



ANGELES' LONG TERM CAPITAL MARKET ASSUMPTIONS AS OF JANUARY 2019

INTRODUCTION:

This report presents Angeles Investment Advisors' updated capital market assumptions as of January 2019. These assumptions are used in asset allocation modeling for our clients over a long-term horizon (>10 years).

Versus our assumptions a year ago, we have made several changes:

- Our US, international and emerging market equity return assumptions increased from last year, reflecting a view of normal valuations going into the year. Starting valuations at year-end 2018 appeared fair relative to historical data. In contrast, one year ago, we had expected P/E multiple contraction in light of elevated valuations in some regions, relative to historical data. As a result, Angeles' global equity return assumption increased 40 basis points from 6.4% a year ago to 6.8%.
- The expected return for direct hedge funds was revised down to 5.0% from 5.5%, reflecting a more conservative view of these more opportunistic strategies relative to global equity and fixed income.
- Return expectations for many fixed income categories were increased on the basis of higher starting yields. US core fixed income's expected return increased from 2.75% to 3.25%. Investment grade credit and long credit expected returns increased by 75 bps each to 4.0% and 5.0%, respectively. High yield had the greatest increase in expected return, adjusted from 4.75% to 6.25%, while bank loans increased 50 bps to 4.25%. The return expectations for emerging markets debt increased to 6.75% for dollar-denominated debt and 6.25% for local currency based debt. Expected returns for US short term debt, municipals, and cash were revised up 25 bps each to 2.25%.
- Across real assets, long term return expectations dropped. US and global real estate securities and private core real estate decreased 50 bps from 5.0% to 4.5% as dividend yields have increased, but dividend growth prospects are diminished. The return expectation for infrastructure decreased to 4.5% to bring it in-line with core real estate. The expected return for timber was reduced further from 5.0% to 4.0%.
- Risk (defined as expected standard deviation of returns) and correlation assumptions reflect historical data through the end of 2018. We modestly increased expected risk for US TIPS (from 7.0% to 7.5%) and MLPs (19.0% to 20.0%) and made no other changes to our risk assumptions. No changes were made to correlation assumptions this year.



We continue to underscore the importance of judgment in using these long-term return and risk assumptions in a quantitative mean variance optimization framework. The recommendations that Angeles presents to its clients on investment policy are derived more from our experience and knowledge than from the “black box” output of mean variance optimization.

WHAT ARE CAPITAL MARKET ASSUMPTIONS?

Capital market assumptions are forecasts for future long-term annualized returns, the standard deviation (volatility) of expected returns, and the correlation of expected returns among asset categories. These assumptions are inputs into asset allocation models. At Angeles, we view the long term as an investment horizon of at least ten years.

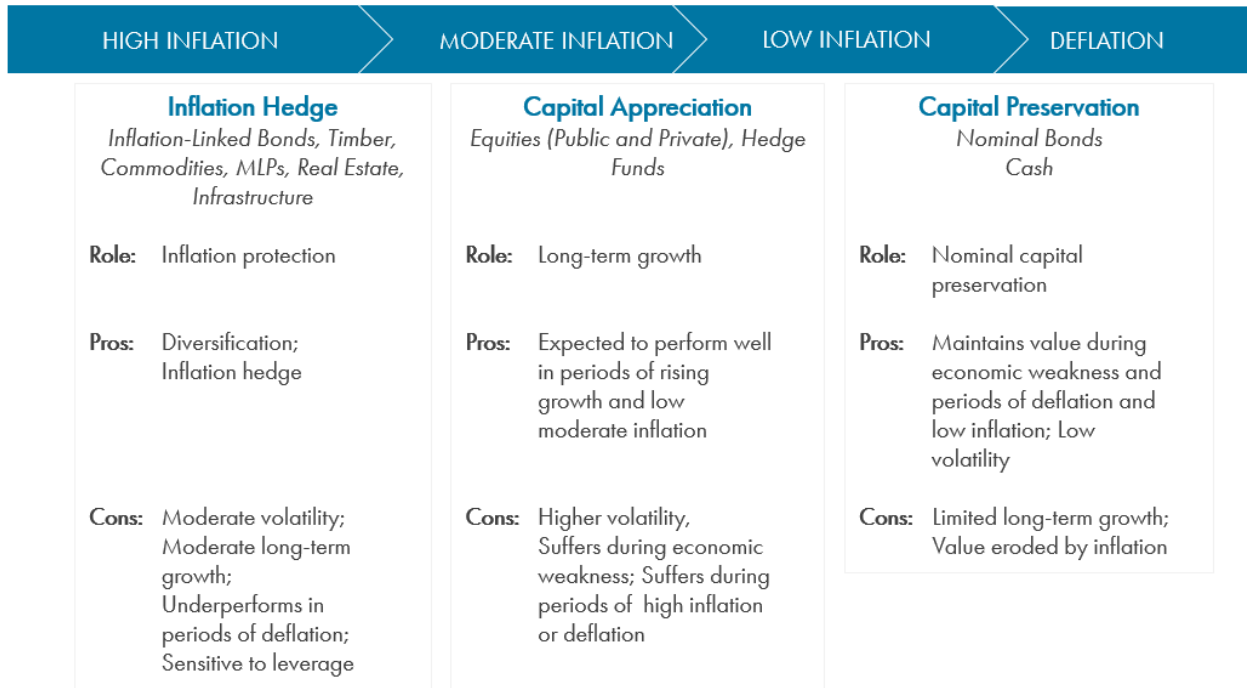
On an annual basis, Angeles formally develops long term capital market assumptions whereby our Investment Committee forecasts the total return, risk (measured by standard deviation), and correlation coefficients for all major and many sub-asset classes as well as inflation. Angeles reviews these assumptions semi-annually as well.

Asset class assumptions are based on passively invested portfolios, net of investment management fees and transaction costs. In other words, public market equity and fixed income forecasts *do not* include the impact of active management or any premium/shortfall due to active management decisions. In categories where there is no passively managed vehicle, such as private equity, hedge funds, and private real estate, we estimate the broad asset class return based upon private partnership vehicle performance, net of all fees and expenses. As such, these return expectations do incorporate some level of active premium.

The capital market assumptions used in asset allocation modeling cannot be relied upon by themselves as a recommendation to invest in any particular asset class. Considerations such as diversification, supply and quality of investment managers, implementation issues and costs, capacity constraints, liquidity constraints, business risks, and the potential for active management premiums should all be evaluated. Each investor’s particular circumstances should be considered as part of the asset allocation process.

Angeles’ conceptual approach to asset allocation is illustrated below and groups a portfolio into three broad categories: (i) Capital Preservation, (ii) Capital Appreciation, and (iii) Inflation Hedged Assets. These three categories serve distinct and important roles in a portfolio and will behave differently in various capital market environments.

FIGURE 1 | CAPITAL MARKET ENVIRONMENT



Our capital market assumptions by asset and sub-asset class, shown on the following page, are organized in this fashion.

TABLE 1 | ANGELES' CAPITAL MARKET ASSUMPTIONS - AS OF JANUARY 2019
US DOLLAR NOMINAL RETURNS (10+ YEARS)

	Expected Return	Expected Standard Deviation	Expected Yield	Expected Sharpe Ratio
Capital Preservation/Risk Reduction				
US Fixed Income	3.25%	5.0%	3.25%	0.20
Investment Grade Credit	4.0%	7.0%	4.0%	0.25
Long-term Credit	5.0%	12.0%	5.0%	0.23
High Yield Debt	6.25%	12.0%	6.25%	0.33
Bank Loans	4.25%	10.0%	4.25%	0.20
Preferred Stock	5.5%	14.0%	5.5%	0.23
Global Fixed Income	2.25%	7.0%	2.25%	0.00
Emerging Market Debt (External/Dollar Denominated)	6.75%	12.0%	6.8%	0.38
Emerging Market Debt (Local Currency)	6.25%	14.0%	6.3%	0.29
US Short-term	2.25%	3.0%	2.3%	0.00
Municipals (National 1-10 Yr)	2.25%	4.0%	2.3%	0.00
Cash	2.25%	1.0%	2.3%	0.00
Capital Appreciation/Growth				
Global Equity	6.8%	17.0%	2.5%	0.27
US Equity	6.5%	16.0%	2.0%	0.27
International Equity	6.5%	18.0%	3.2%	0.24
Emerging Market Equity	9.5%	24.0%	2.6%	0.30
Private Equity	9.5%	20.0%	--	0.36
Direct Hedge Funds	5.0%	8.0%	--	0.34
Hedge Fund of Funds	4.0%	7.0%	--	0.32
Inflation Hedge/Real Assets				
US TIPS	2.25%	7.5%	2.3%	0.00
Global Real Estate Securities	4.5%	19.0%	4.25%	0.12
US REITs	4.5%	19.0%	4.25%	0.12
MLPs	6.5%	20.0%	7.1%	0.21
Private Real Estate - Core	4.5%	10.0%	3.5%	0.23
Private Real Estate - Opportunistic/Value Added	9.5%	20.0%	--	0.36
Gold	3.5%	23.0%	--	0.05
Infrastructure (Private)	4.5%	12.0%	5.0%	0.19
Timber	4.0%	12.0%	5.0%	0.15
Commodities	3.5%	23.0%	--	0.05
US Inflation	2.25%			
Global Inflation	2.2%			

Long term expected return and risk assumptions are not a guarantee of future performance and actual results can and will differ from forecasts over time. The assumptions should not solely be relied upon as a recommendation to invest in any particular asset class. Note that these asset class assumptions are based upon passively invested portfolios net of management fees; they do not consider the impact of active management. Return estimates are shown on a compound return basis, not on arithmetic returns.

Asset class assumptions presented constitute our judgment at the time they were forecasted and are subject to change without notice. Angeles Investment Advisors, LLC attest the information contained herein has been prepared from sources believed reliable but is not guaranteed by us as to its timeliness or accuracy, and is not a complete summary or statement of all available data. This data is intended solely for our clients, is for informational purposes only and may not be publicly disclosed or distributed without our prior written consent.

