





PERIOD ENDING: DECEMBER 31, 2019

Investment Performance Review for

Imperial County Employees' Retirement System

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SEATTLE 206-622-3700 LOS ANGELES 300-297-1777 SAN FRANCISCO 415-362-3484

Investment Landscape

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Review



Recent Verus research

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Annual outlooks

CAPITAL MARKET ASSUMPTIONS

Some important developments occurred in the last year. During our 2020 Capital Market Assumptions webinar, we discussed:

- Market movements of 2019 and how these shifts have affected our long-term outlook
- The impact of falling interest rates on fixed income expectations
- Why it is important to differentiate between shorter-term and longer-term forecasting exercises

Topics of interests

WHY BENCHMARKS MATTER

In this Topics of Interest paper, we seek to outline the importance of benchmark selection within the investment process. The white paper addresses the following points:

- Benchmarks which appear similar can behave very differently, even over long periods of time
- Unconsidered benchmark selection can introduce uncompensated tracking error
- Tools available to investors to assist in determining appropriate benchmark indexes

RISK IN MANAGER SELECTION

In our latest Topics of Interest paper, we provide a framework for assessing the candidacy of a manager for portfolio inclusion and consider the implications of one manager versus alternatives. It addresses the following questions:

- Does the manager add a desired exposure?
- Does the manager exhibit skill?
- What does the manager add to the broader portfolio relative to other candidates?

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4th quarter summary

THE ECONOMIC CLIMATE

- Real GDP grew at a 2.1% rate year-over-year in the third quarter (2.1% quarterly annualized rate). Falling imports and weak fixed investment (-0.2% contribution) acted as a drag on growth, while personal consumption continued to as the greatest driver of growth. p. 7
- U.S. and Chinese negotiators signed the "phase one" trade agreement, and Boris Johnson's Conservative Party in the U.K. won a decisive victory. These events appear to have removed some uncertainty from the geopolitical landscape over the short- to intermediate-term. p. 15

PORTFOLIO IMPACTS

- Global equity markets exhibited strong performance through Q4, and U.S. equity performance was in-line (MSCI ACWI +9.0%, S&P 500 +9.1%). Emerging markets were the top performing asset class (+11.8%). *p. 40*
- U.S. headline inflation increased 2.3% YoY in December, alongside the core inflation growth figure, and up from 1.7% in September. Although this was a notable jump in the inflation rate, investors appear more concerned about global deflationary forces, as indicated by the 10yr U.S. TIPS Breakeven Inflation Rate of 1.73%. Cyclical price pressures remain surprisingly absent from the current environment. p. 9

THE INVESTMENT CLIMATE

- In October, the Federal Open Market Committee cut interest rates by 0.25% to a new range of 1.50 1.75%.
 This marked the third consecutive rate cut by the committee. p. 18
- Global sovereign bond yields picked up modestly in Q4, on higher inflation and growth prospects. The dollar value of negative-yielding outstanding debt fell from nearly \$15 trillion to just above \$11 trillion. Central bankers appealed for fiscal action, citing the limited capacity of monetary policy to sustain further economic expansion. p. 18

ASSET ALLOCATION ISSUES

- Most risk assets provided sizable gains in Q4. Global equities delivered +9.0%, U.S. high yield increased +2.6%, and Emerging Market Local Debt rose +5.2%. Longer duration fixed income saw losses as interest rates rebounded. *p. 40*
- The U.S. dollar weakened -0.5% against both developed and emerging currencies in Q4, reversing moves of the prior quarter. Dollar volatility remains low relative to the big swings that occurred throughout 2014-2018. p. 35
- Although risk assets appear to have rocketed higher in 2019, which may create concerns over valuations, it is important to note that much of this performance was due to assets recovering from a sharp fall in late-2018. p. 25

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

What drove the market in Q4?

"U.S. trade deficit falls 7.6% in October to 16-month low on decline in Chinese imports"

U.S. FEDERAL TRADE DEFICIT (\$BILLIONS)

Jun	Jul	Aug	Sep	Oct	Nov
53.7	52.7	53.5	51.1	46.9	43.1

Article Source: MarketWatch, December 5th, 2019

"As markets climb higher, are stocks becoming overvalued?"

BLENDED FORWARD 12-MONTH P/E RATIO OF THE S&P 500 INDEX

Jul	Aug	Sep	Oct	Nov	Dec
17.0x	16.6x	16.9x	17.3x	17.8x	18.3x

Article Source: CNBC, December 30th, 2019

"Fed 'prepared to adjust' balance sheet to prevent repo market flare-up"

MONTHLY CHANGE IN THE SIZE OF THE FED BALANCE SHEET (\$BILLIONS)

Jul	Aug	Sep	Oct	Nov	Dec
-47.7	-19.2	97.8	162.1	33.1	112.7

Article Source: Yahoo Canada Finance, December 11th, 2019

"China's pork price jumps 110 per cent, sending consumer inflation rocketing to eight-year high"

CHINA CPI INFLATION (YoY % CHANGE)

Jul	Aug	Sep	Oct	Nov	Dec
2.8	2.8	3.0	3.8	4.5	4.5

Article Source: South China Morning Post, December 10th, 2019

U.S. MONTHLY TRADE DEFICIT (BILLIONS)



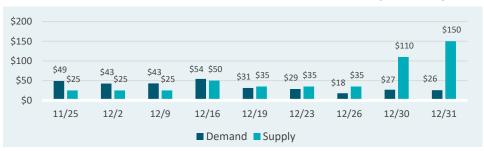
Source: Bloomberg, as of 11/30/19

FORWARD PRICE/EARNINGS RATIO (BLENDED 12-MONTH EARNINGS)



Source: Bloomberg, as of 12/31/19.

YEAR-END LIQUIDITY OFFERED UP BY THE NEW YORK FED (BILLIONS)



Source: New York Fed, as of 12/31/19.



Economic environment



U.S. economics summary

- Real GDP grew at a 2.1% rate year-over-year in the third quarter (2.0% quarterly annualized rate). Falling imports and weak fixed investment (-0.2% contribution) acted as a drag on growth, while personal consumption continued to be the greatest driver of growth.
- U.S. headline inflation came in at 2.3% YoY in December, in line with the core inflation growth figure.
 Despite more than 10 years of economic expansion, cyclical price pressures seem surprisingly absent from the current environment.
 Investors appear more concerned about global deflationary forces.
- The U.S. labor market showed further strength in the fourth quarter and unemployment remained at 50-year lows of 3.5%.
- Consumer sentiment indicators remain near all-time-highs and improved slightly over the quarter.
- American households are in a

- strong financial position, with balance sheets that appear increasingly robust. At the end of Q3, U.S. household debt outstanding was equal to about 74% of GDP, the healthiest level since Q4 2001.
- U.S. and Chinese negotiators signed the "phase one" agreement on trade, and Boris Johnson's Conservative Party won a decisive victory in the U.K. These developments may ease some of the economic uncertainty across the global economy, providing a tailwind to future growth.
- Existing home sales grew +2.7% YoY in November. New home sales, a far smaller portion of the overall market, grew at a stronger rate of +16.9% YoY, as construction activity further accelerated. Rising homebuilder activity in recent years may ease some of the low inventory pressures in the current market environment.

	Most Recent	12 Months Prior
GDP (YoY)	2.1% 9/30/19	3.1% 9/30/18
Inflation (CPI YoY, Core)	2.3% 12/31/19	2.2% 12/31/18
Expected Inflation (5yr-5yr forward)	1.8% 12/31/19	1.8% 12/31/18
Fed Funds Target Range	1.50 – 1.75% 12/31/19	2.25 – 2.50% 12/31/18
10 Year Rate	1.9% 12/31/19	2.7% 12/31/18
U-3 Unemployment	3.5% 12/31/19	3.9% 12/31/18
U-6 Unemployment	6.7% 12/31/19	7.6% 12/31/18



GDP growth

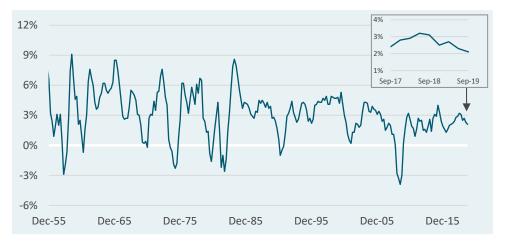
Real GDP grew at a 2.1% rate year-over-year in the third quarter (2.1% quarterly annualized rate). Falling imports detracted -0.3% from the overall GDP print, along with weak fixed investment (-0.2% contribution). Personal consumption, the largest component of gross domestic product, continued to drive the economy forward. The U.S. economy is pacing near the 2.0% rate that economists generally expect for full year 2020.

While trade policies and conflict likely resulted in a mild drag on economic growth in 2019, the U.S. and China have signed

the "phase one" trade deal. A partial trade resolution, or at least an indication that negotiations are headed in a more positive direction, could provide a lift to the economy and markets.

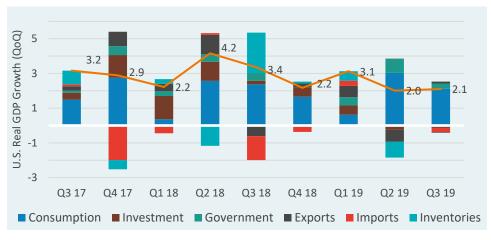
On January 17th, the Federal Reserve Bank of Atlanta GDPNow forecast indicated GDP growth of 1.8% in the fourth quarter. This forecast dipped recently due to weak personal consumption expenditures.

U.S. REAL GDP GROWTH (YOY)



Source: Bloomberg, as of 9/30/19

U.S. GDP GROWTH ATTRIBUTION



Source: BEA, annualized quarterly rate, as of 9/30/19



Inflation

U.S. headline inflation increased 2.3% YoY in December, in line with the core inflation growth figure, and up from 1.7% in September. Although this is a notable jump in the inflation rate, investors appear more concerned about global deflationary forces. Cyclical price pressures remain surprisingly absent from the current environment.

During the quarter, the market's pricing of inflation increased from a low of 1.48% to 1.73%. While the breakeven rate has risen materially from its cycle low of 1.18% achieved in February 2016, it remains depressed by historical standards.

Consumer expectations moved in the opposite direction, falling from 2.7% at the beginning of the year to 2.3% in December.

We believe it is likely that inflation will remain subdued. But it is also worth noting that if inflation or inflation fears returned to the markets, this might place central banks in a perilous position. It is doubtful that central banks could hike interest rates for any sustained period of time without risking recession.

U.S. CPI (YOY)



U.S. BREAKEVEN INFLATION RATE



INFLATION EXPECTATIONS



Source: FRED, as of 12/31/19

Source: Bloomberg, as of 12/31/19



Source: Bloomberg, as of 12/31/19

Labor market

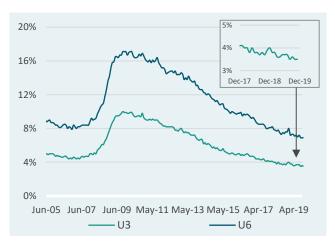
The U.S. labor market continued to show strength in Q4 and unemployment remained at 50-year lows of 3.5%. Year-over-year growth in non-farm payroll additions slowed to its lowest level since September 2017 at 1.4%. Nearly 1.24 jobs are now available per unemployed worker in the labor force, which suggests there is a limited remaining supply of workers to meet business hiring demands.

Average hourly earnings for production and nonsupervisory employees grew 3.0% year-over-year in December, outpacing inflation (2.3%). Sustained real wage growth would support sentiment, which is near cycle highs.

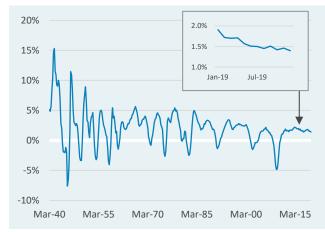
One plausible case for strong consumption to continue hinges on the fact that several key unemployment rates are near historic lows. The unemployment rate for workers who are at least 25 years old and lack high school diplomas (5.3%) is at an at all-time-low level since the data was first recorded in the year 2000. Typically, workers with less education earn less in nominal terms, but have a higher marginal propensity to consume per each dollar earned. These recent increases in employment for those workers who are more likely to spend may lead to outsized positive impacts on economic growth.

U.S. labor market remains strong, though further upside may be limited

U.S. UNEMPLOYMENT



NON-FARM PAYROLL GROWTH (YOY)



U.S. WAGE GROWTH



Source: BLS, as 12/31/19 Source: FRED, as of 11/30/19



Source: FRED, as of 12/31/19

U.S. unemployment



The U.S. job market is very strong, for all levels of education

Source: FRED, as of 11/30/19



The consumer

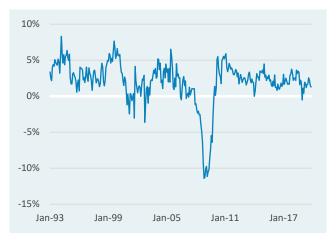
The U.S. consumer continued to push the U.S. economy forward, supported by low unemployment, solid wage gains, and high sentiment. American households are in a strong financial position, with balance sheets that appear robust. At the end of Q3, U.S. household debt outstanding was equal to about 74% of GDP, the healthiest level since Q4 2001.

Retail sales growth slid a bit in real terms, but much of this move was due to a pickup in inflation. The price of a barrel of WTI crude oil rose from \$53 to \$61, helping to propel year-over-year growth in headline inflation from 1.7% to 2.3%. Overall, retail sales growth remains solid, and has been boosted

recently by a surge in e-commerce sales. Cyber Monday sales grew nearly 20% this year, hitting a record \$9.4 billion U.S. dollars according to data from Adobe Analytics. Shoppers' carts were also about 6% larger at checkout than they were last year, perhaps hinting at a more optimistic consumer outlook.

Credit conditions remain benign. Credit-card borrowing ticked down slightly and was offset by faster growth in auto and student loans. Some might consider credit-card debt "worse debt" and auto and student loan debt "better debt" in that prudent investments in transportation and human capital are likely higher-returning than ultra-short-term consumption.

REAL RETAIL SALES GROWTH (YOY)



E-COMMERCE SALES GROWTH (QUARTERLY YOY)



Source: U.S. Census Bureau, Bloomberg, as of 9/30/19

12-MONTH GROWTH IN CONSUMER CREDIT



Source: Federal Reserve, Bloomberg, as of 11/30/19



Source: FRED, as of 11/30/19

Sentiment

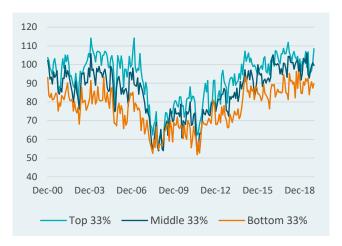
Consumer sentiment indicators remain near all-time-highs and improved slightly as a number of closely-followed geopolitical storylines appeared to move closer to resolution. The U.S. and China "phase one" trade deal, and the victory of Boris Johnson's Conservative Party in the U.K. appears to have at least removed some uncertainty from the geopolitical landscape over the short- to intermediate-term.

Over the quarter, the difference between the sentiment reading for the top third of income earners and the bottom

third of income earners moved from the 10th percentile to the 65th percentile of monthly periods since 2001, indicating a widening in the gap between the "haves" and "have-nots".

Consumers view the economic conditions for buying bigticket household items such as furniture, refrigerators and televisions as close to as favorable as they have been over the course of the expansion. This belief appears to be rooted in dual expectations for job security and real wage gains.

CONSUMER SENTIMENT BY INCOME BRACKET



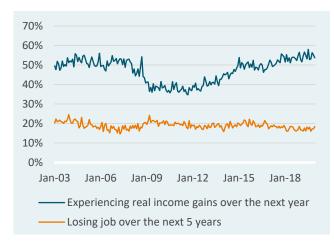
Source: University of Michigan, as of 12/31/19

CONDITIONS FOR BUYING BIG-TICKET ITEMS (%)



Source: University of Michigan, as of 12/31/19

CONSUMER FEAR GAUGE



Source: University of Michigan, as of 12/31/19



Housing

In the first half of 2019 the housing market appeared to be cooling off, coming down from a strong boom throughout the recent economic expansion. The average home sales price is down -8% from the highs of late-2017, although other variables such as the types and location of homes sold can impact these numbers. Homebuilding activity ticked up in the second half of the year as homebuilder sentiment jolted higher in 2019.

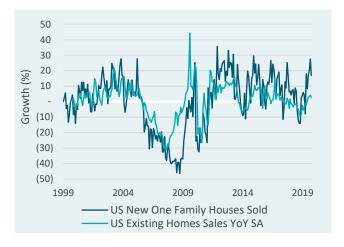
Existing home sales grew +2.7% YoY in November. New home sales, a far smaller portion of the overall market, grew at a stronger rate of +16.9% YoY, as construction activity further accelerated. Rising homebuilder activity in recent years may

ease some of the low inventory pressures in the current market environment.

The housing boom has contributed to a rebound in the U.S. homeownership rate. A decade-long trend away from buying and towards renting appears to have reversed in mid-2016. Since that time, the rate of homeownership has risen to 64.7% from a low of 63.1%.

It is always helpful to remember that home price trends can vary meaningfully by location, which means national statistics are sometimes difficult to interpret at a local level.

U.S. HOME SALES (YOY)



Source: FRED, as of 11/30/19

HOUSING STARTS & PERMITS



Source: Bloomberg, NAHB, as of 11/30/19 (see appendix)

HOMEOWNERSHIP RATE



Source: FRED, as of 9/30/19



International economics summary

- The growth of international developed economies remains in a range of 0.5% to 2.0%, near the 2.1% growth rate of the slowing U.S. economy.
- In January, the IMF forecasted 2.9% global growth in 2019 and an acceleration to 3.3% in 2020. These growth expectations were 0.1% lower than the previous quarter's report, and were mostly a result of downward adjustments to emerging markets expectations.
- Inflation continues to be muted across international developed markets, keeping more options on the table for central banks to step in as needed with accommodative policy.
- The U.K. general election in December resulted in a landslide victory for Boris Johnson. The election, through a consolidation of Tory party power, effectively guarantees that Brexit will ultimately be carried out.

- While the global economy has exhibited mild growth, labor markets continue to tighten across the board. By traditional unemployment measures, job markets are now stronger than pre-2008 levels in most major economies.
- U.S. and Chinese negotiators signed the "phase one" agreement on trade, and the decisive victory of Boris Johnson's Conservative Party in the U.K. appears to have at least removed some uncertainty from the geopolitical landscape over the short- to intermediate-term.
- China has experienced a significant jump in inflation to 4.5% as an outbreak of African swine fever resulted in a doubling of pork prices. This compares to a 5-year average inflation rate of 1.9%. An acceleration of inflation may create issues for Chinese leadership in an already-slowing economy.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	2.1% 9/30/19	2.3% 12/31/19	3.5% 12/31/19
Eurozone	1.2% 9/30/19	1.3% 12/31/19	7.5% 11/30/19
Japan	1.7% 9/30/19	0.9% 12/31/19	2.2% 11/30/19
BRICS Nations	4.9% 9/30/19	4.4% 12/31/19	5.1% 9/30/19
Brazil	1.2% 9/30/19	4.3% 12/31/19	11.2% <i>11/30/19</i>
Russia	1.7% 9/30/19	3.1% 12/31/19	4.6 % 11/30/19
India	4.5% 9/30/19	7.4% 12/31/19	8.5% 12/31/17
China	6.0% 9/30/19	4.5% 12/31/19	3.6% 9/30/19



International economics

The United States grew at a pace of 2.1% year-over-year in the third quarter, moving more closely in line with other developed nations which have posted growth of 1.0%-2.0%.

