PGIM QUANTITATIVE SOLUTIONS

50 YEARS CELEBRATION

2025 Q2 CAPITAL MARKET ASSUMPTIONS

Forecasts may not be achieved and are not a guarantee or reliable indicator of future results.

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All investments involve risk, including the possible loss of capital.

2025 Q2 Capital Market Assumptions

Key Updates in This Quarter's Forecasts

Our long-term outlook for fixed income assets shifted lower from last quarter, coincident with the decrease in sovereign interest rates in Q1 2025. Adjustments to our 10-year annualized return forecasts include:

- US Aggregate Bonds: Revised to 4.5% from 5.2% last quarter.
- US Long Treasury Bonds: Revised to 4.7% from 5.8% last quarter.
- Global Aggregate Bonds Hedged: Revised to 4.4% from 4.6% last quarter.

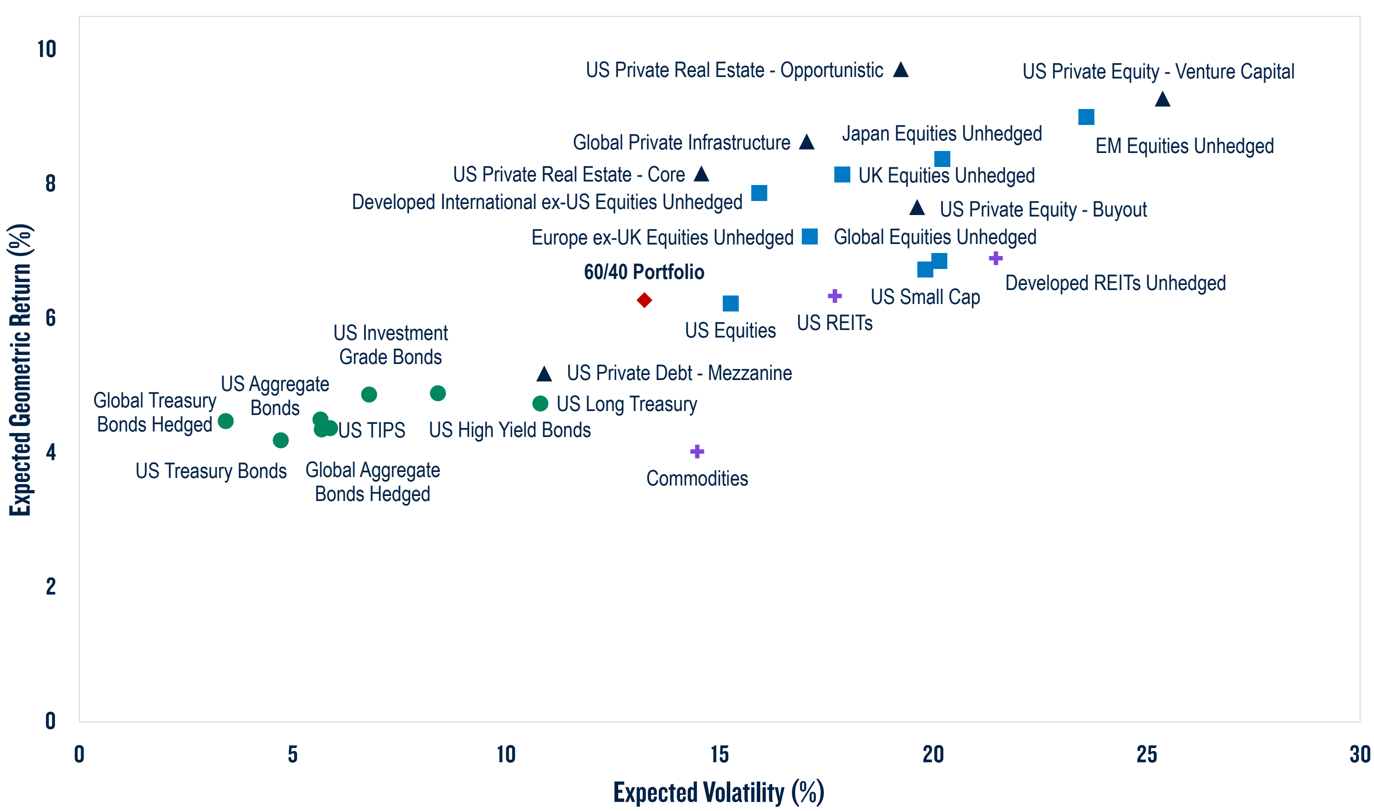
Our 10-year forecasts for equity markets outside the US continue to exceed those of large-capitalization US equities, primarily attributable to more favorable valuations, though that differential modestly declined following a quarter in which US equities underperformed global peers:

- US Large-Cap Equities: Forecasted at 6.2%.
- International Equities ex-US: Forecasted at 7.9%.
- Emerging Markets Equities: Forecasted at 9.0%.

This quarter's portfolio rebalancing recommendations include:

- Reduction in US Investment Grade Bond allocations.
- Reduction in US Aggregate Bond allocations.
- Increase in US REITs exposure.

10-Year Forecast Returns and Volatility



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Summary

Q1 2025 Developments Informing Our Long-Term (10-Year) Forecasts:

The second Trump administration hit the ground running with a slew of measures designed to shake up both policy and the US economy, sending tremors through markets and exposing fault lines in the status quo. But it is their approach to trade and tariff policy that has emerged as the most disruptive factor for the economic outlook.

In contrast to the more narrowly focused approach of the first Trump administration, the second administration announced broad-based tariffs that span a wide range of goods and countries, igniting a trade war with major US trading partners and creating a rapidly evolving situation that has kept markets on edge. Equity markets had hit a high in February and generally sold off into the end of the quarter, with temporary respites as the administration delayed various proposals. The worst of the sell-off came in early April following the "Liberation Day" tariff announcements, but markets had largely retraced their declines from earlier in the month as the administration paused and delayed most of the April tariffs. Regardless, the heightened uncertainty around policy direction significantly increases near-term downside risks.

Already we are seeing some impact in US economic data with a modest contraction in GDP in Q1. GDP fell -0.3% QoQ annualized in the advance Q1 estimate, down from 2.4% in Q4 2024. Nevertheless, there may end up being favorable revisions to this data as most of the volatility in the Q1 numbers came from trade and inventory data, which is less reliably measured. In contrast to weak GDP growth, most other hard economic data in Q1 held up. Firms continue to expand payrolls, retail sales grew solidly, and production continued to expand modestly. That being said, the threat of tariffs may have moved forward some activity, making the underlying trend difficult to evaluate. Despite near-term risks, we left our 10-year US GDP growth forecast roughly unchanged at around 2.1%, which is closer to the GFC average.

While new tariffs are beginning to impact the real side of the economy, pauses and the delays between when the tariffs go into effect and when firms pass along prices means that we haven't seen much impact on inflation data yet. US core CPI had continued to ease to 2.8% in March 2025 after ending 2024 around 3.2%. Nevertheless, that remains stubbornly above the Fed's 2% target, keeping them on hold in Q1 (they are also in wait-and-see mode to evaluate where trade policy ends up and how that will impact the economy). Our 10-year US inflation forecasts remained roughly unchanged in this quarter's Capital Market Assumptions (CMAs), at around 2.5%.