TABLE 2 | CAPITAL MARKET CORRELATION ASSUMPTIONS

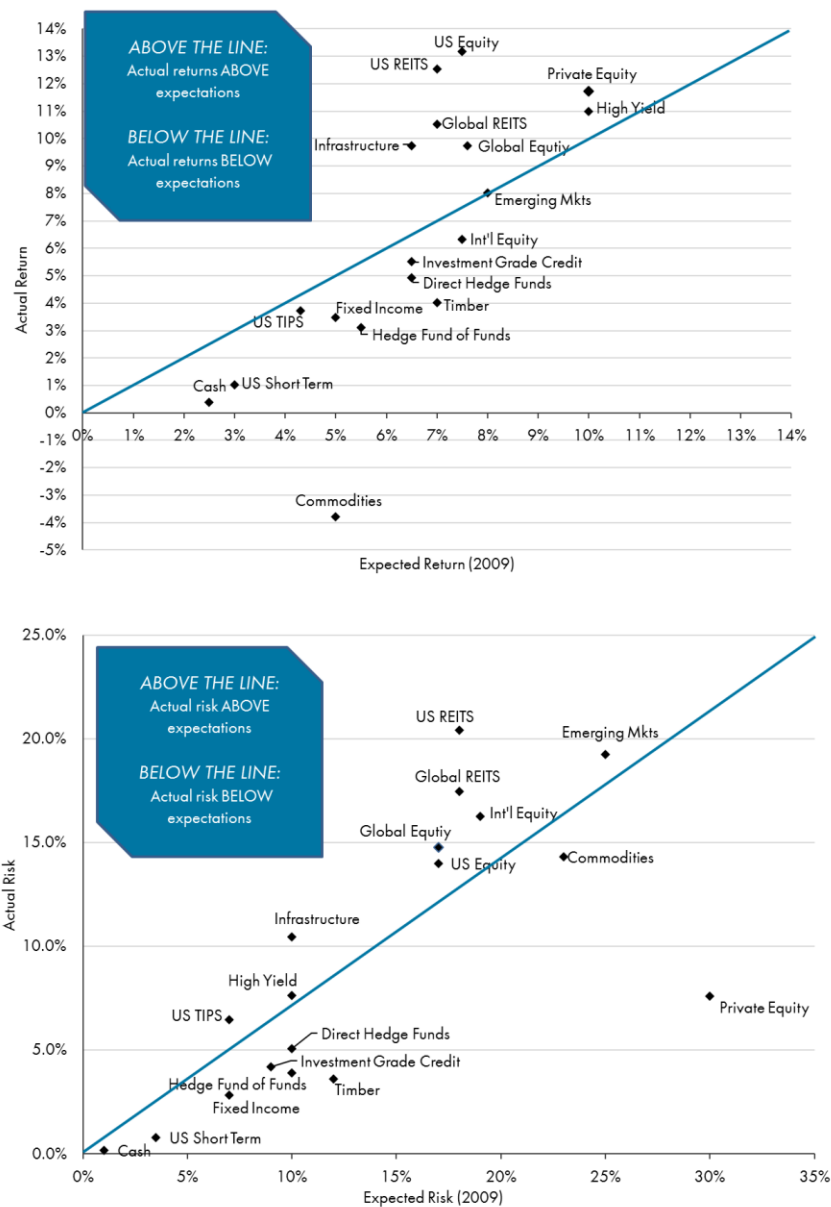
Asset Class	Capital Appreciation / Growth							Capital Preservation / Risk Reduction										Inflation Hedge / Real Assets											
	Global Equity	US Equity	Intl Eq	EM Equity	Private Equity	Direct Hedge Funds	Hedge Fund of Funds	US Core Fixed Income	IG Credit	Long Credit	High Yield	Bank Loans	Pref Stock	Global Fixed Income	EMD External	EMD Local	US Short-term	Municipals (National)	Cash	US TIPS	Global REITs	US REITs	MLPs	Private Real Estate	Gold	Infrastructure	Timber	Commodities	
Global Equity	1.00																												
US Equity	0.95	1.00																											
International Equity	0.95	0.90	1.00																										
Emerging Market Equity	0.90	0.85	0.85	1.00																									
Private Equity	0.65	0.65	0.65	0.60	1.00																								
Direct Hedge Funds	0.85	0.85	0.85	0.65	0.65	1.00																							
Hedge Fund of Funds	0.80	0.80	0.80	0.80	0.65	0.90	1.00																						
US Core Fixed Income	0.05	0.05	0.00	0.00	-0.10	-0.05	-0.05	1.00																					
Investment Grade Credit	0.20	0.20	0.20	0.20	0.00	0.25	0.20	0.75	1.00																				
Long Credit	0.35	0.25	0.35	0.35	0.00	0.25	0.20	0.75	0.95	1.00																			
High Yield	0.75	0.75	0.70	0.75	0.50	0.80	0.75	0.10	0.45	0.40	1.00																		
Bank Loans	0.75	0.75	0.70	0.75	0.50	0.80	0.75	0.10	0.45	0.40	1.00	1.00																	
Preferred Stock	0.60	0.60	0.55	0.60	0.40	0.65	0.60	0.10	0.45	0.40	0.85	0.85	1.00																
Global Fixed Income	0.25	0.20	0.35	0.25	0.00	0.15	0.10	0.70	0.70	0.65	0.15	0.15	0.05	1.00															
Emerging Market Debt External	0.70	0.60	0.70	0.75	0.40	0.65	0.60	0.30	0.65	0.60	0.80	0.80	0.80	0.45	1.00														
Emerging Market Local Currence	0.80	0.70	0.85	0.80	0.50	0.65	0.60	0.20	0.55	0.50	0.65	0.65	0.65	0.55	0.75	1.00													
US Short-term	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	0.75	0.35	0.25	-0.20	-0.20	-0.20	0.50	-0.10	-0.05	1.00												
Municipals (National 1-10 Yr)	-0.10	-0.20	-0.10	0.00	-0.30	-0.20	-0.20	0.90	0.70	0.65	0.05	-0.10	0.25	0.60	0.45	0.20	0.55	1.00											
Cash	0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	-0.10	-0.10	-0.10	0.00	0.00	0.00	0.50	0.05	1.00										
US TIPS	-0.10	-0.10	-0.10	-0.10	0.00	0.00	0.00	0.60	0.45	0.25	0.30	0.30	0.30	0.40	0.45	0.15	0.40	0.40	0.00	1.00									
Global REITs	0.80	0.75	0.80	0.75	0.60	0.75	0.70	0.00	0.40	0.45	0.75	0.75	0.75	0.40	0.75	0.80	-0.15	0.05	0.00	0.10	1.00								
US REITs	0.70	0.75	0.70	0.60	0.50	0.60	0.50	0.00	0.30	0.35	0.65	0.65	0.65	0.30	0.60	0.70	-0.15	0.05	0.00	0.10	0.90	1.00							
MLPs	0.70	0.70	0.70	0.70	0.60	0.80	0.80	0.00	0.30	0.25	0.80	0.80	0.65	0.05	0.70	0.50	-0.20	0.05	0.00	0.20	0.60	0.50	1.00						
Private Real Estate	0.20	0.20	0.20	0.10	0.50	0.20	0.30	-0.10	-0.10	-0.10	0.00	0.00	0.00	0.00	0.00	0.20	0.00	-0.25	0.30	0.00	0.25	0.25	0.00	1.00					
Gold	0.10	0.05	0.15	0.30	0.10	0.20	0.20	0.35	0.30	0.20	0.15	0.05	0.10	0.45	0.40	0.30	0.30	0.40	0.20	0.55	0.10	0.10	0.10	0.05	1.00				
Infrastructure	0.50	0.50	0.50	0.50	0.40	0.40	0.40	0.10	0.30	0.40	0.40	0.40	0.40	0.35	0.65	0.70	0.00	0.00	0.30	0.30	0.50	0.40	0.30	0.30	0.15	1.00			
Timber	0.10	0.10	0.10	0.00	0.20	0.00	0.00	0.10	0.00	0.00	-0.10	-0.10	-0.10	0.20	0.00	0.00	0.20	0.00	0.30	0.00	0.00	-0.15	-0.20	0.30	0.15	0.20	1.00		
Commodities	0.50	0.40	0.50	0.50	0.30	0.60	0.65	-0.10	0.10	0.00	0.50	0.50	0.50	0.15	0.45	0.50	-0.15	-0.15	0.00	0.30	0.40	0.35	0.60	0.30	0.40	0.40	0.00	1.00	

Long-term expected return, risk and correlation assumptions are not a guarantee of future performance and actual results can and will differ from forecasts over time. The assumptions should not solely be relied upon as a recommendation to invest in any particular asset class. Note that these asset class assumptions are based upon passively invested portfolios net of management fees; they do not consider the impact of active management. Return estimates are shown on a compound return basis, not on arithmetic returns.

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Looking back at the last ten years, we revisited our 2009 long-term capital market assumptions to see how our predictions then fared versus actual results through 2018. The past decade was a volatile period, including the tail end of the Global Financial Crisis and Great Recession, the period of deleveraging, the Eurozone debt crisis, and the decline in oil and commodities since mid-2014. During this period, actual return results were below expectations for commodities, cash, short term bonds, timber and hedge funds, and above expectations for US equities, global and US REITs, and infrastructure, but were generally close to return expectations for other major asset classes. Expected risk was also reasonably close to projected results across asset classes. (In reading the charts below, if the asset class plots above the blue line, then the actual trailing 10-year return/risk was higher than our assumption and vice versa).

FIGURE 2 | EXPECTED RETURN AND RISK ASSUMPTIONS IN 2009 VS. ACTUAL TRAILING 10-YEAR RETURN AND RISK



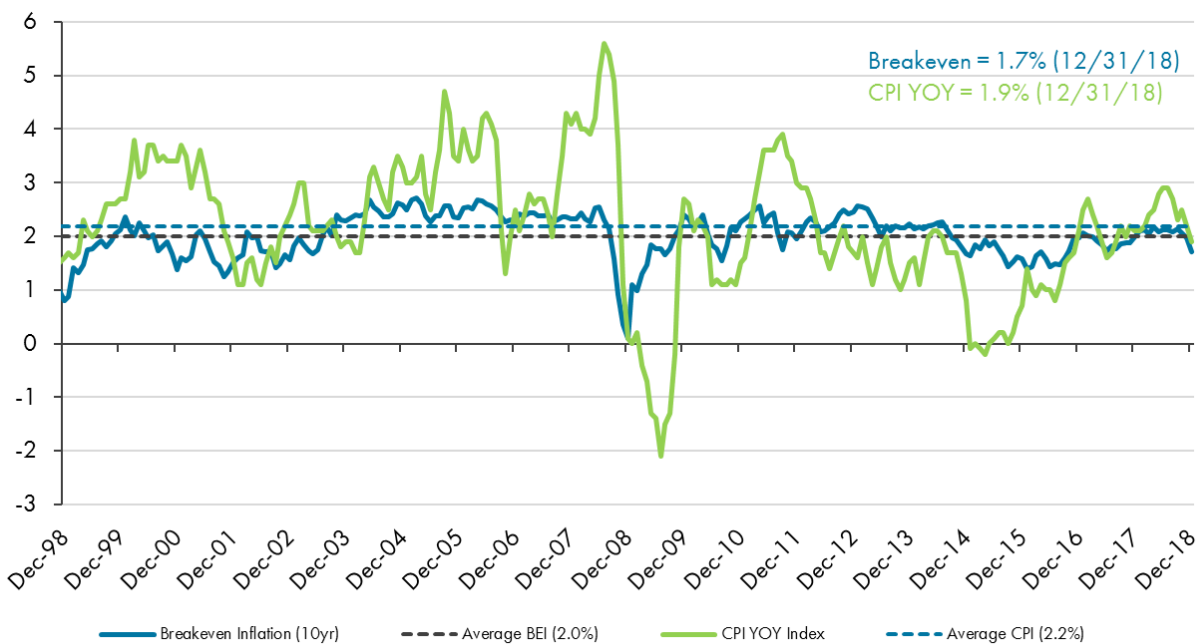
As of December 31, 2018. Data sourced from Morningstar. Expected return and risk data based on Angeles' 2009 Capital Market Assumptions.

INFLATION:

Angeles’ long-term US inflation assumption remains unchanged at 2.25%. We believe the US Federal Reserve will moderately exceed its stated longer run target of 2%, and we expect inflation to remain below the long term average of 2.8% (average since 1922).

The “breakeven” inflation rate is an important factor in setting Angeles’ inflation assumption, as it captures where the market for TIPS¹ is pricing inflation for the coming ten years (assuming a ten-year maturity). The TIPS market has gone from forecasting zero inflation at the depth of the financial crisis (breakeven rate of 0.1% at December 2008), a historic low, to a current breakeven rate of 1.7% (as of December 2018) after dipping at the end of the year amid lower commodity prices and a strong dollar. The low breakeven rates of late 2008 reflected the market’s recessionary and deflationary fears coupled with the illiquidity in the credit markets. Since then, the TIPS and bond markets have normalized amid the reflationary central bank actions around the globe, and are now pricing ten year inflation to be closer to the historical average; see Figure 3.

FIGURE 3 | US BREAKEVEN INFLATION AND CPI



As of December 31, 2018. Data sourced from Bloomberg. The average CPI of 2.2% is calculated using data from August '98- December '18. It differs from the average CPI shown in Figure 4 due to the shorter time horizon.

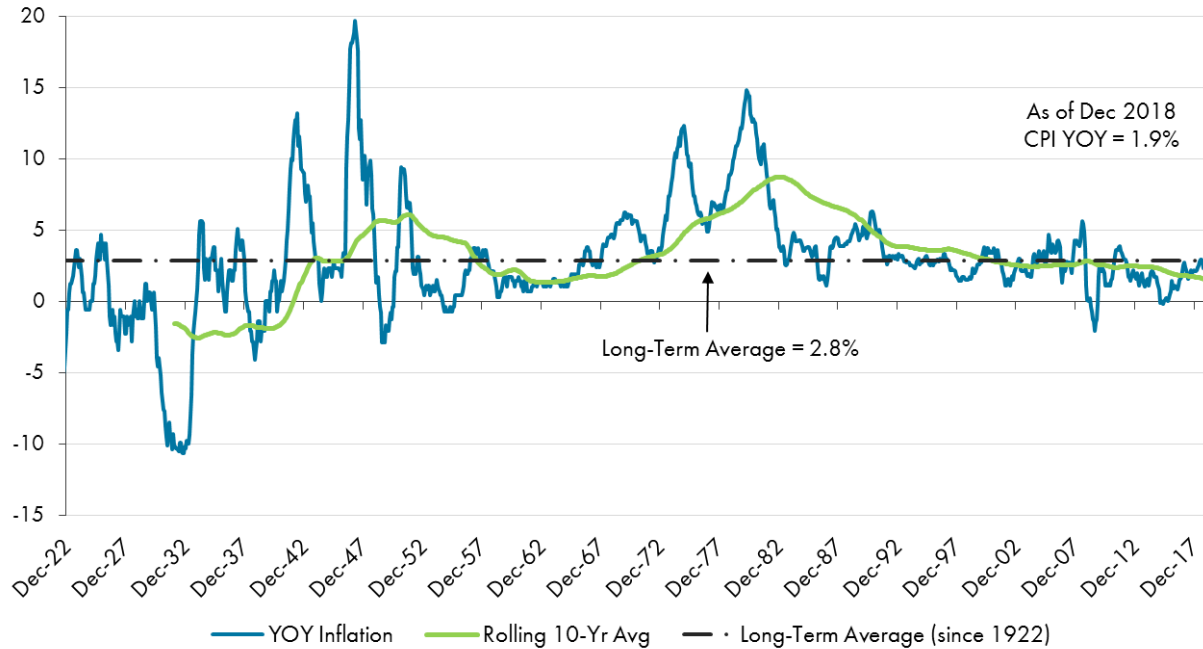
Headline inflation, as measured by the Consumer Price Index (CPI), fluctuated during the year to end at 1.9%. We expect it to remain below the long-term average of 2.8% (going back to 1922), and closer to 20-year average of 2.2%.