While the global economy has exhibited mild growth, labor markets continue to tighten across the board. By traditional unemployment measures, job markets are now stronger than pre-2008 levels in most major economies.

Inflation has remained subdued across international developed markets, and many pundits have viewed the mild inflation data as a cue for central banks to step in and

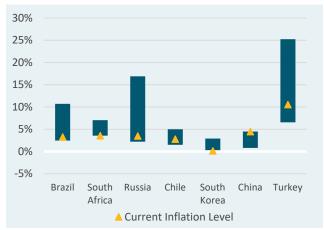
attempt to bolster economic growth through more accommodative policy. Inflation remains muted in emerging economies, and most economies are experiencing CPI below the 5-year average.

China's inflation rate has become an outlier, jumping to 4.5% as an outbreak of African swine fever resulted in a doubling of pork prices in the country during the year. This compares to a 5-year average inflation rate of 1.9%. Prices of other meats in China have also increased on heightened demand for pork substitutes. An acceleration of inflation may create issues for Chinese leadership in an already-slowing economy.

REAL GDP GROWTH (YOY)

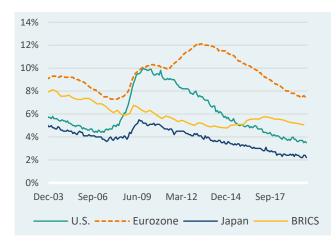


INFLATION (CPI YOY)



Source: Bloomberg, inflation range of past 5 years, as of 11/30/19

UNEMPLOYMENT RATE



Source: Bloomberg, as of 11/30/19 or most recent release



Source: Bloomberg, as of 9/30/19

Fixed income rates & credit



Interest rate environment

- The global sovereign bond rally lost steam in Q4 as inflation and growth prospects mildly reflated. Central bankers at the European Central Bank and the Federal Reserve signaled that policy would likely remain on hold in the absence of significant economic developments.
- Global ten-year sovereign bond yields picked up moderately, most significantly in Europe. Over the quarter, the U.S.-dollar value of global outstanding negative-yielding debt fell from nearly \$15 trillion to just above \$11 trillion.
- In October, the Federal Open
 Market Committee cut the range for its benchmark interest rate by 0.25% to a new range of 1.50 to 1.75%.
- Diversity of opinion among FOMC participants about the path of interest rates has faded. Most members now expect rates to remain flat in 2020, and move back toward 2.50% over the longer term.

- The New York Fed conducted a series of term repurchase operations aimed at providing sufficient liquidity for firms to get through the year-end turn when demand for cash typically surges. The Fed balance sheet grew by \$300B in Q4, and analysts continue to debate whether the Fed's involvement in repo markets should be considered "technical" or "stimulative" in nature.
- The Governing Council of the ECB decided to leave key interest rates unchanged and confirmed that net asset purchases to the tune of €20 billion per month had begun in November.
- In Christine Lagarde's first major move as President, she announced the ECB's first Strategic Policy review since 2003, which will begin in January and will address a wide range of topics, including: low inflation, the price-stability goal, climate change, and cryptocurrency.

Area	Short Term (3M)	10-Year
United States	1.54%	1.92%
Germany	(0.78%)	(0.19%)
France	(0.65%)	0.12%
Spain	(0.61%)	0.47%
Italy	(0.34%)	1.41%
Greece	0.26%	1.47%
U.K.	0.69%	0.82%
Japan	(0.10%)	(0.01%)
Australia	0.94%	1.37%
China	2.43%	3.14%
Brazil	4.30%	6.79%
Russia	4.95%	6.36%

Source: Bloomberg, as of 12/31/19

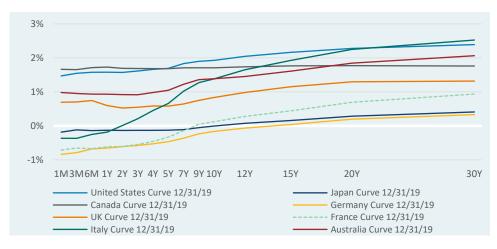


Yield environment

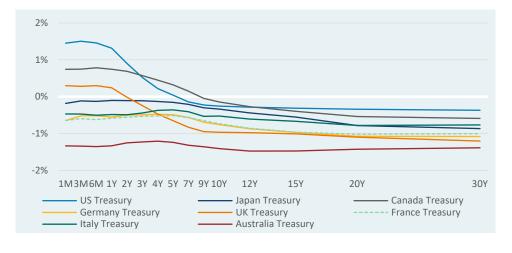
U.S. YIELD CURVE



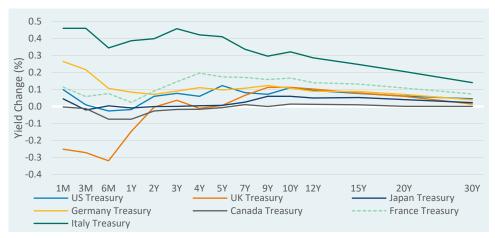
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/19



Credit environment

Credit enjoyed a positive 2019 driven by tightening spreads. Both investment grade and below-investment grade assets remained somewhat stable over the period. In high yield, CCCs and energy-related bonds were the best performers during Q4. High yield spreads tightened meaningfully over the year and the quarter (190 bps and 37 bps, respectively). Investment grade bonds also enjoyed positive performance fueled by this year's rate rally, attractive profit margins, and continued demand from investors for higher quality credit.

In the fourth quarter, high yield bonds have returned +3.4%, materially outperforming bank loans (+1.7%) and investment grade credit (+1.1%). In 2019, high yield bonds have returned +14.4%, materially outperforming bank loans (+8.6%) and slightly

outperforming investment grade credit (+13.8%). Bank loans have experienced outflows for much of the year driven by lessening demand for the asset class.

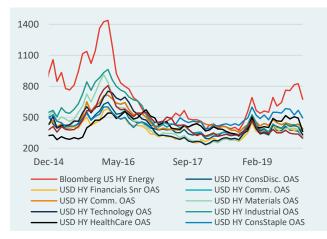
Based on concerns over late-cycle behavior in credit markets, we do not believe investors are being adequately compensated for credit risk. Late-cycle volatility tends to coincide with widening credit spreads and higher propensity for default activity. An underweight to U.S. investment grade, high yield credit, and bank loans may be warranted, with an overweight to emerging market debt which appears to offer more attractive value. This positioning should result in an overall neutral credit risk stance. Within U.S. markets, higher quality and more liquid assets appear most attractive.

SPREADS

15% 10% 5% Jun-01 Jun-05 Jun-09 Jun-13 Jun-17 Barclays Long US Corp. Barclays US Agg. Barclays US HY IG Energy Barclays US HY Bloomberg US HY Energy

Source: Barclays, Bloomberg, as of 12/31/19

HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/19

	Credit Spread (OAS)		
Market	12/31/19	12/31/18	
Long U.S. Corp	1.4%	2.0%	
U.S. Inv Grade Corp	0.9%	1.5%	
U.S. High Yield	3.4%	5.3%	
U.S. Bank Loans*	4.4%	5.1%	

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/19



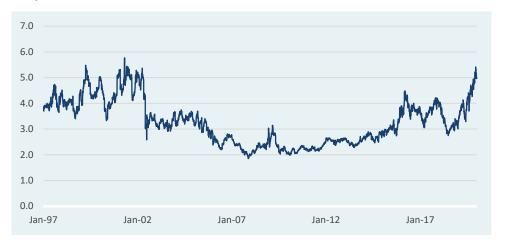
^{*}Discount margin (4-year life)

High yield – what's in it?

The high yield market rallied in 2019 to provide double digit positive returns for only the fourth time since the 2008-2009 global financial crisis. However, the market was characterized by significant divergences as investors rotated into upper-tier credits relative to lower-tier credits due to volatility and geopolitical uncertainty picking up during the year. This was evidenced by the ratio of CCC/BB credit spread levels, which climbed to levels last seen two decades ago. Investors generally see CCC credits as a proxy for less liquid and/or more complex situations and risks, especially relative to the BB segment.

The distressed market was negatively impacted by investor distaste for less liquid risk during the year. This was particularly true in the energy sector, and in certain retail and healthcare industries. Selling pressures peaked in November as the riskiest segment of the high yield market suffered losses in excess of those experienced during the 2018 year-end drawdown. Market participants pulled money from the space, which resulted in significant redemptions amongst distressed-focused hedge funds and even closures of hedge funds that had previously successfully navigated the global financial crisis.

CCC/BB SPREAD RATIO



HIGH YIELD VS. HIGH YIELD DISTRESSED (INDEXED 12/31/2018=100)



Source: Standard & Poor's, J.P. Morgan, Wall Street Journal, as of 12/31/19



Default & issuance

Default activity for 2019 was slightly higher than 2018 by roughly 0.8%. This was mainly due to elevated defaults in commodity-related industries such as energy and metals/mining. The par-weighted default rate for high yield ended the year at 2.6% and remained below its long-term average range of 3.0-3.5%.

For loans, the par-weighted default rate for 2019 was 1.6% and remained below the long-term average of 3.1%, according to data from J.P. Morgan. Notably, defaults in commodity-related sectors accounted for essentially half of the year's default/distressed activity.

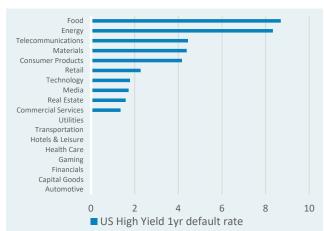
Gross high yield issue activity for 2019 was \$287 billion which was up 52% from a year ago. Loan market issuance is significantly behind last year's pace, likely influenced by lower demand for floating rate securities now that the Federal Reserve has paused monetary tightening. Gross loan issuance is essentially down 44% from a year ago although there was an increase in issuance at the end of December.

HY DEFAULT RATE (ROLLING 1-YEAR)



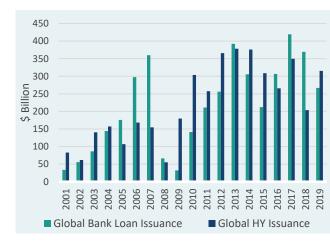
Source: BofA Merrill Lynch, as of 12/31/19

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



Source: BofA Merrill Lynch, as of 12/31/19 – par weighted

GLOBAL ISSUANCE (\$ BILLIONS)



Source: Bloomberg, BofA Merrill Lynch, as of 12/31/19



Equity



Equity environment

- Global equity markets exhibited strong performance through Q4, and U.S. equity performance was in-line (MSCI ACWI +9.0%, S&P 500 +9.1%). Emerging markets were the top performing asset class (+11.8%).
- Global currency volatility has been muted over the last few years, which has made ignoring currency exposure less consequential.
 Expecting low currency volatility to persist may be an assumption that gets investors into trouble.
- Unhedged U.S. investors in U.K. equities outperformed their hedged peers by 7.8% in Q4, as a stronger pound sterling dominated the U.K. equity return narrative.
- Based on price-to-forward earnings ratios international equity valuations appear elevated, but unlike in the U.S., they do not yet appear stretched.

- The outlook for monetary policy remains supportive of global equity price movement in 2020. Of the five major global central banks (Federal Reserve, European Central Bank, Bank of England, Bank of Japan, People's Bank of China), four out of five are providing accommodation through their respective balance sheets. Futures imply better than 50/50 odds that the Bank of England cuts its main rate 0.25% at the end of January and China has continued to cut its benchmark lending rate.
- Inflation remains muted in emerging economies, and most economies are experiencing CPI below the 5-year average. Central bank policy has remained accommodative in many major countries within the universe such as China, South Korea, Brazil, and South Africa. This accommodation could provide a boost for equity market pricing as we move further into 2020.

	QTD TOTAL RETURN		1 YEAR TOT	AL RETURN
	(unhedged)	(hedged)	(unhedged)	(hedged)
US Large Cap (S&P 500)	9.1	1%	31.5%	
US Small Cap (Russell 2000)	9.9	9%	25.	5%
US Large Value (Russell 1000 Value)	7.4%		26.	5%
US Large Growth (Russell 1000 Growth)	10.6%		36.4%	
International Large (MSCI EAFE)	8.2%	5.8%	22.0%	24.6%
Eurozone (Euro Stoxx 50)	8.3%	5.9%	25.9%	32.1%
U.K. (FTSE 100)	10.8%	3.0%	22.1%	19.5%
Japan (NIKKEI 225)	8.2%	9.6%	21.9%	23.5%
Emerging Markets (MSCI Emerging Markets)	11.8%	9.5%	18.4%	17.7%

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/19

A different look at 2019 performance



Most of the high returns of 2019 were due to markets recovering from the 2018 drop

Adjusting for this effect shows us that 2019 was a fairly average year

Source: Standard & Poor's, MSCI, Verus, as of 12/31/19 – "Drawdown" defined as the total market fall in 2018, "Rebound" defined as the total % return from the low point of the fall to the end of 2019. "Net Change" defined as the % market return from the 2018 high point to the end of 2019.



Domestic equity

U.S. equities outpaced international in the third quarter (S&P 500 + 9.1%, MSCI EAFE +8.2%) as domestic markets continued to lead.

Falling interest rates in 2019 have supported stock prices, as fixed income becomes less attractive on a relative basis, and cheaper borrowing should bolster future corporate earnings. As the dividend yield of U.S. stocks is once again higher than U.S. Treasury yields, investors may feel pressure to maintain greater exposure to equities in order to meet return objectives.

The S&P 500 delivered a 31.5% total return in calendar year

2019, while underlying corporate profits are expected to be flat at +0.3%. This of course means that performance has been driven by higher stock multiples rather than fundamentals. It is worth noting that a significant portion of 2019 performance was a recovery from the late-2018 sell-off of nearly -20%.

U.S. markets may continue to outperform over the shorterterm due to relative economic and market strength, and prices may certainly rise further. But history suggests that a widening gap between U.S. and international stock valuations will constrain U.S. performance over the longer-term.



EARNINGS



RELATIVE YIELDS



Source: FactSet, as of 12/20/19

Source: Standard & Poor's, as of 11/30/19



Source: Standard & Poor's, as of 12/31/19

Domestic equity size & style

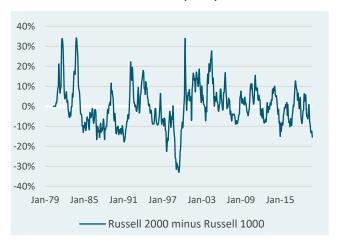
Value stocks lagged growth stocks during the fourth quarter (Russell 1000 Growth +10.6%, Russell 1000 Value +7.4%) while small cap stocks outperformed large stocks (Russell 2000 +9.9%, Russell 1000 +9.0%). During calendar year 2019, both size and value factors significantly underperformed (Russell 1000 +31.4%, Russell 2000 +25.5%; Russell 3000 Growth +35.8%, Russell 3000 Value +26.2%).

The impact of sector performance on the value premium was significant, once again, in 2019. Information Technology delivered very high returns (+50.3%) – a sector which tends to contains more growth stocks. Energy (+11.8%) and Materials (+24.6%) – industries which traditionally contain more value stocks – lagged

the overall index (S&P 500 +31.5%).

In mid-2016 we argued that there were clear and economic reasons for long-term value factor underperformance, and that a tactical overweight to the value factor did not appear warranted. This view has continued to be correct, as those who bought into value anytime of the past three years would have underperformed. While value continues to be historically cheap, price itself is not a catalyst for outperformance. We remain watchful of value stocks, but do not yet see clear signs of opportunity. As always, attempting to time factors is extremely difficult. We believe this should be done only rarely, if at all, and only when market conditions are particularly compelling.

SMALL CAP VS LARGE CAP (YOY)



VALUE VS GROWTH (YOY)



Source: FTSE, as of 12/31/19

VALUE CONTINUES TO LOOK CHEAP



Source: Russell, Bloomberg, as of 12/31/19



Source: FTSE, as of 12/31/19

International developed equity

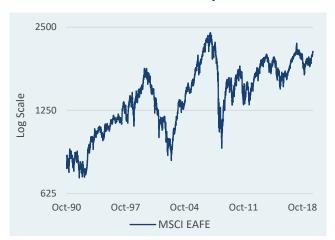
Equities in Europe and Japan posted strong performance for the quarter but failed to keep up with stocks in the U.S. and emerging markets. The U.S. dollar appreciated slightly against the yen, providing headwinds (-1.4%) for unhedged U.S. investors in Japanese stocks. Conversely, a slightly weaker U.S. dollar against the euro put some additional wind in the sails (+2.4%) of U.S. investors in European equities.

When investing in international equities, the "which currency should my assets be denominated?" question has been nearly equally as important as the "what assets should I hold?" question. Over the last three years however, global

currency volatility has been muted, which has made it much easier for investors to avoid thinking about their various currency exposures. Verus' view remains that currency risk is not compensated, and that it tends to result in increased risk without necessarily adding to return.

International equity valuations remain elevated, but unlike in the U.S., they do not yet appear stretched. Forward price-to-earnings ratios for the MSCI U.K. and Italy indices rank in the 59th and 52nd percentiles respectively, relative to the monthly expansion average. Valuations are a bit richer in the rest of the EAFE complex, but they may still have room to run.

INTERNATIONAL DEVELOPED EQUITIES



EFFECT OF CURRENCY (1-YEAR ROLLING)



Source: MSCI, as of 12/31/19

BLENDED FORWARD 12-MONTH P/E RATIOS



Source: MSCI, Bloomberg, as of 12/31/19



Source: MSCI, as of 12/31/19

Emerging market equity

Emerging market equities (+11.8%) outperformed both U.S. (+9.1%) and international developed equities (+8.2%) over the quarter, but still lagged over the full calendar year. In 2019, emerging market equities delivered a total return of 18.4%, and trailed the total return of international developed equities by 3.6%. Regionally, the Asian segment (+12.5%) of the emerging market complex performed better than the Latin American (+10.5%) segment in both Q4 and in 2019.

Emerging market equities saw multiple expansion in Q4: the forward P/E of the MSCI EM Index expanded from a level in

line with the 5-year average to a bit higher than average levels. We do not yet view pricing in this space as rich and see there being more room for multiple expansion.

Inflation remains muted in emerging economies, and most economies are experiencing CPI below the 5-year average. Central bank policy has remained accommodative in many major countries within the universe such as China, South Korea, Brazil, and South Africa. This accommodation could provide a boost for equity market pricing as we move further into 2020.

