PIMCO

PIMCO's Capital Market Assumptions, February 2021

Executive Summary

PIMCO's capital market assumptions (CMAs) are typically updated twice a year to reflect changes in markets and firm views. Last year, the COVID-19 crisis led to a rapid sell-off in equity and credit markets in March, but markets quickly rebounded following government relief packages and dovish Federal Reserve policies, which included cutting short-term rates to zero. We now expect the U.S. cash rate to average near zero over the next five years, while at the same time we've modestly increased our estimates of U.S. GDP and inflation. Other forecasts include

- A marginally more constructive outlook on U.S. rates relative to other developed markets such as Europe and Japan
- A modestly higher expected return for Treasury Inflation-Protected Securities (TIPS) relative to Treasuries
- An increase in our overall estimated expected return for equities given our more optimistic view on GDP growth over the next five years

As we do twice a year, we have updated our five-year capital market assumptions (CMAs) to reflect the changes in markets since our last update in the second quarter The market extremes of 2020 were something few of us have witnessed in our lifetimes. The year started off with a continuation of the strong equity market of 2019, only to be abruptly interrupted by the unfolding COVID-19 crisis in March. However, the rapid sell-off in equity and credit markets reversed almost as quickly following the passage of significant fiscal stimulus in Congress and the Federal Reserve cutting short-term rates almost immediately to zero, where they have remained since.

Figure 1 tells a story of two markets: Equity markets sold off dramatically through the end of March as investors digested the potential implications of the COVID-19 crisis for the global economy. From 31 December 2019 to 23 March 2020, the S&P 500 price level (exclusive of dividends) declined by 30.7% and investment grade (IG) credit spreads – proxied by the Bloomberg Barclays Aggregate Corporate Index – widened by 280 basis points (bps). Reacting swiftly to the markets' dislocations, the Federal Reserve cut rates to zero, and the 10-year government bond yield followed, declining by 1.13%. As expected, investors flocked to the traditional "safe haven" of the U.S. dollar, pushing the US Dollar Index (DXY) up 6.3% through the same period. However, markets quickly reversed on the heels of major fiscal packages passed by Congress and dovish Fed policy in the form of rate cuts and the reinstitution of bond-buying programs. Highlighting the magnitude of the fiscal and monetary responses, the U.S. budget deficit increased by \$2 trillion[1] in 2020, while the Federal Reserve's purchase of U.S. federal debt expanded by \$2.3 trillion. As a result, markets rallied significantly through the remainder of the year. By year end, the S&P 500 price index (not including dividends) was up 10.7% and credit spreads were essentially unchanged from the start of the year. Interest rates, however,

1 The \$2 trillion is determined by the difference between the deficit for fiscal year 2020 and the Congressional Budget Office's March 2020 baseline forecast, which were \$3.1 trillion and \$1.1 trillion, respectively. See https://www.stlouisfed.org/on-the-economy/2020/december/financing-response-covid19 for more details.

Figure 1: Select market factor levels and changes in 2020

	12/31/19	3/23/20	12/31/20	Change 12/31/19 - 3/23/20	Change 3/23/20 - 12/31/20	Change 12/31/19 - 12/31/20
S&P 500	3231	2237	3576	-30.7%	59.8%	10.7%
Barclays inv. grade index: spread level (OAS)	93 bps	373 bps	96 bps	280 bps	-277 bps	3 bps
U.S Treasury 3M yield	1.54%	-0.04%	0.06%	-1.58%	0.10%	-1.48%
U.S. Treasury 10Y yield	1.92%	0.79%	0.91%	-1.13%	0.12%	-1.01%
U.S. dollar index	96.4	102.5	89.9	6.33%	-12.29%	-6.74%

Source: Bloomberg as of 31 December 2020

remained lower than their levels at the beginning of 2020. The 10-year U.S. government bond yield ended the year at 0.91%, a mere 12 bps higher than its level on 23 March.

