Vanguard

Vanguard research

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Vanguard economic and market outlook for 2025: Beyond the landing

The global monetary easing cycle will be in full swing in 2025, with inflation in most developed economies now within touching distance of central banks' targets. The good fortune of high productivity growth and a surge in available labor has propelled the U.S. economy, while other economies have been less lucky. The potential for these positive supply-side factors to wane is a key risk to our U.S. outlook, though expansionary fiscal policy may cushion any negative impact on growth.

We reemphasize the view we put forth a year ago, that an era of sound money—with interest rates above the rate of inflation—lives on. That said, markets face a growing point of tension: Assets with the strongest fundamentals have the most stretched valuations, and vice versa. Short-term economic and policy risks will help determine whether momentum or valuations dominate investment returns in 2025.

Still-sound money

As interest rates return toward neutral, we expect them to settle at higher levels than in the 2010s. This environment sets the foundation for solid cash and fixed income returns over the next decade. **Page 6**.

U.S. economic resilience

Positive labor supply and productivity developments drove U.S. growth in 2024. Whether these drivers wane or accelerate, coupled with demand factors such as fiscal stimulus, holds the key in 2025. **Page 7**.

Growing market tension

The possibility that we are experiencing a valuation-supporting productivity boom must be balanced by the risk that economic developments could expose the vulnerability of stretched equity valuations. **Page 17**.

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Vanguard's 2025 economic forecasts

	GDP growth		Unemployment rate		Core inflation	Monetary policy		
	2025		2025		2025			
Country/region	**Vanguard**	**Trend**	**Vanguard**	**NAIRU**	**Vanguard**	**Year-end 2024**	**Year-end 2025**	**Neutral rate**
U.S.	2.1%	2.7%	4.4%	4.5%	2.5%	4.5%	4.0%	3.5%
Euro area	0.5%	1.2%	6.9%	6.5%–7%	1.9%	3%	1.75%	2%–2.5%
U.K.	1.4%	1.2%	4.4%	4%–4.5%	2.4%	4.75%	3.75%	3%–3.5%
China	4.5%	4.2%	5.1%	5%	1.5%	1.4%	1.2%	4.5%–5%
Japan	1.2%	1.0%	2.4%	2.5%–3%	2.1%	0.5%	1.0%	0%

Notes: Forecasts are as of December 2, 2024. For the U.S., GDP growth is defined as the year-over-year change in fourth-quarter GDP. For all other countries/regions, GDP growth is defined as the annual change in GDP in the forecast year compared with the previous year. Unemployment rate forecasts are the average for the fourth quarter of 2025. NAIRU is the nonaccelerating inflation rate of unemployment, a measure of labor market equilibrium. Core inflation excludes volatile food and energy prices. For the U.S., euro area, U.K., and Japan, core inflation is defined as the year-over-year change in the fourth quarter compared with the previous year. For China, core inflation is defined as the average annual change compared with the previous year. For the U.S., core inflation is based on the core Personal Consumption Expenditures Index. For all other countries/regions, core inflation is based on the core Consumer Price Index. For U.S. monetary policy, Vanguard's forecast refers to the top end of the Federal Open Market Committee's target range. China's policy rate is the seven-day reverse repo rate. The neutral rate is the equilibrium policy rate at which no easing or tightening pressures are being placed on an economy or its financial markets.

Source: Vanguard.

Notes on asset-return distributions

The asset-return distributions shown here represent Vanguard's view on the potential range of risk premiums that may occur over the next 10 years; such long-term projections are not intended to be extrapolated into a short-term view. These potential outcomes for long-term investment returns are generated by the Vanguard Capital Markets Model® (VCMM) and reflect the collective perspective of our Investment Strategy Group. The expected risk premiums—and the uncertainty surrounding those expectations—are among a number of qualitative and quantitative inputs used in Vanguard's investment methodology and portfolio construction process.

IMPORTANT: The projections and other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from the VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of November 8, 2024. Results from the model may vary with each use and over time. For more information, please see "About the Vanguard Capital Markets Model" on page 23.

Global outlook summary

Global inflation has slowed sharply in the last two years and is now within touching distance of 2%. But the path to disinflation has been uneven across countries and regions, with most developed markets enduring monetary-policy-induced slowdowns to get there. The United States is a notable exception, having experienced accelerating economic growth and full employment with no discernible effect from restrictive monetary policy.

Has the U.S. achieved a soft landing? Or will the impact of high interest rates eventually lead to a hard landing? These questions have dominated the market narrative over the last two years, with the focus on whether the U.S. Federal Reserve can perfectly time the rate-cutting cycle to achieve painless disinflation.

Yet this emphasis on the "landing" may not fully explain the pairing of exceptionally strong growth and falling inflation that we've witnessed in the U.S. The forces that do explain it suggest a new narrative for the economy and markets.

In our 2025 outlook, we adopt a framework centered on the supply-side forces that have shaped the U.S. economy. These include a surge in both labor productivity and available labor. Supply-side forces offer a more satisfying explanation for the positive growth and inflation dynamic. Emerging risks—such as those related to immigration policies, geopolitics, or potential tariffs—also fit more naturally into this supply-side-aware framework.

U.S. economic resilience has not been driven by Fed policy

Against the backdrop of restrictive monetary policy, the U.S. economy has had the favorable combination of strong real GDP growth, loosening of overly tight labor markets, and falling inflation. It may be tempting to attribute this good fortune to a "soft landing" engineered by the Fed. However, a closer look suggests that this interpretation may be insufficient. Rather, continued U.S. robustness may owe more to fortuitous supply-side factors, including higher productivity growth and a surge in available labor. Higher output and lower inflation can generally coexist only when the supply-side forces are in the driver's seat. These dynamics have altered our baseline U.S. economic outlook and point to the primary risks on the horizon.

While these positive supply-side drivers of growth may continue in 2025, emerging policy risks such as the implementation of trade tariffs and stricter immigration policies may offset gains. Under such a scenario, U.S. real GDP growth would cool from its present rate of around 3% to closer to 2%. These offsetting policy risks may also increase inflationary pressures. Therefore, we anticipate that core inflation will remain above 2.5% for most of 2025. Although we expect the Fed to reduce its policy rate to 4%, cuts beyond that would prove difficult as any weakening of growth would have to be weighed against a potential inflation revival.

Less good fortune outside the U.S.

Economies outside of the United States have been less lucky on the supply side, and thus unable to achieve the same combination of strong growth alongside significantly reduced inflation. While inflation is now close to target in the euro area, that has come at the price of stagnation in 2023 and 2024, with muted external demand, weak productivity, and the lingering effects of the energy crisis holding activity back. Growth is expected to remain below trend next year, as a slowdown in global trade represents a key risk. Expect the European Central Bank to cut rates below neutral, to 1.75%, by the end of 2025.

In China, policymakers still have work to do despite their coordinated policy pivot in late 2024. Growth should pick up in the coming quarters as financing conditions ease and fiscal stimulus measures kick in. But more decisive and aggressive measures are needed to overcome intensifying external headwinds, structural issues in the property sector, and weak confidence in both the household and business sectors. We maintain our weaker-than-consensus secular view on Chinese growth, and thus expect additional monetary and fiscal loosening in 2025.

The era of sound money lives on, with a new point of tension emerging

Although central banks are now easing monetary policy, we maintain our view that policy rates will settle at higher levels than in the 2010s. This environment sets the foundation for solid cash and fixed income returns over the next decade, but the equity view is more cautious. This structural theme holds even in a scenario where central banks briefly cut rates below neutral to allay temporary growth wobbles. The era of sound money—characterized by positive real interest rates—lives on.

The investment challenge is a growing point of tension in risk assets between momentum and overvaluation. Assets with the strongest fundamentals have the most stretched relative valuations, and vice versa. The economic and policy risks for 2025 will help determine whether momentum or valuations dominate investment returns in the coming year.

The balance of risks favors bonds

Higher starting yields have greatly improved the risk-return tradeoff in fixed income. Bonds are still back. Over the next decade, we expect 4.3%–5.3% annualized returns for both U.S. and global ex-U.S. currency-hedged bonds. This view reflects a gradual normalization in policy rates and yield curves, though important near-term risks remain.

We believe that yields across the curve are likely to remain above 4% in the U.S. A scenario where supply-side tailwinds persist will be supportive for trend growth and thus real rates. Alternatively, the emerging risks related to global trade and immigration policies would also keep rates high due to increased inflation expectations. These risks must be balanced with the possibility that a growth shock, and any associated monetary easing or "flight to safety," would cause yields to fall meaningfully from current levels.

Higher starting yields, which imply a "coupon wall," mean that future bond returns are less exposed to modest increases in yields. In fact, for investors with the time horizon to see coupon payments catch up, interest rates that rise further would improve their total returns despite some near-term pain. We continue to believe fixed income plays an important role as a ballast in long-term portfolios. The greatest downside risk to bonds also pertains to stocks—namely, a rise in long-term rates due to continued fiscal-deficit spending or removal of supply-side support. These are the dynamics we are most closely monitoring.

Rational or irrational exuberance: Only time will tell

U.S. equities have generally delivered strong returns in recent years. 2024 was no exception, with both earnings growth and price/earnings ratios exceeding expectations. The key question for investors is, "What happens next?"

In our view, U.S. valuations are elevated but not as stretched as traditional metrics imply. Despite higher interest rates, many large corporations insulated themselves from tighter monetary policy by locking in low financing costs ahead of time. And more importantly, the market has been increasingly concentrated toward growth-oriented sectors, such as technology, that support higher valuations.

Nevertheless, the likelihood that we are in the midst of a valuation-supporting productivity boom, akin to the mid-1990s, must be balanced with the possibility that the current environment may be more analogous to 1999. In the latter scenario, a negative economic development could expose the vulnerability of current stock market valuations.