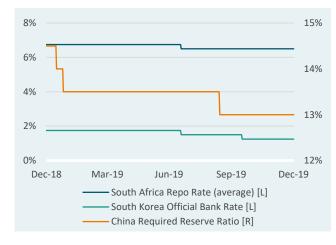
EMERGING MARKET EQUITY



FORWARD P/E



CENTRAL BANK ACCOMODATION



Source: MSCI, as of 12/31/19 Source: MSCI, as of 12/31/19



Source: MSCI, as of 12/31/19

Equity earnings growth



Source: Bloomberg, as of 12/31/19



Equity valuations

Equity valuations expanded materially in 2019 as prices recovered from their year-end 2018 fall and then continued climbing through the fourth quarter. U.S. equities are expensive relative to their long-run average and prices may become more difficult to justify in an environment of flat earnings growth. International and emerging equity valuations are near average levels. We remain watchful of earnings trends in 2020, which may have important implications for the future path of equities.

In the United States, stocks within the Information Technology

(22.7x) and Communication Services (19.5x) sectors have retained forward P/E ratios elevated well above their respective 5- and 10-year averages. Last year, growing concerns over data privacy, support for anti-trust regulation, and several idiosyncratic scandals weighed on the tech sector. Over the course of this election year, we expect the issue of mega-cap tech regulation to remain beneath the microscope.

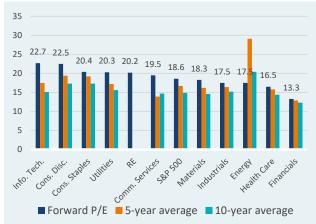
Compared to U.S. and EM equities, international developed equities offer the greatest yield at present, offering a three-month average trailing dividend yield of 3.4%.

FORWARD P/E RATIOS



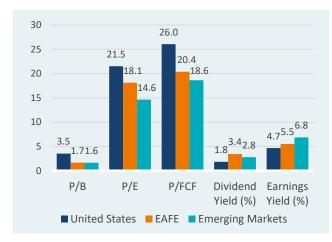
Source: MSCI, 12m forward P/E, as of 12/31/19

S&P 500 INDEX FORWARD SECTOR P/E RATIOS



Source: Standard & Poor's, FactSet, as of 1/17/20

VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, MSCI as of 12/31/19 - trailing P/E



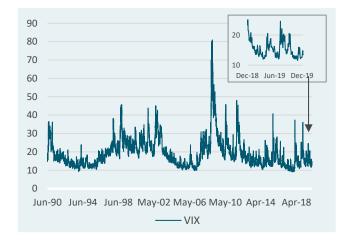
Equity volatility

The implied volatility of large-cap U.S. stocks returned to a subdued level. The CBOE VIX Index, which calculates the market's expectation for volatility implied by S&P 500 Index options, declined from 16.2 to 13.8, a reading which lies in the 15th percentile of weekly readings over the last thirty years. Net non-commercial short VIX positioning reached new all-time-highs in the 4th quarter, meaning that many people are betting on volatility to remain low and push lower. Some investors view this assumption as concerning, and as a signal that the market may be ready for a correction.

U.S. large-cap and emerging market stocks have experienced a higher degree of volatility than international developed stocks over the last several years. Some of the divergence may be attributable to the impacts of the ever-changing U.S.-China trade narrative which has held the full attention of market participants for much of the prior two years.

The MSCI EM Index touched new all-time highs in April and did not eclipse that level for another 174 days. In 2019, the S&P 500 and MSCI EAFE indices spent a maximum of 65 and 82 trading days between fresh all-time highs, respectively.

U.S. IMPLIED VOLATILITY (VIX)



Source: CBOE, as of 12/31/19 Source: Standard & Poor's, MSCI, Bloomberg, as of 12/31/19

ROLLING 1-YEAR REALIZED VOLATILITY



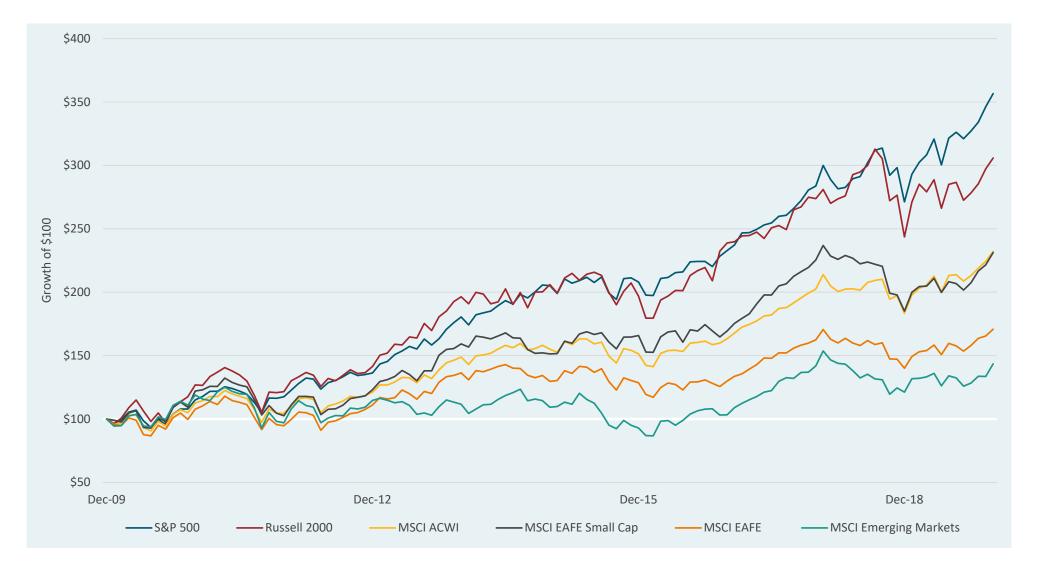
2019 MAX DRAWDOWNS FROM PREVIOUS ALL-TIME-HIGH INDEX LEVELS



Source: Standard & Poor's, MSCI, Bloomberg, as of 12/31/19



Long-term equity performance



Source: Standard & Poor's, Russell, MSCI, Bloomberg, as of 12/31/19



Other assets



Currency

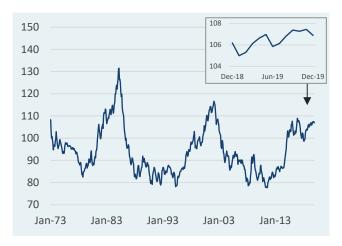
The U.S. dollar weakened versus both developed and emerging market currency baskets in the 4th quarter, fading some of the strong relative performance it had experienced back in Q3 2019. An index tracking the weighted average of the foreign exchange value of the U.S. dollar against major currencies fell 0.5%.

J.P. Morgan's Emerging Market Currency Index fell -1.4% in 2019. Many analysts have argued that global disinflationary pressures have eased some long-standing concerns over the risk of capital flight within the emerging market complex. So

long as inflationary risks are muted, then higher nominal interest rates in the emerging market complex should afford emerging market central bankers' further room to cut rates than their developed market peers. If implemented, the relative accommodation supplied may fuel both growth and currency depreciation.

The British pound sterling bounced back sharply in Q4, rising from \$1.23 to \$1.33. Prime Minister Boris Johnson's Conservative Party secured a firm majority in Parliament, lifting the shroud of "Brexit" from the geopolitical landscape.

U.S. DOLLAR TRADE WEIGHTED INDEX



Source: Federal Reserve, Verus, as of 12/31/19

JP MORGAN EMCI CONSTITUENT 2019 RETURNS



Source: J.P. Morgan, Bloomberg, as of 12/31/19

GBP/USD



Source: Bloomberg, as of 12/31/19



Appendix



Periodic table of returns

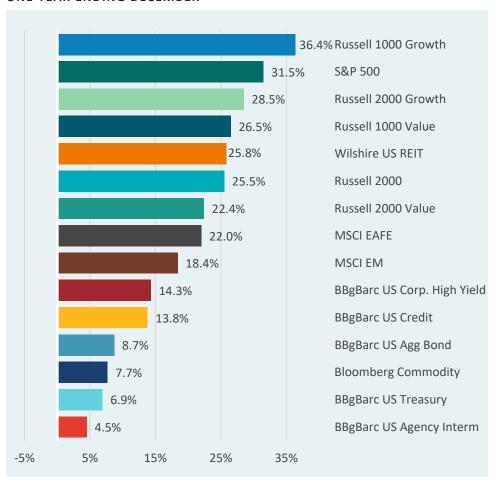
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	5-Year	10-Year
Large Cap Growth	38.7	66.4	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	36.4	14.6	15.2
Large Cap Equity	27.0	43.1	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	1.9	31.4	11.5	13.5
Small Cap Growth	20.3	33.2	12.2	7.3	6.7	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	0.0	28.5	9.3	13.0
Large Cap Value	19.3	27.3	11.6	3.3	1.6	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	-1.5	26.5	8.6	11.8
Small Cap Equity	16.2	26.5	7.0	2.8	1.0	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	25.5	8.3	11.8
Small Cap Value	8.7	21.3	4.1	-2.4	-6.0	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	-6.0	22.4	8.2	10.6
International Equity	15.6	24.3	6.0	2.5	-5.9	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	-4.8	22.0	7.0	9.8
60/40 Global Portfolio	4.9	20.9	-3.0	-5.6	-11.4	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	18.6	6.1	6.4
Emerging Markets Equity	1.2	13.2	-7.3	-9.1	-15.5	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	-9.3	18.4	5.7	5.5
US Bonds	-2.5	11.4	-7.8	-9.2	-15.7	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	-11.0	8.7	5.6	3.7
Hedge Funds of Funds	-5.1	7.3	-14.0	-12.4	-20.5	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	7.0	-11.2	7.8	3.0	3.7
Commodities	-6.5	4.8	-22.4	-19.5	-21.7	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	7.7	2.2	2.8
Real Estate	-25.3	-0.8	-22.4	-20.4	-27.9	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-13.8	4.8	1.1	0.6
Cash	-27.0	-1.5	-30.6	-21.2	-30.3	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-14.6	2.1	-3.9	-4.7
			Large	Cap Equ	iity			9	Small C	ap Grov	vth			Commodities										
	Large Cap Value						I	nterna	tional E	quity			Re	eal Esta	te									
Large Cap Growth						Emerging Markets Equity					Н	edge Fu	nds of I	unds										
	Small Cap Equity					U	JS Bond	ls			60% MSCI ACWI/40% BBgBarc Global Bond													
	Small Cap Value							Cash																

Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 9/30/19.

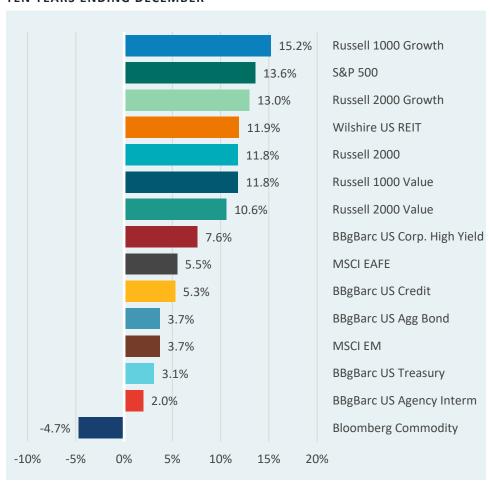


Major asset class returns

ONE YEAR ENDING DECEMBER



TEN YEARS ENDING DECEMBER



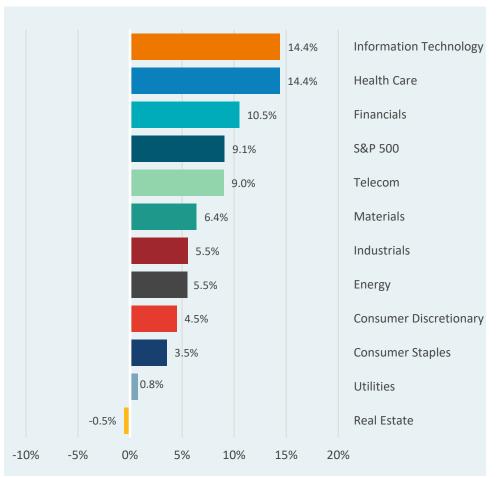
Source: Morningstar, as of 12/31/19

Source: Morningstar, as of 12/31/19

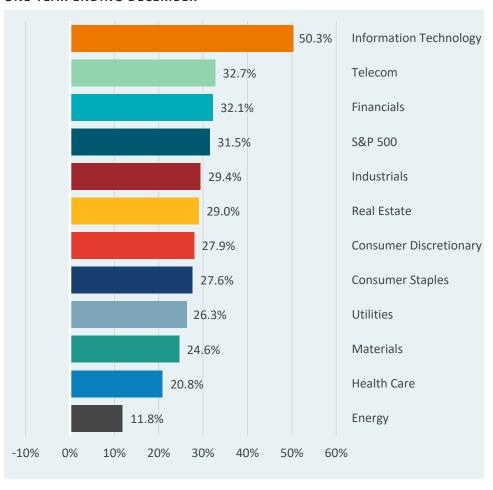


S&P 500 sector returns

Q4 2019



ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/19

Source: Morningstar, as of 12/31/19



Detailed index returns

DOMESTIC EQUITY								FIXED INCOME							
	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year		Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index								Broad Index							
S&P 500	3.0	9.1	31.5	31.5	15.3	11.7	13.6	BBgBarc US TIPS	0.4	0.8	8.4	8.4	3.3	2.6	3.4
S&P 500 Equal Weighted	2.8	7.6	29.2	29.2	12.4	9.8	13.5	BBgBarc US Treasury Bills	0.1	0.5	2.3	2.3	1.7	1.1	0.6
DJ Industrial Average	1.9	6.7	25.3	25.3	15.7	12.6	13.4	BBgBarc US Agg Bond	(0.1)	0.2	8.7	8.7	4.0	3.0	3.7
Russell Top 200	3.1	9.8	31.8	31.8	16.2	12.3	13.7	Duration							
Russell 1000	2.9	9.0	31.4	31.4	15.0	11.5	13.5	BBgBarc US Treasury 1-3 Yr	0.2	0.5	3.6	3.6	1.9	1.4	1.2
Russell 2000	2.9	9.9	25.5	25.5	8.6	8.2	11.8	BBgBarc US Treasury Long	(2.8)	(4.1)	14.8	14.8	6.9	4.1	7.0
Russell 3000	2.9	9.1	31.0	31.0	14.6	11.2	13.4	BBgBarc US Treasury	(0.6)	(8.0)	6.9	6.9	3.3	2.4	3.1
Russell Mid Cap	2.3	7.1	30.5	30.5	12.1	9.3	13.2	Issuer							
Style Index								BBgBarc US MBS	0.3	0.7	6.4	6.4	3.2	2.6	3.2
Russell 1000 Growth	3.0	10.6	36.4	36.4	20.5	14.6	15.2	BBgBarc US Corp. High Yield	2.0	2.6	14.3	14.3	6.4	6.1	7.6
Russell 1000 Value	2.8	7.4	26.5	26.5	9.7	8.3	11.8	BBgBarc US Agency Interm	0.1	0.3	4.5	4.5	2.4	1.9	2.0
Russell 2000 Growth	2.3	11.4	28.5	28.5	12.5	9.3	13.0	BBgBarc US Credit	0.3	1.1	13.8	13.8	5.8	4.4	5.3
Russell 2000 Value	3.5	8.5	22.4	22.4	4.8	7.0	10.6								
INTERNATIONAL EQUITY								OTHER							
Broad Index								Index							
MSCI ACWI	3.5	9.0	26.6	26.6	12.4	8.4	8.8	Bloomberg Commodity	5.0	4.4	7.7	7.7	(0.9)	(3.9)	(4.7)
MSCI ACWI ex US	4.3	8.9	21.5	21.5	9.9	5.5	5.0	Wilshire US REIT	(0.7)	(1.1)	25.8	25.8	7.6	6.9	11.9
MSCI EAFE	3.2	8.2	22.0	22.0	9.6	5.7	5.5	CS Leveraged Loans	1.6	1.7	8.2	8.2	4.5	4.5	5.2
MSCI EM	7.5	11.8	18.4	18.4	11.6	5.6	3.7	Alerian MLP	8.9	(4.6)	6.7	6.7	(5.0)	(7.0)	4.8
MSCI EAFE Small Cap	4.4	11.5	25.0	25.0	10.9	8.9	8.7	Regional Index							
Style Index								JPM EMBI Global Div	2.0	1.8	15.0	15.0	6.7	6.2	6.9
MSCI EAFE Growth	2.9	8.4	27.9	27.9	12.8	7.7	6.9	JPM GBI-EM Global Div	4.1	5.2	13.5	13.5	7.0	2.8	2.7
MSCI EAFE Value	3.7	7.8	16.1	16.1	6.3	3.5	4.0	Hedge Funds							
Regional Index								HFRI Composite	1.8	3.5	10.4	10.4	4.5	3.5	4.0
MSCI UK	5.2	10.0	21.0	21.0	8.3	3.3	5.0	HFRI FOF Composite	1.3	2.5	7.8	7.8	3.7	2.2	2.8
MSCI Japan	2.1	7.6	19.6	19.6	8.9	7.7	6.6	Currency (Spot)							
MSCI Euro	2.9	7.9	22.9	22.9	9.1	5.1	3.7	Euro	1.8	3.0	(1.8)	(1.8)	2.1	(1.5)	(2.4)
MSCI EM Asia	7.1	12.5	19.2	19.2	12.9	6.6	5.8	Pound	2.4	7.5	4.0	4.0	2.3	(3.2)	(2.0)

Source: Morningstar, HFR, as of 12/31/19



MSCI EM Latin American

(1.5)

Definitions

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

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

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

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

Notices & disclosures

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Imperial County Employees' Retirement System

Investment Performance Review

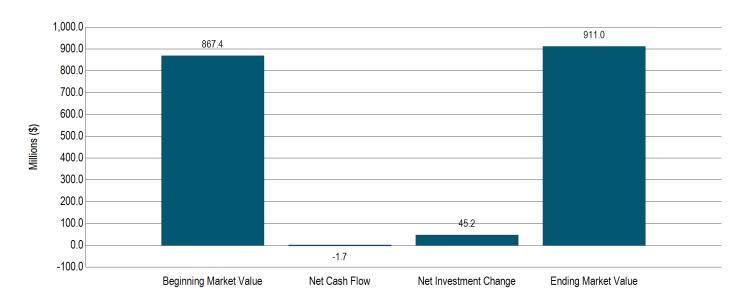
Period Ending: December 31, 2019



Portfolio Reconciliation

	Last Three Months	Fiscal Year-To-Date	One Year
Beginning Market Value	\$867,399,729	\$866,437,865	\$779,063,871
Net Cash Flow	-\$1,666,833	-\$5,689,178	-\$5,878,234
Net Investment Change	\$45,231,016	\$50,215,224	\$137,778,275
Ending Market Value	\$910,963,912	\$910,963,912	\$910,963,912

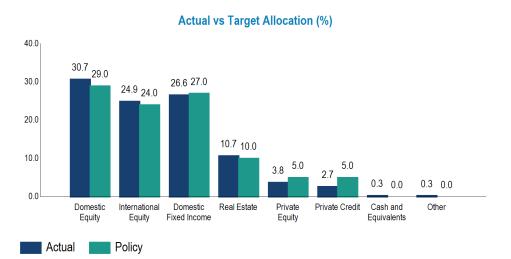
Change in Market Value Last Three Months



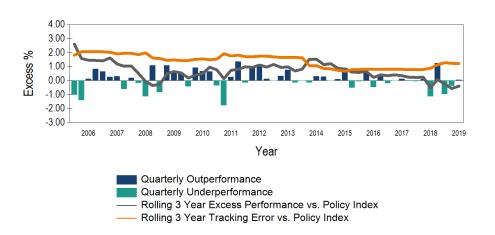
Contributions and withdrawals may include intra-account transfers between managers/funds. Fee transactions are excluded from Portfolio Reconciliation.



