Vanguard

Vanguard research

December 2023

Vanguard economic and market outlook for 2024: A return to sound money

Vanguard has said for more than a year that a return to sound money was underway. In the meantime, the transition to a higher interest rate environment no doubt has challenged investors, who have endured historical losses in bonds and high volatility in stocks. But make no mistake: This structural shift, which will endure beyond the next business cycle, is the single best economic and financial development in the last 20 years.

Sound money—the persistence of positive real interest rates—provides a solid foundation for long-term risk-adjusted returns. In contrast to the last decade, we expect return outcomes for diversified investors to be more balanced. For those with an appropriate risk tolerance, a more defensive risk posture may make sense given higher expected fixed income returns and an equity market that is yet to fully reflect the implications of the return to sound money.

Policy takes hold

We expect monetary policy to become increasingly restrictive in real terms as inflation falls toward central banks' targets. As economic resilience fades, central banks will be in position to reduce policy interest rates. **Page 5**.

Equilibrium elevated

After policy rates recede from their cyclical peaks, we expect rates to settle at a higher level than we had grown accustomed to before the COVID-19 pandemic. Zero interest rates are gone; a higher-rate environment is here to stay. **Page 6**.

Bonds are back

Higher interest rates mean higher returns for long-term bond investors. We see U.S. aggregate bonds and intermediate Treasuries specifically as close to fair value. U.S. equities, meanwhile, and growth stocks in particular, appear more overvalued than a year ago. **Pages 17–18**.

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Vanguard's 2024 economic forecasts

	GDP growth		Unemployment rate		Core inflation	Monetary policy		
	2024		2024		2024			
Country/region	**Vanguard**	**Trend**	**Vanguard**	**NAIRU**	**Vanguard**	**Year-end 2023**	**Year-end 2024**	**Neutral rate**
U.S.	0.25%–0.75%	1.8%	4.5%–5%	3.5%–4%	2.3%	5.5%	3.5%–4%	3%–3.5%
Euro area	0.5%–1%	1.2%	7%–7.5%	6.5%–7%	2.1%	4%	3.25%	2%–2.5%
U.K.	0.5%–1%	1%	4.5%–5%	3.5%–4%	2.8%	5.25%	4.25%	3%–3.5%
China	4.5%–5%	4.1%	4.5%–5%	4.5%–5%	1.2%	2.5%	2.2%	4.5%–5%

Notes: Forecasts are as of December 4, 2023. 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 forecasts are the average for the fourth quarter of 2024. 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, and U.K., 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. 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 September 30, 2023. Results from the model may vary with each use and over time. For more information, see "About the Vanguard Capital Markets Model" on page 21.

Global outlook summary

Higher interest rates are here to stay. Even after policy rates recede from their cyclical peaks, in the decade ahead rates will settle at a higher level than we've grown accustomed to since the 2008 global financial crisis (GFC). This development ushers in a return to sound money—an environment of positive real interest rates—and the implications for the global economy and financial markets will be profound. Borrowing and savings behavior will reset, capital will be allocated more judiciously, and asset class return expectations will be recalibrated. Vanguard believes that a higher interest rate environment will serve long-term investors well, but the transition may be bumpy.

Monetary policy will bare its teeth

The global economy has proven more resilient than we expected in 2023. This is partly because monetary policy has not been as restrictive as initially thought. Fundamental changes to the global economy have pushed up the neutral rate of interest—the rate at which policy is neither expansionary nor contractionary. Various other factors have suppressed the normal channels of monetary policy transmission, including the U.S. fiscal impulse from debt-financed pandemic support and industrial policies, improved household and corporate balance sheets, and tight labor markets that have resulted in real wage growth. In the U.S., our analysis suggests that these offsets almost entirely counteracted the impact of higher policy interest rates. Outside the U.S., this dynamic is less pronounced. Europe's predominantly bank-based economy is already flirting with recession, and China's rebound from the end of COVID-19-related shutdowns has been weaker than expected.

The U.S. exceptionalism is set to fade in 2024. We expect monetary policy to become increasingly restrictive in real terms as inflation falls and offsetting forces wane. The economy will experience a mild downturn as a result. This is necessary to finish the job of returning inflation to target. However, there are risks to this view. A "soft landing," in which inflation returns to target without recession, remains possible, as does a recession that is further delayed. In Europe, we expect anemic growth as restrictive monetary and fiscal policy lingers, while in China, we expect additional policy stimulus to sustain economic recovery amid increasing external and structural headwinds.

Zero rates are yesterday's news

Barring an immediate 1990s-style productivity boom, a recession is likely necessary to bring down the rate of inflation, through weakening demand for labor and slower wage growth. As central banks feel more confident in inflation's path toward targets, we expect them to start to cut policy rates in the second half of 2024.

That said, we expect policy rates to settle higher than after the GFC and during the COVID-19 pandemic. Vanguard research has found that the equilibrium level of the real interest rate, also known as r-star or r*, has increased, driven primarily by demographics, long-term productivity growth, and higher structural fiscal deficits. This higher interest rate environment will last for years, a structural shift that will endure beyond the next business cycle. It is the single most important financial development since the GFC.

A return to sound money

For households and businesses, higher interest rates will limit borrowing, increase the cost of capital, and encourage saving. For governments, higher rates will force a reassessment of fiscal outlooks. The vicious circle of rising deficits and higher interest rates will accelerate concerns about fiscal sustainability. Vanguard's research suggests the window for governments to act on this is closing fast—it is an issue that must be tackled by this generation, not the next.

For well-diversified investors, the permanence of higher real interest rates provides a solid foundation for long-term risk-adjusted returns. However, because the transition to higher rates is not yet complete, near-term financial market volatility is likely to remain elevated.

Bonds are back!

Global bond markets have repriced significantly over the last two years because of the transition to higher rates. In our view, bond valuations are now close to fair, with higher long-term rates more aligned with secularly higher neutral rates. Meanwhile, term premia have increased, driven by elevated inflation and policy uncertainty.

Despite the potential for near-term volatility, we believe this rise in interest rates is the single best economic and financial development in 20 years for long-term investors. Our bond return expectations have increased substantially. We now expect U.S. bonds to return a nominal annualized 4.8%–5.8% over the next decade, compared with the 1.5%–2.5% we expected before the rate-hiking cycle began. Similarly, for international bonds, we expect annualized returns of 4.7%–5.7% over the next decade, compared with a forecast of 1.3%–2.3% when policy rates were low or, in some cases, negative.

If reinvested, the income component of bond returns at this level of rates will eventually more than offset the capital losses experienced over the last two years. By the end of the decade, bond portfolio values are expected to be higher than if rates had not increased in the first place.

Similarly, the case for the 60/40 portfolio has strengthened. For long-term investors in balanced portfolios, the probability of achieving a 10-year annualized return of at least 7%, the post-1990 average, has risen from 8% in 2021 to 40% today.

Moving up the risk spectrum, credit valuations appear fair in the investment-grade space but relatively rich in high-yield. The growing likelihood of recession and declining profit margins skew the risks toward wider spreads.

Higher rates leave equities overvalued

A higher-rate environment depresses asset price valuations across global markets while squeezing profit margins as corporations find it more expensive to issue and refinance debt.

Valuations are most stretched in the U.S. As a result, we have downgraded our U.S. equity return expectations to an annualized 4.2%–6.2% over the next 10 years from 4.4%–6.4% heading into 2023. Within the U.S. market, value stocks are more attractive than they have been since late 2021, and small-capitalization stocks also appear attractive for the long term.

U.S. equities have continued to outperform their international peers. The key drivers of this performance gap over the last two years have been valuation expansion and U.S. dollar strength beyond our fair-value estimates, both of which are likely to reverse. Indeed, our Vanguard Capital Markets Model® (VCMM) projections suggest an increasing likelihood of greater opportunities outside the U.S. from a U.S. dollar investor's perspective. We project 10-year annualized returns of 7.0%–9.0% for non-U.S. developed markets and 6.6%–8.6% for emerging markets.