Shifting focus internationally, the Eurozone economy has continued to struggle, with GDP growing 0.3% QoQ in the second Q1 2025 estimate, following mixed performance in H2 2024. The industrial sector continues to face headwinds from high input costs and stiff foreign competition. However, NATO governments across the continent have steadily increased military spending, which could provide a stimulative boost to the economy. Despite core inflation remaining modestly above 2%, the European Central Bank (ECB) is steering policy rates toward neutral. The ECB reduced policy rates by 50bps in Q1 (with one more 25bps cut in April), following 100bps of cuts in 2024.

The Japanese economy finished 2024 on a solid footing, but activity struggled in Q1 with trade subtracting from GDP growth. A difficult economic environment and a stronger yen likely reduced demand for Japanese exports. At the same time, inflation remains a concern. Nationwide inflation excluding fresh food and energy has steadily climbed from mid-2024, hitting 2.9% YoY in January. The Bank of Japan (BoJ) responded by kicking off 2025 with a rate hike in January. China's GDP grew solidly in Q1, up 5.4% YoY, although the quarterly pace slowed compared to Q4 2024. While growth continues to be supported by fiscal and monetary stimulus, China is also a major target of US tariffs, raising downside risks to near-term growth.

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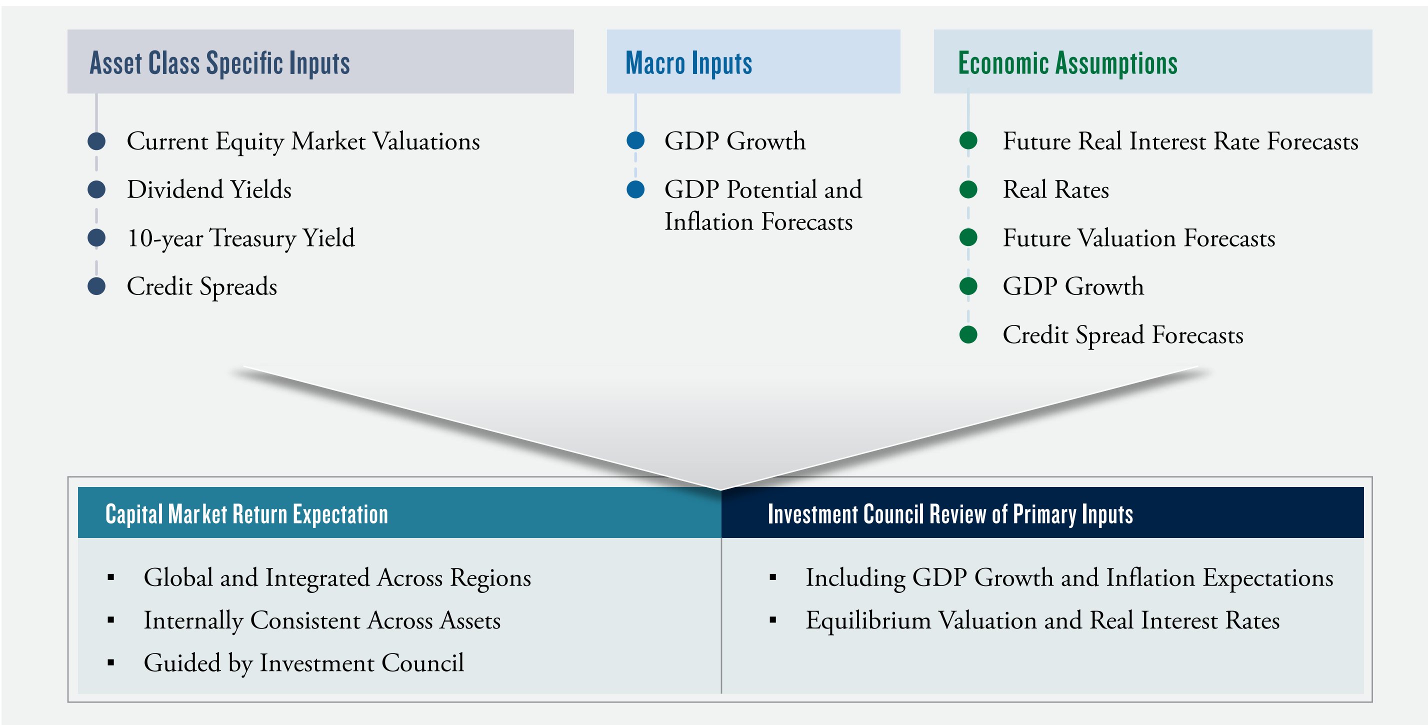
Overview

PGIM Quantitative Solutions' CMAs underpin the long-run outlook for strategic allocations in our individual strategies and multi-asset portfolios. They are the product of a highly systematic process for generating consistent projections across the capital markets.

CMAs provide 10-year expectations for the most widely held equity, fixed income, and non-traditional asset classes, measuring both return and risk. We update our CMAs each quarter. Our investment professionals begin with evolving asset-class fundamentals and macroeconomic assumptions at the country level. For each asset class, we decompose local return expectations into three broad categories: income, growth, and valuation adjustment. We also forecast relative currency adjustments for investors in different domiciles to allow for conversion to hedged or unhedged returns. Our core building blocks and final forecasts are reviewed at their component levels by an investment council of our most senior investment professionals.

Capital Market Assumptions Framework



Shown for illustrative purposes only. Source: PGIM Quantitative Solutions.

Global Economic Outlook

Forward-looking views for economic growth and inflation are some of the most critical building blocks of our CMAs. We currently compile these for 16 countries. Based on our forecasts, long-term real economic growth in developed economies over the next 10 years is expected to continue to moderate, as it has for the last three decades. This is due to the limited growth of the labor force, which is constrained by domestic demographics and based on an assumption of no significant offset from improved productivity growth. Our forecasts for near-term economic growth and inflation are comparable to last quarter's. We expect longer-term economic growth in developed economies to be led by Australia and other countries with younger populations and more liberal immigration policies. We anticipate growth to be slowest in Japan and parts of Western Europe, where the labor force is expected to contract further over the next decade.

Inflation in Developed Markets is anticipated to moderate over the next 10 years relative to current levels, which still exceed most central bank targets. Our 10-year forecasts for Developed Market inflation range from a 2.9% annual rate in Australia to a low of 1.9% in the Eurozone. Emerging Markets, however, are expected to produce real economic growth and inflation at annualized rates of 3.6% and 2.6%, respectively, driven by younger populations and higher rates of return on capital than in Developed Markets.