While the median of our U.S. return outlook over the next decade appears cautious, the range of possible outcomes is wide, and valuations are rarely a good timing tool. Ultimately, high starting valuations will drag long-term returns down. But history shows that, absent an economic or earnings growth shock, U.S. equity market returns can continue to defy their valuation gravity in the near term.

International valuations are more attractive. We suspect this could continue as these economies are likely to be most exposed to rising global economic and policy risks. Differences in long-term price/earnings ratios are the biggest driver of relative returns over five-plus years, but economic growth and profits matter more over shorter horizons. Over the past few years, persistently lackluster growth in the economies and earnings outside of the U.S. kept international returns lukewarm relative to the remarkable return in the U.S. market. Within emerging markets, China is the sole reason valuations are below fair value, but the risks of rising trade tensions and insufficient fiscal stimulus in China pose additional headwinds.

IMPORTANT: The projections and other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of November 8, 2024. Results from the model may vary with each use and over time. For more information, please see page 23.

Cutting to the chase: The global easing cycle in full swing

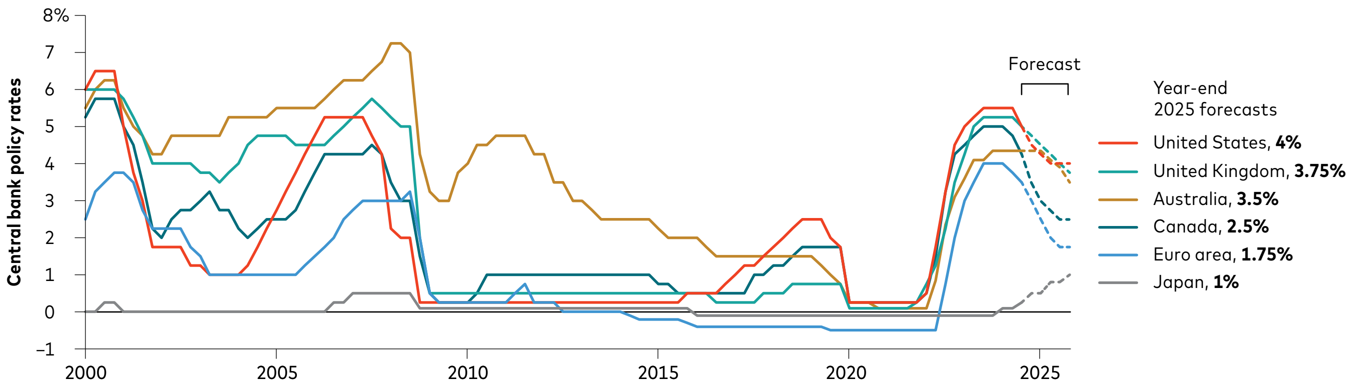
After two years of sharp inflation declines across developed markets, central banks are finally nearing their inflation targets of 2%. Confident that inflation was under control, and with a steady outlook for global economic growth, policymakers began lowering interest rates. The global easing cycle will be in full swing in 2025 as central banks gradually unwind restrictive monetary policies.

Despite significant progress against inflation in the U.S., we expect core inflation to remain above 2% throughout 2025 due to "sticky" shelter and services inflation. The Federal Reserve will most likely adopt a cautious stance toward further monetary easing. Our baseline is that policy rates will decrease to 4% by the end of the year, but risks are skewed toward inflationary pressures reigniting. If inflation were to rebound, the Fed would have to slow its pace of easing or potentially reverse course.

In the euro area, strong progress on inflation was achieved in 2023 and 2024 but at the expense of economic growth. With growth likely to remain below trend next year, we expect the European Central Bank to cut rates below 2% by the end of 2025. Australia's struggle with stubborn inflation will probably keep rates elevated into 2025, while Canada is expected to quickly unwind higher rates to stimulate slumping growth. In China, stimulus measures may provide a short-term boost to the economy, but stringent fiscal and monetary measures will be needed to overcome structural headwinds to growth. Japan will likely be an exception, with a strengthening economy that has the potential to lift rates to 1% by year-end.

Although central banks are easing monetary policies, we believe that policy rates will settle at higher levels than in the 2010s. This structural theme holds even if central banks cut rates below neutral in the short term to alleviate temporary growth concerns. The era of sound money—characterized by positive real interest rates—will endure, setting the foundation for solid cash and fixed income returns over the next decade.

Most policy rates will likely settle lower but above inflation



Notes: The chart shows central banks' nominal monetary policy rates for each quarter through November 4, 2024, and forecasts thereafter. Most major central banks have target inflation rates around 2%.

Sources: Vanguard calculations, using data from Macrobond, as of November 4, 2024.

U.S. economic resilience: Good luck on the supply side

Disinflation in the United States has, so far, been relatively painless. Over the last two years, annual inflation has fallen from 6.7% to 2.1%.[1] Meanwhile, the economy grew about 3% in 2023 and we expect it to grow slightly above 2% in both 2024 and 2025. The labor market has softened only a little.

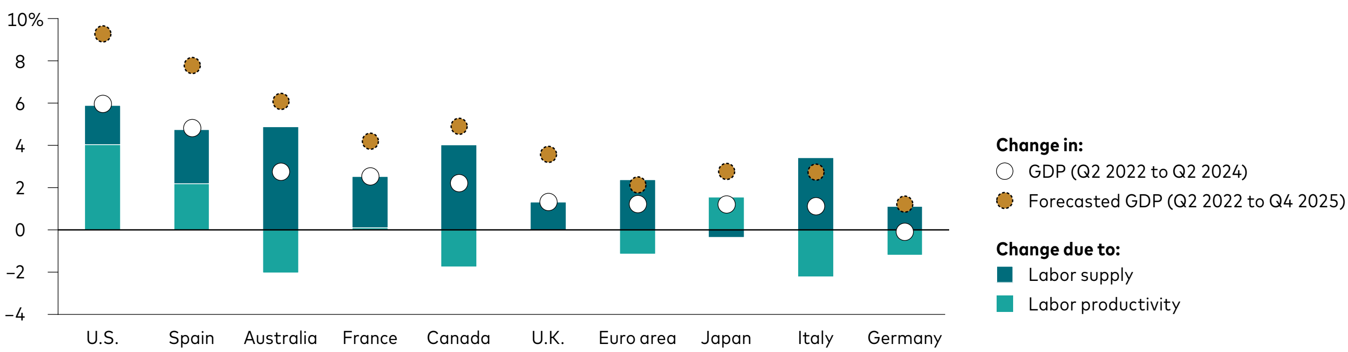
This resilience has stemmed primarily from positive supply-side developments, including strong productivity growth and a surge in available labor. Between the second quarter of 2022 and the second quarter of 2024, productivity increased by 4% and the labor supply grew by 1.8%.[2] Such good luck on the supply side explains both the strong inflation progress and the muted effect of restrictive monetary policy on growth.

As the chart illustrates, other advanced economies have been less lucky. Although most countries have had strong labor supply growth over the last two years, productivity growth has been very weak, notably in Australia, Canada, Italy, and Germany. An exception is Spain, which has seen strong productivity growth.

Three reasons could explain this divergence in productivity between the United States and other advanced economies. First, the U.S. had a surge in new business formations during the pandemic, especially in high-tech sectors, boosting innovation. Second, although the U.S. experienced a pandemic-related spike in unemployment, it also saw a quick return to trend as workers reallocated to more productive jobs. In other economies, furloughs prevented reallocations that would have improved productivity. Finally, expansionary U.S. fiscal policy helped to boost productivity in targeted sectors such as semiconductors and information technology, whereas fiscal policy was less expansive elsewhere.

Although these positive supply-side drivers of U.S. growth may continue in 2025, emerging policy risks such as the implementation of trade tariffs and stricter immigration policies may act as offsetting negative supply impacts, while also increasing inflationary pressures.

Cumulative change in GDP since Q2 2022



Notes: The bars show the cumulative change in labor supply (as measured by hours worked) and labor productivity (as measured by output per hour worked) between Q2 2022 and Q2 2024. The white dots show the cumulative change in GDP for each economy between Q2 2022 and Q2 2024. The tan dots show the forecasted cumulative change in GDP for each economy between Q2 2022 and Q4 2025.

Sources: Vanguard calculations, based on data from Bloomberg, the U.S. Bureau of Economic Analysis, Eurostat, the Australian Bureau of Statistics, Statistics Canada, the Economic and Social Research Institute (Japan), the Office for National Statistics, the European Central Bank, the U.S. Bureau of Labor Statistics, and CEIC, as of October 30, 2024.

1 As measured by the Personal Consumption Expenditures (PCE) price index, as of September 30, 2024.

2 As measured by total hours worked.

Lessons from history: Mind supply-side surprises

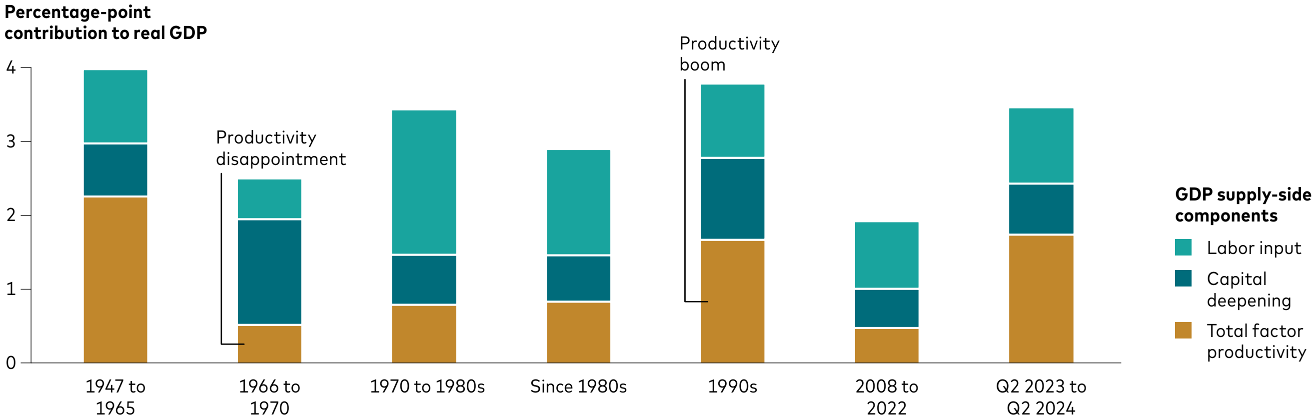
Historically, economies have faced turbulent periods following monetary tightening cycles, with many ending in economic downturns.[3] While monetary policy actions and external shocks—whether geopolitical events or wars—significantly influenced those conditions, unexpected shifts in the supply side of an economy cannot be overlooked. These "supply-side surprises" have often caught policymakers off guard due to the challenge of measuring such changes in real time.

