As the global economy enters its tenth year of expansion following the global financial crisis, concerns are growing that a recession may be imminent. Although several factors will raise the risk of recession in 2019, a slowdown in growth—led by the United States and China—with periodic “growth scares” is the most likely outcome. In short, economic growth should shift down but not out.

Previous Vanguard outlooks anticipated that the secular forces of globalisation and technological disruption would make achieving 2% inflation in the United States, Europe, Japan, and elsewhere more difficult. In 2018, we rightly anticipated a cyclical firming in core inflation across various economies. In 2019, we do not see a material risk of further strong rises in core inflation despite lower unemployment rates and higher wages. This is because higher wages are not likely to funnel through to higher consumer prices, as inflation expectations remain well-anchored.

As inflation moves toward target, financial stability risks rise, and unemployment rates continue to approach or drop below estimates of full employment, global central banks will stay on their gradual normalisation paths. In the United States, we still expect the Federal Reserve to reach terminal rate for this cycle in the summer of 2019, bringing the policy rate range to 2.75%–3% before halting further increases in the face of non-accelerating inflation and decelerating top-line growth. Other developed-market central banks, though, will only begin to lift interest rates from post-crisis lows.

With slowing growth, disparate rates of inflation, and continued policy normalisation, volatility in financial markets is likely to accelerate. Long term, our ten-year outlook for investment returns remains guarded, given the backdrop of high valuations and depressed risk-free rates across major markets.
Editorial note

This publication is an update of Vanguard’s annual economic and market outlook for 2019 for key economies around the globe. Aided by Vanguard Capital Markets Model® simulations and other research, we also forecast future performance for a broad array of fixed interest and equity asset classes.

Acknowledgments

We thank Kristen M. Storti, Donald B. Foote III, and Andrew S. Clarke, CFA, for their significant contributions to this piece and acknowledge the work of the Global Economics and Capital Markets Outlook Team. Further, we would like to acknowledge the work of Vanguard’s broader Investment Strategy Group, without whose tireless research efforts this piece would not be possible.
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 ten 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 at September 30, 2018. Results from the model may vary with each use and over time. For more information, see the Appendix section “About the Vanguard Capital Markets Model.”
Global outlook summary

Global economy: Down but not out

As the global economic expansion enters its tenth year, concerns are growing that a recession may be imminent. Although several factors will raise the risk of recession in 2019, a slowdown in growth—led by the United States and China—is the most likely outcome. In short, economic growth should shift down but not out.

We expect the global economy to continue to grow, albeit at a slightly slower pace, over the next two years, leading at times to so-called growth scares. In 2019, U.S. economic growth should drop back toward a more sustainable 2% as the benefits of expansionary fiscal and monetary policy abate. Europe and Japan are at an earlier stage of the business cycle, though we expect growth there to remain modest.

In emerging markets, China’s growth will remain near 6%, with increasing policy stimulus applied to help maintain that trajectory. Unresolved U.S.-China trade tensions remain one of the largest risk factors to our view, in addition to stronger-than-expected tightening by the Federal Reserve should the U.S. unemployment rate approach 3%.

Global inflation: Unlikely to shoot past 2%

Previous Vanguard outlooks anticipated that the secular forces of globalisation and technological disruption would make achieving 2% inflation in the United States, Europe, Japan, and elsewhere more difficult. In 2018, we rightly anticipated a cyclical firming in core inflation across various economies. In 2019, we do not see a material risk of further strong rises in core inflation despite lower unemployment rates and higher wages, as inflation expectations remain well-anchored.

In the U.S., we expect core inflation to remain near or below 2% throughout 2019; an escalation in tariffs would only temporarily affect U.S. core inflation. In Europe and Japan, price pressures will increase gradually as labour market slack erodes, though core inflation is likely to stay well below 2%. Higher wages are likely, yes, but higher inflation is not.

Monetary policy: Convergence commences, with the Fed stopping near 3%

As inflation moves toward target, financial stability risks rise, and unemployment rates approach full employment, global central banks will stay on their gradual normalisation paths.

In the United States, we still expect the Fed to reach terminal rate for this cycle in the summer of 2019, bringing the policy rate range to 2.75%–3% before halting further increases in the face of nonaccelerating inflation and decelerating growth. Other developed-market central banks will only begin to lift interest rates from post crisis lows. We expect the first rate increase from the European Central Bank in late 2019, followed by a very gradual hiking path thereafter. Japan is late to the party and we do not expect any rate increases in 2019, though some fine-tuning of its policy framework is likely to ease growing financial-stability risk. Emerging-market countries don’t control their own destiny and will be proactively forced to tighten along with the Fed, while further modest currency depreciation, tempered by tightened capital controls, is the most likely outcome in China.

Vanguard’s distinct approach to forecasting

To treat the future with the deference it deserves, Vanguard has long believed that market forecasts are best viewed in a probabilistic framework. This annual publication’s primary objectives are to describe the projected long-term return distributions that contribute to strategic asset allocation decisions and to present the rationale for the ranges and probabilities of potential outcomes. This analysis discusses our global outlook from the perspective of an Australian investor with an AUD-denominated portfolio.
**Investment outlook: No pain, no gain**

With slowing growth, disparate rates of inflation, and continued policy normalisation, volatility in financial markets is likely to accelerate. Long term, our ten-year outlook for investment returns remains guarded, given the backdrop of high valuations and depressed risk-free rates across major markets.

Global fixed interest returns are most likely to be in the 2%–4% range, driven by rising policy rates and higher yields across the maturity curve as policy normalises, especially in the United States. This results in a similar outlook to last year’s (also 2%–4%).

Returns in global equity markets are likely to be about 4%–6% for Australian-dollar-based investors. This remains significantly lower than the experience of previous decades and of the post crisis years, when global equities have risen 12.8% a year since the trough of the market downturn. We do, however, foresee improving return prospects in non-U.S. developed markets, building on slightly more attractive valuations (a key driver of the equity risk premiums) combined with higher expected risk-free rates.

As was the case last year, the risk of a correction for equities and other high-beta assets is projected to be considerably higher than for high-quality fixed interest portfolios.

---

**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 2018. 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.

**Australian bonds:** Bloomberg Ausbond Composite Index from 1989 through 2004, and Bloomberg Barclays Australian Aggregate Bond Index thereafter.


**Global bonds:** 40% Australian bonds and 60% Global Ex-Australian bonds.

**Australian equities:** ASX All Ordinaries Index from 1958 through 1969; MSCI Australia Index thereafter.

**Global ex-Australia equities:** S&P 500 Index from 1958 through 1969; MSCI World Ex Australia Index from 1970 through 1987; MSCI ACWI Ex Australia Index thereafter.

**Global equities:** 30% Australian equities and 70% Global Ex-Australian equities.
I. Global economic perspectives

Global economic outlook: Down but not out
As the global economic expansion enters its tenth year, concerns are growing that a recession may be imminent. Although several factors raise the risk of recession in 2019, a slowdown in growth—led by the United States and China—is the most likely outcome.

Our global economic outlook is based on:

- an assessment of the stage of the business cycle for each of the world’s largest economies (Figure I-1);
- estimates of how recent and expected future policy actions (fiscal, monetary, and trade) will affect economic growth and inflation, among other factors, in 2019 and beyond (see regional outlooks); and
- the probabilities of various risk factors and scenarios that could alter our base case (see Figure I-5 on page 10).

Our analysis of fundamentals and the historical drivers of recession leads us to conclude that continued expansion, albeit at a slower pace—rather than imminent collapse—is the most likely scenario for the global economy in 2019. However, this forecast is not sanguine. The expected easing of global growth in the next two years—driven by a fading boost from U.S. fiscal stimulus, more restrictive Federal Reserve policy, and the continued slowing of growth in China—is fraught with economic and market risks.

We provide explicit estimates from our Investment Strategy Group’s economics team of the most prominent risks for 2019 (see Figure I-5 on page 10).

The global economic cycle
The concern about an imminent global recession often rests on the assumption that the U.S. expansion—which is among the longest on record—is clearly at the latest stage of the business cycle. The typical business cycle is characterised by an economy moving through a series of states: early cycle, when growth recovers strongly after a recession; mid-cycle, as an economy approaches and then exceeds full capacity and growth peaks; and late cycle, as the economy slows down and tips into recession.

Notes: The vertical axis represents GDP growth rate relative to each country’s potential growth rate, represented by the horizontal line. There is no inherent time limit on the length of each stage; different economies progress through the stages at varying speeds. The end of an expansion represents below-trend growth, which may or may not match the common definition of recession of two consecutive quarters of negative real GDP growth.

Sources: Vanguard and the International Monetary Fund (IMF).
again. Yet Figure I-1 illustrates that the United States is only now approaching the later stages of expansion, in which imbalances grow larger, growth begins to decelerate, and recession risks increase. Other major economies, such as Europe and Japan, are even further behind given the slower progress made in their return to full capacity.

As the world’s largest economy, the United States is naturally a critical driver of the global business cycle, and so most U.S. recessions are part of global recessions.

One way to assess the risk of a U.S. recession is to gauge the economy’s proximity to the tipping point in the business cycle. Figure I-2 displays a quantitative assessment of the present stage of the U.S. business cycle (that is, early, mid-, or late cycle). The coloured circles indicate that the U.S. economy is only now transitioning toward the later stages of the expansion, despite the recovery’s near-record length. In other words, current fundamentals such as consumer demand, household balance sheets, price inflation, and the present stance of monetary policy suggest that the U.S. recovery could persist at least through 2020. Other indicators,

Notes: Figure I-2a displays the historical ranges of a cyclical index at various points in the business cycle. Index is shown as a z-score and weighted by first principal components of 25 economic indicators (below). The business cycle is determined by historical observations of the output gap. Figure I-2b displays the underlying components of the cyclical index in Figure I-2a, presenting the current level relative to historical observations. The 2007 and 2001 data points indicate the index and component position 12 months prior to the onset of recession. Underlying indicators: slack = output gap, U3 and U6 unemployment rate gap relative to NAIRU. Price pressures = personal consumption expenditures (PCE), core PCE, average hourly earnings, unit labor costs. Demand = housing starts, residential investment, non-residential investment, durable goods consumption. Sentiment = business optimism, consumer sentiment, consumer confidence. Leverage = household financial obligations ratio, nonfinancial corporate debt, FRB Senior Loan Officer Opinion Survey for consumer and commercial and industrial credit terms. Earnings = corporate profits. Financial = Vanguard financial conditions index, yield curve (measured as the 10 year-3 month Treasury yield) Asset prices = Vanguard’s fair-value CAPE, corporate DAS spread, high-yield DAS spread. Monetary policy = federal funds rate versus neutral rate estimated by the Laubach-Williams (2003) model. Data range is 1980 Q1-present.

Sources: Vanguard, Moody’s Analytics Data Buffet, Federal Reserve Bank of St. Louis, Laubach-Williams (2003).
However, are clearly consistent with a slowdown in growth and a more elevated risk of recession, including tight labour markets and high asset valuations (such as equity price/earnings ratios and tight credit spreads).

