



Vanguard's economic and investment outlook

Vanguard Research

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- Global economic growth is likely to remain frustratingly fragile for some time. As in Vanguard's past economic outlooks, we see a world not in secular stagnation but in the midst of structural deceleration. Against this backdrop, cyclical risks vary meaningfully across major economies. The US economy's cyclical thrust above 2% trend growth should endure, underscoring the economy's resiliency, but growth in Europe is set to remain anaemic in the wake of ongoing deleveraging and weak policy stimulus.
- A deflationary threat still hovers over a world with excess capacity, despite continued monetary stimulus and a tightening US labour market. This will lead to divergent monetary policies. The US Federal Reserve will likely be one of the few central banks to raise rates in 2015 but policy rates are unlikely to rise for the foreseeable future in the euro area or Japan.
- Although not bearish, Vanguard's outlook for global equities and bonds is the most guarded since 2006, given compressed risk premiums and the low-rate environment.

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Notes on asset-return distributions and risk

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 – see the description in the appendix) 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 or 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 30 September 2014. Results from the model may vary with each use and over time. For more information, see the appendix.

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Vanguard's distinct approach to forecasting

To treat the future with the deference it deserves, Vanguard believes that market forecasts are best viewed in a probabilistic framework. This 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 a UK investor with a sterling-denominated portfolio.

Global market outlook summary

Global economy. World economic growth is likely to remain frustratingly fragile for some time. As in Vanguard's past *Economic and Investment Outlooks*, we view a world not in secular stagnation but in the midst of *structural deceleration*. This distinction, however, varies meaningfully across major economies and will likely lead to divergent policy responses and periodic growth scares. The US economy will likely remain resilient to the global slowdown, yet the nation's recent cyclical thrust above its 2% trend growth is not immune to the downside (and growing) risks in Europe and China.

The economic outlook for the euro area is characterised by elevated recession and deflation risks as policymakers struggle to arrest such concerns. Meanwhile, China's economic growth is in a protracted but gradual downward shift; yet, we do not see an emerging-market-style hard landing as likely. Select emerging-market economies, however, can be expected to continue to struggle to adjust to evolving global growth dynamics.

Inflation. A deflationary threat will likely continue to hover over the world. In aggregate, reflationary monetary policies will continue to counteract the disinflationary drag of post-financial crisis global deleveraging. As suggested in Vanguard's past outlooks, recent consumer price inflation remains near generational lows and, in several major economies, is below the targeted inflation rate. Key drivers of US consumer inflation generally point to price stability, with core inflation in the 1%–3% range over the next several years. Nascent wage pressures should build in the United States in 2015 and beyond, but low commodity prices and the prospects of a strong

US dollar should keep inflation expectations anchored. In Europe, deflation remains a significant risk that will not soon disappear.

Monetary policy. Central bank policies should diverge over the next several years. In line with Vanguard's outlook for 2014, we believe the Federal Reserve will keep short-term rates near 0% through to mid-2015. We stress, however, that the Fed's rate rise will likely be more gradual (either moving in smaller increments or pausing) and will end lower than some predict, after accounting for the structural nature of the factors restraining growth. The Bank of England is also deliberating its first policy rate increase, which will likely occur in late-2015 or early-2016. By contrast, the European Central Bank (ECB) and the Bank of Japan may be hard-pressed to raise rates this decade. Indeed, across most major economies, real (inflation-adjusted) short-term interest rates are likely to remain negative to at least 2017. Globally, the burdens on monetary policymakers are high and varied, ranging from raising rates at the right time and pace (in the United States and the United Kingdom), to engineering a soft landing in credit growth (in China), to ensuring appropriate balance sheet expansion (the European Central Bank and in Japan). The Fed's rate liftoff may induce some market volatility, but long-term investors should prefer that to no liftoff at all.

Interest rates. The bond market continues to expect Treasury yields to rise, although our estimates of the "fair-value" range for the 10-year Treasury bond have declined somewhat, to approximately 2.5% over the next year. Global structural deceleration suggests that lower-than-historical yields across the developed world are very likely over the medium term.

Global bond market. As in our previous outlooks, the return outlook for fixed income is positive but muted. The expected long-run median return of the broad fixed income market is centred in the 2%–3% range. It is important to note that we expect the diversification benefits of investment-grade fixed income in a balanced portfolio to persist under most scenarios. Given the macroeconomic backdrop, the increased “reach for yield” in the bond market and compressed credit spreads, we view credit risk as a potentially greater risk than duration risk in the near term.

Global equity market. After several years of suggesting that strong equity returns were possible despite a prolonged period of subpar economic growth, our medium-term outlook for global equities has become even more guarded. Centred in the 6%–9% return range, the long-term median nominal return for global equity markets is below historical averages; for select “frothy” segments of the equity market that we noted last year (i.e., small-caps, dividend- or income-focused equity

strategies), the central tendency can be even lower. That said, the outlook for the global equity risk premium is closer to historical averages when adjusted for the muted expectations for global inflation and interest rates.

Asset allocation strategies. Going forward, cross-currents of valuations, structural deceleration and the exiting from or insufficiency of near-0% short-term rates imply that the investment environment is likely to be more challenging and volatile. The risk premiums in some segments of the equity and bond markets are narrower than was the case just two or three years ago. Our VCMM simulations indicate that balanced portfolio returns over the next decade are likely to be below long-run historical averages, with those for a 60%/40% equity/bond portfolio tending to centre in the 3%–5% range, adjusted for inflation. Even so, Vanguard still firmly believes that the principles of portfolio construction remain unchanged, given the expected risk–return trade-off between equities and bonds.

Indices used in our historical calculations

The long-term returns for our hypothetical portfolios are based on data for the appropriate market indexes to September 2014. 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.

Inflation: Consumer Price Indices – RPI all items long run series: 1900 to 2014: Jan 1974=100. Source: Office of National Statistics.

UK Equity: Barclays Equity Gilt Study from 1900 to 1964, Thomson Reuters Datastream UK Market Index 1965–1969; MSCI UK thereafter

UK Bonds: Barclays Equity Gilt Study 1900–1976; FTSE UK Government Index from 1976 to 1999, and Barclays Sterling Aggregate Index thereafter.

Global Ex UK Equity: S&P 90 Index from January 1926 to 3 March 1957; S&P 500 Index from 4 March 1957 to 1969; MSCI World ex UK from 1970 to 1987; MSCI AC World ex UK from 1988 onwards.

Global Ex UK Bonds: Standard & Poor’s High Grade Corporate Index from 1926 to 1968, Citigroup High Grade Index from 1969 to 1972, Lehman Brothers U.S. Long Credit A A Index from 1973 to 1975, Barclays U.S. Aggregate Bond Index from 1976 to 1990, Barclays Global Aggregate Index from 1990 to 2001; Barclays Global Aggregate ex GBP Index from 2001 onwards.

Global Equity: 25% UK Equity and 75% Global Ex-UK Equity as defined above.

Global Bonds: 35% UK Bonds and 65% Global Ex-UK Bonds as defined above.

I. Global economic perspectives

Global economic outlook: Is the world in secular stagnation?

Similar to our stance for 2014, we view the global recovery as likely to proceed at a modest pace. World economic growth may remain frustratingly fragile, with long-term trend growth in the major economies significantly lower than during past decades as a result of slowing productivity growth and unfavourable demographics. Potential trend real GDP growth for the developed economies seems to have marched lower for years – since well before the global financial crisis – with population and productivity growth rates both falling to levels less than half those of the 1950s–1970s (Figure I-1).

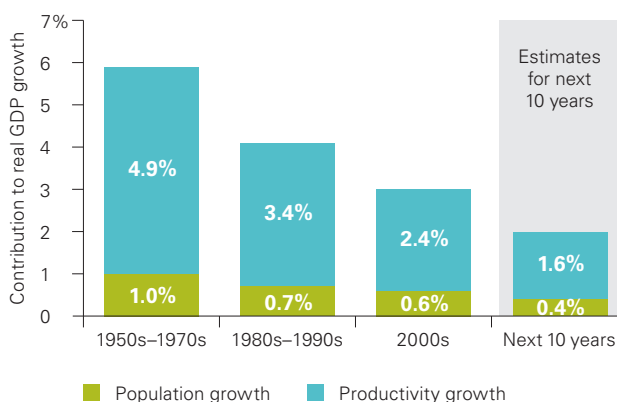
In addition to their own structural challenges, many major emerging markets have not been immune to the structural headwinds in developed markets. As a result, a number of key emerging economies are expected to grow at a rate that, although still higher than that of developed markets, will most likely be lower than their own pre-crisis averages (see Figure I-2).

As was the case last year, our leading indicators continue to point to the possibility of a cyclical upward thrust in near-term growth for the United States and other selected developed economies. Yet, the US economy, which has proved resilient to the global

slowdown so far (last year’s theme), is not immune to the downside (and growing) risks in Europe and China. (See also the accompanying box titled “2015 global growth outlook” on page 8.)

Figure I-1. Structural forces driving trend growth

Developed-market trend GDP growth and components



Notes: Potential GDP growth based on developed countries’ weighted-average real GDP growth rates during non-recessionary periods for the global economy. Global recessions include the following years: 1961, 1967, 1970, 1974–1975, 1980–1982, 1991–1993, 2001, and 2008–2009.

Sources: Vanguard calculations, based on data from Penn World Tables (version 8.0. for 1951–2010) and International Monetary Fund’s (IMF’s) World Economic Outlook (WEO).

Figure I-2. Structural breaks in growth trends

Estimated potential real GDP growth rates

| | Percentage of world economy | Estimated trend growth (%) | | Overall trend |
|----------------|-----------------------------|-----------------------------------|------------------------------|---------------|
| | | Pre-recession average (1990–2007) | Projected future (2014–2019) | |
| United States | 22.4% | 3.0% | 2.1% | ▼ |
| Euro area | 17.1 | 2.0 | 1.1 | ▼ |
| China | 13.3 | 10.0 | 6.3 | ▼ |
| Japan | 6.2 | 1.4 | 0.5 | ▼ |
| United Kingdom | 3.7 | 2.9 | 2.1 | ▼ |
| Brazil | 2.9 | 2.9 | 2.1 | ▼ |
| Russia | 2.7 | 1.5 | 1.3 | ◀▶ |
| India | 2.6 | 6.2 | 5.9 | ◀▶ |
| Canada | 2.3 | 2.5 | 2.0 | ▼ |
| Australia | 1.9 | 3.4 | 2.8 | ▼ |

Notes: Pre-recession and projected trend are based on average annualised real potential GDP growth from IMF WEO. For developing countries, we projected the sum of ten-year annualised projected population growth and the Hodrick-Prescott trend component of real GDP per capita growth. For Australia, data available only to 2015. For euro area, data begin in 1993. For Russia, data begin in 1993.

Sources: Vanguard calculations, based on data from IMF and U.S. Census Bureau.

More important, this cyclical growth assessment should be placed within the context of a structurally lower-growth world. As in past outlooks, we view a world not in secular stagnation but in the midst of structural deceleration. This distinction, however, varies meaningfully across major economies and will likely lead to divergent policy responses and periodic growth scares. Figure I-3 outlines the main drivers and associated policy implications of each type of growth scenario. In assessing the causes of slower growth for a specific country, the delineation between the two scenarios may not be that crisp, since some of the drivers of both secular stagnation and structural deceleration may be present to varying degrees concurrently

Current developments in the euro area, such as entrenched deflationary forces and persistent underutilisation of resources, square well with Figure I-3's description of the secular stagnation scenario, given the reluctance of the ECB to provide more stimulus. As a result, the potential for outright deflation in the euro area remains a significant risk that should prompt policymakers to respond more decisively than in the past. To a lesser extent, the Japanese economy is still grappling with these headwinds too, despite of aggressive policy responses of the last two years.

In the United States and other major economies, slowing trend growth is not caused primarily by "lack of demand" or insufficient policy responses. Stable inflation expectations and low or quickly falling unemployment rates in these countries indicate that demand and spending are adequate. It is the earlier-mentioned structural changes that are restraining the capacity of these economies to expand supply. The distinction is important, for if demand is

adequate but supply is restrained, then price and wage pressures should build over time. Maintaining monetary accommodation beyond 2015 in these cases would be unnecessary and could jeopardise financial stability and generate asset "bubbles," even if inflation remains below central bank targets.

Contrary to the view that central banks should only be concerned with the risk of raising rates too soon, we believe that policymakers face a symmetric risk from delaying the appropriate timing for raising rates. Even with inflation well-anchored, artificially low interest rates may lead to misallocation of capital over time, as low-productivity investments, both public and private, may look viable at ultralow financing costs. Chronic monetary accommodation may also distort corporations' decisions about optimal sources of financing, increasing the use of leverage at the expense of equity financing. This may be happening already, as there has been an explosion in leveraged buyouts and debt-financed equity buybacks.

In the case of China, the long-term rebalancing of the economy is mainly driven by structural forces such as slowing population growth, the slowing pace of migration of the rural population towards urban areas and the rise of the lower-productivity service sector. However, the transition to lower growth rates in the Chinese economy will be in part driven by demand, as years of overcapacity and overinvestment in certain industrial sectors should result in a secular slowdown in investment growth that is unlikely to be lifted by policy. This secular demand weakness in investment may not extend to the rest of the economy, though.

Figure I-3. What is causing slower growth: Secular stagnation or structural deceleration?

Drivers, economic and policy implications

| | Structural deceleration | Secular stagnation |
|------------------------------|---|--|
| Primary drivers | Demographic changes and productivity slowdown reducing trend growth | Deleveraging and insufficient policy responses restraining spending and growth |
| Economic implications | | |
| Inflation expectations | Stable | Falling |
| Output gap ("slack") | Small and closing | Gap not closing |
| Inflation and wage pressures | Building from a low base | Deflation risk increasing |
| Policy implications | | |
| Monetary policy | Gradual tightening is appropriate | More quantitative easing (QE) needed |
| Fiscal policy | Infrastructure spending | More fiscal stimulus |

Note: For more details on drivers of each scenario and a full quantitative assessment of various markets, see appendix Figure IV-1, on page 31.