Since government bond yields are similar to last summer's levels, we have made only modest changes to our duration views. Broadly, we expect muted returns to duration over the secular horizon and are marginally more constructive on U.S. rates relative to other developed markets such as Europe and Japan. One of the most significant changes versus the second quarter is in our assumptions for credit spreads. As shown in Figure 1, investment grade corporate spreads have tightened considerably since last summer and are now generally in line with their historically low levels at the end of 2019. IG and high yield (HY) spreads today reside in approximately their 28th and 35th percentiles, respectively, versus the 90th percentile for both in the second quarter of 2020. Thus, whereas we anticipated spread tightening at our last CMA update, we now expect a modest widening in credit spreads over the secular horizon. However, we still find broad credit reasonably attractive given the Fed's accommodative forward guidance on short-term rates, which should help to keep spreads contained.

Our estimates of GDP have increased versus the second quarter as the approval of several COVID-19 vaccines is likely to amplify the effects of pent-up demand during the months-long quarantine period. Additionally, the election of Joe Biden to the presidency increases the probability of additional fiscal stimulus, which should further support the economy. As such, our five-year real GDP forecast is 2.4% for the U.S. As a result of higher growth expectations, which should underpin stronger corporate profitability, we are constructive on equities despite the significant rally in the latter half of 2020. Given an expectation of contained yield curves and, in particular, real bond yields, we view equities as generally fairly valued today. We have a modest preference for U.S. equities over other developed markets.

FIXED INCOME

U.S. bond yields ended 2020 slightly higher than at the end of the second quarter. Broadly, however, little has changed in our outlook for global interest rates since last summer. As such, our duration views are similar to the second quarter. We continue to expect the U.S. cash rate to remain near zero over the secular horizon. Our average cash rate forecast is 35 bps for the U.S. over the next five years. Low cash rates should mean that global yield curves remain contained, although we expect yields to rise modestly over the secular horizon, producing a slightly positive Sharpe ratio for U.S. duration. Figure 2 shows our rate forecasts for the U.S. curve along with our view for duration-hedged IG credit.[2]

Figure 2: Estimates for the U.S. Treasury yield curve and investment grade credit spreads

Risk factors	Current level	Level at 5-year horizon*	Sharpe ratio**
U.S. Treasury 3M yield	0.09%	1.00%	
U.S. Treasury 2Y yield	0.17%	1.20%	
U.S. Treasury 10Y yield	0.92%	1.62%	0.07
U.S. Treasury 30Y yield	1.71%	1.96%	
Bloomberg Barclays inv grade index: spread level (OAS)	1.02%	1.40%	0.10

Source: PIMCO and Bloomberg as of 11 November 2020. **Hypothetical forecast for illustrative purposes only.**

* For indexes and asset class models, return estimates are based on the product of risk factor exposures and projected risk factor premia which rely on historical data, valuation metrics and qualitative inputs from PIMCO.

** The Sharpe ratio calculation is as follows: (estimated asset return – estimated cash return)/estimated asset volatility. Estimated cash return = 0.35%.

2 As of this writing, U.S. Treasury yields had increased somewhat from what is shown in Figure 2. As of 13 January 2021, the 10-year U.S. Treasury yield was 1.11%.

Our U.S. inflation forecast has increased moderately versus the second quarter due to an expectation of greater economic acceleration and the reimplementation of bond-buying programs by central banks. Our five-year U.S. inflation expectation is 1.9% today versus 1.7% in the second quarter. Further, longer-term market-based inflation expectations are even higher: The 10-year inflation forecast in five years, as measured by the market for inflation swaps, is currently 2.2%. As a result, we expect breakevens to widen somewhat over the secular horizon, implying a smaller rise in real yields relative to nominals. Figure 3 shows our U.S. real yield expectations over the next five years.

