PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

Verus

Table of Contents

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Consulting | Outsourced CIO (OCIO) | Risk Advisory | Private Markets

Summary

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Methodology

CORE INPUTS

— We use a fundamental building block approach based on several inputs, including historical data and academic research to create asset class return forecasts.
— For most asset classes, we use the long-term historical volatility after adjusting for autocorrelation.
— Correlations between asset classes are calculated based on the last 10 years. For illiquid assets, such as private equity and private real estate, we use BarraOne correlation estimates.

Asset	Return Methodology	Volatility Methodology*
Inflation	25% weight to the University of Michigan Survey 5-10 year ahead inflation expectation and the Survey of Professional Forecasters (Fed Survey), and the remaining 50% to the market's expectation for inflation as observed through the 10-year TIPS breakeven rate	-
Cash	75% * current federal funds rate + 25% * U.S. 10-year Treasury yield	Long-term volatility
Bonds	Nominal bonds: current yield; Real bonds: real yield + inflation forecast	Long-term volatility
International Bonds	Current yield	Long-term volatility
Credit	Current option-adjusted spread + U.S. 10-year Treasury – effective default rate	Long-term volatility
International Credit	Current option-adjusted spread + foreign 10-year Treasury – effective default rate	Long-term volatility
Private Credit	Levered gross return (LIBOR + spread + original issuance discounts) – management fees – carried interest	Estimated volatility
Equity	Current yield + real earnings growth (historical average) + inflation on earnings (inflation forecast) + expected P/E change	Long-term volatility
Intl Developed Equity	Current yield + real earnings growth (historical average) + inflation on earnings (intl. inflation forecast) + expected P/E change	Long-term volatility
Private Equity	US large cap domestic equity forecast * 1.85 beta adjustment	1.2 * Long-term volatility of U.S. small cap
Commodities	Collateral return (cash) + spot return (inflation forecast) + roll return (assumed to be zero)	Long-term volatility
Hedge Funds	Return coming from traditional betas + 15-year historical idiosyncratic return	Long-term volatility
Core Real Estate	Cap rate + real income growth – capex + inflation forecast	65% of REIT volatility
REITs	Core real estate	Long-term volatility
Value-Add Real Estate	Core real estate + 2%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Opportunistic Real Estate	Core real estate + 3%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Infrastructure	Current yield + real income growth + inflation on earnings (inflation forecast)	Long-term volatility
Risk Parity	Expected Sharpe Ratio * target volatility + cash rate	Target volatility

Long-term historical volatility data is adjusted for autocorrelation (see Appendix)

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Equities								
U.S. Large	S&P 500	5.3%	6.4%	15.7%	0.31	0.39	1.21	1.19
U.S. Small	Russell 2000	5.3%	7.4%	21.6%	0.23	0.32	0.77	0.81
International Developed	MSCI EAFE	6.1%	7.6%	17.9%	0.32	0.40	0.52	0.57
International Small	MSCI EAFE Small Cap	4.7%	6.9%	22.2%	0.19	0.29	0.66	0.71
Emerging Markets	MSCI EM	6.1%	8.9%	25.3%	0.23	0.34	0.32	0.40
Global Equity	MSCI ACWI	5.7%	7.1%	17.3%	0.31	0.39	0.84	0.86
Private Equity	Cambridge U.S. Private Equity	9.5%	12.4%	26.0%	0.35	0.46	-	-
Private Equity (Direct)	Cambridge U.S. Private Equity	10.5%	13.4%	26.0%	0.39	0.50	-	-
Private Equity (Fund of Funds)	Cambridge U.S. Private Equity	8.5%	11.4%	26.0%	0.31	0.42	-	-
Fixed Income								
Cash	30 Day T-Bills	0.4%	0.4%	1.2%	-	-	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5-10	1.7%	1.8%	5.3%	0.25	0.27	0.59	0.60
U.S. Treasury	Bloomberg Treasury 7-10 Year	1.5%	1.7%	6.8%	0.16	0.20	0.43	0.45
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	0.5%	1.0%	9.5%	0.01	0.06	-0.01	0.02
Global Aggregate	Bloomberg Global Aggregate	1.4%	1.6%	6.1%	0.16	0.20	0.28	0.30
Core Fixed Income	Bloomberg U.S. Aggregate Bond	2.2%	2.3%	4.1%	0.44	0.46	0.80	0.80
Core Plus Fixed Income	Bloomberg U.S. Universal	2.4%	2.5%	4.0%	0.50	0.51	0.82	0.83
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1-3 Year	1.5%	1.6%	3.6%	0.31	0.33	1.07	1.06
Short-Term Credit	Bloomberg Credit 1-3 Year	1.6%	1.7%	3.6%	0.34	0.35	1.25	1.24
Long-Term Credit	Bloomberg Long U.S. Corporate	2.4%	2.8%	9.4%	0.21	0.26	0.67	0.70
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	3.1%	3.7%	11.2%	0.24	0.30	1.01	1.00
Bank Loans	S&P/LSTA Leveraged Loan Index	2.3%	2.7%	9.3%	0.20	0.25	0.82	0.83
Global Credit	Bloomberg Global Credit	1.5%	1.8%	7.3%	0.15	0.19	0.67	0.68
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	5.2%	5.9%	12.6%	0.38	0.44	0.66	0.68
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	4.2%	4.9%	12.2%	0.31	0.37	0.04	0.09
Private Credit	S&P LSTA Leveraged Loan Index	6.8%	7.8%	14.6%	0.44	0.51	-	-
Private Credit (Direct Lending - Unlevered)	S&P LSTA Leveraged Loan Index	5.0%	5.5%	10.5%	0.44	0.49	-	-
Private Credit (Direct Lending - Levered)	S&P LSTA Leveraged Loan Index	8.0%	9.4%	17.4%	0.44	0.51	-	-
Private Credit (Credit Opportunities)	S&P LSTA Leveraged Loan Index	7.0%	8.0%	15.0%	0.44	0.51	-	-
Private Credit (Junior Capital / Mezzanine)	S&P LSTA Leveraged Loan Index	8.8%	10.4%	19.0%	0.44	0.53	-	-
Private Credit (Distressed)	S&P LSTA Leveraged Loan Index	9.0%	12.6%	29.1%	0.30	0.42	-	-

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Other								
Commodities	Bloomberg Commodity	3.0%	4.2%	15.9%	0.16	0.24	-0.25	-0.18
Hedge Funds	HFRI Fund Weighted Composite	3.8%	4.1%	7.7%	0.44	0.48	0.88	0.49
Hedge Funds (Fund of Funds)	HFRI Fund of Funds Composite	2.8%	3.1%	7.7%	0.31	0.35	-	-
Hedge Funds (Equity Style)	Custom HFRI Benchmark Mix*	4.5%	5.6%	15.0%	0.27	0.34	-	-
Hedge Funds (Credit Style)	Custom HFRI Benchmark Mix*	3.6%	4.1%	10.1%	0.32	0.37	-	-
Hedge Funds (Asymmetric Style)	Custom HFRI Benchmark Mix*	2.3%	2.4%	4.9%	0.39	0.41	-	-
Real Estate Debt	Bloomberg CMBS IG	2.1%	2.4%	7.4%	0.23	0.27	1.12	1.11
Core Real Estate	NCREIF Property	6.5%	7.2%	12.5%	0.49	0.54	2.08	2.02
Value-Add Real Estate	NCREIF Property + 200bps	8.5%	9.8%	16.7%	0.49	0.56	-	-
Opportunistic Real Estate	NCREIF Property + 300bps	9.5%	11.1%	18.7%	0.49	0.57	-	-
REITs	Wilshire REIT	6.5%	8.2%	19.3%	0.32	0.40	0.67	0.72
Global Infrastructure	S&P Global Infrastructure	6.6%	8.0%	17.6%	0.35	0.43	0.45	0.51
Risk Parity	S&P Risk Parity 10% Vol Index	5.4%	5.9%	10.0%	0.50	0.55	-	-
Currency Beta	MSCI Currency Factor Index	0.8%	0.9%	3.4%	0.12	0.13	0.24	0.25
Inflation		2.5%	-	-	-	-	-	-

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

*To represent hedge fund styles, we use a combination of HFRI benchmarks: Equity Style = 33% HFRI Fundamental Growth, 33% HFRI Fundamental Value, 33% HFRI Activist. Credit Style = 20% HFRI Distressed/Restructuring, 20% HFRI Credit Arbitrage, 20% HFRI Fixed Income-Corporate, 20% HFRI Fixed Income-Convertible Arbitrage, 20% HFRI Fixed Income-Asset Backed. Asymmetric Style = 50% HFRI Relative Value, 50% HFRI Macro
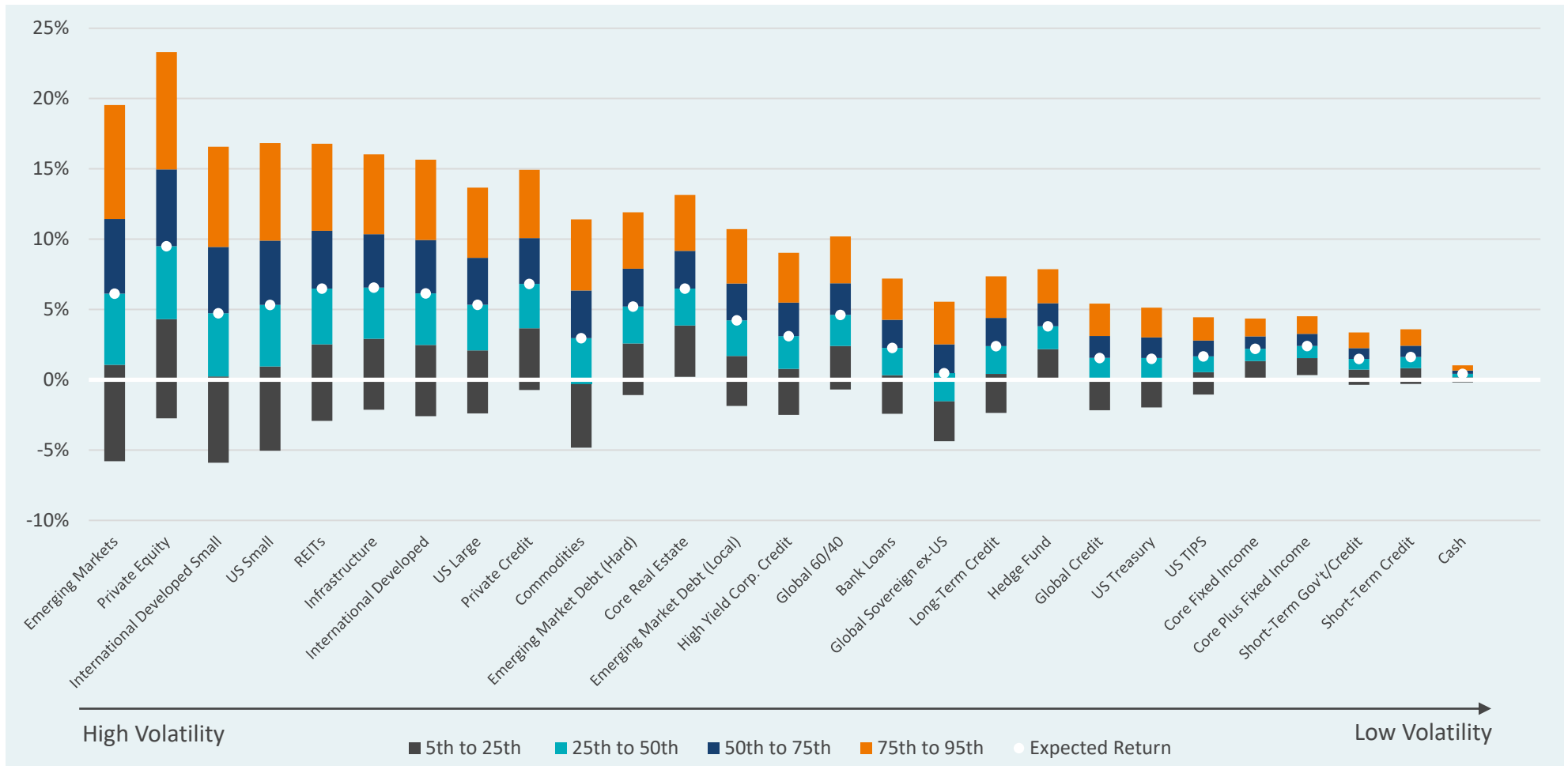
Correlation assumptions