Source: Vanguard.

**2015 global growth outlook:
US resiliency in spite of global weakness**

The United States in 2015 faces an economic environment similar to that of a year ago, with cyclical risks tilted toward above-trend growth of 2.5%–3.0%. As shown in Figure I-4a, our proprietary US leading indicators dashboard points towards a slight acceleration. The most positive indicators are those associated with manufacturing activity, financial conditions, consumer and business confidence and the labour market. The “red signals,” associated with credit growth, reflect the lingering effects of the global financial crisis. The ebbs and flows of red, yellow and green do a reasonable job of leading the GDP growth line, and thus the dashboard helps inform our projected growth distributions.

Using simple regression analysis, we mapped our proprietary indicators to a distribution of potential scenarios for US economic growth in 2015, as shown in Figure I-4b. The odds of growth at or exceeding 2.5% in 2015 (47%) are significantly higher than the potential for growth to stagnate and fall below 1.5% (33%). Our base case is a

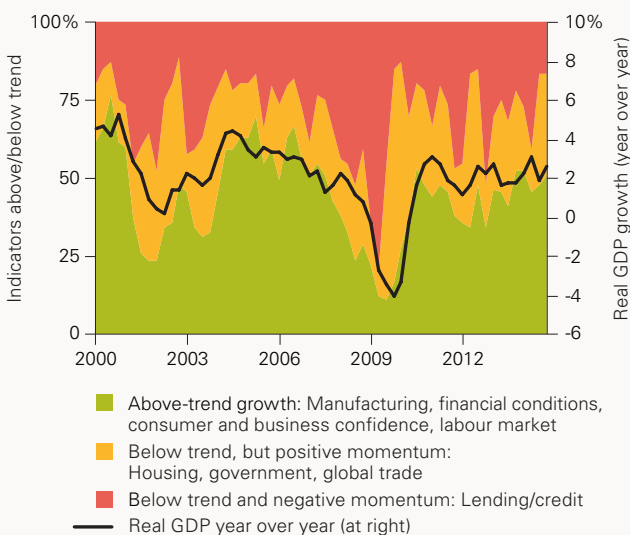
continuation of the cyclical thrust observed since second-quarter 2014, with growth in real GDP in 2015 averaging close to 3% for the year.

In contrast, our euro area dashboard of leading indicators (Figure I-4c) anticipates a challenging 2015 for that region’s economy. The significant increase in “red indicators” throughout 2014, as shown in the figure, is indicative of growing cyclical risks around an already depressed trend growth rate. This translates into significant odds of real GDP growth falling close to or even into recessionary territory in 2015 (35%) (Figure I-4d).

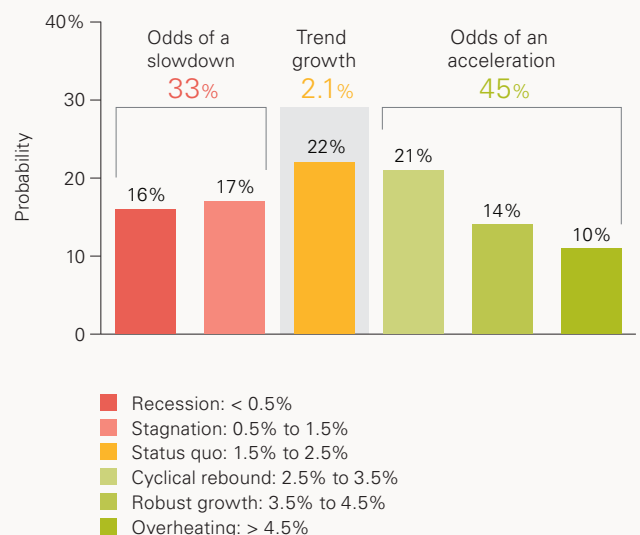
Our outlook for China points to a continuation of current growth trends into 2015, notably slower than the pre- global crisis level of 10%. Vanguard’s proprietary economic indicators dashboard for China, shown in Figure I-4e, suggests that areas of concern for 2015 are financial conditions, domestic trade, and housing. Figure I-4f estimates a 48% probability that the country’s real GDP growth will stay within the 7%–8% bucket (down from 60% in our 2014 outlook) and a 37% probability that it will fall below 7% (these are much higher odds than last year’s 23%). Our base case is growth towards the lower end of the middle range, around 7%.

Figure I-4. Vanguard global dashboard of leading economic indicators and implied economic growth for 2015

a. United States: Economic indicators



b. Estimated distribution of US growth outcomes, 2015



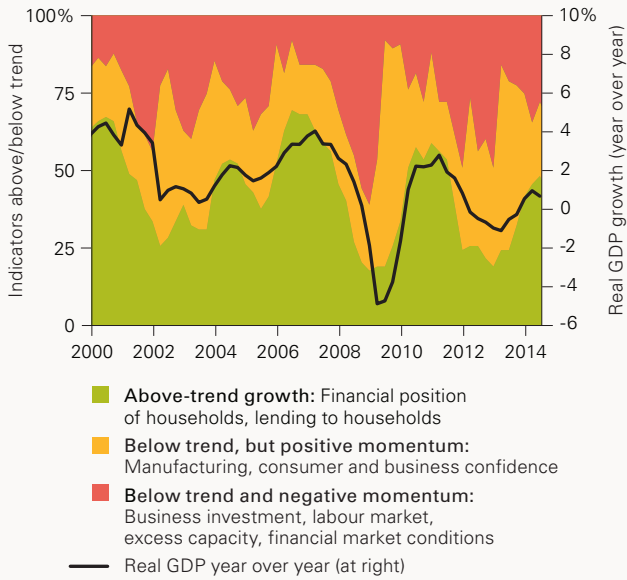
Sources: Vanguard calculations, based on data from Moody’s Analytics Data Buffet.

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 2014 and adjusting for the time-varying trend growth rate. “Trend growth” represents “Projected future” estimated trend growth presented in Figure I-2.

Sources: Vanguard calculations, based on data from U.S. Bureau of Economic Analysis, Federal Reserve, and Moody’s Analytics Data Buffet.

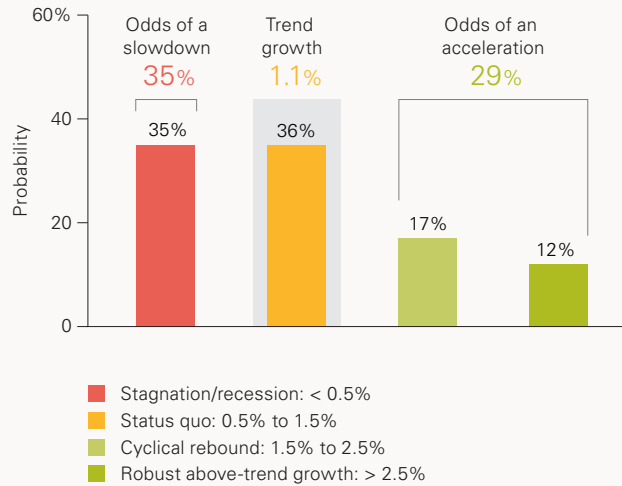
Figure I-4 (continued). Vanguard global dashboard of leading economic indicators and implied economic growth for 2015

c. Euro area: Economic indicators



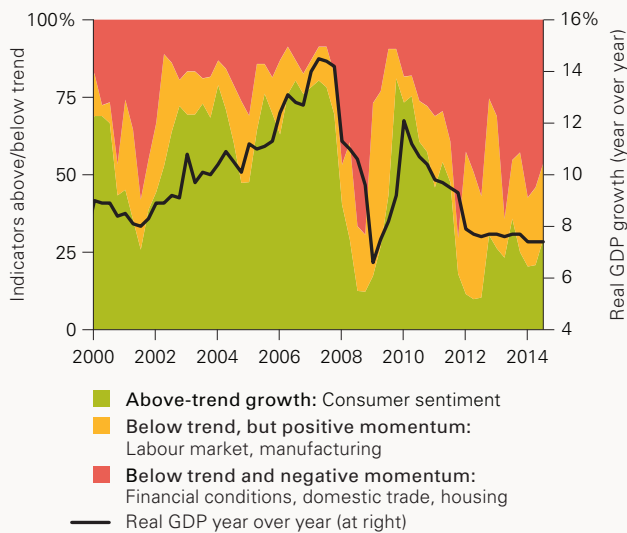
Sources: Vanguard calculations, based on data from Moody's Analytics Data Buffet and Thomson Reuters Datastream.

d. Estimated distribution of euro area's growth outcomes, 2015



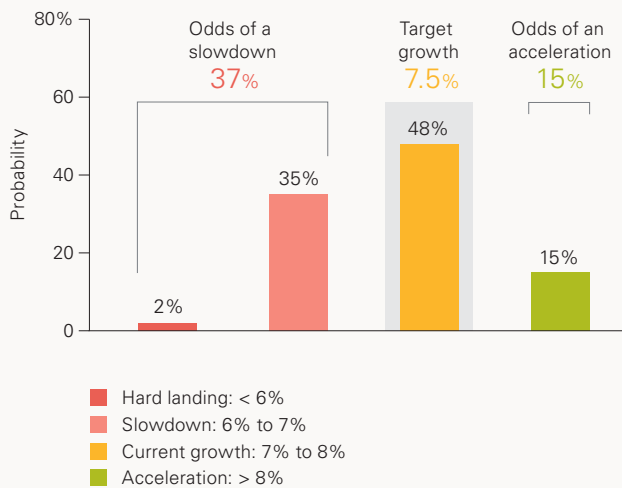
Notes: Distribution of growth outcomes generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2014 and adjusting for the time-varying trend growth rate. "Trend growth" represents "Projected future" estimated trend growth presented in Figure I-2.
 Sources: Vanguard calculations, based on data from Eurostat, Destatis (Federal Statistical Office of Germany), French National Institute of Statistics and Economic Studies (INSEE), Italian National Institute of Statistics (ISTAT), Instituto Nacional de Estadística (INE, Spanish Statistical Office), Statistics Netherlands (CBS), and Thomson Reuters Datastream.

e. China: Economic indicators



Sources: Vanguard calculations, based on data from Moody's Analytics Data Buffet and CEIC.

f. Estimated distribution of China's growth outcomes, 2015



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 1990 to September 2014 and adjusting for the time-varying trend growth rate. "Target growth" is the 2015 growth target set by Chinese officials.
 Sources: Vanguard calculations, based on data from Thomson Reuters Datastream and CEIC.

Europe: Can a Japanese-style 'lost decade' be avoided?

Since the beginning of 2010, economic activity in Europe has been severely impaired by the sovereign debt crisis and, even now, the euro area is still struggling to recover, raising concerns that the region may be entering a Japanese-style lost decade of low growth and deflation.¹

Weighed down by poor performance in the peripheral countries, the level of economic activity in the euro area is still around 1% below its previous peak when the global financial crisis began in 2008. Indeed, even Japan during its so-called lost decade recorded positive growth, as Figure I-5 illustrates. Particularly concerning during 2014 has been the relative loss of momentum from the stronger core countries, although this deceleration may partly be explained by the impact of the Ukrainian crisis on trade with Germany.

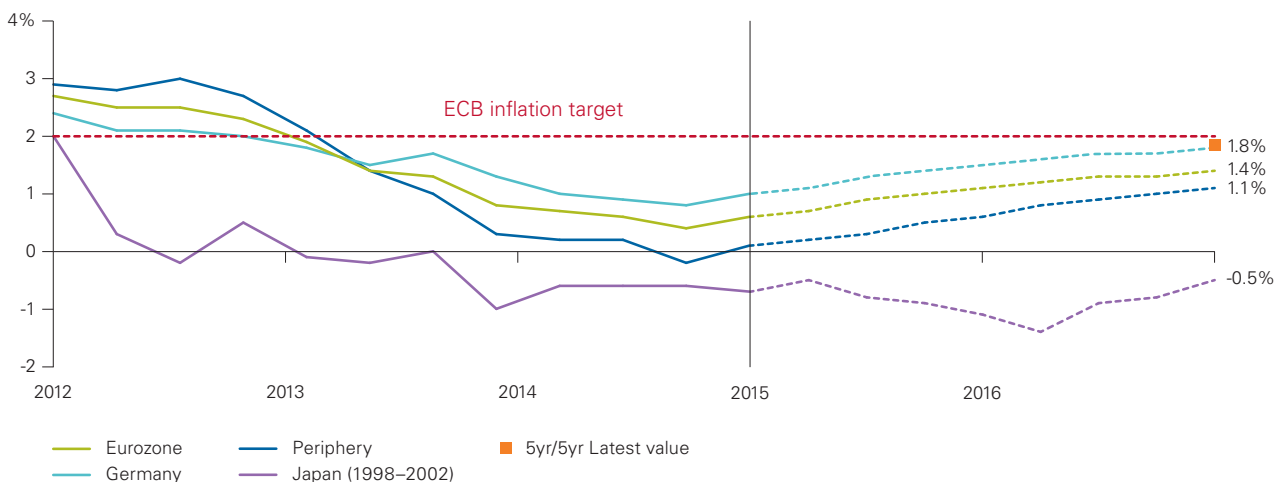
There is increasing concern that the euro area will slip into outright deflation, as occurred in Japan during 1998–2002. Indeed, this year euro area inflation dropped to a new cyclical low of 0.3%, its weakest print in five years and well below the ECB's 2% inflation target.

On the member state level, several peripheral countries are experiencing deflation as they undergo internal price devaluation to restore price competitiveness. For now, overall sustained deflation is not our central expectation but the persistence of significant spare capacity will keep underlying price pressures subdued and a short period of falling prices could well occur if low oil prices persist. This expectation is reflected in market-based and ECB inflation forecasts which do not have inflation returning to the 2% target in the immediate future (see Figure I-5).