**Figure I-2** suggests that the chances of a U.S. recession occurring and thereby derailing growth in the global economy are roughly 30% as we enter 2019. U.S. growth in 2019 is likely headed lower, but not below zero—in other words, down but not out.

A modest yet persistent challenge that the global economy will face in 2019 (and beyond) is the growth in global debt. In part because of ultra stimulative global monetary policy, global debt levels have rarely if ever been higher, and may be sowing the seeds for the next crisis. The global debt-to-GDP ratio stood at 220% in 2018, up from 175% in 2008.

Specifically, two segments of the global debt markets are concerning: emerging-market debt denominated in hard currency and non financial corporate debt in the U.S. and Europe. In the case of the latter, rapid growth in so-called leveraged loans is particularly alarming, having accounted for about 50% of the total corporate debt issuance in 2018, according to the International Monetary Fund (IMF). As the business cycle continues to mature and financial conditions gradually tighten in 2019, the global economy will be less able to sustain such credit growth (Chen and Kang, 2018). **Figure I-3** illustrates that credit booms eventually fade, helping to contribute to economic slowdowns.

Although many emerging-market economies are vulnerable, China is the key risk factor given the size of its economy, hefty corporate debt, and rapidly rising household debt. China’s credit profile stabilised moderately in 2017 and 2018, thanks to a recovery in nominal growth and the government’s financial deleveraging campaign. Furthermore, a typical emerging-market debt crisis that is triggered by withdrawal of foreign funding is unlikely, given that over 90% of Chinese debt is domestic. Meanwhile, as downside risk to growth emerges, the Chinese government has engaged in further monetary

---

**FIGURE I-3**

**Most credit booms eventually lead to slower growth, a headwind for 2019**

![Graph showing the relationship between credit booms and slower growth](image)

**Notes:** Credit booms are defined as periods where the credit-to-GDP ratio is growing at a rate of at least 30 percentage points over a rolling five-year window. The change in credit-to-GDP ratio is the difference between the credit-to-GDP ratio at the start of the credit boom and the credit-to-GDP ratio when credit is growing at its fastest rate, again over a rolling five-year window. The change in GDP growth is the average growth differential between the five-year post-boom and five-year pre-boom periods.  
**Sources:** Vanguard calculations, based on data from Bloomberg, the IMF, and the Bank for International Settlements (BIS).
and fiscal easing. These stimulus measures, alongside strengthened capital controls, will most likely avert a near-term crisis in China and spillover to the global economy. Although China may be delaying important long-term reforms, its near-term growth is unlikely to collapse.

Where could the next recession come from?
To understand what factors might cause a global recession today, it is useful to examine what precipitated such downturns in the past (Figure I-4). A more systematic analysis, involving a historical sample of 108 recessions in 23 developed markets over the last 60 years, shows that the length of the expansion is a necessary but not sufficient condition for recession; thus, the duration of the recovery provides little insight into the causes, depth, or even timing of the next recession.

As inflation in most developed markets has fallen to more desired levels since the early 1990s, mainly because of a focus on explicit or implicit inflation-targeting by central banks, the sources of (or catalysts for) global or regional downturns have expanded beyond typical inflation pressures, as they did in the 1970s.

However, there has been no absence of significant inflation shocks to the global economy in the previous four decades. The reason behind the dramatic decline in inflation-induced recessions since the 1980s is that central banks learned to act pre-emptively in the face of inflation shocks, getting ahead of any price-wage inflationary spirals by better managing market expectations.

In 2019, we do not see a material risk of a strong rise in core inflation despite lower unemployment rates and higher wages, assuming inflation expectations remain well-anchored.

FIGURE I-4
Drivers of recessions vary
Drivers of 108 country-specific recessions since 1960

Notes: Recessions are defined as two consecutive quarters of negative real GDP growth. We examined 23 developed economies starting in 1960, or with the earliest available quarterly data. Recessions were categorised using a variety of macroeconomic indicators and historical analysis. Inflation recessions are those where regional inflation averaged greater than 4% in the 12 months preceding the recession’s start. External pressures signify recessions caused by export-demand weakness. Financial imbalance broadly represents a misallocation of capital, either through unsustainable equity, housing, or credit valuations resulting in elevated financial sector stress. Commodity price crashes are most likely to affect commodity export-driven economies. Examples of idiosyncratic factors (other) include weather events, tax increases, and political developments.

Source: Vanguard calculations, based on data from Thomson Reuters, Moody’s Analytics Data Buffet, and the Associated Press.
Vanguard’s risk scorecard

Although we are not predicting a global recession in our central case, a wide range of triggers could spark a global downturn.

Figure I-5 describes some of the global concerns that are front and centre for investors as we head into 2019. For each potential risk, it indicates the odds attached to upside, downside, and base-case scenarios based on our assessment of risks.

Overall, the largest single risk to our forecasts is if an overly aggressive Federal Reserve continues to raise rates beyond 3% in 2019, perhaps because of a temporary rise in core inflation or wages. This risk, if it materialised sometime in 2019, would significantly raise the odds of a U.S. recession in 2020. This would also adversely affect emerging-market countries that are dependent on dollar funding and vulnerable to a strengthening dollar. Other risks are rated at lower odds, yet some of them are interrelated.

### FIGURE I-5

**Global risks to the outlook**

<table>
<thead>
<tr>
<th>2019 global risks</th>
<th>Description</th>
<th>Negative scenario</th>
<th>Base case</th>
<th>Positive scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global monetary policy normalisation</td>
<td>Extreme nature of existing policy stimulus, uncharted territory of quantitative tightening, and uncertainty about the neutral setting for policy ( r^* ).</td>
<td>27%</td>
<td>52%</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>27% Policy mistake in the U.S.: Fed continues tightening beyond ( r^* ) and the yield curve inverts. ECB/BOE hold off on normalisation plans, increasing the divergence of global policy rates.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>52% Soft landing in the U.S. at 2.75%–3%. Gradual ECB/BOE normalisation commences. Global growth slowing back to trend.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21% Soft landing in the U.S. at 3% or higher. Jump in productivity growth leads to higher growth with no inflation and shifts ( r^* ) up. Global trend growth increases without global inflation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade war and protectionism</td>
<td>Bilateral U.S.-China trade war continues to escalate. Tariffs can be increased further and non-tariff barriers can be put in place.</td>
<td>18%</td>
<td>53%</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>18% Trade war extends beyond tariffs to quantitative restrictions, boycotts, etc., with major retaliations from China. Geopolitical risks rise. Impact to GDP growth could be more than 100 basis points.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53% Trade war escalates in intensity, with level of existing tariffs and coverage of imports increased. Impact on the global economy of 30–50 basis points.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>29% The U.S. and China reach a bilateral agreement. Tariffs are rolled back.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instability of Chinese economy</td>
<td>Fears are rising about a potential hard landing in China, given the collateral damage of financial deleveraging and the expectation of continued deterioration in China-U.S. relations.</td>
<td>23%</td>
<td>57%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>23% Capital flows intensify amid further escalation in the trade war and rising Fed policy rate. Policymakers fail to provide enough stimulus. Headline growth falls below 6%.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>57% Further monetary and fiscal easing will support domestic demand, while financial stability risk remains under control. Headline growth likely moderates to 6.0%–6.3% for 2019.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20% U.S.-China striking a trade deal and/or policy over-easing represent upside risks to growth.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Two factors that we have built into our base case for 2019 are escalating U.S.-China trade tensions and some further moderation in China’s economic growth. Those two (interrelated) factors are already acting as a small impediment to global growth in our base case, but the risk is that they could further undermine global demand and ultimately global growth. We also think there is a non trivial risk of disruption to economic activity from a flare-up of the standoff in Europe between Italy’s government and European policymakers that, in extremis, could lead to Italy’s exit from the euro area. Brexit-related risks continue to drag on the United Kingdom’s economy and, to a lesser extent, Europe’s, but we do not see this as one of the major risks likely to lead to a global downturn.

FIGURE I-5 (continued)

Global risks to the outlook

<table>
<thead>
<tr>
<th>2019 global risks</th>
<th>Description</th>
<th>Negative scenario</th>
<th>Base case</th>
<th>Positive scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro breakup risk</td>
<td>An escalation in tensions relating to Italy. The risk is that the European Commission will assess penalties on Italy, which further stokes Italian resentment toward the European Union and provokes an Italian exit from the euro.</td>
<td>16%</td>
<td>68%</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>The Italian government maintains a loose fiscal policy that results in EU sanctions, prompting a political crisis and eventual departure from the euro. This results in a wider crisis in the euro area and the departure of more countries.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Italian government revises fiscal policy to abide by EU rules and market tensions subside, but public and private sector deleveraging is still minimal. Euro breakup concerns are diminished but have not disappeared.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emerging-market debt crises</td>
<td>Key drivers of emerging-market cycles are global monetary divergence, the effect of the U.S. dollar on dollar-denominated debt and global/China demand for commodities.</td>
<td>24%</td>
<td>57%</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Trade wars, a slowdown of the Chinese economy, or a strong U.S. dollar due to continued divergence of monetary policy lead to spillovers and broader emerging-market crises.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emerging-market debt crises remain contained to a few idiosyncratic cases. Global monetary convergence and the stabilisation of the Chinese economy ease the risk of contagion to all emerging markets.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.S. dollar level normalises as developed-market central banks commence normalisation. Risk-on environment helps emerging markets undergo V-shape bounce-back.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Odds for each scenario are based on median responses to a poll of Vanguard’s Global Economics and Capital Markets Outlook Team.

Source: Vanguard.
Global growth outlook: Moderating to trend
Vanguard dashboards of leading economic indicators and implied economic growth for 2019

2019 Australia growth outlook: No boom, but not bad
We expect the Australian economy to revert to its trend growth of 2.7% through 2019. Our proprietary Australia leading indicators dashboard is a statistical model based on more than 40 leading economic indicators from major sectors of the Australian economy. As Figure I-6a shows, the pickup in green (above trend) indicators points to the potential that growth experiences a cyclical pickup. The most positive (green) indicators are those associated with the labour market and sentiment. The negative “red signals” are associated with retail sales, some commodity exports, and credit/financial conditions. The only below trend but positive momentum signals (yellow) are expectations of labour costs and market performance of the consumer staples sector. Our most prominent risks to the Australian outlook include the set of global risks and a slowdown in the labour market. Using simple regression analysis, we mapped our proprietary indicators to a distribution of potential scenarios for Australia’s economic growth in 2019, as shown in Figure I-6b. The odds of growth at or exceeding 4% in 2019 (13%) are balanced with growth slowing down in 2019 (42%). Our base case is for growth of around 2.5-3% in 2018, though our dashboard might suggest that more strength lies ahead.