In the late 1960s, for example, the Federal Reserve encountered challenges as it began an easing cycle. When favorable productivity conditions disappeared, a growing economy experienced a surge in inflation. This prompted the Fed to aggressively raise rates again, contributing to a painful recession. The surprise element of a shifting supply side complicated the Fed's ability to achieve continued growth without accelerated inflation.

The late 1990s, however, represented the classic example of a successful "soft landing."[4] Despite some initial weakness as the Fed began to hike interest rates in late 1993, productivity gains—particularly driven by technological advancements—began to accelerate and helped cushion the economy. This surge in productivity allowed the Fed to maintain higher interest rates without stalling economic growth or fueling inflation. Ultimately, the Fed recognized favorable supply-side conditions and guided the economy through continued growth with low inflation.

Over the past two years, the U.S. economy has achieved a favorable balance of strong growth, low unemployment, and cooling inflation. We attribute these conditions to recent supportive supply dynamics, including a surge in both productivity and available labor. As in past episodes, how these conditions evolve from here—and the ability of policymakers to recognize them—will play a decisive role in the trajectory of the economy in 2025.

Supply-side forces have driven much of the U.S. economy through economic cycles



Notes: All variables are percent changes at an annual rate. Labor input is the time people spend working to produce goods and services. Capital deepening is the ratio of capital to labor. Total factor productivity is the ratio of aggregate outputs to aggregate inputs.

Sources: Vanguard calculations, using data from the Federal Reserve Bank of San Francisco, as of June 30, 2024.

3 Alan S. Blinder. *Landings, Soft and Hard: The Federal Reserve, 1965–2022*. Journal of Economic Perspectives, Winter 2023. pubs.aeaweb.org/doi/pdfplus/10.1257/jep.37.1.101.

4 Philip N. Jefferson. *Philip N. Jefferson: Is This Time Different? Recent Monetary Policy Cycles in Retrospect*. Bank for International Settlements, February 22, 2023. bis.org/review/r240223a.htm.

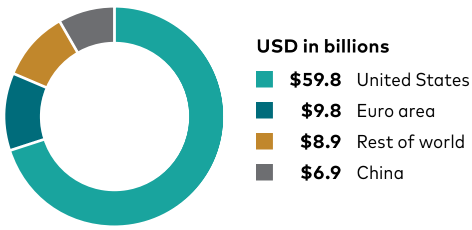
Artificial intelligence: Transformative potential, but 2025 is too soon for significant productivity growth

Excitement surrounding artificial intelligence (AI) and its potential to transform the global economy is warranted, but widespread adoption won't happen overnight. When new technologies emerge, firms can take years, sometimes decades, to find profitable commercial applications for them and see improved productivity. While we expect AI adoption to be relatively quicker than previous innovations (a common trait of digital technologies), significant productivity growth from AI utilization likely wouldn't occur until the late 2020s even in our most optimistic scenario.

Although considerable uncertainty exists in predicting how technology and social attitudes toward AI will evolve in coming years, we estimate that in developed economies, roughly 30% of current working hours are spent on tasks that will be performed by AI in 20 years. Contrary to dystopian fears, this will not cause 30% unemployment because many of these working hours will be reallocated to other, less AI-sensitive tasks.

AI adoption curves and economic significance will vary by country, but early indicators suggest a substantial first-mover advantage for the U.S., which financial markets have noticed. Based on our estimate of AI task displacement, we expect the U.S. economy to grow at a real rate of 3.1% between 2028 and 2040, with nearly half of that growth attributable to AI. In a less rosy scenario, where AI technologies only marginally improve from current capabilities, the benefits would be insufficient to overcome growing government deficits, and economic growth would be about 1% per year.

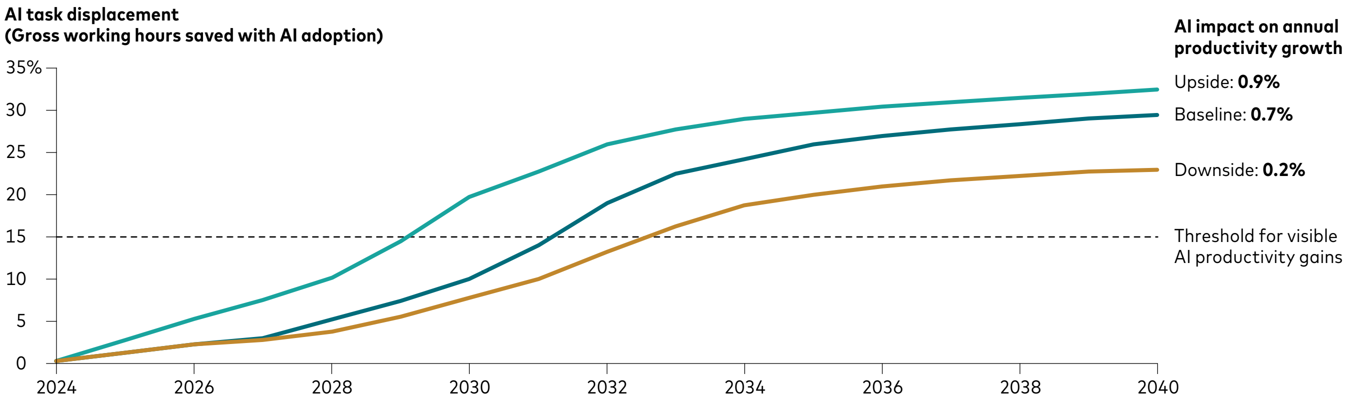
U.S. leads the pack in AI



Notes: The chart shows private investment in AI for 2023 and includes only companies that received more than $1.5 million in investment. The data likely understate global AI investment as they reflect only private equity transactions.

Sources: Vanguard calculations, using data from Our World in Data, Stanford University's *AI Index Report 2024*, and the U.S. Bureau of Labor Statistics, as of December 31, 2023.

An AI boom in 2025 would require rapid commercial adoption



Sources: Vanguard calculations, using data from O*NET, the U.S. Bureau of Labor Statistics, and the Congressional Budget Office, as of June 30, 2024.

United States: Resilience and recalibration

The Federal Reserve began easing interest rates for the first time this cycle at its September 2024 meeting, acknowledging the progress toward restoring price stability. Indeed, the U.S. economy has achieved a favorable balance of strong GDP growth, low unemployment, and cooling inflation. We attribute this confluence to recent supply dynamics—labor force and productivity growth—that have shaped the economic landscape over the past two years. Going forward, these conditions along with a shifting policy environment will require the Fed to recalibrate its current expectations about how far it needs to, or can, ease policy rates.

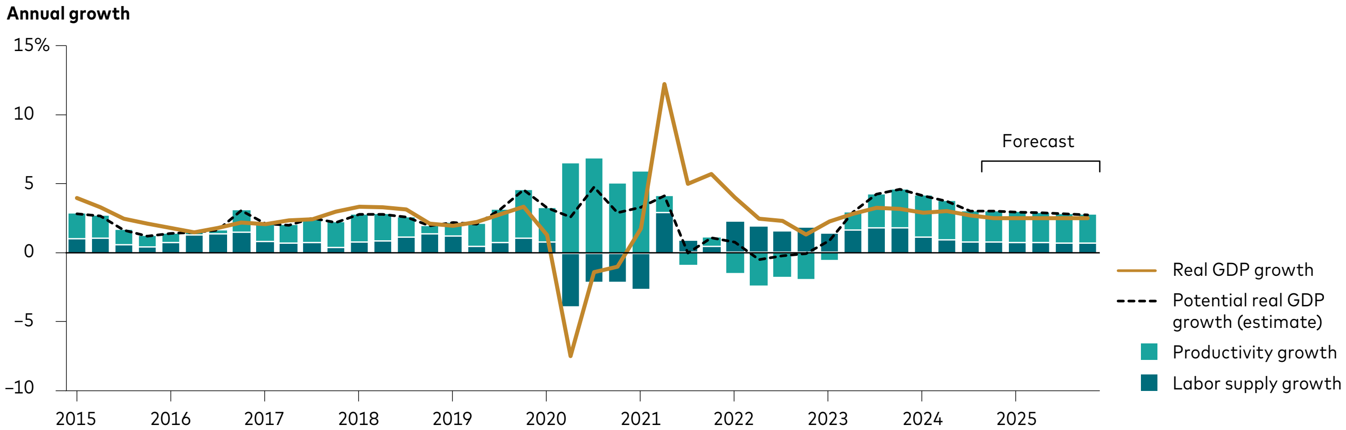
We anticipate that growth momentum will remain solid in 2025, supported by less restrictive monetary policy as well as ongoing productivity tailwinds that have increased our estimate of potential growth. We forecast GDP growth of 2.1%, reflecting a modest drag from potential changes to trade and immigration policies.