All this has prompted the ECB to cut policy rates to near zero and announce a series of unconventional measures including liquidity injections and a limited programme of quantitative easing involving the purchase of private sector assets². A primary focus of these measures is to counteract the weakness in bank lending which is acting as an important drag on growth. This partly reflects inadequate demand. But importantly, credit supply has also been restricted as European banks have been required to repair their balance sheets damaged by earlier overexpansion and response to tighter regulatory requirements. As a result, banks have shrunk their balance sheets by around €3 trn since 2011 but capital ratios are now higher.

Figure I-5. Inflationary expectations below target

Euro area core HICP



Note: The blue-shaded ranges shown around the ECB's September 2014 central projection are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the ranges is twice the average absolute value of these differences. Periphery HICP is a GDP-weighted average of Greece, Spain, Italy and Portugal. HICP forecasts for Germany and the eurozone periphery are based on Bloomberg consensus. The 5-year European Forward Inflation Swap data is as of 27 October 2014.

Source: September 2014 ECB Staff Macroeconomic Projections for the Euro Area, Bloomberg, Eurostat, Cabinet Office - Japan

¹ See *Global Macro Matters – Europe's Economy: A Long Haul* (Davis, 2014b).

² This involves an ABS and covered bond purchase programme announced in September to augment the effects of the targeted long-term refinancing operations (TLTROs) measures, the cheap financing for banks provided by the ECB.

Even so, questions have been raised about the likely effectiveness of these ECB policies and many commentators have suggested that more needs to be done in the form of direct sovereign bond purchases, i.e. “full-blown” quantitative easing. It now seems more likely than not that the ECB will proceed with such a policy in 2015. Their hesitancy to act so far partly reflects the political and legal obstacles that the ECB faces. As was highlighted by the German Constitutional Court’s referral of the ECB’s Outright Monetary Transaction (OMT) to the European Court of Justice, there will likely be opposition from Germany, even if there is unanimous agreement in the ECB’s Governing Council.

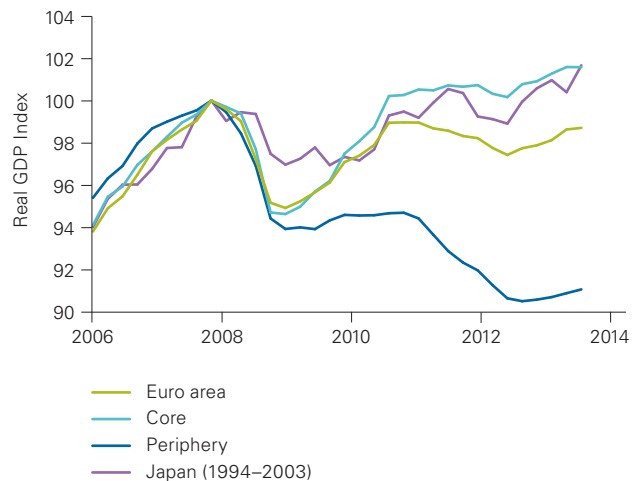
Another serious drag on growth in the euro area has been the programme of necessary fiscal retrenchment, especially in the periphery where debt levels had risen especially sharply (see Figure I-7). This process is far from over. As highlighted in Figure I-7, despite the substantial effort made by Greece, Portugal and Ireland, the public debt as a proportion of output remains substantially higher than their 2003 levels in all three countries. Core countries (France and Italy) are also finding it hard to reduce their budget deficits in line with the European Commission deficit target of 3% of GDP.

Importantly, at the level of the euro area as a whole, public sector debt and deficits are not especially high. Indeed, the euro area’s headline deficit has dropped below 3% of GDP on average. This has led many commentators, including the IMF, to suggest that there is more scope for fiscal stimulus, but such calls for looser fiscal policy to provide stimulus to the region have, for now, been met with resistance in the creditor countries, especially in Germany.

Perhaps the most serious threat to the sustainability of the euro area is the asymmetry of the adjustment costs. For the weaker periphery economies, painful internal wage and price adjustment need to take place to enable them to become more competitive relative to the core nations (see Figure I-8). On the other hand, the taxpayers of the stronger creditor countries continue to be exposed to the risk of past (and potentially future) financial bailouts of the weaker countries. As a result, a prominent downside risk that could derail the central scenario of muted economic activity relates to the political uncertainties which stem from a populist backlash to fiscal austerity and structural reform measures. Many member states are in the middle of their fourth or even fifth consecutive year of restrictive fiscal policy, and unemployment remains painfully high, standing at over 20% in some peripheral economies and much higher for younger workers. As electoral

Figure I-6. Euro area growth worse than Japan’s in the 1990s

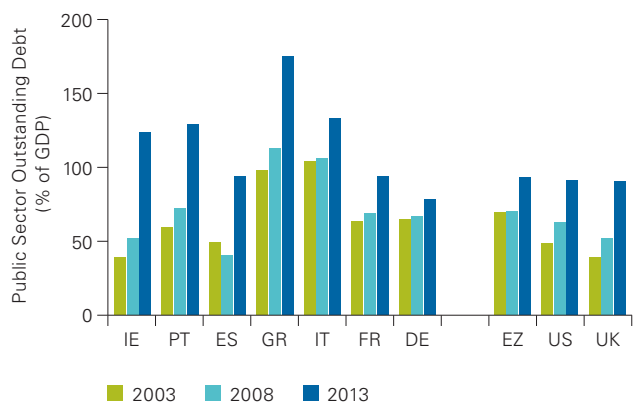
Aggregate euro area, core, and periphery real GDP relative to Japan



Sources: Vanguard calculations, based on data from Moody’s Analytics Data Buffet, Eurostat, National Bank of Belgium (NBB)–Belgostat, French National Institute of Statistics and Economic Studies (INSEE), Deutsche Bundesbank, Hellenic Statistical Authority (ELSTAT), Central Statistics Office (CSO, Ireland)–National Accounts Quarterly, Italian National Institute of Statistics (ISTAT), Statistics Netherlands, Instituto Nacional de Estadística (INE), and Cabinet Office–Japan.

Figure I-7. Public sector debt ratios are still high in the periphery

Public sector debt as a percent of GDP



Sources: Vanguard calculations, based on data from Moody’s DataBuffet.com, Thomson Reuters Datastream, France’s National Institute of Statistics and Economic Studies (INSEE), Deutsche Bundesbank, Statistics Netherlands, Ireland’s Central Statistics Office (CSO), Italian National Institute of Statistics (ISTAT), Hellenic Statistical Authority (ELSTAT), Instituto Nacional de Estadística–Portugal (Statistics Portugal), and European Commission: Eurostat.

cycles run inexorably, there is ample scope for politics to impact on sentiment; for example in Greece, where anti-austerity parties could fare well in the upcoming 2015 elections; and Spain, where the Catalanian independence debate rumbles on.

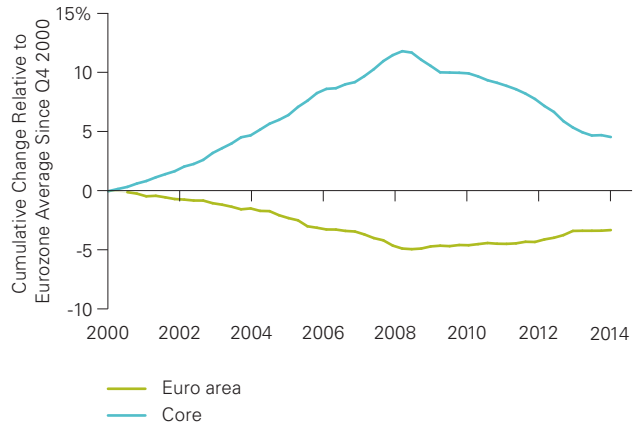
Overall, we still expect the euro area to hold together and continue manoeuvring somewhat clumsily through its quandaries with a modest acceleration in growth over the next few years. But investors should still prepare for periodic market volatility driven by flare-ups in political risk, concerns about falling European inflation and the potential for further debt write-downs.

In the UK, much attention has been given to the headline that growth during the past year has been higher than any other G7 country (at just over 3% y-o-y in 2014Q3), shown in Figure I-9. Moreover, UK growth in 2014 has tended to exceed expectations and now appears to be in an expansion phase, with relatively strong growth of 2.5–3.0% expected in 2015. This is explained by strong job creation, wealth effects from the recovery in the housing market, increased confidence (which reached a record high in August), growth in business investment and muted price pressures. Relative to the euro area, this is partly explained by the greater degree of stimulus from both monetary and fiscal policy, as well as some specific measures designed to boost the housing market which have stimulated domestic demand. Nevertheless, since exiting the economic downturn in 2008-09, the rate of GDP growth has still been slower compared with the early-2000s, reflecting weakness in both domestic and global markets.

Monetary policy prospects in the UK will be importantly affected by the speed with which UK demand moves back into line with productive potential, thereby using up spare capacity. The extent to which this is happening can partly be gauged by looking at measures of unemployment, which have fallen more quickly than expected over the last 12 months. Moreover, the outlook is for the rate to decline further albeit at a more subdued pace. Surprisingly, however, this has not yet translated into commensurate earnings growth (see Figure I-10). Weekly wage inflation has averaged 1.5% from 2010 to present, suggesting that unemployment still seems to be far above a rate that would prompt pay growth or inflationary pressures to rise, as confirmed by the Bank of England's own inflation forecast (see Figure I-7). As a result, members of the Monetary Policy Committee are wary of raising interest rates before a lot more of the slack in the job market has been eliminated since to do so would risk condemning the economy to an unnecessarily weak recovery.

Figure I-8. Structural reforms are helping to reform competitiveness

Unit labour costs

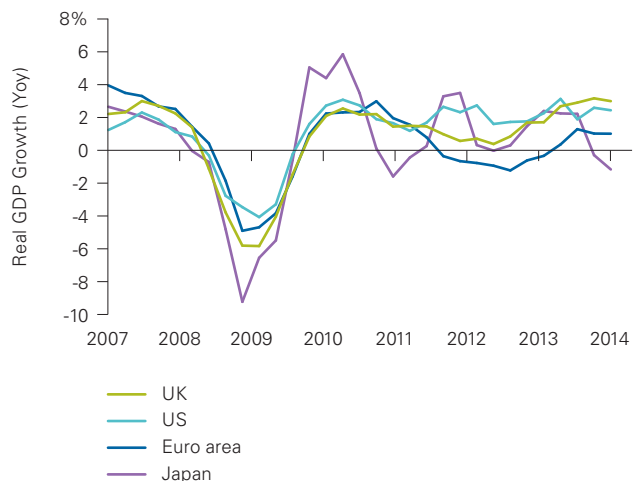


Notes: "Core" is defined as the GDP-weighted average of changes in unit labour costs in Germany, France, and the Netherlands. "Periphery" is defined as the GDP-weighted average of changes in unit labour costs in Italy, Spain, Greece, Portugal, and Ireland. CEPR refers to the Centre for Economic Policy Research.

Sources: Thomson Reuters Datastream, Moody's Databuffet, Eurostat, Federal Reserve, Bureau of Economic Analysis

Figure I-9. Brisk UK growth in 2014

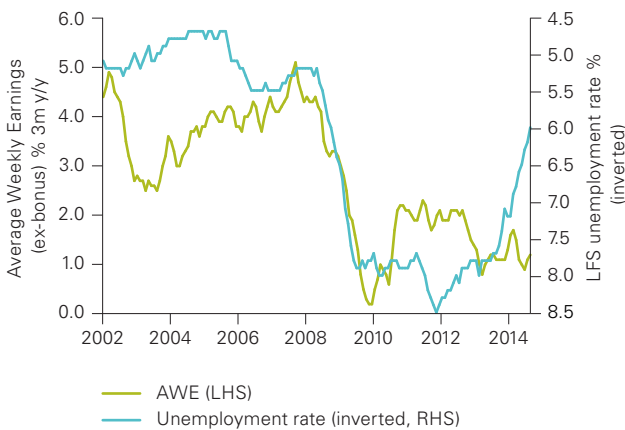
Real GDP year-on-year growth



Sources: Moody's Databuffet, European Commission: Eurostat, National Bank of Belgium (BNB), French National Institute of Statistics and Economic Studies (INSEE), Deutsche Bundesbank, Hellenic Statistical Authority (ELSTAT), Central Statistics Office (CSO): National Accounts Quarterly, Italian National Institute of Statistics (ISTAT), Statistics Netherlands, Instituto Nacional de Estadística, National Institute of Statistics (INE), Cabinet Office- Japan, U.S. Bureau of Economic Analysis.

Figure I-10. Wage growth subdued despite falls in unemployment

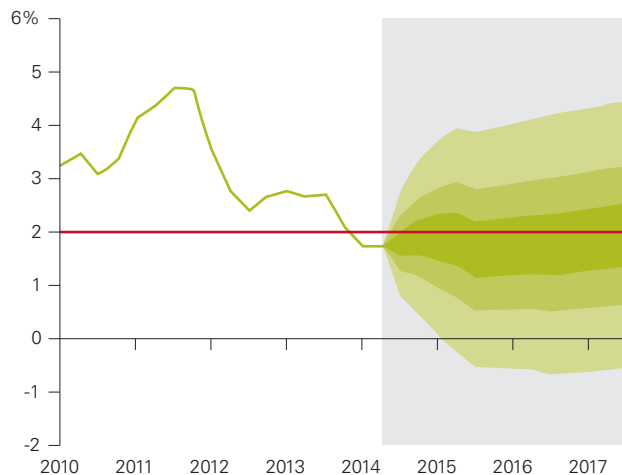
Average Weekly Earnings Growth (LHS) and Unemployment Rate (RHS, inverted)



Source: Office for National Statistics, UK

Figure I-11. Inflation set to be below target at the two year horizon

BoE Inflation Forecast



Notes: Chart depicts the probability of various outcomes for CPI inflation in the future. It has been conditioned on the assumption that the stock of purchased assets financed by the issuance of central bank reserves remains at £375 billion throughout the forecast period. If economic circumstances identical to today's were to prevail on 100 occasions, the MPC's best collective judgment is that inflation in any particular quarter would lie within the darkest central band on only 30 of those occasions. The fan chart is constructed so that outcomes of inflation are also expected to lie within each pair of the lighter red areas on 30 occasions. In any particular quarter of the forecast period, inflation is therefore expected to lie somewhere within the fans on 90 out of 100 occasions. And on the remaining 10 out of 100 occasions inflation can fall anywhere outside the red area of the fan chart. Over the forecast period, this has been depicted by the light grey background.

