2017 economic and market outlook: Stabilisation, not stagnation

Vanguard Research

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- By late 2016, market sentiment had quickly shifted from an overly pessimistic outlook of cyclically weak stagnation toward an overly optimistic expectation of a growth acceleration. Both views are incorrect.

- Global growth should stabilise, not stagnate. Ever tightening labour markets should place modest upward pressure on otherwise low inflation. But further monetary stimulus could prove unproductive in spurring unlevered growth. Global bond yields are unlikely to rise materially higher until the major economies address structural impediments to higher productivity growth. The risks to the consensus outlook vary notably across markets.

- Vanguard's outlook for portfolio returns is modest compared with the heady returns experienced since the depths of the Global Financial Crisis. This guarded, but not bearish, outlook is unlikely to change until we see a combination of higher short-term rates and more favourable valuation metrics. In some ways, the investment environment for the next five years may prove more challenging than the previous five, underscoring the need for discipline, reasonable expectations, and low-cost strategies.

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Editorial note

This publication is an update of Vanguard's annual *Economic and Investment Outlook*. We present our economic and market perspectives for 2017 for key economies around the globe. Aided by Vanguard Capital Markets Model® simulations and other research, we also forecast future performance for a broad array of fixed income and equity asset classes.

Acknowledgements

We thank Lara de la Iglesia and Andrew S. Clarke, CFA, for their significant contributions to this piece and the work of the Global Economics Team. Further, we would like to acknowledge the work of Vanguard's broader Investment Strategy Group, without whose tireless research efforts this piece would not be possible.

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Notes on asset-return distributions

The asset-return distributions shown here represent Vanguard's view on the potential range of risk premiums that may occur over the next ten years; such long-term projections are not intended to be extrapolated into a short-term view. These potential outcomes for long-term investment returns are generated by the Vanguard Capital Markets Model® (VCMM – see also 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, derived from 10,000 simulations for each modeled asset class. Simulations as of September 30, 2016. Results from the model may vary with each use and over time. For more information, see the Appendix.

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 outlook summary

Global economy: *Stabilisation, not stagnation*

Since the end of the Global Financial Crisis, economic growth has fallen short of historical averages and consistently disappointed policymakers. Deflationary shocks have roiled the markets, and much of the world's bond market offers negative yields. Some analysts still believe the world is headed for Japanese-style secular stagnation. And yet the modest global recovery – at times frustratingly weak – has endured, proving the most ardent pessimists wrong.

With forecasters having downgraded global growth outlooks for at least five consecutive years, we believe that the risks to the consensus outlook of 3% are more balanced this year. We anticipate "sustained fragility" for global trade and manufacturing, given China's ongoing rebalancing and the need for structural business-model adjustments across emerging-market economies. We do not anticipate a Chinese hard landing in 2017, but we are more bearish than consensus on China's medium-run growth prospects.

Our growth outlook for developed markets remains modest but steady. Increasingly sound economic fundamentals supported by US and European policy should help offset weakness in the United Kingdom and Japan. For the United States, 3% GDP growth is possible in 2017, even as job growth cools. Our long-held estimate of 2% US trend growth is neither "new" nor "subpar" when accounting for lower population growth and exclusion of the consumer-debt-fueled boost to growth between 1980 and the Global Financial Crisis.

For the Euro area we anticipate modest growth of 1.5%, which should gradually remove excess capacity. UK growth will be restrained by the ongoing uncertainty around the probable, impending exit from the European Union (EU).

Inflation: *Global disinflationary forces waning for now*

Many developed economies will struggle to consistently achieve 2% core inflation due to a combination of depressed inflation expectations, excess capacity and structural falls in some prices associated with digital technology and excess commodity capacity in China and elsewhere. That said, some of the most pernicious deflationary forces are cyclically moderating. US core inflation should modestly "overshoot" 2% in 2017, prompting the US Federal Reserve to raise rates. UK inflation is also set to overshoot following the post-Brexit depreciation of sterling. By contrast, euro area inflation will only return to target levels gradually.

Monetary policy and interest rates: *Central banks grapple with their limits*

The US Federal Reserve is likely to pursue a "dovish tightening," raising rates to 1.5% in 2017 while leaving the federal funds rate below 2% through at least 2018.

Meanwhile, the Bank of England (BoE) will face an ongoing trade-off between rising inflation and a potential weakening of the economy.

Elsewhere, further monetary stimulus seems possible, but its benefits may be waning and, in the case of negative interest rates, potentially harmful to the very same credit-transmission channel that monetary policy attempts to stimulate. Even so, the European Central Bank (ECB) and Bank of Japan (BoJ) could yet add to the quantitative easing implemented in 2016.

Chinese policymakers have the most difficult task of engineering a "soft landing" by lowering real borrowing costs and the real exchange rate without accelerating capital outflows. The margin of error is slim, and policymakers should continue to provide fiscal stimulus to the economy this year to avert a hard landing. The most important policy measure we are monitoring is the pace of reforms for China's state-owned enterprises, which are currently key sources of overinvestment and deflationary excess capacity.