The global equity risk premium that emerges from current stock and bond market valuations is the lowest since the 1999–2009 "lost decade." The spread between global equity and global bond returns is expected to be 0 to 2 percentage points annualized over the next 10 years. In contrast to the last decade, we expect return outcomes for diversified investors to be more balanced. For those with an appropriate risk tolerance, a more defensive risk posture may make sense given higher expected fixed income returns and an equity market that is yet to fully reflect the implications of the return to sound money.

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 as of September 30, 2023. Results from the model may vary with each use and over time. For more information, see "About the Vanguard Capital Markets Model" on page 21.

Fading growth resilience to spur rate cuts in 2024

After nearly two years of steady interest rate hikes in most developed markets, and with inflation falling back from generational highs, we expect central banks' policy rates to remain near current levels in the first half of 2024 before receding. As inflation falls toward central banks' targets, monetary policy will become increasingly restrictive in real terms. The resilience that global economies exhibited through much of 2023 is likely to fade as the effects of COVID-era expansive fiscal policy and excess savings diminish.

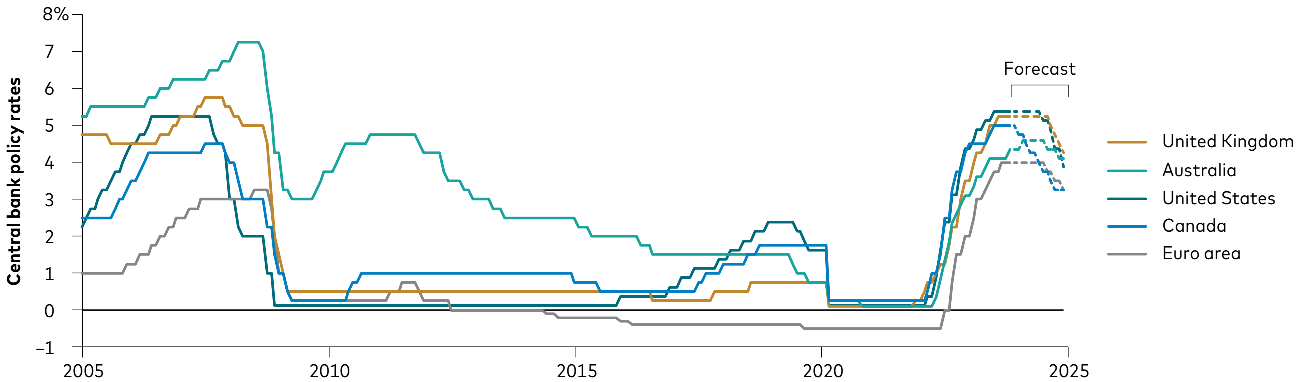
Inflation's initial surge was driven by well-understood factors including pandemic-related supply-demand imbalances, sharply higher commodities prices, and expansionary fiscal policy. As we move into 2024, most of the remaining gap between current levels of inflation and central banks' targets is attributable to services, a typically "stickier" component of inflation tied closely to labor markets.

We expect policy interest rates to reach or remain at their peaks in the first half of 2024, dampening economic activity. We expect the U.S. and other developed markets to experience below-trend growth in 2024, with uncomfortably high odds of slipping into mild recessions.

This economic slowdown, coupled with inflation falling to target, gives us conviction that central banks will start to ease policy in the second half of 2024. In our base case, we expect rate cuts of 75 basis points in the euro area and 150 to 200 basis points—or 1.5 to 2 percentage points—in the U.S.

Although policy rates are likely to be cut, we expect them to settle at a higher level than we've become accustomed to in recent years. By the end of 2025, we expect policy rates to be between 2.25% and 3.75% across major developed markets. We're not returning to a zero interest rate world anytime soon, and this will have profound implications for the global economy and financial markets.

Rate cuts in 2024, but zero rates are behind us



Notes: Monthly data are from January 2005 through November 2023. Forecasts thereafter run through year-end 2024.
Sources: Vanguard calculations, based on data from Bloomberg, as of November 30, 2023.

Read a **May 2023 commentary by Joe Davis**, Vanguard global chief economist, on a rate-cutting lesson.

Why we expect rates to settle at a higher level

Although interest rates in 2024 are likely to recede from their peaks, in the years ahead we expect them to settle at a higher level than we experienced after the 2008 global financial crisis. Zero interest rates are yesterday's news.

In our view, the equilibrium real interest rate—also known as the neutral rate, r-star, or r*—has increased. This is the theoretical level of interest rates at which monetary policy would neither stimulate nor restrict an economy. Described another way, the neutral rate is the balancing point between savings and investments in an economy.

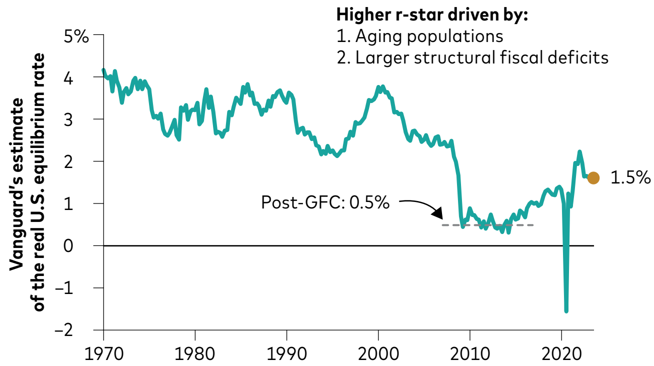
Vanguard research suggests r-star has increased by about 100 basis points—or 1 percentage point—since 2008 to around 1.5% today, making the nominal interest rate around 3.5%.

There are two important drivers for this higher equilibrium rate: aging populations and relatedly higher structural government deficits. As people age and retire, accumulated savings are spent and the size of the working-age population shrinks. On the other side, governments borrow to finance infrastructure and other long-term needs. So, as fewer people are saving and more are borrowing, interest rates will rise.

The pattern exists across other developed markets including the U.K., the euro zone, Australia, Japan, and Canada. Every country has its own dynamics, so the changes occur at different rates, but we calculate an increase of roughly 1 percentage point in equilibrium real interest rates since the GFC.

A notable exception to this upward trend is China, where the economy is rebalancing to a lower, but more sustainable, growth path. In our view, this will lead to a lower equilibrium real interest rate there relative to that of the last two decades.

The U.S. neutral rate is likely to settle at a higher level



Notes: The chart depicts our estimate for the real U.S. neutral rate using our proprietary extended Laubach-Williams model; a similar pattern exists for other developed markets. If inflation were at the Federal Reserve's 2% target and real r-star were 1.5%, then nominal r-star would be 3.5%.

Sources: Vanguard calculations, based on data from the Federal Reserve Bank of New York, as of June 30, 2023. More information can be found at www.newyorkfed.org/research/policy/rstar.

Read **Vanguard's June 2023 research** on why we think the U.S. neutral rate is higher than widely believed.

