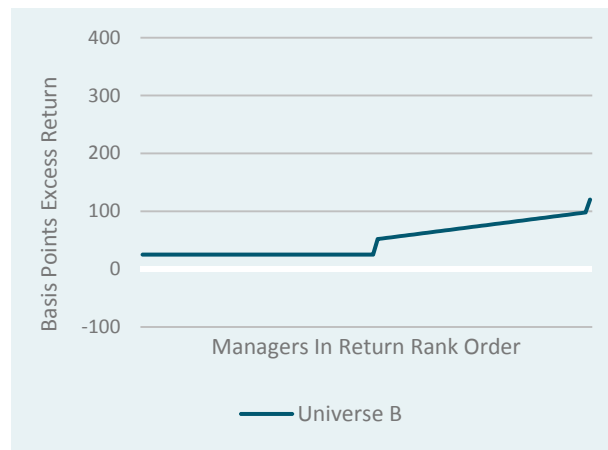
- Each universe has 100 managers
- Each universe has an average excess return of 50 basis points
- Each universe has a median excess return of 25 basis points

Simply using the median manager as a description of the universes would be highly misleading – the median manager in each case would be the same even though the behavior within each of these universes is very different.

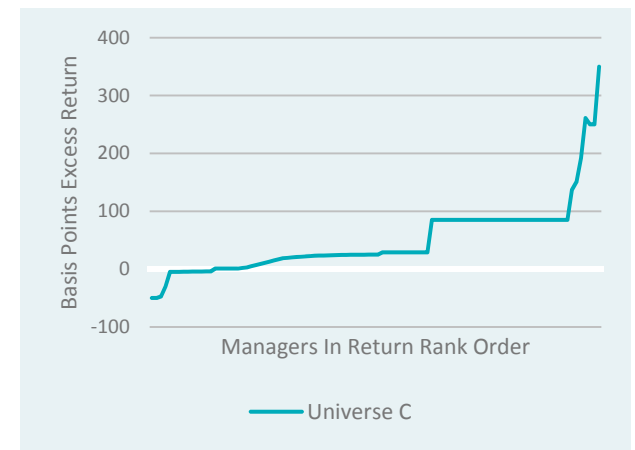
UNIVERSE A



UNIVERSE B



UNIVERSE C



Representative Data Only

Also, investors have different needs

The standard approach effectively assumes all investors behave in the same way towards risk and return. This assumption is flawed.

In reality, investors have different...

- Levels of funding
- Propensity of sponsor to add funds where needed
- Areas of legal authority
- Investment histories
- Board member experience
- Theoretical and practical opinions about investment management

These wide range of differences will by definition mean that investors should approach active management analysis in different ways.

Alternative approach to managers

The alternative approach to thinking about managers:

- Use the risk and return characteristics of all of the managers in the universe to calculate properties of the universe as a whole
- Plot the output of this analysis to demonstrate the behavior of the universe over time visually

Our goal is, where possible, to move away from using the median manager to describe active management behavior.

The active management environment

Our work on the active management environment addresses some of the shortfalls of traditional active management analysis. These new insights allow for us to better understand the range of impacts that active management can have on portfolio outcomes.

- Even without skilled manager selection there are many cases where active management can help investors achieve better portfolio outcomes in risk and return terms.
- Those better portfolio outcomes may come from additional return or lower risk. Not all investors have the same definition of better outcomes, and the trade-offs facing them vary by universe.
- Adding skilled manager selection to the process can add additional value in portfolio construction.
- Fees remain an important part of the active management conversation. Fees and survivor bias should be taken into account when analyzing active management universes.

Using the median manager to decide whether active management is appropriate can be misleading. This new tool can help investors make more informed decisions.

How to read a universe chart

The line represents the area where we would expect to find 75% of all of the managers in the universe for the time period covered.

All universe data has been adjusted downwards to reflect the effect of fees and of survivorship bias.