	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	5.2	6.0	17.9	9.6	7.2	8.3
Policy Index	5.1	6.3	18.0	10.0	7.3	7.9
InvMetrics Public DB Gross Rank	50	55	60	44	39	46
Total Domestic Equity	9.1	10.4	31.1	14.6	11.3	13.4
Russell 3000	9.1	10.4	31.0	14.6	11.2	13.4
InvMetrics Public DB US Eq Gross Rank	15	8	19	20	24	30
Total International Equity	9.1	6.6	21.0	10.1	6.2	5.2
MSCI ACWI ex USA Gross	9.0	7.1	22.1	10.4	6.0	5.4
InvMetrics Public DB ex-US Eq Gross Rank	74	85	77	50	48	85
6 10001101111						
Total Fixed Income	0.5	2.8	9.8	4.6	3.7	4.9
	0.5 0.2	2.8 2.5	9.8 8.7	4.6	3.7 3.0	4.9 3.7
Total Fixed Income						
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc	0.2	2.5	8.7	4.0	3.0	3.7
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc Gross Rank	0.2 55	2.5 16	8.7 29	4.0 48	3.0 41	3.7 30
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc Gross Rank Total Real Estate	0.2 55 1.0	2.5 16 1.7	8.7 29 4.8	4.0 48 6.0	3.0 41 8.3	3.7 30 11.0
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc Gross Rank Total Real Estate NCREIF-ODCE	0.2 55 1.0 1.5	2.5 16 1.7 2.9	8.7 29 4.8 5.4	4.0 48 6.0 7.1	3.0 41 8.3 9.0	3.7 30 11.0 11.4
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc Gross Rank Total Real Estate NCREIF-ODCE Total Private Equity	0.2 55 1.0 1.5 2.8	2.5 16 1.7 2.9 7.5	8.7 29 4.8 5.4 12.5	4.0 48 6.0 7.1 17.5	3.0 41 8.3 9.0 16.7	3.7 30 11.0 11.4
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc Gross Rank Total Real Estate NCREIF-ODCE Total Private Equity Russell 3000 +3% (Lagged)	0.2 55 1.0 1.5 2.8 1.9	2.5 16 1.7 2.9 7.5 6.9	8.7 29 4.8 5.4 12.5 6.0	4.0 48 6.0 7.1 17.5 16.2	3.0 41 8.3 9.0 16.7 13.7	3.7 30 11.0 11.4
Total Fixed Income BBgBarc US Aggregate TR InvMetrics Public DB Total Fix Inc Gross Rank Total Real Estate NCREIF-ODCE Total Private Equity Russell 3000 +3% (Lagged) Total Private Credit	0.2 55 1.0 1.5 2.8 1.9	2.5 16 1.7 2.9 7.5 6.9 4.2	8.7 29 4.8 5.4 12.5 6.0 8.9	4.0 48 6.0 7.1 17.5 16.2	3.0 41 8.3 9.0 16.7 13.7	3.7 30 11.0 11.4



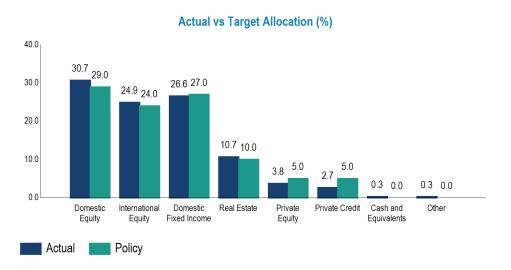
Rolling Annualized Excess Performance and Tracking Error
Total Fund vs. Policy Index



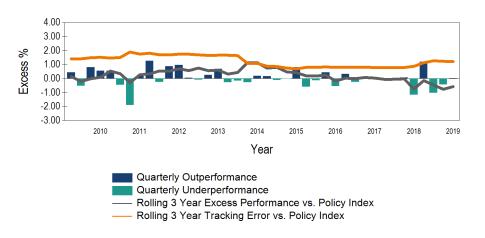
New Policy Index (as of 10/1/2018): 29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc US Aggregate, 10% NCREIF Property Index, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged). Prior Policy Index (10/1/2016 to 9/30/2018): 29% Russell 3000, 24% MSCI ACWI Ex USA Gross, 27% BBgBarc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



	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	5.2	5.9	17.7	9.4	7.0	8.0
Policy Index	5.1	6.3	18.0	10.0	7.3	7.9
Total Domestic Equity	9.1	10.4	31.1	14.6	11.2	13.3
Russell 3000	9.1	10.4	31.0	14.6	11.2	13.4
Total International Equity	9.0	6.4	20.7	9.8	5.8	4.8
MSCI ACWI ex USA Gross	9.0	7.1	22.1	10.4	6.0	5.4
Total Fixed Income	0.4	2.7	9.5	4.3	3.4	4.6
BBgBarc US Aggregate TR	0.2	2.5	8.7	4.0	3.0	3.7
Total Real Estate	1.0	1.7	4.8	6.0	7.8	10.4
NCREIF-ODCE	1.5	2.9	5.4	7.1	9.0	11.4
Total Private Equity	2.8	7.5	12.5	17.5	15.8	
Russell 3000 +3% (Lagged)	1.9	6.9	6.0	16.2	13.7	
Total Private Credit	1.9	4.2	8.9			
BBgBarc High Yield +2% (Lagged)	1.8	4.9	8.5			
Total Opportunistic	1.6	1.0	-10.7	7.5	6.1	14.6
Assumption Rate + 1%	2.0	4.0	8.3	8.3	8.4	8.7



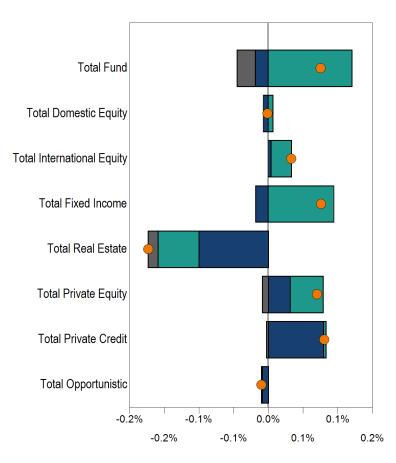
Rolling Annualized Excess Performance and Tracking Error
Total Fund vs. Policy Index



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



Attribution Effects



Performance Attribution

	Quarter	YTD
Wtd. Actual Return	5.20%	17.98%
Wtd. Index Return *	5.30%	18.85%
Excess Return	-0.10%	-0.88%
Selection Effect	0.15%	0.26%
Allocation Effect	-0.19%	-0.87%
Interaction Effect	-0.06%	-0.27%

^{*}Calculated from benchmark returns and weightings of each component.

Attribution Summary Last Three Months

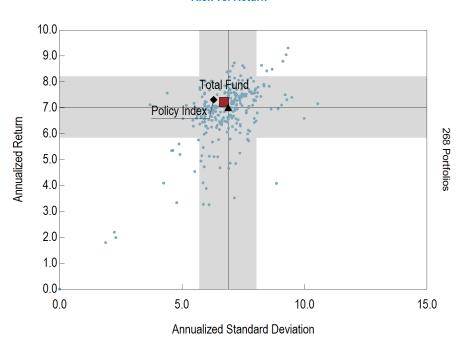
	Wtd. Actual	Wtd. Index	Excess	Selection	Allocation	Interaction	Total
	Return	Return	Return	Effect	Effect	Effects	Effects
Total Domestic Equity	9.1%	9.1%	0.0%	0.0%	-0.2%	0.0%	-0.2%
Total International Equity	9.1%	9.0%	0.1%	0.0%	0.1%	0.0%	0.1%
Total Fixed Income	0.5%	0.2%	0.3%	0.1%	0.1%	0.0%	0.2%
Total Real Estate	1.0%	1.6%	-0.6%	0.0%	-0.3%	0.0%	-0.4%
Total Private Equity	2.8%	1.9%	0.9%	0.0%	0.0%	0.0%	0.1%
Total Private Credit	1.9%	1.8%	0.1%	0.0%	0.1%	0.0%	0.1%
Total Opportunistic	1.6%	2.0%	-0.4%	0.0%	0.0%	0.0%	0.0%
Total	5.2%	5.3%	-0.1%	0.2%	-0.2%	-0.1%	-0.1%

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



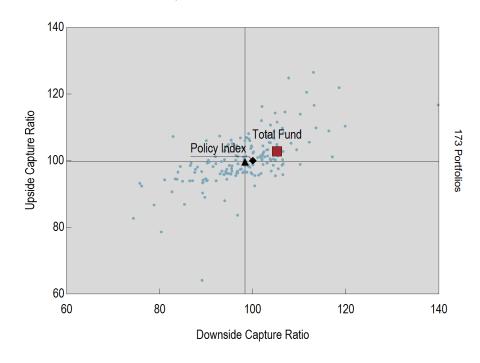
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Total Fund	7.23%	-0.08%	6.72%	-0.51%	1.06	0.98%	0.98	0.92	-0.08	102.77%	105.24%

Risk vs. Return



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

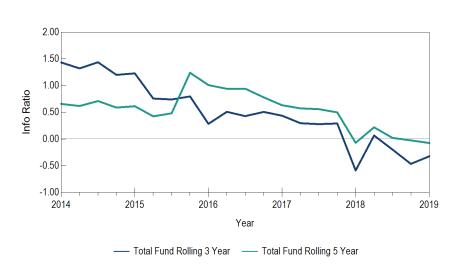
Up Markets vs. Down Markets



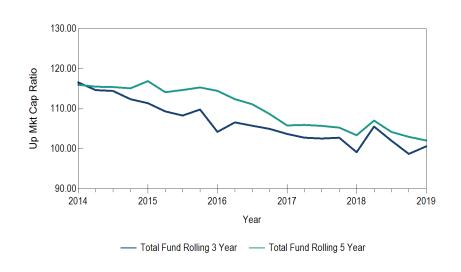
- Total Fund
- Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Gross



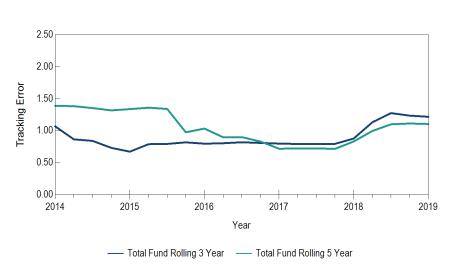
Rolling Information Ratio



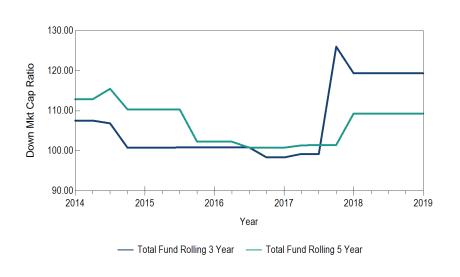
Rolling Up Market Capture Ratio (%)



Rolling Tracking Error



Rolling Down Market Capture Ratio (%)





	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015	Inception	Inception Date
Total Fund	910,963,912	100.0	5.2	6.0	17.9	9.6	7.2	8.3	17.9	-4.0	16.2	7.8	0.0	9.3	Mar-89
Policy Index			5.1	6.3	18.0	10.0	7.3	7.9	18.0	-2.8	15.9	8.3	-1.2		Mar-89
InvMetrics Public DB Gross Rank			50	55	60	44	39	46	60	50	30	49	53	6	Mar-89
Total Domestic Equity	279,918,188	30.7	9.1	10.4	31.1	14.6	11.3	13.4	31.1	-5.2	21.2	12.9	0.3		
Russell 3000			9.1	10.4	31.0	14.6	11.2	13.4	31.0	-5.2	21.1	12.7	0.5		
InvMetrics Public DB US Eq Gross Rank			15	8	19	20	24	30	19	35	35	51	44		
BlackRock Russell 3000	279,918,188	30.7	9.1	10.4	31.1	14.6			31.1	-5.2	21.2	12.9		13.5	Dec-15
Russell 3000			9.1	10.4	31.0	14.6			31.0	-5.2	21.1	12.7		13.2	Dec-15
eV US All Cap Core Equity Gross Rank			37	37	43	44			43	49	49	35		45	Dec-15
Total International Equity	226,915,220	24.9	9.1	6.6	21.0	10.1	6.2	5.2	21.0	-14.0	28.3	4.7	-3.5		
MSCI ACWI ex USA Gross			9.0	7.1	22.1	10.4	6.0	5.4	22.1	-13.8	27.8	5.0	-5.3		
InvMetrics Public DB ex-US Eq Gross Rank			74	85	77	50	48	85	77	35	59	40	57		
BlackRock International Equity	156,909,662	17.2	8.2	7.1	22.5	10.0	6.1	5.9	22.5	-13.4	25.5	1.5	-0.5	7.5	Jul-03
MSCI EAFE Gross			8.2	7.1	22.7	10.1	6.2	6.0	22.7	-13.4	25.6	1.5	-0.4	7.6	Jul-03
eV All EAFE Equity Gross Rank			71	66	56	51	64	81	56	35	65	47	67	72	Jul-03
DFA Emerging Markets Value	32,391,342	3.6	9.9	2.3	10.3	9.5	5.3	2.9	10.3	-11.4	34.5	20.5	-18.3	4.5	Jan-07
MSCI Emerging Markets Gross			11.9	7.3	18.9	12.0	6.0	4.0	18.9	-14.2	37.8	11.6	-14.6	4.8	Jan-07
eV Emg Mkts Equity Gross Rank			75	92	94	80	74	99	94	16	70	7	92	73	Jan-07
Harding Loevner Emerging Markets	37,614,216	4.1	12.3	8.4	25.4	11.3			25.4	-18.6	35.0			9.4	Jul-16
MSCI Emerging Markets Gross			11.9	7.3	18.9	12.0			18.9	-14.2	37.8			10.3	Jul-16
eV Emg Mkts Equity Gross Rank			30	32	21	58			21	84	68			49	Jul-16
Total Fixed Income	242,732,660	26.6	0.5	2.8	9.8	4.6	3.7	4.9	9.8	-0.5	4.6	5.1	-0.3		
BBgBarc US Aggregate TR			0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6		
InvMetrics Public DB Total Fix Inc Gross Rank			55	16	29	48	41	30	29	58	59	41	55		
Tortoise Capital	100,646,238	11.0	0.5	3.0	10.2	4.9	4.2	5.3	10.2	0.2	4.5	5.1	1.2	6.5	Dec-92
BBgBarc US Aggregate TR			0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6	5.4	Dec-92
eV US Core Plus Fixed Inc Gross Rank			55	33	45	48	25	30	45	24	70	45	15	32	Dec-92
MacKay Shields Core Plus Opportunities	98,716,435	10.8	0.4	3.0	10.1	4.7			10.1	-0.7	4.9	5.1		3.3	Mar-15
BBgBarc US Aggregate TR			0.2	2.5	8.7	4.0			8.7	0.0	3.5	2.6		2.9	Mar-15
eV US Core Plus Fixed Inc Gross Rank			59	29	52	62			52	69	54	46		85	Mar-15
BlackRock US TIPS	43,369,987	4.8	8.0	2.2	8.5	3.5	2.8	3.5	8.5	-1.1	3.2	4.8	-1.2	4.2	Apr-07
BBgBarc US TIPS TR			0.8	2.1	8.4	3.3	2.6	3.4	8.4	-1.3	3.0	4.7	-1.4	4.0	Apr-07
eV US TIPS / Inflation Fixed Inc Gross Rank			58	49	47	40	40	47	47	47	46	37	43	63	Apr-07

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



	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015	Inception	Inception Date
Total Real Estate	97,251,621	10.7	1.0	1.7	4.8	6.0	8.3	11.0	4.8	7.5	5.8	7.5	16.1		
NCREIF ODCE			1.5	2.9	5.4	6.5	8.1	10.1	5.4	7.1	7.0	8.0	13.3		
ASB Real Estate	28,644,554	3.1	0.8	0.0	3.0	4.5	7.2		3.0	6.6	4.0	5.6	17.3	9.0	Dec-12
NCREIF-ODCE			1.5	2.9	5.4	7.1	9.0		5.4	8.3	7.6	8.8	15.0	10.2	Dec-12
NCREIF Property Index			1.6	3.0	6.4	6.7	8.2		6.4	6.7	7.0	8.0	13.3	9.1	Dec-12
Clarion Lion	30,129,690	3.3	1.8	3.2	6.3	7.6	9.5	12.2	6.3	8.6	7.9	9.1	15.7	5.4	Dec-06
NCREIF-ODCE			1.5	2.9	5.4	7.1	9.0	11.4	5.4	8.3	7.6	8.8	15.0	6.1	Dec-06
NCREIF Property Index			1.6	3.0	6.4	6.7	8.2	10.2	6.4	6.7	7.0	8.0	13.3	6.9	Dec-06
ARA American Strategic Value Realty	36,533,695	4.0	0.0	1.5	5.4				5.4					7.0	Jan-18
NCREIF ODCE +2%			2.0	4.0	7.5				7.5					8.2	Jan-18
1221 State St. Corp	1,943,683	0.2	7.9	7.9	7.9	2.6	4.9	1.8	7.9	0.0	0.0	17.5	0.0	1.8	Sep-08
Total Private Equity															
Harbourvest Buyout IX	7,394,179	8.0	5.5	8.9	17.6	21.5	20.2		17.6	23.6	23.2	15.8	21.1		Sep-11
Harbourvest Credit Ops IX	1,222,661	0.1	2.1	4.4	8.0	13.2	13.3		8.0	14.4	17.5	10.9	16.1		Sep-11
Harbourvest International PE VI	2,553,812	0.3	3.3	-5.2	-2.9	10.0	10.7		-2.9	14.8	19.4	13.6	9.8		Jun-10
Harbourvest Venture IX	4,529,670	0.5	1.0	12.5	24.6	19.7	17.8		24.6	25.9	9.4	6.5	24.2		Sep-11
Harbourvest 2017 Global Fund	13,641,861	1.5	1.7	7.3	8.8				8.8	20.9				16.7	Sep-17
Harbourvest 2018 Global Fund	4,958,794	0.5	4.1	11.8	14.3				14.3					13.1	Dec-18
Russell 3000 + 3%			9.9	12.0	34.9				34.9					20.7	Dec-18
Total Private Credit															
Portfolio Advisors	24,396,200	2.7	1.9	4.2	8.9				8.9	6.7				7.2	Oct-17
BBgBarc High Yield +2% (Lagged)			1.8	4.9	8.5				8.5	5.1				6.8	Oct-17
Total Opportunistic	2,458,407	0.3	1.6	1.0	-10.7	7.5	6.8	15.8	-10.7	32.0	5.3	7.3	4.5		
KKR Mezzanine Partners	2,279,320	0.3	-0.1	3.4	-4.2	9.3	7.9		-4.2	25.3	8.7	5.6	5.9	11.3	Apr-11
PIMCO BRAVO	179,087	0.0	29.5	-21.2	-49.1	-7.5	-1.8		-49.1	77.8	-12.4	12.5	2.2	9.7	May-11
Total Cash															
Cash Account	2,990,639	0.3	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
91 Day T-Bills	. ,		0.4	0.9	2.1	1.6	1.1		2.1	1.9	0.9	0.3	0.0		