Investment outlook: *Muted, but positive given low-rate reality*

Vanguard's outlook for global stocks and bonds remains the most guarded in ten years, given fairly high equity valuations and the low-interest-rate environment. We don't expect global bond yields to increase materially from year-end 2016 levels during the year ahead.

Bonds. The return outlook for fixed income remains positive, yet muted, with our medium-run outlook in the range of 0%-2%. Over time we anticipate that global interest rates will gradually rise, but remain at a lower level compared with recent decades. As we stated in 2015, even in a rising-rate environment, duration tilts are not without risks, given global inflation dynamics and our expectations for monetary policy. Recent low volatility and compressed corporate bond spreads point to credit risks outweighing those of duration.

Stocks. After several years of suggesting that low economic growth need not equate with poor equity returns, our medium-run outlook for global equities remains guarded in the 5%–8% range. That said, our long-term outlook is not bearish and can even be viewed as positive when adjusted for the low-rate environment.

Asset allocation. Vanguard's outlook for portfolio returns is modest across all asset allocations when compared with the heady returns experienced since the depths of the Global Financial Crisis. This guarded but not bearish outlook is unlikely to change until we see a combination of higher short-term rates and more favourable valuation metrics. The investment environment for the next five years may prove more challenging than the previous five, underscoring the need for discipline, reasonable return expectations, and low-cost strategies.

Indices used in our historical calculations

The long-term returns for our hypothetical portfolios are based on data for the appropriate market indices through September 2016. 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. Code: CDKO. 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 through March 3, 1957; S&P 500 Index from March 4, 1957, through 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 US Long Credit A A Index from 1973 to 1975, Barclays US 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

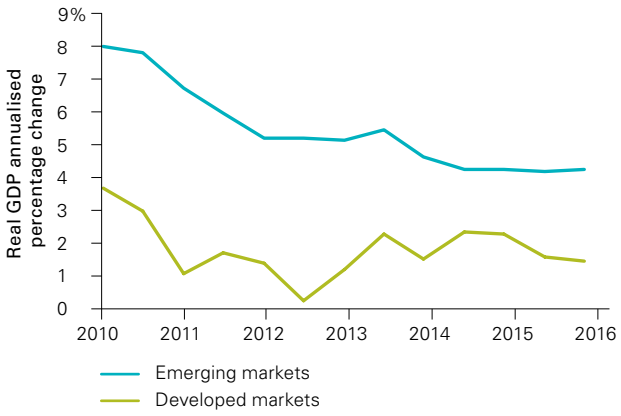
Global economic outlook: Low growth, not stagnation

Since the end of the Global Financial Crisis, economic growth rates have fallen short of historical norms (see **Figure I-1a**), and interest rates have hovered at historical lows (**Figure I-1b**) despite increasingly high levels of debt (**Figure I-1c**). A significant share of the world's government bonds have negative yields. With 80% of the world economy at full employment, real wage growth nevertheless remains low and growing income inequality remains an issue in developed markets (**Figure I-1d**).

Policymakers' aggressive efforts to boost growth and counteract deflationary shocks have become exercises in disappointment. Stubbornly low growth has raised concerns that the global economy is settling into a Japanese-style secular stagnation. These concerns

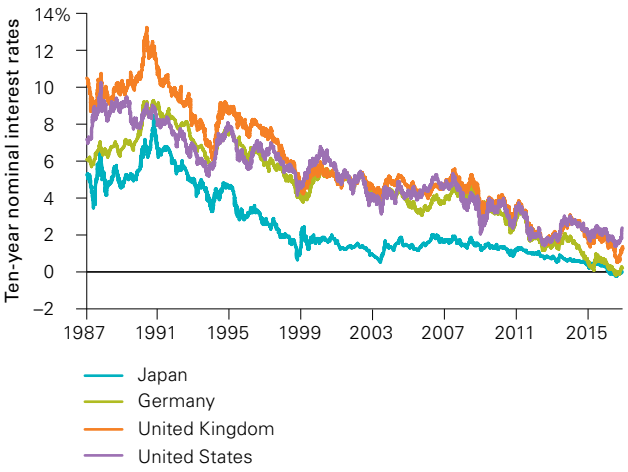
Figure I-1. The global economic backdrop

a. Low growth persists across the globe



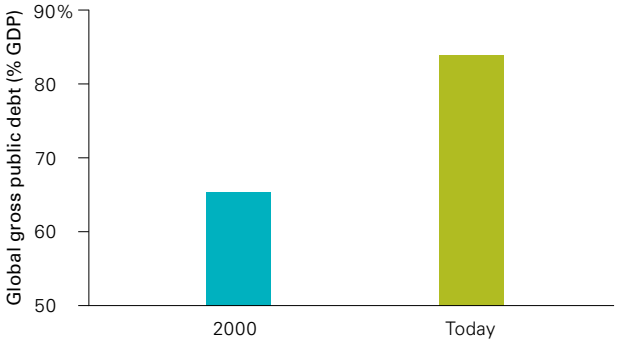
Source: Vanguard calculations based on data from the International Monetary Fund (IMF) *World Economic Outlook* (2016).