Figure 3: Estimates for the U.S. Treasury real yield curve

Risk factors	Current level	Level at 5-year horizon*	Sharpe ratio**
U.S. TIPS 2Y real yield	-1.45%	-0.93%	
U.S. TIPS 10Y real yield	-0.80%	-0.53%	0.14
U.S. TIPS 30Y real yield	-0.17%	-0.15%	

Source: PIMCO and Bloomberg as of 11 November 2020. **Hypothetical forecast for illustrative purposes only.**

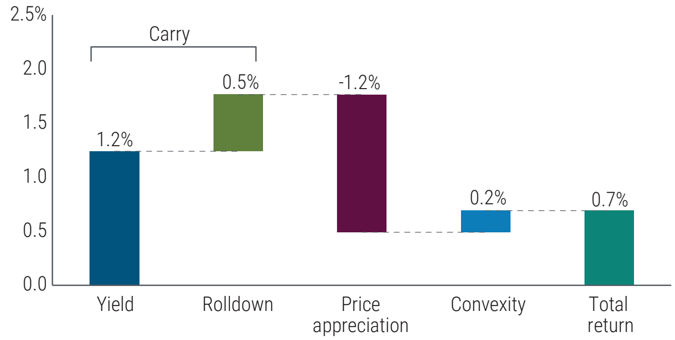
* For indexes and asset class models, return estimates are based on the product of risk factor exposures and projected risk factor premia which rely on historical data, valuation metrics and qualitative inputs from PIMCO.

** The Sharpe ratio calculation is as follows: (estimated asset return – estimated cash return)/estimated asset volatility. Estimated cash return = 0.35%.

Figure 4 shows an approximate decomposition of the sources of return for a hypothetical 10-year Treasury bond, a 10-year TIPS bond, and duration-hedged IG credit. A generic 10-year nominal Treasury bond should return 70 bps per year under our base case assumptions. The loss from price appreciation is effectively offset by our expectations for yields. As shown in the return decomposition for a 10-year TIPS bond, the smaller anticipated repricing headwind produces modestly higher expected returns for real bonds relative to nominals. Finally, in the case of IG credit, spread widening presents a modest headwind to returns, but the overall estimated return for duration-hedged credit is still favorable.

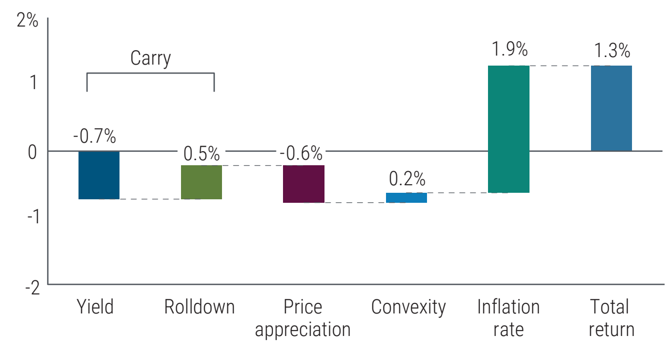
Figure 4: Estimated return decomposition for 10-year Treasury bond, 10-year TIPS bond, and duration-hedged IG credit (5-year horizon)

10-year U.S. Treasury bond



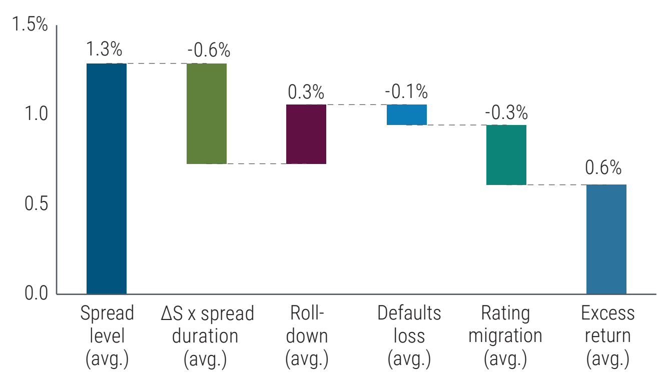
Source: PIMCO as of 9 November 2020. **Hypothetical forecast for illustrative purposes only.** Total return estimate represents 10-year U.S. government bond return decomposed into carry (average yield plus roll-down) and price appreciation/losses due to yield changes.