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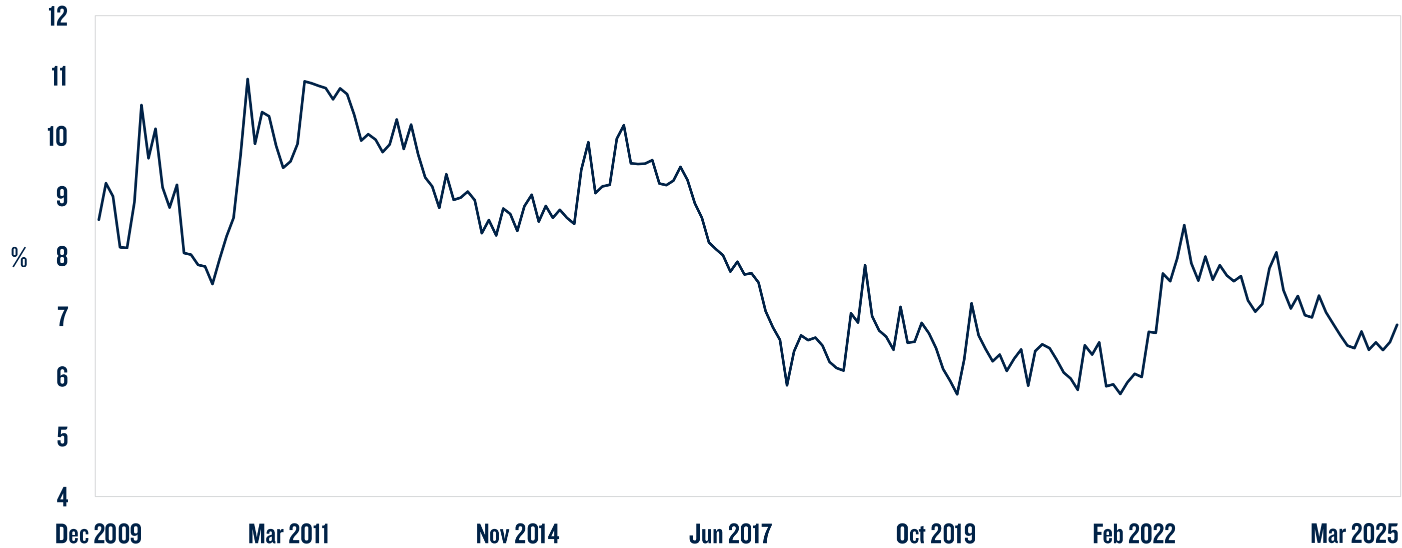
Evolution of Our Market Outlook

Over the last 10 years, coincident with rising valuation ratios and a moderation in expected Developed Market growth and inflation, our long-term Capital Market Assumptions for Global Equities trended downward through 2017 before stabilizing at historically low levels. More recently, declining equity markets in 2022 and an increase to our longer-run inflation expectations have partially reversed this trend, moving our forecasts higher. Our outlook for returns of Global Equities over the next 10 years is 6.9%, an increase of 0.3% from our forecast of 6.6% for the first quarter of 2025.

PGIM Quantitative Solutions' Expected 10-Year Return for Global Equities



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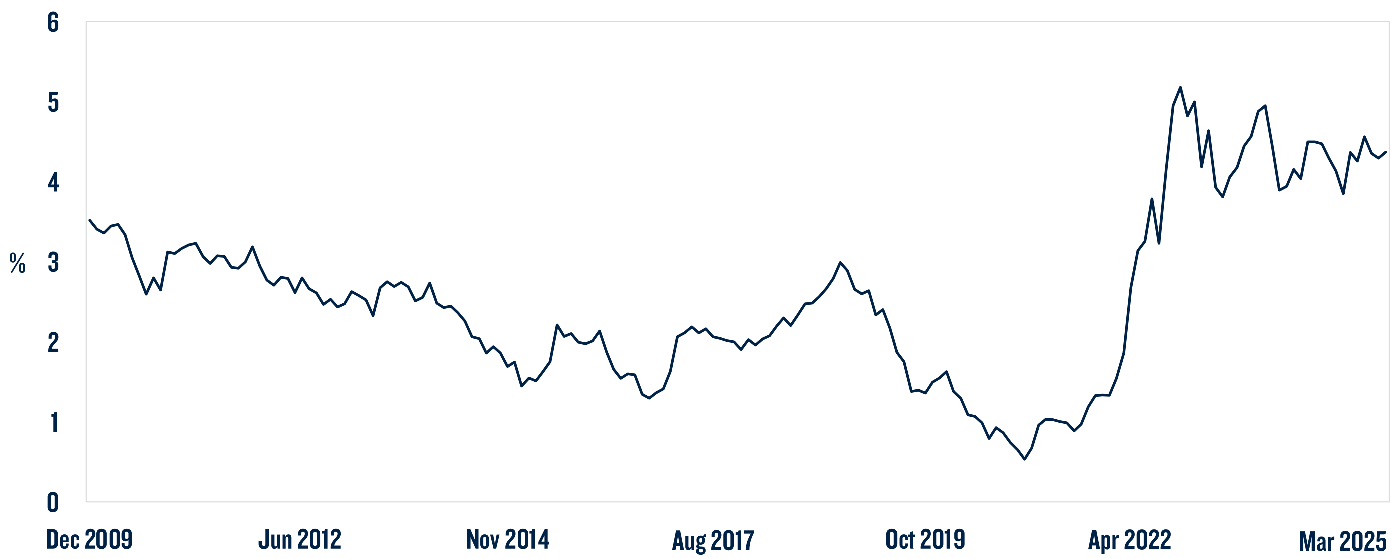
Our Capital Market Assumptions for Global Fixed Income assets have moved materially higher over the past three years, coincident with the significant increase in global interest rates. During the first quarter of 2024 the amount of negative-yielding debt remaining in the Bloomberg Global Aggregate Index fell to zero for the first time since 2010, a decline from $11.3 trillion at the end of 2021 and $17.8 trillion at the end of 2020.

PGIM Quantitative Solutions' Expected 10-Year Return for Hedged Global Aggregate Bonds



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Global Fixed Income Markets

Long-term fixed income forecasts begin with our view of 10-year forward policy rates for each of the major Developed Market central banks. We derive expected policy rates for each central bank jurisdiction as a function of current and future equilibrium real interest rates, the expected GDP output gap over the next 10 years[1], and the expected rate of inflation. Our forecasts for short-term interest rates also incorporate a forward-looking central bank reaction function, placing less weight on current interest rate levels. While the 2010s were a period of low and stable short-term interest rates, the 2020s have been characterized by a much more volatile period for short-term rates as central banks responded to the pandemic and inflationary aftermath. Moreover, the volatility in short-term rates flows through to our assumptions about future rates, as higher current rates tend to make our forecasts higher. Since our overall methodology takes a building block approach, this volatility also flows through to forecasts for other asset classes, making this a more forward-looking approach that helps to stabilize our long-term forecasts.

Our long-term forecasts for short-term interest rates are comparable to those for the first quarter of 2025. For the US, policy rates in 10 years are expected to be roughly 150 basis points lower than the 4.4% policy rate midpoint that prevailed at the end of the first quarter of 2025 given our forward views of inflation and growth relative to potential.