Labor supply dynamics, especially immigration policy, will be a key factor influencing the U.S. labor market trajectory in 2025. Strong macroeconomic fundamentals, an aging domestic labor force, and stricter immigration policies could all contribute to a potentially tighter labor market. While hiring has slowed in recent months, we expect the unemployment rate will remain in the low 4% range. An outright contraction in available labor is a risk that could reignite wage inflation in the service and construction sectors.

We expect core inflation to remain near 2.5% in 2025, above the Fed's 2% target, due to strong economic momentum coupled with potentially inflationary effects from new immigration and trade policies.

In response, the Fed will have to adjust to those policies and recalibrate to the likelihood that a neutral policy rate is above its currently assumed 2.9%. We expect a more cautious reaction in 2025, with the policy rate remaining at or above 4% by year-end.

Productivity growth will likely keep the U.S. going strong



Sources: Vanguard calculations, using data from the Federal Reserve Bank of St. Louis, as of September 30, 2024.

Euro area: Policy rate to dip below neutral to support the economy

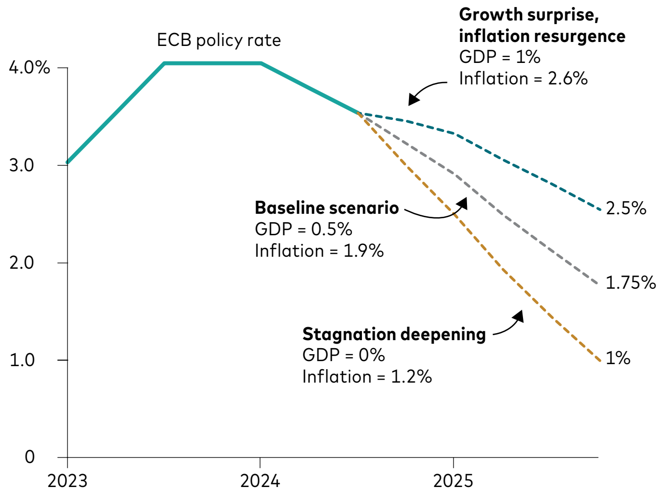
The euro area experienced a modest recovery in 2024, following a year of stagnation in 2023. However, concerns about growth remain heightened. Manufacturing continues to face headwinds due to the lingering effects of the energy crisis and weakening external demand. The services sector is also slowing due to restrictive fiscal and monetary policies. We expect the euro area to continue experiencing below-trend growth, with a slowdown in global trade representing a key risk.

Disinflation has been strong and fast. Since reaching a peak of 10.6% in October 2022, annual inflation has dropped over 8 percentage points, standing at 2.0% in October 2024. Core inflation remains slightly elevated because of the slower-moving services component. But with anemic growth set to continue next year, we expect both headline and core inflation to end 2025 below 2%.

The European Central Bank (ECB) will continue easing policy. We expect the policy rate to dip below neutral in 2025 and end the year at 1.75%. The risks to this outlook are skewed to the downside. A sharp intensification of trade tensions and a significant slowdown in global growth would each likely result in a more dovish monetary policy stance.

Taking a step back, euro area growth in 2023 and 2024 has struggled mainly because of very weak productivity growth. Finding a way to rejuvenate productivity is vital to the long-term outlook. Advances in artificial intelligence and a stated desire by governments to reduce red tape are encouraging. In 2025 and 2026, we anticipate a modest recovery in productivity growth and a moderation in the growth of hours worked.

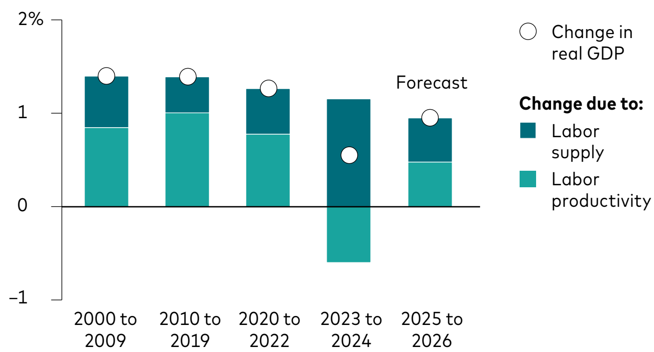
ECB policy rate will fall, but by how much?



Notes: The chart shows the ECB policy rate at the end of each quarter through September 2024, then its forecasted path through year-end 2025 under three scenarios: our baseline, a downside surprise, and an upside surprise. GDP refers to annual GDP growth for 2025, and inflation refers to core inflation at year-end 2025.

Sources: Vanguard calculations, using data from the ECB, as of September 30, 2024.

Decline in labor productivity was a drag on growth in recent years



Notes: The chart shows the average annualized growth of real GDP, labor productivity (measured as output per hour worked), and labor supply (measured as hours worked) for different periods. Projections were used for periods after Q3 2024.

Sources: Vanguard calculations, using data from Eurostat and the ECB, as of September 30, 2024.

United Kingdom: Fiscal loosening to revive growth in 2025

After a lackluster end to 2023, the U.K. economy recovered in 2024. However, growth has been uninspiring. Unlike in the U.S., supply-side forces in the U.K., particularly productivity, have been weak.

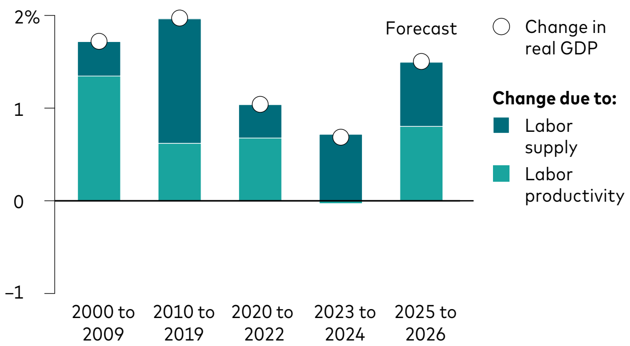
In 2025, U.K. growth is expected to accelerate above potential, driven by fiscal stimulus. The autumn budget announced in October 2024 represented the largest fiscal-loosening event in decades, bar the COVID-19 pandemic, with much of the spending expected to be realized in 2025 and 2026. This loosening comes despite taxes also rising significantly. The size of the government's role in the economy is increasing.

Meanwhile, strong progress has been made on inflation. Core inflation, which excludes food and energy prices, fell from an annual rate of 7.1% in May 2023 to 3.3% in October 2024. We expect progress to be slower in 2025. Services inflation remains elevated and is more stubborn, and fiscal easing will support demand. An intensification of global trade tensions also poses an inflation risk. Expect core inflation to be around 2.4% by year-end.

The Bank of England will continue lowering interest rates in 2025, but at a gradual pace. Expect the policy rate to end 2025 at 3.75%, still above our estimate of neutral.

Over the next two years, we expect productivity growth to recover to a rate similar to the average since 2010, helped by the extra public investment announced in the autumn budget. However, this would still be lower than the productivity growth seen in the 2000s. Labor supply growth in 2025 and 2026 is expected to remain broadly similar to the figures from 2023 and 2024.

Stagnant labor productivity inhibited growth in recent years



Notes: The chart shows the average annualized growth of real GDP, labor productivity (measured as output per hour worked), and labor supply (measured as hours worked) for different periods. Projections were used for periods after Q3 2024.

Sources: Vanguard calculations, using data from Bloomberg and the Office for National Statistics, as of September 30, 2024.

China: More work to do after a policy pivot

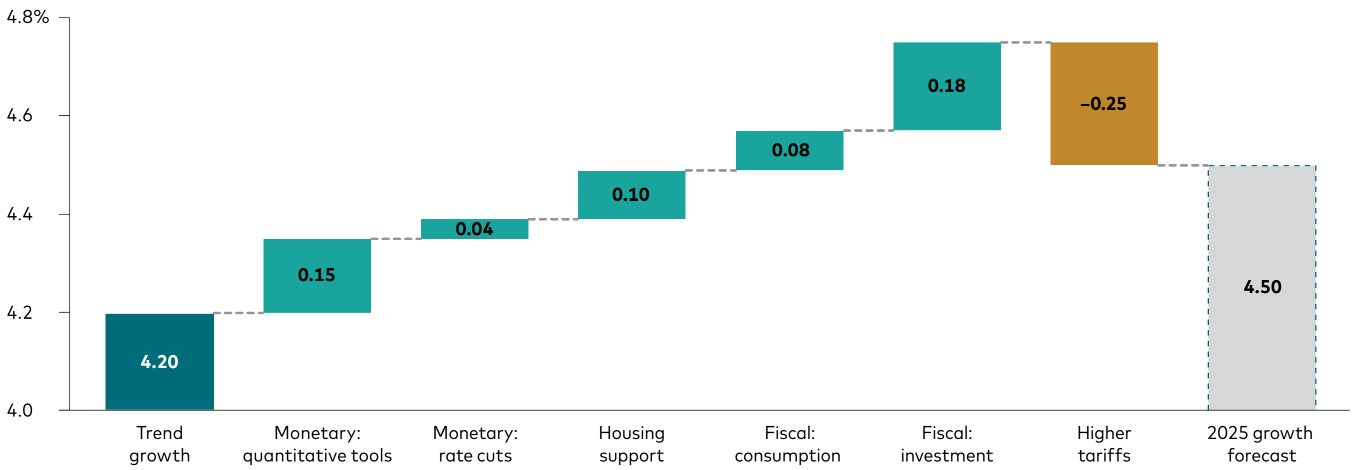
Despite resilient Chinese manufacturing and export activities, subdued domestic demand prompted a coordinated policy pivot in late 2024, encompassing monetary easing and an aggressive local government debt-resolution program. While these moves boost sentiment and mitigate risks to growth and financial stability, a more decisive fiscal push will be needed to engineer a meaningful recovery in private confidence and spending.