United States: Above trend but falling
Our proprietary U.S. leading indicators dashboard is a statistical model based on more than 80 leading economic indicators from major sectors of the U.S. economy. As Figure I-6c shows, in spite of a high proportion of green indicators (above-trend readings) in the dashboard at present, there is an incipient increase in red indicators, signaling the start of a gradual slowdown in the U.S. economy. The most positive (green) indicators are those associated with increased business and consumer confidence, a tightening labour market, and a stronger manufacturing sector. The negative (red) indicators are associated with trade balance, disposable personal income, and mortgage applications. Building permits and new-vehicle sales are below trend but show positive momentum (yellow indicators).

Figure I-6

a. Australian economic indicators

b. Estimated distribution of Australia growth outcomes

Notes: Distribution of growth outcomes generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1980 to 2018 and adjusting for the time-varying trend growth rate. Trend growth estimated according to model presented in Lancaster and Tulip (2015). Source: Vanguard calculations, based on data from CEIC and Thomson Reuters Datastream.
c. U.S. economic indicators

- Above-trend growth: Business and consumer confidence, manufacturing surveys, industrial production
- Below trend, but positive momentum: Building permits, new-vehicle sales
- Below trend and negative momentum: Trade balance, disposable personal income, mortgage applications

d. Estimated distribution of U.S. growth outcomes

- Odds of a slowdown
- Odds of an acceleration: 20%

Notes: Distribution of growth outcomes generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2018 and adjusting for the time-varying trend growth rate. Trend growth represents projected future estimated trend growth.

Source: Vanguard calculations, based on data from Moody's Analytics Data Buffet and Thomson Reuters Datastream.

---

e. China economic indicators

- Above-trend growth: Business and consumer confidence, manufacturing surveys, industrial production
- Below trend, but positive momentum: Building permits, new-vehicle sales
- Below trend and negative momentum: Trade balance, disposable personal income, mortgage applications

f. Estimated distribution of China growth outcomes

Notes: Distribution of growth outcomes generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2018 and adjusting for the time-varying trend growth rate. Trend growth represents projected future estimated trend growth.

Source: Vanguard calculations, based on data from CEIC and Thomson Reuters Datastream.
Using regression analysis, we mapped our proprietary indicators to a distribution of potential scenarios for U.S. economic growth in 2019, as shown in Figure I-6d. The odds of growth at or exceeding 3% in 2019 (38%) are lower than the odds of growth slowing down (62%). Our base case is for U.S. growth to moderate toward its long-term trend of 2%.

China: Continued deceleration
China is expected to continue its modest deceleration in 2019, with risks tilted to the downside, according to our proprietary China leading indicators dashboard (Figure I-6e). Specifically, despite ongoing policy efforts to stabilise near-term economic growth and combat international headwinds (as evident in improving fixed asset investment and commodity production), yellow and red indicators associated with softening sentiment and worsening asset returns suggest that more-aggressive stimulus measures may be needed to bolster private enterprise. Against this backdrop, China’s economy is expected to grow by about 6%–6.3% in 2019 (Figure I-6f), with the risks of a downside slightly greater than those of a growth acceleration.

Euro area: Above trend but falling
The euro area is expected to grow at a moderate rate of about 1.5% in 2019, which is slightly above trend. As illustrated by our leading indicators dashboard (Figure I-6g), the proportion of indicators that are tracking above trend fell throughout 2018, primarily driven by a weaker industrial sector and net trade. A slowdown in the global trade and industrial cycle, in addition to delays in German car production, explains most of this deterioration in economic momentum; German exports and German industrial production are both currently in the red category, indicating below-trend growth and negative momentum. We expect growth to stabilise in the first half of 2019 as car production recovers. Moreover, a large proportion of leading indicators are still in green territory, including business and consumer sentiment, labour market data, and monetary policy. This should provide support to growth next year. However, as shown in Figure I-6h, the risks to the growth outlook are skewed to the downside given China’s continuing slowdown, U.S.-China trade tensions, and elevated political risks concerning Brexit and Italy.

Figure I-6 (continued)

G. Euro-area economic indicators

<table>
<thead>
<tr>
<th>Indicators above/below trend</th>
<th>Real GDP growth year-over-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above-trend growth: Business and consumer confidence, interest rates, employment growth</td>
<td>8%</td>
</tr>
<tr>
<td>Below trend, but positive momentum: Building permits, real wages</td>
<td>6</td>
</tr>
<tr>
<td>Below trend and negative momentum: Industrial production, export growth, new factory orders</td>
<td>4</td>
</tr>
<tr>
<td>Real GDP growth year-over-year (right axis)</td>
<td>2</td>
</tr>
</tbody>
</table>

Notes: Distribution of growth outcomes generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2018 and adjusting for the time-varying trend growth rate. Trend growth represents projected future estimated trend growth.

Source: Vanguard calculations, based on data from Bloomberg and Macrobond.
Australia: The economy may pleasantly surprise

Australia has not been immune from the concern that the business cycle may turn. For a ‘small open economy,’ external risks will always loom large. Further pessimism stems from persistently low inflation, lacklustre wages growth, and declining house prices. Any talk of upside is quashed with bearish counterpoint. Fundamentals have been strong, and the labour market flirts with ‘full employment.’ Our baseline view is that growth reverts to trend, and the 2019 GDP falls between 2% and 3%. Australia’s trend growth has declined due to changing technology, demographics, and globalisation. Last year, we noted that markets might confuse the trend for the cycle, and this observation still applies; any fade in growth could be mis-diagnosed as fundamental weakness.

Our leading indicator dashboard signals (see Figure I-6a on page 12) that the economy’s strength may continue for some time yet. Over 2018, the labour market improved substantially, with the underemployment rate falling and the headline unemployment rate now sitting at 5%. The Reserve Bank of Australia previously thought that this ‘full employment’ threshold would not be achieved until 2020, so in many ways, we are ahead of where we expected to be. Most of the ‘green’ on the dashboard represents labour market indicators, thus any further acceleration would be healthy (not leverage-induced). Notably, our forecast distribution places the probability of outright recession (growth below 0%) over 2019 at 10%.

There is a small possibility that the labour market sparks a wage or inflation surprise in 2019. Figures 1-7a and 1-7b compare Australia’s labour market to the United States. Both economies are experiencing labour shortages, as official statistics and surveys cite difficulty finding workers. These series trend with wages growth – intuitively, the only feasible way to fill unmet demand (aside from hiring more workers) is to entice potential hires with increased wages. In the USA, this shortage preceded a strong boost to wages and CPI in February 2018, though it surprised investors. The massive repricing of economic expectations induced considerable market volatility. Given that job vacancies are at all-time highs and wages have been slow to respond, a similar event might unfold in the future.

Figure I-7

The labour market is tight

a. Despite divergence after the mining boom, rising vacancies hint at higher wages

b. …as job openings signalled ahead of wages in the USA

Source: Vanguard calculations, using data from the Australian Bureau of Statistics and CEIC. The Job Vacancies Survey was suspended from 2008 Q3 to 2009 Q3.

Source: Vanguard calculations, using data from the U.S. Bureau of Labor Statistics and CEIC.
After the labour market, most point to housing as a barometer of Australia’s health. Housing is highly correlated with the business cycle, as we discussed in our recent research *The Fundamentals of Housing*. The decline in house prices stir up part of the concern over the business cycle. Our primary explanation for the slowdown, however, is that speculation has receded. Additionally, attached dwellings face a persistent supply glut, effecting capping price growth. Figures 1-8a and 1-8b present snapshots of detached and attached dwelling markets. Transaction volumes have plummeted, especially for detached houses. If investors and speculators have withdrawn from the market, then only serious buyers remain, and they have just one response to the current price level: not buying it.

Figures 1-9a and 1-9b support our view that speculation is fading. Housing finance commitments have softened recently, especially investor loans. APRA’s limit on banks’ investor loan growth is responsible for some of this decline, but the magnitude – and the series’ volatility – suggests that investment loans represented levered property bets. Furthermore, as household debt is at all-time highs, most households are not keen to borrow more. With increased scrutiny on lending practices, banks are making access to credit more difficult. Together, these forces deter all but the most serious buyers with financial capacity. House prices may continue to decline, especially in the eastern capitals, though as we noted in *The Foundations of Housing*, the speed and intensity of declines will indicate the economy’s likely path. Slow declines in house prices over a longer period would not affect the business cycle as acutely as deeper, quicker drops.

The Reserve Bank of Australia (RBA) has the unenviable task of setting monetary policy to balance a tightening labour market, flagging inflation, and anxiety over housing. It is understandable that consensus pushes expectations for increases in the official cash rate later into 2019-2020. Figures 1-10a and 1-10b plot inflation and the unemployment gap against the RBA’s actions. Since mid-2015, core inflation has missed the target range (2%-3%), fueling doubt that inflation – and hence, interest rates – will rise. Adding to the scepticism that the next move is up, not down, the RBA has not responded to the labour market, severing a link between unemployment and interest rates that investors assumed would continue.

**FIGURE I-8**

Excess supply and low transaction volumes can explain much of the decline in prices

a. Declining house prices have followed transaction volumes…

b. …while units face a literal buildup of supply

---

Notes: Supply is defined as the sum of building commencements and completions in a given quarter. Established transfers are calculated as the sum of the transfer series for the available capital cities for detached houses and units, respectively. Both price indices refer to the capital cities.

Source: Vanguard calculations, using data from the Australian Bureau of Statistics and CEIC.
FIGURE I-9
Speculators could be retreating from the apartment market… 
and households aren’t keen on more debt

a. Declines in finance commitments could signal credit tightening…

b. …though households simply might not want more debt

Source: Vanguard calculations, using data from the Australian Bureau of Statistics and CEIC.

FIGURE I-10
The RBA faces an uphill battle convincing everyone that the next move is up

a. Inflation has been below target since 2016, embedding doubt that the RBA will get there

b. The RBA has not responded to the labour market’s recent tightening

Source: Vanguard calculations, using data from the Reserve Bank of Australia, Australian Bureau of Statistics, Thomson Reuters Datastream, and CEIC.
As a result, investors look for ways to reconcile what they see: the muted rebound of wages (Figure I-7a) only boosts their conviction that rates ought to remain steady.

We think investors understand Australia’s risks, but worry that they are complacent that the RBA will be on hold for so long. ‘Full employment’ is not a ‘yes/no’ condition: a low unemployment rate does not immediately create wage acceleration. Each passing month of labour market improvement pressurises wages and prices. An upward surprise in either, like what unfolded in February 2018 in the USA, becomes more likely in this environment, though investors are not pricing it.

Indeed, the RBA continues to face a dilemma, reinforced by expectations anchored to the status quo. Figure I-11 updates our framing of the dilemma with added indicators. Low wages and inflation are the only things holding investors back from embracing a neutral or positive view, as many signals are strong and improving. The RBA highlights the strength of the labour market and consumption in its public commentary, and has used similar visuals to Figure I-7a to highlight issues in the labour market.