Since 1922, year-over-year headline inflation in the US has averaged 2.8%, with considerable amount of variability in the level of inflation, particularly from the 1920s through the 1940s (a period that included both Depression-era deflation as well as post-World War II inflation). Since spiking in the mid-1970s and early

¹ TIPS, which stands for Treasury Inflation Protected Securities, is a US Treasury inflation-linked principal indexed bond that is adjusted by the change in inflation as measured by the Consumer Price Index (CPI) over the term of the bond.

1980s, inflation has remained close to the long-term average and volatility has declined meaningfully. The standard deviation of year-over-year inflation declined from 17.5% (from 1922 through 1981) to 5.0% (from 1982 through 2018). This reduction in volatility is attributable to both the globalization of trade and manufacturing, and the US Federal Reserve’s focus on keeping inflation well-contained. We expect the volatility of inflation to remain low, as the Federal Reserve aims to keep inflation close to its target of 2%.

FIGURE 4 | HEADLINE INFLATION: US CONSUMER PRICE INDEX (CPI)

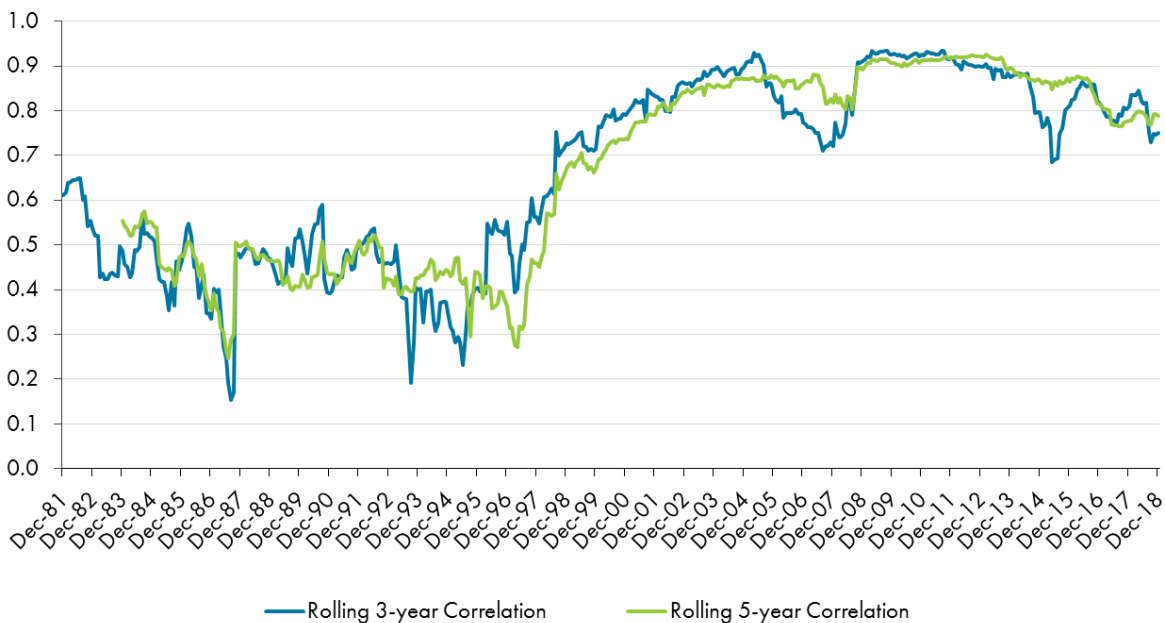


As of December 31, 2018. Data sourced from Bloomberg.

GLOBAL PUBLIC EQUITY RETURNS:

As we have since 2007, Angeles advocates considering US and international equity as a single asset class, global equity. We believe globalizing the equity portfolio is appropriate given the greater interdependence among nations and businesses, the increased influence of global trade on domestic economies, and the fact that country factors are less important attributes in equity performance than in years past. The correlation of US and non-US equity markets has been steadily increasing since the late 1990s and has hovered between 0.7 and 0.9 for most of the past 10 years, as illustrated in Figure 5. This is consistent with the notion that geographic distinctions are of decreasing importance to equity investors.

FIGURE 5 | ROLLING CORRELATIONS OF THE MSCI EAFE AND RUSSELL 3000 INDEX

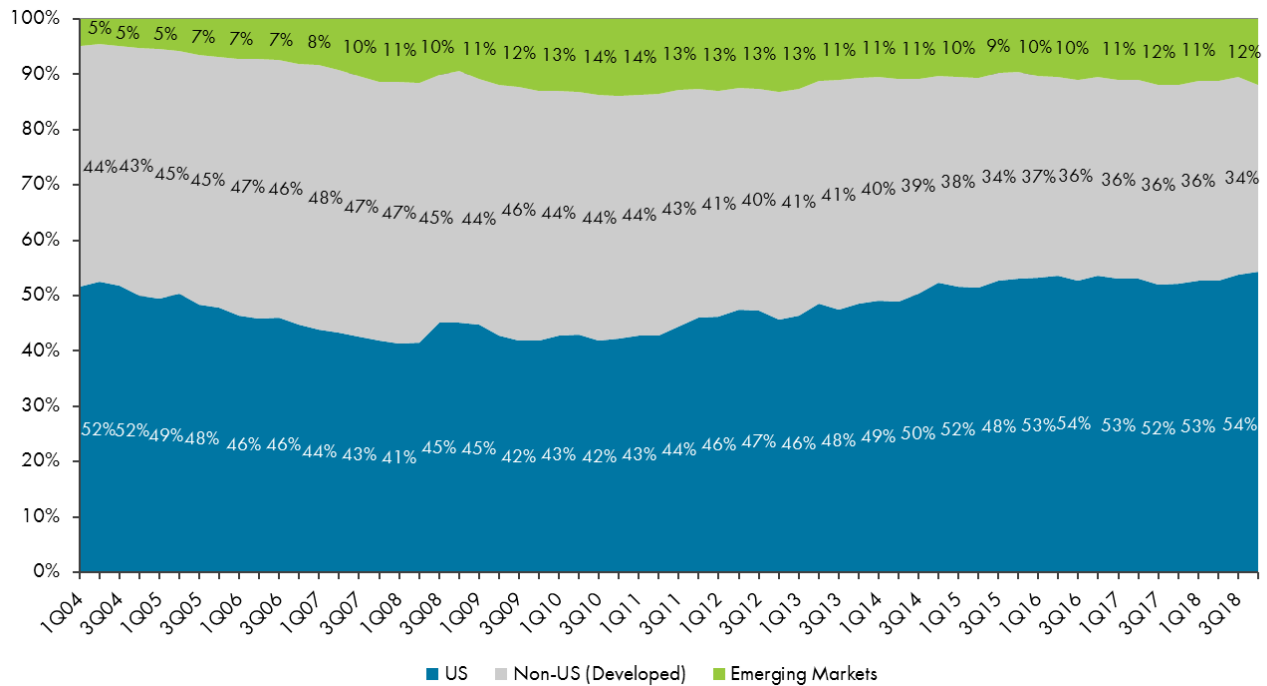


As of December 31, 2018. Monthly returns used. Data sourced from eVestment Alliance. MSCI EAFE returns are in US dollars.

The global equity market was volatile over 2018 and ended the year negative as ongoing geopolitical concerns, weaker than expected Chinese growth, and US central bank tightening weighed negatively on markets toward the end of the year. Within the global equity market, the share of emerging markets stocks, as measured by market capitalization, underperformed the developed world in dollar terms during 2018. The US equity market has seen robust economic data and the dollar rose 3.7% over the course of the year. The US has outperformed the international developed market and emerging markets equities over the last 10 years. From the start of 2009 to the end of 2018, the US share in global equity markets (approximated by the MSCI All Country World Index (ACWI)²) grew from 45% to 54% while the share of non-US developed nations shrank from 46% to 34%. The share of emerging market domiciled issues has more than doubled in size since 2005, growing from 5% in 2005 to 12% in 2018.

² MSCI ACWI is a common global equity benchmark that is market capitalization weighted and includes the US, developed non-US countries, and emerging equity markets.

FIGURE 6 | REGIONAL ALLOCATION WITHIN THE MSCI ACWI (2005-2018)



As of December 31, 2018. Data sourced from MSCI. Emerging Markets classified by MSCI.

In determining our expected return for global equities, Angeles applies a forward-looking fundamental, economic “building block” approach while being mindful of historical returns and trends. The framework used to arrive at the forecasted return of 6.8% for the global equity market separates the total return for equities into five components by major region as illustrated in Figure 7.

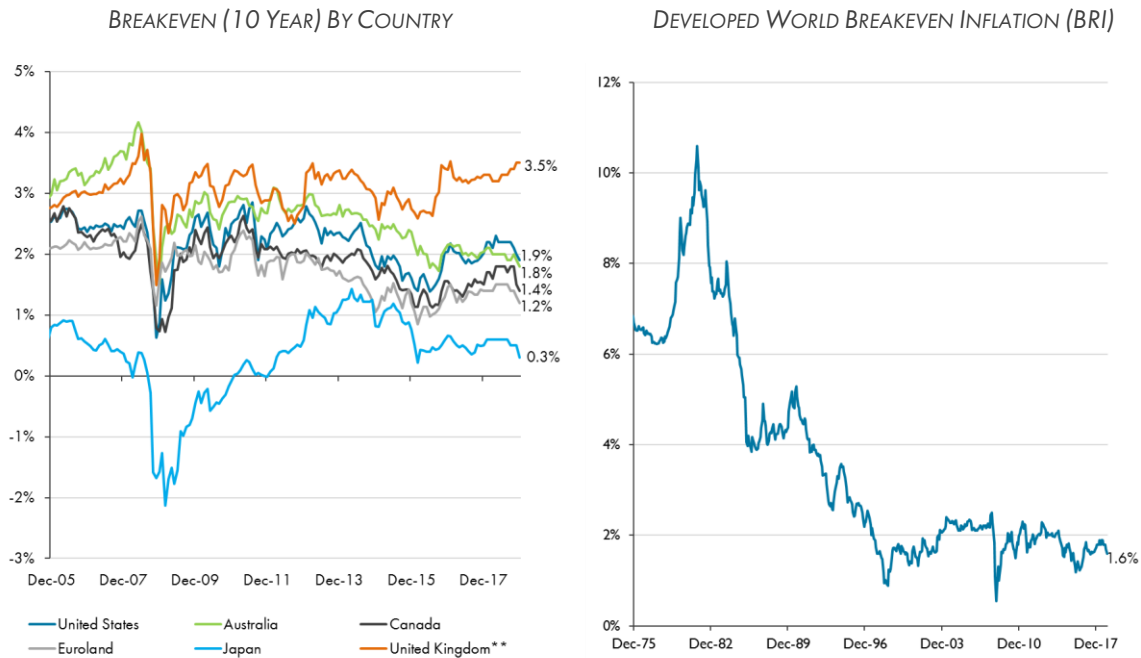
FIGURE 7 | EQUITY BUILDING BLOCKS

	US	Intl	EM	Global
Real GDP Growth	2.25	1.5	3.5	2.1
Dividend Yield	2.0	3.25	2.5	2.5
Inflation	2.25	1.75	3.50	2.2
P/E Expansion or Contraction	0.0	0.0	0.0	0.0
Currency Movements	flat	flat	flat	flat
Expected Total Return for Equities	6.5	6.5	9.5	6.8

Note: Assumes Global Equity weights of 55% for the US, 34% for developed non-US and 11% for emerging markets.

Inflation: Angeles' assumption for global inflation is 2.2% as we expect global levels of inflation to be slightly lower than in the US (2.25%), with low inflation in Japan and the eurozone counteracting higher inflation in the UK and emerging markets. Inflation expectations in non-US developed countries were unchanged from the previous year as "breakeven" inflation rates have been relatively stable.