Powerful offsets delayed monetary policy transmission

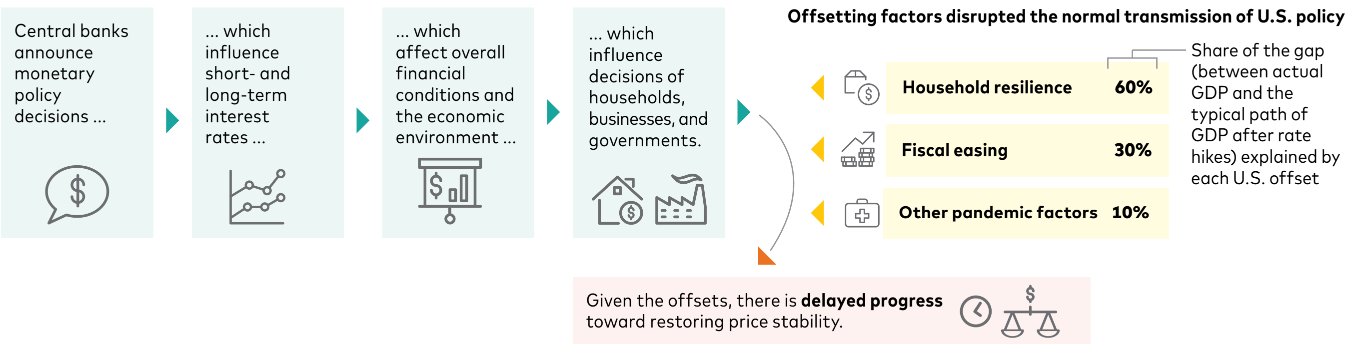
Central banks have raised interest rates to their highest levels in decades to return elevated inflation toward the banks' targets. Some central banks in developed markets have had a degree of success in the effort. Prices have fallen, though not yet by enough to declare victory.

In the United States especially, a combination of factors has reduced the potency of monetary policy, allowing economic activity to remain resilient. Among them is that the neutral rate has moved structurally higher (see page 6). But other factors have also played a significant role in disrupting the transmission of monetary policy, including:

- **Household resilience.** Consumers have benefited from inexpensive long-term, fixed-rate loans that have helped shield them from higher interest rates. They also accumulated meaningful cash positions during the pandemic, mitigating the need to borrow.
- **Fiscal easing.** Government cash transfers boosted household savings, and industrial policy supported public and private investment, which helped sustain demand despite rising prices.
- **Other pandemic factors.** Monetary policy could do little to combat the pandemic's disruption to the supply of goods and services, which drove up inflation.

We expect these offsets to fade and monetary policy to become more restrictive in real terms as inflation decelerates. We believe the effects will be slowing growth, a somewhat looser labor market, and, eventually, a recession. Our outlooks for the U.S., the euro area, and the United Kingdom (pages 9–11) offer more details.

The transmission of monetary policy, disrupted



Notes: The graphic represents the period from the second quarter of 2022 through the third quarter of 2023. Shares of offsets are rounded. Business and residential investment, an additional offset not shown above, had a negligible contribution.

Sources: Vanguard and the Federal Reserve, as of October 31, 2023.

The implications of a return to sound money

We are witnessing a return to sound money. Given our view that the equilibrium real interest rate, or neutral rate, has increased, Vanguard anticipates that rates over the next decade will be higher on average than they were over the last decade. This is the single most important financial development since the 2008 global financial crisis, and it has profound implications for households, businesses, and governments.

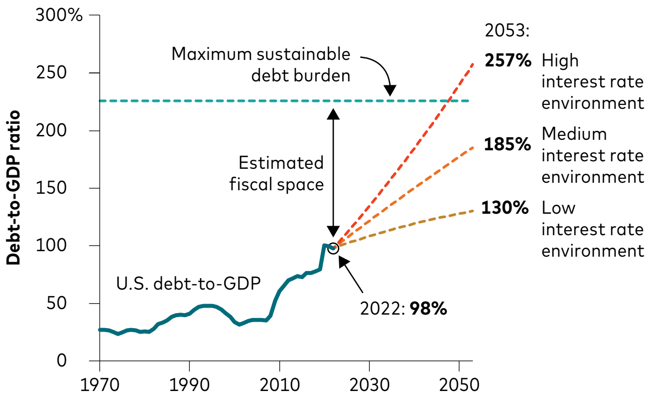
For households, saving will become more attractive. Higher interest rates will encourage prudent consumption behavior, such as moving away from luxuries and big-ticket items that require credit in favor of focusing on essentials. Purchases of more speculative, higher-risk retail investments, such as cryptocurrency, are likely to become less commonplace.

For businesses, higher borrowing costs will ensure that capital is allocated more judiciously, to the most productive and profitable projects. More than $3 trillion of U.S. corporate debt is due for repayment over the next five years. Not all companies will be affected immediately, as many locked in cheap financing when interest rates were low. Smaller companies that issue high-yielding debt and are typically more leveraged, however, will be more vulnerable to higher rates.

For governments, higher rates will force a reassessment of fiscal policy. Rising debt has become an issue that must be tackled by this generation, not the next. A potentially vicious circle of rising deficits and higher interest rates will accelerate concerns about fiscal sustainability.

The trajectory of government debt looks increasingly worrisome as we move from a low interest rate environment to one of medium or high interest rates. Vanguard research suggests the window for addressing these concerns is closing fast. In the U.S., we estimate that at the current debt-to-GDP level of around 100%, the government should keep its primary deficits below 2% of GDP to ensure a sustainable path. Current official deficit projections greater than 3% of GDP for coming decades would put debt on an unsustainable trajectory unless policy action is taken.

Higher interest rates will exert pressure on debt sustainability



Notes: All debt-to-GDP projections are based on real economic growth of 2%, average inflation of 2%, and a primary deficit of 3.5%. "Low interest rate environment" assumes an average interest rate of 1.8%, consistent with the average 5-year Treasury yield over the 2008–2019 period, "Medium interest rate environment" assumes an average interest rate of 3.5%, and "High interest rate environment" assumes an average interest rate of 5%. Maximum sustainable debt burden and estimated fiscal space are calculated using Vanguard's proprietary fiscal space methodology, detailed in *Assessing U.S. Fiscal Space* (Aliaga-Díaz, Patterson, and Raithatha, 2023).

Sources: Vanguard calculations, based on data from the Congressional Budget Office, as of June 30, 2023.

Read **Vanguard's December 2023 policy research** on the sustainability of U.S. fiscal policy.

United States: Monetary policy to finally weigh on economy

The U.S. economy has been exceptionally resilient since the Federal Reserve began raising interest rates early in 2022 to combat inflation. Offsets to monetary policy, including pandemic-era household fiscal support and recent industrial policy legislation, are largely responsible for this resilience.

Policy hasn't been restrictive enough for long enough to overcome these offsets. But we expect the accumulated impact of monetary policy to take firm hold in 2024, for which we forecast U.S. growth of just 0.5%.

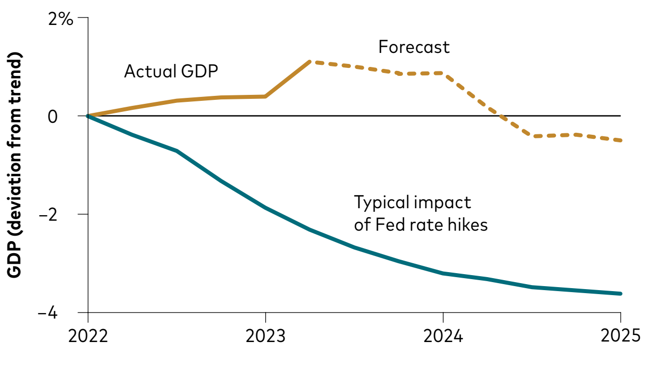
The U.S. economy is outperforming expectations at this stage of the policy tightening cycle. Our analysis suggests that, if not for the offsets, the economy would have been growing in a range close to 0.0% in 2023 rather than on track to grow between 2.5% and 3%.

A resilient consumer and fiscal policy are behind this outperformance. A strong labor market that has averaged more than 225,000 monthly job creations in 2023 has driven above-trend growth in real incomes. This has added to household balance sheets that were already stronger because of the fiscal support received during the COVID-19 pandemic. The Bipartisan Infrastructure Law, the CHIPS Act, and the Inflation Reduction Act—all enacted between November 2021 and August 2022—have further supported growth through private and public investment.