Our baseline forecasts project a year of trend growth for Australia. This scenario is probable and the RBA would continue to drag its feet on raising the cash rate if we drew this outcome from the set of possibilities. Yet, the tightness of the labour market signals that perhaps more upside awaits. Since many investors may treat our baseline as ‘best case,’ they risk being caught off-guard by an upward surprise. It is impossible to predict when, or if, a surprise would occur. However, the market is most vulnerable when convinced that the status quo will continue.

FIGURE I-11
Doubt in the RBA comes from the dilemma they face

<table>
<thead>
<tr>
<th></th>
<th>Value at time of writing</th>
<th>Economic interpretation/Implied Rate Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Gap</td>
<td>−0.4%</td>
<td></td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Unemployment Gap</td>
<td>−0.3%</td>
<td></td>
</tr>
<tr>
<td>Unemployed-Vacancy Ratio</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Dwelling Investment Growth</td>
<td>3.8%</td>
<td></td>
</tr>
<tr>
<td>Real Consumption Growth</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>Credit-to-GDP Gap</td>
<td>−7.9%</td>
<td></td>
</tr>
<tr>
<td>Underemployment</td>
<td>8.1%</td>
<td></td>
</tr>
<tr>
<td>House Price Growth</td>
<td>−0.3%</td>
<td></td>
</tr>
<tr>
<td>AUD TWI Growth</td>
<td>−6.0%</td>
<td></td>
</tr>
<tr>
<td>Core Inflation</td>
<td>1.8%</td>
<td></td>
</tr>
<tr>
<td>Wage Growth</td>
<td>2.3%</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Most data as at Q3 2018; Credit-to-GDP gap as at Q1 2018, dwelling investment, house prices, and real consumption as at Q2 2018.
Source: Vanguard calculations, using data from the Australian Bureau of Statistics, Reserve Bank of Australia, Bank for International Settlements, Thomson Reuters Datastream, CEIC.
United States: Going for a soft landing

Much of our global outlook hinges on our expectations for conditions in the United States. In 2019, U.S. economic growth should decline from current levels toward trend growth of about 2%. While we believe a recession remains some time off (see Figure I-2 on page 7), we expect the U.S. labour market will cool, with employment growth falling closer in line with the trend growth of the labour force (80,000–100,000 per month), and structural factors such as technology and globalisation should prevent inflation from rising significantly above the Federal Reserve’s 2% target.

The strong performance of the U.S. economy over the last two years is in part explained by significant support from expansionary monetary and fiscal policies. We estimate that the latter contributed over 50 basis points to headline growth in 2018. (A basis point is one-hundredth of a percentage point.) In 2019, we expect monetary policy to dial back to “neutral,” with the federal funds rate reaching 2.75%–3% in June of 2019. On the fiscal policy front, we may continue to see the expansionary effects of the Tax Cuts and Jobs Act through the first part of the year. However, we expect the boost to the year-over-year GDP growth rates from consumer spending to begin fading away toward the second half.

But the strong performance of the U.S. economy has been due to more than just policy. The U.S. consumer has been the key engine of growth during the recovery from the global financial crisis, with almost all drivers of spending firing on all cylinders, including recent support from lower income-tax payroll withholdings (see Figure I-7 on page 15). Looking ahead to 2019, the dashboard gets a bit more muddled. Nothing is flashing red, but, with the exception of household debt measures and wage growth, all indicators get worse. Higher interest rates will start to bleed through to mortgage rates and rates for auto and personal loans. They will also affect asset valuations in credit-sensitive sectors such as housing. On the jobs front, it will be hard for the U.S.

---

**Figure I-12**

**Dashboard of consumer drivers**

<table>
<thead>
<tr>
<th>2017/2018</th>
<th>2019</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage growth</td>
<td></td>
<td>Further improvement in wages will be limited by low labour productivity growth</td>
</tr>
<tr>
<td>Jobs (growth, lower unemployment)</td>
<td></td>
<td>Employment growth will level off</td>
</tr>
<tr>
<td>Household debt to disposable income</td>
<td></td>
<td>Outstanding debt and the cost of servicing it will remain low</td>
</tr>
<tr>
<td>Wealth effects</td>
<td></td>
<td>High equity valuations and market volatility on the rise could be a drag on financial wealth. Rising rates will affect credit-sensitive sectors, including home prices. Year-over-year tax cuts will disappear.</td>
</tr>
<tr>
<td>Interest rates and cost of credit</td>
<td></td>
<td>Mortgage rates and rates for auto and personal loans will rise</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td></td>
<td>Unknown; policy uncertainty and market volatility will rise</td>
</tr>
<tr>
<td>Consumer prices (inflation and import prices)</td>
<td></td>
<td>Inflation will stay close to the Fed’s target</td>
</tr>
</tbody>
</table>

economy to replicate the impressive pace of job creation of the last two years. While the labour market will stay strong, it may not provide similar contributions to growth in 2019. And several unknowns such as trade policy uncertainty, increased market volatility, and high equity valuations will possibly affect consumer confidence and stock market wealth.

One of the most puzzling aspects of an otherwise strong U.S. economy continues to be subpar wage growth. As the unemployment rate (3.7% as at November 2018) has fallen to the lowest level since the 1960s, why does wage growth, which is only now reaching 3%, remain so tepid by historical standards?

All else equal, stronger demand for workers should result in higher wages, but all else is not equal. Fundamentally, we should not expect inflation-adjusted (real) wages to exceed the levels of labour productivity growth and inflation. Productivity growth rates have been 1% since the recovery began in 2010, compared with 2% before the global financial crisis. This means we should not expect pre-crisis levels of wage growth, particularly after incorporating inflation, which has struggled to consistently achieve the Fed’s 2% target (see Figure I-13).1

While low labour productivity can explain subdued real wage growth, one concern that investors have for 2019 is that ever tighter labour markets could eventually fuel a wage-inflation spiral involving nominal wages and final consumer prices. The concern is rooted in the strong historical relationship between nominal wages and inflation. However, as shown in Figure I-14a, the beta of nominal wage growth on consumer inflation has declined significantly since the 1990s. At the core of this shift in the wage-inflation relationship is the Fed’s ability to manage inflation expectations effectively. If they

FIGURE I-13
Absent a significant increase in productivity, higher wage growth is unlikely

Notes: Real wage growth is calculated as the growth rate of hourly wages as reported in the Employment Cost Index (ECI) minus core PCE inflation rate for that year. Trend for real wage growth is estimated as a centred three-year moving average of real wage growth.

Sources: Congressional Budget Office, Bureau of Labor Statistics.

remain in check, workers would have little reason to fear high inflation and thus would not demand higher nominal wages above and beyond any labour productivity gains plus reasonable levels of inflation around the Fed’s 2% target. If wage gains keep pace with productivity and inflation expectations remain near the Fed’s target, unit labour costs for businesses would not rise faster than inflation and there would be no impact on final consumer prices.

Inflation expectations and the Fed’s ability to manage them (that is, the Fed’s credibility) are often overlooked in Phillips curve models that correlate rising inflation with low unemployment. Figure I-14b shows our inflation estimates from an augmented Phillips curve model that incorporates not only labour market slack but also inflation expectations and other secular forces affecting inflation, such as globalisation and technology. Core inflation is projected to hover closely near the Fed’s inflation target in 2019.

Yet it is this Phillips curve logic that has many who are attempting to anticipate the Fed’s next move very focused on the labour market. However, in 2019, the Fed will be able to worry less about the unemployment-inflation link by leaning heavily on its credibility with the market. It will instead rely more on its assessment of a neutral policy stance as its guiding principle.

Calibrating policy rates to neutral is an extremely complex exercise full of risks. The so-called soft landing requires significant skill by policymakers. The neutral rate (usually referred to as r*) is a moving target and not directly observable, as it has to be estimated with statistical models. The Fed’s extremely gradualist approach during this rate-hiking cycle does help increase the odds of a successful landing this time, however. Our best attempt to estimate the neutral rate places it somewhere in the 2.5%–3% range. If this is correct, the Fed is likely to...

FIGURE I-14

Runaway inflation remains unlikely

a. Pass-through of earnings to inflation has waned with anchored inflation expectations

b. An “augmented” Phillips curve model

Notes: Figure indicates the sensitivity of core PCE inflation to year-over-year growth in average hourly earnings using rolling ten-year regression coefficients. Data cover January 1960–September 2018.

Sources: Vanguard calculations, Moody’s Analytics Data Buffet.

Notes: Core PCE model is a root mean square error (RMSE)-weighted average of two models: a bottom-up model where we model the deviation of augmented Phillips curve fitted values to each major component in the core PCE and a top-down macro model. The RMSE is 0.35 for the bottom-up model and 0.24 for the top-down model. This leads to a 40% weight for the bottom-up model and a 60% weight for the top-down model in the weighted model.


2 See the 2018 Vanguard Global Macro Matters paper From Reflation to Inflation: What’s the Tipping Point for Portfolios?
increase the policy rate to a range of 2.75%–3% by June of 2019 and then stop or at least pause to reassess conditions.

The risks to our view are not negligible. Historically, the U.S. Treasury yield curve has provided one of the clearest real-time indicators of overly tight policy. If policy becomes too restrictive, the slope of the yield curve falls, and at some point before a recession, it inverts.\(^3\) Inversion typically occurs when the market believes the Fed has gone too far and drives the yield of the 10-year Treasury below the federal funds rate and that of the 3-month Treasury yield. Recession typically ensues 12 to 18 months later. Since the onset of policy rate increases in 2015, the slope of the Treasury curve has flattened from 300 basis points to around 80 basis points today. As the Fed continues to normalise policy in 2019, the risks of inversion will build (Figure I-15a). Some subscribe to the view that a new policy environment means that a flatter yield curve does not hold the same predictive power it once did. Our research leads us to believe that while this power has diminished over time, it still presents a fairly significant risk to our 2019 U.S. base case.\(^4\)

![Figure I-15](image)

**The yield curve remains a relevant leading indicator of economic growth**

a. Further flattening expected; inversion risk increases in 2019

b. Relationship of growth to yield curve has not deteriorated in the quantitative-easing era

Notes: FFR refers to federal funds rate. The U.S.10-year Treasury path range uses the 35th to 65th percentile of projected VCMM path observations. Distribution of return outcomes is derived from 10,000 simulations for each modeled asset class. Simulations are as at 30 September 2018. Results from the model may vary with each use and over time.

Sources: Vanguard calculations, based on data from Thomson Reuters Datastream and Moody’s Analytics Data Buffet; Federal Reserve Bank of New York.

---

\(^3\) As measured by the difference between 3-month and 10-year constant-maturity Treasury yields.

\(^4\) See the 2018 Vanguard Global Macro Matters paper *Rising Rates, Flatter Curve: This Time Isn’t Different, It Just May Take Longer.*
Outside of monetary policy, the largest domestic risk to our U.S. outlook stems from trade policy. Trade represents a relatively small proportion of the U.S. economy (20% of GDP vs. a developed-market average of 35%). However, if trade tensions reverberate through financial markets (as shown in increases in the BBB spread in Figure I-16), the implications for economic conditions, including growth, become more significant. While we believe the U.S. will avoid recession in 2019, if the impacts of monetary and trade policies spread to financial markets, the likelihood of a downturn will become more substantial.