Interest Rates		
Country	Current Short-Term Interest Rates (Mar 31, 2025)	Long-Term Forecast of Short Interest Rates
United States	4.29%	2.80%
United Kingdom	4.54	2.31
Eurozone	1.95	1.96
Japan	0.38	1.92
Australia	3.70	3.25
Canada	2.64	2.49

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For longer-maturity government bond returns, we forecast each country's expected long-term slope to define a term structure of yields across their respective government yield curves. The forecast slope for each country is a function of forecast and potential real economic growth and will evolve countercyclically. When economic growth is forecast below potential, the slope of the yield curve is expected to be steeper (early cycle), whereas if growth is forecast to be closer to, or above, potential (late cycle), the yield curve is forecast to be flatter.

Our bond return forecasts are largely predicated on income and valuation factors. At a given maturity point, the forecast income return for a government bond will consist of the average expected coupon yield over the forecast horizon, as well as proceeds (losses) from bonds maturing to lower (higher) yields. Changes in yield at a given maturity point over the forecast horizon will determine the necessary valuation adjustment. If yields are forecast to rise (fall) over the next 10 years, the valuation adjustment will be negative (positive).

US 10-year Treasury yields decreased modestly in the first quarter of 2025 from 4.6% at the end of 2024 to 4.2%. Looking forward, yields for the Bloomberg US Treasury Index are expected to decrease from current levels over the next 10 years, resulting in a positive valuation adjustment and an expected return of 4.7%, a decrease of 0.2% from our Q1 2025 forecast, attributable to the aforementioned decrease in yields during the quarter. Unhedged Developed Market government bonds outside the US are forecast to return less over the next decade given lower initial yields. Long-run returns in Developed Market government bonds for a US investor are forecast to be 4.0% on an unhedged basis and 4.5% on a hedged basis given the differentials in forecast short-term interest rates.

[1]GDP-weighted Eurozone country average for European Central Bank.

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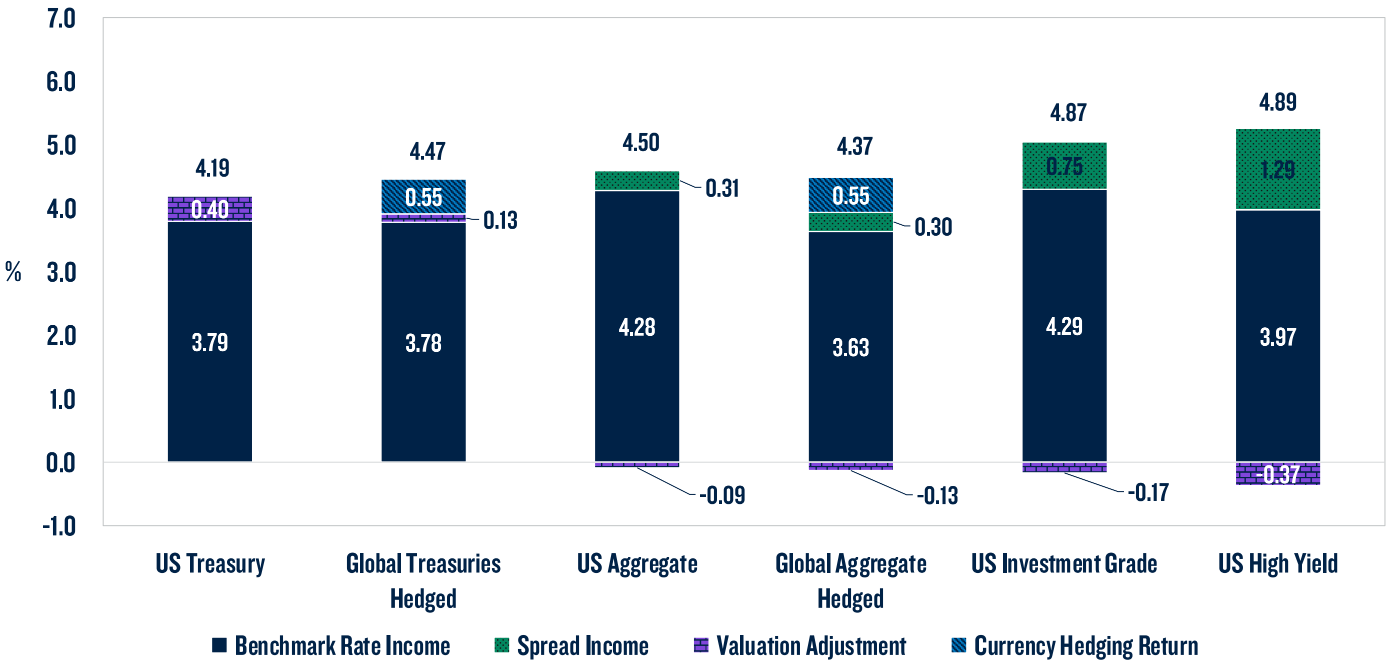
Decomposition of Fixed Income Return Forecasts



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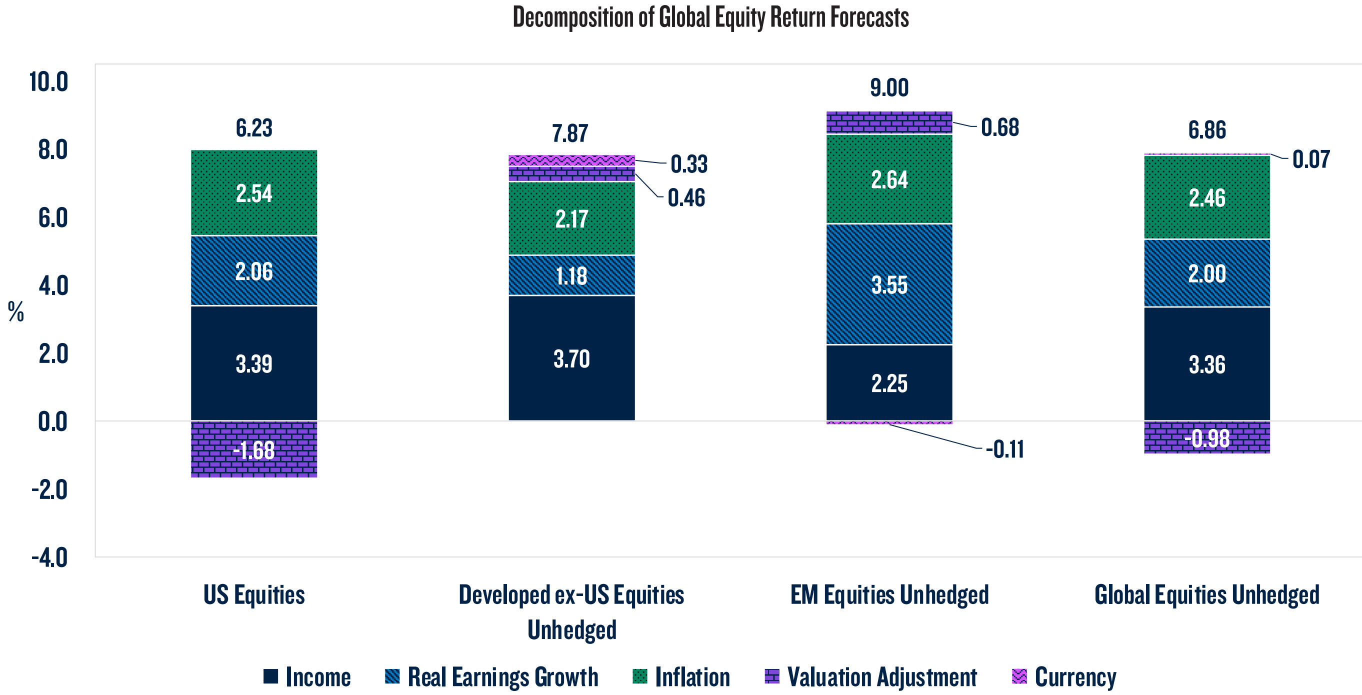
Our long-term forecast for US Aggregate Bonds is 4.5%, which includes an expected spread return of 0.2%. Our forecast for hedged Global Aggregate Bonds from a US investor perspective is 4.4%, given similar assumptions for credit spreads and defaults, as well as gains from currency hedging, which partially offset lower starting levels for underlying government yields outside the US. For both US Investment Grade and US High Yield Bonds, spreads at the end of the first quarter of 2025 were somewhat lower than expected averages for the next 10 years.