While near-term growth momentum may improve, we expect full-year GDP growth to decelerate to 4.5% in 2025 amid persistent structural and external headwinds, including the prolonged housing downturn, deepening supply-demand imbalances, and global trade developments. We expect staged U.S. tariff hikes to have a mild negative impact on growth compared with the impact of tariffs in 2018 and 2019. We anticipate that policymakers could respond with more comprehensive stimulus to cushion the downside risk.

Further monetary easing, including interest rate and reserve requirement ratio (RRR) cuts, is expected to counter persistent deflationary pressure. Although we see a modest inflationary thrust from currency depreciation in the face of higher tariffs, the magnitude is limited. Instead, the supply-centric policy support so far has reinforced the negative feedback loop between weak demand and low prices, widening the gap between real and nominal growth. Hence, both the magnitude and composition (that is, more support to consumers) of policy stimulus are critical to break the cycle.

Still, cyclical stimulus isn't sufficient without structural reforms, given declining trend growth. Contrary to most developed markets central banks' "higher for longer" interest rate trajectory, China is likely to stay "lower for longer" in the coming years.

China's policy stimulus will be partly offset by tariff hikes



Notes: The chart shows the projected impact of each policy stimulus on GDP growth in 2025. The monetary quantitative tools include RRR and other targeted liquidity facility instruments. Fiscal stimulus to consumption and investment includes fiscal tools such as targeted local government bond issuance.

Sources: Vanguard calculations, using data from the Ministry of Finance, the People's Bank of China, and CEIC, as of November 12, 2024.

Japan: Bank of Japan to continue its gradual hiking cycle

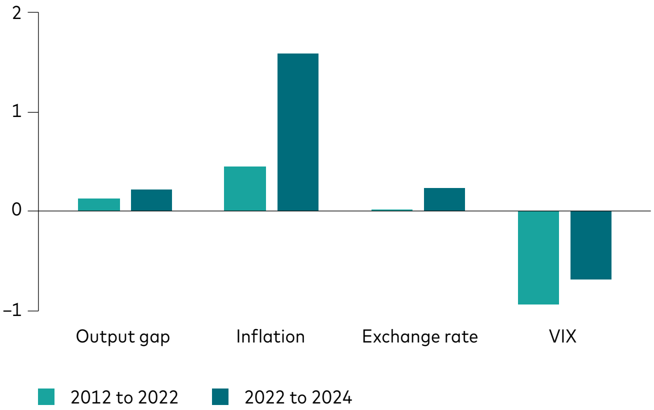
In 2024, amid persistent inflationary pressure, the Bank of Japan (BoJ) increased interest rates for the first time in 18 years. In 2025, we expect the BoJ to continue to gradually normalize monetary policy, as economic activity recovers and inflation momentum holds steady.

We also expect Japan's economy to recover to a growth rate above 1% in 2025, with the driver shifting from exports to a pickup in domestic demand. Risks from the global economy may increase uncertainty, with potential tariffs by the U.S. offsetting China's policy stimulus, though the overall impact for Japan is likely to be limited.

As for inflation, steady wage growth on the back of strong corporate profits and structural labor shortages will likely support a recovery in domestic consumption and keep core inflation robust at around 2% in 2025. More importantly, a virtuous cycle of wages and inflation will continue to strengthen—a positive development after decades of economic and market stagnation—potentially justifying further BoJ rate hikes.

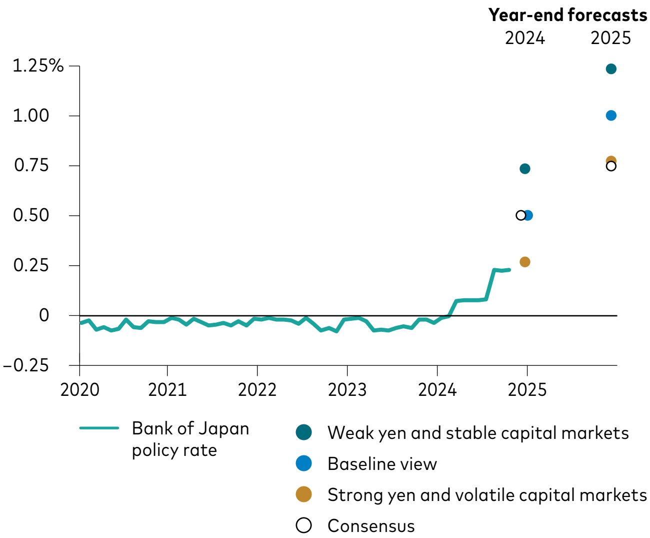
Therefore, we expect the BoJ to embark on a rate-hiking cycle, with the policy rate rising to 1% by the end of 2025. However, we expect the pace of rate hikes to be gradual given concerns about the yen and capital market stability. Global trade developments may also prompt the BoJ to proceed with caution. On the other hand, a pace of Federal Reserve easing that is only mild would weaken the yen, giving the BoJ more conviction to hike. On balance, the risk is tilted toward the downside, and the BoJ will likely exercise a prudent policy stance with accommodative financial conditions over an extended period.

The BoJ has become more responsive to inflation post-Abenomics



Notes: The chart shows Vanguard's estimate of the augmented Taylor rule, which incorporates exchange rates and capital market volatility as well as traditional Taylor rule measures of economic growth and inflation. The y-axis represents the degrees to which we estimate that specific variables, represented on the x-axis, have been important to the BoJ in rate-setting as measured by the Taylor rule, an equation introduced by the economist John Taylor in 1993. Y-axis values are Taylor rule coefficients. The Chicago Board Options Exchange Volatility Index (VIX) is used as a proxy for capital market volatility. Output gap is the difference between actual and potential growth. The Abenomics period (when the policies of Shinzo Abe, whose second term as prime minister ran from 2012 to 2020, were in force) is from Q1 2012 through Q1 2022; the post-Abenomics period is from Q2 2022 through Q2 2024. For sources, see the source line under the chart below.

The yen and capital markets will also determine the policy rate



Notes: The chart shows the BoJ's policy rates through October 2024, and then our projections for year-end 2024 and year-end 2025 under three scenarios: our baseline view, an environment with a weak yen and stable capital markets, and an environment with a strong yen and volatile markets. The consensus projections of the financial markets are also shown.

Sources: Vanguard calculations, using data from the Statistics Bureau of Japan, the Bank of Japan, and CEIC, as of October 31, 2024. Consensus views are from Bloomberg, as of November 11, 2024.

Emerging markets: High real rates will continue to restrict growth

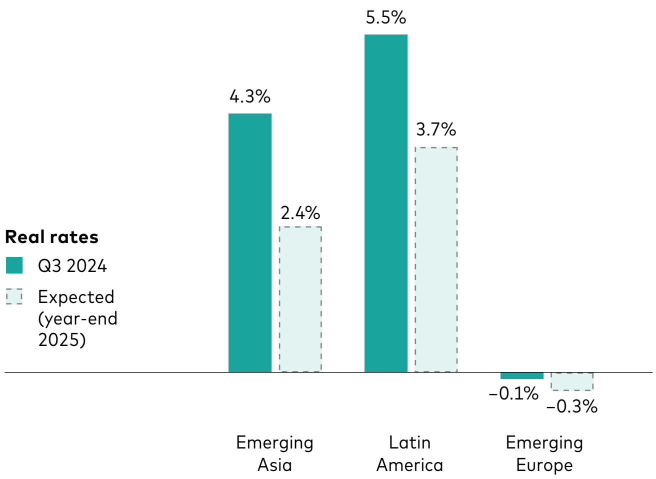
Across many emerging markets, proactive policymaking has led to significant progress in reducing inflation. Indeed, most central banks in these markets felt comfortable enough to start easing policy from restrictive levels before their developed markets counterparts did. This was partly due to high real rates restricting economic activity in 2024.

In 2025, we expect the easing cycle across emerging markets to both continue and broaden. But rates will remain in restrictive territory and thus continue to pin back growth. We expect emerging markets growth in aggregate to be around 4% in 2025, consistent with the growth seen in 2024, but potential escalation in global trade tensions presents downside risk. With the Federal Reserve and other central banks in developed markets now easing monetary policy too, the rate differential to developed markets should narrow. This development would decrease many emerging markets central banks' concerns about foreign exchange depreciation and capital flows.

Within emerging Asia, inflation has generally remained near or below target. Deflationary risks are mounting in China. Most emerging Asia central banks are easing monetary policy, and we expect slightly higher inflation in this region. We are most constructive on the outlooks for India, the Philippines, and Indonesia, where we expect growth averaging around 5% in 2025.

In Latin America, inflationary pressures persist, with services inflation expected to remain above central banks' targets in 2025. This is primarily due to still-elevated wage growth. Easier monetary policy should keep growth steady at 2%–2.5% in 2025. Pro-cyclical fiscal policy in Brazil is expected to continue to boost the economy, while restrictive interest rates and U.S.-related policy uncertainty make us more bearish on Mexico. Finally, in emerging Europe, lower commodity prices should help inflation reach target in 2025. Expect below-trend growth of around 2.5%.

Real interest rates will likely fall across emerging markets



Note: Real rate is calculated as a GDP-weighted policy rate minus the GDP-weighted year-over-year CPI rate.

Sources: Vanguard calculations, using data from Refinitiv, as of September 30, 2024.

U.S. outperformance rides on earnings growth

Over the past decade, U.S. equities have delivered an astounding 12.8% annualized return, far outpacing international equities (5.7% USD; 7.6% local currency). While valuation expansion and the technology sector have attracted attention in the U.S., broad earnings growth (primarily driven by revenue) has largely been responsible for U.S. outperformance. Conversely, ex-U.S. developed markets have had stagnant earnings growth, partly due to negative output gaps since 2010. Non-U.S. tech has been a bright spot, but its lower index weight (13% versus 32% in the U.S.) has dampened returns.