10-year U.S. TIPS bond



Source: PIMCO as of 9 November 2020. **Hypothetical forecast for illustrative purposes only.** Total return estimate represents 10-year TIPS return decomposed into carry (average yield plus roll-down), price appreciation/losses due to yield changes and inflation accrual.

Estimated return decomposition for duration-hedged U.S. investment grade credit



Source: PIMCO as of 9 November 2020. **Hypothetical forecast for illustrative purposes only.** Estimate of U.S. IG credit spread excess return (over duration-matched governments) decomposed into carry (average spread level adjusted for losses due to defaults), roll-down and price appreciation/losses due to spread changes adjusted for losses due to downgrades.

Finally for fixed income, Figure 5 shows our estimated expected returns, volatility estimates, and Sharpe ratios for some key bond benchmarks on both a currency-hedged and unhedged basis. Our expected return on the Bloomberg Barclays US Government Bond Index has increased modestly from 0.4% in the second quarter to 0.8% today. This primarily reflects slightly higher yields today versus the second quarter. Nonetheless, we view expected returns for U.S. duration as generally low overall. As mentioned previously, the largest change in our return assumptions comes from the credit spread component of fixed income, which is materially tighter today than in the second quarter. As a result, once we venture outside pure duration benchmarks to indices such as the Bloomberg Barclays U.S. Credit Index or U.S. High Yield Index, expected returns are lower today than in the second quarter. Nonetheless, despite a lower level of expected returns, Sharpe ratios across the fixed income credit markets are still generally attractive. This reflects our expectation of a Fed-contained yield curve, modest spread widening, and a low cash rate over the secular horizon.

EQUITIES

Our more optimistic view on GDP growth over the next five years has led to an increase in our overall estimated expected return for equities. Despite the significant rally in the second half of 2020, our view of generally bounded real yields and a more positive tone on the global economy leads us to believe that equity valuations are broadly fair today. We expect U.S. equities to return 5.3% annualized over the secular horizon, or approximately 5% over the cash rate. Our currency-hedged expected return for the MSCI EAFE Index is 4.9%, reflecting our slight preference for U.S. equities versus other developed markets today. Our expected return on emerging market (EM) equities has come down since the second quarter following a staggering 74% return for the MSCI Emerging Markets Index from 23 March 2020 through the end of the year. The higher unhedged expected returns in Figure 6 reflect an overall constructive view on non-U.S. foreign exchange (FX) going forward.

Figure 5: Estimated annualized total returns and Sharpe ratios for select fixed income benchmarks

	Unhedged			USD-hedged (for global indices)		
Index	**5-year nominal return***	**Volatility****	**Sharpe ratio*****	**5-year nominal return***	**Volatility****	**Sharpe ratio*****
Bloomberg Barclays Global Aggregate Bond Index	1.7%	4.6%	0.29	1.0%	2.3%	0.30
Bloomberg Barclays U.S. Aggregate Bond Index	1.0%	2.9%	0.23			
Bloomberg Barclays U.S. Government Bond Index	0.8%	3.4%	0.12			
Bloomberg Barclays U.S. Credit Index	1.4%	5.4%	0.19			
Bloomberg Barclays U.S. Treasury Long Index	1.5%	10.6%	0.11			
Bloomberg Barclays U.S. Long Credit Index	1.6%	11.1%	0.11			
Bloomberg Barclays U.S. Long Government/Credit Index	1.5%	8.9%	0.13			
Bloomberg Barclays U.S. High Yield Index	2.3%	7.0%	0.27			
Bloomberg Barclays U.S. TIPS Index	1.1%	5.1%	0.15			
Bloomberg Barclays Municipal Bond Index	2.5%	3.4%	0.63			
Bloomberg Barclays HY Municipal Bond Index	4.6%	7.3%	0.58			
Bloomberg Barclays Fixed-Rate MBS Index	0.9%	1.3%	0.43			
JPMorgan EMBI Global Index	2.7%	8.1%	0.29			
JPMorgan GBI-EM Global Div Index	4.9%	11.0%	0.41	2.5%	3.9%	0.55

Source: PIMCO calculations as of 9 Nov 2020. **Hypothetical example for illustrative purposes only.**

* For indexes and asset class models, return estimates are based on the product of risk factor exposures and projected risk factor premia which rely on historical data valuation metrics and qualitative inputs from senior PIMCO investment professionals.