**Euro area: Stable growth as policy normalises**

After a sharp slowdown in 2018, euro-area growth is likely to stabilise around 1.5% in 2019, which is slightly above trend (see Figure I-6h on page 14). The slowdown was exacerbated by weak global demand for euro-area exports and delays to German car production as carmakers adjust to new European Union (EU) emissions standards.

In early 2019, we expect growth to modestly rebound as car production gets back on track. In addition, domestic demand in the euro area is likely to remain resilient, supported by healthy levels of business and consumer confidence and very low interest rates, which should continue to stimulate demand for credit. A stronger rebound remains unlikely in our view, given China’s ongoing slowdown and U.S.-China trade tensions, which will weigh on demand for euro-area exports.

In 2019, risks to the euro area are tilted slightly to the downside, given a number of important global risks we outlined in the global growth outlook section. Domestically, the biggest risk is a further escalation in tensions between Italy’s government and European policymakers. In 2019, Italy may break the 3% fiscal-deficit ceiling imposed on all EU members, and given the recent downgrade of Italian sovereign debt by key ratings agencies and the associated rise in Italian bond yields, Italy’s debt levels are likely to remain elevated for the foreseeable future. Nervousness about Italy’s fiscal position may spill over to other Italian assets and to periphery bond markets, which on its own could dampen growth. The larger risk, however, is that the European Commission imposes penalties on Italy, further stoking Italian resentment toward the EU and provoking Italy to exit from the euro. We think the chance of an Italian exit is only 5% over the next five years, but the situation warrants close attention.

**FIGURE I-16**

**Trade war impacts**

GDP impact of higher costs of traded goods and financial market uncertainty

Baseline: A 25% tariff on $350 billion in imported goods (approximate amount of the U.S. trade deficit with China) and a retaliatory 25% tariff on $350 billion in exported goods along with a 25-basis-point widening of the credit spread.

Further escalation: A 25% tariff on a further $200 billion in imported goods (approximate amount of automobile, steel, and aluminum imports exposed to announced tariffs) and retaliatory 25% tariff on a further $200 billion in exported goods along with a 100-basis-point widening of the credit spread.

Notes: All figures in USD. Tariff impacts are based on increasing prices of imports and exports by percentage indicated in the Federal Reserve’s FRB/US model. The credit spread is the BBB spread. BBB spread impacts are based on shocking the yield spread of long-term BBB corporate bonds versus the 10-year Treasury bond yield by the indicated percentage.

Source: Vanguard calculations, based on the Federal Reserve’s FRB/US Model.
In 2019, we expect the labour market to continue tightening, given that growth is likely to remain above trend for most of the year. The unemployment rate, now close to 8%, is likely to approach 7.5% by year-end, leading to a further lift in wage growth and core inflation (Figure I-17a).

At this stage, we see a low probability of a surprise surge in core inflation, for two key reasons. First, Germany’s economy is becoming deeply integrated with low-wage countries in Central and Eastern Europe, so German firms will be unwilling to offer higher wages at home. Second, periphery countries such as Italy, Spain, and Portugal need to contain their labour costs to restore competitiveness with the more efficient German economy.

Given this environment of tightening labour markets and rising inflation pressures, we expect the European Central Bank (ECB) to lift interest rates for the first time in late 2019 (Figure I-17b). By that stage, we estimate that the output gap will be slightly positive, with core inflation on track to reach target over the short to medium term. This will be followed by a very gradual hiking path thereafter (25 basis points every six months), given that we do not anticipate strong price pressures, as outlined above. Our analysis suggests that core inflation is unlikely to reach the ECB’s target until wage growth increases.

**FIGURE 1-17**

**European wage pressures are building, which will prompt the ECB to initiate a gradual hiking cycle**

a. Drivers of euro-area wage growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Productivity</th>
<th>Past Inflation</th>
<th>Labor Market Slack</th>
<th>Compensation per Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>-1.0</td>
<td>-0.5</td>
<td>0</td>
<td>-0.5</td>
</tr>
<tr>
<td>2012</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2014</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>2016</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2018</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Notes: This decomposition has been derived from an OLS regression of compensation per employee on productivity growth, past inflation, and labour market slack. The nonaccelerating inflation rate of unemployment (NAIRU) is derived from the estimate by the Organisation for Economic Co-operation and Development (OECD).

Source: Vanguard calculations, based on data from Eurostat and the OECD.
United Kingdom: Brexit is still the wild card

The United Kingdom is set to leave the EU on March 29, 2019. What happens beyond then depends on what, if any, deal it strikes with the EU. Under our base case, we assume that an agreement is reached that has the United Kingdom leave in March, with some kind of free-trade deal that starts after a transition period. In the long run, according to government estimates, U.K. GDP would fall by as much as 5%. In 2019, however, the transition period would help limit disruption to the economy, so growth would be likely to remain around trend at 1.6%.

In contrast to previous years, our conviction in our base case is relatively low, given that several Brexit options are still on the table that could materially affect growth. One of the two most prominent risks is a “Crash Brexit,” in which the United Kingdom fails to reach a deal and effectively falls out of the EU with no backstop. Such a scenario could be chaotic in the short run, depending on what sort of safety net the government puts in place, leading to sharply lower growth and possibly a recession.

The second risk is a “No Deal Brexit” scenario, in which the U.K. Parliament fails to ratify the deal, which could potentially lead to a second referendum and a vote to remain in the EU. Under this scenario, there would be several months of uncertainty as the referendum takes place, but a decision to remain in the EU could boost growth.

Headline and core inflation are likely to slow and ultimately settle close to 2% in 2019, after being pushed well above target by the sharp drop in the pound sterling after the EU referendum (Figure I-18a on page 26). There will still be further upward pressure on inflation, mostly from low unemployment and rising wages. However, we expect the Bank of England to preemptively respond to this potential inflation pickup to keep consumer price growth in line with its 2% target.

U.K. inflation is currently above the Bank of England’s 2% target, and in normal times, this would already warrant policy tightening. We are not in normal times, however, given that the country is about to leave the EU.

The Bank of England understands that sentiment is fragile and that the possibility of a “No Deal Brexit” is still on the table, so a rate hike could damage sentiment and push the United Kingdom into an unintended slowdown. We therefore believe that the central bank is likely to keep rates on hold until there is further clarity around Brexit.

If our base case plays out, and a “Compromise Brexit” deal is struck before March 2019, we would expect the Bank of England to increase rates twice in 2019, in May and in November, to bring inflation back in line with target (Figure I-18b on page 26). If no Brexit deal is reached, however, it will need to reassess its inflation outlook. If the hit to aggregate demand is judged to be greater and more persistent than the hit to aggregate supply, interest rates may be cut. But there is a chance that rates may need to rise even in a “No Deal Brexit” scenario, as the negative supply shock could lead to inflation accelerating above target for a sustained period.

Notes: Economists’ forecast reflects the median expectation from a survey conducted by Bloomberg. The forecast implied by market pricing is derived from the forward overnight interest rate swap curve.
Sources: Vanguard, Bloomberg.
FIGURE I-18

Bank of England to hike rates twice per year to stem inflation pressures

a. U.K. goods inflation is expected to fall because of a stronger pound

![Graph showing year-over-year change in U.K. core goods inflation and trade-weighted sterling index.]

Sources: Bloomberg and the Office of National Statistics.

b. Bank of England rate view (versus forward curve and economists’ forecast)

![Graph showing interest rate forecasts and rates over time.]

Notes: Economists’ forecast reflects the median expectation from a survey conducted by Bloomberg. The forecast implied by market pricing is derived from the forward overnight interest rate swap curve.

Sources: Vanguard and Bloomberg.
China: Reprioritising policy goals amid rising risks

The confluence of China’s financial deleveraging campaign and rising geopolitical tensions with the United States has predictably shaken private sector confidence and slowed Chinese economic growth in 2018. These factors, along with the expectation of continued friction in China-U.S. relations, have compelled policymakers to reprioritise near-term growth stability over long-term economic restructuring and medium-term financial stability (see Figure I-19). As the government ramps up efforts to boost domestic demand in 2019 amid rising external and domestic challenges, we view the chance of a hard landing as low and expect China’s economy to settle into a lower growth range of 6%–6.3% in 2019.

External headwinds have been rising as the United States and China approach a full-blown trade war. The stimulus from export front-loading is waning, and the true economic implications of U.S. tariffs will become apparent. We estimate the direct impact of current tariffs on China’s GDP growth at a modest −0.15%, but this could accelerate to −0.60% with a 25% tariff on U.S. imports from China.

Figure I-19

China’s current easing is more moderate than in prior cycles

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic objectives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth stability</td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>HIGH</td>
</tr>
<tr>
<td>Financial stability</td>
<td>LOW</td>
<td>HIGH</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Structural reform</td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>HIGH</td>
</tr>
</tbody>
</table>

Policy bias

- Tightening
- Easing

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity tools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currency depreciation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure spending</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax policy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank credit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shadow credit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property regulations</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Vanguard.
In addition, the potential downside is greater when considering the indirect impact on the labour market, consumption, business confidence, and financial markets. Although there are hopes that a trade deal is imminent, the U.S.-China conflict extends beyond trade to areas such as investment, technology, intellectual property rights, market access, and industry policy. Hence, the path to an eventual truce between the two economic superpowers is likely to be bumpy and prolonged.

China’s 2016–2017 financial sector deleveraging campaign and regulatory crackdown on shadow banking had the adverse side effect of curbing credit to small and medium-sized private enterprises, a key component of China’s new economy. As policymakers recognise the downside risk to growth, they are ready to pause or even modestly backtrack these deleveraging efforts to boost corporate sentiment; further monetary easing, such as required reserve ratio cuts, is in the pipeline (see Figure I-20). We expect regulatory reform aimed at encouraging entrepreneurship and private enterprise,

**FIGURE I-20**

Proactive policy stimulus should limit growth downside
Vanguard Financial Conditions Index versus Nowcast Index

Notes: Vanguard Financial Conditions Index is a VAR-weighted index of financial indicators. Positive values imply accommodative financial conditions; negative values imply tight conditions. Vanguard’s Nowcast Index is designed to track China’s economic growth in real time using a dynamic factor approach to weight economic and financial market indicators, accounting for co-movement between the factors. 

Source: Vanguard calculations, based on data from Bloomberg, CEIC, and Thomson Reuters Datastream.
alongside fiscal expansionary measures including infrastructure investment and tax cuts, to combat the effects of a trade war.