Source: BoE Inflation Report, November 2014

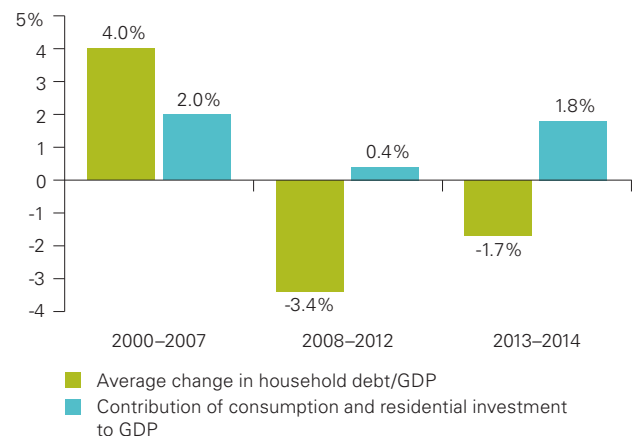
Americas: In the United States, growth tailwinds and full employment in 2015

As in past outlooks, we maintain that US trend growth (in terms of real GDP) is near 2%, versus its historical average of 3.0%–3.5% since 1947. This projection is based on several headwinds—including slower labour force and population growth and higher levels of structural unemployment than were the case over the past three decades. Indeed, real GDP growth has averaged 2.3% since the financial recovery began in 2009, well below the experience in previous recoveries. Nevertheless, Vanguard's US economic outlook for 2015 is best described as one of resiliency, with the ongoing cyclical thrust expected to continue in the near term.

Significant progress has been made to date in reducing consumer debt. Although this debt may not reach more sustainable levels of 60%–70% of GDP until 2016 or so, lower interest rates to service the debt, combined with rising stock and home values, have substantially aided the transition to a "passive deleveraging" phase of the cycle.

For economic growth to occur, the pace of consumer deleveraging matters most, not the absolute level of debt outstanding; that pace has continued to slow in 2014. Figure I-12 shows that the contribution of consumer spending and residential investment to GDP growth has been increasing as the pace of reduction in household debt has eased. As a result, the consumer need not "lever up" and save less in order for the country to achieve stronger growth in 2015–2016.

Figure I-12. Slower US consumer deleveraging is a positive for growth



Sources: Vanguard calculations, based on data from Moody's Analytics Data Buffet, Federal Reserve, and U.S. Bureau of Economic Analysis.

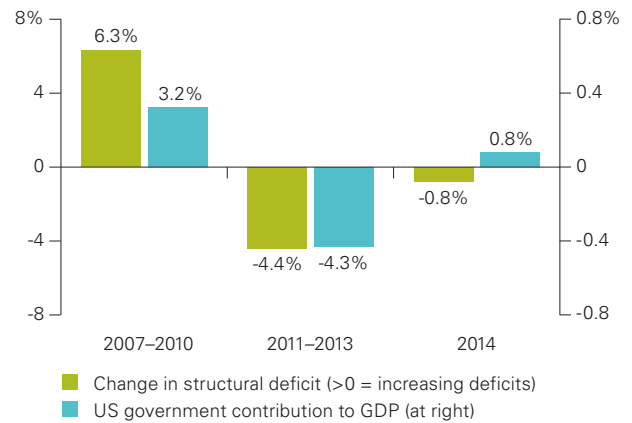
Similarly, on the public-sector side, as the pace of fiscal austerity and deficit reduction has slowed recently, so too has the government's drag on growth (see Figure I-13). The third quarter of 2014 saw the first year-over-year positive contribution to growth from the government sector since the first half of 2010, primarily the result of positive growth in state and local sectors but also helped by less negative growth at the federal level.

Finally, also, the long-expected acceleration in business investment began in 2014 and is expected to continue through 2015 and possibly into 2016. The health of corporate balance sheets and the rising pace of revenue growth (see Figure I-14) indicate that this acceleration is feasible, albeit at a moderate pace, so long as policy uncertainty does not spike over the coming year.

Based on these tailwinds, we expect the recent cyclical thrust in the US economy above its 2% trend growth to continue into 2015. Above-trend growth should continue producing meaningful gains in unemployment, reducing slack in the economy and bringing the economy closer to the so-called full-employment equilibrium.³

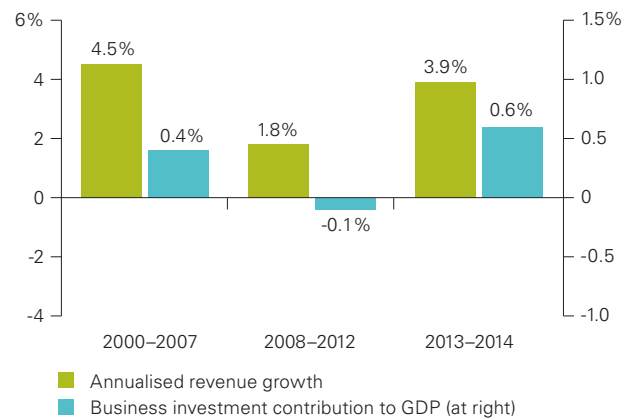
However, in line with our structural deceleration view, the move, today and in future, towards full-employment typified by a falling unemployment rate is explained by structural changes in the labour force. A falling unemployment rate can represent either more people finding jobs or dropping out of the labour force (i.e., they have stopped looking for jobs). By our estimates, more than 80% of the drop in labour force participation is structural in nature and thereby most likely permanent. Indeed, an ageing population coupled with increased use of disability programmes has the potential to reduce participation permanently. The remaining 20% drop in the labour force is attributed to cyclical reasons. An example is of discouraged workers who would restart their job search once prospects of finding employment improved meaningfully.

Figure I-13. Slower pace of fiscal contraction also supports US growth



Sources: Vanguard calculations, based on data from Moody's Analytics Data Buffet, Federal Reserve, and US Bureau of Economic Analysis.

Figure I-14. US businesses starting to expand as revenue growth takes hold



Sources: Vanguard calculations, based on data from Moody's Analytics Data Buffet, U.S. Census Bureau, and U.S. Bureau of Economic Analysis.

³ See *Global Macro Matters—Rate Liftoff: It's Not 'Easy' Being the Fed* (Davis, 2014d).

Asia-Pacific: Will China's rebalancing dilemma show in the growth numbers?

Although Chinese economic growth is likely to continue trending towards a lower but more sustainable pace, given years of overinvestment, we do not foresee an emerging-market-style hard landing as likely.⁴ China is likely to grow at a 6%–7% pace over the next two to three years (see Figure I-15), in line with market expectations but notably slower than its previous trend.

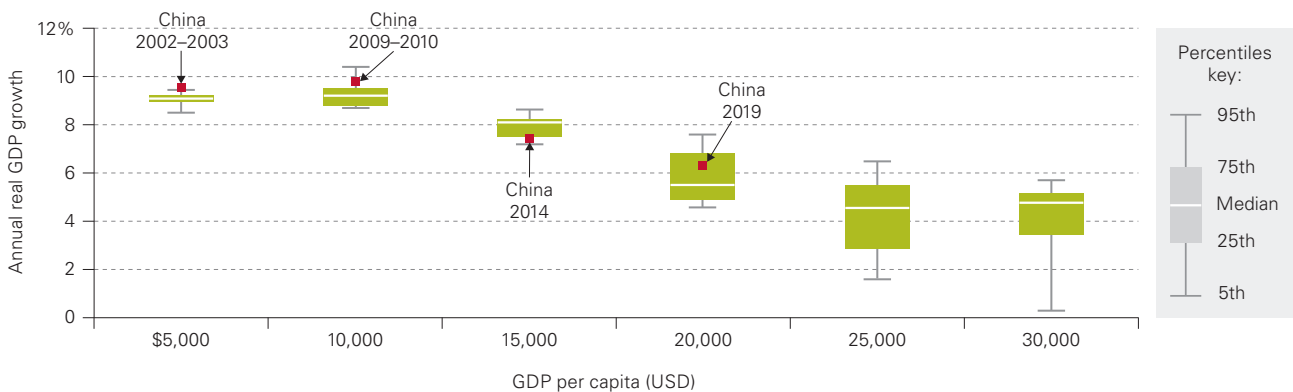
In the bigger picture, the prolonged downshift in China's economic growth in recent years is due to a combination of factors. From a cyclical perspective, the tepid recovery in the global economy, the

significant appreciation of the renminbi in REER⁵ terms, the government's anticorruption and austerity campaign and regulators' stricter control on credit growth and curbs on speculative housing demand have all weighed on economic growth. But more important, the overcapacity and oversupply in China's real estate and manufacturing sectors during the past decade will continue to weigh on China's investment demand in the foreseeable future.

In addition, given the contracting labour force, falling return on capital and moderating total factor productivity growth, the economy's growth potential could gradually fall towards 5% in 2020, in the absence of meaningful progress on structural reforms. In fact, the other wealthy Asian economies all experienced a slowdown on the pathway from low to high income.

Figure I-15. China: Moving to high-income status means slower growth

Historical real GDP growth versus GDP per capita for various Asian economies



Notes: Chart illustrates real GDP growth rates against GDP per capita for China (for the years shown) and for Hong Kong, Japan, Taiwan, South Korea, and Singapore (represented by the blue "bars and whiskers") for 1951–November 2014. For each level of GDP per capita, we calculated distribution of real GDP growth rates across the five Asian economies. China 2014 and 2019 forecasts represent data from IMF World Economic Outlook (WEO), October 2014.

Sources: Vanguard calculations, based on data from Penn World Tables (version 8.0 for 1951–2011) and IMF WEO, October 2014.

⁴ For more perspective on Vanguard's views on China, see *Global Macro Matters—China: Slowdown Possible, Financial Crisis Less So* (Davis, 2014a).

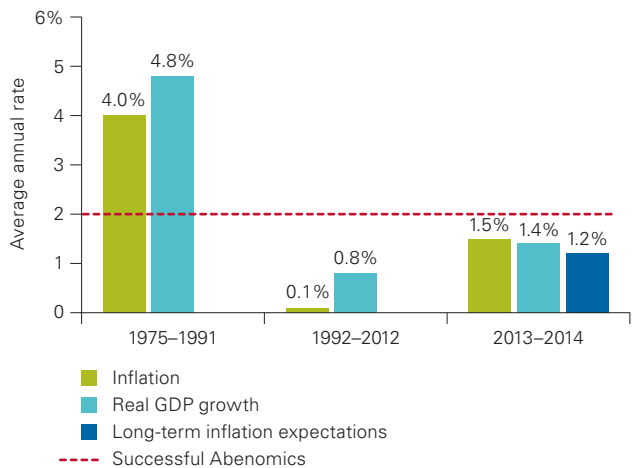
⁵ REER is the real effective exchange rate.

The challenge for China is to attempt, through structural reform, to alter the country's growth model strategically and lift the economy's long-term potential growth, while also maintaining a relatively stable pace of growth. The key to rebalancing is to ensure that investment spending flows towards the most productive uses of capital, avoiding misallocation and overinvestment in certain sectors. Policymakers have recently announced pro-market reforms, which are promising, as credit and investment will respond more to market signals (as would emerge with interest rate liberalisation) than to short-term policy targets or strict controls. However, the transition is not free of risks. Normal swings in market-driven investment and credit flows, coupled with the current high weight of investment spending in GDP growth, could easily cause a sharp economic slowdown. Gradual and flexible implementation of the reforms will be critical. Meanwhile, given the central government's healthy balance sheet and a low inflation outlook, policymakers still have some leeway, and we believe a growth guideline of about 7% for 2015 should be within reach.

In Japan, the outlook is less reassuring. In 2015, we believe the economy should be able to sustain higher levels of inflation of about 1%–2%, given the boost from aggressive monetary easing and renewed yen depreciation. However, the pickup in real GDP growth should remain modest at around 1%, as fiscal stimulus fades and private-sector activities have yet to gather steam. This outlook is consistent with our view that "Abenomics"⁶ so far represents a reflation of prices, rather than a lift to real economic growth (Figure I-16).

Figure I-16. 'Abenomics' getting behind schedule?

Japan's historical real GDP growth and inflation



Notes: "Successful 'Abenomics'" reflects Japan's achieving its goals of 2% inflation. Long-term inflation expectations represent ten-year US break-even inflation less ten-year yield differential between United States and Japan through October 31, 2013, and ten-year US break-even inflation thereafter.

Sources: Vanguard calculations, based on data from Thomson Reuters Datastream, IMF, Japanese Statistics Bureau, Economic and Social Research Institute–Government of Japan, and CEIC.

⁶ "Abenomics" refers to the economic policies implemented by Japanese Prime Minister Shinzo Abe. His "three arrow" approach focused on (1) fiscal and (2) monetary stimulus measures aimed at fighting deflation and (3) long-term structural policies aimed at increasing growth and eventually bringing down the level of debt/GDP in Japan.

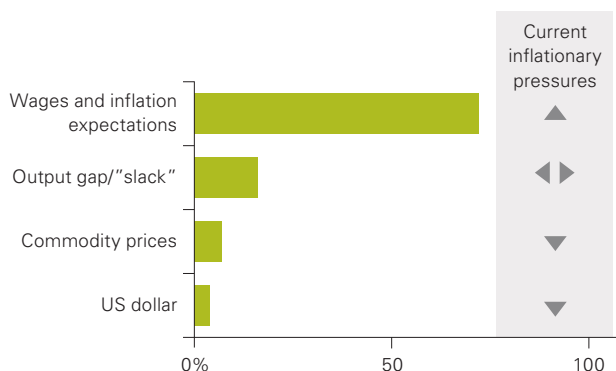
II. Global inflation and policy focus

Global inflation outlook

In the near term, a deflationary threat will likely remain in place over the developed world. In aggregate, reflationary monetary policies should play a critical role in counter-acting the deflationary drag of post-financial crisis global deleveraging. Although central bank balance sheets have risen to a combined total of more than \$5.9 trillion since the onset of the financial crisis, core inflation trends are low (see Figure II-1). Indeed, recent consumer price inflation remains near generational lows and, in several major economies, is below the targeted rate.