Historically, rotations from U.S. to international outperformance have coincided with U.S. earnings contractions. International markets outperformed in six of the eight periods since 1980 where U.S. year-over-year earnings declined substantially.

Stretched valuations: A long-term hurdle

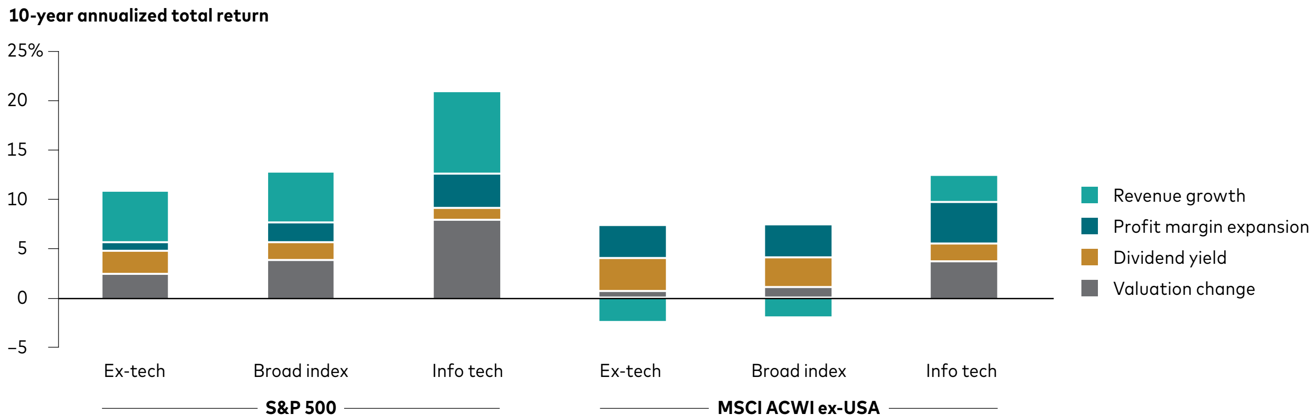
Here is the catch: Replicating the past decade's stellar returns is not an easy feat—it would require unprecedented earnings growth or historically high valuations. But the time horizon matters. Over the short term, our analysis suggests that if economic growth and earnings hold up, U.S. equities could sustain elevated valuations. However, as the horizon extends, growth and earnings impacts diminish, with valuations eventually dominating returns as a "fundamental gravity."

For these reasons, our 10-year outlook leans toward the U.S. underperforming international markets. However, there remains a 30% probability that the U.S. could still outperform over the long term, but by a narrower margin than in recent years.

The push and pull of policy shifts

Looking ahead, the challenge is that regions with the most attractive valuations are also most exposed to economic policy risks. Emerging markets and Europe have low valuations but are particularly vulnerable to U.S. trade policy. A tug-of-war between tax cuts and tariffs will be key to reconciling near-term U.S. equity earnings. This policy tension raises the prospect of an adverse economic development that may expose the current overvaluation of U.S. equities.

Valuations, revenue, and the technology sector drove U.S. outperformance



Notes: The chart shows the component drivers behind the 10-year annualized returns for technology stocks versus the broad market and versus the broad market minus tech stocks—first for the U.S. market and then for international markets. The drivers were P/E ratios (valuation change), dividend yield, and earnings per share broken down by profit margin expansion and revenue growth. The following indexes were used: Standard & Poor's 500 Index, S&P 500 Information Technology Sector Index, MSCI ACWI ex USA Total Return USD Index, and MSCI ACWI ex USA Information Technology Total Return USD Index. **Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.**

Sources: Vanguard calculations, based on data from Bloomberg, as of September 30, 2024.

Digging deeper into U.S. equity overvaluation

Valuations have been a central theme driving equity returns over the past few years. The cyclically adjusted price/earnings (CAPE) ratio for the U.S. equity market has been above our estimate of fair value since late 2020, aside from a brief sell-off in 2022. Market concentration and corporate interest rate-lock support this trend. Both may support equity valuations in the near term. But there is growing tension between momentum and overvaluation.

Deconstructing U.S. valuations

High market concentration means that several large growth companies are dominating the Standard & Poor's 500 Index (in fact, the six largest companies in the index currently account for about 30% of its overall market cap). These companies benefit from competitive moats and winner-take-all business models that have translated into earnings resilience despite rising interest rates.

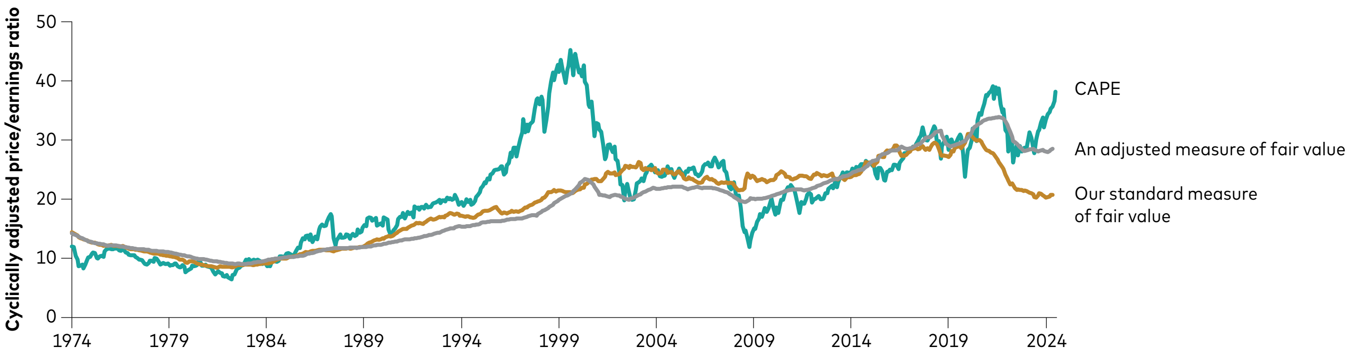
Large companies also took advantage of the low borrowing costs that prevailed before 2022 to protect their balance sheets from rising interest rates—a luxury that was not as easily available to non-U.S. and smaller U.S. companies.

Adjusting for these factors paints a less-severe picture of U.S. overvaluation. The chart shows our "standard" fair-value CAPE estimate compared with an estimate factoring in the market concentration and lower cost of debt for large technology companies. This analysis suggests that valuations could be about 25% above fair value instead of 72%, and that getting back to the new fair value would not require as much of a market correction.

Three paths forward for U.S. returns

Moving forward, we see three possible scenarios for U.S. equities. First, a boom in productivity, akin to the mid-1990s, could continue to support large-cap and growth stock valuations and drive the market higher. Second, a shift toward lower rates and broadening growth could catalyze a rotation into undervalued factors such as value and small-cap. Finally, the current environment may be more analogous to 1999: An adverse economic development could expose the vulnerability of current stock market valuations and increase the odds of a market drawdown. While these risks will be important in the near term, we expect high valuations and stretched margins to be meaningful headwinds to U.S. equity returns over the long term.

Fair value may not be that far away



Notes: The chart shows the CAPE ratio for U.S. equities, measured by the MSCI USA Index until April 30, 2003, and the MSCI US Broad Market Index thereafter. It also depicts our "standard" fair-value estimate based on a statistical model considering interest rate and inflation, and an adjusted fair-value estimate taking into account the recent divergence between companies' after-tax cost of debt and market yields, and the rising share of the technology sector in the overall equity index.

Sources: Vanguard calculations, based on data from Refinitiv, Bloomberg, and Global Financial Data. Fair-value estimates as of September 30, 2024, and actual data as of November 8, 2024.

"Coupon wall" strengthens the case for bonds

Higher starting yields cushion bond returns while still allowing investors to take advantage of falling rates. This development, which we refer to as the "coupon wall," creates an asymmetric and favorable risk/return environment. The long-term case for bonds remains solid.

The U.S. Treasury yield curve is near our estimate of fair value that considers our baseline U.S. economic view of strong productivity growth and a cautious Federal Reserve. Expect the yield curve to stay near current levels and for relatively high coupons to drive returns.

Risks to our outlook hinge on a tug-of-war between productivity gains and potentially inflationary policy. If the latter were to materialize, we believe yields across the curve would likely rise and the stock/bond correlation would turn positive as investors demand more compensation for uncertainty.

If productivity gains were to win out, any downward pressure on inflation would increase the chances that the Fed would cut below 4% and that short-term yields would fall more than long-term yields. We expect long-term yields to remain above 4% due to our strong growth outlook. Further, if yields fall because of a negative shock to demand, bonds should provide a hedge in multiasset portfolios.

We estimate an 81% probability that the Bloomberg U.S. Aggregate Index will provide a positive total return over the next year. Negative returns would result only if yields were to rise enough to breach the coupon wall and induce a capital loss that is larger than the income generated from coupons. We calculate this threshold as around 0.8 to 0.9 percentage points higher than current yields.

Starting yields are much higher than they were three years ago

	Net effect on total return	2021	2024
Positive price and income return	Positive total return	19%	51%
Negative price return and positive income return	Positive total return	22%	30%
Negative price return and positive income return	Negative total return	59%	19%

Notes: The two charts show the one-year-ahead price (y-axis) and income (x-axis) Vanguard Capital Markets Model (VCMM) return projections for the Bloomberg U.S. Aggregate Index as of May 31, 2021, and November 8, 2024. The forecasts are sorted by positive price returns (interest rates fall) and two scenarios under negative price returns (interest rates rise): income returns from coupons offset price losses and income returns do not offset price losses, leading to negative total returns.

Sources: Vanguard calculations, based on data from Bloomberg, as of May 31, 2021, and November 8, 2024.