Responding to the slowdown through monetary policy easing revives the “impossible trinity” as the United States continues to raise interest rates. However, we believe a repeat of 2015–2016, when China foreign exchange reserves declined by more than $1 trillion in 18 months amid a surge in capital outflows, is unlikely. With near-term growth stability becoming the top priority, monetary policy independence will prove critical in keeping domestic rates low in a global rising rate environment. As such, an “asymmetric capital control” is likely to be maintained, with tight control on outflows and inflows welcomed. A more flexible exchange rate regime should be allowed, especially when modest depreciation will be needed to offset the negative impact stemming from tariffs (see Figure I-21).

Although navigating the trilemma is a challenge in its own right, an ideal “Goldilocks” policy response would neutralise economic headwinds while pushing forward market reforms and safeguarding medium-term financial stability. The government will strive to avoid both under-

---

**FIGURE I-21**

From an impossible tri-brid approach to a standard corner solution

China is moving toward less capital-account openness and more exchange-rate flexibility

---

The current world environment is making it difficult for China to sustain all three (partial) fronts simultaneously.

These forces are driving China to make a change.

---

Fixed exchange rate
- Saudi Arabia
- Jordan

Monetary union/currency board
- Europe
- Hong Kong

---

5 The impossible trinity is a trilemma in international economics that states that it is impossible to have a fixed foreign exchange rate, free capital movement (absence of capital controls), and independent monetary policy at the same time.
and over-easing the economy in 2019, but achieving this balance amid multiple goals will be difficult. While we are not as concerned about the near-term growth outlook as many in the market and view the chance of a hard landing as rather low, there are rising concerns that the government is delaying the reforms necessary to alleviate medium-term financial risk and ultimately address distortions in resource allocation (see Figure I-22).6

Even though the path is likely to be bumpy, we remain cautiously optimistic that China will resume its economic liberalisation and reform as a necessary response to enduring international and domestic pressures. The era of “growth at all costs” is coming to an end, and previous inefficiencies and excesses that were masked by China’s size and population can no longer go unaddressed. Reform efforts in recent years have demonstrated China’s commitment to emphasising high-quality growth and progressing to a technology-intensive consumption- and service-oriented economy. We believe that continued reforms to improve corporate governance of state-owned enterprises; strengthening intellectual property protection; and providing a level playing field for all firms, including foreign, private, and state-owned enterprises, are critical for China’s long-term development through more efficient capital allocation in domestic and international markets. In our view, this is China’s ultimate path to higher productivity and future growth potential.

Japan: No exit, but more flexibility

The Japanese economy has managed to weather multiple natural disasters and softening external demand in 2018, thanks to strong domestic demand. In 2019, impediments to growth will likely intensify, given the scheduled consumption tax hike and potential escalation of U.S. protectionism, notably auto tariffs. Nonetheless, we see the downside as being contained because the negative impact should be offset by continued labour market strength, strong corporate profitability, and various mitigating fiscal measures. Households’ net burden from the 2019 tax hike is estimated to be only a quarter of the 2014 tax hike as a larger portion of the tax revenue (roughly half, versus one-fifth in 2014) will be rechanneled back to the real economy through social security enhancements, cash subsidies, and infrastructure projects. Overall, we expect growth to revert to its trend of approximately 0.8% in 2019, with the risk skewed modestly to the downside.

Although a positive output gap and tight labour market would warrant monetary policy normalisation in most economies, the decades-long struggle with suppressed inflation expectations precludes the Bank of Japan (BoJ) from tightening. We expect core inflation to gradually rise toward 1% throughout 2019, but it is likely several years away from the BoJ target of 2% as a result of these muted expectations (Figure I-23).

A standard Taylor rule would imply that the bank’s current policy stance is accommodative enough, even under our more conservative forecast for inflation and the output gap (see Figure I-24). Nonetheless, the Taylor rule estimate based on market inflation expectations demonstrates that the current policy rate is still not low enough to achieve the BoJ’s 2% inflation target. This dichotomy is a result of a number of structural factors—
FIGURE I-23
The Bank of Japan’s inflation woes
Core inflation forecasts (Bank of Japan and Vanguard)

Notes: Core CPI includes all items except fresh food and energy. This measure is also referred to as BoJ Core.
Source: Vanguard calculations, based on data from Thomson Reuters and the Bank of Japan.

FIGURE I-24
A cyclical view of slack suggests current easing is sufficient, but a structural view suggests otherwise
Stylized Taylor rule estimates using inflation forecasts

Notes: The Taylor rule estimate using market inflation expectations takes a structural view of policy setting, taking into account only inflation expectations. It tends to be structurally low because of its highly adaptive nature, with no consideration given to what a cyclical upswing and tight labor market could do to boost prices. Vanguard’s and the BoJ’s forecasts take a cyclical view of slack by also factoring in the pass-through effects (which are limited in Vanguard’s assessment) of a positive output gap and tight labor markets on prices.
Source: Vanguard calculations, based on data from the BoJ, IMF, Bloomberg, and Moody’s Analytics Data Buffet.
including labour market duality, the more adaptive nature of Japan’s inflation expectations, and global technology advancement—that are preventing labour market and economic pressure from being translated into wage and price increases. As a result, the BoJ is unlikely to raise rates in 2019 and should maintain its forward guidance that interest rates remain low for an extended period.

However, additional tweaks and policy fine-tuning measures will likely occur over the next few years. The BoJ is mindful that the side effects accompanying prolonged monetary easing, such as the decrease in Japanese government bond (JGB) market liquidity and deteriorating profitability of financial institutions, are becoming more prominent. The bank’s quantitative and qualitative easing program continues to absorb most of the JGBs issued (see Figure I-25) and a prevailing low-yield environment continues to dampen profit margins for banks.

Hence, the BoJ will continue to seek more flexibility to enhance the sustainability and credibility of its policy framework without hampering the benefits of easy money. For safe-haven assets such as JGBs, this could mean giving a wider trading band than the current +/- 20 basis points for the 10-year yield. Although this could indirectly result in higher yields, it is by no means an exit from monetary stimulus. The yield curve control target will likely be anchored at approximately 0%, and a negative interest rate policy will still be in place. For risky assets such as the bank’s annual 6 trillion yen ETF purchase program, fine-tuning could imply a “soft taper” as in the case of current JGB purchases, with the bank intervening only when the equity market falls below a certain threshold instead of treating the 6 trillion yen as a fixed, hard target.

Japan’s long-term economic growth prospects remain well below the average of G20 countries. Without the necessary structural reforms, accommodative monetary...
policy alone is unlikely to lift labour supply, investment, and productivity—and, hence, potential growth. In our view, confidence about economic prospects in the medium term, instead of low interest rates or easy access to credit, is the most important factor driving business investment decisions. The “third arrow” of Prime Minister Shinzo Abe’s economic platform has notched notable wins in corporate tax and governance reforms, enhancing labour participation of women and older and foreign workers, reducing pay disparity between regular and non-regular employees, and embracing global trade liberalisation. However, progress on immigration reform has been marginal, even as the nation bears a decades-long demographic headwind. Continued deregulation and broader adoption of automation technology, especially in the consumption and service sectors, will be critical to supporting productivity growth in the long term.

**Emerging markets: A mixed bag**

Growth for emerging markets in aggregate is expected to be 4.6% in 2019; however, there will be vast heterogeneity among and within regions (see Figure I-26). The Asia region is expected to register slower growth as China slows down, but it remains the fastest growing of the emerging-market regions. China is projected to register growth lower than 6.5% in 2019. Emerging-market Asian economies are deeply integrated with China-led supply chains and will feel the repercussions of declining export demand from China. However, the newly ratified Comprehensive and Progressive Agreement for Trans-Pacific Partnership could lessen the blow.

In the Latin American region, the growth projection is 2.8%, an improvement from last year. Central bank policy rates across most emerging-market regions remain low compared with the pre-normalisation era (see Figure I-27). Across most emerging markets,

---

**Notes:** The GDP is at current prices used to create weighted markers for the regions. The Real GDP Growth data is obtained from IMF. The same is averaged for five-year periods (2014-18) and (2019-23).

**Source:** IMF Data Mapper.
inflation and currency volatility will determine the pace of central bank hikes in 2019. Apart from some recent volatility, emerging-market currency volatility since normalisation (2016–2018) has been lower than during the pre-normalisation period (2010–2015).

Most risks for the emerging-market sector are external. The most notable are the U.S.-China trade tensions and a slowdown in China. Monetary policy normalisation by the U.S. Federal Reserve has led to tighter financial conditions for emerging markets; this in turn has translated to volatility in emerging-market currencies and declining capital inflows. Populism and geopolitical risks, both at home and abroad, are downside risks for emerging markets. Corporate leverage has increased in emerging markets since the global financial crisis, with high levels of corporate debt issuance in non-local currency. A strengthening dollar could severely damage corporate balance sheets within emerging markets.

FIGURE I-27
Idiosyncratic emerging markets
Emerging markets represent a mixed basket; we expect tighter monetary policy to affect growth in countries with unsustainable borrowing

1. Current account (percentage of GDP as at November 2018)
2. Real effective exchange rate (REER) misalignment (as at November 2018)
3. International reserves (percentage of GDP as at Q4 2017)
4. Ease of doing business rank (as at Q4 2017)
5. Household debt (percentage of GDP as at Q1 2018)
6. Per capita GDP (in USD as at Q3 2018)
7. Inflation (percentage change in consumer prices as at September 2018)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging markets Asia</td>
<td>1.0%</td>
<td>3.2%</td>
<td>20%</td>
<td>68</td>
<td>42.6%</td>
<td>$6,104</td>
<td>3.4%</td>
</tr>
<tr>
<td>Emerging markets Europe</td>
<td>–0.2%</td>
<td>3.1%</td>
<td>20%</td>
<td>50</td>
<td>24.0%</td>
<td>$11,322</td>
<td>7.2%</td>
</tr>
<tr>
<td>Latin America</td>
<td>–2.2%</td>
<td>6.1%</td>
<td>20%</td>
<td>77</td>
<td>23.5%</td>
<td>$9,780</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

**Notes:** Real exchange rate misalignment is defined as the deviation of the real effective exchange rate (REER) from its past five-year average. This vulnerability indicator is two-sided. Rapid appreciations or depreciations of a country’s exchange rate may indicate that flows of foreign funds into or out of the economy may be unsustainable. Depreciations in the exchange rate also reduce purchasing power and increase the risk of economic slowdown. The World Bank Ease of Doing Business score serves as the basis for ranking economies on their business environment and is an indication of an economy’s position relative to that of other economies.

**Source:** Vanguard calculations, based on data from the IMF World Economic Outlook, the Bureau of Industry and Security, the World Bank, and Moody’s Analytics Data Buffet.
II. Global capital markets outlook

Vanguard’s outlook for global stocks and bonds is subdued at best due to high equity valuations in a few regions around the world and low interest rates. Downside risks are more elevated in the equity market than in the bond market. Although we are hard-pressed to find compelling evidence of financial bubbles, risk premiums for many asset classes appear slim.