We calculate the expected returns for fixed income credit indexes to include any additional income expected from an average credit spread yield over comparable government bonds, adjusted for expected default and downgrade losses over the forecast horizon. We then calculate the valuation adjustment for expected changes in spreads. Long-run returns for both US Investment Grade and US High Yield Bonds are expected to be 4.9%.

Global Equity Markets



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All of our long-term asset class forecasts, including equities, are based on income, growth, and valuation considerations.

Consistent with historical precedent, and assuming the continuation of current dividend taxation regimes, the US equity market has a large share of expected income returns coming from share buybacks, equal to about 1.9% in our long-term forecasts. Outside the US, the expected impact of net buybacks in developed economies on long-term income returns is anticipated to be a much more modest 0.6%. For Emerging Markets, an expected drag on income returns from net share issuance is forecast at 0.4%.

> To build the income component of our long-term equity forecasts, we calculate each country's expected income contribution based on current and anticipated levels of dividend yield as well as the expected returns attributable to buyback activity (positive) or net positive share issuance (negative).

For the growth component of our equity return forecasts, nominal GDP growth over the next 10 years is expected to approximate long-term nominal earnings growth for each equity market. We calculate this as the combined annualized rate of expected inflation plus real GDP growth. As noted earlier, our near-term growth and inflation expectations are similar to those from last quarter. Our 10-year forecast for US real annualized GDP growth is now 2.1%, with 2.5% for inflation translating to an earnings growth component of 4.6%. While the impact of tariffs may elevate inflation over the next few quarters, over the longer term we anticipate inflation will continue to moderate to a level closer to the Fed target of 2%. For Developed Markets outside the US, our 10-year expectation for real GDP growth is 1.2%, while inflation is expected to average 2.2%. This assumption would provide nominal earnings growth of 3.4%. For Emerging Markets, higher nominal GDP growth relative to Developed Markets is expected to result in long-run nominal earnings growth of 6.2%.

Among Developed Markets, the US maintains a negative expected long-term valuation adjustment of -1.7% annually, attributable to still historically elevated valuation ratios. Developed equities outside the US, in contrast, are expected to have a positive valuation repricing given historical valuation ratios that are below long-run averages. Emerging Market equity returns are forecast to be 0.7% higher per year, attributable to a positive valuation adjustment.

Private Assets

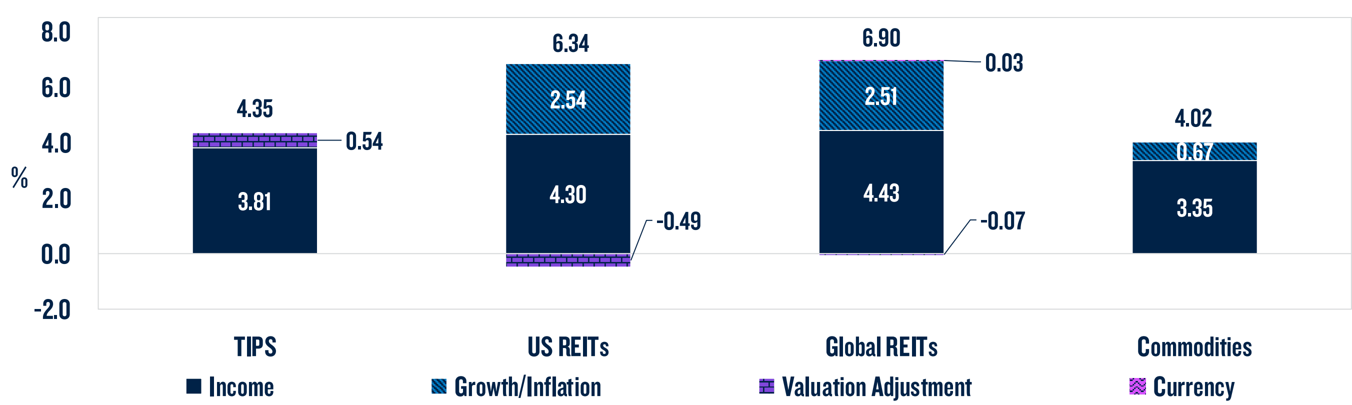
Our methodology for forecasting Private Assets outside of Real Estate ties the forecast outcomes of Private Assets to those of public market assets and assigns a premium consistent with historical empirical outcomes, acknowledging the underlying illiquidity and potential leverage employed in these asset classes relative to public market counterparts. Our forecasts for private Real Estate incorporate data from the NCRIEF Property Index (NPI) to determine yields and relative valuations in addition to linkages to forecast macroeconomic inputs. Investors in Private Assets must also evaluate cash flow considerations that may impact other liquid allocations in a multi-asset portfolio. For further reference about these considerations please see Shen et al. (2021)[2]. Private equity funds that take a buyout strategy invest in equity ownership in mature companies, resulting in a change of control. These are typically large transactions that use leverage. Our 10-year annualized forecast for US Buyout Private Equity is 7.7% versus a forecast of 6.2% for public US Equities. Venture capital funds seek private equity stakes in startups and small- to medium-sized companies with strong growth potential. Our annualized 10-year forecast for US Venture Capital Private Equity is 9.3% versus a forecast of 6.7% for public US Small Cap Equities.

Private mezzanine debt invests in loans that are subordinate to other debt in a firm's capital structure and that are backed by little to no collateral. Our annualized forecast for US Mezzanine Private Debt is 5.2%, which is somewhat higher than our forecast of 4.9% for public US High Yield Debt. Given the increasing role of private infrastructure investments in institutional portfolios, we are now also producing a forecast for Global Private Infrastructure. Our annualized 10-year forecast for Global Private Infrastructure is 8.6% versus a forecast of 7.9% for Global Listed Infrastructure. Private real estate funds covered in the NPI for our forecasts include properties that have been acquired, at least in part, on behalf of tax-exempt institutional investors and held in a fiduciary environment. The property types allowed into the NPI are hotels, office buildings, industrial properties, apartments, and other retail-use properties. Allowed properties can be wholly owned or even jointly owned properties. Returns on investment are required to be reported without leverage. From the unlevered initial forecast, we then calculate a core real estate forecast to represent funds with 20% leverage and an opportunistic real estate forecast to represent funds with 40% leverage. Our forecasts for Core and Opportunistic Private Real Estate this quarter are 8.2% and 9.7%, respectively.