	Cash	US Large	US Small	Intl Large	Intl Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex-US	US Core	Core Plus	Short-Term Gov't/Credit	Short-Term Credit	Long-Term Credit	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commodities	Hedge Funds	Real Estate	REITs	Infrastructure	Risk Parity	Currency Beta
Cash	1.0																											
US Large	-0.2	1.0																										
US Small	-0.2	0.9	1.0																									
Intl Large	-0.2	0.9	0.8	1.0																								
Intl Small	-0.2	0.9	0.8	1.0	1.0																							
EM	-0.1	0.7	0.7	0.8	0.8	1.0																						
Global Equity	-0.2	1.0	0.9	1.0	0.9	0.9	1.0																					
PE	-0.2	0.7	0.6	0.6	0.6	0.6	0.7	1.0																				
US TIPS	0.0	0.2	0.1	0.2	0.2	0.3	0.2	0.2	1.0																			
US Treasury	0.2	-0.3	-0.4	-0.3	-0.3	-0.2	-0.3	-0.2	0.7	1.0																		
Global Sovereign ex-US	0.1	0.2	0.1	0.3	0.4	0.5	0.3	0.1	0.6	0.4	1.0																	
US Core	0.2	0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.8	0.9	0.6	1.0																
Core Plus	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.8	0.8	0.6	1.0	1.0															
Short-Term Gov't/Credit	0.4	-0.1	-0.1	0.0	0.0	0.1	0.0	-0.1	0.6	0.7	0.5	0.8	0.7	1.0														
Short-Term Credit	0.0	0.4	0.4	0.4	0.4	0.5	0.4	0.0	0.6	0.3	0.5	0.6	0.7	0.6	1.0													
Long-Term Credit	0.0	0.3	0.2	0.3	0.3	0.4	0.3	0.1	0.7	0.6	0.5	0.8	0.9	0.5	0.7	1.0												
US HY	-0.2	0.8	0.7	0.8	0.8	0.8	0.8	0.5	0.4	-0.2	0.4	0.2	0.5	0.1	0.7	0.6	1.0											
Bank Loans	-0.3	0.6	0.7	0.6	0.7	0.6	0.7	0.3	0.3	-0.3	0.3	0.1	0.3	0.0	0.6	0.4	0.9	1.0										
Global Credit	-0.1	0.6	0.5	0.7	0.7	0.8	0.7	0.3	0.6	0.2	0.7	0.5	0.7	0.3	0.8	0.8	0.8	0.6	1.0									
EMD USD	-0.2	0.6	0.5	0.7	0.7	0.7	0.7	0.4	0.6	0.1	0.6	0.5	0.7	0.3	0.7	0.7	0.8	0.7	0.9	1.0								
EMD Local	0.0	0.6	0.5	0.7	0.7	0.8	0.7	0.4	0.4	0.0	0.7	0.3	0.5	0.3	0.6	0.5	0.7	0.5	0.8	0.8	1.0							
Commodities	-0.1	0.5	0.5	0.6	0.6	0.6	0.6	0.3	0.2	-0.3	0.3	-0.1	0.1	0.0	0.3	0.1	0.6	0.5	0.5	0.5	0.6	1.0						
Hedge Funds	-0.2	0.8	0.8	0.8	0.8	0.7	0.8	0.6	0.2	-0.3	0.2	0.0	0.2	0.0	0.5	0.4	0.8	0.7	0.6	0.6	0.5	0.5	1.0					
Real Estate	-0.2	0.6	0.6	0.5	0.5	0.5	0.6	0.4	0.2	-0.1	0.2	0.1	0.1	-0.1	0.1	0.2	0.4	0.3	0.3	0.4	0.4	0.3	0.5	1.0				
REITs	-0.2	0.7	0.6	0.6	0.6	0.5	0.7	0.5	0.5	0.1	0.3	0.4	0.5	0.2	0.5	0.5	0.7	0.5	0.6	0.6	0.5	0.3	0.5	0.7	1.0			
Infrastructure	-0.2	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.4	-0.1	0.5	0.3	0.4	0.2	0.6	0.5	0.8	0.7	0.8	0.8	0.8	0.5	0.7	0.3	0.7	1.0		
Risk Parity	-0.1	0.7	0.6	0.7	0.7	0.7	0.8	0.4	0.5	0.0	0.4	0.3	0.5	0.3	0.7	0.5	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.4	0.6	0.8	1.0	
Currency Beta	0.0	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	1.0

Note: Correlation assumptions are based on the last ten years. Private Equity and Real Estate correlations are especially difficult to model – we have therefore used BarraOne correlation data to strengthen these correlation estimates.
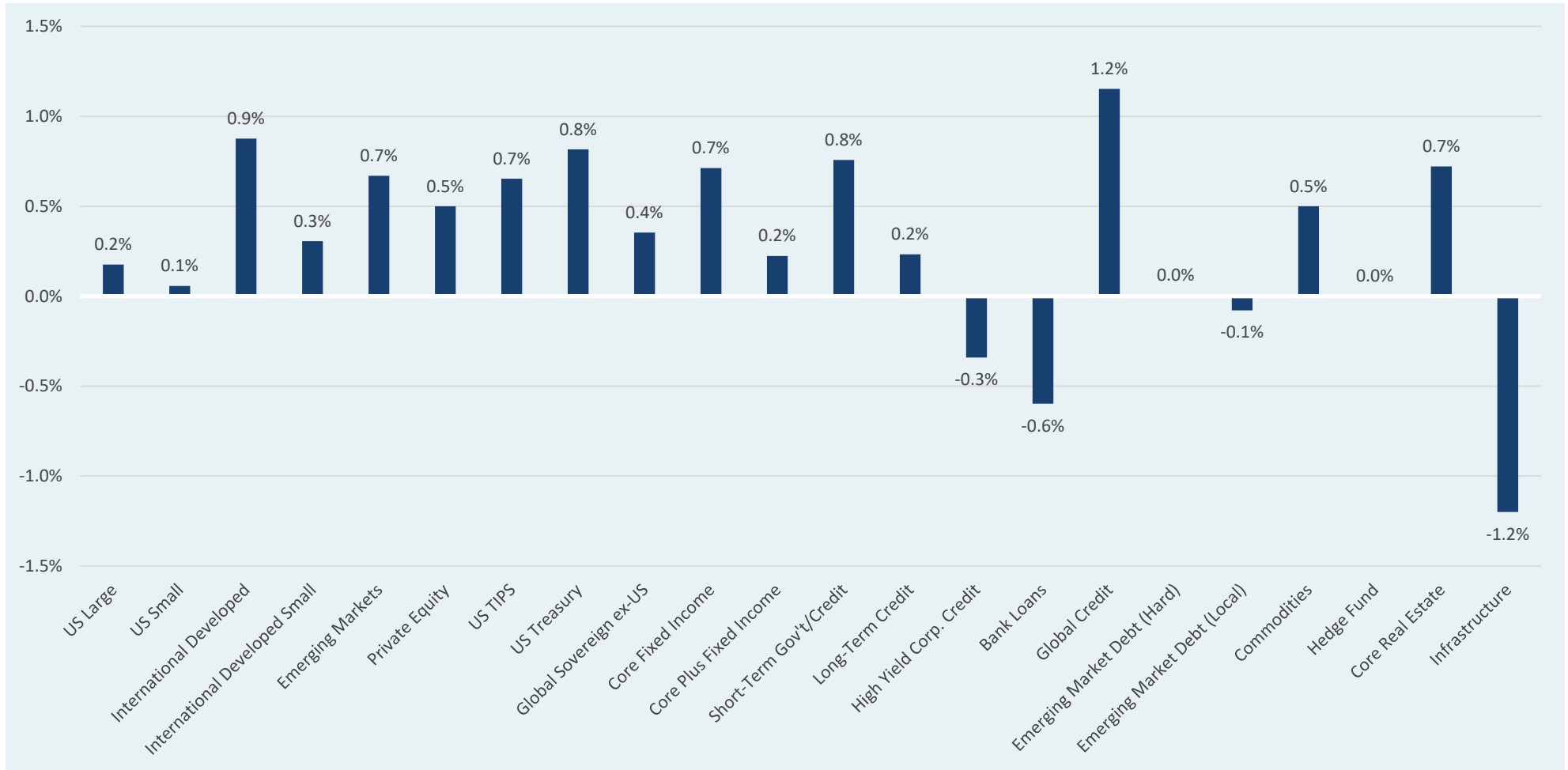
Range of likely 10-year outcomes

10-YEAR RETURN 90% CONFIDENCE INTERVAL

High Volatility → Low Volatility

Legend: ■ 5th to 25th ■ 25th to 50th ■ 50th to 75th ■ 75th to 95th ○ Expected Return

Source: Verus, MPI

2022 vs. 2021 return forecast

Source: Verus, as of 9/30/21

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Relevant forecast changes

— The return expectations of higher quality fixed income increased, as bond yields recovered from pandemic lows. On the other hand, riskier fixed income forecasts were generally lower due to extremely tight credit spreads. Equity return expectations increased modestly as valuations fell and inflation moved higher.

— Inflation expectations increased materially throughout the year as price pressures ramped up and year-over-year growth in U.S. consumer prices reached 5.4% in September. The U.S. TIPS breakeven inflation rate increased from 1.6% to 2.4%, as inflation expectations surpassed pre-COVID levels in the first quarter. Household inflation expectations (University of Michigan) jumped and have tracked much more closely to current inflation levels, moving from 2.7% to 3.0%. The Survey of Professional Forecasters also increased from 2.0% to 2.4%. Overall, our inflation forecast increased from 2.0% to 2.5%. Inflation is an important component of the performance of asset classes such as equities, real estate, and commodities. It is worth noting that inflation expectations affect *nominal* returns, rather than *real* returns.

— Credit spreads have steadily trended lower as markets recovered and the social and business risks from COVID-19 subsided. Spreads are now at historically tight levels, though this may be reflective of very muted credit default activity. Core fixed income spreads came in slightly from 90 bps to 81 bps, and high yield spreads fell from 551 bps to 323 bps.

— The long end of the yield curve increased as the 10-year U.S. Treasury yield climbed from 0.68% to 1.49%. The short end of the curve remained anchored at zero, though as the economy has improved, the market has priced in Fed interest rate hikes as early as 2022. The three-month U.S. dollar LIBOR reference rate showed little change, moving from 0.23% to 0.13%.

— Emerging market hard and local currency debt forecasts were mixed. Hard currency-denominated debt spreads to U.S. Treasury yields decreased from 471 bps to 392 bps. The yield of local-denominated debt fell very slightly from 4.6% to 4.5%.

All data cited above is as of 9/30/21

Inflation

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Inflation

We use a weighted average of market expectations (50%), consumer expectations (25%), and professional forecasts (25%) to create a 10-year inflation forecast. The market's expectations for 10-year inflation can be inferred by taking the difference between the U.S. 10-year Treasury yield and the 10-year Treasury Inflation-Protected (TIPS) yield (referred to as the breakeven inflation rate).
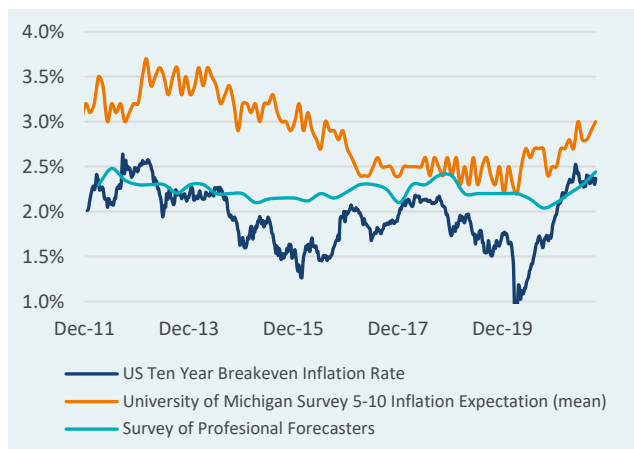
Inflation at the beginning of the year remained depressed from 2020 economic downturn, but then spiked in the second quarter due to a combination of year-over-year base effects, a recovery in energy, and pandemic-related supply/demand imbalances. Inflation is now a nationwide

concern, and debates abound regarding how "transitory" it might be.

Consumer inflation expectations further separated from investor inflation expectations during the year, as consumer expectations tend to more closely track the current rate of inflation. While investors are pricing lower-for-longer inflation, American households are expecting 3.0% long-term inflation—the highest forecast since 2016. Inflation expectations from the Survey of Professional Forecasters rose from 2.0% to 2.4% during the year.

Our inflation forecast increased from 2.0% to 2.5%.