The market’s efficient frontier of expected returns for a unit of portfolio risk is now in a lower return orbit. More importantly, common asset-return centric portfolio tilts, seeking higher return or yield, are unlikely to escape the strong gravity of low return forces in play.

Global equity markets: Higher risk, lower return

Global equity has rewarded patient investors with 12.8% annualised return in the nine-and-a-half years since the lows of the global financial crisis. As part of this strong performance, valuations have risen gradually. For instance, valuations in the global emerging markets and some global ex-Australia developed market equities appear stretched relative to our proprietary fair-value benchmark, thereby making our global equity outlook guarded. The ten year outlook for global equities is now centred in the 4%–6% range based on our Vanguard Capital Markets Model (VCMM) projections.

Equity valuations and Vanguard’s ‘fair-value’ CAPE

Our equity market outlook for the stock market is based primarily on market valuations, such as price/earnings (P/E) ratios. Another popular P/E ratio is the cyclically adjusted price earnings ratio (CAPE). Practitioners typically compare these valuation metrics with their long-run averages to assess whether the market is over or under-valued. However, a straight comparison of CAPE (or other valuation multiples) with its historical average can be misleading as this comparison fails to account for today’s low inflation and interest rates.

Because a secular decline in interest rates and inflation depresses the discount rates used in asset pricing models, investors are willing to pay a higher price for future earnings, thus inflating price-to-earnings ratios. Thus a high CAPE may not be indicating overvalued stock prices, but may be an outcome of low interest rates.

Vanguard’s fair-value CAPE accounts for current interest rates and inflation levels and provides a more useful time-varying benchmark against which the traditional CAPE ratios can be compared, instead of the popular use of historical average benchmarks.
Figure II-1a plots Shiller’s CAPE versus our fair-value model. Today, the CAPE for the MSCI Australia index appears fairly valued.

We have also extended this fair-value concept to other regions. As illustrated in Figure II-1b, our equity valuation dashboard indicates that non-Australian developed markets are approaching overvalued territory after adjusting valuations for rates and inflation. For emerging markets, it is important to note that their stocks typically trade at lower multiples than developed markets due to the higher risk and higher earning yields required by investors. Even after adjusting for higher risk, emerging markets are above what we estimate as their fair-value level.

Global equity and the diversification of domestic risks
As shown in Figure II-2a, our expected return outlook for Australian equities over the next decade is centred in the 4.5%-6.5% range, in contrast with the 9.8% annualised return generated over the last 30 years. Over this period,

---

**FIGURE II-1**

Divergence in global equity valuations

a. Domestic market appears fairly valued

![Figure II-1a](image)

**Note:** “Fair-value CAPE” is based on statistical model that corrects CAPE measures for the level of inflation expectations and for interest rates. The statistical model specification is a five-variable vector error correction (VEC), including equity earnings-yield (MSCI Australia index), Australian ten-year trailing inflation, ten-year Govt. bond yield, 10 year trailing equity and bond volatility estimated over the period January 1970 – September 2018.

**Sources:** Vanguard calculations, based on data from Thomson Reuters Datastream and the Reserve Bank of Australia

b. Other developed market approaching over-valued territory

![Figure II-1b](image)

**Note:** Australia valuation measure is the current CAPE percentile relative to “fair-value CAPE” for the MSCI Australia index from estimated over the period December 1969 – September 2018. Developed markets valuation measure is the weighted average of each region’s (US, UK, Euro-area, Japan and Canada) current CAPE percentile relative to each region’s own “fair-value CAPE from estimated over the period January 1980 January 1970 – September 2018, except for the U.S. which is estimated over the period January 1940 – September 2018. Emerging Markets valuation measure is a composite valuation measure of EM to U.S. relative valuations and current U.S. CAPE percentile relative to its fair value CAPE. The relative valuation is the current ratio of EM to U.S. P/E metrics relative to its historical average, using 3 year trailing average earnings from January 1990 to September 2018. 

**Source:** Vanguard calculations, based on data from Robert Shiller Online Data, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Thomson Reuters Datastream.
while valuation expansion proved to be a tailwind to returns, we expect valuations to contract as interest rates gradually rise over the next decade. An expected valuation contraction of about 3.1% is the primary reason behind our muted ten-year outlook for Australian equity.

From an Australian investor’s perspective, the expected return outlook for global ex-Australia equity markets is in the 4%–6%, comparable to our global equity outlook (Figure II-2a and Figure II-2b). The long-term median expected return for ex-Australia equity versus its 3 decade historical average, as illustrated in Figure II-2a, suggests that two total returns may not be that different.

This result is a function of the high level of valuations, long-term expectations of the Australian dollar remaining range-bound, and the small weight of the Australian equity market in global benchmarks. As illustrated in Figure II-5, an asset-return-centric strategy, which focuses primarily on higher return expectations of Australian equity by eliminating a portfolio’s exposure to ex-Australian equities, has lower expected risk-adjusted returns because it ignores the diversification benefits of international equities. Our 10-year outlook for global equity (in AUD) is in the 4%-6% range, as shown in Figure II-2b.

b. Equity market ten-year return outlook: Setting reasonable expectations

FIGURE II-2
The outlook for equity markets is subdued

a. Global ex-Australia equity exposure may provide returns that are similar to domestic market

Notes: Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualised nominal returns as at 30 September 2018 in AUD for asset classes highlighted here. Median volatility is the 50th percentile of an asset class’s distribution of annualised standard deviation of returns. See appendix section titled Index benchmarks for further details on asset classes shown here.

Sources: Vanguard calculations, Dimson-Marsh-Staunton data, FactSet, Morningstar Direct and Thomson Reuters Datastream.
Global fixed interest markets: An improved outlook

Higher interest rates have improved our outlook for fixed interest compared to this time last year. As shown in Figure II-4, it is in the 2%–4% range for the next decade, slightly higher than this time last year. Expected returns for the riskier fixed interest sub-asset classes appear more differentiated compared to our previous years’ projections, in part due to recent expansion in credit spreads, thereby giving them the cushion to capture the risk premium. (Figure II-3).

Australian interest rates: Higher long-term rates than last year

Despite the expected rise in the official cash rate in the future, the risk of a material rise in long-term interest rates remains modest. As illustrated in Figure II-4, duration strategies are fairly-valued and less risky than investors may believe in a normalising-rate environment. This is because we expect the short end of the yield curve to rise more than the long end over the next decade, as the long rates are anchored by growth and inflation expectations. Our 2%–3% outlook for cash over the next decade is also modestly higher than last year.

![Rates and risk premia add up to modest returns](image-url)

**Notes:** Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualised nominal returns as at 30 September 2018 in AUD for asset classes highlighted here. Median volatility is the 50th percentile of an asset class’s distribution of annualised standard deviation of returns. See appendix section title Index benchmarks for further details on asset classes.

**Source:** Vanguard.
Credit bonds:
Risk premium still comes with equity correlation
The central tendency for Australian credit bonds is in the 3%–4% range. This reflects the accumulation of credit and default risk premia that accompanies the higher risk of credit bonds. As illustrated in Fig II-4, the Australian credit bonds spreads are stretched and indicate signs of froth in the credit market. One must keep in mind that the credit spreads tend to widen in times of equity market stress, thereby reducing diversification benefits. As shown in Figure II-5, a 20% overweight or tilt to credit increases a portfolio’s volatility excessively relative to a marginal increase in return.

Inflation-Linked bonds:
Markets don’t see inflation coming
Inflation expectations for Australia remain near historical lows and are now at the same level as our inflation expectation for the next decade. Markets are placing low odds on higher inflation outcomes. While not as attractive from a return perspective, linkers could be a valuable inflation hedge for some institutions and investors sensitive to inflation risk.

Domestic versus international:
Benefits of diversification remain
The central tendency of expected return for ex-Australian aggregate bonds appears to be similar to that of Australian aggregate bonds (Figure II-3). We expect the diversification benefits of global fixed interest in a balanced portfolio to persist under most scenarios. Yields in most developed markets are at historically low levels, particularly in Europe and Japan, yet the diversification through exposure to hedged ex-Australian bonds should help offset some risk specific to the Australian fixed interest market. Less-than-perfect correlation between two of the main drivers of bond returns—interest rates and inflation—is expected as global central bank policies transition through different stages of normalisation.

FIGURE II-4
Frothy credit valuations

Note: Valuation percentiles are relative to year 30 projections from VCMM. Australian credit bond and Australian aggregate bond valuations are current spreads relative to year 30 from VCMM. Duration valuation is the expected return differential over the next decade between long-term govt bond index and short-term govt bond index, to that of year 21-30. Australian linkers is the 10-year ahead annualised inflation expectation relative to year 21-30 from VCMM.

Source: Vanguard.
Portfolio implications: A low return orbit

Investors have experienced spectacular returns over the last few decades. Figure II-5a contrasts our 4%-6% outlook for a global 60% equity / 40% bond portfolio for the next decade against the extraordinary 11.1% and 8.5% returns since 1970 and 1990 respectively. As highlighted in previous sections, elevated international equity valuations, low rates and compressed spreads have pulled the expected returns in a lower return orbit. The efficient frontier is also flat when it comes to increasing risk, as seen from the return and volatility expectations of balanced portfolios of Figure II-5c.

In an attempt to increase portfolio returns, investors often employ popular strategies such as overweighting higher expected return or higher yield assets. Common “reach for yield” strategies include overweighting real estate investment trusts (REITs) or higher yielding credit bonds. Similarly, “reach for return” strategies involve tilting the portfolio towards emerging market equities to take advantage of higher growth. Home bias causes some to shy away from Ex-Australian equities.