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



	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015	Inception	Inception Date
Total Fund	910,963,912	100.0	5.2	5.9	17.7	9.4	7.0	8.0	17.7	-4.1	16.0	7.4	-0.4	8.8	Mar-89
Policy Index			5.1	6.3	18.0	10.0	7.3	7.9	18.0	-2.8	15.9	8.3	-1.2		Mar-89
Total Domestic Equity	279,918,188	30.7	9.1	10.4	31.1	14.6	11.2	13.3	31.1	-5.2	21.2	12.8	0.1		
Russell 3000			9.1	10.4	31.0	14.6	11.2	13.4	31.0	-5.2	21.1	12.7	0.5		
BlackRock Russell 3000	279,918,188	30.7	9.1	10.4	31.1	14.6			31.1	-5.2	21.2	12.8		13.5	Dec-15
Russell 3000			9.1	10.4	31.0	14.6			31.0	-5.2	21.1	12.7		13.2	Dec-15
Total International Equity	226,915,220	24.9	9.0	6.4	20.7	9.8	5.8	4.8	20.7	-14.3	27.9	4.4	-4.0		
MSCI ACWI ex USA Gross			9.0	7.1	22.1	10.4	6.0	5.4	22.1	-13.8	27.8	5.0	-5.3		
BlackRock International Equity	156,909,662	17.2	8.2	7.0	22.4	9.9	6.0	5.7	22.4	-13.5	25.4	1.3	-0.6	7.3	Jul-03
MSCI EAFE Gross			8.2	7.1	22.7	10.1	6.2	6.0	22.7	-13.4	25.6	1.5	-0.4	7.6	Jul-03
DFA Emerging Markets Value	32,391,342	3.6	9.7	2.0	9.6	8.9	4.7	2.3	9.6	-11.9	33.8	19.8	-18.8	3.9	Jan-07
MSCI Emerging Markets Gross			11.9	7.3	18.9	12.0	6.0	4.0	18.9	-14.2	37.8	11.6	-14.6	4.8	Jan-07
Harding Loevner Emerging Markets	37,614,216	4.1	12.0	7.9	24.0	10.1			24.0	-19.5	33.6			8.3	Jul-16
MSCI Emerging Markets Gross			11.9	7.3	18.9	12.0			18.9	-14.2	37.8			10.3	Jul-16
Total Fixed Income	242,732,660	26.6	0.4	2.7	9.5	4.3	3.4	4.6	9.5	-0.8	4.3	4.8	-0.6		
BBgBarc US Aggregate TR			0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6		
Tortoise Capital	100,646,238	11.0	0.4	2.8	9.9	4.6	3.9	5.0	9.9	-0.1	4.3	4.8	0.9	6.2	Dec-92
BBgBarc US Aggregate TR			0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6	5.4	Dec-92
MacKay Shields Core Plus Opportunities	98,716,435	10.8	0.3	2.8	9.7	4.3			9.7	-1.0	4.5	4.7		2.9	Mar-15
BBgBarc US Aggregate TR			0.2	2.5	8.7	4.0			8.7	0.0	3.5	2.6		2.9	Mar-15
BlackRock US TIPS	43,369,987	4.8	0.8	2.1	8.5	3.4	2.7	3.4	8.5	-1.2	3.2	4.8	-1.3	4.1	Apr-07
BBgBarc US TIPS TR			0.8	2.1	8.4	3.3	2.6	3.4	8.4	-1.3	3.0	4.7	-1.4	4.0	Apr-07



	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015	Inception	Inception Date
Total Real Estate	97,251,621	10.7	1.0	1.7	4.8	6.0	7.8	10.4	4.8	7.5	5.8	6.5	15.0		
NCREIF ODCE			1.5	2.9	5.4	6.5	8.1	10.1	5.4	7.1	7.0	8.0	13.3		
ASB Real Estate	28,644,554	3.1	0.8	0.0	3.0	4.5	6.8		3.0	6.6	4.0	4.6	16.2	8.4	Dec-12
NCREIF-ODCE			1.5	2.9	5.4	7.1	9.0		5.4	8.3	7.6	8.8	15.0	10.2	Dec-12
NCREIF Property Index			1.6	3.0	6.4	6.7	8.2		6.4	6.7	7.0	8.0	13.3	9.1	Dec-12
Clarion Lion	30,129,690	3.3	1.8	3.2	6.3	7.6	9.0	11.4	6.3	8.6	7.9	8.0	14.6	4.6	Dec-06
NCREIF-ODCE			1.5	2.9	5.4	7.1	9.0	11.4	5.4	8.3	7.6	8.8	15.0	6.1	Dec-06
NCREIF Property Index			1.6	3.0	6.4	6.7	8.2	10.2	6.4	6.7	7.0	8.0	13.3	6.9	Dec-06
ARA American Strategic Value Realty	36,533,695	4.0	0.0	1.5	5.4				5.4					7.0	Jan-18
NCREIF ODCE +2%			2.0	4.0	7.5				7.5					8.2	Jan-18
1221 State St. Corp	1,943,683	0.2	7.9	7.9	7.9	2.6	4.9	1.8	7.9	0.0	0.0	17.5	0.0	1.8	Sep-08
Total Private Equity															
Harbourvest Buyout IX	7,394,179	0.8	5.5	8.9	17.6	21.5	19.2		17.6	23.6	23.2	13.7	18.0		Sep-11
Harbourvest Credit Ops IX	1,222,661	0.1	2.1	4.4	8.0	13.2	12.2		8.0	14.4	17.5	8.5	12.8		Sep-11
Harbourvest International PE VI	2,553,812	0.3	3.3	-5.2	-2.9	10.0	10.1		-2.9	14.8	19.4	12.2	8.3		Jun-10
Harbourvest Venture IX	4,529,670	0.5	1.0	12.5	24.6	19.7	17.2		24.6	25.9	9.4	5.3	22.4		Sep-11
Harbourvest 2017 Global Fund	13,641,861	1.5	1.7	7.3	8.8				8.8	20.9				16.7	Sep-17
Harbourvest 2018 Global Fund	4,958,794	0.5	4.1	11.8	14.3				14.3					13.1	Dec-18
Russell 3000 + 3%			9.9	12.0	34.9				34.9					20.7	Dec-18
Total Private Credit															
Portfolio Advisors	24,396,200	2.7	1.9	4.2	8.9				8.9	6.7				7.2	Oct-17
BBgBarc High Yield +2% (Lagged)			1.8	4.9	8.5				8.5	5.1				6.8	Oct-17
Total Opportunistic	2,458,407	0.3	1.6	1.0	-10.7	7.5	6.1	14.6	-10.7	32.0	5.3	5.0	3.0		
KKR Mezzanine Partners	2,279,320	0.3	-0.1	3.4	-4.2	9.3	7.2		-4.2	25.3	8.7	4.0	4.1	10.4	Apr-11
PIMCO BRAVO	179,087	0.0	29.5	-21.2	-49.1	-7.5	-2.3		-49.1	77.8	-12.4	11.2	1.0	8.9	May-11
Total Cash															
Cash Account	2,990,639	0.3	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
91 Day T-Bills			0.4	0.9	2.1	1.6	1.1		2.1	1.9	0.9	0.3	0.0		



	3 Years										
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
BlackRock Russell 3000	14.60%	0.03%	12.38%	0.03%	1.00	0.04%	1.00	1.05	0.84	100.20%	100.04%
BlackRock International Equity	9.91%	-0.20%	10.99%	-0.23%	1.00	0.16%	1.00	0.75	-1.28	99.80%	101.13%
DFA Emerging Markets Value	8.90%	-3.08%	14.22%	-2.53%	0.95	3.85%	0.93	0.51	-0.80	90.11%	105.18%
Harding Loevner Emerging Markets	10.10%	-1.89%	15.28%	-2.13%	1.02	4.29%	0.92	0.55	-0.44	97.12%	106.32%
Tortoise Capital	4.60%	0.57%	2.64%	1.06%	0.88	0.75%	0.94	1.12	0.76	100.46%	74.02%
MacKay Shields Core Plus Opportunities	4.30%	0.27%	2.75%	0.59%	0.92	0.64%	0.95	0.97	0.42	98.35%	82.58%
BlackRock US TIPS	3.40%	0.09%	3.00%	0.09%	1.00	0.03%	1.00	0.58	2.81	101.11%	99.10%
ASB Real Estate	4.53%	-2.59%	2.39%	-0.19%	0.66	1.69%	0.67	1.21	-1.53	62.05%	
Clarion Lion	7.58%	0.45%	3.13%	0.12%	1.05	0.51%	0.98	1.89	0.89	106.80%	

	5 Years											
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio	
BlackRock International Equity	5.98%	-0.20%	12.26%	-0.21%	1.00	0.12%	1.00	0.40	-1.63	99.59%	100.66%	
DFA Emerging Markets Value	4.68%	-1.32%	16.63%	-1.45%	1.02	4.09%	0.94	0.22	-0.32	102.80%	105.16%	
Tortoise Capital	3.90%	0.85%	2.90%	1.12%	0.91	0.85%	0.92	0.98	1.00	106.06%	80.02%	
BlackRock US TIPS	2.71%	0.10%	3.47%	0.08%	1.01	0.12%	1.00	0.48	0.81	101.27%	99.24%	
ASB Real Estate	6.78%	-2.21%	4.07%	-1.42%	0.91	2.01%	0.76	1.41	-1.10	75.39%		
Clarion Lion	9.01%	0.02%	4.14%	-0.35%	1.04	0.82%	0.96	1.92	0.02	104.40%		



Vintage	Manager & Fund Name	Estimated 12/31 Market Value ³	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) ¹	Tot. Value/ Paid-In (TVPI) ²	Net IRR Since Inception ⁴	IRR Date
2011	HarbourVest IX-Buyout	\$7,394,179	\$10,000,000	\$8,275,000	83%	\$1,725,000	\$6,458,658	\$7,871,859	78.1%	167.4%	17.9%	9/30/19
2011	HarbourVest IX-Credit	\$1,222,661	\$2,000,000	\$1,500,000	75%	\$500,000	\$999,302	\$1,316,167	66.6%	148.1%	13.6%	9/30/19
2008	HarbourVest Int'l VI ⁵	\$2,553,812	\$3,712,930	\$2,630,078	71%	\$1,082,852	\$2,057,708	\$2,667,015	78.2%	175.3%	14.8%	9/30/19
2011	HarbourVest IX-Venture	\$4,529,670	\$4,000,000	\$3,800,000	95%	\$200,000	\$2,768,841	\$4,895,136	72.9%	192.1%	18.1%	9/30/19
2017	HarbourVest 2017 Global	\$13,641,861	\$30,000,000	\$13,200,000	44%	\$16,800,000	\$2,260,137	\$14,391,861	17.1%	120.5%	16.7%	9/30/19
2018	HarbourVest 2018 Global	\$4,958,794	\$20,000,000	\$4,600,000	23%	\$15,400,000	\$0	\$3,958,794	0.0%	107.8%	N/A	N/A
2019	HarbourVest 2019 Global	N/A	\$20,000,000	\$0	0%	\$20,000,000 \$0		N/A	N/A	N/A	N/A	N/A
	Total Illiquid Private Equity	\$34,300,977	\$89,712,930	\$34,005,078	38%	\$55,707,852	\$55,707,852 \$14,544,646		103.2%	146.0%		
	% of Portfolio (Market Value)	4.0%						Management	Admin	Interest	Other	Total
								Fee	Fee	Expense	Expense	Expense ⁶
						HarbourVest IX	X-Buyout	\$24,903	\$0	\$204	\$5,737	\$30,844
						HarbourVest IX	X-Credit	\$4,975	\$0	\$1,745	\$1,928	\$8,648
						HarbourVest Ir	nt'l VI	\$6,728	\$0	\$110	\$174	\$7,012
						HarbourVest IX-Venture		\$9,978	\$0	\$212	\$374	\$10,564
						HarbourVest 2017 Global		\$64,714	\$0	\$2,245	\$47,475	\$114,434
						HarbourVest 2	018 Global	\$30,163	\$0	\$168	\$36,277	\$66,608
						HarbourVest 2019 Global		\$0	\$0	\$0	\$0	\$0



\$0

\$4,684

\$141,461

\$91,965 **\$238,110**

¹(DPI) is equal to (capital returned / capital called)

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

³Last known market value + capital calls - distributions (preliminary MV's as of 9/30/19)

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

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

⁶All fees and expenses are for 3Q 2019

		Estimated 12/31	Total	Capital	%	Remaining	Capital	Market Value	Distrib./ Paid-In	Tot. Value/ Paid-In	Net IRR Since	IRR
Vintage	Manager & Fund Name	Market Value ³	Commitment	Called	Called	Commitment	Returned	for IRR	(DPI) ¹	(TVPI) ²	Inception⁴	Date
2013	Portfolio Advisors Credit Strategies Fund	\$12,978,259	\$11,250,000	\$11,250,000	100%	\$0	\$0	\$12,436,215	0.0%	115.4%	8.6%	9/30/19
2017	Crescent Direct Lending Levered Fund II	\$4,936,038	\$7,000,000	\$5,081,501	73%	\$1,918,499	\$48,772	\$3,470,456	1.0%	98.1%	11.4%	9/30/19
2017	Audax Direct Lending Fund A	\$1,947,962	\$7,000,000	\$1,873,721	27%	\$5,126,279	\$72,094	NA	3.8%	107.8%	NM^6	NM^6
2018	Ares Capital Europe IV	\$4,380,642	\$8,000,000	\$3,569,037	45%	\$4,430,963	\$81,940	NA	2.3%	125.0%	NM^7	NM^7
2019	Lone Star Fund XI	\$153,299	\$5,750,000	\$263,253	5%	\$5,486,747	\$0	NA	0.0%	58.2%	20.4%	9/30/19
2019	Ascribe Opportunities IV	\$0	\$6,000,000	\$0	0%	\$6,000,000	\$0	NA	NA	NA	NA	NA
	Total Illiquid Private Credit	\$24,396,200	\$45,000,000	\$22,037,512	49%	\$22,962,488	\$202,806	\$15,906,671	72.2%	73.1%		
	% of Portfolio (Market Value)	2.8%					Management	Accrued	Admin	Interest	Other	Total
	,						Fee	Carried Interest	Fee	Expense	Expense	Expense ⁵
					Portfolio Ad	visors CSF	\$0	\$107,019	\$0	\$0	\$0	\$107,019
					Crescent Di	irect Lending II	\$60,016	\$10,408	\$3,133	\$0	\$0	\$73,557
					Audax Direct Lending A		\$12,118	\$0	\$0	\$0	\$41,879	\$53,997
					Ares Capital Europe IV		\$13,602	\$18,294	\$19,757	\$0	\$0	\$51,653
					Ascribe Opportunities IV		\$0	\$0	\$0	\$0	\$0	\$0
					Lone Star Fund XI		\$0	\$0	\$0	\$0	\$0	\$0

\$85,736



\$22,890

\$135,721

\$41,879 **\$286,226**

¹(DPI) is equal to (capital returned / capital called)

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

³Last known market value + capital calls - distributions (preliminary MV's as of 9/30/19)

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

⁵All fees and expenses are for 3Q 2019

⁶The Fund issued its first capital call on October 26, 2018. As such it does not consider the IRR to be meaningful.

⁷Given the nature of the ACE IV strategy, Ares will begin reporting fund-level IRR metrics beginning in Q3 2019, one year after the fund's first investment.

Vintage	Manager & Fund Name	Estimated 12/31 Market Value ³	Total Commitment	Capital Called	% Called	Remaining Commitment	Capital Returned	Market Value for IRR	Distrib./ Paid-In (DPI) ¹	Tot. Value/ Paid-In (TVPI) ²	Net IRR Since Inception ⁵	IRR Date
2010	KKR Mezzanine ⁶	\$2,279,320	\$10,000,000	\$10,000,000	100%	\$0	\$13,137,486	\$2,251,093	131.4%	154.2%	8.2%	9/30/19
2011	PIMCO BRAVO ⁴	\$179,087	\$10,000,000	\$10,000,000	100%	\$0	\$18,054,734	\$138,288	180.5%	182.3%	22.1%	9/30/19
	Total Illiquid Opportunistic % of Portfolio (Market Value)	\$2,458,407	\$20,000,000	\$20,000,000	100%	\$0	\$31,192,220 Management	\$2,389,381 A ccrued	11.9% Admin	167.9%	Other	Total _
							Fee	Carried Interest	Fee	Expense	Expense	Expense ⁷
					KKR Mezza	anine	\$0	\$0	\$0	\$0	\$0	\$0
				_	PIMCO BR	AVO	\$0	\$0	\$49	\$0	\$489	\$538
							\$0	\$0	\$49	\$0	\$489F	\$538



¹(DPI) is equal to (capital returned / capital called)

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

³Last known market value + capital calls - distributions (preliminary MV's as of 9/30/19)

⁴Investment period ended, no further capital to be called.