INFLATION EXPECTATIONS

Legend:
- US Ten Year Breakeven Inflation Rate
- University of Michigan Survey 5-10 Inflation Expectation (mean)
- Survey of Profesional Forecasters

Source: U. of Michigan, Philly Fed, as of 9/30/21

U.S. 10-YR ROLLING AVERAGE INFLATION SINCE 1923

Forecast: 2.5% Average: 2.8%
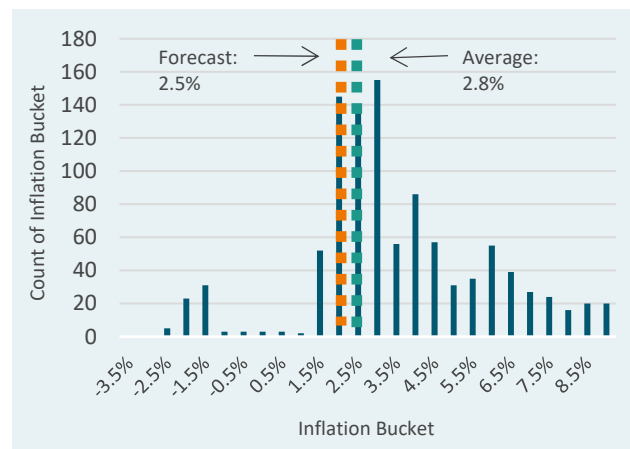
Source: Bloomberg, as of 9/30/21

FORECAST

	10-Year Forecast
University of Michigan Survey *(25% weight)*	+3.0%
Survey of Professional Forecasters *(25% weight)*	+2.4%
US 10-Year TIPS Breakeven Rate *(50% weight)*	+2.4%
Inflation Forecast	2.5%

Source: Verus, as of 9/30/21

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Fixed income

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Cash

The U.S. Treasury yield recovered from its collapse to nearly zero in 2020, though the curve steepness is mild, historically speaking. The Federal Funds Rate range remains at 0-0.25%, and no interest rate hikes are priced in until at least 2022.

The yield of cash seems to have decoupled from the rate of inflation in many developed markets, as near-zero interest rates and relatively high inflation result in deeply negative interest rates on an inflation-adjusted basis. We believe that the current federal funds rate, as well as the steepness of the U.S. Treasury yield curve, may provide

guidance regarding the future longer-term cash return. We place a 75% forecasting weight on the current federal funds rate and a 25% weight to the 10-year U.S. Treasury.

Applying these relationships result in a 10-year cash forecast of 0.4%.

CASH YIELD (3-MONTH T-BILL)

Source: FRED, as of 9/30/21

U.S. TREASURY YIELD CURVE

- US Treasury Curve 9/30/21
- US Treasury Curve 12/31/19
- US Treasury Curve 12/31/17
- US Treasury Curve 12/31/20
- US Treasury Curve 12/31/18
- US Treasury Curve 12/31/10
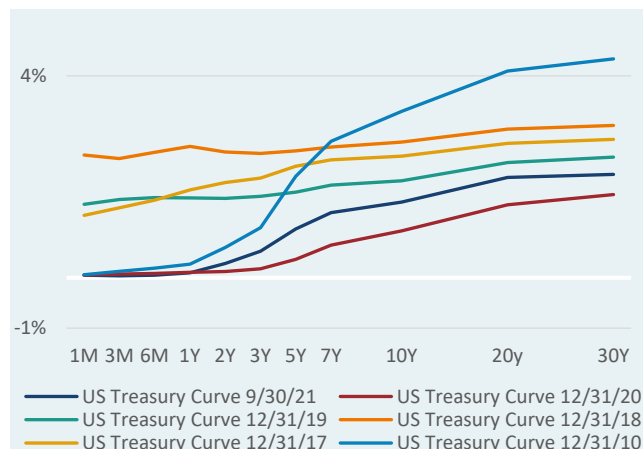
Source: Bloomberg, as of 9/30/21

FORECAST

	10-Year Forecast
Cash	+0.4%
Inflation Forecast	-2.5%
Real Return	-2.1%

Source: Verus, as of 9/30/21

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Rates

We forecast the return from rates based upon the current 10-year Treasury yield, with all cash flows reinvested at the current yield. The 10-year yield rose from 0.7% to 1.5% through September.

U.S. Treasury yields remain high relative to other developed nations, which will likely limit increases in domestic interest rates, as higher rates would attract foreign capital inflows and push rates downward. Investors generally believe U.S. yields will stay lower-for-longer. The U.S. yield curve has steepened as the long end of the curve has risen, but remains relatively flat by historical standards.

Developed world central banks are moving away from extremely loose policies that were enacted to fight the pandemic-induced recession. Higher inflation is also a new risk that creates unique challenges for policymakers who must decide how to balance the need for economic recovery with the risks of rising inflation.

Our expectations are for a 1.5% return over the next ten years, in line with the current U.S. 10-year Treasury yield.

U.S. 10-YR TREASURY YIELD

Source: Bloomberg, as of 9/30/21

U.S. TREASURY YIELD CURVE

Legend: US Treasury Curve 9/30/21, US Treasury Curve 12/31/20, US Treasury Curve 12/31/19, US Treasury Curve 12/31/18, US Treasury Curve 12/31/17, US Treasury Curve 12/31/10
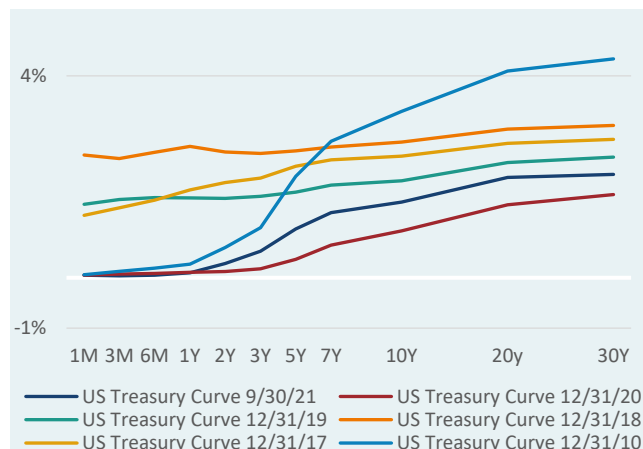
Source: Bloomberg, as of 9/30/21

FORECAST

	10-Year Forecast
U.S. 10-Year Treasury	+1.5%
Inflation Forecast	-2.5%
Real Return	-1.1%

Source: Verus, as of 9/30/21

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Real rates

TIPS provide high sensitivity to duration (interest rate risk) over short periods and track inflation (CPI) fairly well over longer periods. Changing inflation expectations, demand for inflation protection, and rate movements contribute to the price movement of TIPS. Currently, investors appear to expect higher inflation to be temporary, but also expect that inflation will be higher in the next decade than the most recent decade.

The long end of the yield curve increased as the 10-year U.S. Treasury climbed from 0.69% to 1.49%. While inflation has risen substantially, inflation expectations have been more subdued. The breakeven inflation rate increased from 1.63% to 2.38%.

To arrive at a nominal 10-year forecast, we add the current real TIPS yield to our 10-year inflation forecast. Our real rates forecast remains in negative territory as both Treasury yields and priced inflation has risen.

NOMINAL YIELD VS. REAL
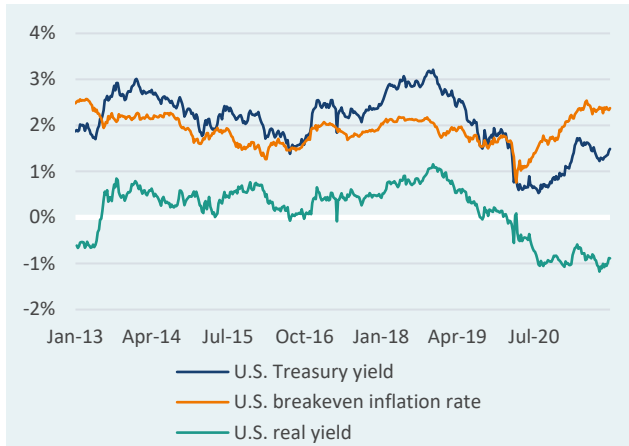
Source: Bloomberg, as of 9/30/21

INFLATION EXPECTATIONS
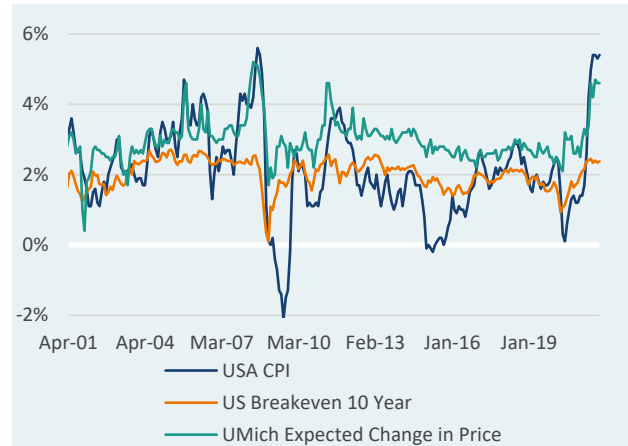
Source: Bloomberg, as of 9/30/21

FORECAST

	10-Year Forecast
U.S. 10-Year TIPS Real Yield	-0.9%
Inflation Forecast	+2.5%
Nominal Return	1.7%

Source: Verus, as of 9/30/21

Core fixed

Credit fixed income return is composed of a bond term premium (duration) and credit spread. The bond term premium is represented by the 10-year U.S. Treasury yield.

We use default rates and credit spreads for each respective fixed income category to provide our 10-year return forecast. Our default rate assumption is derived from a variety of sources, including historical data and academic research. The effective default that is subtracted from the return forecast is based on our assumed default and recovery rates.

Core fixed income spreads fell from 90 bps to 81 bps over the year and remain below the 30-year average of 1.25%. Higher interest rates bolstered our core fixed income expectations, while slightly tighter credit spreads had an opposing effect. Our forecast increased from 1.5%. to 2.2% during the year.

U.S. CORE CREDIT SPREAD
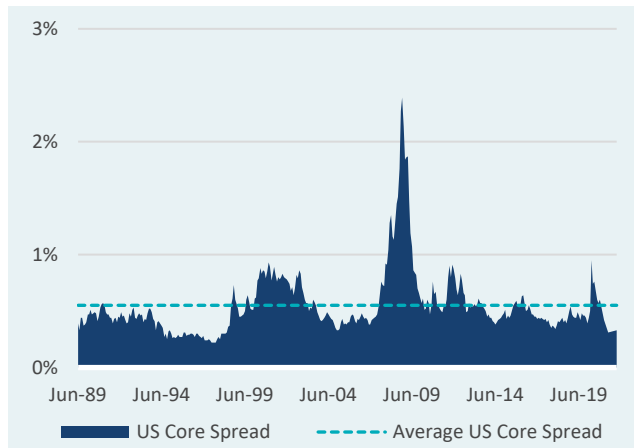
Source: Bloomberg, as of 9/30/21

ROLLING EXCESS RETURN (10-YR)
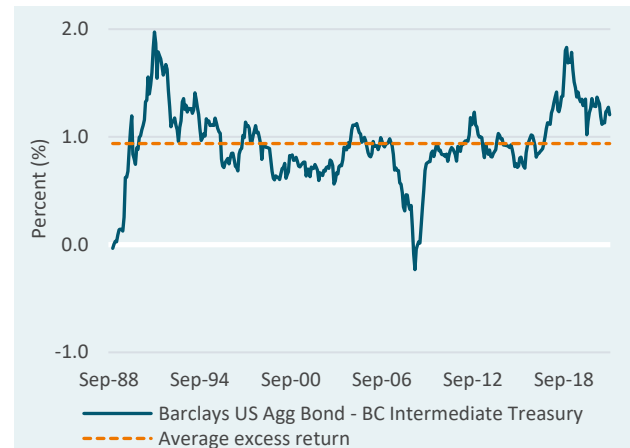
Source: Bloomberg, as of 9/30/21

FORECAST

	10-Year Forecast
Bloomberg U.S. Option-Adjusted Spread	+0.8%
Effective Default	-0.1%
U.S. 10-Year Treasury	+1.5%
Nominal Return	2.2%
Inflation Forecast	-2.5%
Real Return	-0.4%

Source: Verus, as of 9/30/21

Private credit

The spectrum of private credit is broad and the types of investments in this asset class can differ considerably in terms of return expectations and risks involved. To reflect the disparate characteristics of this asset class, our private credit forecast assumes a diversified portfolio comprised of 25% direct lending, 25% direct lending with fund-level leverage, and 50% credit opportunities strategies. Our resulting private credit forecast is a result of our combined expectations for each of these exposure types.