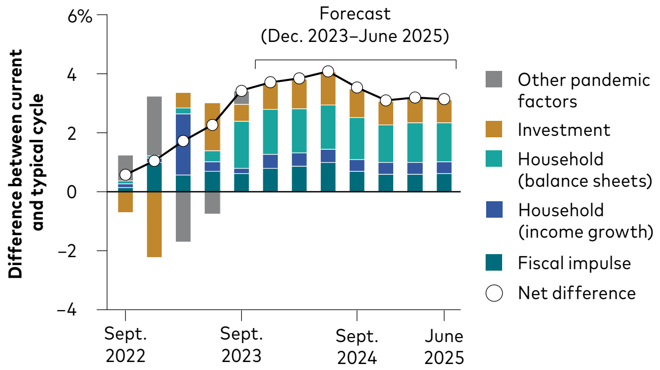
Despite significant progress on inflation and strong economic growth, we believe a "soft landing"—where inflation returns sustainably to the Federal Reserve's target absent weakness in demand—is unlikely. The last mile on the path to 2% inflation will be the most difficult. In the year ahead, we expect a combination of below-trend growth, rising unemployment, and slowing wage growth. This would occur as the labor market loosens, in large part because of higher-than-expected labor supply growth. We expect the Fed to start easing policy in the second half of 2024, and we expect the policy rate to be cut below 4% by the end of 2024.

Offsetting factors have blunted the impact of U.S. monetary policy

a. Growth has offset monetary policy impact ...



b. ... driven by consumer strength and fiscal policy



Notes: This simulation of the impact of the current U.S. rate hiking cycle on U.S. GDP was performed using a proprietary vector autoregression model with a combination of short- and long-run drivers including inflation, short-term and long-term interest rates, potential GDP, real disposable income, and commodity prices. The offset factors were measured using a growth decomposition model to assess the impacts of labor income, liquid asset balances, residential and business investment, and the fiscal impulse estimate using Congressional Budget Office (CBO) budgetary projections. The bars in Chart B reflect differences between actual and trend, or expected, growth for various growth drivers. We project the drivers' effects to wane in 2024 and 2025, when we foresee growth falling below trend.

Sources: Vanguard calculations, based on data from the CBO, as of September 30, 2023.

Read more about **our outlooks for U.S. growth, inflation, labor market, and the Federal Reserve**.

Euro area: Monetary policy transmission is about a third complete

Euro area economic activity has slowed since the European Central Bank (ECB) started raising interest rates in mid-2022. This contrasts sharply with the United States, where the economy has proven resilient. We see three reasons for this relative weakness: more effective transmission of monetary policy, mildly restrictive fiscal policy, and larger exposure to the slowing global trade cycle. We expect these headwinds to spill into 2024, when we forecast muted euro area growth of just 0.5%–1%.

The economy is slowing broadly in line with expectations at this stage of the tightening cycle. Evidence is building that tighter monetary policy is taking hold: Credit growth is slowing, and corporate net interest payments are rising sharply. In contrast to the U.S., corporate funding in the euro area is predominantly bank-based rather than capital-market-based. As such, higher interest rates are feeding through more quickly into profit and loss statements. Still, we assess that the transmission of ECB monetary policy in the fight against inflation is only about one-third complete, bolstering our view that rates won't be cut as quickly as some may hope.

We expect euro area fiscal policy to be mildly restrictive in 2024, driven by the unwinding of energy support to households; the phaseout of attractive tax credits in the Italian construction sector is also a factor.

The euro area is an open economy—international trade accounts for about one-quarter of its GDP—with a relatively large manufacturing base. Activity has suffered recently from soft growth in China and a broader slowdown in global trade. Exports contracted at an average quarterly rate of –0.3% in the three quarters ended June 30, 2023. We expect this headwind to fade in 2024.

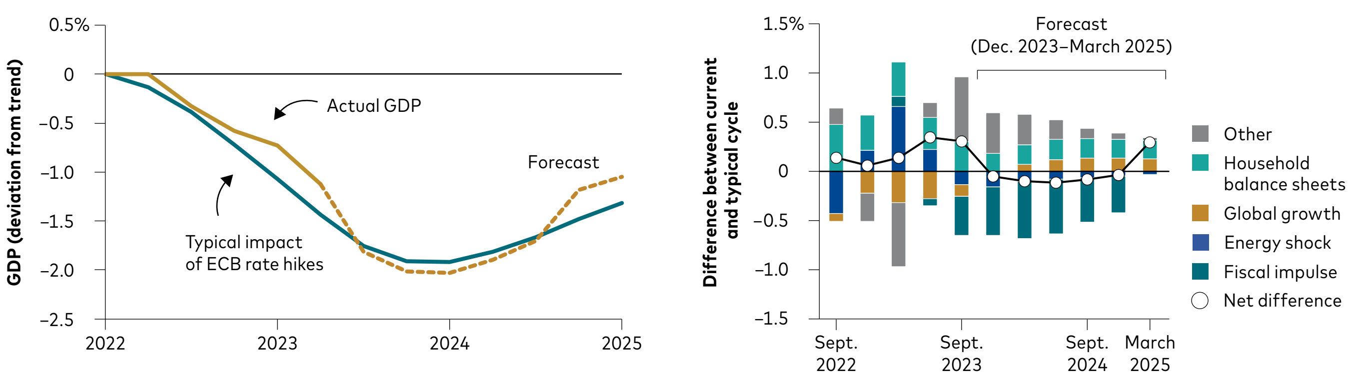
Finally, strong household balance sheets, bolstered by savings built up during the COVID-19 pandemic, should continue to provide support to the consumer relative to previous tightening cycles.

With the output gap—the difference between actual and potential economic activity—expected to widen in coming quarters, we expect the ECB to start easing policy from mid-2024. Our base case is for the ECB to cut the policy rate to around 3.25% by the end of 2024.

Offsetting factors have had little impact on euro area monetary policy

a. Policy is having its intended effects ...

b. ... and should continue to do so in 2024



Notes: This simulation of the impact of the current ECB rate-hiking cycle on euro area GDP was performed using a proprietary error-correction model of euro area consumption using a combination of short- and long-run drivers including disposable income, unemployment rate, household wealth, and the short-run interest rate. The model was supplemented by simulations run on the Bloomberg SHOK model for the impact of energy prices and global growth on euro area GDP, as well as by fiscal impulse estimates using International Monetary Fund (IMF) budgetary projections.

Sources: Vanguard calculations, based on data from Eurostat, the IMF, and Bloomberg, as of October 27, 2023.

Read more about **our outlooks for euro area growth, inflation, labor market, and policy**.

United Kingdom: Changes in mortgage market slow monetary policy transmission

In a global developed markets context of increasing interest rates, the U.K. is no exception. It has witnessed its most rapid interest rate-hiking cycle since the late 1980s, and the hikes are starting to hurt the domestic economy. Economic activity was subdued through most of 2023, and we expect this fragility to persist through 2024 as the impact of tighter monetary policy intensifies.

Despite more than 5 percentage points of monetary policy tightening in the last two years, inflation in the U.K. remains elevated relative to other advanced economies. This is partly because the U.K. is suffering from the worst of both worlds—a U.S.-style labor supply shock and a euro area-style energy shock.

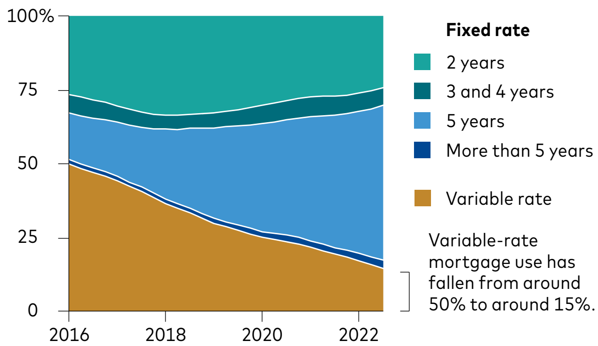
The transmission of monetary policy through the housing channel is slower and weaker than in the past. The portion of outstanding mortgages on variable rates has fallen from around 50% in 2016 to around 15% at the end of 2022. Similarly, the popularity of longer-term mortgages (for example, 5 years) has increased at the expense of shorter alternatives (for example, 2 years).