** PIMCO's estimate of volatility over the secular horizon

*** The Sharpe ratio calculation is as follows: (estimated asset return - estimated cash return)/estimated asset volatility. Estimated cash return = 0.35%.

Figure 6: Estimated annualized total returns and Sharpe ratios for select equity benchmarks

	Unhedged			USD-hedged (for global indices)		
Index	5-year nominal return*	Volatility**	Sharpe ratio***	5-year nominal return*	Volatility**	Sharpe ratio***
S&P 500 Index	5.3%	14.9%	0.34			
MSCI World Index	5.5%	15.0%	0.34	5.1%	14.3%	0.33
MSCI EAFE Index	5.9%	16.0%	0.35	4.9%	13.9%	0.32
MSCI Emerging Markets Index	6.2%	20.3%	0.29	5.4%	17.6%	0.29
MSCI All Country World Index	5.6%	15.0%	0.35	5.1%	14.1%	0.34
Dow Jones US Select REIT Index	6.4%	18.8%	0.32			

Source: PIMCO calculations as of 9 Nov 2020. **Hypothetical example for illustrative purposes only.**

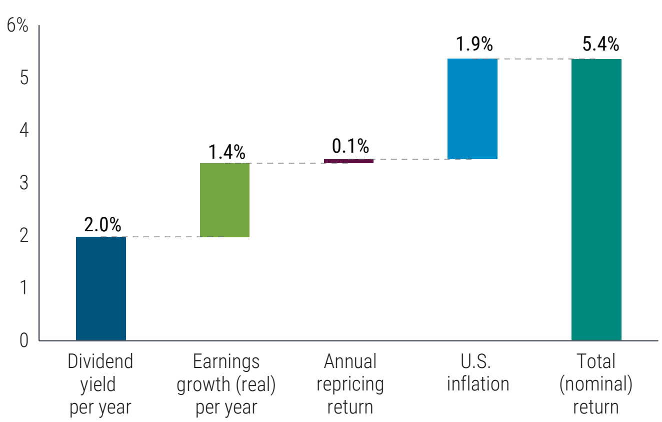
* For indexes and asset class models, return estimates are based on the product of risk factor exposures and projected risk factor premia which rely on historical data, valuation metrics and qualitative inputs from senior PIMCO investment professionals.

** PIMCO's estimate of volatility over the secular horizon

*** The Sharpe ratio calculation is as follows: (estimated asset return - estimated cash return)/estimated asset volatility. Estimated cash return = 0.35%

Figure 7 shows the decomposition of our expected U.S. large-cap equity return over the secular horizon. Given an expectation of low real yields, we do not anticipate material changes in valuation multiples over the secular horizon. However, it is important to note that the multiple is by far the most volatile component of equity returns and also the most difficult to forecast. Equity investors should be cognizant of the high degree of uncertainty in equity returns.

Figure 7: Estimated return decomposition for U.S. large-cap equity (5-year horizon)*



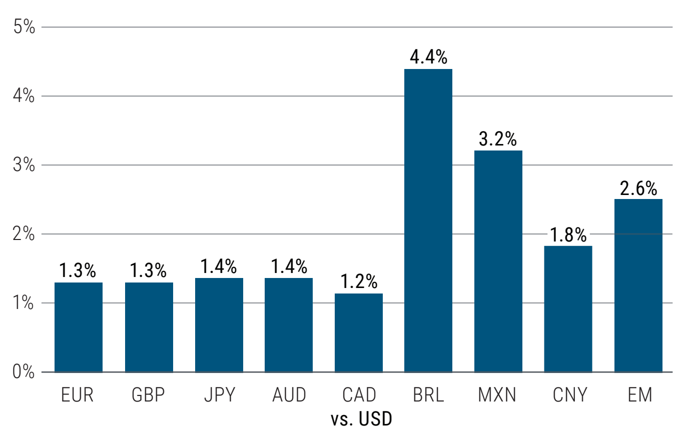
Source: PIMCO as of 9 November 2020. **Hypothetical forecast for illustrative purposes only.**