Figure II-1. Wage pressures are the canary in the coal mine

Decomposition of variance of US core inflation, 1983–2013



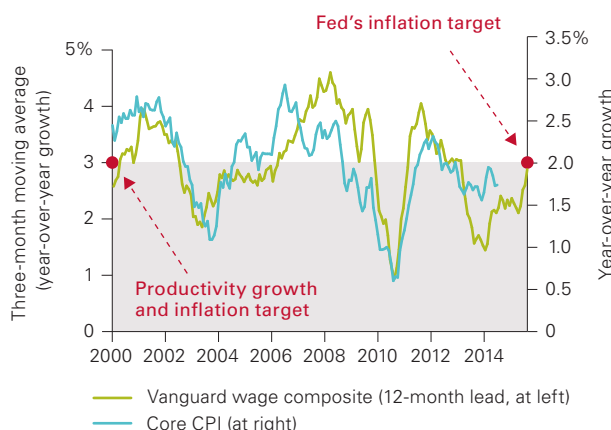
Note: Chart based on inflation-variance decomposition described in Vanguard research (Davis, 2007).

Sources: Vanguard, based on data from U.S. Bureau of Labor Statistics, Federal Reserve Board, Bridge/Commodity Research Bureau, and Federal Reserve Bank of Philadelphia.

In spite of the cyclical thrust in the United States, the recent negative movements in drivers of inflation such as commodity and import prices, and the strength of the US dollar, are tempering the rise in core inflation measures (as shown in Figure II-1). However, labour costs and the inflation expectations embedded in salary negotiations are the most important drivers of inflation trends. Nascent wage pressures should build in the United States in 2015 and beyond, suggesting that core US inflation is likely to approach its 2% target over the next year or so (see Figure II-2).⁷

Figure II-2. Based on wages, core inflation expected to approach target in 2015

Vanguard wage inflation composite index and core CPI



Notes: Vanguard wage composite consists of 26 weighted wage indicators across industries and is calibrated to core CPI. It leads CPI by 11 months. Left and right axes aligned based on estimate of inflationary level of wage growth and Fed's target inflation. Productivity growth and inflation target on left represents 2% inflation target plus estimated productivity growth of 1%. Right axis represents Fed's inflation target of 2%.

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

⁷ See *Global Macro Matters—Higher Inflation? Follow the Money* (Davis, 2014c).

The risk of returning to a high inflationary regime is low, despite the size of central bank balance sheets. For the next ten years, our VCMM simulations project a similar median inflation rate for the United States, the euro area and Japan, with consumer price indices averaging 1.5%–2.0% per year (see Figure II-3). In fact, in the euro area and Japan, deflation remains a much greater risk than high inflation. The deflationary tail risk in our VCMM simulations for Japan and Germany (and the rest of the euro area) is more than double that of the United States.

Of note, Vanguard’s median secular inflation expectation for many developed markets is approximately 1 percentage point lower than the historical average inflation rate observed since the 1950s. This is due to the regime change in global central banks’ monetary policy and inflation management that took place in the 1980s. All else being equal, this implies that nominal asset-class returns may be 1% lower than historical long-run averages, even if their expected average real

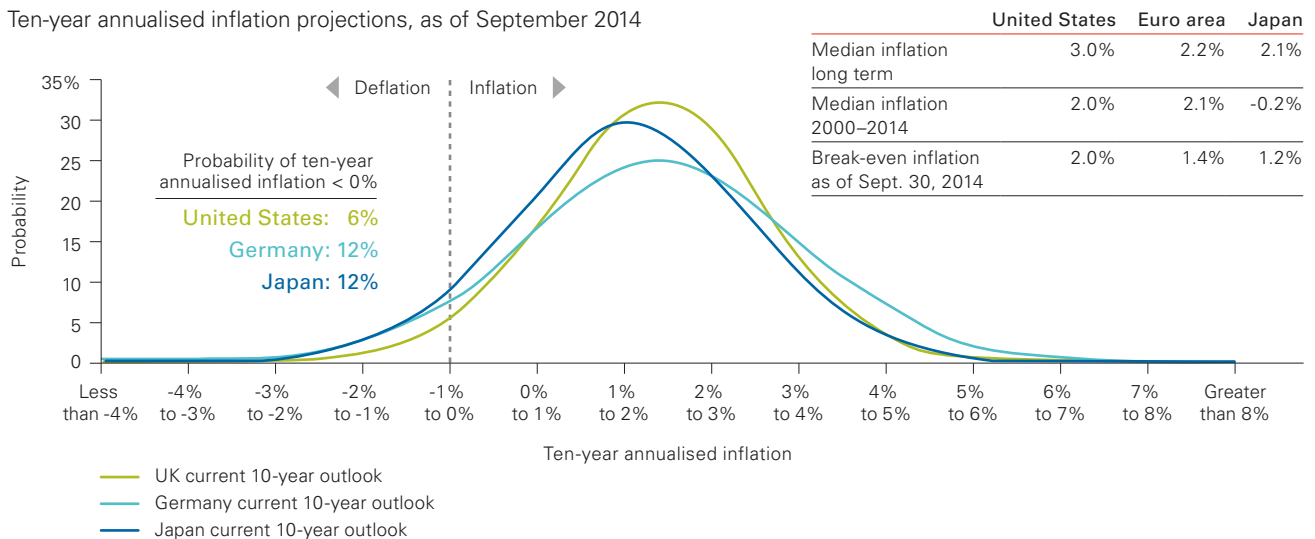
(inflation-adjusted) returns are identical. We discuss this point further in the “Global capital markets outlook” section beginning on page 20.

Looking ahead, we continue to believe that the countervailing forces of sluggish economic growth and monetary-policy reflation in the United States and Europe will reinforce an “inflation paradox.” On the one hand, we expect some investors to continue to have significant concerns about future inflation. As a result, conversations about portfolio construction will include much discussion about inflation protection and the performance of various asset classes under expected and unexpected scenarios (Davis et al., 2012b).

On the other hand, monetary policymakers in developed markets are likely to continue to guard against the pernicious deflationary forces of debt deleveraging for an extended period. It is worth emphasising that despite aggressive monetary policy, some developed markets could be a recession away from realising deflation.

Figure II-3. Risks of deflation persist globally to varying degrees

Ten-year annualised inflation projections, as of September 2014



Notes: Figure displays projected range of ten-year annualised inflation of United States, Germany, and Japan, corresponding to distribution of 10,000 VCMM simulations as of 30 September 2014.
Sources: Vanguard calculations, based on data from Moody’s Analytics Data Buffet, U.S. Bureau of Labor Statistics: Consumer Price Index, European Commission: Eurostat, Thomson Reuters Datastream, Ministry of Internal Affairs and Communications Japan.

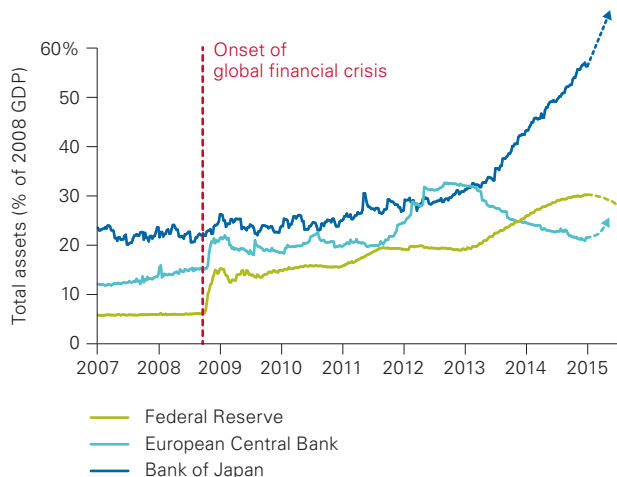
Global interest rates and central bank outlook

Global monetary policy has been extremely aggressive for the most part, but central bank policies should diverge over the next several years (Figure II-4). As in our 2014 outlook, we believe the US Federal Reserve will keep short-term rates near 0% through to mid-2015. We stress, however, that the Fed's rate rise will probably be both more gradual (either moving in smaller increments or pausing) and will end lower than some think (the Fed's long-term rate "dots" may come down). Across most major economies, real (inflation-adjusted) short-term interest rates are likely to remain negative to at least 2017. Indeed, the European Central Bank and the Bank of Japan may be hard-pressed to raise rates this decade. Globally, the burdens on monetary policymakers are high and varied, ranging from raising rates at the right time and pace (in the United States and the United Kingdom), to engineering a soft landing of credit growth (in China), to ensuring appropriate balance-sheet expansion (the ECB and in Japan).

With tapering of the QE programme in the United States completed, markets will pay close attention to policy communications from the Fed and other banks in coming years, in the hope of gleaning insights into the timing of the first rate increase. Our perspective on the structural nature of labour force decline and the resulting impact on unemployment means we would not be surprised by a somewhat earlier rate liftoff in the United States than the market expects. That said, we believe the timing of the liftoff is receiving more attention than is warranted, considering the implications of another key question at hand: How high will policy rates ultimately climb?

Figure II-4. Global monetary policies diverging

Global central bank assets as percentage of a region's 2008 GDP



Notes: Total assets for each central bank are shown as percentage of that country's or region's 2008 GDP. Data as of November 2014.

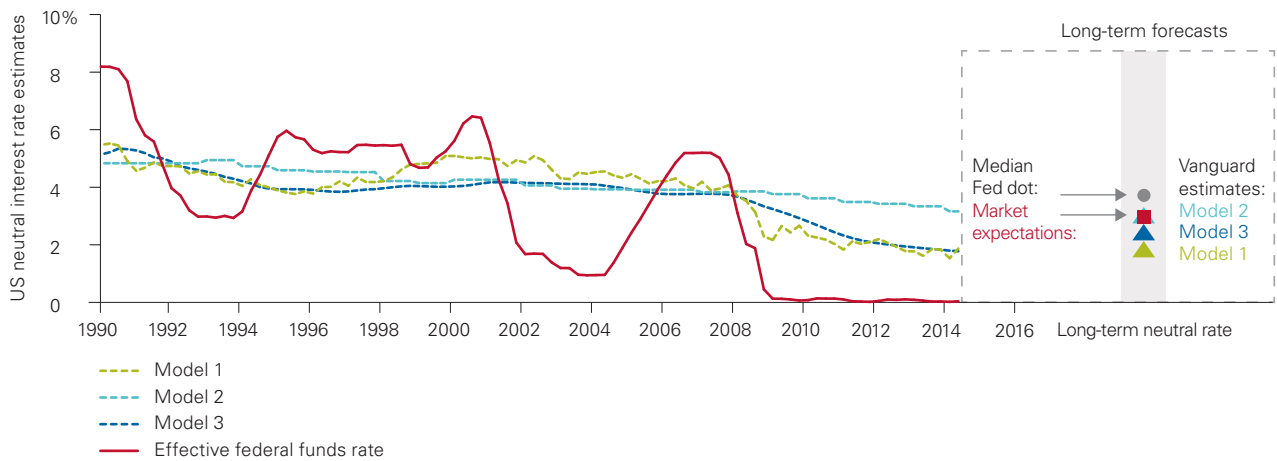
Sources: Vanguard calculations, based on data from Federal Reserve, ECB, Bank of Japan, and IMF.

The neutral interest rate is the policy rate that would prevail today if the economy were at full employment, so it is a good estimate of how much the federal funds rate may increase. Figure II-5 combines the results of three models used to estimate neutral rates, and compares them with estimates from the Fed and market participants. The three models and the market-based measure, pointing to a 2%–3% range compared to historical levels of about 3.5%–4.5%, seem to suggest

that Fed projections of longer-term rates may be somewhat higher than many anticipate. We understand that rates will in all likelihood rise at some point, but the structural nature of issues facing the US labour market means that fears of a bond bubble in the United States may be overblown. What’s more, the similarities across regions in terms of issues affecting growth suggest that yields across the developed world are very likely to be lower than historical averages over the medium term.

Figure II-5. Fed liftoff: ‘When’ is less important than ‘how much’

Estimates of neutral interest rates in US economy



Notes: Models 1, 2, and 3 are alternative estimates of the neutral policy rate in the United States. Model 1 is Federal Reserve Bank of San Francisco model as described in Laubach and Williams (2003); Model 2 is an estimate based on the neoclassical Solow growth model. Model 3 is an estimate based on Taylor’s (1993) rule, in which the intercept of the regression is collected over a rolling ten-year window. “Market expectations” are based on an estimate of a 1-day maturity forward five years in the future using Diebold–Li factors from the Federal Reserve Board. “Median Fed dot” is median of the Federal Open Market Committee’s September 2014 long-run federal funds rate estimates (3.75%).

Sources: Vanguard calculations, using data from Federal Reserve.

III. Global capital markets outlook

Global asset classes outlook: UK interest rates and bonds

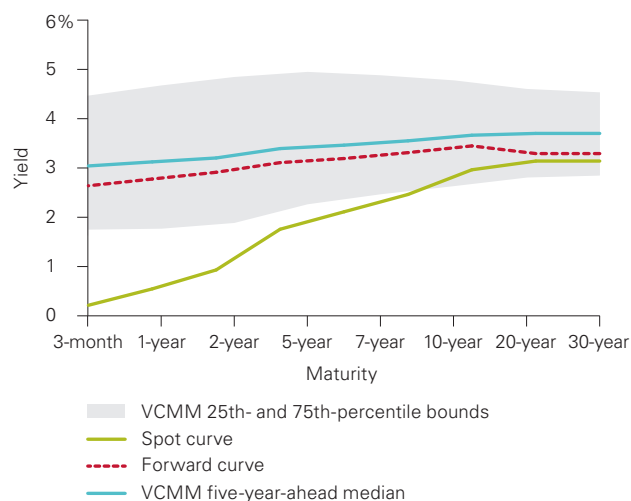
UK interest rates outlook

The bond market continues to expect the yields for UK gilts to rise slightly. This rise is also the central tendency in our VCMM simulations over the next several years, a view that is consistent with the forward market and is therefore reflected in today's bond prices. As shown in Figure III-1, the VCMM five-year-ahead median forecast (blue line) of the yield curve is slightly lower yet similar to the rates implied by the forwards (dashed line). Our simulations indicate a 50% probability of rates being within the grey band of Figure III-1, representing the 25th percentile and 75th percentile bounds of the simulated interest rates, five years ahead.