FIGURE 8 | BREAKEVEN INFLATION RATE



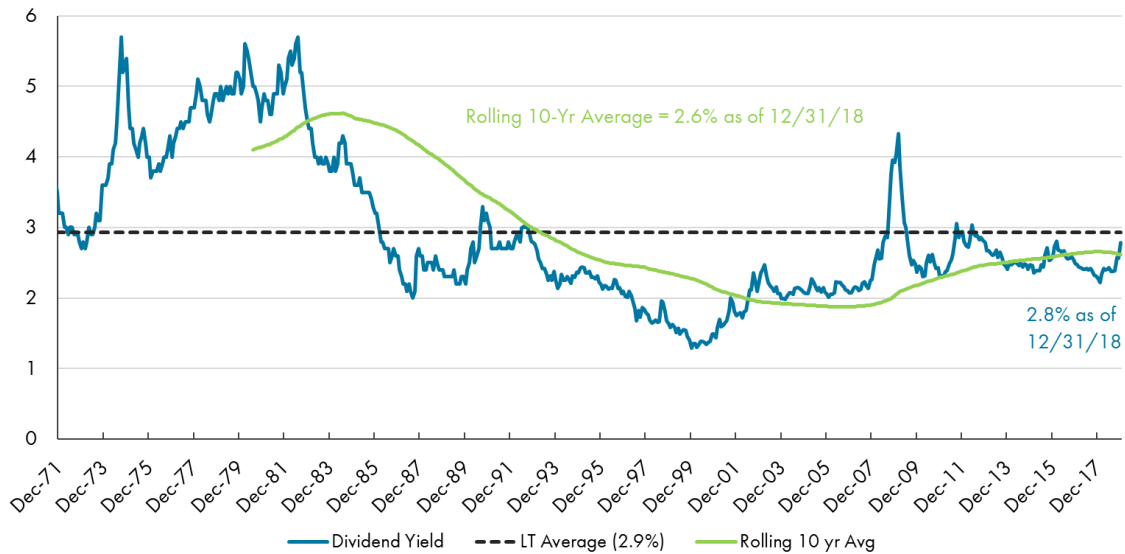
** UK Breakeven rates are calculated from UK inflation-linked bonds, which are based on the Retail Price Inflation (RPI).

As of December 31, 2018. Data provided by Bridgewater Associates. Breakeven rates calculated by Bridgewater and may vary from data provided by other sources such as Bloomberg. Developed World BEI rate is GDP weighted based on the rolling 5-year average nominal GDP.

Dividend/Income Return: The return from dividends has historically been the most stable component of equity returns, though the last few years have experienced some volatility reflecting recent dramatic price swings in global equity markets. As global equity market prices bottomed in early March 2009, the dividend yield of the MSCI ACWI Index peaked at 4.3%. As of December 2018, the dividend yield was 2.8%.

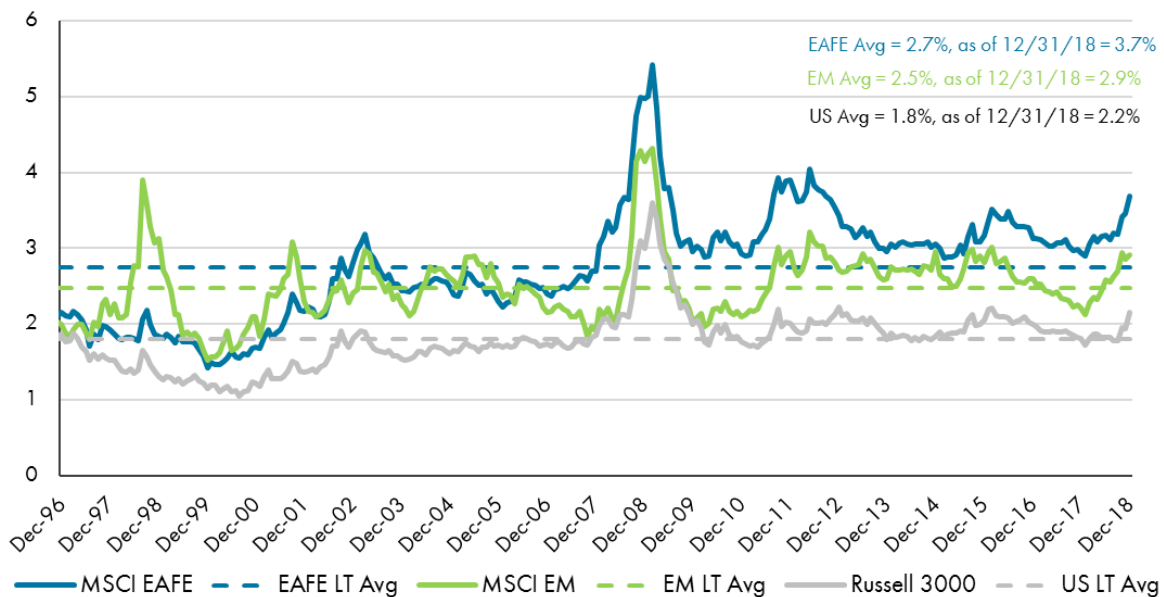
Angeles' forecasted US dividend yield is unchanged at 2.0% based on the longer-term US average of 1.8% (Figure 10). Angeles' forecasted global dividend yield increased from 2.4% to 2.5%, reflecting a modest increase in our underlying international equity dividend yield assumption (3.0% to 3.25%). This global dividend yield assumption is below the rolling 10-year average of 2.6% and the long term average of 2.9%.

FIGURE 9 | HISTORICAL DIVIDEND YIELD: GLOBAL EQUITY MARKET*



As of December 31, 2018. Data sourced from Bloomberg. *MSCI World (ex-Emerging Markets) prior to 1996, MSCI ACWI (including EM) beyond.

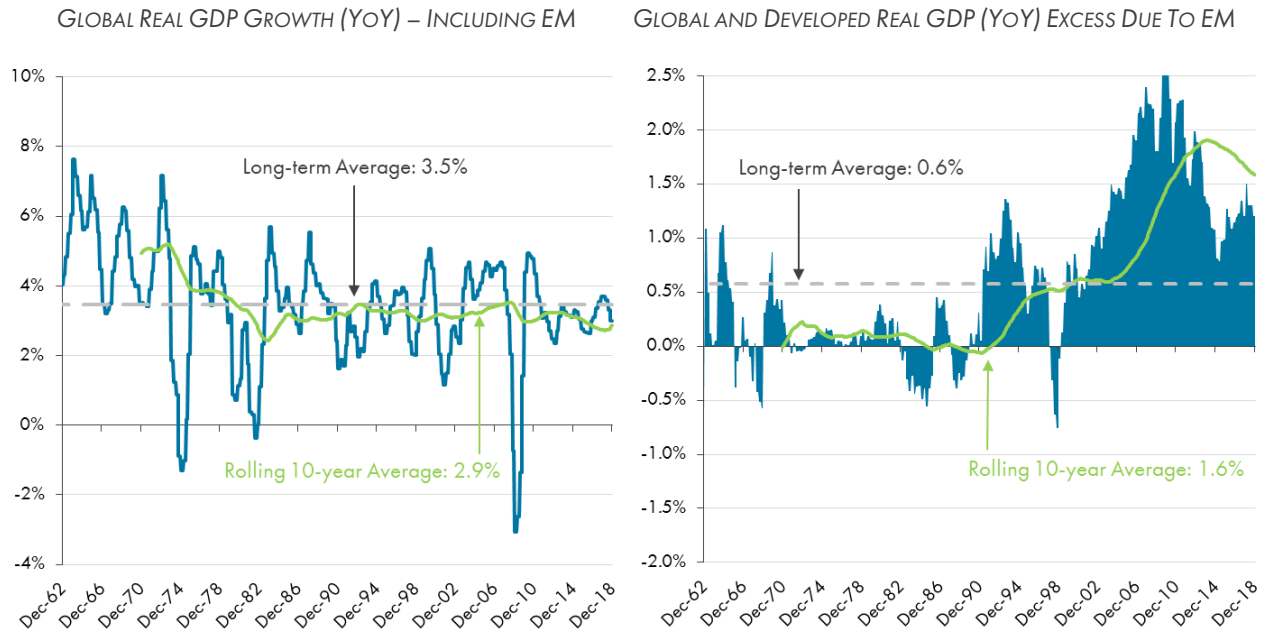
FIGURE 10 | DIVIDEND YIELD BY REGION



As of December 31, 2018. Data sourced from Bloomberg.

Real GDP Growth: Angeles' long term forecast for real GDP growth globally (including emerging markets) is unchanged from the previous year at 2.1%. Our forecast is below the long term average of real global GDP of 3.5% since 1960, and more in-line with, but conservative relative to, the average growth rate over the past decade (2.9%). We believe global growth will continue to remain below the long term average due to slowing labor productivity and population growth, and a slowdown of exports in the emerging world.

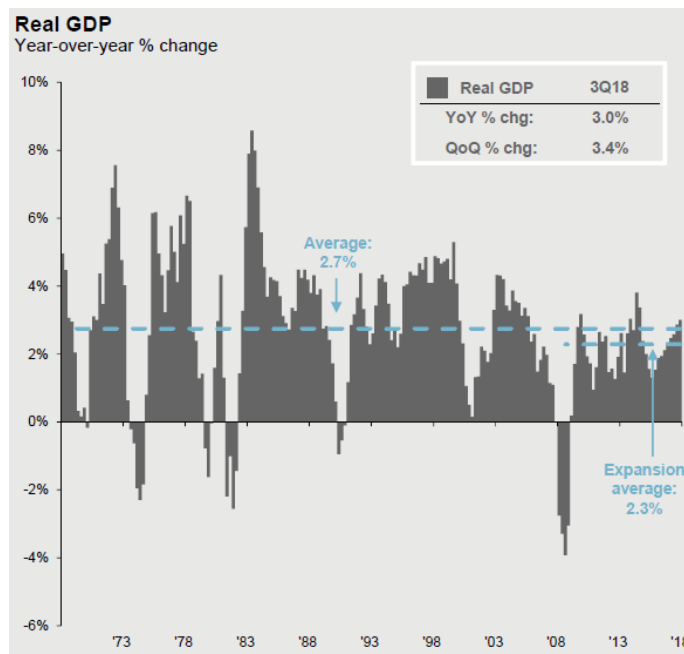
FIGURE 11 | GROSS DOMESTIC PRODUCT (GDP)



As of December 31, 2018. Data provided by Bridgewater Associates.

Angeles' long term forecast for real US GDP growth remains 2.25%, which is below the long term YOY average of 2.7% (since 1965) and in line with the post-Great Recession expansion average of 2.3%; see Figure 12.

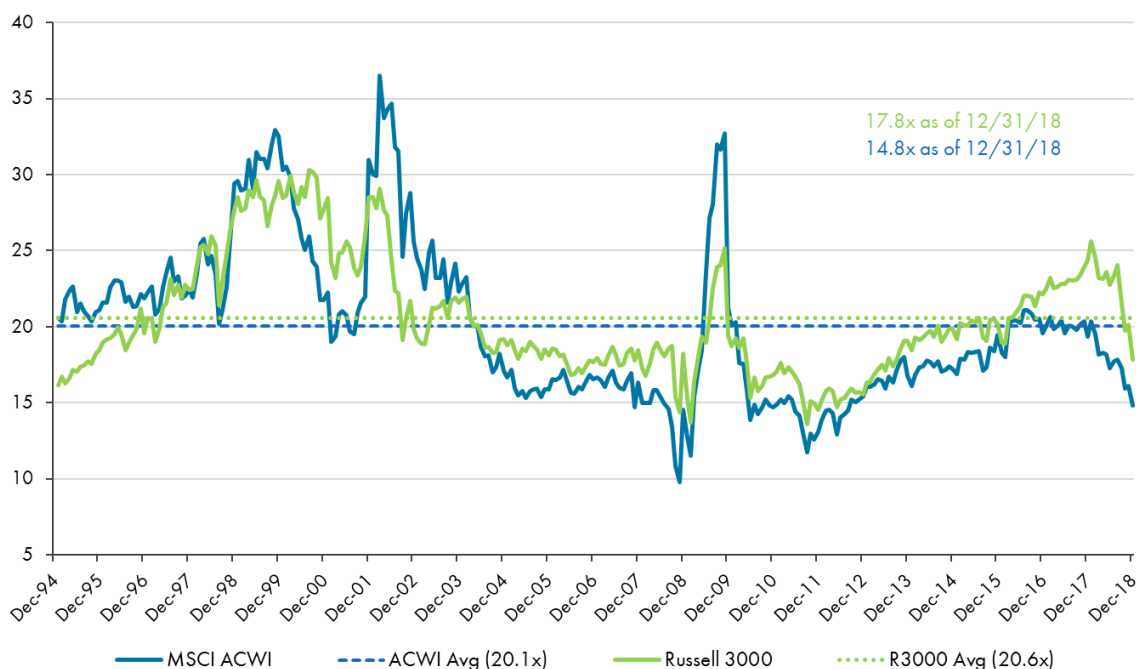
FIGURE 12 | REAL US GDP



As of December 31, 2018. Chart sourced from JPM Asset Management. Underlying data sourced from BEA, FactSet, JPM Asset Management.