We follow a building block approach to build return expectations.
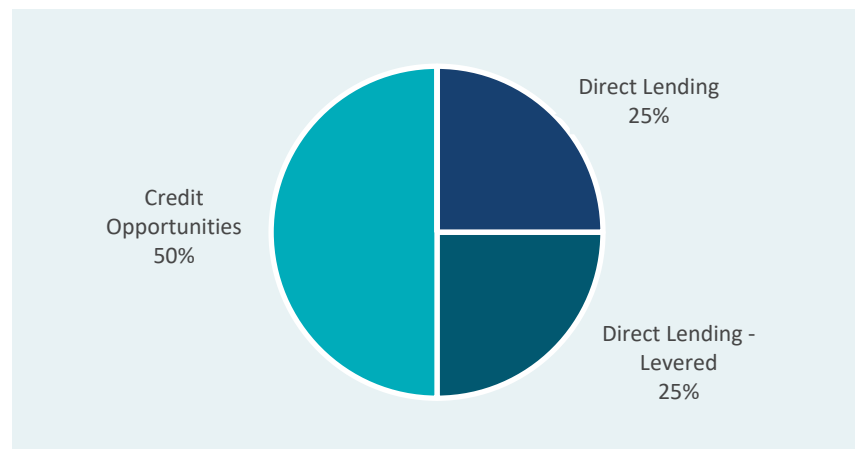
Direct lending expected return is a product of interest rates (LIBOR with a 0.5% rate floor), a floating rate credit spread above LIBOR, plus original issuance discounts, minus management fees and carried interest. Direct lending with fund-level leverage includes these same building blocks but is adjusted for the added spread from leverage and the costs of that leverage. The expected return of credit opportunities strategies is a result of interest rates (U.S. Treasury yield), credit spread, original issuance discounts, minus management fees and carried interest, with an adjustment for added spread from leverage and the costs of that leverage. Further details of this methodology is provided on the next page.

PRIVATE CREDIT WEIGHTS

Direct Lending
25%

Direct Lending -
Levered
25%

Credit
Opportunities
50%

Source: Verus

FORECAST

	10-Year Forecast
Credit Opportunities *(50% weight)*	7.0%
Direct Lending – Unlevered *(25% weight)*	5.0%
Direct Lending – Levered *(25% weight)*	8.0%
Private Credit Weighted Return Forecast	6.8%
Inflation Forecast	-2.5%
Real Return	4.3%

Source: Verus, as of 9/30/21 – assuming universe weights as indicated by left-hand chart
Please reach out to your Verus consultant for Private Credit universe forecast methodology

Private credit

Below we illustrate the specific building blocks of our private credit forecasts. The build up method is used to calculate a gross investment level return, which is adjusted to account for fund level leverage, management fees, and carried interest.

	Direct Lending –Unlevered	Direct Lending – Levered		Credit Opportunities*		Junior Capital / Mezzanine	Distressed
Interest Rate Floor	0.5%	0.5%	Base Interest Rate	0.7% - 1.2%	Fixed rate coupon	8.5%	Return expectations for distressed have been developed on a range bound basis given the diversity of strategies included in the asset class:
Spread	5.5%	5.5%	Spread	4.5% - 9.0%	Paid-in-kind coupon	3.5%	
Original Issuance Discount	2.0%	2.0%	Original Issuance Discount	1.5%	Annualized equity upside	1.5%	Distressed strategies are highly opportunistic by nature and returns are primarily, if not entirely, driven by capital appreciation limiting the ability to use a build up method.
Gross return	*6.7%*	*6.7%*	*Gross return*	*5.7% - 10.7%*	*Gross return*	*13.5%*	
Leverage Cost	NA	2.3%	Leverage Cost	2.34%	Leverage Cost	NA	
Leverage Level	0.0x	1.0x	Leverage Level	0.3x – 0.5x	Leverage Level	0.0x	
Levered gross return	*6.7%*	*11.0%*	*Levered gross return*	*7.4% - 13.2%*	*Levered gross return*	*13.5%*	Distressed strategies typically target 10%+ net returns, but market conditions often weigh heavily into the overall performance.
Effective Management Fees	1.0%	1.8%	Effective Management Fees	1.5% - 2.0%	Effective Management Fees	1.5%	
Carried Interest	0.7%	1.2%	Carried Interest	0.9% - 2.3%	Carried Interest	3.2%	Periods of market volatility, dislocation, and economic downturns generally provide a more attractive investment environment for distressed strategies where outperformance may be expected. Historically, median fund level net returns have ranged between 9-10% although top to bottom quartile dispersion is has been wide historically.
Total Net Return	**5.0%**	**8.0%**	**Total Net Return**	**7.0%**	**Total Net Return**	**8.8%**	**Total Net Return** | **9.0%**

Return expectations for credit opportunities have been developed on a range-bound basis given the diversity of strategies included in the asset class. Values represent the mid-point estimate of those ranges. For Credit Opportunities, our return assumption is the midpoint of the total net return range of 5.0% - 9.0%.

Source: Verus

Credit summary

	Core	Long-Term Credit	Global Credit*	High Yield*	Bank Loans*	EM Debt (USD)	EM Debt (Local)	Private Credit	Real Estate Debt
Index	Bloomberg U.S. Aggregate	Bloomberg Long U.S. Corporate	Bloomberg Global Credit	Bloomberg U.S. High Yield	S&P LSTA	JPM EMBI	JPM GBI-EM	N/A	Bloomberg CMBS IG
Method	OAS + U.S. 10-Year	OAS + U.S. 10-Year	OAS + Global 10-Year Treasuries	OAS + U.S. 10-Year	LIBOR + Spread	OAS + U.S. 10-Year	Current Yield	Build up method using Direct Lending (unlevered), Direct Lending (levered), Opportunistic Credit**	LIBOR + Spread
Spread to	Intermediate U.S. Treasury	Long-Term U.S. Treasury	Global Long-Term Treasuries	Intermediate U.S. Treasury	LIBOR	Intermediate U.S. Treasury	-	-	LIBOR
Default Assumption	-0.5%	-4.5%	-	-	-	-0.5%	-0.5%	-	-3.7%
Recovery Assumption	80%	95%	-	-	-	60%	40%	-	47%
Spread	0.8%	1.1%	0.8%	3.2%	4.3%	3.9%	-	-	4.0%
Yield	-	-	-	-	-	-	4.5%	-	-
Risk Free Yield	1.5%	1.5%	1.2%	1.5%	0.1%	1.5%	-	-	0.1%
Effective Default	-0.1%	-0.2%	-0.4%	-1.6%	-2.1%	-0.2%	-0.3%	-	-2.0%
Nominal Return	2.2%	2.4%	1.5%	3.1%	2.3%	5.2%	4.2%	6.8%	2.1%
Inflation Forecast	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Real Return	-0.4%	-0.2%	-1.0%	-0.6%	-0.3%	2.7%	1.7%	4.3%	-0.4%

*We assume half of the spread of higher risk credit will be lost to defaults, as this has roughly been the case throughout history.

**We assume 25% Direct Lending (Unlevered), 25% Direct Lending (Levered), 50% Credit Opportunities – please refer to the previous page for more information.

Source: Verus

Verus

Equities

Equities

Investment returns in the equity space can be broken down into earnings growth, dividend yield, inflation, and repricing. Over the very long-term, repricing represents a small portion of return to equity investors, but over shorter time frames, the impacts on return can vary considerably.

If investors are willing to pay more for earnings, it could signal that investors are more confident in positive earnings growth going forward, while the opposite is true if investors pay less for earnings. It is somewhat surprising that investor confidence varies so much given that the long-term earnings growth is relatively stable.

Investor confidence in earnings growth can be measured using both the Shiller P/E ratio and the trailing 12-month P/E ratio. We take an average of these two valuations metrics when determining our repricing assumption. In short, if the P/E ratio is too high (low) relative to history, we expect future returns to be lower (higher) than the long-term average. Implicit in this analysis is the assumption that P/E's will exhibit mild mean reversion over 10 years.

We make a conservative repricing estimate given how widely repricing can vary over time. We then skew the repricing adjustment because the percentage change in index price is larger with each incremental rise in valuations when P/E's are low, compared to when they are high.

TRAILING 10-YR S&P 500 RETURN COMPOSITION
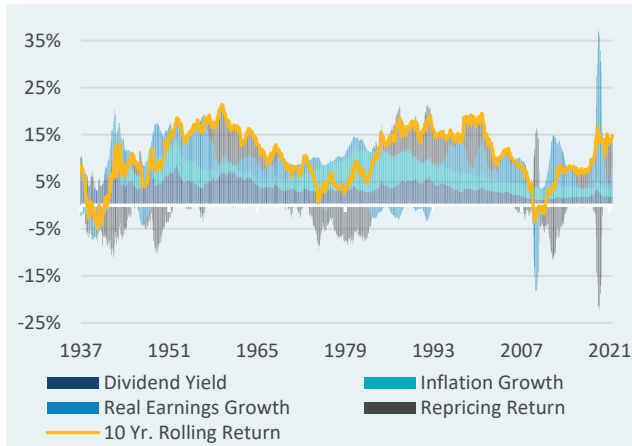
Source: Shiller, Standard & Poor's, as of 6/30/21

U.S. LARGE SHILLER P/E

Source: Shiller, S&P 500, as of 9/30/21

P/E REPRICING ASSUMPTION

Average P/E Percentile Bucket	Lower P/E	Upper P/E	Repricing Assumption
Lower 10%	-	10	2.00%
10% - 20%	10	13	1.50%
20% - 30%	13	15	0.75%
30% - 45%	15	18	0.50%
45% - 55%	18	19	0.0%
55% - 70%	19	21	-0.25%
70% - 80%	21	22	-0.50%
80% - 90%	22	24	-0.75%
Top 10%	24	-	-1.00%

Source: Verus

Verus

Global equity

Global Equity is a combination of U.S. large, international developed, and emerging market equities. We can therefore combine our existing return forecasts for each of these asset classes to arrive at our global equity return forecast.

We use the MSCI ACWI Index as our benchmark for global equity and apply the country weights of this index to determine the weightings for our global equity return calculation. As with other equity asset classes, we use the historical standard deviation of the benchmark (MSCI ACWI Index) for our volatility forecast.

The valuation of global equities are driven by the richness/cheapness of the underlying markets, as indicated by the current price-to-earnings ratio.

Our return building blocks produce a local return forecast for international equities. For investors who wish to incorporate market implied currency movements into the return forecast, please see the adjustments and explanation in the Appendix.

GLOBAL EQUITY P/E RATIO HISTORY
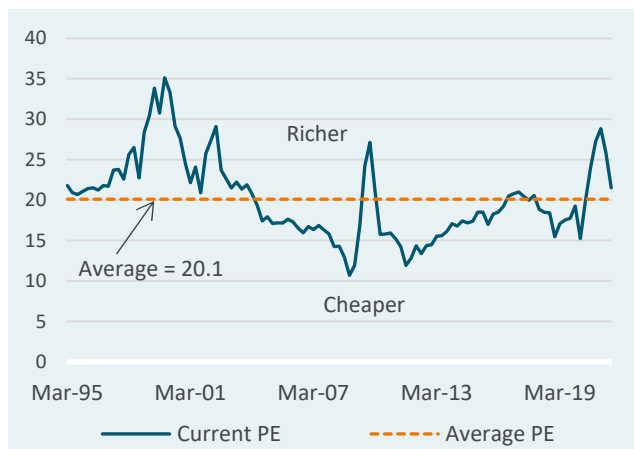
Source: MSCI, as of 9/30/21

MARKET PERFORMANCE (3-YR ROLLING)
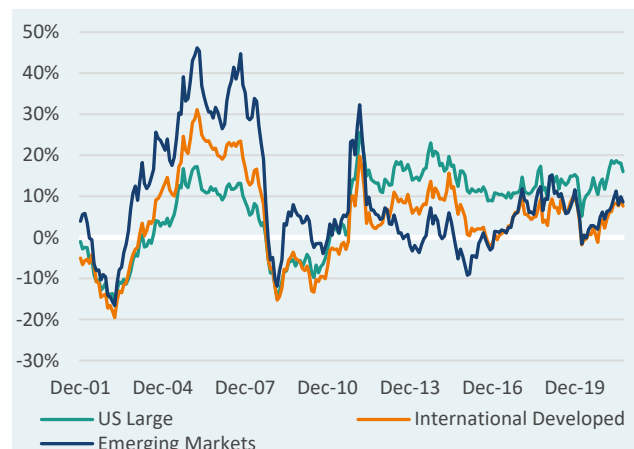
Source: MSCI, Standard & Poor's, as of 9/30/21

FORECAST

Market	Weight	CMA return
U.S. Large	58%	5.3%
Developed Large	31%	6.1%
Emerging Markets	11%	6.1%
Global Equity Forecast		5.7%