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

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

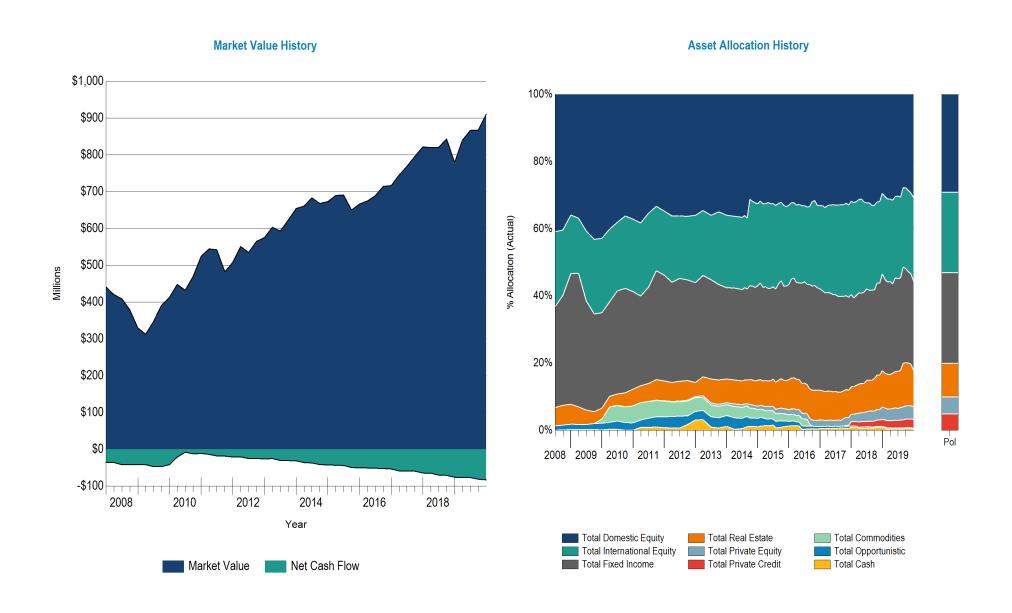
⁷All fees and expenses are for 3Q 2019

Manager	Beginning Market Value	Contributions	Disbursements	Fees ²	Net Cash Flow	Investment Income	Capital Gain/ Loss	Total Gains/Earnings/ Losses	Ending Market Value
Blackrock Russell 3000 Index	\$241,281,135	\$8,000,000	\$0	\$0	\$8,000,000	\$0	\$30,637,053	\$30,637,053	\$279,918,188
DFA Emerging Markets	\$29,528,630	\$0	\$0	\$0	\$0	\$0	\$2,862,712	\$2,862,712	\$32,391,342
Harding Loevner Emerging Markets	\$33,497,943	\$0	\$0	\$0	\$0	\$0	\$4,116,273	\$4,116,273	\$37,614,216
Blackrock International Equity	\$144,983,842	\$0	\$0	\$0	\$0	\$0	\$11,925,820	\$11,925,820	\$156,909,662
Tortoise Capital	\$101,659,060	\$0	(\$1,482,023)	\$0	(\$1,482,023)	\$0	\$469,201	\$469,201	\$100,646,238
MacKay Shields Core Plus Opp.	\$98,375,740	\$0	\$0	\$0	\$0	\$0	\$340,695	\$340,695	\$98,716,435
Blackrock US TIPS	\$43,015,460	\$0	\$0	\$0	\$0	\$0	\$354,527	\$354,527	\$43,369,987
Clarion Lion Properties	\$37,473,444	\$372,663	(\$8,373,601)	(\$92,872)	(\$8,093,810)	\$0	\$750,056	\$750,056	\$30,129,690
ICERS State Street Real Estate	\$1,775,926	\$0	\$0	\$0	\$0	\$10	\$0	\$10	\$1,943,683
ASB Allegiance Real Estate	\$36,283,608		(\$8,000,000)	(\$66,209)	(\$8,066,209)	\$278,147	\$149,007	\$427,154	\$28,644,554
ARA American Strategic Value Realty	\$36,533,695	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,533,695
Portfolio Advisors Credit Strategies Fund	\$12,697,182	\$0	\$0	(\$107,019)	(\$107,019)	\$81,838	\$306,258	\$388,096	\$12,978,259
Crescent Direct Lending II	\$3,924,601	\$917,764	\$0	(\$73,557)	\$844,207	\$0	\$167,230	\$167,230	\$4,936,038
Audax Direct Lending A	\$1,625,122	\$286,700	(\$15,498)	(\$53,997)	\$217,205	\$28,204	\$77,431	\$105,635	\$1,947,962
Ares Capital Europe IV	\$3,703,822	\$573,370	\$0	(\$51,653)	\$521,717	\$88,301	\$66,802	\$155,103	\$4,380,642
Lone Star Fund XI	\$308,452	\$57,978	(\$103,177)	\$0	(\$45,199)	\$0	(\$109,954)	(\$109,954)	\$153,299
PIMCO BRAVO 1	\$138,288	\$0	\$0	(\$538)	(\$538)	\$0	\$41,337	\$41,337	\$179,087
KKR Mezzanine I ¹	\$2,282,552	\$0	\$0	\$0	\$0	\$36,004	(\$39,235)	(\$3,231)	\$2,279,320
HarbourVest International VI ¹	\$2,581,785	\$24,098	(\$137,301)	(\$7,012)	(\$120,215)	\$51	\$92,191	\$92,242	\$2,553,812
HarbourVest Buyout IX ¹	\$7,465,153	\$0	(\$477,680)	(\$30,844)	(\$508,524)	\$354	\$437,196	\$437,550	\$7,394,179
HarbourVest Credit Opportunities IX ¹	\$1,289,458	\$0	(\$93,506)	(\$8,648)	(\$102,154)	\$1,361	\$33,996	\$35,357	\$1,222,661
HarbourVest Venture IX ¹	\$4,848,402	\$0	(\$365,466)	(\$10,564)	(\$376,030)	\$765	\$56,533	\$57,298	\$4,529,670
HarbourVest 2017 Global ¹	\$14,147,410	\$0	(\$750,000)	(\$114,434)	(\$864,434)	\$7,004	\$351,881	\$358,885	\$13,641,861
HarbourVest 2018 Global ¹	\$3,792,900	\$1,000,000	\$0	(\$66,608)	\$933,392	\$0	\$232,502	\$232,502	\$4,958,794
Cash	\$4,185,748	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,990,639
Totals	\$867,399,357	\$11,232,572	(\$19,798,252)	(\$683,955)	(\$9,249,633)	\$522,039	\$53,319,512	\$53,841,550	\$910,963,912

¹Market value as of 9/30/2019/ +/- 4Q19 calls and distributions

²Fee transactions not included in the Portfolio Reconciliation page at beginning of report







Current	Policy
30.7%	29.0%
24.9%	24.0%
26.6%	27.0%
10.7%	10.0%
3.8% 2.7%	5.0%
0.3%	5.0% 0.0%

	Current Balance	Current Allocation	Policy	Difference	Policy Range	Within IPS Range?
Domestic Equity	\$279,918,188	30.7%	29.0%	\$15,738,654	19.0% - 39.0%	Yes
International Equity	\$226,915,220	24.9%	24.0%	\$8,283,881	14.0% - 34.0%	Yes
Domestic Fixed Income	\$242,732,660	26.6%	27.0%	-\$3,227,597	17.0% - 40.0%	Yes
Real Estate	\$97,251,621	10.7%	10.0%	\$6,155,230	5.0% - 15.0%	Yes
Private Equity	\$34,300,977	3.8%	5.0%	-\$11,247,219	0.0% - 10.0%	Yes
Private Credit	\$24,396,200	2.7%	5.0%	-\$21,151,996	0.0% - 10.0%	Yes
Cash and Equivalents	\$2,990,639	0.3%	0.0%	\$2,990,639	0.0% - 0.0%	No
Other	\$2,458,407	0.3%	0.0%	\$2,458,407	0.0% - 10.0%	Yes
Total	\$910,963,912	100.0%	100.0%			



Total Fund Investment Fee Analysis

Period Ending: December 31, 2019

Account	Fee Schedule	Market Value As of 12/31/2019	% of Portfolio	Estimated Annual Fee (\$)	Estimated Annual Fee (%)
1221 State St. Corp	No Fee	\$1,943,683	0.2%		
ARA American Strategic Value Realty	1.25% of First 10.0 Mil, 1.20% of Next 15.0 Mil, 1.10% of Next 25.0 Mil, 1.00% Thereafter	\$36,533,695	4.1%	\$431,871	1.18%
ASB Real Estate	1.25% of First 5.0 Mil, 1.00% of Next 10.0 Mil, 0.75% Thereafter	\$28,644,554	3.2%	\$264,834	0.92%
BlackRock International Equity	0.15% of First 50.0 Mil, 0.10% of Next 50.0 Mil	\$156,909,662	17.4%	\$125,000	0.08%
BlackRock Russell 3000	0.03% of Assets	\$279,918,188	31.1%	\$83,975	0.03%
BlackRock US TIPS	0.07% of Assets	\$43,369,987	4.8%	\$30,359	0.07%
Cash Account	No Fee	\$2,990,639	0.3%		
Clarion Lion	1.25% of First 10.0 Mil, 1.00% of Next 15.0 Mil, 0.85% Thereafter	\$30,129,690	3.3%	\$318,602	1.06%
DFA Emerging Markets Value	0.54% of Assets	\$32,391,342	3.6%	\$174,913	0.54%
Harbourvest 2017 Global Fund	262,500 Annually	\$13,641,861	1.5%	\$262,500	1.92%
Harbourvest 2018 Global Fund	138,000 Annually	\$4,958,794	0.6%	\$138,000	2.78%
Harbourvest Buyout IX	100,000 Annually	\$7,394,179	0.8%	\$100,000	1.35%
Harbourvest Credit Ops IX	20,000 Annually	\$1,222,661	0.1%	\$20,000	1.64%
Harbourvest International PE VI	35,000 Annually	\$2,553,812	0.3%	\$35,000	1.37%
Harbourvest Venture IX	40,000 Annually	\$4,529,670	0.5%	\$40,000	0.88%
Harding Loevner Emerging Markets	1.05% of Assets	\$37,614,216	4.2%	\$394,949	1.05%
KKR Mezzanine Partners	150,000 Annually	\$2,279,320	0.3%	\$150,000	6.58%
MacKay Shields Core Plus Opportunities	0.35% of Assets	\$98,716,435	11.0%	\$345,508	0.35%
PIMCO BRAVO	1.90% of Assets	\$179,087	0.0%	\$3,403	1.90%
Portfolio Advisors Credit Strategies Fund	180,000 Annually	\$12,978,259	1.4%	\$180,000	1.39%
Tortoise Capital	0.29% of First 100.0 Mil, 0.25% of Next 100.0 Mil	\$100,646,238	11.2%	\$286,616	0.28%
Investment Management Fee		\$899,545,971	100.0%	\$3,385,530	0.38%

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



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

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

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

^{*}Portfolio Advisors fee is 0.20% on committed capital and 1.00% on invested capital.

^{*}Total fund market value excludes other investments managed by Portfolio Advisors.

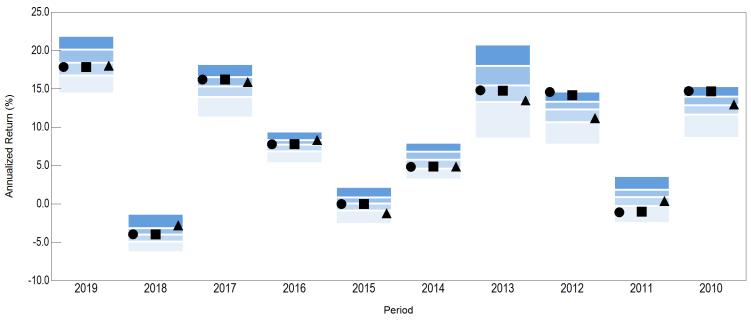
Total Fund Cumulative Performance vs. InvMetrics Public DB Gross



	Return (Ra	nk)								
5th Percentile	6.4	21.9	7.1	21.9	11.)	8.2	9.7	9.6	
25th Percentile	5.7	20.1	6.6	20.1	10.)	7.5	8.8	8.8	
Median	5.2	18.5	6.0	18.5	9.4	4	7.0	8.1	8.1	
75th Percentile	4.7	16.8	5.5	16.8	8.	3	6.5	7.3	7.5	
95th Percentile	3.9	14.4	4.1	14.4	6.3	3	4.7	5.7	5.9	
# of Portfolios	293	289	292	289	28	1 2	268	254	228	
Total FundTotal Fund ex ParametricPolicy Index	5.2 5.2 5.1	(50) 17.9 (50) 17.9 (53) 18.0	(60) 6.0 (60) 6.0 (59) 6.3	(55) 17.9 (55) 17.9 (35) 18.0	(60) 9.0 (60) 9.0 (59) 10.0	6 (44)	7.2 (39) 7.2 (39) 7.3 (36)	7.9 (5 ⁴ 7.9 (5 ⁴ 7.8 (57	4) 8.3 (A	46) 47) 60)



Total Fund Consecutive Periods vs. InvMetrics Public DB Gross

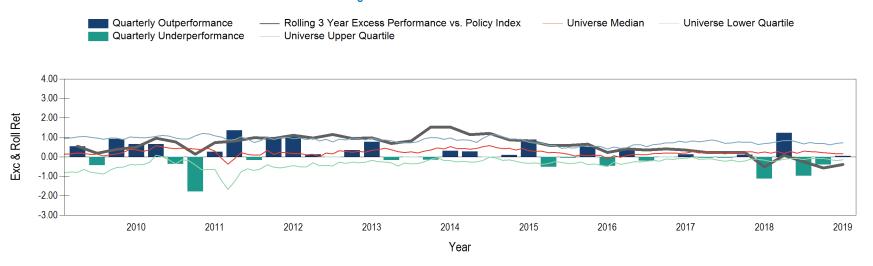


	Return (Rank)								
5th Percentile	21.9	-1.3	18.2	9.4	2.2	8.0	20.8	14.6	3.6	15.4
25th Percentile	20.1	-3.1	16.5	8.4	0.9	6.8	18.0	13.4	1.9	14.0
Median	18.5	-4.0	15.3	7.7	0.1	5.8	15.5	12.4	0.9	12.9
75th Percentile	16.8	-4.9	14.0	6.9	-0.9	4.6	13.3	10.7	-0.3	11.7
95th Percentile	14.4	-6.3	11.3	5.3	-2.6	3.2	8.5	7.8	-2.5	8.6
# of Portfolios	289	319	304	305	316	248	231	236	206	188
Total Fund	17.9 (60)	-4.0 (50)	16.2 (30)	7.8 (49)	0.0 (53)	4.8 (74)	14.8 (59)	14.6 (6)	-1.1 (89)	14.7
Total Fund ex Parametric	17.9 (60)	-4.0 (50)	16.2 (30)	7.8 (49)	0.0 (53)	4.9 (72)	14.7 (59)	14.2 (11)	-1.0 (88)	14.7
▲ Policy Index	18.0 (59)	-2.8 (18)	15.9 (40)	8.3 (26)	-1.2 (81)	4.9 (72)	13.5 (74)	11.2 (72)	0.4 (63)	13.0

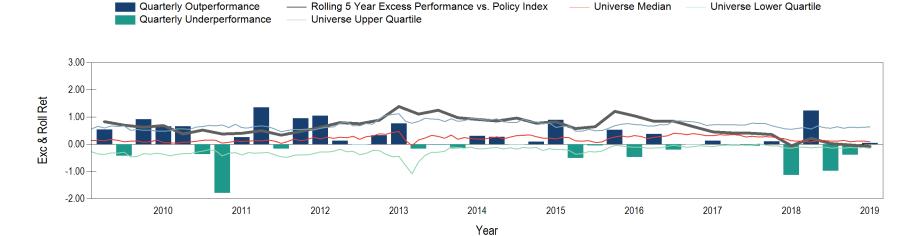


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Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance





	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total Domestic Equity	279,918,188	9.1	10.4	31.1	14.6	11.3	13.4	31.1	-5.2	21.2	12.9	0.3
Russell 3000		9.1	10.4	31.0	14.6	11.2	13.4	31.0	-5.2	21.1	12.7	0.5
InvMetrics Public DB US Eq Gross Rank		15	8	19	20	24	30	19	35	35	51	44
BlackRock Russell 3000	279,918,188	9.1	10.4	31.1	14.6			31.1	-5.2	21.2	12.9	
Russell 3000		9.1	10.4	31.0	14.6			31.0	-5.2	21.1	12.7	
eV US All Cap Core Equity Gross Rank		37	37	43	44			43	49	49	35	

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

Large
Value

Total Domestic Equity

BlackRock Russell 3000

Mid
Value

Small
Value

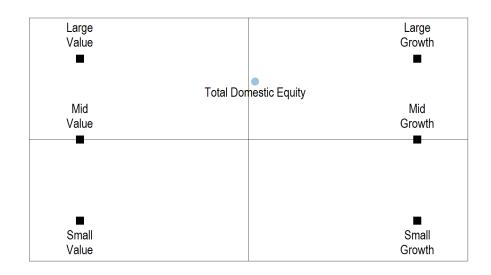
Small
Value

Large
Growth

Growth

Small
Growth

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





	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total Domestic Equity	279,918,188	9.1	10.4	31.1	14.6	11.2	13.3	31.1	-5.2	21.2	12.8	0.1
Russell 3000		9.1	10.4	31.0	14.6	11.2	13.4	31.0	-5.2	21.1	12.7	0.5
BlackRock Russell 3000	279,918,188	9.1	10.4	31.1	14.6			31.1	-5.2	21.2	12.8	
Russell 3000		9.1	10.4	31.0	14.6			31.0	-5.2	21.1	12.7	

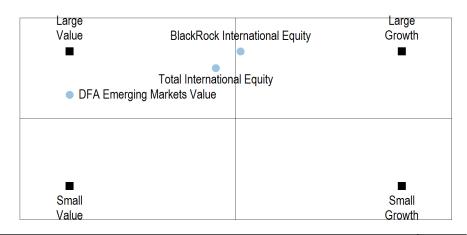


	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total International Equity	226,915,220	9.1	6.6	21.0	10.1	6.2	5.2	21.0	-14.0	28.3	4.7	-3.5
MSCI ACWI ex USA Gross		9.0	7.1	22.1	10.4	6.0	5.4	22.1	-13.8	27.8	5.0	-5.3
InvMetrics Public DB ex-US Eq Gross Rank		74	85	77	50	48	85	77	35	59	40	57
BlackRock International Equity	156,909,662	8.2	7.1	22.5	10.0	6.1	5.9	22.5	-13.4	25.5	1.5	-0.5
MSCI EAFE Gross		8.2	7.1	22.7	10.1	6.2	6.0	22.7	-13.4	25.6	1.5	-0.4
eV All EAFE Equity Gross Rank		71	66	56	51	64	81	56	35	65	47	67
DFA Emerging Markets Value	32,391,342	9.9	2.3	10.3	9.5	5.3	2.9	10.3	-11.4	34.5	20.5	-18.3
MSCI Emerging Markets Gross		11.9	7.3	18.9	12.0	6.0	4.0	18.9	-14.2	37.8	11.6	-14.6
eV Emg Mkts Equity Gross Rank		75	92	94	80	74	99	94	16	70	7	92
Harding Loevner Emerging Markets	37,614,216	12.3	8.4	25.4	11.3			25.4	-18.6	35.0		
MSCI Emerging Markets Gross		11.9	7.3	18.9	12.0			18.9	-14.2	37.8		
eV Emg Mkts Equity Gross Rank		30	32	21	58			21	84	68		

EAFE Effective Style Map 3 Years Ending December 31, 2019



EAFE Effective Style Map 5 Years Ending December 31, 2019





	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total International Equity	226,915,220	9.0	6.4	20.7	9.8	5.8	4.8	20.7	-14.3	27.9	4.4	-4.0
MSCI ACWI ex USA Gross		9.0	7.1	22.1	10.4	6.0	5.4	22.1	-13.8	27.8	5.0	-5.3
BlackRock International Equity	156,909,662	8.2	7.0	22.4	9.9	6.0	5.7	22.4	-13.5	25.4	1.3	-0.6
MSCI EAFE Gross		8.2	7.1	22.7	10.1	6.2	6.0	22.7	-13.4	25.6	1.5	-0.4
DFA Emerging Markets Value	32,391,342	9.7	2.0	9.6	8.9	4.7	2.3	9.6	-11.9	33.8	19.8	-18.8
MSCI Emerging Markets Gross		11.9	7.3	18.9	12.0	6.0	4.0	18.9	-14.2	37.8	11.6	-14.6
Harding Loevner Emerging Markets	37,614,216	12.0	7.9	24.0	10.1			24.0	-19.5	33.6		
MSCI Emerging Markets Gross		11.9	7.3	18.9	12.0			18.9	-14.2	37.8		