* Decomposition based on the S&P 500

FOREIGN EXCHANGE

Figure 8 shows our CMAs for selected currencies in excess of the U.S. cash rate. Although investors sought the traditional "safe haven" of the U.S. dollar during the height of the COVID-related market stresses in March, the U.S. dollar generally depreciated versus developed market peers in 2020. Overall, our long-term currency views remain similar to, albeit slightly lower than, our last CMA update in the second quarter. Although a higher U.S. cash rate should create a headwind to FX investments from the perspective of a U.S. investor, we anticipate spot returns to more than offset the cash rate differential. We continue to be long-term constructive on EM currencies as well, with the caveat that EM FX can imbed equity-like risks in terms of its volatility. EM FX investors must be aware that unhedged exposure can generate substantial swings in performance.

Figure 8: Estimated annualized foreign exchange risk premium over U.S. cash (1- to 5-year horizon)



Source: PIMCO as of 9 Nov 2020. **Hypothetical forecast for illustrative purposes only.**

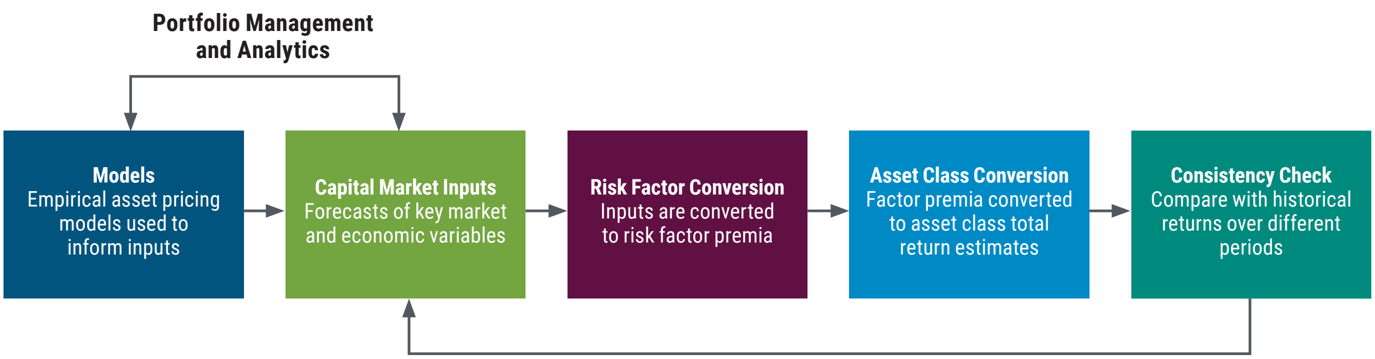
PIMCO'S CMA PROCESS

PIMCO's capital market assumptions provide investors with our views on the long-term (five-year) estimated expected returns for the major asset classes. Our CMAs are updated on a semiannual basis in December and June of each year and are driven by our future expectations for the key risk factors that drive asset prices and returns. For example, our expected returns for U.S. Treasuries are driven by our views on the evolution of the U.S. cash rate and yield curve over the next five years. Similarly, expected returns for U.S. credit are a function of both our views on how the U.S. nominal yield curve will migrate from its current level and our expectation for the path of credit spreads.

Through our Cyclical and Secular Forum process, as well as constant internal debate and discussion, PIMCO forms views on the long-term levels of key risk factors. And while our views are informed and influenced by a set of quantitative guide value models, we differ from some in the industry who focus on long-term valuation from a purely quantitative perspective. We believe that our approach combines the rigor and repeatability of quantitative modeling with investment expertise and experience. In short, past performance is no guarantee of future results, and estimated expected returns that are based solely on quantitatively oriented models can be overly reliant on the historical experience of markets.