Multiple Expansion/Contraction: Equity valuations, typically measured by the price/earnings (P/E) multiple, measures how much investors are willing to pay for corporate earnings. Since January 1995, the MSCI ACWI (global equity index) has had an average P/E ratio of 20.1X (based on trailing earnings). As of year-end 2018, the ACWI Index's P/E was 14.8X, below the long term average since 1995.

FIGURE 13 | PRICE/EARNINGS RATIO OF MAJOR MARKETS



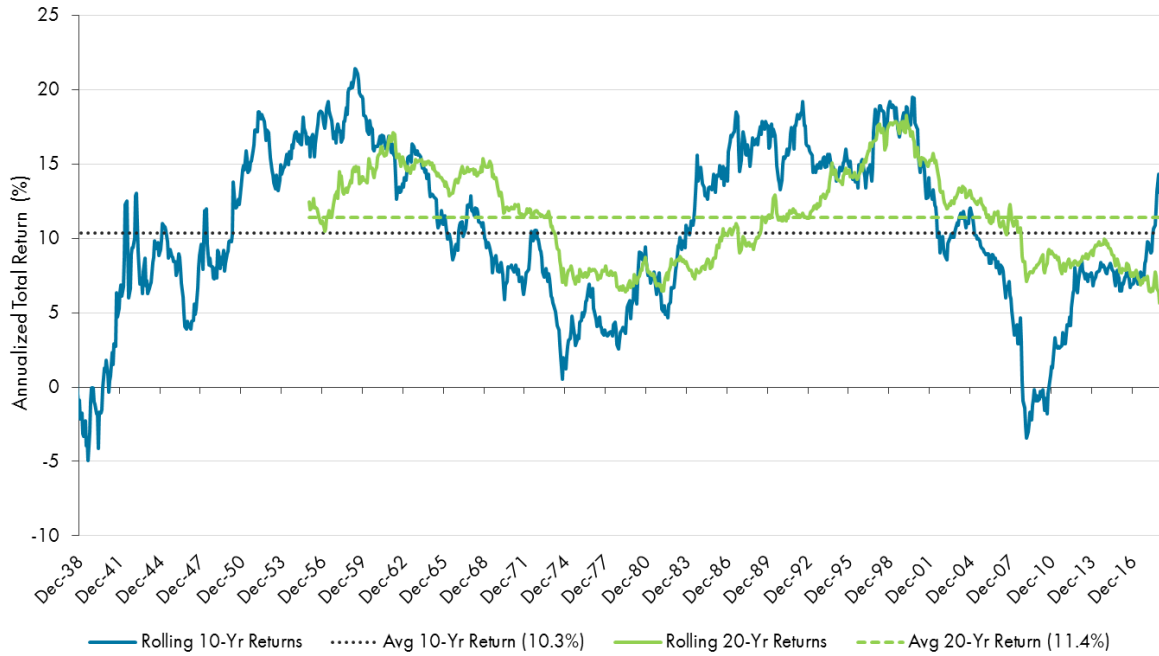
As of December 31, 2018. Data sourced from Bloomberg. Note" P/E is calculated as price per share divided by earning per share from continuing operations and before extraordinary items. PE for the index is market cap weighted.

As of December 2018, the current P/E ratio of the US broad equity market (Russell 3000 Index) was 17.8X, below the long term average of 20.6X. Relative to historical data, equities do not appear to be overvalued, and we therefore do not project multiple compression across the major global markets.

Currency Movements: While currency movements can depress or amplify returns for US dollar-based investors over short time intervals, foreign currency returns have an expected return of zero over the long term. Therefore, we have not adjusted our expected equity returns for any long term currency effect.

Incorporating the five elements discussed above results in an expected return forecast of 6.8% for global equities. While below the average rolling ten year total return of the S&P 500 (10.3% since 1936), Angeles believes this return is appropriate given the impact of short term market conditions on long term total returns. The chart below illustrates the cyclical quality of returns and speaks to the unprecedented nature of the 2008 equity returns. The S&P 500 was used as a proxy given its extensive record; our 6.8% estimate is a global equity return assumption.

FIGURE 14 | ROLLING LONG-TERM ANNUALIZED RETURNS OF THE S&P 500 INDEX



As of December 31, 2018. Data sourced from Dimensional Fund Advisors prior to 1970 and eVestment Alliance post 1970.

FIXED INCOME RETURNS:

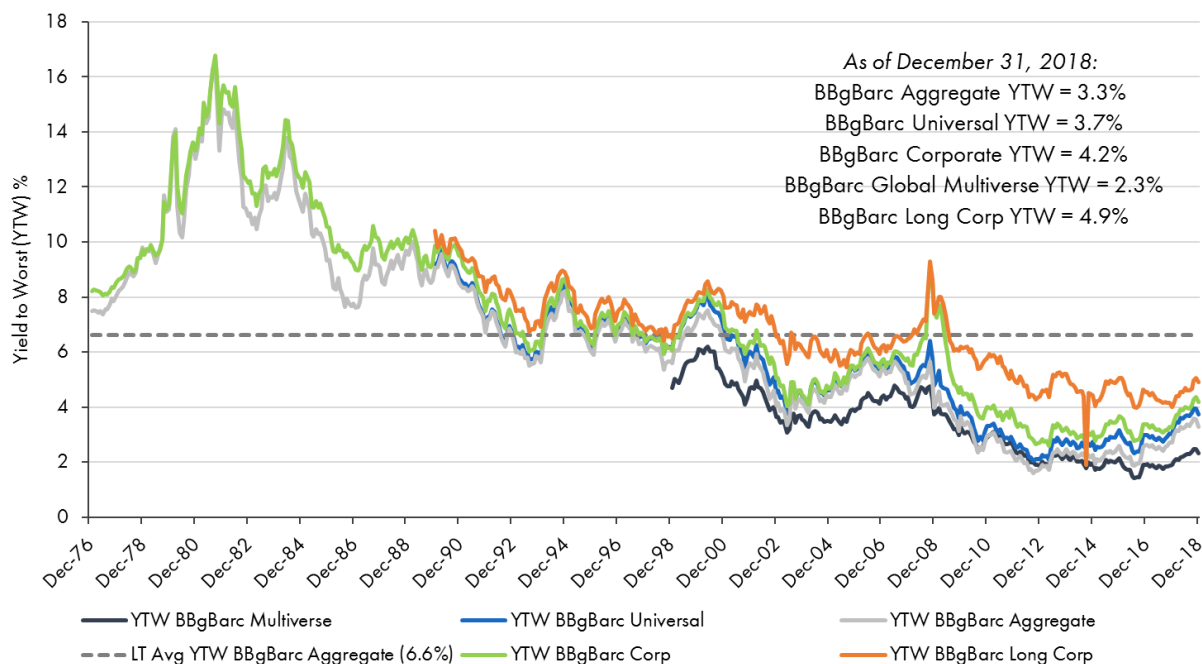
Angeles' fixed income return assumptions are based principally on bonds' yield-to-maturity (yield-to-worst³ for corporate holdings) since the return of a bond portfolio will essentially equal its yield if the portfolio is held until maturity or interest rates remain stable. In the short term, yield levels are poor predictors of bond sector performance because yields can compress or widen based upon economic and business conditions. Historical data analysis shows that yield-to-maturity is a solid predictor of long term performance when the forecast period is more than five years.

As of December 2018, the yield-to-worst for the Bloomberg Barclays Universal Bond Index increased from the previous year to 3.7%; the average maturity at year end 2018 was 8 years. This yield provides an estimate for the return that an investor can expect to receive if they were to hold a portfolio similar to the Barclays Universal Index for the next eight years.

The Bloomberg Barclays Universal Index is similar to the Bloomberg Barclays Aggregate Index in that both indices track the broad US bond market and are commonly used fixed income benchmarks. However, the Aggregate Index consists only of investment grade bonds while the Universal Index includes allocations to high yield (4.7% as of December 2018) and dollar-denominated emerging market debt (3.1% as of December 2018). Over time, the yields of these two indices have closely tracked each other, as shown below, with the Universal having a slight yield premium that has averaged 34 basis points since 1990.

We increased our expected return for fixed income from 2.75% to 3.25%.

FIGURE 15 | HISTORICAL YIELD TO WORST (YTW)



As of December 31, 2018. Data sourced from PIMCO and Bloomberg. "BBlgBarc" is short for Bloomberg Barclays. Yield data for Universal not available prior to 1990.

³ Yield to worst is generally defined as the yield to maturity assuming call provisions are exercised as early as possible.

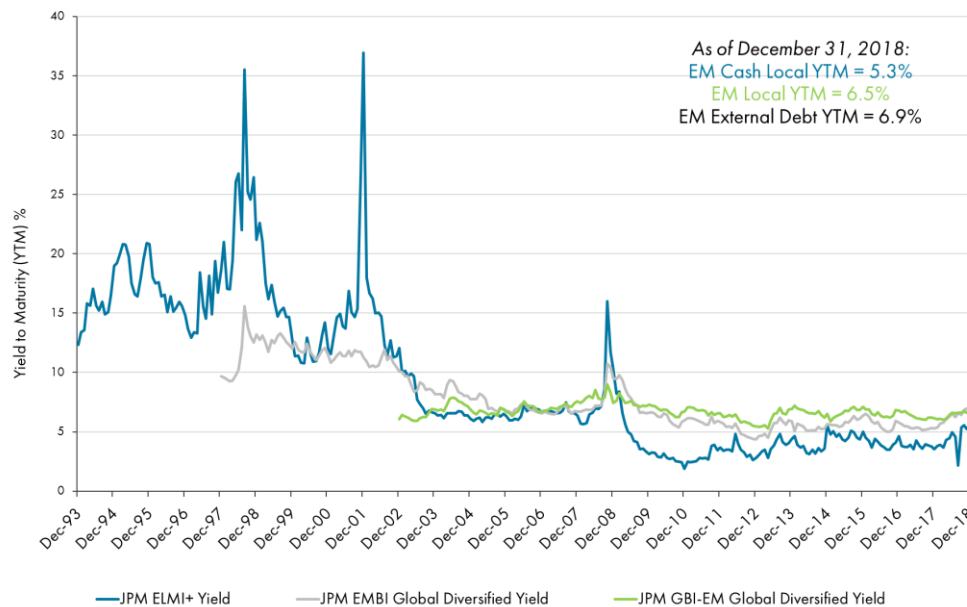
Yields have come down significantly since the late 1970s and early 1980s, when inflation hit double digit levels, and are now well below the long term average yield (since inception of the index in 1976) of 6.6% for the Aggregate Index. Yields rose over the course of 2018, resulting in increases to expected returns across many of our fixed income assumptions.

For below-investment grade (high yield) bonds, Angeles adjusts the yield-to-worst for expected default levels and recovery rates. Using a 8.0% yield-to-worst (for the ICE BofAML US High Yield Index as of December 2018) as a starting point, Angeles assumes an expected credit loss rate of approximately 1.75% (taking into consideration historical default and recovery rates) to forecast a long term return of 6.25% for high yield bonds. This is a 150 bps increase from the previous year’s expectation.

Angeles takes a similar approach for assessing the outlook on bank loans. Based on a yield-to-worst of 5.1% (for the Credit Suisse Leveraged Loan Index as of December 2018), Angeles assumes an expected credit loss rate of approximately 85 bps to arrive at a forecasted long term return of 4.25% for bank loans.

Our return assumptions were lowered for both emerging market local currency index and external debt (US dollar denominated) (JPM EMBI) to 6.25% and 6.75%, respectively. Notably, the relationship in yields for local EM debt versus dollar-denominated has shifted where the EM local currency index now has a lower yield to maturity than the dollar-dominated index.