The dot represents the behavior of the benchmark over the period concerned.

The relative positioning of the benchmark compared to the universe area tells us about the possible benefits of active management.

The shape of the probability density function will not be oval in most cases. The size and shape of the area calculated contains important information about the behavior of active managers and the outcomes achieved.

Some possible scenarios

Active managers were able to add volatility, but rarely were able to generate compensation for that volatility.



Active managers who reduced volatility had to give up significant return to do so.

Active managers were rarely able to produce much more return than the benchmark in absolute terms.



Volatility reduction by active managers resulted in little or no return reduction.

Active managers had opportunities to add return, both at similar levels of volatility to the benchmark and incrementally at higher volatility levels.



Few managers took advantage of the opportunities available to reduce volatility relative to the benchmark.

Active managers had significant ability to add return relative to the benchmark at similar and lower levels of volatility.

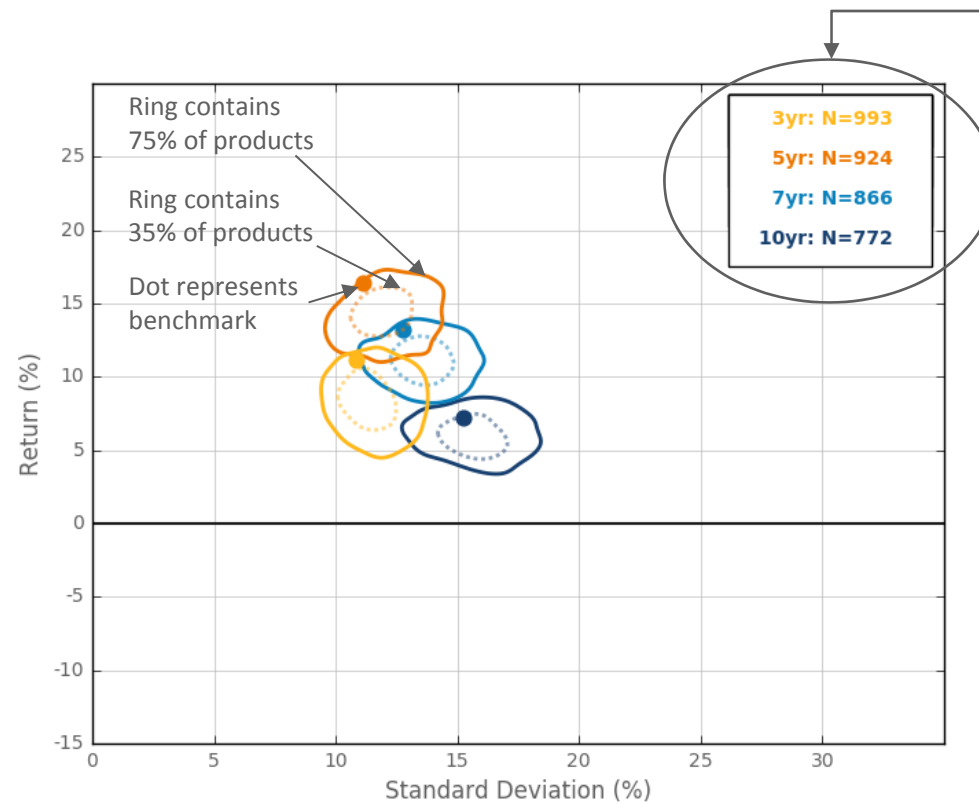


Most of the active manager universe chose to reduce volatility relative to the benchmark.

Tracking universes through time

Tracking the behavior of a single universe through time can provide insight into the way that active management has changed in that space over those time periods.

The movement of the universe, the change in shape and of size all provide information about product behavior.



The number of products included in the analysis provides insight into the robustness of the analysis.

The relative position of the benchmark relative to the universe may also change through time, representing dynamic structure changes through time.

Throughout this report each asset class universe chart is placed at the same position on the page, at the same size and with the scales of the axes identical. This allows for easy comparison between universes.