Real Assets

We group together Commodities, REITs, and TIPS as Real Assets in our Capital Market Assumptions. For US TIPS, we assume that expected inflation and break-even inflation converge over time, implying that the inflation risk premia and liquidity risk premia in TIPS offset one another. Under these assumptions, we forecast a long-term return from TIPS of 4.4%, which is somewhat above the expected return of US Treasuries given the slightly higher duration of US TIPS. This US TIPS forecast is 0.7% lower than the prior quarter's forecast, attributable to the decline in underlying real yields during the first quarter. Our forecast returns for US and Global REITs include current and forecast dividend payments, expected appreciation linked to forecast price level changes, and a valuation adjustment based on current payout ratios. Our long-run forecasts for US and Global REITs are 6.3% and 6.9%, respectively. Our long-run expected return for Commodities is 4.0%, reflecting a return on cash investment of 3.3%, assuming investment through liquid futures and a growth premium of 0.7%, consistent with historical spot returns over cash and a linkage to forecast inflation.

Decomposition of Real Asset Return Forecasts



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[2]Shen et al. (2021), "Harnessing the Potential of Private Assets: A Framework for Institutional Portfolio Construction", PGIM Institutional and Advisory Solutions.

Currency and Currency Hedging Returns

Our long-term forecasts for currency returns and return to currency hedging are based on our forward views of local relative price levels and short-term policy rates. These views allow us to provide our long-term forecasts for a range of domiciles outside the US. Over the next 10 years we are forecasting generally negative returns for the US dollar relative to Developed Market peers with outcomes ranging from an annualized loss of -0.4% for the Australian dollar to a gain of 1.5% for the Swiss franc. Forecast outcomes for Emerging Market currencies range from an expected loss of -2.3% for the South African rand to a gain of 0.8% for the Taiwan dollar. Long-term currency hedging returns against a market-weighted basket of Developed Market exposures are forecast to be net positive for US investors as short-term interest rates are anticipated to be higher over the long term in the US relative to the Eurozone and Japan.

Global 60/40 Portfolio

Based on our long-term forecasts, a balanced portfolio of 60% Global Equities unhedged and 40% Global Aggregate Bonds hedged is forecast to return 6.3% annually over the next 10 years, an increase of 0.1% from our forecast for the first quarter of 2025.

PGIM Quantitative Solutions Q2 2025 10-Year Capital Market Assumptions

Asset	Expected Geometric Return (%)	Expected Arithmetic Return (%)	Expected Volatility (%)	Expected Sharpe Ratio
Fixed Income				
Cash	3.35	--	--	--
US Treasury Bonds	4.19	4.30	4.72	0.20
US Long Treasury	4.74	5.32	10.81	0.18
Global Treasury Bonds Hedged	4.47	4.53	3.43	0.34
US Aggregate Bonds	4.50	4.66	5.65	0.23
Global Aggregate Bonds Hedged	4.37	4.54	5.88	0.20
US Investment Grade Bonds	4.87	5.10	6.80	0.26
US High Yield Bonds	4.89	5.24	8.41	0.22
US TIPS	4.35	4.51	5.69	0.20
Equities				
US Equities	6.23	7.39	15.26	0.26
US Small Cap	6.73	8.69	19.83	0.27
UK Equities Unhedged	8.14	9.74	17.88	0.36
Europe ex-UK Equities Unhedged	7.22	8.69	17.12	0.31
Japan Equities Unhedged	8.38	10.42	20.22	0.35
Developed International ex-US Equities Unhedged	7.87	9.14	15.92	0.36
EM Equities Unhedged	9.00	11.79	23.59	0.36
Global Equities Unhedged	6.86	8.89	20.15	0.27
Real Assets				
US REITs	6.34	7.91	17.70	0.26
Developed REITs Unhedged	6.90	9.20	21.47	0.27
Commodities	4.02	5.07	14.48	0.12
Private Assets				
US Private Real Estate - Core	8.16	9.22	14.58	0.40
US Private Real Estate - Opportunistic	9.71	11.56	19.24	0.43
US Private Debt - Mezzanine	5.19	5.78	10.90	0.22
US Private Equity - Buyout	7.66	9.59	19.63	0.32
US Private Equity - Venture Capital	9.28	12.50	25.38	0.36
Global Private Infrastructure	8.64	10.09	17.04	0.40
60/40 Portfolio	6.27	7.15	13.24	0.29

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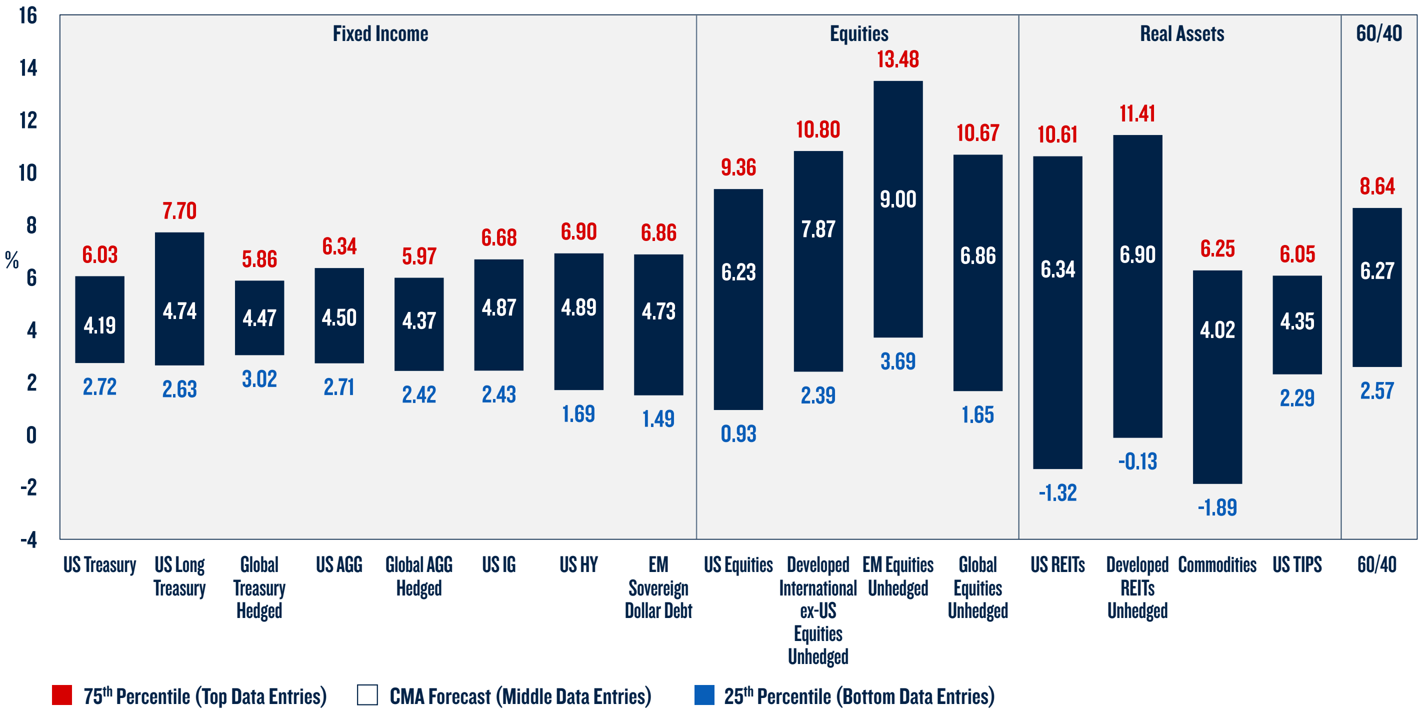
Incorporating Economic Uncertainty in Our 10-Year Forecasts