These changes have slowed the transmission of policy to the real economy, as more households are now able to wait longer before refinancing.

The mortgage channel is also less potent than it once was, because a greater proportion of homeowners no longer have a mortgage: In 1997, more than 60% of homeowners had a mortgage; today, the proportion is closer to 45%.

With services inflation elevated and wage growth resilient, we expect interest rates will need to stay elevated for an extended period. In our base case, we expect the bank rate to remain at 5.25% until at least mid-2024, after which we expect a gradual easing cycle to begin.

A greater use of fixed-rate mortgages



Note: The chart shows quarterly data from the first quarter of 2016 through the third quarter of 2022.

Sources: U.K. Housing Survey and the Bank of England, as of September 30, 2023.

Read more about **our outlooks for U.K. growth, inflation, labor market, and policy**.

China: Policy rates to stay *lower* for longer

Amid a backdrop of global economic resilience, China's recovery from its lengthy COVID-19-related lockdowns has stuttered. A beleaguered property market, weak private-sector confidence, and a reluctant, belated policy response has left the economy seeking firm footing.

But stimulus has gained momentum. An unusual 1 trillion yuan ($140 billion) increase to the fiscal deficit, equivalent to 0.8% of GDP, signals an important policy shift to buttress domestic demand and mitigate local governments' financial constraints. We believe that continued policy easing is necessary—and forthcoming—to cushion against lingering downside risks.

We expect China's economy to grow by 4.5%–5% in 2024 amid intensifying external headwinds and a continued decline in sustainable potential, or trend, growth. The magnitude of stimulus will likely be more modest than after the 2008 global financial crisis, when it was equivalent to around 12% of GDP. Financial stability concerns will likely limit the scale of stimulus to targeted measures.

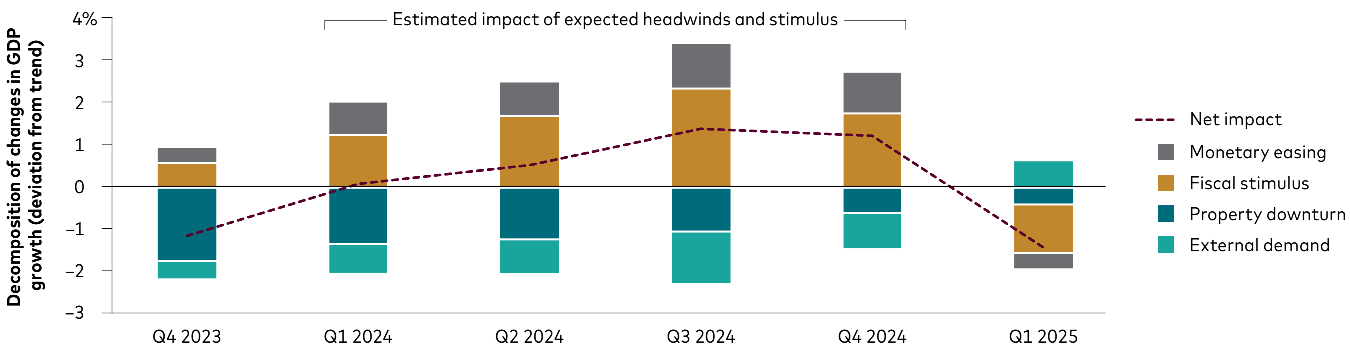
We expect coordinated monetary, fiscal, and regulatory policy to work to ensure economic normalization toward prepandemic trend levels.

We expect fiscal expansion to take the lead, facilitated by monetary easing—which could take the form of further cuts to the policy rate and banks' reserve requirements—in addition to further support for the housing sector. We expect policymakers to set their 2024 growth target at 5% once again, but that would require more aggressive stimulus given falling trend growth that we estimate in the low 4% range.

We anticipate that policy interest rates will stay lower for longer—in contrast to the rest of the world—given requirements for growth, deleveraging, and a decline in China's neutral rate, a theoretical rate that would neither stimulate nor restrict an economy.

Financial system vulnerabilities have grown as leverage has risen; rate differentials with developed markets could drive capital outflows. Although an anticipated slowing in U.S. growth in 2024 should ease pressure on the yuan, we believe policymakers will continue to monitor cross-border capital flows closely. We expect increased fiscal and monetary policy coordination and strengthened macroprudential regulations to manage financial stability and ensure a smooth deleveraging beyond 2024.

Impact of headwinds and policy stimulus will determine China's growth



Notes: This simulation uses Vanguard's proprietary semi-structural China macroeconomic model. We incorporated the following shocks: a 3% increase from trend in money supply; a 10% increase from trend in fiscal stimulus; a 5% decrease compared with trend in property investment coupled with a 5% decrease from trend in property prices; and a 5% decrease from trend in external demand.

Sources: Vanguard estimates, based on data from CEIC, as of September 30, 2023.

Read more about **our outlooks for China's growth, inflation, labor market, and policy**.

Emerging markets: Holding up, with divergence across regions

Despite interest rates having reached a cyclical peak in 2023, growth in emerging markets has remained resilient. With inflation's rise exacerbated by a need to protect their currencies, emerging markets central banks were ahead of their developed markets counterparts in raising policy rates—unlike in past rate-hiking cycles. Now, with inflation slowing, interest rates are becoming more restrictive, raising concerns about growth. In response, emerging markets central banks are leading the cutting cycle.

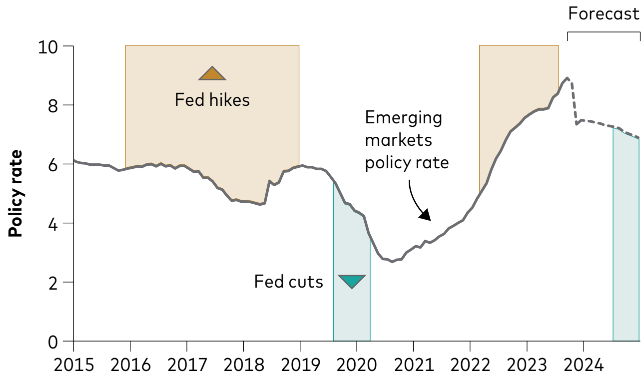
Broadly, we expect central banks in Latin America and emerging Europe to cut rates modestly through 2024. We expect banks in emerging Asia to remain on pause for longer, until the second half of 2024. Beyond these cyclical rate cuts, we expect interest rates to settle at levels higher than before the hiking cycle and to remain there for an extended period.

We expect emerging markets GDP to grow mostly in line with consensus in 2024, and to a greater degree than developed markets. We anticipate growth of around 4% for emerging markets broadly—around 5% for emerging Asia and 2%–2.5% for emerging Europe and Latin America.

A divergence theme is likely to continue across regions. Emerging Asia should benefit from an upturn in the global tech cycle and a modest boost from continued normalization of China's economy. The euro area's flirtation with recession and its relatively stubborn inflation could leave growth in emerging Europe below trend and consensus expectations. In Latin America, we expect growth below trend but in line with consensus, owing to lower expected U.S. growth and more restrictive interest rates in both places.

We expect inflation to continue to fall but at a slower pace. Still, upside risks remain in the form of volatile energy and food prices. We expect inflation in emerging Europe to remain above central banks' targets as labor markets remain tight. In Latin America, we expect inflation to make only slow progress toward central banks' targets as services inflation and elevated wage growth remain obstacles. We expect inflation in emerging Asia to remain well-behaved, owing to price controls in some countries and flagging demand in others.

Emerging markets are leading the monetary policy cycle



Notes: The emerging markets policy rate is a GDP-weighted average of the following countries, listed in order of GDP: India, Brazil, Mexico, South Korea, Indonesia, Turkey, Poland, Israel, Thailand, Philippines, South Africa, Colombia, Romania, Chile, Czech Republic, Peru, and Hungary.