Appendix 3:

Supporting documents

Possible investor behaviors

Investors with high risk tolerance and a need for high return might consider significant volatility increase.



Other investors would be more likely to be best served by passive approaches.

Investors prepared to run some downside risk might consider active products offering modest risk reduction although passive management a good alternative.



Other investors might well choose passive approaches to this universe.

Investors with high risk tolerance might consider active products with markedly higher risk investment styles.



Investors who would normally invest passively might think about active products with volatility levels similar to the benchmark.

Investors with at or above market levels of risk tolerance might select active products with those strategies in the expectation of higher return.



Other investors might hire active lower volatility products. Passive management is unlikely to be appropriate.

Methodological note

As a means of describing the distribution of products in risk-return space, we estimate joint probability distribution functions (PDF) using product reported performance. The joint PDF is a mathematical description of the probability of observing a given outcome within some region of risk-return space, such that the integral of the function over all possible outcomes is one.

To estimate the PDF, we assume the reported product performance numbers represent an independent, random sampling of outcomes from the opportunity set within the asset class considered. While this is not perfectly true, as commonalities in strategy and imitation will lead to clustering, it is a reasonable approximation. We apply multivariate kernel density estimation, which effectively smooths the point-wise sampling of outcomes. We choose the Gaussian kernel density estimator implemented in Python within the SciPy library¹, where the bandwidth (a parameter governing the smoothing) is estimated by Scott's Rule². This approach is non-parametric and makes no specific assumption about the underlying probability distribution (as opposed to fitting e.g. a multivariate normal distribution).

Probability contours are defined as curves enclosing the designated percentage of most likely outcomes (e.g. the 75% probability contour encloses the outcomes most likely to be observed 75% of the time). We determine these using Monte Carlo integration by resampling the kernel density estimate and iteratively converging the result using the Newton-Raphson method.

1) <http://www.scipy.org/>

2) D.W. Scott, "Multivariate Density Estimation: Theory, Practice, and Visualization", John Wiley & Sons, New York, Chicester, 1992.

Product behavior as sampling

THE TRADITIONAL APPROACH

The concentration on the median product behavior has historically forced us to throw useful information about universes away. More than that, it has forced us to focus too hard on the specific results that specific products achieved over the particular time period we are measuring.

Doing this forces us to discard almost all the information about all of the products other than those at the median and quartile breaks, and to concentrate in detail on the characteristics of those specific products which happen to fall on those break lines. Those products, however, may provide little useful insight for us to help guide the decision process about use of active management.

This combination of too little information being used about most products in a universe and too much being used about a very small number of products selected simply because of their rank order in the universe is likely to lead to misunderstandings about the nature of active management.

THE UNIVERSE AS A WHOLE

The alternative approach that we propose in this document, and which will be covered more fully in an upcoming paper, takes a different approach, and uses a tool which is broadly used in the scientific community – the joint probability density function. Details of the calculation methodology used can be found on page 31 of this document.

What we are trying to do is to produce a description of the universe as a whole: we regard individual products as having no particular value on their own, but simply as random samples from the true universe. No particular portfolio is important in itself, but each portfolio adds a small amount of information about the likely true characteristics of the universe that they represent. Each portfolio is simply a random draw from an infinite universe of active products in that asset class.

A GRAPHICAL ANALYSIS

We use this information to plot an area representing the characteristics of the universe on a standard risk-return chart. This area represents the true characteristics of the active management universe – not simply the behavior of one product in that universe. It uses information about all of the products in the universe and avoids concentrating on any single portfolio. It allows us for the first time to describe product universes in their own terms, clearly, visually and in a robust fashion.

Maybe the most important characteristic of these ranges is that it provides us with a much clearer view of the investment opportunity set available to investors as a whole. That opportunity set is not a single point on the chart, as represented by a benchmark or a median: it is in fact an area, and for many universes quite an extensive one.

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