PGIM Quant's 10-year forecasts are based on building blocks with inherent uncertainty, particularly uncertainty as to the economic environment that will prevail over the next 10 years. To model this economic uncertainty, we conduct forward-looking simulations incorporating joint distributions of expansionary and recessionary investment environments. In contrast to simulations assuming a single multivariate normal distribution of asset class returns that are inconsistent with observed historical outcomes, our robust simulations consider periods of crisis that result in more pronounced drawdowns than would be captured in static average expected return and covariance forecasts.

Through these simulations we generate a distribution of return outcomes centered on our Capital Market Assumptions. Presented in the following chart are the 25th and 75th percentile ranges for the primary asset classes we forecast.[3]

Simulation-Based Forecast Ranges



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[3] Beginning in Q1 2022, PGIM Quantitative Solutions introduced a methodology change in the Economic Uncertainty Simulations that removed the quarterly modeling of deviations from expected economic growth and inflation. The updated monthly asset-class-based simulations result in wider uncertainty bands than the previous methodology.

Risk-Based Policy Portfolios[4]

To provide insight into how our evolving CMAs can be used to inform multi-asset portfolios, PGIM Quant produces three representative risk-based policy portfolios every quarter. These policy portfolios are based on public market assets only and are meant to mimic three distinct liability profiles from a US investor perspective. Suggested portfolios are constructed each quarter through constrained optimization based on our evolving risk and return forecasts. Suggested portfolios selected along the efficient frontier will be those with the highest Sharpe ratios and with at least the same expected return as the respective policy portfolio to which they are benchmarked.

For the second quarter of 2025, starting from the benchmark policy portfolios, intra-equity allocation changes common to all the policy portfolios included reductions in exposure to US Large Cap equities and increased allocations to International ex-US and Emerging Markets equities. Within Fixed Income, allocations to US Aggregate bonds were increased in the Growth and Balanced portfolios and decreased in the Income portfolio. Allocations to US Investment Grade bonds were decreased across all the portfolios with allocations to High Yield bonds increased in the Income portfolio and decreased in the Balanced and Growth portfolios. Within Real Assets, allocations to Commodities were decreased in the Growth and Balanced portfolios and increased in the Income portfolio, allocations to TIPS were increased in the Balanced and Growth portfolios, and allocations to REITs were increased across all the portfolios

Across broad asset class groups, Equity allocations were increased in the Income portfolio and decreased in the Balanced and Growth portfolios. Allocations to Fixed Income were increased in the Balanced and Growth portfolios and decreased in the Income portfolio, while Real Asset allocations were increased across all the portfolios.

Q2 Risk-Based Policy Portfolios			
	Income Focused	Balanced Income and Growth	Growth Focused
Equities	**30.0%**	**55.0%**	**70.0%**
US Large Cap	20.0%	35.0%	40.0%
US Small Cap	2.0%	3.0%	8.0%
International ex-US	5.0%	12.0%	15.0%
Emerging Markets	3.0%	5.0%	7.0%
Fixed Income	**60.0%**	**35.0%**	**20.0%**
US Aggregate	50.0%	30.0%	10.0%
US Investment Grade	8.0%	3.0%	3.0%
US High Yield	2.0%	2.0%	7.0%
Real Assets	**10.0%**	**10.0%**	**10.0%**
TIPS	6.0%	3.0%	2.0%
US REITs	2.0%	4.0%	5.0%
Commodities	2.0%	3.0%	3.0%
Expected Geometric Return	**5.6%**	**6.3%**	**6.7%**
Expected Standard Deviation	**7.1%**	**10.0%**	**12.4%**
Expected Sharpe Ratio	**0.35**	**0.34**	**0.33**

Q2 Optimized Risk-Based Policy Portfolios			
	Income Focused	Balanced Income and Growth	Growth Focused
Equities	**31.0%**	**52.5%**	**67.0%**
US Large Cap	15.0%	30.0%	35.0%
US Small Cap	4.0%	1.5%	6.0%
International ex-US	7.0%	14.0%	17.0%
Emerging Markets	5.0%	7.0%	9.0%
Fixed Income	**57.0%**	**35.5%**	**21.5%**
US Aggregate	48.5%	34.5%	15.0%
US Investment Grade	6.0%	1.0%	1.5%
US High Yield	2.5%	0.0%	5.0%
Real Assets	**12.0%**	**12.0%**	**11.5%**
TIPS	5.5%	5.0%	4.0%
US REITs	2.5%	5.5%	6.5%
Commodities	4.0%	1.5%	1.0%
Expected Geometric Return	**5.8%**	**6.4%**	**6.8%**
Expected Standard Deviation	**7.4%**	**9.7%**	**12.0%**
Expected Sharpe Ratio	**0.36**	**0.36**	**0.35**

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[4]For illustrative purposes only. All risk-based policy portfolios have significant inherent shortcomings and do not consider many real-world frictions. There is no current PGIM Quantitative Solutions client portfolio with this composition of assets. Does not constitute investment advice and should not be used as the basis for any investment decision.

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Innovations in Suggested Allocations from Q1 2025

Changes in our forecasts for the second quarter of 2025 have resulted in a number of innovations in our optimized portfolios. In the Income portfolio, a 3% increase in the US Small Cap allocation was funded by reductions in US Aggregate bonds and US High Yield bonds. Within Real Assets, a 2.5% reduction in the US TIPS allocation was used to fund a 2.5% increase in the US REITs allocation.

In the Balanced portfolio, decreased allocations to US Aggregate bonds, US High Yield bonds and Commodities were used to fund increased allocations to US REITs and US Small Cap equities. In the Growth portfolio, a 3.5% increase in the US REITs allocation was financed by a proportionate reduction in the US Investment Grade bond allocation.