Sources: Vanguard calculations, based on data from Refinitiv, as of October 31, 2023.

Read more about **our outlooks for Mexico's growth, inflation, labor market, and policy**.

Stretched U.S. equity valuations are apt to ease

The valuation-driven equity rally of 2021, supported by fiscal stimulus and the end of COVID-19 restrictions, pushed the cyclically adjusted price/earnings (CAPE) ratio for the U.S. equity market to highs not seen since the dotcom bubble of the late 1990s. The sell-off in 2022 reversed much of that. In 2023, however, valuations again have increased, and the prospect that the higher interest rate environment will last for years remains underappreciated.

U.S. equity prices exceed fair value

Our analysis shows that, over the long term, equity prices trade within a fair-value range that depends in part on the macroeconomic environment. Lower rates of interest and inflation increase the level of justifiable valuations; higher rates of interest and inflation do the opposite.

More than a decade of low rates and low inflation followed the global financial crisis of 2008, boosting our fair-value estimates for equities. But the rapid monetary tightening aimed at bringing down inflation has more than reversed the valuation support provided by an era of easy money.

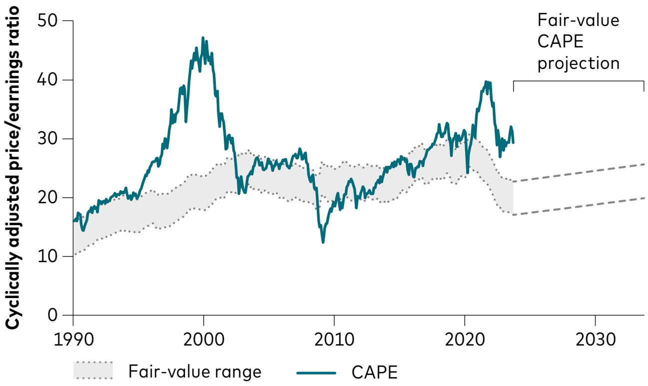
Looking ahead, we believe that the Federal Reserve and other central banks will win the fight against inflation. We expect short- and long-term interest rates to recede from their peaks but settle at higher levels than we've become accustomed to. As a result, our estimates of equities' fair value will increase, but only modestly. We do not envision any near-term return to the high levels reached at the start of this decade.

Our views are reflected in the declining expected valuations in our 10-year U.S. equity return forecast. Despite some expected rate relief, price/earnings ratios must ease for U.S. equities to reach fair value.

International valuations remain more attractive

As in the United States, our fair-value estimates for most non-U.S. equity markets declined in recent years. International valuations did not rise as much as U.S. valuations, however, and non-U.S. shares were priced more modestly to begin with. The result: Most non-U.S. equity markets remain fairly valued, and we expect valuation changes to have only a minor impact on international equity returns in the coming decade.

U.S. equity valuations need to fall to return to fair value



The components of our forecasts of equities' total returns

	Valuation change	+	Earnings growth	+	Dividend yield	+	Currency effect	=	Total return
U.S. equities	–1.2%		4.4%		2.0%		–		**5.2%**
Global ex-U.S. equities	–0.1%		3.4%		3.7%		1.1%		**8.1%**

Notes: The chart shows the cyclically adjusted price/earnings (CAPE) ratio for U.S. equities, measured by the MSCI US Broad Market Index. CAPE reflects contemporaneous real equity prices and 10-year average historical real earnings. The chart also shows our estimates of fair value, considering inflation and interest rates. Our historical fair-value estimates are based on actual levels of inflation and interest rates and reflect underlying data since January 31, 1940, while our 10-year fair-value forecast considers our expectations for inflation and rates.

The table reflects the distribution of 10,000 Vanguard Capital Markets Model (VCMM) simulations of annualized nominal equity returns, in U.S. dollars, over the 10-year period ending September 30, 2033. Nominal returns do not reflect investment expenses, taxes, or inflation.

Sources: Vanguard calculations, based on data from Refinitiv and Global Financial Data, as of September 30, 2023.

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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.

Below-trend earnings growth could suppress returns

In the last quarter-century, corporate earnings grew at an annualized rate of 7.2%.[1] In the decade ahead, our forecast is for annualized earnings growth of 4.4% for U.S. equities and 3.4% for global ex-U.S. equities.

We expect slower earnings growth due to a compression in corporate profit margins. Weaker earnings growth will weigh on equities' total returns.

Profit margins are key—and are likely to fall

Earnings growth is a function of revenue growth and profit margins. While individual companies and industries may grow more quickly or more slowly than the overall economy, corporate revenue growth in aggregate is highly correlated with changes in economic output. Absent shocks, changes in output tend to be relatively slow-moving. As a result, cyclicality in earnings growth is often driven by changes in profit margins.

In the post-COVID era, profit margins reached new peaks and earnings growth was revitalized amid waves of fiscal stimulus and declines in the share of labor costs per unit of output. In the coming years, we expect profit margins—and thus corporate earnings growth—to weaken. Government stimulus will have faded. Profit margins also face pressure from increases in labor and borrowing costs, plus "onshoring" or "near-shoring" of supply chains.

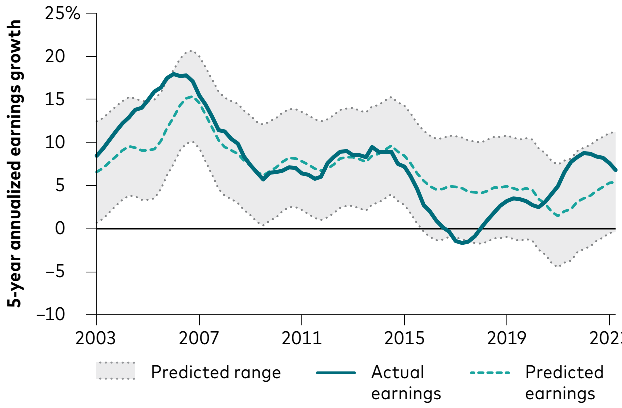
The risk to equity returns

Declines in profit margins and revenue growth trends augur weaker earnings growth compared with historical averages. Coupled with likely downside pressure on equity valuations, slower earnings growth helps support our forecast for lower long-term equity returns than we had forecast last year.

One element that may offset some of the future drag on earnings growth is our expectation for a weaker U.S. dollar over the next decade.

A depreciating U.S. dollar increases the value of offshore earnings, a significant factor given the international sales and earnings of many large U.S. companies.

Recent profit-margin-driven earnings growth has started to reverse



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Global ex-U.S. equities	−0.1%		3.4%		3.7%		1.1%		**8.1%**

Notes: In the chart, five-year annualized earnings growth figures, actual and predicted, reflect the aggregate results of Standard & Poor's 500 Index constituents, including loss-making companies, as of June 30, 2023. Predicted earnings reflect the median forecast of a proprietary Vanguard model of corporate earnings, which is detailed in "From Economics to Earnings: A Macro-Based Equity Earnings Growth Forecasting Model," an article published in the February 2023 issue of *The Journal of Investing*.

The table reflects the distribution of 10,000 Vanguard Capital Markets Model (VCMM) simulations of annualized nominal equity returns, in U.S. dollars, for the 10 years ending September 30, 2033. Nominal returns do not reflect investment expenses, taxes, or inflation.

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

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1 As measured by the S&P 500 Index, as of June 30, 2023.