Source: Verus, weights rescaled to equal 100%, as of 9/30/21

Equity summary

	U.S. Large	U.S. Small	EAFE	EAFE Small	EM
Index	S&P 500	Russell 2000	MSCI EAFE Large	MSCI EAFE Small	MSCI EM
Method	Building Block Approach: current dividend yield + historical average real earnings growth + inflation on earnings + repricing				
Current Shiller P/E Ratio	38.3	63.6	21.3	-	12.7
Regular P/E Ratio	25.1	181.5**	19.0	51.6	15.3
2021 Shiller P/E Change	+24.4%	+47.6%	+25.3%	-	+13.4%
2021 Regular P/E Change	-3.5%	-98.7%	-45.1%	+80.4%	-23.9%
Current Shiller P/E Percentile Rank	95%	98%	45%	-	49%
Current Regular P/E Percentile Rank	90%	99%	54%	55%*	61%
Average of P/E Methods' Percentile Rank	93%	99%	50%	55%*	55%
2021 YTD Return	15.9%	12.4%	8.3%	10.0%	-1.2%
Shiller PE History	1982	1988	1982	Not Enough History	2005
Long-Term Average Shiller P/E	23.4	32.4	22.4	-	14.7
Current Dividend Yield	1.4%	1.3%	3.0%	2.3%	2.8%
Long-Term Average Real Earnings Growth	2.4%	2.5%	1.6%	1.2%	0.8%
Inflation on Earnings	2.5%	2.5%	1.5%	1.5%	2.5%
Repricing Effect (Estimate)	-1.0%	-1.0%	0.0%	-0.3%	0.0%
Nominal Return	5.3%	5.3%	6.1%	4.7%	6.1%
Inflation Forecast	2.5%	2.5%	2.5%	2.5%	2.5%
Real Return	2.8%	2.8%	3.6%	2.2%	3.6%

Data as of 9/30/21

*Average trailing P/E from previous 12 months (25% weight) and current P/E (75% weight) are blended into one P/E metric, which is then percentile ranked relative to long-term history. This is done to reduce reliance on a single price multiple, as insufficient data history is available to calculate Shiller P/E for this asset class.

**Earnings fell to nearly zero during 2020, which is the cause of this very high figure

NOTE: For all equities, we exclude data prior to 1972, which allows for a more appropriate comparison between data sets

Private equity

Private equity and public equity returns have been correlated historically because the underlying economic forces driving these asset class returns are quite similar. The return relationship between the two can vary in the short-term, but over the long-term investors have received a premium, driven by leverage, concentrated factor exposure (smaller and undervalued companies), skill, and possibly illiquidity.

Historically, the beta of private equity relative to public equities has been high. We use a beta assumption of 1.85 to U.S. large cap equities in our capital market forecast.

Private equity performance typically differs based on the implementation approach. We provide a 10-year forecast for the entire private equity universe of 9.5%. Direct private equity programs have historically outperformed the broader universe by approximately 1.0%, and we forecast direct private equity accordingly with a forecast of 10.5%. Private equity fund-of-fund (FoF) programs have historically lagged the universe by 1.0%, and we forecast private equity fund-of-funds at 8.5% to reflect this drag.

**PRIVATE EQUITY EXCESS RETURN
(PE – U.S. SMALL CAP EQUITY)**

Cambridge Associates US PE Return - Russell 2000 Return
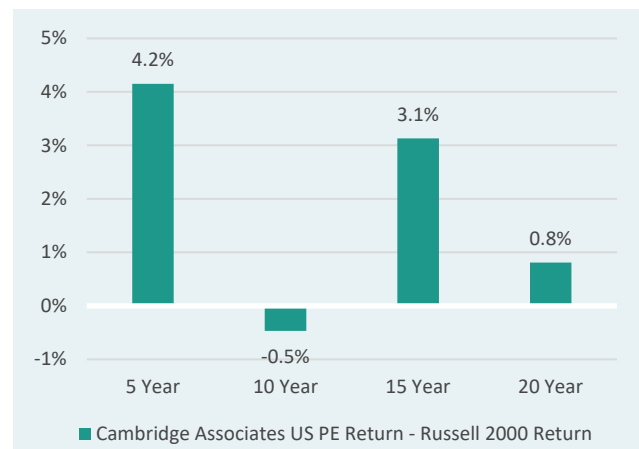
Source: Cambridge, Russell, as of 3/31/21

PRIVATE EQUITY IMPLEMENTATION FORECASTS

	10-Year Forecast
Private Equity Universe Forecast	9.5%
Private Equity FoF Forecast	8.5%
Private Equity Direct Forecast	10.5%

Source: Verus, as of 9/30/21

PRIVATE EQUITY UNIVERSE FORECAST

	10-Year Forecast
U.S. Large Cap Forecast	+5.3%
1.85 Beta Multiplier	+4.2%
Nominal Return	9.5%
Inflation Forecast	-2.5%
Real Return	7.0%

Source: Verus, as of 9/30/21

Real assets / alternatives

Verus

Hedge funds

Hedge fund performance variation through time can be partly explained by public market betas (ex: equity, rates, credit, etc.) and partly explained by non-public sources of return (ex: alternative betas, skill, luck). Certain hedge funds can be mostly explained by public market betas, while others are driven mostly by non-public sources of return. We do not believe hedge funds should be thought of as an asset class, and in most cases we recommend benchmarking and modeling individual hedge funds in line with the underlying asset class exposure set (equity hedge funds modeled as equity exposure, fixed income hedge funds modeled as fixed income exposure, etc.) Our forecast for "hedge funds" that we show here can be thought of as a forecast of the broad universe of hedge funds.

To forecast hedge fund returns, we identified the portion of historical hedge fund performance that can be attributed to public market betas, and the portion of hedge fund returns that cannot be attributed to public market beta. This means our forecast has two components: the public market return (explained return) and the non-public market return (unexplained return).

To forecast the public market beta portion of hedge funds, we take the historical sensitivity of hedge funds to equity, rates, credit, and commodities and pair these with our current 10-year public market forecasts for each asset class. To forecast the non-public market return portion of hedge funds (unexplained return) we simply assume the historical performance contribution of these sources will continue.

HEDGE FUND FORECAST
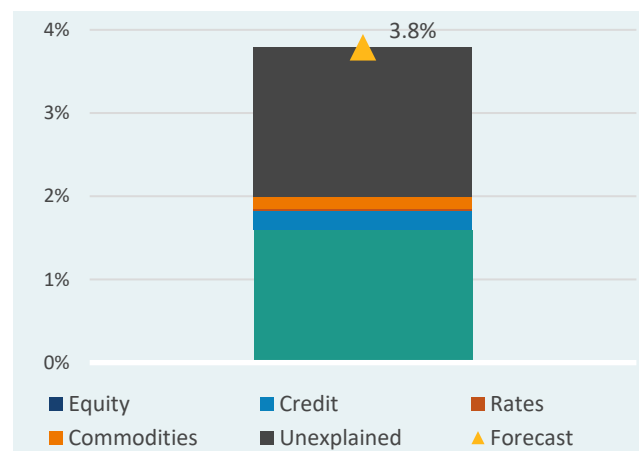
Source: Verus, as of 9/30/21

HEDGE FUND PUBLIC MARKET SOURCES OF RETURN (EXPLAINED RETURN)

Equity
Rates
Credit
Commodities

HEDGE FUND NON-PUBLIC SOURCES OF RETURN (UNEXPLAINED RETURN)

Alternative betas
Skill
Luck

Source: Verus

FORECAST

	10-Year Forecast
Public Market % of Return	+2.0%
Non-Public Market % of Return	+1.8%
Nominal Return	+3.8%
Inflation Forecast	-2.5%
Real Return	1.3%

Source: Verus, as of 9/30/21

Verus

Hedge fund styles

As mentioned, we do not believe hedge funds should be thought of as an asset class, and in most situations we recommend benchmarking and modeling individual hedge funds in line with the underlying asset class exposure set. In line with this view, we forecast three broad hedge fund categories - equity hedge funds, credit hedge funds, and asymmetric hedge funds. To forecast hedge fund returns, we identified the portion of historical hedge fund performance that can be attributed to public market betas, and the portion of hedge fund returns that cannot be attributed to public market beta. This means our forecast has two components: the public market return (explained return) and the non-public market return (unexplained return).

In practice, we believe hedge funds that have both identifiable core capabilities and persistent high correlations to equities fit equity sleeves. We take a similar approach with credit hedge funds and fixed income sleeves. Funds designed to have little persistent relationship with public market exposures while exhibiting a high degree of tactical or opportunistic trading behaviors fall into a third category, which we call Asymmetric hedge funds. Our forecast for "hedge funds" that we show here match the use cases outlined above as opposed to a broad universe approach.

HEDGE FUND: EQUITY
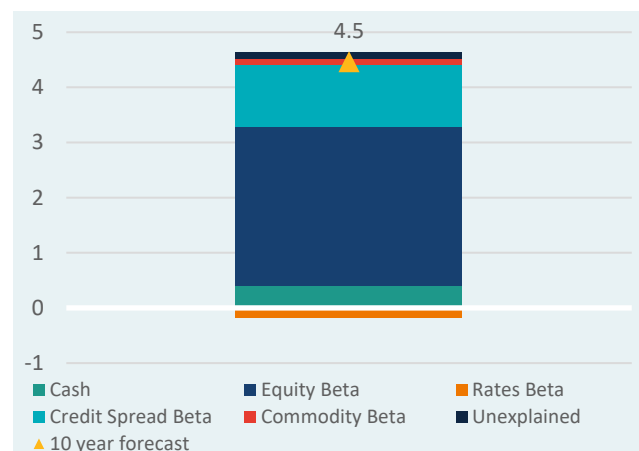
HEDGE FUND: CREDIT
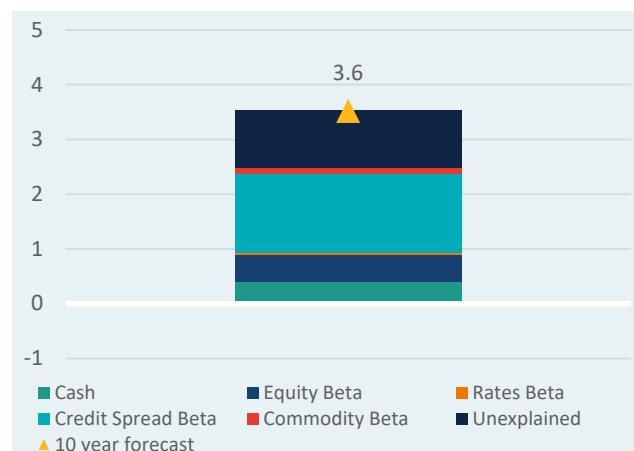
HEDGE FUND: ASYMMETRIC

Source: Verus
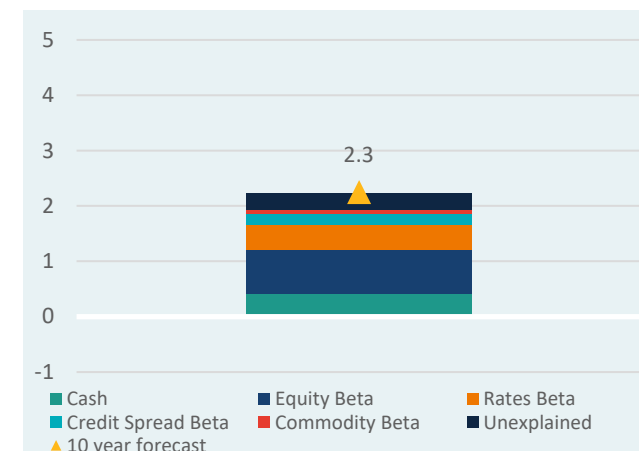
Source: Verus

Source: Verus

Private core real estate/REITS

Performance of the NCREIF property index can be decomposed into an income return (cap rate) and capital return. The return coming from income has historically been more stable than the return derived from capital changes.

The cap rate is the ratio of earnings less expenses to price and does not include extraordinary expenses. A more accurate measure of the yield investors receive should include non-recurring capital expenditures; we assume a 2.0% capex expenditure. We also assume income growth will roughly equal the rate of broad economic growth, and we use GDP forecasts as an estimate for future income growth.

Private real estate and REITs have provided very similar returns over the long-term. Investors should be careful when comparing risk-adjusted returns of publicly traded assets to returns of appraisal priced assets, due to data problems and smoothing effects. While private real estate appears to be less volatile than REITs, the true risks to investors are likely very similar.

We assume the effects of leverage and liquidity offset each other. Therefore, our return forecast is the same for private real estate and REITs.