Quarter-over-Quarter Changes in Optimized Risk-Based Policy Portfolio Allocations			
	Income Focused	Balanced Income and Growth	Growth Focused
Equities	**3.0%**	**0.5%**	**0.0%**
US Large Cap	0.0%	0.0%	0.0%
US Small Cap	3.0%	0.5%	0.0%
International ex-US	0.0%	0.0%	0.0%
Emerging Markets	0.0%	0.0%	0.0%
Fixed Income	**-3.0%**	**-1.5%**	**-3.5%**
US Aggregate	-2.5%	-0.5%	0.0%
US Investment Grade	0.0%	-1.0%	-3.5%
US High Yield	-0.5%	0.0%	0.0%
Real Assets	**0.0%**	**1.0%**	**3.5%**
TIPS	-2.5%	0.0%	0.0%
US REITs	2.5%	2.5%	3.5%
Commodities	0.0%	-1.5%	0.0%
Expected Geometric Return	**-0.3%**	**-0.2%**	**0.0%**
Expected Standard Deviation	**0.5%**	**0.2%**	**0.3%**
Expected Sharpe Ratio	**-0.06**	**-0.02**	**-0.01**

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Policy Portfolio Including Private Assets

Given the increasingly important role private asset classes play in a growing number of institutional allocations, beginning in the second quarter of 2022, we introduced an additional policy portfolio that includes allocations to a number of private asset classes. The allocations are designed to approximate the risk profile of the Balanced policy portfolio, while providing diversifying exposure to private equity, private debt, and private real estate allocations. As in the policy portfolios that include only public markets, suggested portfolios are constructed through constrained optimization based on our evolving risk and return forecasts. Suggested portfolios selected along the efficient frontier will be those with the highest Sharpe ratios and with at least the same expected return as the benchmark policy portfolio.

For the second quarter of 2025, the Private Assets policy portfolio allocation changes mirrored those in the Balanced portfolio that included only public markets investments. Specifically, exposure to US equities was reduced in order to fund an overweight allocation to Emerging Markets equities and to fund cross-asset class allocations to Real Assets. Within Fixed Income, allocations to Investment Grade and High Yield bonds were decreased while the allocation to US Aggregate bonds was increased. Within Real Assets, TIPS and Commodities allocations were increased, while exposure to REITs was decreased. In Private Assets, allocations were increased to Private Equity Buyout and Venture Capital as well as to Core and Opportunistic Real Estate. In contrast, the allocation to Private Mezzanine Debt was reduced.

Capital Market Assumptions Balanced Portfolio With Private Assets Allocation		
	Benchmark	Optimal
Equities	**28.0%**	**23.0%**
US Large Cap	18.0%	13.0%
US Small Cap	2.0%	0.0%
International ex-US	6.0%	6.0%
Emerging Markets	2.0%	4.0%
Fixed Income	**35.0%**	**35.0%**
US Aggregate	30.0%	34.0%
US Investment Grade	3.0%	1.0%
US High Yield	2.0%	0.0%
Real Assets	**7.0%**	**9.0%**
TIPS	2.0%	4.0%
US REITs	3.0%	1.0%
Commodities	2.0%	4.0%
Private Assets	**30.0%**	**33.0%**
Private Equity Buyout	6.0%	8.0%
Venture Capital	4.0%	6.0%
Private Mezzanine Debt	10.0%	5.0%
Core Real Estate	6.0%	8.0%
Opportunistic Real Estate	4.0%	6.0%
Total	**100.0%**	**100.0%**
Expected Geometric Return	**6.7%**	**6.9%**
Expected Standard Deviation	**8.7%**	**8.5%**
Expected Sharpe Ratio	**0.42**	**0.46**

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PGIM Quantitative Solutions' Steady State CMAs

PGIM Quant is now providing a longer-term forecast view beyond a 10-year horizon based on our 'steady state' views for asset classes. We construct long-term CMAs by combining 10-year CMAs and steady state CMAs. Returns are expected to follow the 10-year CMA scenario for the first segment of history and then follow the steady state CMAs thereafter. One motivation for this structure is that assets that are cheap (rich) on a valuation basis might have better (worse) returns over the near-term horizon. However, the longer an investor's time horizon, the less weight they should place on an asset class being cheap or rich today, and the more weight they should place on what happens in the steady state. Steady state CMAs are intended to answer the question of "what will asset returns be after prices have returned to equilibrium and economies grow at their long-run pace?" To accomplish this, we remove valuation components and cyclical terms in our existing model, anchoring them to an equilibrium level.

CMA volatility estimates are constructed based on historical standard deviations over the long term. To construct steady state volatility, we rely on the methodology developed by Cox, Ingersoll, and Ross (1985)[5], whose model links the volatility of interest rates to the square root of interest rates. Higher interest rates are associated with greater volatility in interest rates, just not linearly. In our case, we have volatility estimates over the subsequent 10 years, and want to model how those values would change if the return estimates change. The steady state volatility is calculated by scaling the 10-year volatility by the square root of the ratio of the steady state return to the -year return expectation. This approach ensures that if an asset class has a higher return in the steady state, such as would occur due to interest rates rising beyond our typical 10-year horizon, then the volatility is also scaled higher. However, since the scaling uses a square root instead of a linear adjustment, volatility will not increase as much as returns in the steady state. This means that the Sharpe ratio will also increase (see Tokat-Acikel et al. 2021 for details[6]).

Long-Term Capital Market Assumptions				
Asset	Expected Geometric Return (%)	Expected Arithmetic Return (%)	Expected Volatility (%)	Expected Sharpe Ratio
Fixed Income				
Cash	2.71	--	--	--
US Treasury Bonds	3.86	3.97	4.53	0.28
Global Treasury Bonds Hedged	3.80	3.85	3.16	0.36
US Aggregate Bonds	4.25	4.40	5.49	0.31
Global Aggregate Bonds Hedged	3.88	4.03	5.54	0.24
US Investment Grade Bonds	4.74	4.97	6.70	0.34
US High Yield Bonds	5.20	5.58	8.67	0.33
US TIPS	3.87	4.01	5.36	0.24
Equities				
US Equities	8.66	10.27	17.99	0.42
US Small Cap	9.16	11.83	23.13	0.39
UK Equities Unhedged	8.25	9.87	18.00	0.40
Europe ex-UK Equities Unhedged	7.29	8.77	17.20	0.35
Japan Equities Unhedged	5.77	7.17	16.77	0.27
Developed International ex-US Equities Unhedged	7.24	8.40	15.27	0.37
EM Equities Unhedged	9.37	12.27	24.07	0.40
Global Equities Unhedged	8.40	10.89	22.30	0.37
Real Assets				
US REITs	6.86	8.56	18.41	0.32
Developed REITs Unhedged	6.96	9.28	21.56	0.30
Commodities	3.26	4.11	13.05	0.11
60/40 Portfolio	7.10	8.15	14.44	0.38

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[5] Cox, Ingersoll, & Ross. 1985. "A Theory of the Term Structure of Interest Rates." Econometrica, 53 (2): 385-407. https://doi.org/10.2307/1911242.
[6] Tokat-Acikel, Aiolfi, Hall, Jin, & Johnson. 2021. "Top-Down Portfolio Implications of Climate Change"
PGIM Quantitative Solutions White Paper. https://www.pgimquantitativesolutions.com/white-paper/top-down-portfolio-implications-climate-change

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