U.S. dollar strength is likely to ebb

We believe the U.S. dollar faces more headwinds than tailwinds in the coming decade. The result should be some dollar depreciation and a boost to non-U.S. equity returns for dollar-based investors.[2]

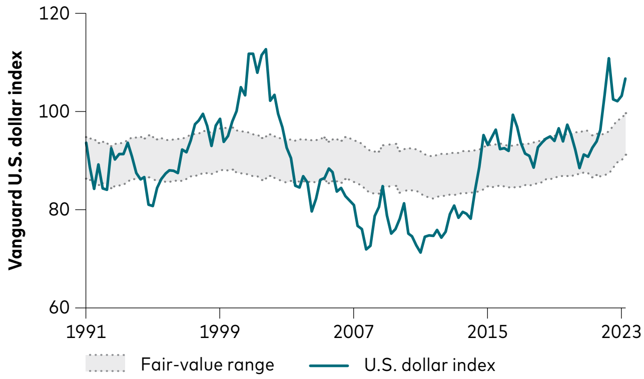
The depreciation could unwind much of the roughly 12% overvaluation we see now. Our view reflects a new, proprietary Vanguard model that estimates the fair value of the dollar against a basket of five leading currencies and estimates the currency impact experienced by unhedged international investors.

Just as an undervaluation 10 years ago set the stage for U.S. dollar strengthening over the last decade, we expect today's overvaluation to precede U.S. dollar weakness. Normalizations in global interest rates, inflation, and productivity growth also suggest a weaker dollar over time. The central tendency of our forecasts is a modest annualized decline of 1.1%.[3]

To be sure, currency forecasting is a challenge. The probability of the U.S. dollar depreciating over the next decade is around 75%, and the decline almost certainly will not prove linear.

A key risk to our outlook—more likely to affect the magnitude than the direction of the dollar's movement in the coming decade—revolves around cross-border differences in economic output per capita. Economic theory suggests that productivity differences should offset over long periods, but U.S. worker productivity gains could continue to outstrip those of competing labor forces if, for example, U.S. firms lead the adoption of artificial intelligence. If so, a stronger-than-expected rise in the dollar's fair value could narrow the valuation gap and result in less dollar depreciation.

The U.S. dollar: Stronger than fundamentals warrant



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Global ex-U.S. equities	–0.1%		3.4%		3.7%		1.1%		**8.1%**

Notes: Our U.S. dollar index and fair-value estimates are proprietary measures that compare the U.S. dollar with an equity market-capitalization-weighted basket of the euro, the Japanese yen, the British pound, the Canadian dollar, and the Australian dollar. The non-U.S. dollar currencies' index weights reflect the relative weights of MSCI World Index constituent regions and countries that typically trade goods, services, and securities in those currencies. The fair-value estimates are based on the portion of exchange rate movements that can be explained through differentials in relative economic strength, measured by productivity (GDP per capita at purchasing power parity) and long-term real rates.

The bottom table reflects the distribution of 10,000 Vanguard Capital Markets Model (VCMM) simulations of annualized nominal equity returns, in U.S. dollars, during the 10 years ending September 30, 2033. Nominal returns do not reflect investment expenses, taxes, or inflation.

Sources: Vanguard calculations, based on data from Refinitiv and the International Monetary Fund, as of September 30, 2023.

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2 Vanguard believes investors should accept currency risk in their international equity allocations. Doing so lowers the correlation between international and domestic equity returns and hedges domestic inflation risk. Alternatively, we believe the currency risk in international fixed income allocations should be hedged. If unhedged, the volatility of such holdings can increase to equity-like levels, reducing the ability of bonds to provide ballast in portfolios.

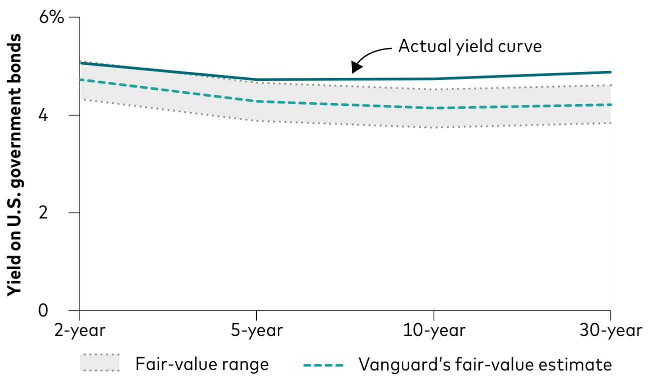
3 Our forecast corresponds to the distribution of 10,000 VCMM simulations for 10-year annualized changes in the U.S. dollar against an equity market-capitalization-weighted basket of the euro, the Japanese yen, the British pound, the Canadian dollar, and the Australian dollar.

Thanks to higher interest rates, bonds are back

Short-term pain can lead to long-term gain. Bond investors should keep that adage in mind, having endured two years of negative total returns because of rising interest rates. But higher interest payments offset declines in bond prices, raising expected total returns over the long term. Reinvestments and new money going into fixed income are attractively valued.

This doesn't mean volatility is behind us. Market participants eagerly anticipate policy rate cuts in 2024, which our economists foresee beginning in the second half of the year. However, we differ in our assessment of how far short-term rates will fall. Further, central banks' unwinding of their bond-buying programs could reduce liquidity and raise the risk premium (investors' requirement for higher yield as compensation for the risk of interest rate changes over a bond's lifetime).

Our proprietary yield curve model shows that Treasuries are near fair value based on current fundamentals

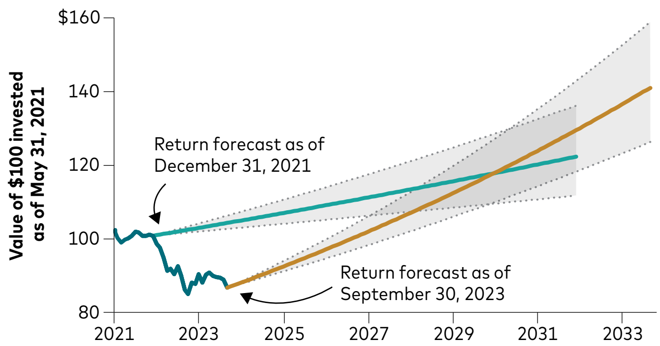


Notes: The chart shows the actual constant-maturity interest rate for U.S. government bonds at four points on the yield curve, as of September 30, 2023, and our estimate of fair value. The fair-value range is half a standard deviation above and below our estimate—meaning, essentially, we have 68% confidence that the yield curve's fair value falls within that range. Fair value is derived from a statistical model specification that is a five-variable vector error correction model, including 10-year Treasury yield, first three principal components of covariance matrix for 10-year trailing inflation, 10-year trailing food inflation, 10-year trailing hourly earnings growth, effective federal funds rate, and the 5-year trailing real GDP estimated over the period from January 1, 1979, through September 30, 2023.

Sources: Vanguard calculations, based on data from FactSet, the U.S. Bureau of Labor Statistics, the Federal Reserve, Refinitiv, and Global Financial Data, as of September 30, 2023.

Unlike two years ago, the yield curve today is close to its fair-value range based on historical relationships with current fundamentals, according to our proprietary model. If anything, bonds at the long end of the maturity spectrum may be somewhat undervalued. The bottom line: Rather than a bane, the rise in interest rates is the single best development for bond investors in 20 years.

Rising rates mean higher returns for long-term investors



Notes: The chart shows actual returns for the Bloomberg U.S. Aggregate Bond Index along with Vanguard's forecast for cumulative returns over the subsequent 10 years as of December 31, 2021, and September 30, 2023. The dotted lines represent the 10th and 90th percentiles of the forecasted distribution. A hypothetical investor who had a lump sum invested in a bond portfolio similar to the Bloomberg U.S. Aggregate Bond Index at the end of 2021 would have had steep declines in 2022. But according to our model, that portfolio would "break even" in early 2030 (where the solid lines intersect) with a hypothetical portfolio in a world where interest rates remained low and bond prices didn't suffer steep declines. Investing new money would mean arriving at that breakeven point earlier.

Sources: Vanguard calculations, based on data from Bloomberg, as of September 30, 2023.