EM Effective Style Map 3 Years Ending December 31, 2019

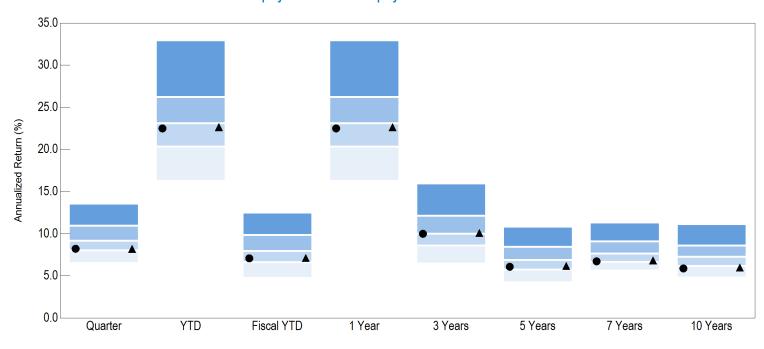


EM Effective Style Map 5 Years Ending December 31, 2019





BlackRock International Equity vs. eV All EAFE Equity Gross Universe



	Return (Ra	ank)														
5th Percentile	13.6		32.9		12.5		32.9		16.0		10.8		11.3		11.1	
25th Percentile	11.0		26.3		9.9		26.3		12.2		8.5		9.1		8.6	
Median	9.2		23.2		8.0		23.2		10.0		6.9		7.7		7.3	
75th Percentile	8.1		20.4		6.7		20.4		8.6		5.8		6.7		6.2	
95th Percentile	6.5		16.3		4.8		16.3		6.5		4.3		5.7		4.8	
# of Portfolios	388		387		387		387		370		327		289		253	
 BlackRock International Equity MSCI EAFE Gross 	8.2 8.2	(71) (71)	22.5 22.7	(56) (54)	7.1 7.1	(66) (65)	22.5 22.7	(56) (54)	10.0 10.1	(51) (49)	6.1 6.2	(64) (62)	6.7 6.8	(74) (71)	5.9 6.0	(81) (79)



BlackRock International Equity vs. eV All EAFE Equity Gross Universe



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

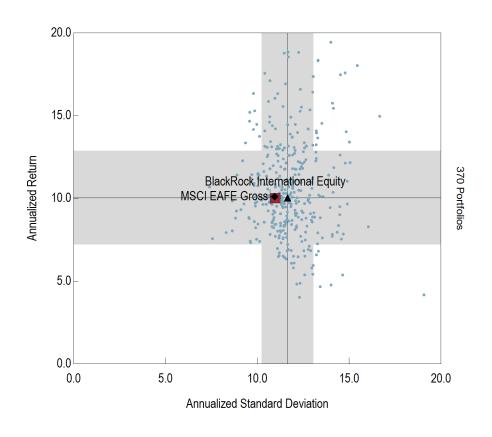
BlackRock International Equity

MSCI EAFE Gross

Return	(Rank)																	
32.9	,	-8.0		39.0		8.1		12.6		3.0		36.3		31.7		-5.1		25.7	
26.3		-12.6		31.6		3.4		5.2		-1.9		28.1		23.1		-9.7		16.1	
23.2		-15.1		27.0		1.3		1.4		-3.7		24.6		20.4		-12.0		11.7	
20.4		-17.8		24.3		-0.6		-0.9		-5.4		20.5		17.5		-14.5		8.7	
16.3		-22.2		19.7		-4.9		-5.4		-8.6		8.6		13.3		-18.2		4.6	
387		391		370		350		325		314		284		263		278		352	
22.5 22.7	(56) (54)	-13.4 -13.4	(35) (35)	25.5 25.6	(65) (63)	1.5 1.5	(47) (47)	-0.5 -0.4	(67) (66)	-4.7 -4.5	(64) (60)	23.2 23.3	(61) (60)	17.8 17.9	(74) (72)	-11.8 -11.7	(48) (47)	8.1 8.2	(79) (78)

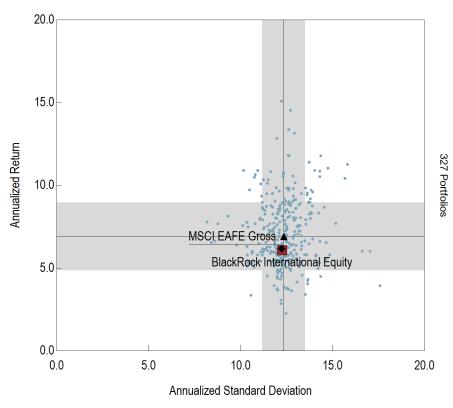


Annualized Return vs. Annualized Standard Deviation 3 Years Ending December 31, 2019



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

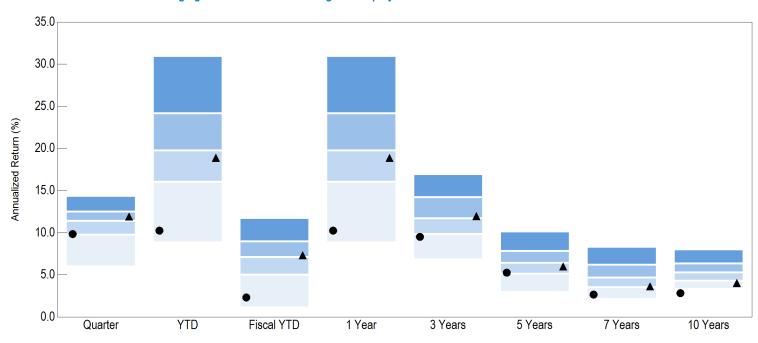
Annualized Return vs. Annualized Standard Deviation 5 Years Ending December 31, 2019



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



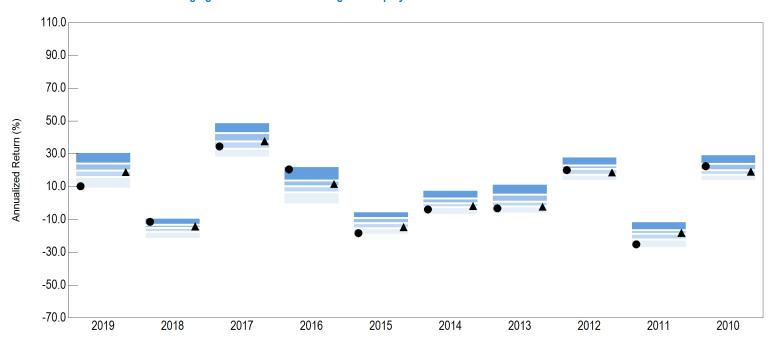
DFA Emerging Markets Value vs. eV Emg Mkts Equity Gross Universe



	Return (R	ank)														
5th Percentile	14.4		31.0		11.7		31.0		16.9		10.1		8.3		8.0	
25th Percentile	12.5		24.2		9.0		24.2		14.2		7.9		6.2		6.4	
Median	11.5		19.8		7.1		19.8		11.7		6.5		4.7		5.3	
75th Percentile	9.8		16.1		5.1		16.1		9.9		5.2		3.6		4.3	
95th Percentile	6.0		8.9		1.2		8.9		6.9		3.0		2.2		3.3	
# of Portfolios	375		373		374		373		347		304		251		150	
DFA Emerging Markets ValueMSCI Emerging Markets Gross	9.9 11.9	(75) (36)	10.3 18.9	(94) (57)	2.3 7.3	(92) (47)	10.3 18.9	(94) (57)	9.5 12.0	(80) (47)	5.3 6.0	(74) (60)	2.7 3.6	(89) (74)	2.8 4.0	(99) (83)



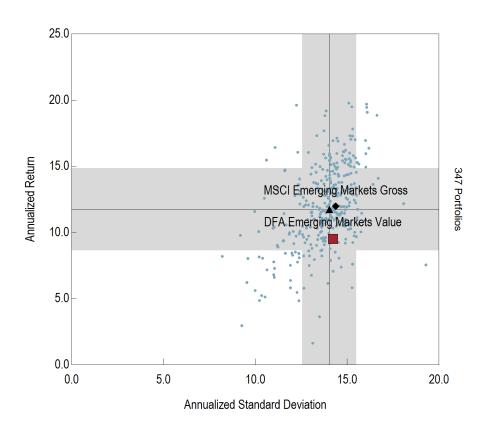
DFA Emerging Markets Value vs. eV Emg Mkts Equity Gross Universe



	Return (Ran	ık)								
5th Percentile	31.0	-9.0	49.2	22.4	-5.0	8.0	11.7	28.4	-11.1	29.6
25th Percentile	24.2	-13.2	42.8	13.7	-9.0	2.9	5.2	23.0	-16.4	23.9
Median	19.8	-15.2	37.6	10.4	-12.2	-0.1	1.0	20.9	-18.6	20.1
75th Percentile	16.1	-17.4	33.2	6.6	-15.3	-2.4	-2.0	17.3	-22.2	17.3
95th Percentile	8.9	-21.8	27.8	-0.6	-19.2	-7.0	-6.3	13.7	-27.3	13.7
# of Portfolios	373	355	343	337	273	251	198	155	139	113
 DFA Emerging Markets Value MSCI Emerging Markets Gross 	10.3 (94) 18.9 (57)	-11.4 (16) -14.2 (37)	34.5 (70) 37.8 (49)	20.5 (7) 11.6 (40)	(/	-3.9 (84) -1.8 (69)	-3.2 (84) -2.3 (78)	20.1 (56) 18.6 (68)	-25.2 (92) -18.2 (45)	22.4 (34) 19.2 (62)

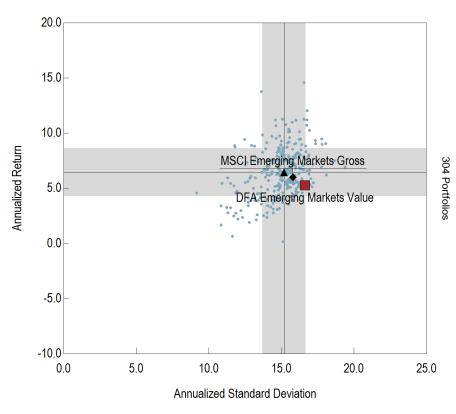


Annualized Return vs. Annualized Standard Deviation 3 Years Ending December 31, 2019



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

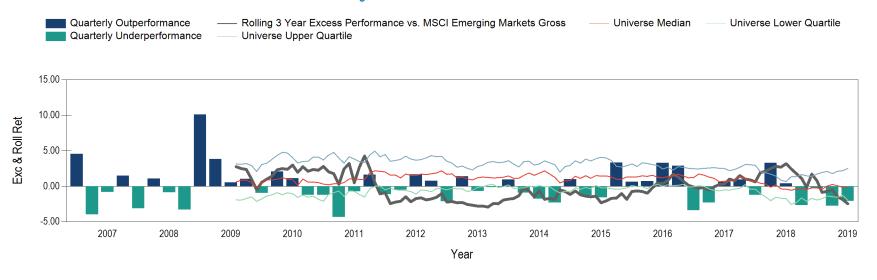
Annualized Return vs. Annualized Standard Deviation 5 Years Ending December 31, 2019



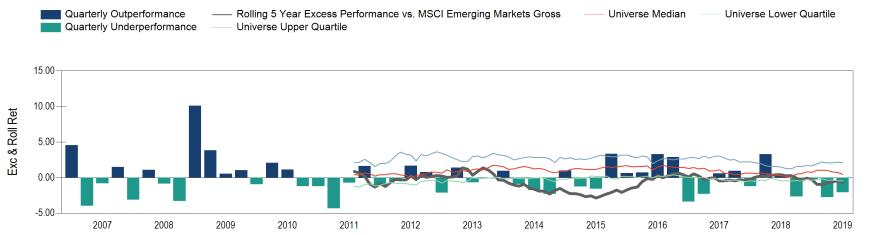
- DFA Emerging Markets Value
- MSCI Emerging Markets Gross
- ▲ Universe Median
- 68% Confidence Interval
- eV Emg Mkts Equity Gross



Rolling 3 Year Annualized Excess Performance



Rolling 5 Year Annualized Excess Performance

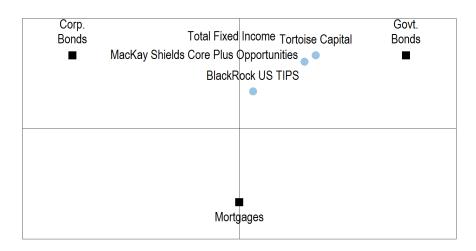


Year

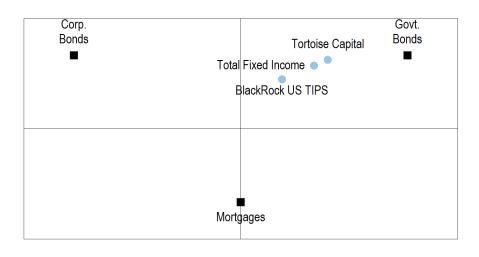


	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total Fixed Income	242,732,660	0.5	2.8	9.8	4.6	3.7	4.9	9.8	-0.5	4.6	5.1	-0.3
BBgBarc US Aggregate TR		0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6
InvMetrics Public DB Total Fix Inc Gross Rank		55	16	29	48	41	30	29	58	59	41	55
Tortoise Capital	100,646,238	0.5	3.0	10.2	4.9	4.2	5.3	10.2	0.2	4.5	5.1	1.2
BBgBarc US Aggregate TR		0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6
eV US Core Plus Fixed Inc Gross Rank		55	33	45	48	25	30	45	24	70	45	15
MacKay Shields Core Plus Opportunities	98,716,435	0.4	3.0	10.1	4.7			10.1	-0.7	4.9	5.1	
BBgBarc US Aggregate TR		0.2	2.5	8.7	4.0			8.7	0.0	3.5	2.6	
eV US Core Plus Fixed Inc Gross Rank		59	29	52	62			52	69	54	46	
BlackRock US TIPS	43,369,987	0.8	2.2	8.5	3.5	2.8	3.5	8.5	-1.1	3.2	4.8	-1.2
BBgBarc US TIPS TR		0.8	2.1	8.4	3.3	2.6	3.4	8.4	-1.3	3.0	4.7	-1.4
eV US TIPS / Inflation Fixed Inc Gross Rank		58	49	47	40	40	47	47	47	46	37	43

Fixed Income Style Map 3 Years Ending December 31, 2019



Fixed Income Style Map 5 Years Ending December 31, 2019



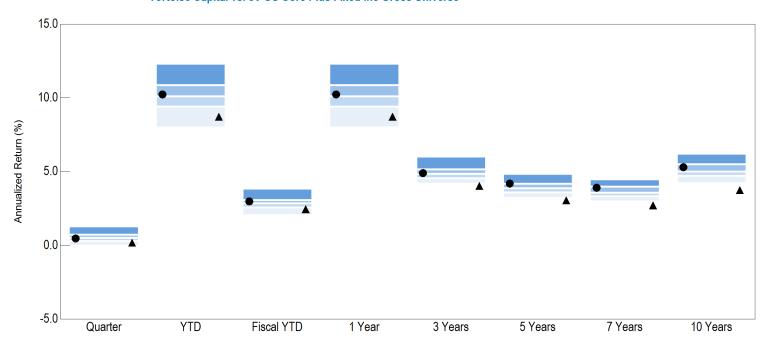
	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total Fixed Income	242,732,660	0.4	2.7	9.5	4.3	3.4	4.6	9.5	-0.8	4.3	4.8	-0.6
BBgBarc US Aggregate TR		0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6
Tortoise Capital	100,646,238	0.4	2.8	9.9	4.6	3.9	5.0	9.9	-0.1	4.3	4.8	0.9
BBgBarc US Aggregate TR		0.2	2.5	8.7	4.0	3.0	3.7	8.7	0.0	3.5	2.6	0.6
MacKay Shields Core Plus Opportunities	98,716,435	0.3	2.8	9.7	4.3			9.7	-1.0	4.5	4.7	
BBgBarc US Aggregate TR		0.2	2.5	8.7	4.0			8.7	0.0	3.5	2.6	
BlackRock US TIPS	43,369,987	8.0	2.1	8.5	3.4	2.7	3.4	8.5	-1.2	3.2	4.8	-1.3
BBgBarc US TIPS TR		0.8	2.1	8.4	3.3	2.6	3.4	8.4	-1.3	3.0	4.7	-1.4

Correlation Matrix Last 5 Years

	Total Fixed Income	Tortoise Capital	MacKay Shields Core Plus Opportunities	BlackRock US TIPS	BBgBarc US Aggregate TR	
Total Fixed Income	1.00					
Tortoise Capital	0.99	1.00				
MacKay Shields Core Plus Opportunities						
BlackRock US TIPS	0.88	0.84		1.00		
BBgBarc US Aggregate TR	0.95	0.96		0.79	1.00	



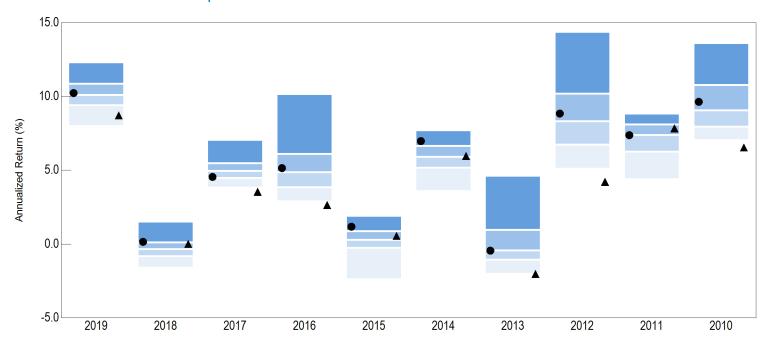
Tortoise Capital vs. eV US Core Plus Fixed Inc Gross Universe



	Return (R	ank)														
5th Percentile	1.3		12.3		3.8		12.3		6.0		4.8		4.5		6.2	
25th Percentile	0.7		10.9		3.1		10.9		5.2		4.2		4.0		5.5	
Median	0.5		10.1		2.9		10.1		4.9		3.9		3.6		5.0	
75th Percentile	0.3		9.4		2.6		9.4		4.6		3.6		3.3		4.7	
95th Percentile	0.0		8.0		2.1		8.0		4.2		3.2		3.0		4.2	
# of Portfolios	113		113		113		113		111		108		104		98	
Tortoise CapitalBBgBarc US Aggregate TR	0.5 0.2	(55) (87)	10.2 8.7	(45) (90)	3.0 2.5	(33) (82)	10.2 8.7	(45) (90)	4.9 4.0	(48) (98)	4.2 3.0	(25) (99)	3.9 2.7	(28) (99)	5.3 3.7	(30) (99)