Our estimates of the fair-value range for the 10-year gilt yield have fallen substantially, with the current macroeconomic environment justifying a 10-year yield in the range of 2.5%–3%. Based on our estimates of the fundamental drivers of government bond yields, the main factor behind this lowered expectation for longer-term rates is the structural deceleration scenario discussed throughout this paper. As the markets price in lower trend growth and inflation, the terminal level for the short rate gets revised downwards, and with it all other rates across the maturity spectrum. This is because fair-value estimates of long-term government bond yields are determined by the expected average short rate over the maturity of the bond (plus a small term premium).

Thus, we are hard-pressed to identify a bubble in gilts. After the recent correction pushed long-term interest rates back closer to our fair-value range, current levels of yields for gilts appear justified based on fundamental drivers. The rise in long rates is likely to be gradual and is priced in by the markets.

Figure III-1. A rise in interest rates is already priced in by the markets



Note: This yield-curve forecast displays the 25th- to 75th-percentile range of 10,000 VCMM simulations for projected yields (five years ahead) of UK gilt curve as of September 2014.

Sources: Vanguard and Moody's Analytics.

Duration tilts are not without risks

In the long run, short-term rates tend to rise more than long-term rates in substantially more than half of our VCMM scenarios. During rising rate scenarios, the prospects for near-term losses in short-term bond portfolios are elevated as well. A short-duration strategy entails substantial forgone income. Focusing solely on avoiding capital losses on long-term bonds ignores the fact that a steep yield curve produces significant income differences among duration strategies. In other words, going short duration may not necessarily outperform a broadly diversified fixed income portfolio in the years ahead, as supported by the simulations discussed below.

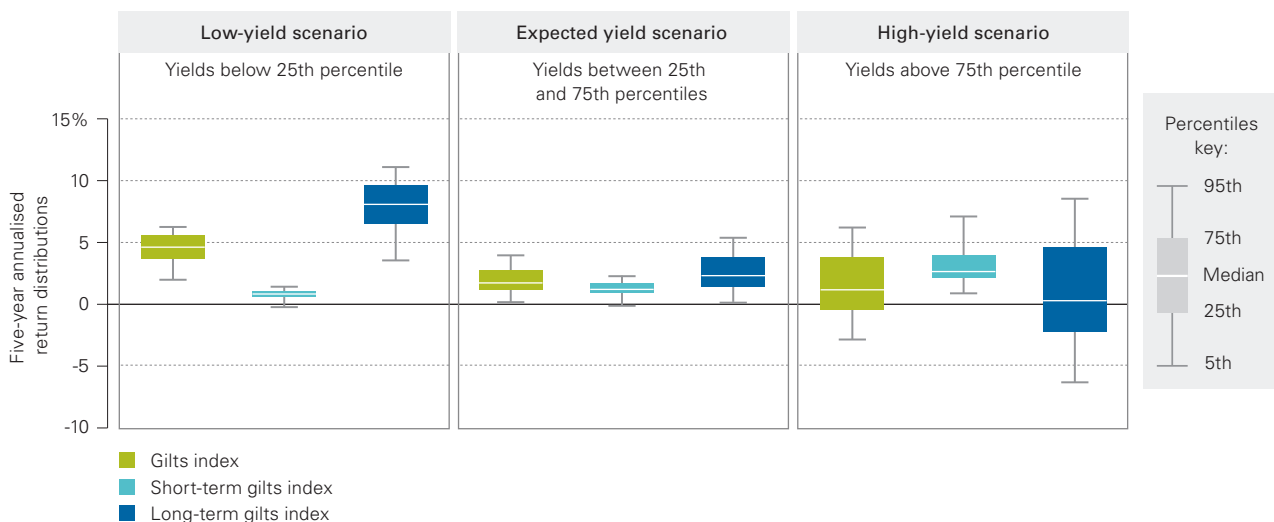
the short-term gilts index will most likely underperform a broad and long-term gilts index. If rates rise more than expected (above the grey band in Figure III-1), then a "shortening duration strategy" works, and short-term gilts will most likely outperform.

Of most importance in this analysis is that if rates rise within the expected range (within the grey band in Figure III-1), the short-term gilts index displays returns (on the median) that are very similar to those of the long-term gilts index. This is because our median VCMM simulations as well as current market expectations are centred on a breakeven yield-curve expectation in which all maturities produce similar returns.

Figure III-2 displays the range of potential returns in three future yield-curve scenarios. Our central tendency is centred on the median interest rate scenario in Figure III-1, but it's important to note that it captures the (highly likely) possibility that actual rates may rise more or less than is indicated by our central tendency. If future rates rise less than expected (the area below the grey 25th/75th percentile band in Figure III-1), then

Across the three scenarios, the total gilts index does a decent job of diversifying the uncertainty about the rise in rates. All three scenarios simulate a rate rise, but the probability of rates increasing more or less than in the central baseline (i.e., market expectation) is 50-50, essentially a coin toss. Hence, diversification across maturities is critical, and short-duration strategies are not without risks.

Figure III-2. Duration tilts: Short-duration strategies are not without risks



Note: Forecast displays the distribution of 10,000 simulations of VCMM for five-year annualised returns of the sub-asset classes shown as of September 2014. The scenarios are obtained based on sorting the 3-month and 30-year UK gilt yields at the end of every year from VCMM. The three scenarios combined are a subset of the 10,000 simulations from VCMM. See Appendix section titled "Index simulations," for further details on sub-asset classes shown here.

Source: Vanguard.

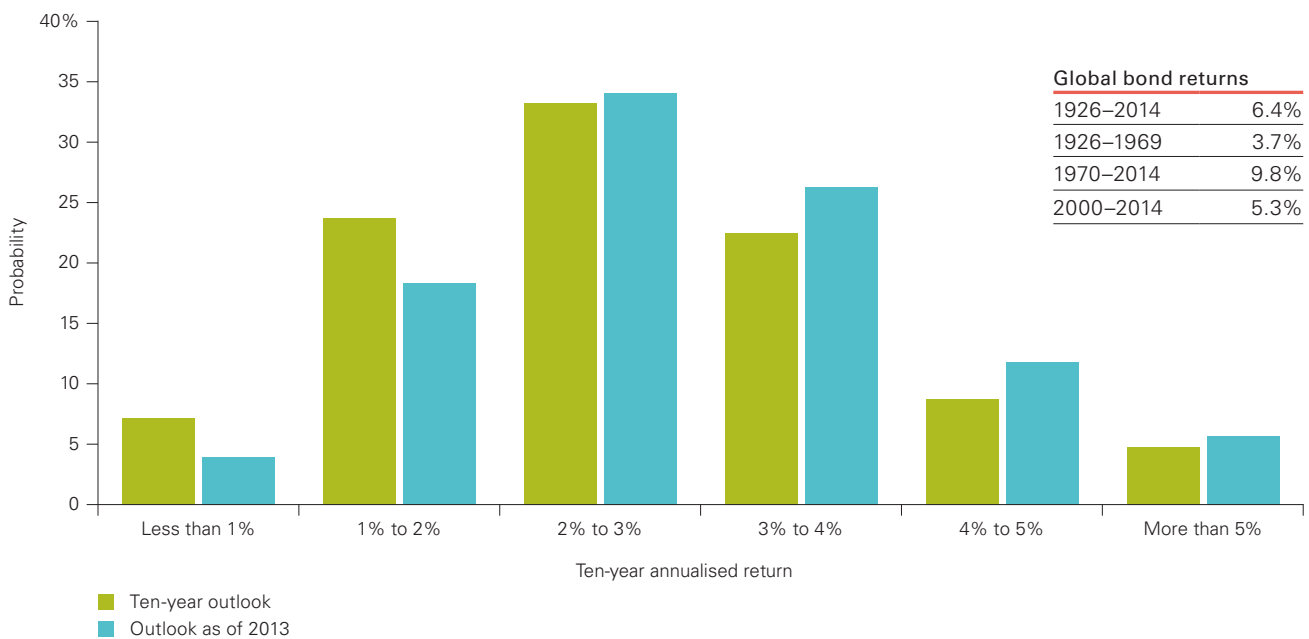
Global fixed income markets

As in past outlooks, the return forecast for fixed income is positive but muted and has fallen when compared to last year due to a fall in interest rates across most parts of the world. As displayed in Figure III-3, the expected ten-year median return of the global fixed income market is centred in the 2.0%–3.0% range, slightly below last year but in line with current benchmark yields.

However, we encourage investors to evaluate the role of fixed income from a perspective of balance and diversification rather than outright return. High-grade or investment-grade bonds act as ballast in a portfolio, buffering losses in riskier assets like equities.

Several segments of the UK bond market have expected ten-year median returns centred in the 2.5%–3.5% range (Figure III-4). Current yields of UK non-gilts are low compared with a ten-year-ahead projection from VCMM simulations. The potential for a rise in the yield (and spreads) is much larger for credit bonds compared with other higher-quality segments of the UK fixed income market, which also contributes to an increased investment risk. From a strategic asset allocation point of view, non-gilts' spreads tend to widen along with spikes in equity volatility and reduce the diversification benefit of holding bonds alongside equities when compared with gilts.

Figure III-3. Projected global fixed income ten-year return outlook



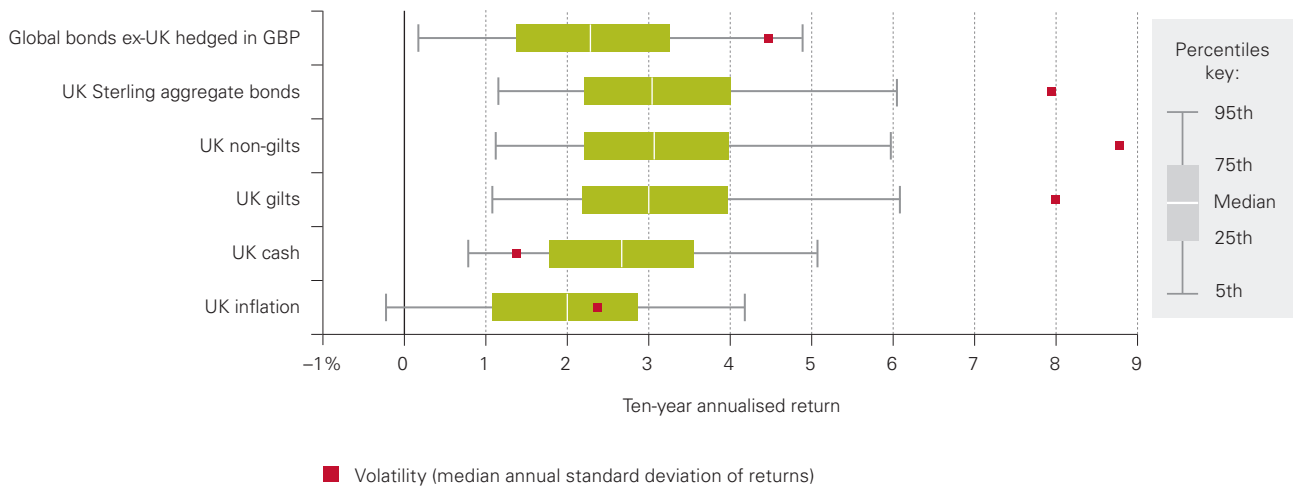
Note: Figure displays projected range of returns for a portfolio of 35% UK bonds and 65% ex-UK bonds, rebalanced quarterly from 10,000 simulations from VCMM as of September 2014 in GBP. Benchmarks used for historical returns are defined in "Indices used in historical calculations", on page 34. See appendix section titled "Indexes simulated" for further details on the asset classes shown above.

Source: Vanguard.

Although the central tendency of expected return for global ex-UK bonds appears to be slightly lower than that of UK aggregate bonds (Figure III-4), we expect the diversification benefits of global fixed income 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 international (i.e. non-UK) bonds should help offset some risk specific to the UK fixed income 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 are likely to diverge in the near term.⁸

Figure III-4. Bond market ten-year outlook: Setting reasonable expectations



Notes: Forecast corresponds to distribution of 10,000 simulations from VCMM for the 10-year annualised returns as of September 2014 in GBP for asset classes shown above. See appendix section titled “Indices simulated” for further details on the asset classes shown above.

Source: Vanguard.

⁸ See Philips and Thomas (2013).

Global asset classes outlook: Global equity markets

US equity valuations

Most valuation metrics for the broad US equity market (see Figure III-5) and its segments are elevated compared with their historical averages. That said, the long-term outlook for the global equity risk premium is closer to historical averages when adjusted for the muted expectations for global inflation and interest rates.