TRAILING 10-YR NCREIF RETURN COMPOSITION

- 10 Year NCREIF Property Capital Return
- 10 Year NCREIF Property Income Return
- 10 Year NCREIF Property Total Return
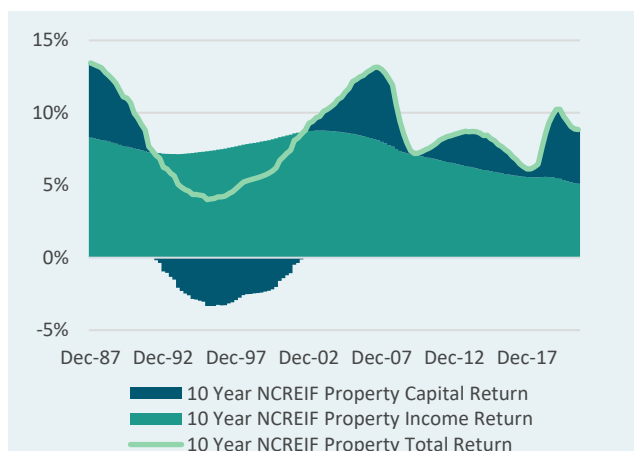
Source: NCREIF, as of 6/30/21

PRIVATE REAL ESTATE

	Private Real Estate 10-Year Forecast
Current Cap Rate	+4.1%
Real Income Growth	+1.9%
Capex Assumption	-2.0%
Inflation	+2.5%
Nominal Return	6.5%
Inflation Forecast	-2.5%
Real Return	+4.0%

Source: Verus, as of 9/30/21

REITS

	10-Year Forecast
Nominal Return Forecast	6.5%
Inflation Forecast	-2.5%
Real Return	4.0%

Source: Verus, as of 9/30/21

Verus

Value-add & opportunistic real estate

Value-add real estate includes properties which are in need of renovation, repositioning, and/or lease-up. Properties may also be classified as value-add due to their lower quality and/or location. Opportunistic real estate can also include development and distressed or very complex transactions. Greater amounts of leverage are usually employed within these strategies. Leverage increases beta (risk) by expanding the purchasing power of property managers via a greater debt load, which magnifies gains or losses. Increased debt also results in greater interest rate sensitivity. An increase/decrease in interest rates may result in a write-up/write-down of fixed rate debt, since debt holdings are typically marked-to-market.

Performance of value-add real estate is composed of the underlying private

real estate market returns, plus a premium for additional associated risk, which is modeled here as 200 bps above our core real estate return forecast. Performance of opportunistic real estate strategies rests further out on the risk spectrum, and is modeled as 300 bps above the core real estate return forecast.

Additional expected returns above core real estate are justified by the higher inherent risk of properties which need improvement (operational or physical), price discounts built into properties located in non-core markets, illiquidity, and the ability of real estate managers to potentially source attractive deals in this less-than-efficient marketplace.

CAP RATE SPREADS

Legend: Cap Rate Spread — Cap Rate — 10-Year Treasury Yield
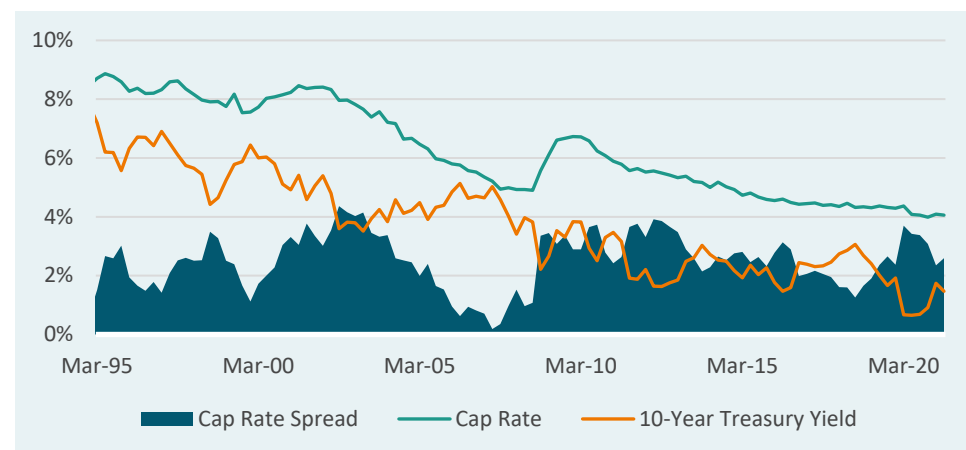
Source: NCREIF, Bloomberg, as of 6/30/21

FORECAST

	Value-Add 10-Year Forecast	Opportunistic 10-Year Forecast
Premium above core	+2.0%	+3.0%
Current Cap Rate	+4.1%	+4.1%
Real Income Growth	+1.9%	+1.9%
Capex Assumption	-2.0%	-2.0%
Inflation	+2.5%	+2.5%
Nominal Return	8.5%	9.5%
Inflation Forecast	-2.5%	-2.5%
Real Return	6.0%	7.0%

Source: Verus, as of 9/30/21

Verus

Infrastructure

Infrastructure includes a variety of investment types across a subset of industries. There is not one definition for what can be included within infrastructure. The asset class has grown dramatically during the last decade as investors sought assets that might provide more attractive yield relative to fixed income along with the potential for inflation protection.

Similar to real estate investment, income plays a significant role in the returns which investors receive. Income yields are currently lower than average due to higher prices and competition in the space, which

might reasonably be expected to translate into lower expected future returns.

Due to the discount rate effect, infrastructure asset valuations would generally be negatively affected by material increases in interest rates. Because leverage is used in this space, higher interest rates would also impact investors in the form of higher borrowing costs.

5-YR ROLLING RETURN COMPOSITION
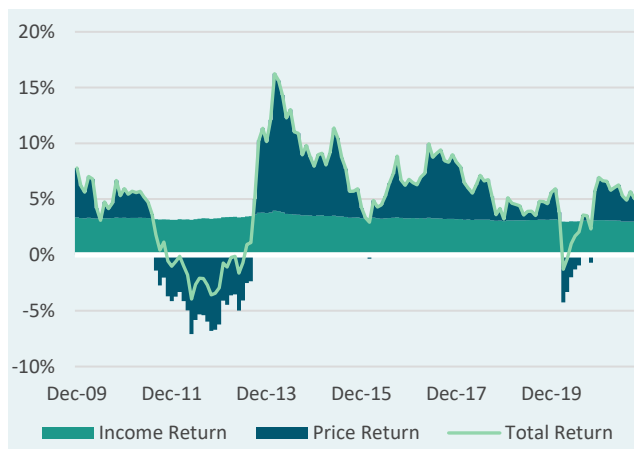
Source: S&P Global Infrastructure Index, as of 9/30/21

ADVANCED ECONOMY REAL GDP GROWTH
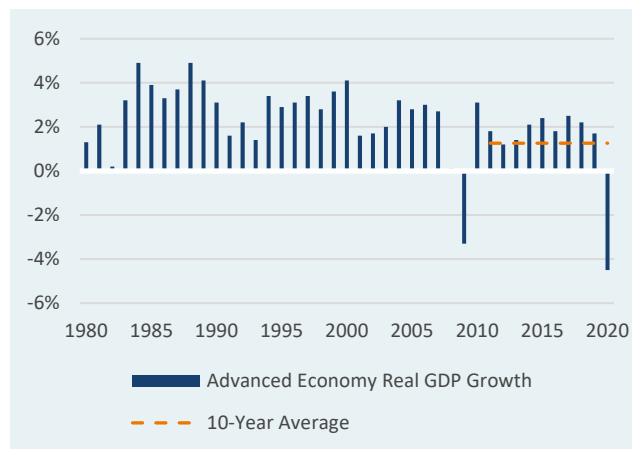
Source: IMF, as of 9/30/21

FORECAST

	10-Year Forecast
Global Inflation	+2.2%
Yield	+3.1%
Income Growth	+1.3%
Nominal Return	6.6%
U.S. Inflation Forecast	-2.5%
Real Return	4.0%

Source: Verus, as of 9/30/21

Commodities

Commodity returns can be decomposed into three sources: collateral return (cash), spot changes (inflation), and roll yield.

Roll return is generated by either backwardation or contango present in futures markets. Backwardation occurs when the futures price is below the spot price, which results in positive yield. Contango occurs when the futures price is above the spot price, and this results in a loss to commodity investors. Historically, futures markets have fluctuated between backwardation and contango but with a net-zero effect over the very long-term (since 1877). Therefore, roll return is assumed to

be zero in our forecast. Over the most recent 10-year period, roll return has been negative, though this is likely the result of multiple commodity crises and a difficult market environment.

Our 10-year commodity forecast combines collateral (cash) return with spot return (inflation) to arrive at the nominal return, and subtracts out inflation to arrive at the real return.

TRAILING 10YR BLOOMBERG COMMODITY RETURN COMPOSITION (%)
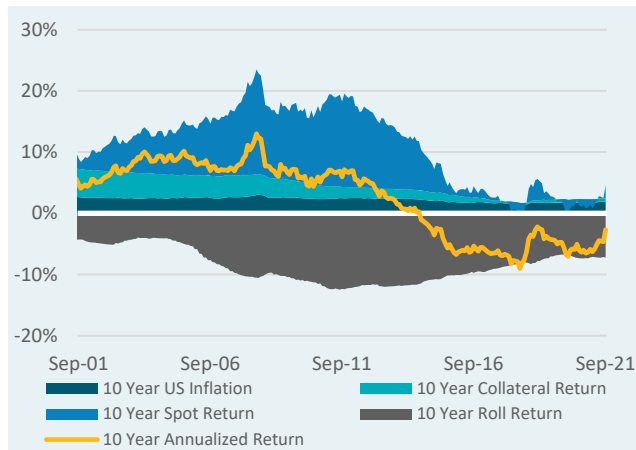
Source: MPI, Bloomberg, as of 9/30/21

BLOOMBERG COMMODITY RETURN COMPOSITION (%)
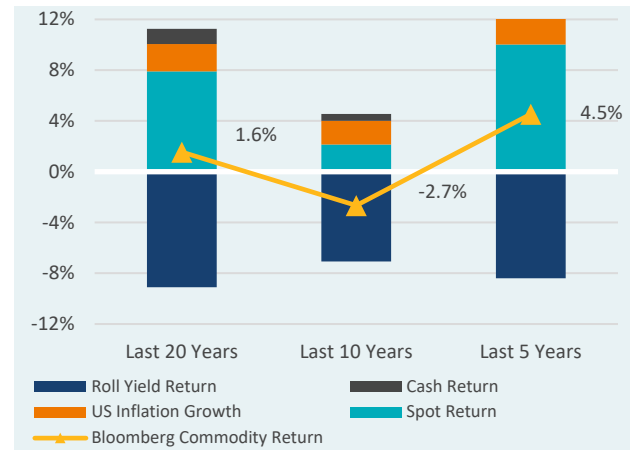
Source: MPI, Bloomberg, as of 9/30/21

FORECAST

|	10-Year Forecast
Collateral Return (Cash)	+0.4%
Roll Return	+0.0%
Spot Return (Inflation)	+2.5%
Nominal Return	3.0%
Inflation Forecast	-2.5%
Real Return	0.4%

Source: Verus, as of 9/30/21

Currency beta

Currency beta is a long-short portfolio of G10 currencies constructed by investing in three equally weighted factors: carry, momentum, and value. A significant amount of academic research has concluded that these factors demand a risk premium in the currency market. Studies have also shown that currency beta explains a high portion of active currency managers' returns, indicating it may be a good neutral starting point or benchmark for currency investing. Currency beta portfolios gain exposure to the carry, momentum, and value factors in a systematic and transparent manner. For more detailed information on currency beta, please contact your consultant.

We model each factor in the currency beta portfolio separately, and then take a weighted average to get an overall return forecast. For the carry portfolio, the main driver of returns is the yield an investor receives from holding currencies with relatively higher interest rates. We therefore use a 12-month average of the portfolio's yield as the expected return. For value, our return forecast assumes a certain level of mean reversion to PPP fair value based on historical data. Lastly, for momentum, we simply assume the average historical return due to lack of long-term fundamental return drivers. Short-term volatility levels typically drive returns in the momentum portfolio, which is difficult to model in a 10-year return forecast.