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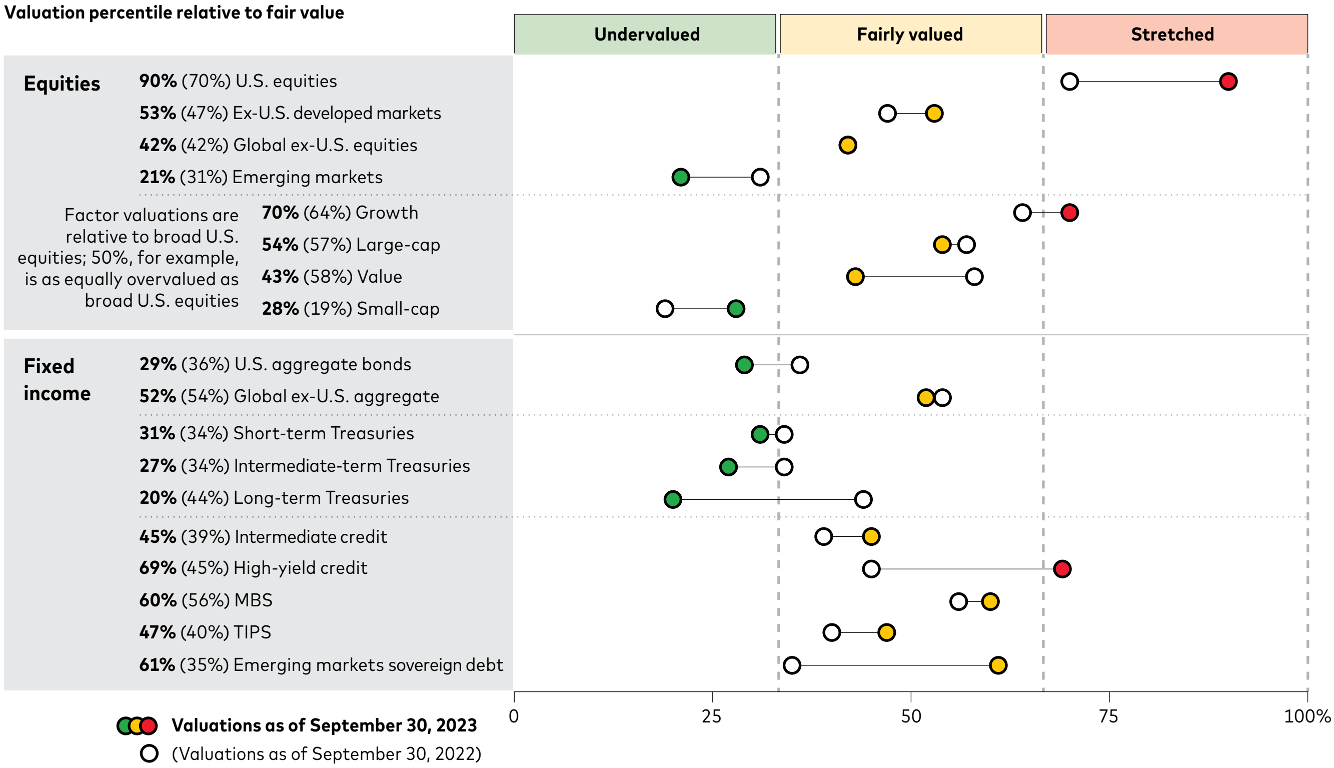
How stock and bond valuations have changed in the last year

Potential opportunities and cautionary signals for long-term investors



Notes: The U.S. equity valuation measure is the current cyclically adjusted price/earnings ratio (CAPE) 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, high-yield credit, mortgage-backed securities (MBS), and emerging markets sovereign debt 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 September 30, 2023, and September 30, 2022 (in parentheses).

Sources: Vanguard calculations, based on data from Robert Shiller's website at aida.wss.yale.edu/~shiller/data.htm, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Refinitiv, as of September 30, 2023.

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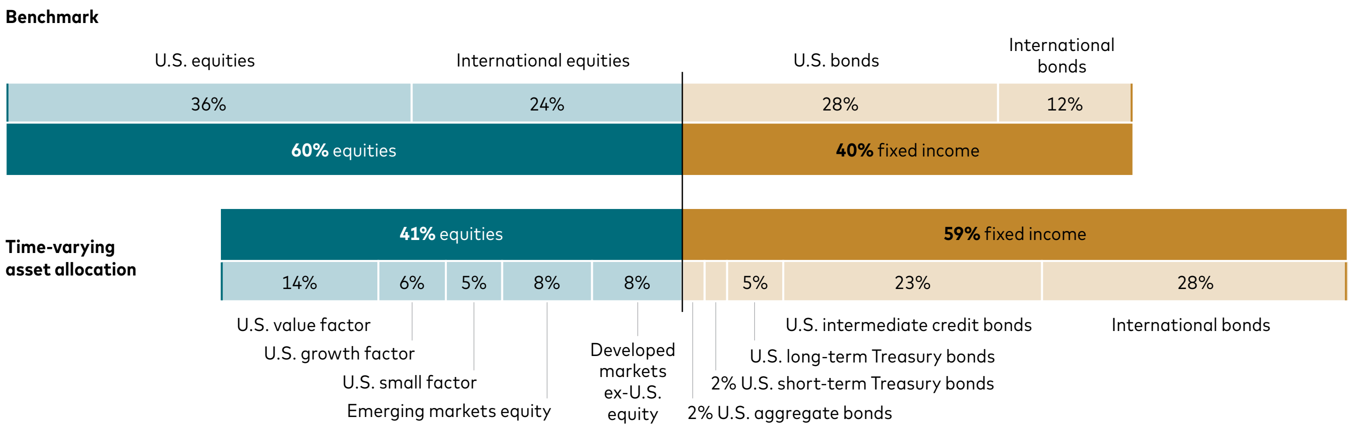
A strong tilt to bonds in our time-varying portfolio

Higher interest rates have led to substantially higher expected returns for fixed income and a compressed equity risk premium. The developments have produced a dramatic shift in the composition of our valuation-aware time-varying asset allocation, or TVAA. Our TVAA is geared to investors who are comfortable with model forecast risk, a type of active risk in which investors embrace our disciplined model for navigating changing market and economic environments.

Given changing risk/return tradeoffs, the TVAA portfolio reflects a decrease of 19 percentage points in the equity allocation relative to a 60% stock/40% bond benchmark, a meaningful de-risking move. Notably, the TVAA, which includes additional sub-asset-class tilts, results in an expected return similar to that of the 60/40 benchmark, but with lower volatility. This comes at the expense of active risk (tracking error relative to the benchmark) of 3.4%.

A more attractive risk/return trade-off means our asset allocation favors bonds



Notes: Time-varying portfolio allocations were determined by the Vanguard Asset Allocation Model (VAAM). The assets under consideration were U.S. and non-U.S. equities and fixed income, as well as real estate investment trusts (REITs), U.S. high-yield corporate bonds, and emerging markets equities, which were used to illustrate time-varying allocation not only within equities versus fixed income but also within sub-asset classes. See "Indexes for VCMM simulations" on page 22 for additional details on asset class indexes. Minimum home-bias constraint of 60% was applied for U.S. equities, and 70% was applied for U.S. fixed income. The allocation to non-U.S. equities would have been higher had there been no home-bias constraint, given the asset class's higher expected return. Vanguard Capital Markets Model 10-year projections as of September 30, 2023, were used. The sum of individual sub-asset class allocations may not total 100% because of rounding.

Source: Vanguard calculations, as of September 30, 2023.

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	41%	6.4%	7.5%	0.23	–4.8%	3.4%	50.8%
Benchmark	60%	6.4%	9.8%	0.18	–8.6%	—	—

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, as of September 30, 2023.

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About the Vanguard Capital Markets Model

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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 Investment Strategy Group. 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 Vanguard Capital Markets Model 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. 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 September 30, 2023. 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 US 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. High Yield Corporate 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-market 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 September 30, 2023. 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. 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 price fluctuations. Unlike stocks and bonds, U.S. Treasury bills are guaranteed as to the timely payment of principal and interest. Investments that concentrate on a relatively narrow market sector face the risk of higher 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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ISGVEMO 122023