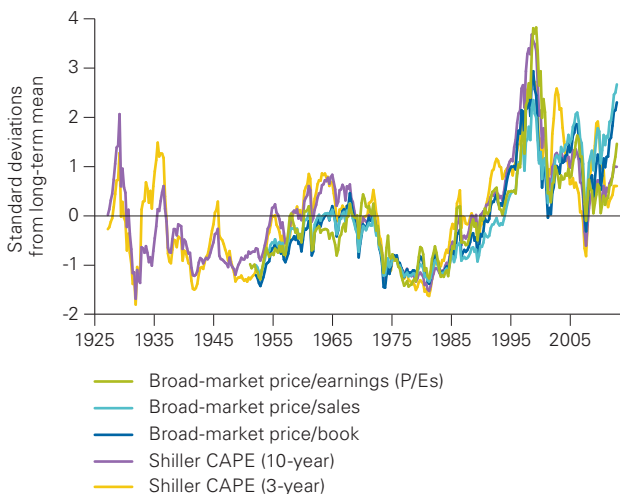
Figure III-6 compares Shiller's (2000) cyclically adjusted price-earnings (CAPE) multiple against a fair-value CAPE estimate based on the fundamental drivers of equity-market earnings yields, namely interest rates and inflation expectations. Unlike what the model indicated in the late 1990s, we find that current CAPE levels are accounted for by current levels of bond yields and inflation (i.e., Shiller's CAPE and our fair-value estimate are at similar levels). This suggests that currently high price/earnings ratios (P/Es) may not be just signalling market overvaluation. In a scenario of structural deceleration and a lower

ending level for policy rates (i.e., lower neutral rates), we expect all asset yields to be lower relative to historical norms, both for equities and fixed income. If that is the case, lower earnings yields (i.e., higher P/Es) may have become the norm going forward. However, even with no or muted multiple contraction, forward-looking equity returns may still be lower than the historical average if the earnings yield (and its two components: dividend yields and reinvestment of earnings) remains compressed.

In short, we are hard-pressed to identify market bubbles, and the uncertainty associated with forward-looking return estimates underscores the fact that today's valuation levels present a range of potential outcomes. A key takeaway from our analysis, however, is that because the premium compensating increased equity risk appears to endure at lower yield levels, we would encourage investors to exercise caution in making drastic strategic or tactical changes to the risk profile of their portfolios.

Figure III-5. Signs of froth in long-term valuations for US equities

Selected valuation metrics, 1926–2014

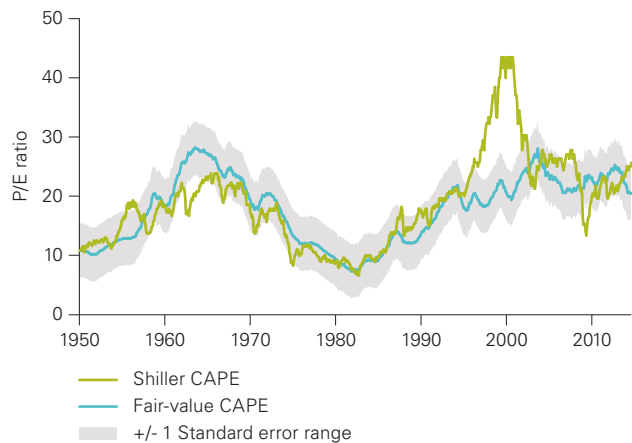


Notes: Figure displays valuation metrics standardised to have a long-term average of 0.0 and a standard deviation of 1.0. "Broad-market price/earnings" displays market value of domestic corporations from Federal Reserve Flow of Funds database relative to trailing four-quarter average of after-tax corporate profits from national accounts of U.S. Bureau of Economic Analysis (BEA). "Broad-market price/sales" displays market value of domestic corporations from Flow of Funds database relative to Gross Value Added of Corporate Business from BEA's national accounts. "Broad-market price/book" displays market value of domestic corporations relative to net worth at historical cost of Nonfinancial Corporate Business, both from Flow of Funds database. "Shiller CAPE (10-year)" is ten-year "cyclically adjusted price/earnings" ratio as defined in Shiller (2000). Shiller CAPE (3-year) is Shiller's measure adjusted to smooth earnings over a trailing 36-month period. Data as of August 30, 2014.

Sources: Vanguard calculations, based on data from Federal Reserve, U.S. Bureau of Economic Analysis, and Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm.

Figure III-6. Are high equity valuations becoming the norm?

Shiller CAPE versus estimated fair-value CAPE



Note: "Fair-value CAPE" is based on a statistical model that corrects CAPE measures for the level of inflation expectations and for lower interest rates. The statistical model specification is a three-variable vector error correction (VEC), including equity-earnings yields, ten-year trailing inflation, and ten-year US Treasury yields estimated over the period January 1940–June 2014.

Sources: Vanguard calculations, based on Robert Shiller website (see Notes to Figure III-5, at left), U.S. Bureau of Labor Statistics, and Federal Reserve Board.

Long-term global equity return outlook

VCMM simulations for ten-year returns of a global equity portfolio are centred in the 6%–9% range, slightly lower than this time last year (see Figure III-7) given that valuations, combined across most developed markets, are slightly above where they were last year. This outlook can be attributed to the fact that current market valuations have increased as markets continue to price in a structurally lower-growth world, with lower interest rates and subdued inflation pressures across the board. When returns are adjusted for future inflation, we estimate a 40% likelihood that a global equity portfolio will fail to produce a 5% average real return over the decade 2014–2024.

A closer look at the long-term median expected return for UK equity versus global ex-UK equity in Figure III-7 suggests that the expected equity market return seems similar in both. This result is a function of the current starting level of valuations as well as long-term trends of the UK pound priced-in by the markets as discussed in Davis et al (2014). This is in spite of our concerns on the economic outlook for Europe and Japan, two key markets for the ex-UK equity benchmark. As explained in Davis et al (2013 and 2010), low economic growth expectations do not always translate into low equity return expectations. Additionally, the projected distribution of long-term returns shown in Figures III-7 and III-8 display wide and fat tails. As discussed in Davis, Aliaga-Díaz, and Thomas (2012),

Figure III-7. Projected global equity ten-year-return outlook

VCMM-simulated distribution of expected average annualised nominal return of global equity market, estimated as of September 2013 and September 2014



Notes: Figure displays the projected range of returns for 25% UK equity, 75% ex-UK equity portfolio in GBP, rebalanced quarterly from 10,000 simulations from VCMM as of September 2014. Benchmarks used for historical returns are defined in "Indices used in historical calculations", on page 34. See appendix section titled "Indexes simulated" for further details on the asset classes shown above.
Source: Vanguard.

although valuations are useful in predicting stock returns over the long term, they still leave more than half the volatility of long-run returns unexplained.

Equity portfolios with a high degree of home bias can always take advantage of global diversification benefits by rebalancing towards non UK exposures for the following reasons:

- The expected median volatility on global ex-UK equity is likely to be lower than the UK equity market.
- The less than perfect correlation between global ex-UK equity and UK equity will likely provide investors with diversification benefits.

In terms of emerging markets, Vanguard’s research (see Davis et al., 2013) gives perspective on why the currently weak economic growth environment for China and other BRIC countries⁹ should not carry over to our long-term equity market return expectations. Markets are forward-looking and thus are already pricing in the lowered market consensus expectations for growth. This is reflected in emerging-market valuations at average “normal” levels (see Figure III-9), suggesting that risk-adjusted returns for emerging markets may not differ much from those of other global equities. Thus, the case for emerging markets in long-term portfolios should not be based on any projected return outperformance, but rather on the diversification benefits of emerging markets.

Figure III-8. Setting reasonable expectations, being aware of widely dispersed potential returns



Notes: Forecast corresponds to distribution of 10,000 simulations from VCMM for the 10-year annualised returns as of September 2014 in GBP for asset classes shown above. See appendix section titled “Indices simulated” for further details on the asset classes shown above.

Source: Vanguard.

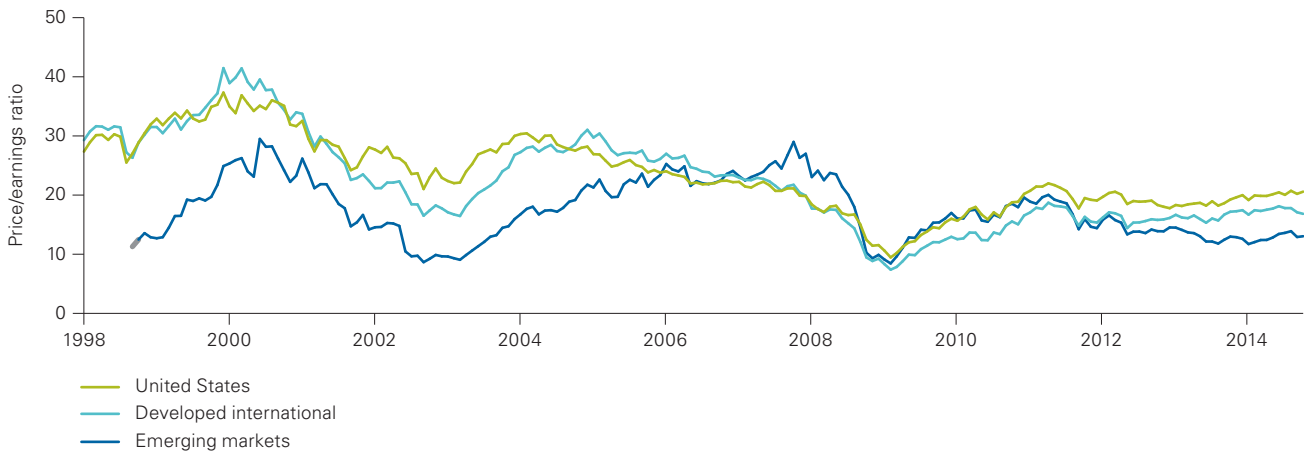
9 BRIC countries include Brazil, Russia, India, and China.

Figure III-8 also includes simulations for commodity futures returns. The simulated returns show a wide distribution, with lower median returns and slightly lower median volatility than equities. Because commodity futures markets are forward-looking, futures contracts are already pricing in the weak outlook for spot commodity prices. Thus, futures return expectations may be normal even if investors are pessimistic about the outlook for spot prices.

From a portfolio construction viewpoint, commodities are a good diversifier of UK equity risk only in the presence of supply-side shocks such as adverse weather for agricultural commodities, or geopolitical events affecting world oil production. When commodity returns are driven by global demand considerations (such as a global economic slowdown), correlations to equity markets tend to increase (in some cases, sharply), and the diversification value may be very low. For these reasons, we caution investors to keep in mind the time-varying nature of correlation in deciding an adequate exposure to commodities.

Figure III-9. Emerging market valuations holding up

Prices over 36-month trailing earnings for selected equity indexes



Notes: Figure displays price/earnings ratio with aggregate earnings. “United States” represented by MSCI US Index; “Developed international” represented by MSCI World ex USA Index; and “Emerging markets” represented by MSCI Emerging Markets Index.

Sources: Vanguard calculations, based on data from MSCI and Thomson Reuters Datastream.

Implications for balanced portfolios and asset allocation

To examine the potential portfolio construction implications of Vanguard’s range of expected long-run returns, Figure III-10 presents simulated real (inflation-adjusted) return distributions for 2014–2024 for three hypothetical portfolios ranging from more conservative to more aggressive: 20% equities/80% bonds; 60% equities/40% bonds; and 80% equities/20% bonds. The historical performance of these portfolios is shown on the left-hand side of the figure. The results have several important implications for strategic asset allocation, as discussed next.

Modest outlook for long-run returns

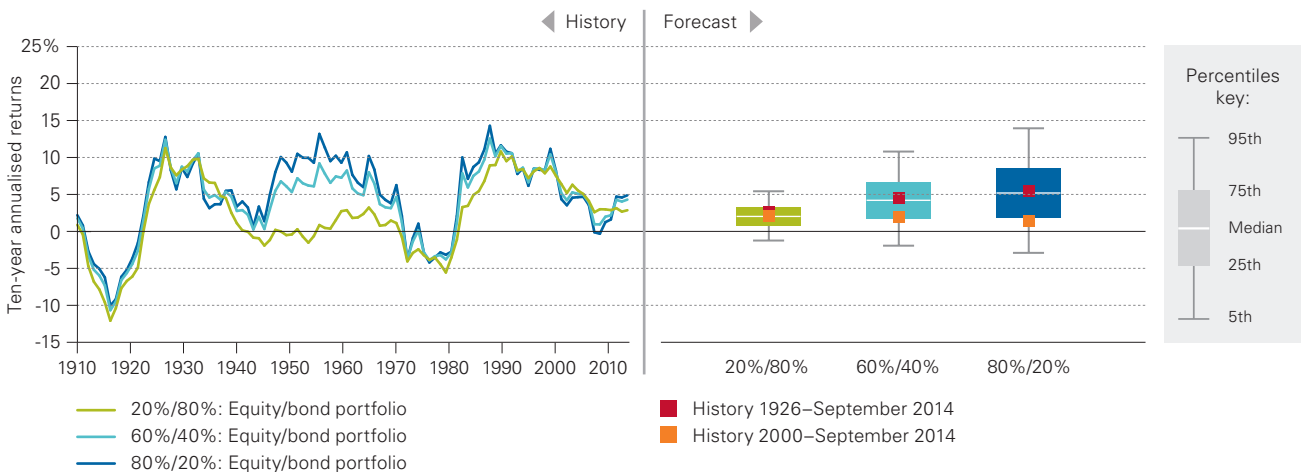
Amid widespread concern over the current low yields of long-term gilts, Figure III-10’s real long-run return profile for balanced portfolios may seem better than expected. However, Vanguard believes it’s important for investors to consider real-return

expectations when constructing portfolios, because today’s yields are, in part, associated with lower expected inflation than was the case 20 or 30 years ago.

Figure III-10 does show that the inflation-adjusted returns of a balanced portfolio for the decade ending 2024 are likely to be moderately below the long-run historical averages (indicated by the small boxes for 1926–September 2014). Also, the likelihood of achieving real returns in excess of those since 2000 for all but the most conservative portfolios is higher.

Specifically, our VCMM simulations indicate that the average annualised returns of a 60% equity/40% bond portfolio for the decade ending 2024 are expected to centre in the 3%–5% real-return range, below the actual average real return of 5.0% for the same portfolio since 1926. Viewed from another angle, the likelihood that our portfolio would achieve at least the 1926–2014 average real return is estimated at approximately 40%, and the odds of attaining a higher real return than that achieved since 2000 (2.3%) are near 65%.