FIGURE 16 | EMERGING MARKET DEBT HISTORICAL YIELDS

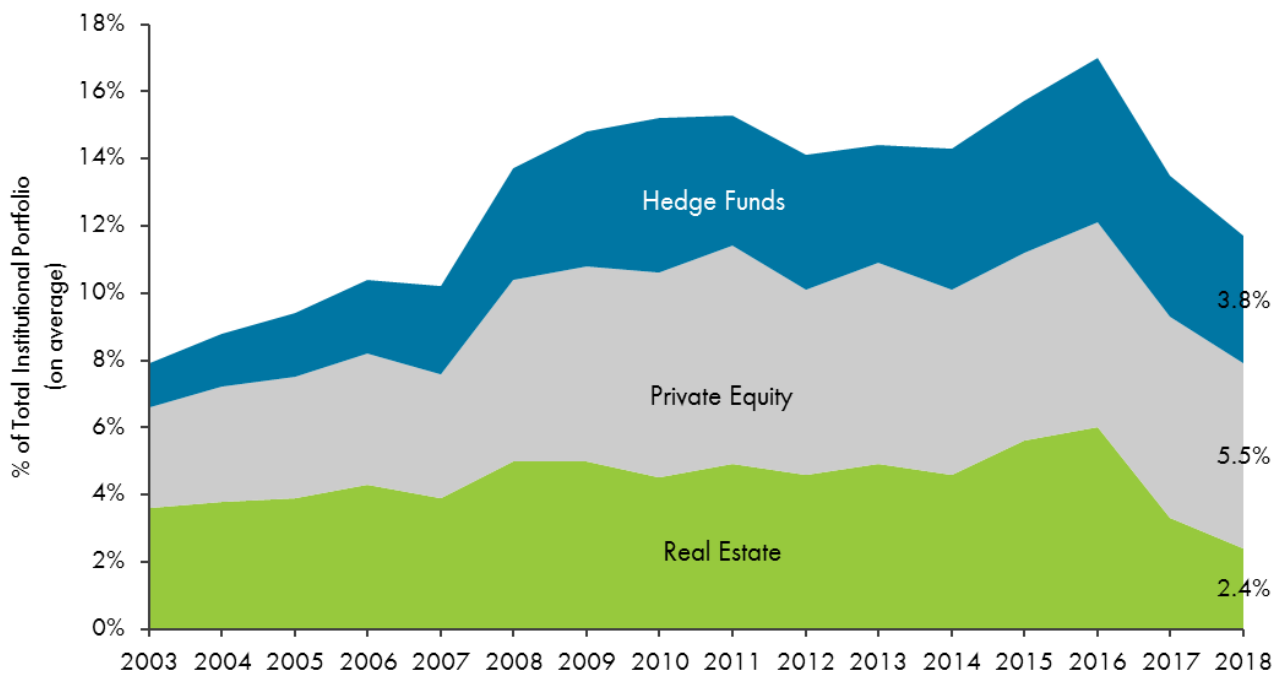


As of December 31, 2018. Data sourced from PIMCO and JP Morgan. EM Cash Local is represented by JPM ELMI+ Index, EM External Debt is represented by JPM EMBI Global Diversified Index, and EM Local Debt is represented by JPM GBI-EM Global Diversified Index.

ALTERNATIVE INVESTMENTS RETURN FORECASTS:

Alternative investments include less traditional asset classes such as real estate, private equity and hedge funds that tend to have lower correlations with traditional asset classes (i.e., stocks, bonds, and cash). There has been a marked increase in institutions allocating to these less traditional investments over the past decade. According to Greenwich Associates’ most recent Investment Management Report, the average allocation to alternatives among institutions was 12%, a significant increase since 2003. Most of this growth has come from an increase in hedge fund and private equity allocations. The average institution’s allocation to real estate has fallen over the past 2 years, while private equity and hedge fund allocations have remained steady.

FIGURE 17 | INSTITUTIONAL ALLOCATION TO ALTERNATIVES



Data sourced from Greenwich Associates’ US Investment Management 2018 Market Trends Report (most recent available at time of this writing); Greenwich Associates is a strategic consulting and research firm that conducts annual surveys among institutional investors.

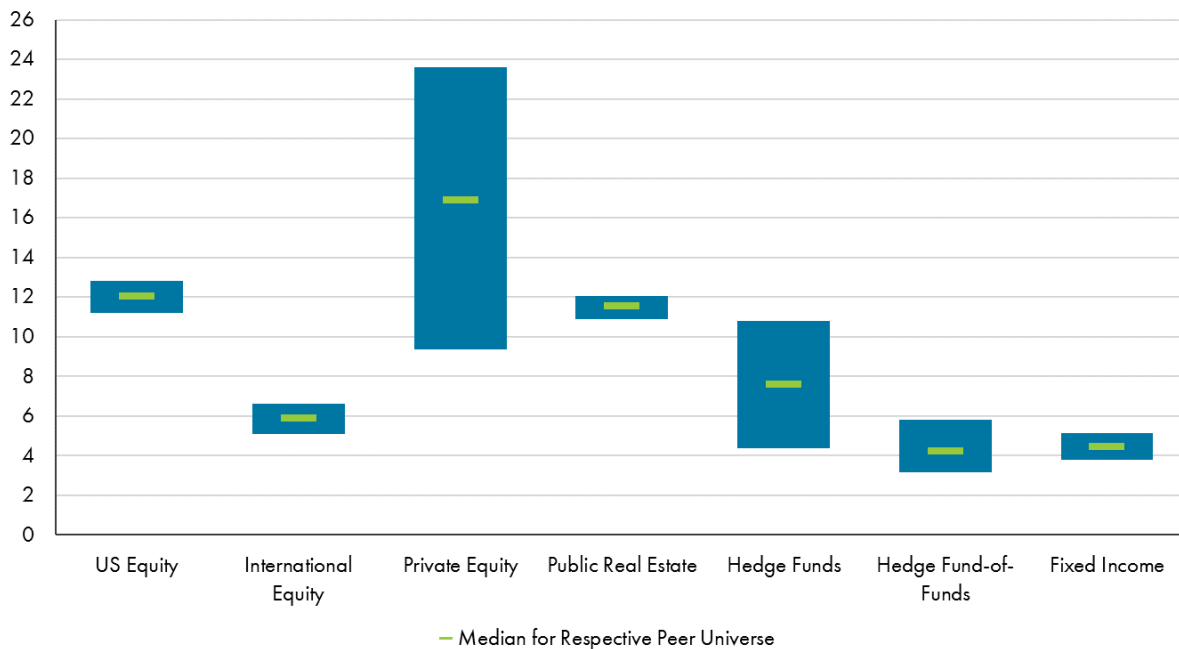
Given liquidity issues, the importance of fund/manager selection, the lack of investable benchmarks, and the multiplicity of sub-strategies, Angeles tends to be more conservative in setting the return and risk assumptions for alternative assets. We gauge the return expectations for these alternative asset classes in conjunction with the expectations for traditional asset classes to ensure that they are reasonable and comparable to one another.

Private equity: For a private equity portfolio, we assume an allocation to both buyout and venture capital partnerships and assume a collective return of 9.5%, which is a 270 basis point premium above public global equity markets. While this reflects the value-added from manager and partnership selection, it represents Angeles’ estimate of a median return for a mature portfolio that has vintage year diversification while accounting for the lack of liquidity and long term nature of a private equity investment.

The distribution around median private equity returns is large, due to significant selection and execution risk. Successful private equity partnership selection is critical to achieving premium returns in excess of public markets. Private equity funds have experienced a wide dispersion in returns with the average spread between top and bottom quartile private equity funds averaging over 14% for the past ten years. This is two to twelve times the average spread between top and bottom quartile managers for other asset class segments. For example, the spread between top and bottom quartile managers over the past ten years was 1.7% for large cap US equity strategies and 1.4% for core plus US bond strategies.

FIGURE 18 | DISTRIBUTION OF RETURNS BY ASSET CLASS

25TH PERCENTILE TO 75TH PERCENTILE QUARTILE CHART – TRAILING 10 YEARS THROUGH 12/31/18



*Data as of December 31, 2018. Data sourced from Morningstar, HFR, and Cambridge Associates. The blue bars represent median (50th percentile) returns, while the gray bars represent returns for the 25th and 75th percentile fund within the respective peer universe. Quartile data based on returns from Morningstar open-ended universes with exception of private equity, which is based on private equity funds (buyout, growth equity, private equity energy, and mezzanine funds) compiled by Cambridge Associates. Morningstar universes: US Equity (US OE Large Blend), International Equity (US OE Foreign Large Blend), Public Real Estate (US OE Real Estate), and Fixed Income (US OE Intermediate-Term Bond). Hedge Fund data based on constituent performance within the HFRI Fund Weighted Index through December 31, 2018. Hedge Fund-of-Funds data based on constituent performance within the HFRI Fund-of-Funds Index through December 31, 2018. Cambridge US Private Equity data based on 2009 Vintage Year funds through September 30, 2018 and shown on a net IRR basis.

A blend of buyouts and venture capital (70%/30% assumed in Figure 19 below) has outpaced the 270 basis point assumed premium to equity markets in periods greater than 5 years. A review of historical net of fee and expenses limited partner returns and volatility is shown in Figure 19.

FIGURE 19 | RETURN-RISK TABLE AND SCATTERPLOT
20 YEARS ENDING SEPTEMBER 2018

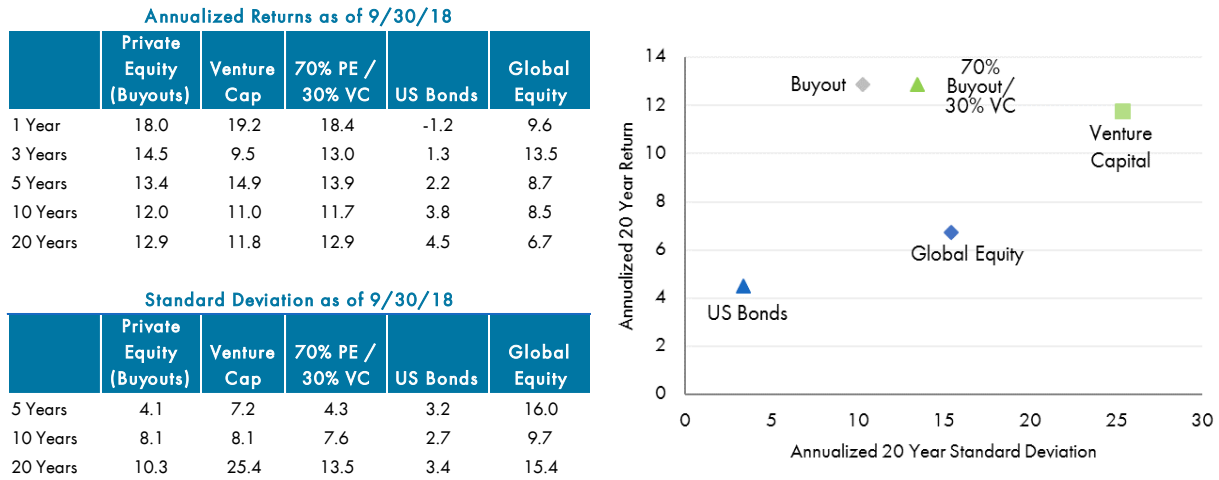
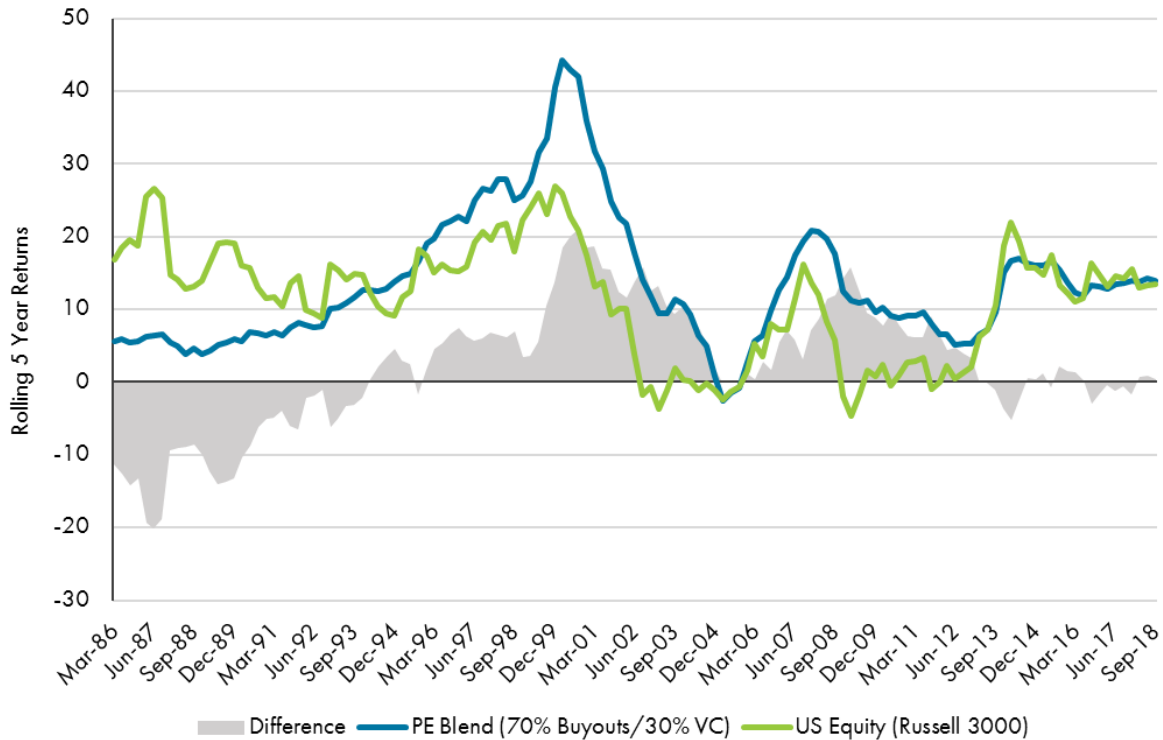