3-YEAR ROLLING PERFORMANCE
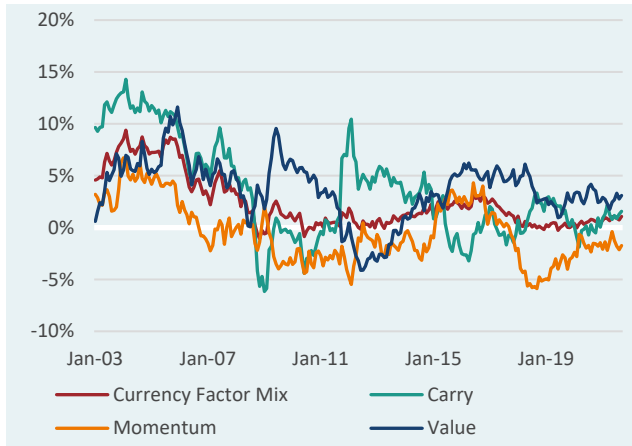
Source: MSCI, as of 9/30/21

CURRENCY BETA CONSTRUCTION
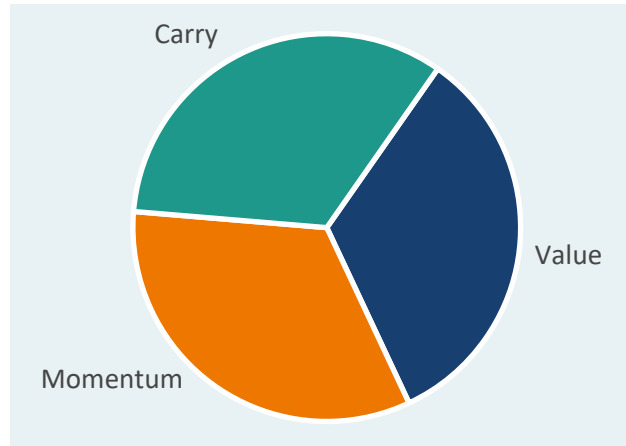
Source: Verus

RETURN FORECAST

Factor	Weight	Return Forecast	Weighted return
Carry	33.3%	0.8%	0.3%
Momentum	33.3%	-0.8%	-0.3%
Value	33.3%	2.4%	0.8%
Currency Beta			**0.8%**

Source: Verus, as of 9/30/21

Risk parity

Risk parity is built upon the philosophy of allocating to risk premia rather than to asset classes. Because risk parity by definition aims to diversify risk, the actual asset allocation can appear very different from traditional asset class allocation.

We model risk parity using an assumed Sharpe Ratio of 0.5, which considers the historical performance of risk parity. This assumed Sharpe Ratio is higher than other asset class forecasts, but is consistent with these forecasts because *portfolios* of assets tend to deliver materially higher Sharpe Ratios than individual assets. An assumed Sharpe Ratio of 0.5 brings us to an expected return of 5.4%.

The expected return of Risk Parity is determined by this Sharpe Ratio

forecast, along with a 10% volatility assumption.

We used the S&P Risk Parity 10% Volatility Index to represent risk parity correlations relative to the behaviors of each asset class. Risk parity funds are suggested to be better able to withstand various difficult economic environments - reducing volatility without sacrificing return, over longer periods.

It is difficult to arrive at a single model for risk parity , since strategies can differ significantly across firms/strategies. Risk parity almost always requires explicit leverage. The amount of leverage will depend on the specific strategy implementation style, as well as expected correlations and volatility.
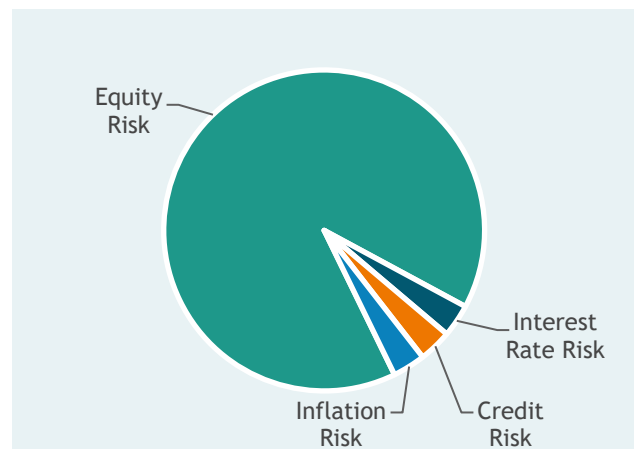
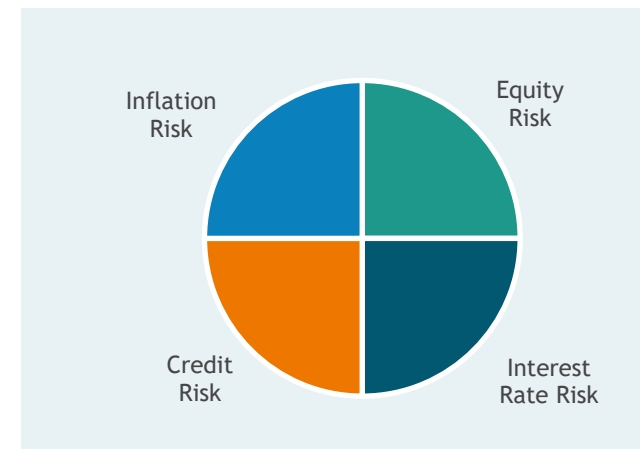## VS. TRADITIONAL ASSET CLASSES (3YR ROLLING)
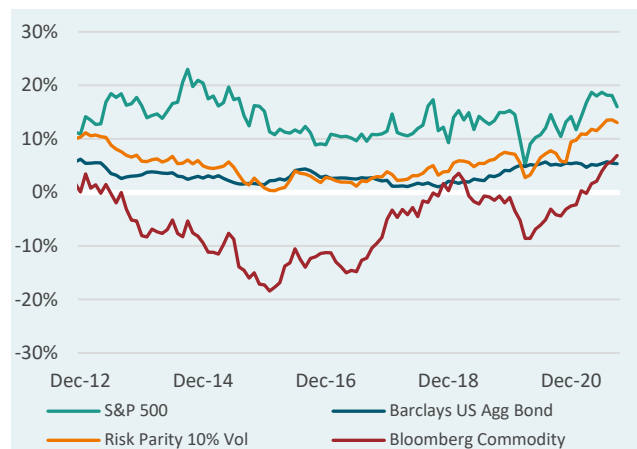
Source: MPI, as of 9/30/21
Note: Risk parity is modeled here as S&P Risk Parity 10% Vol Index

Legend: S&P 500, Barclays US Agg Bond, Risk Parity 10% Vol, Bloomberg Commodity

TRADITIONAL ASSET ALLOCATION

Equity Risk, Inflation Risk, Credit Risk, Interest Rate Risk

Source: Verus

RISK PARITY

Inflation Risk, Equity Risk, Credit Risk, Interest Rate Risk

Source: Verus

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Appendix

30-year return & risk assumptions

— Occasionally investors may have a specific need for longer-term capital market forecasts. We have developed a set of 30-year assumptions to meet those needs.

— The return forecasts below have been constructed using our existing building block approach, but with longer-term inputs. Risks and correlations are estimated using the same approach as our 10-year forecasts, using full-history autocorrelation-adjusted realized risk and past 10 year realized correlations.

— These return figures must be thought of separately from our 10-year forecasts, and are not meant to imply performance for the 20 years *beyond* our 10 year forecasts.

— Please reach out to your Verus consultant with questions regarding whether 30-year Capital Market Assumptions might be appropriate for your needs.

Asset Class	Index Proxy	Thirty Year Return Forecast		Standard Deviation	Sharpe Ratio Forecast	Sharpe Ratio Forecast
		Geometric	Arithmetic	Forecast	(g)	(a)
Equities						
U.S. Large	S&P 500	5.7%	6.8%	15.7%	0.33	0.40
U.S. Small	Russell 2000	5.7%	7.8%	21.6%	0.24	0.33
International Developed	MSCI EAFE	6.1%	7.6%	17.9%	0.31	0.39
International Small	MSCI EAFE Small Cap	4.7%	6.9%	22.2%	0.18	0.28
Emerging Markets	MSCI EM	5.9%	8.7%	25.3%	0.21	0.32
Global Equity	MSCI ACWI	5.9%	7.3%	17.3%	0.31	0.39
Private Equity	Cambridge U.S. Private Equity	10.1%	13.0%	26.0%	0.37	0.48
Private Equity (Direct)	Cambridge U.S. Private Equity	11.1%	14.0%	26.0%	0.40	0.51
Private Equity (Fund of Funds)	Cambridge U.S. Private Equity	9.1%	12.0%	26.0%	0.33	0.44
Fixed Income						
Cash	30 Day T-Bills	0.6%	0.6%	1.2%	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5 - 10	2.0%	2.1%	5.3%	0.26	0.29
U.S. Treasury	Bloomberg Treasury 7-10 Year	2.0%	2.2%	6.8%	0.21	0.24
U.S. 30-year Treasuries	Bloomberg U.S. Treasury 20+ Year	2.0%	2.8%	12.8%	0.11	0.17
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	1.0%	1.5%	9.5%	0.04	0.09
Global Aggregate	Bloomberg Global Aggregate	1.5%	1.7%	6.1%	0.15	0.18
Core Fixed Income	Bloomberg U.S. Aggregate Bond	2.9%	3.0%	4.1%	0.56	0.58
Core Plus Fixed Income	Bloomberg U.S. Universal	3.4%	3.5%	4.0%	0.70	0.71
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1 - 3 year	2.2%	2.3%	3.6%	0.45	0.46
Short-Term Credit	Bloomberg Credit 1-3 Year	2.8%	2.9%	3.6%	0.62	0.63
Long-Term Credit	Bloomberg Long U.S. Corporate	3.2%	3.6%	9.4%	0.28	0.32
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	4.7%	5.3%	11.2%	0.37	0.42
Bank Loans	S&P/LSTA Leveraged Loan	2.3%	2.7%	9.3%	0.18	0.23
Global Credit	Bloomberg Global Credit	1.2%	1.5%	7.3%	0.08	0.12
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	6.1%	6.8%	12.6%	0.44	0.49
Emerging Markets Debt (Local)	JPM GBI EM Global Diversified	4.2%	4.9%	12.2%	0.30	0.35
Private Credit	S&P LSTA Leveraged Loan Index	6.8%	7.8%	14.6%	0.43	0.49
Private Credit (Direct Lending – Unlevered)	S&P LSTA Leveraged Loan Index	5.0%	5.5%	10.4%	0.43	0.47
Private Credit (Direct Lending – Levered)	S&P LSTA Leveraged Loan Index	8.0%	9.4%	17.4%	0.43	0.50
Private Credit (Credit Opportunities)	S&P LSTA Leveraged Loan Index	7.0%	8.0%	15.0%	0.43	0.49
Private Credit (Junior Capital / Mezzanine)	S&P LSTA Leveraged Loan Index	8.8%	10.4%	19.0%	0.43	0.52
Private Credit (Distressed)	S&P LSTA Leveraged Loan Index	9.0%	12.6%	29.1%	0.29	0.41

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

30-year return & risk assumptions

— Occasionally investors may have a specific need for longer-term capital market forecasts. We have developed a set of 30-year assumptions to meet those needs.
— The return forecasts below have been constructed using our existing building block approach, but with longer-term inputs. Risks and correlations are estimated using the same approach as our 10-year forecasts, using full-history autocorrelation-adjusted realized risk and past 10 year realized correlations.
— These return figures must be thought of separately from our 10-year forecasts, and are not meant to imply performance for the 20 years *beyond* our 10 year forecasts.
— Please reach out to your Verus consultant with questions regarding whether 30-year Capital Market Assumptions might be appropriate for your needs.