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Emerging markets equities: Soft earnings growth dampens outlook

Investors looking to emerging markets equities to bolster international returns are likely to be disappointed in the near term. A soft earnings profile, driven by our underwhelming outlook for Chinese growth and coupled with our expectations for limited upside valuation potential, suggests muted return prospects.

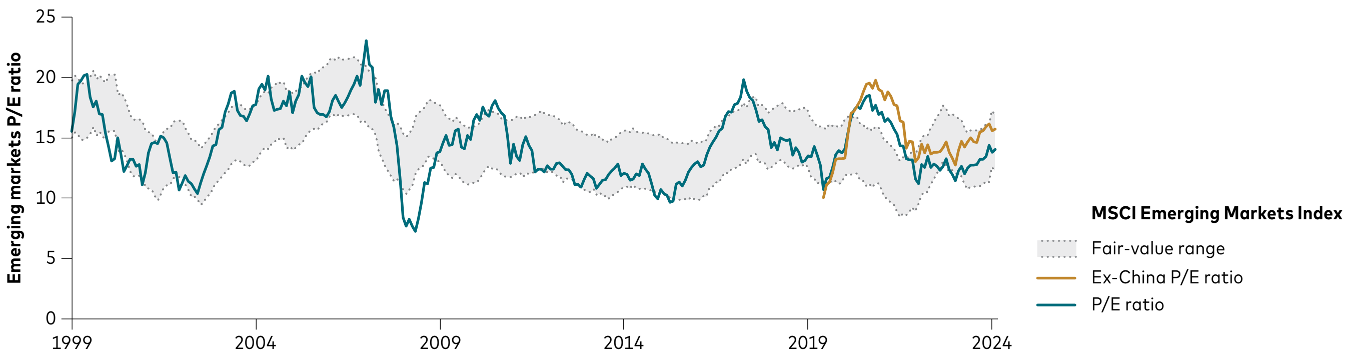
We expect corporate earnings growth within emerging markets equities to be just 2.2% per year over the next decade. This is less than one-third of their 20-year historical average (7.2%) and about half of the earnings growth expected from the U.S. stock market. Our subdued outlook is driven by the weaker-than-consensus view we have on economic growth in China, which accounts for 27% of the MSCI Emerging Markets Index.

Meanwhile, emerging markets equity valuations have increased over the past year, driven in large part by expectations for stimulus in China in the second half of 2024. In our assessment, emerging markets equity valuations are now "fair" rather than "undervalued," and even approaching "overvalued" when China is excluded. Continued U.S. dollar strength and additional trade policy uncertainty could further limit the upside in emerging markets returns in the near term.

What could cause us to change our mind? The main possibility is a China policy "bazooka" that significantly and sustainably raises earnings growth prospects for both the local market and broader emerging markets. Another influence that could benefit emerging markets over a longer time horizon is the ongoing reshaping of manufacturing supply chains. Some emerging markets could benefit more than we expect if they are able to successfully position themselves as integral pieces of an evolving global trade network.

Despite the near-term risks, the long-term outlook for emerging markets is reasonable relative to developed markets where valuations are more stretched. Furthermore, emerging markets continue to bring diversification benefits to a global portfolio given their low correlation with the rest of the world.

Emerging markets equity valuations are within our fair-value range

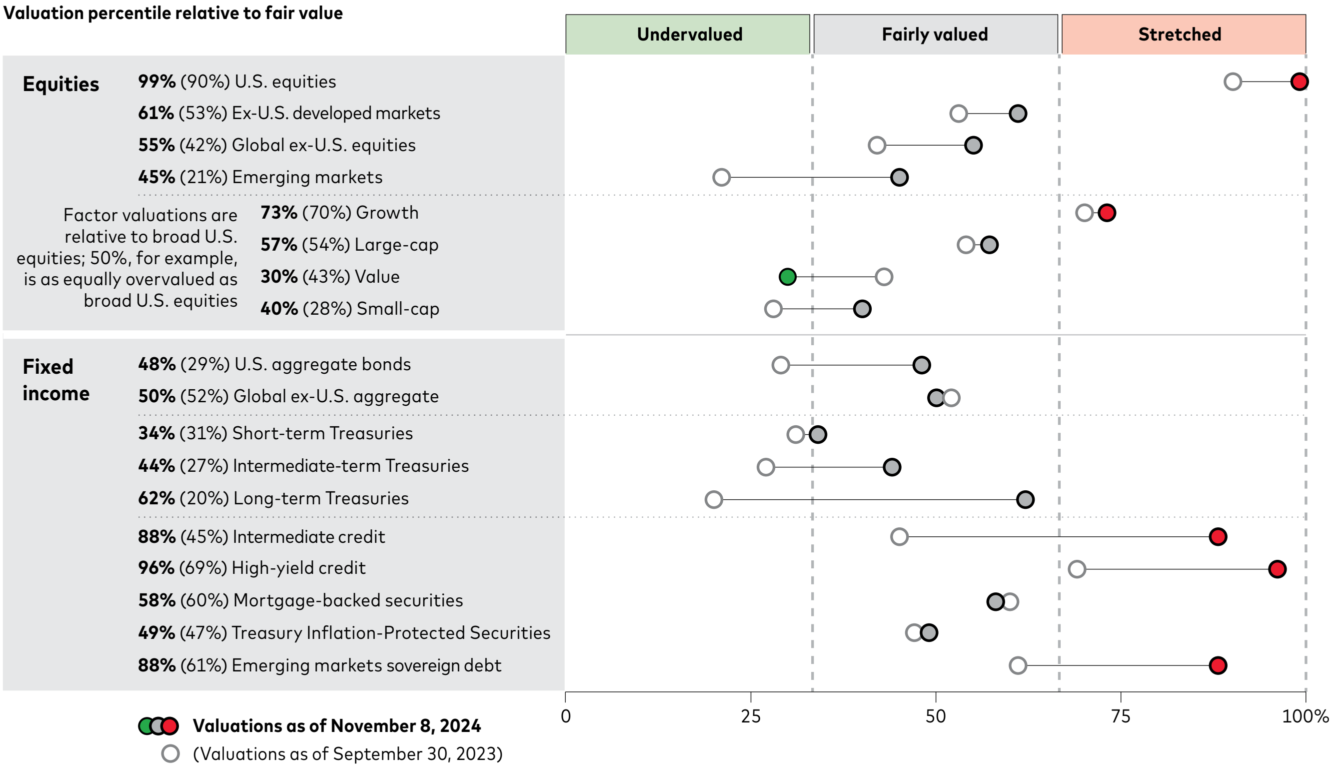


Notes: The price-to-earnings ratio reflects the price divided by the trailing 3-year average earnings for the MSCI Emerging Markets Index. Our fair-value estimate (the "predicted" value midway between the top and bottom of our fair-value range) is based on a statistical model where the inputs include emerging markets inflation, emerging markets policy rates minus the federal funds rate, Vanguard's Leading Economic Indicators for emerging markets, and the inflation-adjusted 2-year U.S. Treasury yield.

Sources: Vanguard calculations, based on data from the Federal Reserve Bank of St. Louis FRED database and Bloomberg, as of November 8, 2024.

How stock and bond valuations have changed in the last year

Risk asset valuations are more stretched, but opportunities exist



Notes: The U.S. equity valuation measure is the current cyclically adjusted price/earnings (CAPE) ratio percentile relative to our fair-value CAPE estimate for the MSCI US Broad Market Index. Factor valuations are relative to U.S. equities as the base at the 50th percentile. Growth, value, and small-cap valuation measures are all based on the percentile rank based on our fair-value model relative to the market. The large-cap valuation measure is a composite valuation measure of the style factor to U.S. relative valuations and the current U.S. CAPE percentile relative to its fair-value CAPE. The emerging markets valuation measure is based on the percentile rank based on our fair-value model relative to the market. The ex-U.S. developed markets and global ex-U.S. equity valuation measures are the market-capitalization-weighted CAPE percentiles relative to our fair-value CAPE estimate for the MSCI EMU Index, MSCI UK Index, MSCI Japan Index, MSCI Canada Index, MSCI Australia Index, and MSCI Emerging Markets Index; the MSCI Emerging Markets Index is used only for global ex-U.S. equities.

Aggregate bond valuation measures are market-capitalization-weighted averages of intermediate-term credit and Treasury valuation percentiles for the U.S. and global ex-U.S. (market-capitalization-weighted averages of the euro area, the U.K., Japan, Canada, and Australia). Treasury valuation measures are the key rate duration-weighted average of our fair-value model. Intermediate credit spread, high-yield credit spread, mortgage-backed securities (MBS) spread, and emerging markets sovereign debt spread valuation measures are based on current spreads relative to the VCMM simulation of spreads in year 30 of our forecast. The Treasury Inflation-Protected Securities (TIPS) valuation measure is based on the 10-year annualized inflation forecast relative to our equilibrium forecast for inflation. The valuation percentiles are as of November 8, 2024, and September 30, 2023 (in parentheses).

Sources: Vanguard calculations, based on data from Robert Shiller's website at shillerdata.com/, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Refinitiv, as of November 8, 2024.