Ultimately, PIMCO combines these qualitative and quantitative inputs to form our top-down views on the path for key risk factors. These risk factor views are then converted into forward-looking estimates of risk premia (normalized returns in excess of cash) for the major risk factors, such as duration, credit, and equities. Finally, the risk premia are converted into estimated expected returns for the various asset classes based on their risk factor exposure profile and yield characteristics. A schematic of the CMA process is shown in Figure 9.

Figure 9: Outline of PIMCO's approach to capital market assumptions



Source: PIMCO. **For illustrative purposes only.**

A "safe haven" currency is a currency perceived to be low risk due to the stability of the issuing government and the strength of the underlying economy. All investments contain risk and may lose value.

Past performance is not a guarantee or a reliable indicator of future results.

The analysis contained in this paper is based on hypothetical modeling. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM.

ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

Because of limitations of these modeling techniques, we make no representation that use of these models will actually reflect future results, or that any investment actually will achieve results similar to those shown. Hypothetical or simulated performance modeling techniques have inherent limitations. These techniques do not predict future actual performance and are limited by assumptions that future market events will behave similarly to historical time periods or theoretical models. Future events very often occur to causal relationships not anticipated by such models, and it should be expected that sharp differences will often occur between the results of these models and actual investment results.

Return assumptions are for illustrative purposes only and are not a prediction or a projection of return. Return assumption is an estimate of what investments may earn on average over a 5 year period. Actual returns may be higher or lower than those shown and may vary substantially over shorter time periods. Return assumptions are subject to change without notice.

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All investments contain risk and may lose value. Investing in the **bond market** is subject to risks, including market, interest rate, issuer, credit, inflation risk, and liquidity risk. The value of most bonds and bond strategies are impacted by changes in interest rates. Bonds and bond strategies with longer durations tend to be more sensitive and volatile than those with shorter durations; bond prices generally fall as interest rates rise, and low interest rate environments increase this risk. Reductions in bond counterparty capacity may contribute to decreased market liquidity and increased price volatility. Bond investments may be worth more or less than the original cost when redeemed. **Inflation-linked bonds (ILBs)** issued by a government are fixed income securities whose principal value is periodically adjusted according to the rate of inflation; ILBs decline in value when real interest rates rise. **Treasury Inflation-Protected Securities (TIPS)** are ILBs issued by the U.S. government. **Sovereign securities** are generally backed by the issuing government. Obligations of U.S. government agencies and authorities are supported by varying degrees, but are generally not backed by the full faith of the U.S. government. Portfolios that invest in such securities are not guaranteed and will fluctuate in value. Investing in **foreign-denominated and/or -domiciled securities** may involve heightened risk due to currency fluctuations, and economic and political risks, which may be enhanced in **emerging markets**. **Currency rates** may fluctuate significantly over short periods of time and may reduce the returns of a portfolio. **High yield, lower-rated securities** involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. **Equities** may decline in value due to both real and perceived general market, economic and industry conditions. Investors should **consult their investment professional** prior to making an investment decision.

To calculate **estimated volatility** we employed a block bootstrap methodology to calculate volatilities. We start by computing historical factor returns that underlie each asset class proxy from January 1997 through the present date. We then draw a set of 12 monthly returns within the dataset to come up with an annual return number. This process is repeated 25,000 times to have a return series with 25,000 annualized returns. The standard deviation of these annual returns is used to model the volatility for each factor. We then use the same return series for each factor to compute covariance between factors. Finally, volatility of each asset class proxy is calculated as the sum of variances and covariance of factors that underlie that particular proxy. For each asset class, index, or strategy proxy, we will look at either a point in time estimate or historical average of factor exposures in order to determine the total volatility. Please contact your PIMCO representative for more details on how specific proxy factor exposures are estimated.

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