FIGURE 20 | ROLLING 5-YEAR RETURNS ENDING SEPTEMBER 2018
PRIVATE EQUITY 70/30 BLEND VS. PUBLIC EQUITY MARKET (RUSSELL 3000)



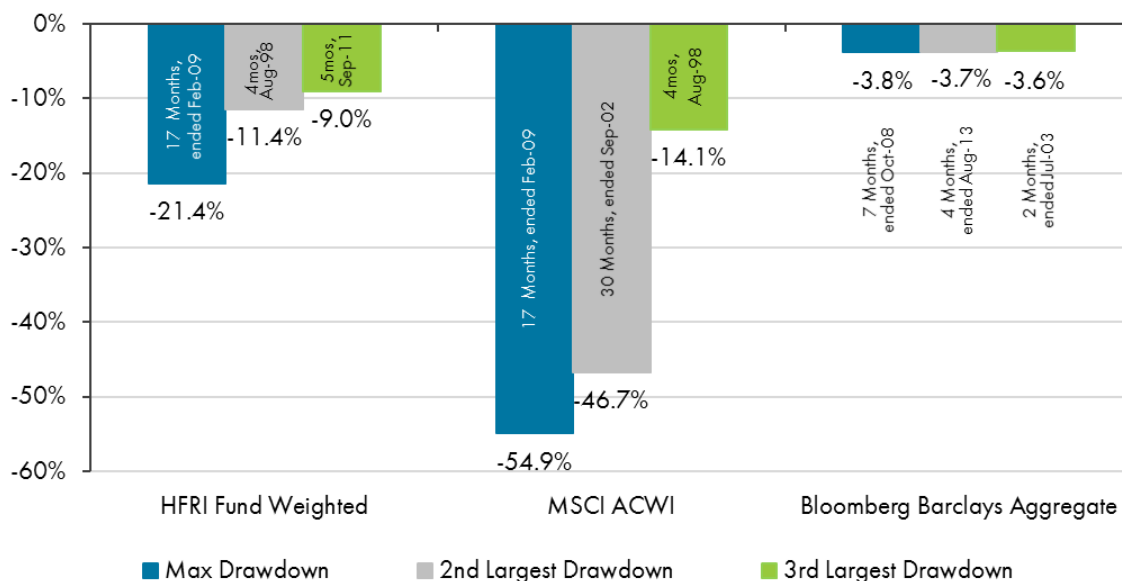
As of September 30, 2018 (most recent data available at time of this writing). Based on quarterly returns. Private Equity and Venture Capital index data is sourced from Cambridge Associates. US Bonds are represented by Bloomberg Barclays Aggregate, Global Equity by MSCI ACWIMI from Sep 1994 and beyond (MSCI ACWI used for prior returns), US Equity by Russell 3000 Index, and International Equity by MSCI EAFE Index. 70/30 private equity/venture cap blend assumes quarterly rebalancing.

Hedge Funds/Absolute Return Strategies: Hedge funds vary widely in the range of investment strategies and risk characteristics of funds. The term “hedge fund” can encompass investments in virtually any public security, derivative and private vehicle, and may utilize no to large amounts of leverage. Generally, hedge funds seek to earn positive absolute returns, irrespective of market movements.

Angeles’ return forecast for hedge funds is calculated based on a combination of underlying traditional asset class forward-looking return assumptions, which predominately centers on global equities and high yield bonds, the largest drivers of “beta” in hedge fund returns. Direct hedge fund return expectations were lowered from last year’s projections by 50 bps to 5.0%, reflecting a more conservative view of these more opportunistic strategies looking forward. Our hedge fund-of-funds expected return was lowered to 4.0%

The credit crunch that started in 2007 and peaked in 2008 and early 2009 roiled the hedge fund market as forced selling from leveraged players exacerbated the downward spiral in markets. As a result, this period marked the largest drawdown experienced among hedge funds since the inception of the first benchmark for hedge funds (the oldest benchmark, Hedge Fund Research, started January 1990). A broad index for hedge funds (the HFRI Fund Weighted Composite Index) lost 21% over the 16-month span ending February 2009. While this was weak in absolute terms, it managed to provide some protection from the extreme losses experienced in the equity markets, where the MSCI ACWI returned -55% during the same period. In addition to losses, illiquid markets in 2008 led to considerable illiquidity for hedge funds, with many unable to meet redemption requests in a timely fashion.

FIGURE 21 | THREE LARGEST DRAWDOWNS (JANUARY 1995 – DECEMBER 2018)

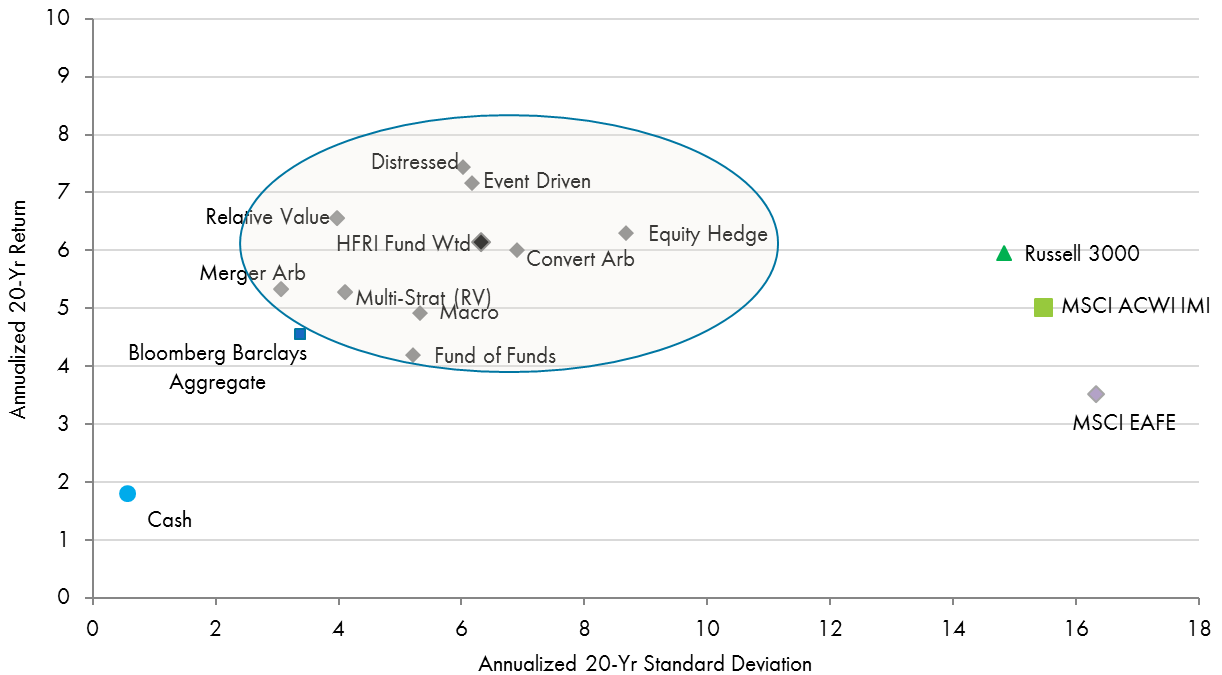


As of December 31, 2018. Data sourced from HFRI and eVestment.

Even considering the extreme events of 2008 and early 2009, hedge funds continue to offer solid risk-adjusted returns versus equities and other asset traditional classes over the long term, as shown in Figure 22. A broad measure of the hedge fund market, approximated by the HFRI Fund Weighted Composite, has gained an annualized 6.1% over the past 20 years – above both the global equity market (which has gained

5.0%) and the broad bond market (up 4.5% for this period). Meanwhile, risk, as measured by standard deviation, has been less than half that of the equity market.

FIGURE 22 | RISK/REWARD FOR HEDGE FUNDS: 20-YRS ENDED DECEMBER 2018

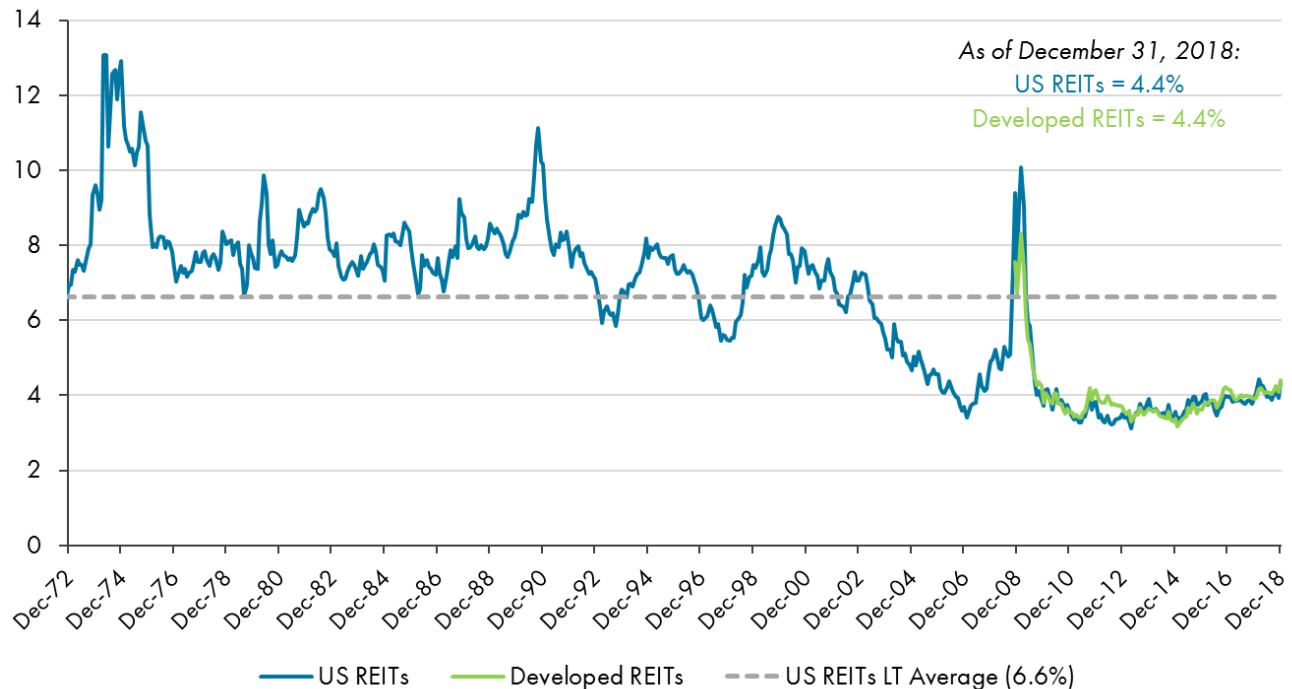


As of December 31, 2018. Data sourced from HFRI and eVestment Alliance.

Real estate: Over the longer term, Angeles believes a diversified real estate portfolio will add value to portfolios while providing diversification benefits.

Angeles' return forecast for public real estate securities (REITs and real estate operating companies) was lowered 50 bps to 4.5% for both domestic and global securities. The dividend yield for both the global and US REIT markets was 4.4% as of December 2018. We expect to see reduced dividend growth for REITs moving forward, which is reflected in the reduced margin between the current dividend yield and our long term expectation.

FIGURE 23 | REIT DIVIDEND YIELD



As of December 31, 2018. Data sourced from NAREIT and FTSE EPRA.