Asset Class	Index Proxy	Thirty Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)
		Geometric	Arithmetic			
Other						
Commodities	Bloomberg Commodity	2.8%	4.0%	15.9%	0.14	0.21
Hedge Fund	HFRI Fund Weighted Composite	4.4%	4.7%	7.7%	0.50	0.53
Hedge Fund of Funds	HFRI Fund of Funds Composite	3.4%	3.7%	7.7%	0.37	0.40
Hedge Fund (Equity Style)	Custom HFRI Benchmark Mix*	5.3%	6.3%	15.0%	0.31	0.38
Hedge Fund (Credit Style)	Custom HFRI Benchmark Mix*	4.6%	5.1%	10.1%	0.40	0.45
Hedge Fund (Asymmetric Style)	Custom HFRI Benchmark Mix*	2.7%	2.8%	4.9%	0.43	0.45
Real Estate Debt	Bloomberg IG CMBS	2.1%	2.4%	7.4%	0.20	0.24
Core Real Estate	NCREIF Property	6.2%	6.9%	12.5%	0.45	0.50
Value-Add Real Estate	NCREIF Property + 200bps	8.2%	9.5%	16.7%	0.46	0.53
Opportunistic Real Estate	NCREIF Property + 300bps	9.2%	10.8%	18.7%	0.46	0.54
REITs	Wilshire REIT	6.2%	7.9%	19.3%	0.29	0.38
Global Infrastructure	S&P Global Infrastructure	7.2%	8.6%	17.6%	0.37	0.45
Risk Parity	S&P Risk Parity 10% Vol Index	5.6%	6.1%	10.0%	0.50	0.55
Currency Beta	MSCI Currency Factor Index	0.8%	0.9%	3.4%	0.06	0.07
Inflation		2.3%	-	-	-	-

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

*To represent hedge fund styles, we use a combination of HFRI benchmarks: Equity Style = 33% HFRI Fundamental Growth, 33% HFRI Fundamental Value, 33% HFRI Activist. Credit Style = 20% HFRI Distressed/Restructuring, 20% HFRI Credit Arbitrage, 20% HFRI Fixed Income-Corporate, 20% HFRI Fixed Income-Convertible Arbitrage, 20% HFRI Fixed Income-Asset Backed. Asymmetric Style = 50% HFRI Relative Value, 50% HFRI Macro
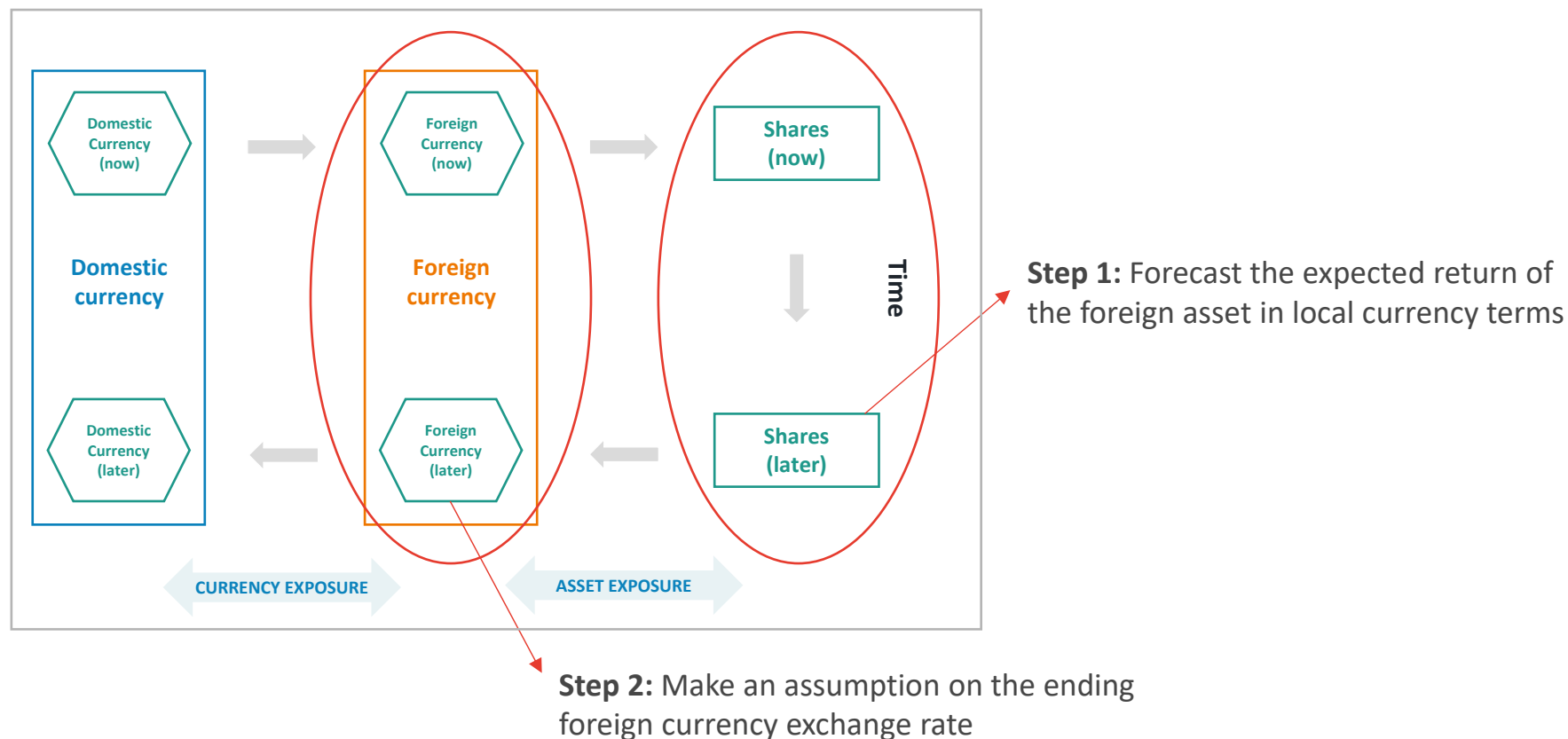
10-year return forecasts with currency adjustment

Asset Class	Index Proxy	Ten Year Return Forecast (Geometric)			Standard Deviation Forecast
		CMA Forecast	Currency Adjustment	Total	
Equities					
International Developed Equity Unhedged	MSCI EAFE	6.1%	1.4%	7.6%	17.9%
International Developed Equity Hedged	MSCI EAFE Hedged	6.1%	1.4%	7.6%	15.9%
International Small Equity Unhedged	MSCI EAFE Small Cap	4.7%	1.4%	6.1%	22.2%
International Small Equity Hedged	MSCI EAFE Small Cap Hedged	4.7%	1.4%	6.1%	19.4%
Fixed Income					
Global Sovereign ex U.S. Unhedged	Bloomberg Global Treasury ex U.S.	0.5%	1.3%	1.7%	9.5%
Global Sovereign ex U.S. Hedged	Bloomberg Global Treasury ex U.S. Hedged	0.5%	1.3%	1.7%	3.8%
Global Credit Unhedged	Bloomberg Global Credit	1.5%	0.3%	1.9%	7.3%
Global Credit Hedged	Bloomberg Global Credit Hedged	1.5%	0.3%	1.9%	5.0%

The currency adjustment is the market implied price change for major currency pairs based on forward contract pricing. Since the market implied spot price change and the cost/gain from hedging are both derived from pricing in the forward market, they are one and the same. Therefore, the currency adjustment is the same for both unhedged and hedged forecasts. See the following slides for the more detail on the currency adjustment methodology.

Explanation of the currency adjustment

Our fundamental building block approach produces a return forecast in local currency. In order to create useable forecasts for non-U.S. dollar-denominated assets, we must make an assumption about future foreign exchange rates.


Step 1: Forecast the expected return of the foreign asset in local currency terms

Step 2: Make an assumption on the ending foreign currency exchange rate

Explanation of the currency adjustment

— There are two options to adjust a local currency return forecast to a U.S. dollar forecast: make a specific exchange rate forecast or take market pricing based on the forward curve

 ▪ It is important to note that ignoring currency is making a specific assumption that the current exchange rate will be unchanged over the next 10 years, which has rarely been the case throughout history

— Markets price future exchange rates in the forward market, which represents the SPOT currency price for FORWARD delivery

— Forward currency contracts are priced based on the interest rate differential between two currencies – interest rate differentials reflect a significant amount of information, including growth, inflation, and monetary policy expectations

— A currency with a higher interest rate is priced to depreciate relative to a currency with a lower interest rate

— We adjust our local currency return forecasts based on forward market pricing because we believe this is the neutral, "no opinion" position, rather than making a specific forecast

— Historically, this currency adjustment has had a positive relationship with 10-year forward exchange rate movements

10-YEAR ROLLING ABSOLUTE CURRENCY PERFORMANCE IMPACT
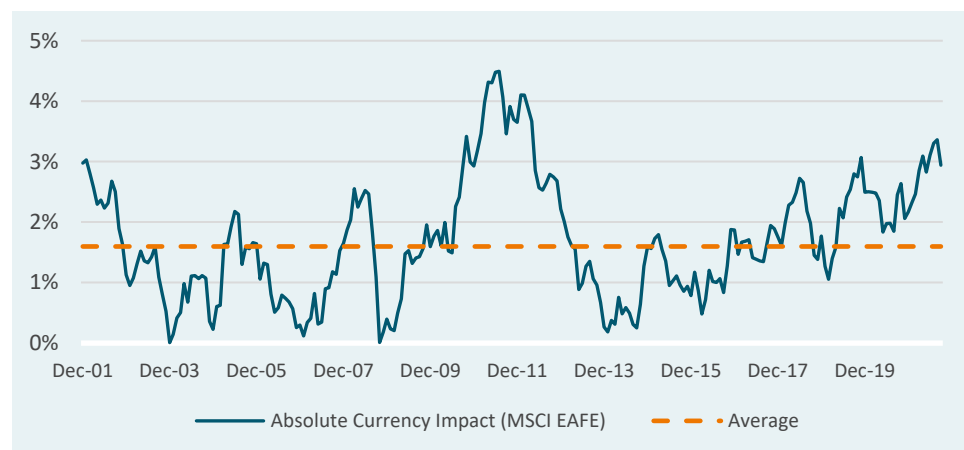
Source: Verus, MSCI, as of 9/30/21

CURRENCY ADJUSTMENT VS. FORWARD USD MOVEMENT
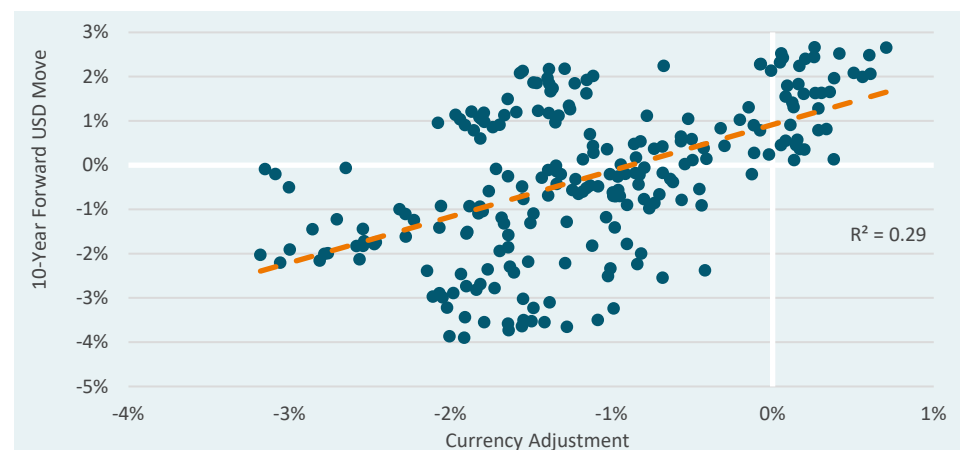
Source: Verus, Bloomberg, using data since 1989, based on the MSCI EAFE Index

Autocorrelation adjustment

— We adjust all volatility forecasts that use the long-term historical volatility for autocorrelation.

— Autocorrelation occurs when the future returns of a time series are described (positively correlated) by past returns.

— Time series with positive autocorrelation exhibit artificially low volatility, while time series with negative autocorrelation exhibit artificially high volatility.

— Many asset classes that we tested showed positive autocorrelation, meaning the volatility forecasts that we use in the forecasting process are too low for those asset classes.

— The result of this process was that several asset classes have higher volatility forecasts than if we had made no adjustment for autocorrelation.

Autocorrelation has been shown to be statistically significant across many asset classes, which implies an adjustment is appropriate

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Hedge fund style regression details

— We forecast hedge fund styles by assuming that historical exposure to market "betas" will hold in the future. Historical beta exposure is calculated using a 10-year regression, which is displayed below.

— The "unexplained" component below is the portion of historical hedge fund returns that were not explained by public betas. This portion of return is likely comprised of a combination of unique/alternative betas, hedge fund alpha, and idiosyncratic return.

HEDGE FUND EQUITY

	Beta Coefficients
Intercept	0.08
Equity Beta	0.55
Rates Beta	-0.15
Credit Spread Beta	0.69
Commodity Beta	0.05
Unexplained return	0.11

HEDGE FUND CREDIT

	Beta Coefficients
Intercept	0.26
Equity Beta	0.09
Rates Beta	0.03
Credit Spread Beta	0.90
Commodity Beta	0.04
Unexplained	1.05

HEDGE FUND ASYMMETRIC

	Beta Coefficients
Intercept	0.02
Equity Beta	0.15
Rates Beta	0.42
Credit Spread Beta	0.13
Commodity Beta	0.04
Unexplained	0.30

Note: We have trimmed the "unexplained" component of Hedge Fund Credit by 50%. We assume that the secular falling interest rate environment has resulted in a historic tailwind to credit performance which will not persist in the future as it is unlikely that interest rates head into deeply negative territory.

Notices & disclosures