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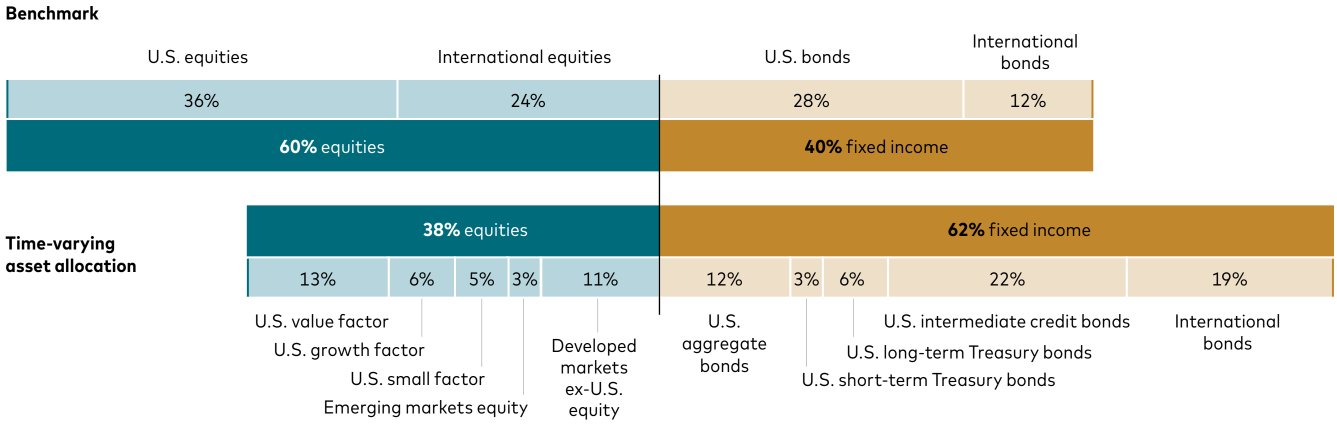
A continued tilt toward fixed income

Elevated interest rates and high starting equity valuations continue to imply a narrow equity risk premium. Accordingly, our valuation-aware time-varying asset allocation (TVAA) is underweight equity and overweight fixed income relative to a 60/40 benchmark. Our TVAA is geared toward investors who are comfortable with model forecast risk, which is a type of active risk.

Within equity sub-asset classes, the portfolio remains overweight U.S. value, U.S. small-cap, and developed markets ex-U.S. equities due to their more appealing valuations and higher anticipated returns. The most notable change is a reduction in emerging markets equities, as lower earnings growth and investor sentiment have weighed on the outlook. Within fixed income, the portfolio remains overweight U.S. credit, given its more favorable expected returns despite stretched valuations, and U.S. long-term bonds.

Our TVAA results in expected returns slightly higher than would be expected of the 60/40 benchmark, with lower volatility. This comes at the expense of active risk (tracking error relative to the benchmark) of 4.27%.

For valuation-aware investors, our model still favors fixed income



Notes: Time-varying portfolio allocations were determined by the Vanguard Asset Allocation Model (VAAM). Equity assets under consideration were U.S. value, U.S. growth, U.S. small-cap, developed markets ex-U.S., and emerging markets. Fixed income assets under consideration were U.S. aggregate bonds, U.S. intermediate-term credit, U.S. short-term Treasuries, U.S. long-term Treasuries, and hedged international bonds. See "Indexes for VCMM simulations" on page 24 for additional details on asset class indexes. Constraints applied: The U.S. equity home bias range is 60%–70% of equities and hedged international bonds are limited to a minimum of 30% of fixed income. U.S. value and growth equities are each bound to a range of 30%–70% of U.S. equities, U.S. small-cap is limited to 20% of U.S. equities, and emerging markets equities are limited to 20% of total equities. U.S. credit and short-term and long-term Treasuries are limited to a maximum of 50% of all bonds, and long-term Treasuries are limited to a maximum of 15% of U.S. bonds.

Source: Vanguard calculations, using data as of November 8, 2024.

Portfolio characteristics

	Equity allocation	10-year expected annualized return	10-year expected annualized volatility	Expected Sharpe ratio	Expected maximum drawdown	Tracking error compared with the benchmark	Probability of underperforming the benchmark
TVAA	38%	5.9%	7.0%	0.22	–4.6%	4.27%	48.2%
Benchmark	60%	5.7%	9.8%	0.13	–9.6%	—	—

Notes: Vanguard calculations are based on portfolios optimized by the VAAM, using return projections from the VCMM. Sharpe ratio is a measure of return above the risk-free rate that adjusts for volatility. A higher Sharpe ratio indicates a higher expected risk-adjusted return. Expected maximum drawdown is the median peak-to-trough drop in the portfolio's value in 10,000 VCMM simulations. The probability of underperforming the benchmark is in any given year.

Source: Vanguard calculations, using data as of November 8, 2024.

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About the Vanguard Capital Markets Model

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and over time.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The VCMM is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the VCMM is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

The primary value of the VCMM is in its application to analyzing potential client portfolios. VCMM asset-class forecasts—comprising distributions of expected returns, volatilities, and correlations—are key to the evaluation of potential downside risks, various risk–return trade-offs, and the diversification benefits of various asset classes. Although central tendencies are generated in any return distribution, Vanguard stresses that focusing on the full range of potential outcomes for the assets considered, such as the data presented in this paper, is the most effective way to use VCMM output.

The VCMM seeks to represent the uncertainty in the forecast by generating a wide range of potential outcomes. It is important to recognize that the VCMM does not impose "normality" on the return distributions, but rather is influenced by the so-called fat tails and skewness in the empirical distribution of modeled asset-class returns. Within the range of outcomes, individual experiences can be quite different, underscoring the varied nature of potential future paths. Indeed, this is a key reason why we approach asset-return outlooks in a distributional framework.

Indexes for VCMM simulations

The long-term returns of our hypothetical portfolios are based on data for the appropriate market indexes through November 8, 2024. We chose these benchmarks to provide the most complete history possible, and we apportioned the global allocations to align with Vanguard's guidance in constructing diversified portfolios. Asset classes and their representative forecast indexes are as follows:

- **U.S. equities:** MSCI US Broad Market Index.
- **Global ex-U.S. equities:** MSCI All Country World ex USA Index.
- **Global ex-U.S. developed market equities:** MSCI World ex USA Index.
- **Emerging markets equities:** MSCI Emerging Markets Index.
- **U.S. REITs:** FTSE Nareit U.S. Real Estate Index.
- **U.S. Treasury bonds:** Bloomberg U.S. Treasury Index.
- **U.S. short-term Treasury bonds:** Bloomberg U.S. 1–5 Year Treasury Bond Index.
- **U.S. intermediate-term Treasury bonds:** Bloomberg U.S. 5–10 Year Treasury Bond Index.
- **U.S. long-term Treasury bonds:** Bloomberg U.S. Long Treasury Bond Index.
- **U.S. intermediate credit bonds:** Bloomberg U.S. Credit Bond Index.
- **U.S. high-yield corporate bonds:** Bloomberg U.S. Corporate High Yield Bond Index.
- **U.S. bonds:** Bloomberg U.S. Aggregate Bond Index.
- **Global ex-U.S. bonds:** Bloomberg Global Aggregate ex-USD Index USD Hedged.
- **U.S. TIPS:** Bloomberg U.S. Treasury Inflation Protected Securities Index.
- **Emerging markets sovereign bonds:** Bloomberg Emerging Markets USD Sovereign Bond Index—10% Country Capped.
- **Mortgage-backed securities (MBS):** Bloomberg U.S. Mortgage Backed Securities Index.

All equity indexes below are weighted by market capitalization:

- **Small-cap equities:** Stocks with a market cap in the lowest two-thirds of the Russell 3000 Index.
- **Large-cap equities:** Stocks with a market cap in the highest one-third of the Russell 1000 Index.
- **Growth equities:** Stocks with a price/book ratio in the highest one-third of the Russell 1000 Index.
- **Value equities:** Stocks with a price/book ratio in the lowest one-third of the Russell 1000 Index.

Indexes used in our historical calculations

The long-term returns for our hypothetical portfolios are based on data for the appropriate market indexes through November 8, 2024. We chose these benchmarks to provide the best history possible, and we split the global allocations to align with Vanguard's guidance in constructing diversified portfolios.

U.S. bonds: Standard & Poor's High Grade Corporate Index from 1926 through 1968; Citigroup High Grade Index from 1969 through 1972; Lehman Brothers U.S. Long Credit AA Index from 1973 through 1975; and Bloomberg U.S. Aggregate Bond Index thereafter.

Ex-U.S. bonds: Citigroup World Government Bond Ex-U.S. Index from 1985 through January 1989 and Bloomberg Global Aggregate ex-USD Index thereafter.

Global bonds: Before January 1990, 100% U.S. bonds, as defined above. From January 1990 onward, 70% U.S. bonds and 30% ex-U.S. bonds, rebalanced monthly.

U.S. equities: S&P 90 Index from January 1926 through March 1957; S&P 500 Index from March 1957 through 1974; Dow Jones Wilshire 5000 Index from the beginning of 1975 through April 2005; and MSCI US Broad Market Index thereafter.

Ex-U.S. equities: MSCI World ex USA Index from January 1970 through 1987 and MSCI All Country World ex USA Index thereafter.

Global equities: Before January 1970, 100% U.S. equities, as defined above. From January 1970 onward, 60% U.S. equities and 40% ex-U.S. equities, rebalanced monthly.

Notes on risk

All investing is subject to risk, including the possible loss of the money you invest. Past performance is no guarantee of future returns. Diversification does not ensure a profit or protect against a loss. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

U.S. government backing of Treasury or agency securities applies only to the underlying securities and does not prevent share-price fluctuations. Unlike stocks and bonds, U.S. Treasury bills are guaranteed as to the timely payment of principal and interest. Funds that concentrate on a relatively narrow market sector face the risk of higher share-price volatility. Investments in stocks and bonds issued by non-U.S. companies are subject to risks including country/regional risk and currency risk. These risks are especially high in emerging markets.

Bond funds are subject to the risk that an issuer will fail to make payments on time, and that bond prices will decline because of rising interest rates or negative perceptions of an issuer's ability to make payments. High-yield bonds generally have medium- and lower-range credit-quality ratings and are therefore subject to a higher level of credit risk than bonds with higher credit-quality ratings. Although the income from U.S. Treasury obligations held in the fund is subject to federal income tax, some or all of that income may be exempt from state and local taxes.

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