Core private real estate offers investors a stable level of income combined with the potential for modest price appreciation, particularly in periods of *unexpected* inflation. However, private real estate is relatively illiquid as open-ended funds are subject to “redemption queues” that often restrict redemptions during times of duress, when liquidity is most needed. We reduced our return expectations for core private real estate and expect new investors in core private real estate portfolios to earn returns of 4.5%, in-line with REITs.

Like private equity investments, “value added” and “opportunistic” real estate strategies employ more leverage in acquiring underperforming properties and real estate related assets and making significant improvements to the assets. “Value-added” strategies employ leverage of 40-60% (versus 20% to 30% for core private real estate) and similarly seek to benefit through improved operating income and significant capital appreciation, as opposed to a steady yield. In the case of private opportunistic and value-added real estate portfolios, Angeles forecasts returns by adjusting our REIT model for the increased level of leverage employed. We project that private opportunistic/value added real estate will achieve returns of 9.5% with volatility of 20%, which is consistent with private equity.

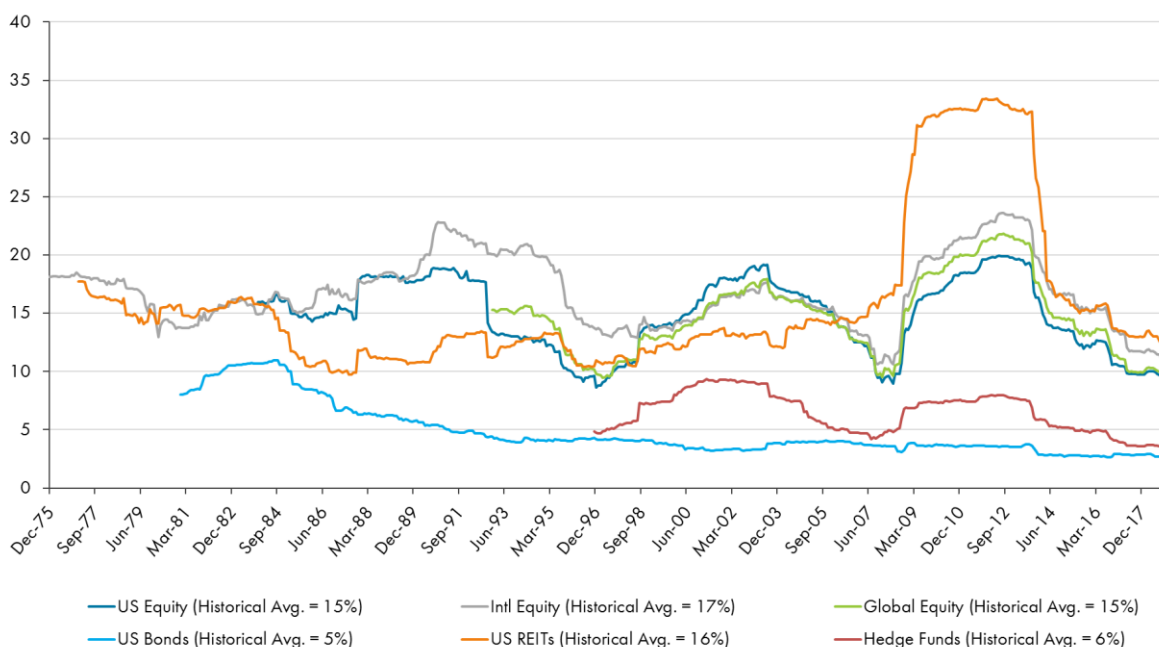
EXPECTED STANDARD DEVIATION OF RETURNS AND CORRELATION:

The standard deviations of returns for asset classes tend to be relatively stable over time and historical data tends to be a reliable predictor of future volatility. To forecast expected standard deviations of returns, we review historical data, looking at the entire time series as well as multiple rolling time periods; in some cases, we may put a greater weight on more recent historical periods. We may adjust upward an asset class' volatility assumption if it appears to be overvalued, i.e., at the high end of its historical valuation range. Risk estimates for private investments that utilize accounting data or where the use of market-related pricing may be lagged consistently underestimate investment volatility. As such, for private asset classes, we factor in the use of financial leverage and illiquidity when estimating standard deviation and correlation.

After thorough examination of broader market data and observed volatility across client results, no changes were made to our volatility assumptions from 2018.

The chart below provides the rolling five-year standard deviation for the major asset classes.

FIGURE 24 | ROLLING 5-YEAR HISTORICAL STANDARD DEVIATIONS



As of December 31, 2018. Data sourced from eVestment Alliance. Historical data based on monthly returns.

To forecast correlations, we similarly look at historical data. In addition to examining the entire time available time series, we analyze rolling time periods and, in some cases, may put a greater weight on more recent historical periods if we observe a shift in the relationship across specific asset classes. While correlations tend to be stable for long periods of time, we have observed relationships shift as certain macroeconomic factors evolve (such as inflation, leverage, growth). We observed that correlations across risk-sensitive assets (such as capital appreciation assets, credit, leveraged assets) increased during the global financial crisis and have remained elevated, while correlations between risk-sensitive and risk-averse asset classes have declined. Despite the increases in certain correlations, long term historical data still supports the value in and benefits of diversification. No changes were made to correlation assumptions this year.

APPENDIX A | HISTORICAL ASSET CLASS STATISTICS (US\$)

AS OF DECEMBER 31, 2018

Asset Class	Index Proxy	Yield					Annualized Return				Sharpe Ratio	Standard Deviation			
		12/31/18	12/31/17	12/31/16	12/31/15	12/31/14	10 Year	15 Year	20 Year	25 Year	25 Year	10 Year	15 Year	20 Year	25 Year
Capital Preservation/Risk Reduction															
US Core Fixed Income	BBgBarc Aggregate Bond Index	3.3	2.7	2.6	2.6	2.3	3.5	3.9	4.5	5.1	0.7	2.8	3.2	3.4	3.5
US Core Fixed Income	BBgBarc Universal Bond Index	3.7	3.0	3.0	3.2	2.7	4.1	4.1	4.8	5.3	0.8	2.8	3.2	3.3	3.5
Investment Grade Credit	BBgBarc Credit Index	4.1	3.2	3.3	3.5	3.0	5.5	4.6	5.2	5.7	0.6	4.2	5.0	5.0	5.0
Long-term Fixed Income	BBgBarc Long Credit	4.9	4.0	4.6	5.0	4.4	7.4	6.0	6.3	6.8	0.5	7.9	9.1	8.9	8.6
High Yield	ICE BofAML US High Yield	8.0	5.8	6.2	8.8	6.7	11.0	6.9	6.4	7.0	0.5	7.7	9.0	8.9	8.3
Bank Loans	Credit Suisse Leveraged Loan	5.1	4.3	4.7	6.0	5.3	8.3	4.5	4.6	5.3	0.5	4.9	6.3	5.6	5.1
Preferred Stock	ICE BofAML Fxd Rate Pref	5.7	1.9	5.4	4.5	4.7	7.7	3.1	4.2	4.9	0.2	11.9	13.7	12.0	10.9
US Short-term	BBgBarc 1-3 Year Govt Index	2.5	1.9	1.2	1.1	0.7	1.0	2.0	2.9	3.5	0.7	0.8	1.2	1.4	1.5
Cash	ICE BofAML 3M US Trsy Note	2.4	1.4	0.5	0.2	0.0	0.4	1.3	1.9	2.6	0.1	0.2	0.5	0.6	0.7
Global Fixed Income	BBgBarc Multiverse	2.3	1.9	1.9	2.2	2.0	2.8	3.5	---	---	---	5.1	5.4	---	---
Emerging Market Debt External	JPM EMBI Global Diversified	6.9	5.3	5.8	6.4	5.6	8.2	7.0	9.1	8.8	0.5	6.6	8.0	8.3	11.6
Emerging Market Debt Local	JPM GBI-EM Diversified Unhedged	6.5	6.1	6.8	7.1	6.5	3.5	5.6	---	---	---	12.2	11.9	---	---
Municipals (National 1-10 Yr)	BbgBarc US 1-10 Yr Municipal	2.3	2.0	2.1	--	--	3.3	3.4	3.9	4.2	0.6	2.6	2.8	2.9	3.0
Capital Appreciation/Growth															
Global Equity	MSCI ACWI IMI Index (ND)	2.7	2.3	2.4	2.6	2.4	9.7	6.4	5.0	---	---	14.8	15.0	15.5	---
US Equity Total Market	Russell 3000 Index	2.2	1.8	2.0	2.1	1.8	13.2	7.9	6.0	9.0	0.4	14.0	14.0	14.8	14.7
International Equity	MSCI EAFE Index (ND)	3.7	3.0	3.2	3.2	3.1	6.3	4.7	3.5	4.6	0.1	16.3	16.3	16.3	15.9
Emerging Market Equity	MSCI Emerging Markets Index (ND) ³	3.0	2.3	2.6	2.9	2.8	8.0	7.9	8.5	4.7	0.1	19.3	21.4	21.8	22.3
Private Equity	Cambridge Private Equity Index ¹	N.A.	N.A.	N.A.	N.A.	N.A.	12.0	14.6	12.9	14.6	1.2	8.1	8.8	10.3	9.9
Venture Capital	Cambridge Venture Capital Index ¹	N.A.	N.A.	N.A.	N.A.	N.A.	11.0	10.6	11.8	15.4	0.6	8.1	7.5	25.4	23.3
Direct Hedge Funds	HFRI Fund Weighted Index	N.A.	N.A.	N.A.	N.A.	N.A.	4.9	4.5	6.1	7.5	0.8	5.1	5.7	6.3	6.5
Hedge Fund of Funds	HFRI Fund of Funds Index	N.A.	N.A.	N.A.	N.A.	N.A.	3.1	2.7	4.2	4.6	0.4	3.9	5.0	5.2	5.5
Inflation Hedge/Real Assets															
Global REITs	FTSE EPRA/NAREIT Developed Index	4.4	3.9	4.2	3.6	3.4	10.5	7.6	8.6	7.4	0.3	17.5	18.9	17.6	17.2
US REITs	FTSE NAREIT All Equity REITs Index	4.4	4.0	4.4	4.0	3.6	12.5	8.5	9.9	9.9	0.4	20.4	22.4	20.3	18.9
Master Limited Partnerships	Alerian MLP Index	8.9	7.8	7.1	8.4	5.9	9.6	7.0	10.6	---	---	18.1	17.6	17.2	---
Private Real Estate	NCREIF Index ¹	N.A.	N.A.	N.A.	N.A.	N.A.	6.4	9.0	9.1	9.3	1.6	5.7	5.2	4.6	4.2
Gold	London Gold Fixing Index	N.A.	N.A.	N.A.	N.A.	N.A.	3.9	7.8	7.7	4.8	0.1	17.3	17.9	17.0	15.9
Infrastructure	FTSE Global Core Infrastructure Index	N.A.	N.A.	N.A.	N.A.	N.A.	9.7	---	---	---	---	10.5	---	---	---
Timber	NCREIF Timberland Index ¹	N.A.	N.A.	N.A.	N.A.	N.A.	4.0	7.4	6.4	7.6	1.0	3.6	5.1	5.0	5.1
Commodities	Bloomberg Commodity Index	N.A.	N.A.	N.A.	N.A.	N.A.	-3.8	-2.5	1.8	2.0	0.0	14.3	16.3	16.0	15.1
US TIPS	BBgBarc TIPS Index	2.8	2.3	2.2	2.3	2.0	3.7	4.0	5.1	---	---	6.5	7.5	7.3	---
Inflation	CPI All Urban Consumers NSA ²	N.A.	N.A.	N.A.	N.A.	N.A.	1.8	2.1	2.2	2.2	-0.3	0.7	1.1	1.0	0.9

¹Based on quarterly returns through 12/31/18. Returns are lagged on a quarter basis for private equity and venture capital. ²Prior to 12/31/98, performance was based off returns of the MSCI Emerging Markets Index (Gross Dividends). Long term expected return and risk assumptions are not a guarantee of future performance and actual results can and will differ from forecasts over time. The assumptions should not solely be relied upon as a recommendation to invest in any particular asset class. Note that these asset class assumptions are based upon passively invested portfolios net of management fees; they do not consider the impact of active management. Return estimates are shown on a compound return basis, not on arithmetic returns. Asset class assumptions presented constitute our judgment at the time they were forecasted and are subject to change without notice. Angeles Investment Advisors, LLC attest the information contained herein has been prepared from sources believed reliable but is not guaranteed by us as to its timeliness or accuracy, and is not a complete summary or statement of all available data. This data is intended solely for our clients, is for informational purposes only and may not be publicly disclosed or distributed without our prior written consent.