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



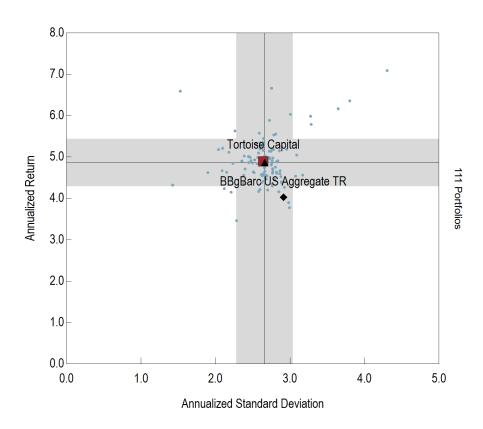
5th Percentile
25th Percentile
Median
75th Percentile
95th Percentile
of Portfolios
Tortoise Capital

Tortoise CapitalBBgBarc US Aggregate TR

Return	(Rank)																		
12.3		1.5		7.0		10.1		1.9		7.7		4.6		14.4		8.8		13.6	
10.9		0.1		5.5		6.1		0.9		6.7		1.0		10.2		8.1		10.8	
10.1		-0.3		5.0		4.9		0.3		5.9		-0.4		8.3		7.4		9.1	
9.4		-0.8		4.5		3.9		-0.2		5.2		-1.0		6.7		6.3		8.0	
8.0		-1.6		3.8		2.9		-2.4		3.6		-2.0		5.1		4.4		7.0	
113		120		122		134		115		118		116		124		118		123	
10.2 8.7	(45) (90)	0.2 0.0	(24) (31)	4.5 3.5	(70) (99)	5.1 2.6	(45) (97)	1.2 0.6	(15) (42)	7.0 6.0	(16) (50)	-0.4 -2.0	(52) (96)	8.8 4.2	(45) (97)	7.4 7.8	(51) (37)	9.6 6.5	(40) (97)

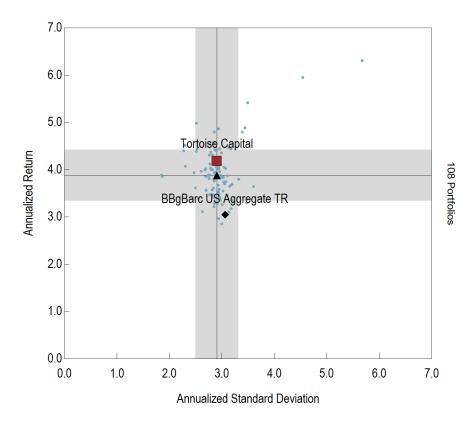


Annualized Return vs. Annualized Standard Deviation 3 Years Ending December 31, 2019



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

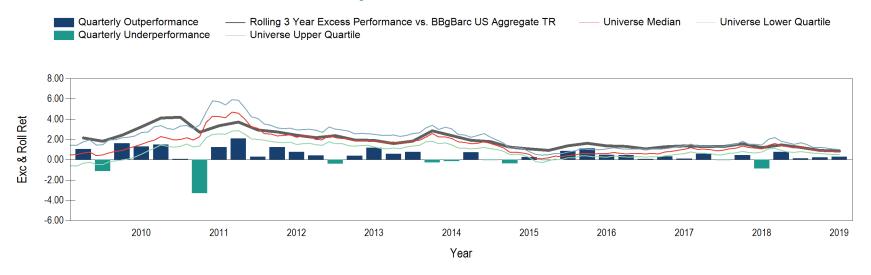
Annualized Return vs. Annualized Standard Deviation 5 Years Ending December 31, 2019



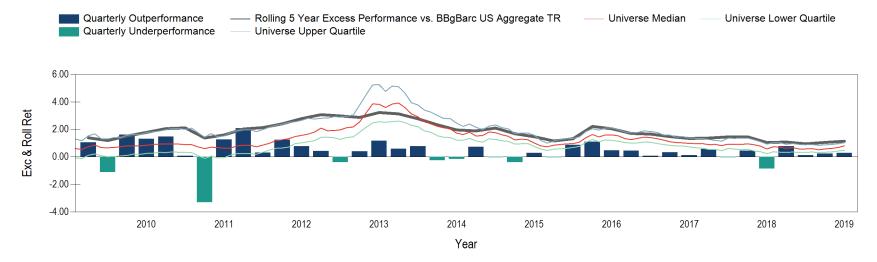
- Tortoise Capital
- BBgBarc US Aggregate TR
- ▲ Universe Median
- 68% Confidence Interval
- eV US Core Plus Fixed Inc Gross



Rolling 3 Year Annualized Excess Performance

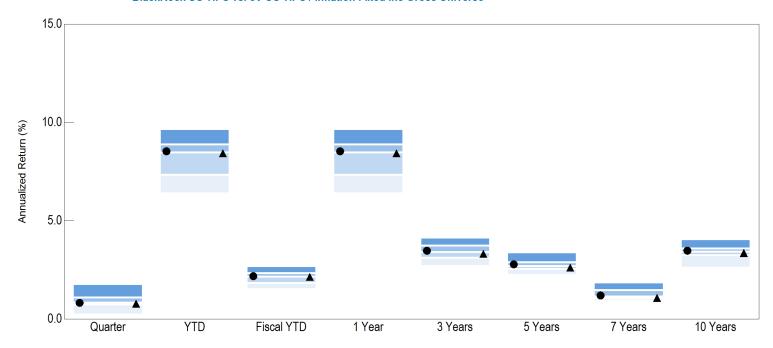


Rolling 5 Year Annualized Excess Performance





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



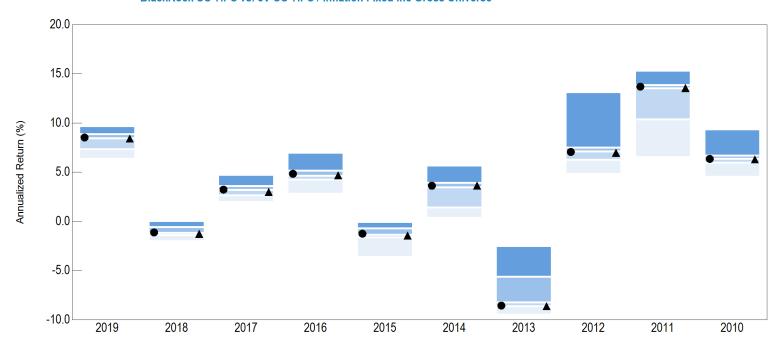
5th Percentile	1.8		9.7		2.7		9.
25th Percentile	1.1		8.9		2.3		8.
Median	0.8		8.5		2.2		8.
75th Percentile	0.7		7.3		1.8		7.
95th Percentile	0.2		6.4		1.5		6.
# of Portfolios	36		36		36		3
BlackRock US TIPS	0.8	(58)	8.5	(47)	2.2	(49)	8.
▲ BBgBarc US TIPS TR	0.8	(69)	8.4	(59)	2.1	(53)	8.

Return (Rank)

5th Percentile	1.8		9.7		2.7		9.7		4.1		3.4		1.9		4.1	
25th Percentile	1.1		8.9		2.3		8.9		3.8		2.9		1.5		3.6	
Median	8.0		8.5		2.2		8.5		3.4		2.7		1.2		3.4	
75th Percentile	0.7		7.3		1.8		7.3		3.1		2.6		1.1		3.3	
95th Percentile	0.2		6.4		1.5		6.4		2.7		2.3		0.9		2.6	
# of Portfolios	36		36		36		36		36		34		34		28	
BlackRock US TIPS BBgBarc US TIPS TR	0.8 0.8	(58) (69)	8.5 8.4	(47) (59)	2.2 2.1	(49) (53)	8.5 8.4	(47) (59)	3.5 3.3	(40) (67)	2.8 2.6	(40) (69)	1.2 1.1	(39) (76)	3.5 3.4	(47) (68)



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



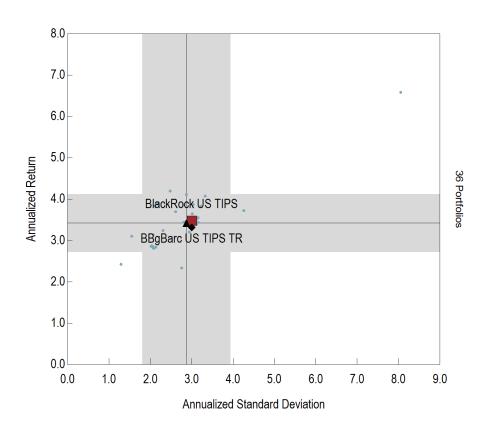
5th Percentile
25th Percentile
Median
75th Percentile
95th Percentile
of Portfolios

•	BlackRock US TIPS
•	BBgBarc US TIPS TF

Return	(Rank)																		
9.7		0.0		4.7		7.0		-0.1		5.7		-2.5		13.1		15.3		9.4	
8.9		-0.6		3.6		5.2		-0.7		4.0		-5.6		7.5		13.9		6.7	
8.5		-1.1		3.2		4.7		-1.3		3.5		-8.2		7.1		13.5		6.4	
7.3		-1.4		2.7		4.3		-1.6		1.4		-8.6		6.3		10.4		6.0	
6.4		-2.0		2.0		2.8		-3.6		0.4		-9.4		4.9		6.6		4.6	
36		41		38		42		44		50		43		43		47		39	
8.5 8.4	(47) (59)	-1.1 -1.3	(47) (65)	3.2 3.0	(46) (71)	4.8 4.7	(37) (47)	-1.2 -1.4	(43) (59)	3.6 3.6	(45) (44)	-8.5 -8.6	(62) (76)	7.1 7.0	(59) (66)	13.7 13.6	(37) (49)	6.4 6.3	(52) (57)

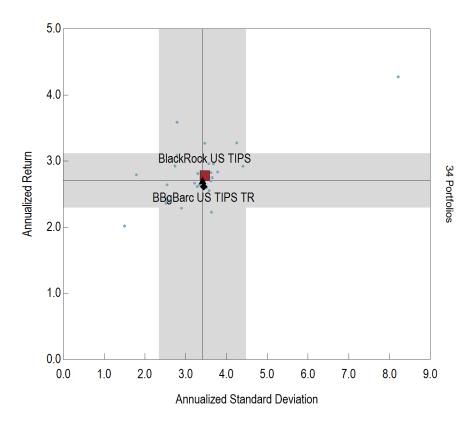


Annualized Return vs. Annualized Standard Deviation 3 Years Ending December 31, 2019



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

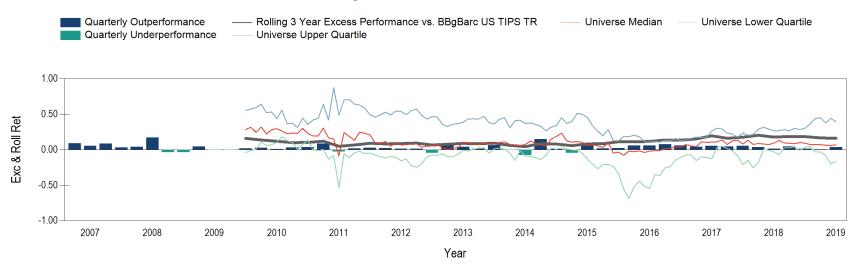
Annualized Return vs. Annualized Standard Deviation 5 Years Ending December 31, 2019



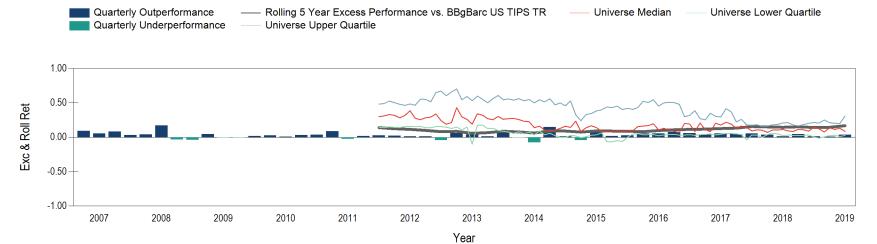
- BlackRock US TIPS
- BBgBarc US TIPS TR
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Rolling 3 Year Annualized Excess Performance



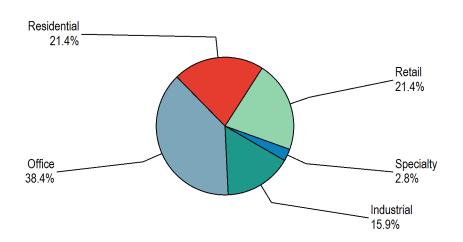
Rolling 5 Year Annualized Excess Performance



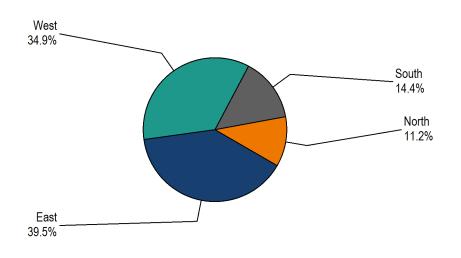


	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
Total Real Estate	97,251,621	1.0	1.7	4.8	6.0	8.3	11.0	4.8	7.5	5.8	7.5	16.1
NCREIF ODCE		1.5	2.9	5.4	6.5	8.1	10.1	5.4	7.1	7.0	8.0	13.3
ASB Real Estate	28,644,554	8.0	0.0	3.0	4.5	7.2		3.0	6.6	4.0	5.6	17.3
NCREIF-ODCE		1.5	2.9	5.4	7.1	9.0		5.4	8.3	7.6	8.8	15.0
NCREIF Property Index		1.6	3.0	6.4	6.7	8.2		6.4	6.7	7.0	8.0	13.3
Clarion Lion	30,129,690	1.8	3.2	6.3	7.6	9.5	12.2	6.3	8.6	7.9	9.1	15.7
NCREIF-ODCE		1.5	2.9	5.4	7.1	9.0	11.4	5.4	8.3	7.6	8.8	15.0
NCREIF Property Index		1.6	3.0	6.4	6.7	8.2	10.2	6.4	6.7	7.0	8.0	13.3
ARA American Strategic Value Realty	36,533,695	0.0	1.5	5.4				5.4				
NCREIF ODCE +2%		2.0	4.0	7.5				7.5				
1221 State St. Corp	1,943,683	7.9	7.9	7.9	2.6	4.9	1.8	7.9	0.0	0.0	17.5	0.0

Property Type Allocation
Allocation as of December 31, 2019



Geographic Diversification
Allocation as of December 31, 2019

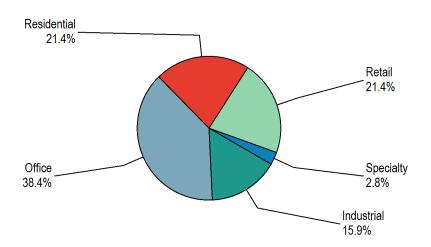


ARA American Strategic Value Realty funded 1/4/2018.

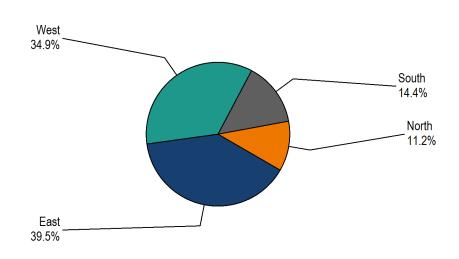


	Market Value	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2019	2018	2017	2016	2015
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ASB Real Estate	28,644,554	8.0	0.0	3.0	4.5	6.8		3.0	6.6	4.0	4.6	16.2
NCREIF-ODCE		1.5	2.9	5.4	7.1	9.0		5.4	8.3	7.6	8.8	15.0
NCREIF Property Index		1.6	3.0	6.4	6.7	8.2		6.4	6.7	7.0	8.0	13.3
Clarion Lion	30,129,690	1.8	3.2	6.3	7.6	9.0	11.4	6.3	8.6	7.9	8.0	14.6
NCREIF-ODCE		1.5	2.9	5.4	7.1	9.0	11.4	5.4	8.3	7.6	8.8	15.0
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ARA American Strategic Value Realty	36,533,695	0.0	1.5	5.4				5.4				
NCREIF ODCE +2%		2.0	4.0	7.5				7.5				
1221 State St. Corp	1,943,683	7.9	7.9	7.9	2.6	4.9	1.8	7.9	0.0	0.0	17.5	0.0

Property Type Allocation
Allocation as of December 31, 2019



Geographic Diversification
Allocation as of December 31, 2019



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



Performance Return Calculations

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

Data Source

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

Illiquid Alternatives

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

Manager Line Up					
Manager	Inception Date	Data Source	Manager	Inception Date	Data Source
BlackRock Russell 3000	12/10/2015	J.P. Morgan	1221 State Street Corp	9/30/2008	ICERS/Union Bank
BlackRock International Equity	7/3/2003	J.P. Morgan	Cash	-	J.P. Morgan
DFA Emerging Markets Value	1/11/2007	J.P. Morgan	HarbourVest IX-Buyout	2011 ¹	HarbourVest
Harding Loevner	7/5/2016	Harding Loevner	HarbourVest IX-Credit	2011 ¹	HarbourVest
Bradford & Marzec Fixed (Tortoise Capital)	12/1/1992	J.P. Morgan	HarbourVest International VI	2008 ¹	HarbourVest
MacKay Shields Core Plus Ops	3/2/2015	CITCO	Harbourvest IX-Venture	2011 ¹	HarbourVest
BlackRock US TIPS	4/11/2007	J.P. Morgan	Harbourvest 2017 Global	2017 ¹	HarbourVest
ASB Real Estate	12/31/2012	ASB Real Estate	Harbourvest 2018 Global	2018 ¹	HarbourVest
Clarion Lion	12/31/2006	Clarion Lion	Harbourvest 2019 Global	2019 ¹	HarbourVest
Portfolio Advisors	10/31/2017	Portfolio Advisors	KKR Mezzanine	2010 ¹	KKR
			PIMCO BRAVO	2011 ¹	PIMCO
			ARA American Strategic Value Realty	43104	ARA

¹Represents fund vintage year.

Policy & Custom Index Composition

Policy Index (10/1/2018-Current)

29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc Aggregate, 10% NCREIF Property, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged).

Policy Index (10/1/2016-9/30/2018)

29% Russell 3000, 24% MSCI ACWI ex USA Gross, 27% BBgBarc Aggregate, 5% NCREIF Property, 5% NCREIF Property +2%, 5% Russell 3000 +3% (Lagged), 5% BBgBarc High Yield +2% (Lagged).

Policy Index (7/1/2014-9/30/2016)

29% Russell 3000, 25% MSCI ACWI ex-US (Gross), 30% Barclays U.S. Aggregate, 6% NCREIF Property Index, 5% Bloomberg Commodity Index, 5% Russell 3000 +3% (Lagged).



Glossary

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

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

Beachmark R-squared: Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager. **Beta:** A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

Book-to-Market: The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios. Capture Ratio: A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

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

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

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

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

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

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

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

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

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

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

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

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

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

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