Figure III-10. Projected ten-year real return outlook for balanced portfolios



| Equity/bond portfolios | Bottom 5th percentile | 25th percentile | 50th percentile | 75th percentile | 95th percentile | History 1926–2014 | History 2000–2014 |
|------------------------|-----------------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|
| 20%/80% | -1.3% | 0.6% | 2.0% | 3.3% | 5.4% | 3.0% | 3.0% |
| 60%/40% | -1.9% | 1.6% | 4.2% | 6.9% | 10.8% | 5.0% | 2.3% |
| 80%/20% | -2.9% | 1.6% | 5.2% | 8.7% | 13.9% | 5.8% | 1.7% |

Note: Forecast displays the 5th/25th/75th/95th percentile range of 10,000 simulations from VCMM for projected real returns for balanced portfolios in GBP as of September 2014. Benchmarks used for historical returns are defined in “Indices used in historical calculations”, on page 34. See appendix section titled “Indexes simulated” for further details on the asset classes shown above. The equity portfolio is 25% UK equity and 75% global ex-UK equity. The bond portfolio is 35% UK bonds and 65% global ex-UK bonds. For ex-UK Bonds, hedging commences in 1955. Prior to 1955, no hedging/currency conversion is used because 3-month bill yields are unavailable, and the exchange rate between USD and GBP was fixed; thus, there is no forward rate to calculate. GBP/USD Exchange Rate calculated using history of fixed rate changes until 1957, when time series becomes available within Datastream.

Source: Vanguard calculations, using data from Thomson Reuters Datastream, Barclays Live, Federal Reserve, Bank of England, Office of National Statistics, Moody’s Analytics Databuffet, OECD

Portfolio construction strategies

Contrary to suggestions that an environment of structural deceleration, subdued inflation pressures and permanently lower interest rates warrants some radically new investment strategy, Figure III-10 reveals that the simulated ranges of portfolio returns are upward sloping on risk. Simply put, higher risk accompanies higher (expected) return. Our analysis of equity valuations in Figure III-6 showed that the US equity risk premium endures, when one adjusts for the muted expectations for global inflation and interest rates. Thus, in our VCMM simulations the forward-looking equity risk premium expectation over bonds may not be lower than it has been in the past.

Nevertheless, although risk/return trade-offs and the equity risk premium may not be different, portfolio return expectations themselves need to be recalibrated downwards based on the prospects of lower global trend growth and central banks' lifting of policy rates very gradually, if at all. In this environment, we expect asset yields to be lower relative to historical norms across the board, both for equities and fixed income. Investment objectives based either on fixed spending requirements or on fixed portfolio return targets may require investors to consciously assess whether the extra risk needed to reach those goals is within reasonable risk-tolerance levels. A balanced approach may also include calibrating investment objectives against reasonable portfolio return expectations and adjusting investment behaviour, such as savings and portfolio contributions.

We encourage investors to evaluate carefully the trade-offs involved in any shifts towards risky asset classes; that is, tilting a bond portfolio towards corporates or a wholesale move from bonds into equities. The crosscurrents of valuations, structural deceleration and divergent monetary policies imply that the investment environment is likely to be more challenging and volatile in the years ahead. Having both a realistic expectation of the extra return to be gained in such an environment and an understanding of the implications for holistic portfolio risk is crucial to maintaining the discipline needed for long-term investment success.

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IV. Appendix: Further analysis, VCMM, and index simulations

Figure IV-1. Assessing drivers of global slowdown

| Secular stagnation Demand-side factors restraining aggregate spending | United States | Euro area | Japan | United Kingdom | Canada | Australia | China |
|---|---------------|-----------|--------|----------------|--------|-----------|--------|
| Monetary policy ineffective at zero–lower bound | Yellow | Red | Yellow | Yellow | Green | Green | Green |
| Consumer debt-deleveraging | Yellow | Red | Red | Red | Green | Red | Green |
| Fiscal austerity and deficit reduction | Green | Red | Yellow | Red | Red | Red | Yellow |
| Government, consumers, and business all restraining spending | Green | Red | Red | Red | Green | Green | Green |
| Rising income inequality and ageing of population | Yellow | Yellow | Red | Yellow | Yellow | Green | Red |
| Overall assessment | Green | Red | Yellow | Yellow | Green | Green | Green |
| Structural slowdown Supply-side factors impairing potential GDP growth | | | | | | | |
| Rising structural unemployment rate | Red | Red | Yellow | Red | Green | Green | Green |
| Slowing population growth | Yellow | Yellow | Red | Yellow | Red | Red | Red |
| Additional demographic effects on labour force participation rate | Red | Green | Green | Green | Green | Green | Red |
| Productivity slowdown | Red | Red | Red | Red | Red | Red | Red |
| Slowdown in business investment | Red | Red | Red | Red | Green | Green | Yellow |
| Overall assessment | Red | Yellow | Yellow | Yellow | Green | Green | Yellow |

■ Highly significant factor
■ Somewhat significant factor
■ Factor not present

Notes: “Monetary policy ineffective at zero–lower bound” is red if the country is at the zero-bound for policy rates and has not implemented quantitative easing; “Consumer debt-deleveraging” determined by percentage change in household debt (percentage of GDP) from 2008 to November 2014; “Fiscal austerity and deficit reduction” calculated by the expected reduction in average structural balance between 2001–2007 and 2014–2019; “Government, consumers, and business all restraining spending” is red if all three sectors are restraining spending, and green if at least one sector is not restraining spending; “Rising income inequality and ageing of population” is red if both income inequality and life expectancy are increasing faster than other countries, yellow if both are increasing slowly, and green if only one or neither is increasing; “Rising structural unemployment rate” is determined by the difference in NAIRU between 2006 and 2014; “Slowing population growth” calculated by the difference in average birth rate between 1960–1990 and 2000 to November 2014; “Additional demographic effects on labour force participation rate” determined by difference between 2000–2007 labour force participation rate and 2008 to November 2014 labour force participation rate; “Productivity slowdown” determined by decrease in total factor productivity growth as explained by Gordon (2014); “Slowdown in business investment” determined by calculating the difference between average fixed capital formation as percentage of GDP for 2000–2007 and 2008 to November 2014.

Sources: Vanguard calculations, based on data from ECB, Moody’s Analytics, U.S. Bureau of Economic Analysis, U.S. Federal Reserve, IMF, Cabinet Office of Japan, Australian Bureau of Statistics, Statistics Canada, Thomson Reuters Datastream, World Bank, OECD, U.S. Census Bureau, Japan Statistics Bureau, Gordon (2014), and National Bureau of Statistics of China.

About the Vanguard Capital Markets Model

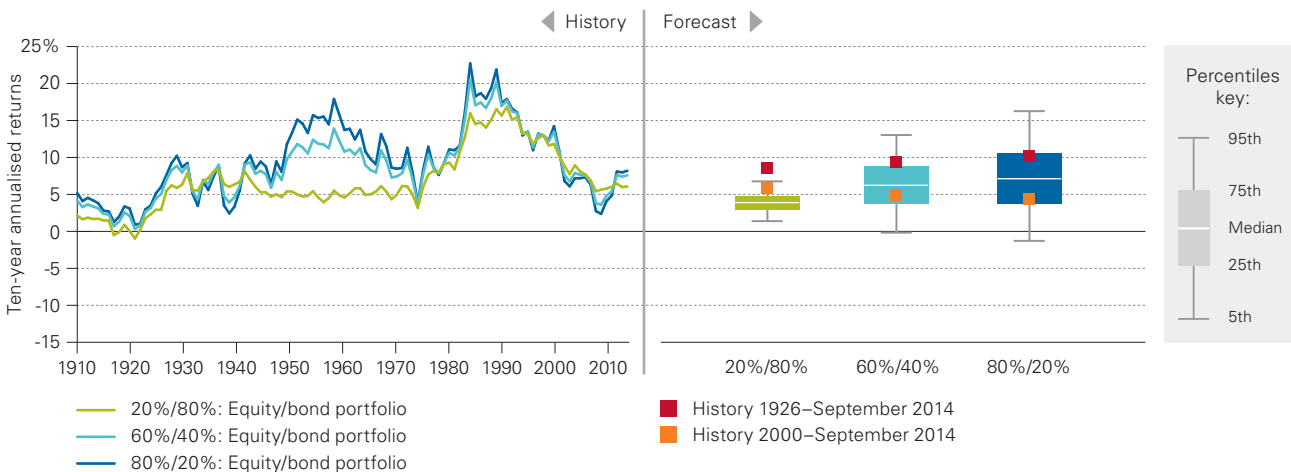
IMPORTANT: The projections or other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. VCMM results will vary with each use and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

UK and international equity markets, several maturities of the UK gilt and corporate fixed income markets, international fixed income markets, UK 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.

Figure IV-2. Projected ten-year nominal return outlook for balanced portfolios



| Portfolios | Bottom 5th percentile | 25th percentile | 50th percentile | 75th percentile | 95th percentile | History 1926–2014 | History 2000–2014 |
|------------|-----------------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|
| 20%/80% | 1.4% | 2.9% | 4.0% | 5.0% | 6.8% | 7.8% | 5.9% |
| 60%/40% | -0.2% | 3.6% | 6.3% | 9.0% | 13.1% | 9.8% | 5.2% |
| 80%/20% | -1.3% | 3.6% | 7.2% | 10.8% | 16.3% | 10.6% | 4.7% |

Notes: Forecast displays the 5th/25th/75th/95th percentile range of 10,000 simulations from VCMM for projected nominal returns for balanced portfolios in GBP as of September 2014. Benchmarks used for historical returns are defined in "Indices used in historical calculations", on page 34. See appendix section titled "Indexes simulated" for further details on the asset classes shown above. The equity portfolio is 25% UK equity and 75% global ex-UK equity. The bond portfolio is 35% UK bonds and 65% global ex-UK bonds. For ex-UK Bonds, hedging commences in 1955. Prior to 1955, no hedging/currency conversion is used because 3-month bill yields are unavailable, and the exchange rate between USD and GBP was fixed; thus, there is no forward rate to calculate. GBP/USD Exchange Rate calculated using history of fixed rate changes until 1957, when time series becomes available within Datastream.

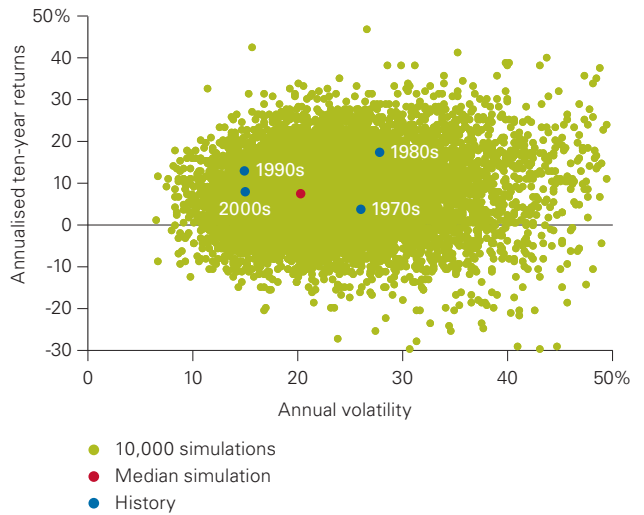
Source: Vanguard calculations, using data from Thomson Reuters Datastream, Barclays Live, Federal Reserve, Bank of England, Office of National Statistics, Moody's Analytics Databuffet, OECD

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, as shown in Figure IV-2, which highlights balanced portfolio returns before adjusting for inflation.

Figure IV-3 further illustrates this point by showing the full range of scenarios created by the model. The scatter plot displays 10,000 geometric average ten-year returns and standard deviations for UK equities. The dispersion in returns and volatilities is wide enough to encompass historical market performance for various decades.

Figure IV-3. VCMM simulation output for UK stock market (10,000 simulations)



Notes: Benchmarks used for historical returns are defined in “Indices used in historical calculations”, on page 34.

Source: Vanguard.

Index simulations

The long-term returns of our hypothetical portfolios are based on data for the appropriate market indexes to September 2014. 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 indices are as follows:

- **UK equities:** MSCI United Kingdom Index.
- **Global ex-UK equities:** MSCI All Country World ex-UK Index.
- **Commodity futures:** Bloomberg Commodity Index in GBP (unhedged).
- **UK cash:** 3-Month Gilts.
- **UK Gilts:** Barclays Sterling Gilts Index.
- **UK non-Gilts:** Barclays Sterling non-Gilts Index.
- **UK Sterling Aggregate bonds:** Barclays Sterling Aggregate Bond Index.
- **Global ex-UK bonds:** Barclays Global Aggregate ex-GBP Bond Index.
- **Short-term Gilts index:** Barclays Sterling Gilts 1–5 Year Index.
- **Long-term Gilts index:** Barclays Sterling Gilts 10+ Year Index.

Indices used in historical calculations

Inflation: Consumer Price Indices – RPI all items long run series: 1900 to 2014: Jan 1974=100. Source: Office of National Statistics.

UK Equity: Barclays Equity Gilt Study from 1900 to 1964, Thomson Reuters Datastream UK Market Index 1965–1969; MSCI UK thereafter

UK Bonds: Barclays Equity Gilt Study 1900–1976; FTSE UK Government Index from 1976 to 1999, and Barclays Sterling Aggregate Index thereafter.

Global ex-UK Equity: S&P 90 Index from January 1926 to 3 March 1957; S&P 500 Index from 4 March 1957 to 1969; MSCI World ex UK from 1970 to 1987; MSCI AC World ex UK from 1988 onwards.

Global ex-UK Bonds: Standard & Poor's High Grade Corporate Index from 1926 to 1968, Citigroup High Grade Index from 1969 to 1972, Lehman Brothers U.S. Long Credit A A Index from 1973 to 1975, Barclays U.S. Aggregate Bond Index from 1976 to 1990, Barclays Global Aggregate Index from 1990 to 2001; Barclays Global Aggregate ex GBP Index from 2001 onwards.

Global Equity: 25% UK Equity and 75% Global ex-UK Equity as defined above.

Global Bonds: 35% UK Bonds and 65% Global ex-UK Bonds as defined above.

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