Figure II-5b illustrates that these common asset-return centric strategies, and they are unlikely, by themselves, to restore portfolios to higher orbits of historical returns.
FIGURE II-5
Asset allocation for a challenging decade

a. A lower return orbit…

5b: …that popular active tilts will likely fail to escape

<table>
<thead>
<tr>
<th>Portfolios with common 20% tilts</th>
<th>5th percentile</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
<th>95th percentile</th>
<th>Median volatility</th>
<th>Risk adjusted return</th>
</tr>
</thead>
<tbody>
<tr>
<td>60/40 without ex-AUS equity</td>
<td>1.2%</td>
<td>3.4%</td>
<td>4.9%</td>
<td>6.5%</td>
<td>8.9%</td>
<td>11.6%</td>
<td>0.42</td>
</tr>
<tr>
<td>AUS credit tilt</td>
<td>1.2%</td>
<td>3.3%</td>
<td>4.9%</td>
<td>6.5%</td>
<td>8.8%</td>
<td>10.2%</td>
<td>0.47</td>
</tr>
<tr>
<td>EM equity tilt</td>
<td>1.1%</td>
<td>3.3%</td>
<td>4.9%</td>
<td>6.5%</td>
<td>8.8%</td>
<td>10.2%</td>
<td>0.47</td>
</tr>
<tr>
<td>TIPS tilt</td>
<td>0.9%</td>
<td>3.1%</td>
<td>4.7%</td>
<td>6.3%</td>
<td>8.7%</td>
<td>10.2%</td>
<td>0.45</td>
</tr>
<tr>
<td>60/40 stock/bond</td>
<td>1.0%</td>
<td>3.2%</td>
<td>4.8%</td>
<td>6.4%</td>
<td>8.7%</td>
<td>10.1%</td>
<td>0.47</td>
</tr>
<tr>
<td>80/20 stock/bond</td>
<td>0.2%</td>
<td>3.1%</td>
<td>5.2%</td>
<td>7.3%</td>
<td>10.3%</td>
<td>13.5%</td>
<td>0.38</td>
</tr>
<tr>
<td>100% equity</td>
<td>-0.8%</td>
<td>2.8%</td>
<td>5.4%</td>
<td>8.1%</td>
<td>11.9%</td>
<td>17.0%</td>
<td>0.32</td>
</tr>
<tr>
<td>60/40 stock/bond</td>
<td>1.0%</td>
<td>3.2%</td>
<td>4.8%</td>
<td>6.4%</td>
<td>8.7%</td>
<td>10.1%</td>
<td>0.47</td>
</tr>
<tr>
<td>60/40 balanced portfolios</td>
<td>100% bonds</td>
<td>1.4%</td>
<td>2.3%</td>
<td>2.9%</td>
<td>3.5%</td>
<td>4.6%</td>
<td>4.0%</td>
</tr>
<tr>
<td>20/80 stock/bond</td>
<td>1.9%</td>
<td>2.9%</td>
<td>3.7%</td>
<td>4.4%</td>
<td>5.5%</td>
<td>4.4%</td>
<td>0.82</td>
</tr>
<tr>
<td>60/40 stock/bond</td>
<td>1.0%</td>
<td>3.2%</td>
<td>4.8%</td>
<td>6.4%</td>
<td>8.7%</td>
<td>10.1%</td>
<td>0.47</td>
</tr>
<tr>
<td>80/20 stock/bond</td>
<td>0.2%</td>
<td>3.1%</td>
<td>5.2%</td>
<td>7.3%</td>
<td>10.3%</td>
<td>13.5%</td>
<td>0.38</td>
</tr>
<tr>
<td>100% bonds</td>
<td>1.4%</td>
<td>2.3%</td>
<td>2.9%</td>
<td>3.5%</td>
<td>4.6%</td>
<td>4.0%</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Notes: Summary statistics of 10,000 VCMM simulations for projected ten-year annualised nominal returns as at September 2018 in AUD before costs. Historical returns are computed using indexes defined in “Indexes used in our historical calculations” on page 5. The global equity is 40% Australian equity and 60% global ex-Australian equity. The global bond portfolio is 30% Australian bonds and 70% global ex-Australian bonds. Portfolios with tilts include a 20% tilt to the asset specified funded from fixed interest allocation for the fixed interest tilt and equity allocation for the equity tilt.

Source: Vanguard.
Portfolio strategies for three potential economic scenarios

Based on our global economic perspective on the cyclically rising risks to inflation and policy normalisation imposed by tight global labour markets, we examine in Figure II-6 three possible economic scenarios occurring over the next three years. The status quo scenario reflects our baseline view, with continued low volatility and positive financial conditions. The high growth scenario illustrates an upside risk scenario of sustained economic growth with a tighter labour market, and a moderate pickup in wages and inflation. The recessionary scenario represents our estimate of markets’ response to a turn in the business cycle and a correction in equity market valuations.

Figure II-6 shows optimal portfolios for each scenario that vary their exposures to the following four factors, or risk premiums: 1) equity risk premium, 2) term premium, 3) credit premium and 4) inflation risk premium. In a high growth scenario, expected returns on global equity would be high, causing the efficient frontier to be steep. Long and short rates would also rise faster than expected, resulting in an optimal portfolio loading on equity and short duration.

On the contrary, a recessionary scenario portfolio would underweight equity and overweight long duration. Surprisingly, the allocation to Australian equity remains rather large, as the portfolios that is also heavy on long-term government bonds derives a large diversification benefit from lower returning Australian equity (especially in a recession). The portfolio strategy in a status quo scenario is well diversified.

Using our VCMM simulations, we are able not only to illustrate the effectiveness of various portfolio strategies designed for each scenario, but also demonstrate the risks of such strategies. The following conclusions can be drawn from our analysis:

1. **Portfolios designed for specific macroeconomic scenarios entail important trade-offs:** If the scenario for which the portfolio was designed does not take place, then the portfolio performance is the worst of all the options.

2. **A balanced portfolio works well for investors who are agnostic about the future state of the economy:** The 60/40 balanced portfolio is an “all-weather” strategy, with either top or middle of the road performance in each scenario.

3. **Portfolio tilts should be done within an optimisation framework:** Ad hoc tilts ignore correlations among assets and lead to inefficient portfolios. For instance, in a recession-scenario strategy, Australian equities can be relatively over-weighted (as opposed to underweighted) because of the added diversification benefits of long-term bonds.
Cyclical surprises and asset allocation trade-offs

a. Optimal portfolios for different economic environments

Scenario 1  Status quo/baseline  Diversified portfolio
Scenario 2  Recession  Overweight long duration and underweight equity
Scenario 3  High growth  Overweight short duration

- Scenario 1: 29% Aus equity, 31% Global ex-Aus equity, 25% Global aggregate ex-Aus Hedged, 1% Australian Credit, 11% Aus short term Govt. bonds, 2% Aus long term Govt. bonds, 1% Aus short term linkers.
- Scenario 2: 42% Aus equity, 3% Global ex-Aus equity, 0% Global aggregate ex-Aus Hedged, 1% Australian Credit, 0% Aus short term Govt. bonds, 54% Aus long term Govt. bonds, 0% Aus short term linkers.
- Scenario 3: 36% Aus equity, 38% Global ex-Aus equity, 4% Global aggregate ex-Aus Hedged, 0% Australian Credit, 22% Aus short term Govt. bonds, 0% Aus long term Govt. bonds, 0% Aus short term linkers.

b. Not always the best, but the diversified portfolio is never the worst

Best
- Diversified portfolio
- Overweight long duration and underweight equity
- Overweight short duration

Second-best
- Overweight long duration and underweight equity
- Diversified portfolio
- Diversified portfolio

Worst
- Overweight short duration
- Overweight short duration
- Overweight long duration and underweight equity

Strategy upside relative to balanced portfolio
- 0.6% higher annualised return with 1.2% lower volatility in a recessionary scenario

Strategy downside relative to balanced portfolio
- 2.6% lower annualised return with 9% lower volatility in a high growth scenario
- 1% lower annualised return with 3.0% higher volatility in a slowdown scenario

Note: Performance is relative to the efficient frontier. Forecast displays simulation of 3-year annualised returns of asset classes shown as at 30 September 2018. Scenarios are based on sorting the VCMM simulations based on the rates, growth, volatility and equity return. The three scenarios are a subset of the 10,000 VCMM simulations. See appendix section titled “Index simulations”, for further details on asset classes shown here.

Source: Vanguard.
Portfolio construction strategies: Time-tested principles apply

Contrary to suggestions that an environment of low rates and compressed equity risk premium warrants some radically new investment strategy, Figure II-5 reveals that diversification benefits of global fixed interest and global equity are particularly compelling, given the simulated ranges of portfolio returns and volatility.

The market’s efficient frontier of expected returns for a unit of portfolio risk is now in a lower orbit. More importantly, common asset-return centric portfolio tilts, such as seeking higher return or yield, are unlikely to escape the strong gravity of low-return forces in play, as they ignore the benefits of diversification. A successful asset allocation strategy requires a total-portfolio approach that leverages the benefits of diversification, by weighing risk, returns and correlations simultaneously.

Factors within a long term investor’s control, such as saving more, working longer, spending less and controlling investment costs, far outweigh the less reliable benefits of ad-hoc asset-return seeking tilts. Thus decisions around saving more, spending less, and controlling costs will be much more important than portfolio tilts.

Investment objectives based either on fixed spending requirements or on fixed portfolio return targets may require investors to consciously weigh their options in conjunction with their risk-tolerance levels. Ultimately, our global market outlook suggests a more challenging environment ahead. Still, investors adhering to investment principles of discipline and diversification with sound asset allocation and a consistent rebalancing strategy are likely to be rewarded over the long term.
References


III. Appendix: VCMM and index simulations

About the Vanguard Capital Markets Model

IMPORTANT: The projections or 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 Vanguard Capital Markets Model 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 Australian and international equity markets, several maturities of the Australian Treasury and corporate fixed interest markets, international fixed interest markets, 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 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 analysing 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 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 recognise 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 modelled 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, which highlights balanced portfolio returns before adjusting for inflation.
Index simulations

The long-term returns of our hypothetical portfolios are based on data for the appropriate market indexes through September 2018. 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:

- **Australian equities**: MSCI Australia Index.
- **Global ex-Australia equities**: MSCI All Country World ex-Australia Index.
- **Australian REITs**: FTSE EPRA/NAREIT Australian Index.
- **Commodity futures**: Bloomberg Commodity Index in AUD (unhedged).
- **Australian cash**: Australian 1-Month Government Bond.
- **Australian Government Bonds / Treasury Index**: Bloomberg Barclays Australian Aggregate Treasury Index.
- **Australian credit bonds**: Bloomberg Barclays Australian Credit Index.
- **Australian bonds**: Bloomberg Barclays Australian Aggregate Bond Index.
- **Global ex-Australia bonds**: Bloomberg Barclays Global Aggregate ex-AUS Bond Index.
- **Australian Linkers**: Bloomberg Barclays Australia Inflation Linked Treasury Index.
- **Short-term Treasury index**: Bloomberg Barclays Australian Aggregate Treasury 1-5 Year Index.
- **Long-term Treasury index**: Bloomberg Barclays Australian Aggregate Treasury 10+ Year Index.

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. Investments in bond funds are subject to interest rate, credit, and inflation risk. Foreign investing involves additional risks, including currency fluctuations and political uncertainty. Diversification does not ensure a profit or protect against a loss in a declining market. 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.

Stocks of companies in emerging markets are generally more risky than stocks of companies in developed countries. U.S. government backing of Treasury or agency securities applies only to the underlying securities and does not prevent price fluctuations. Investments that concentrate on a relatively narrow market sector face the risk of higher price volatility. Investments in stocks issued by non-U.S. companies are subject to risks including country/regional risk and currency risk.

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.
This paper contains general information only and is intended to assist you. Vanguard Investments Australia Ltd (ABN 72 072 881 086 / AFS Licence 227283) is the product issuer. We have not taken yours and your clients’ circumstances into account when preparing this paper so it may not be applicable to the particular situation you are considering. You should consider yours and your clients’ circumstances and our Product Disclosure Statement (PDS) or Prospectus before making any investment decision. You can access our PDS or Prospectus online or by calling us. This paper was prepared in good faith and we accept no liability for any errors or omissions. Past performance is not an indication of future performance.