b. Interest rates remain low, but may have bottomed



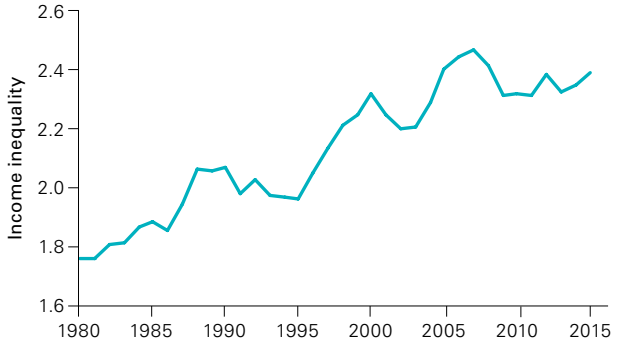
Source: Vanguard calculations based on data from Bloomberg.

c. Debt levels have risen



Source: Vanguard calculations based on data from the IMF *World Economic Outlook* (2016).

d. Income inequality in developed markets continues to climb



Notes: Income inequality is measured by the inverted Pareto Lorenz coefficient of the G7 (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States).

Source: Vanguard calculations based on data from The World Wealth and Income Database and the IMF *World Economic Outlook* (2016).

reflect a misunderstanding of the structural forces that have shaped growth, inflation, and interest rates and will continue to do so in the years ahead.

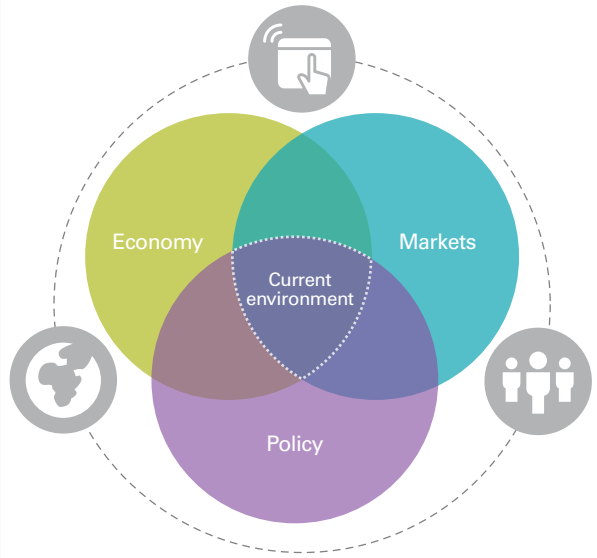
As in the 2015 and 2016 editions of *Vanguard's Economic and Market Outlook*, we maintain that low growth reflects slowing productivity and unfavourable demographics. Interest rates, meanwhile, have also been depressed by expanding globalisation and by waves of technological disruption and the challenges of a burgeoning digital economy (see **Figure I-2**).

Not only do these structural forces provide a coherent explanation of pre-crisis growth trends and world interest rates, but they also can reconcile currently low growth rates with full employment in most developed markets. And, although a secular stagnation view hinges on global demand weakness and thus calls for more monetary or fiscal policy stimulus, a structural view provides an intuitive explanation for the increasing ineffectiveness of such policies.[1]

In the near term, those structural drivers will continue to restrain global growth. Although the deleveraging cycles in the developed economies – including the United States, Japan, and Europe – have progressed, many emerging markets have barely started the deleveraging process. Meanwhile, the influence of unfavourable demographics and weaker productivity growth is unlikely to be reversed soon.

Central banks across the globe have reached a critical stage. They're bumping up against the limits of monetary policy, which is generating diminishing benefits and increasing risks (see *Vanguard Global Macro Matters – Monetary Policy Is (Barely) Carrying the World*, 2016). As policymakers recognise that monetary accommodation is an insufficient response to forces that are neither cyclical nor a reflection of weak demand, they will curtail additional stimulus, and in the United States nudge short-term interest rates higher.

Figure I-2. Long-term structural forces intersect to shape growth, policy, and interest rates



Structural drivers

Technology
Falling relative cost of technology depressing business capital investments

Demographics
Population aging, baby boomers, and declining dependency ratios

Globalisation
Booming emerging markets and Chinese exports; buildup of foreign-exchange reserves (emerging markets savings glut)

Impact since 1980	Economy	Impact over next five years
▼	Growth	◀▶
▼	Inflation	▼
▲	Inequality	▲
	Markets	
▼	Interest rates	◀▶
▲	Asset returns	▼
	Policy metrics	
▲	Government debt	▲
▲	Global trade	◀▶
▼	Monetary policy rates	▲

Source: Vanguard.

1 Infrastructure spending is an exception, as public investment in infrastructure would be recommended under either view. Under a secular stagnation view, infrastructure spending could provide a short-term demand-side boost no different from any other expansionary fiscal policy. Under our structural view, infrastructure spending could increase the long-term productive capacity of the economy and raise potential labour productivity growth, as well as potential GDP.

The process will unfold at different times in different regions. In the United States, the right course for the Federal Reserve is to continue its "dovish tightening" by raising short-term rates deliberately to 1.5% in 2017 and reducing its long-term rate projections toward 2.5%, a level more consistent with an unlevered-growth world.

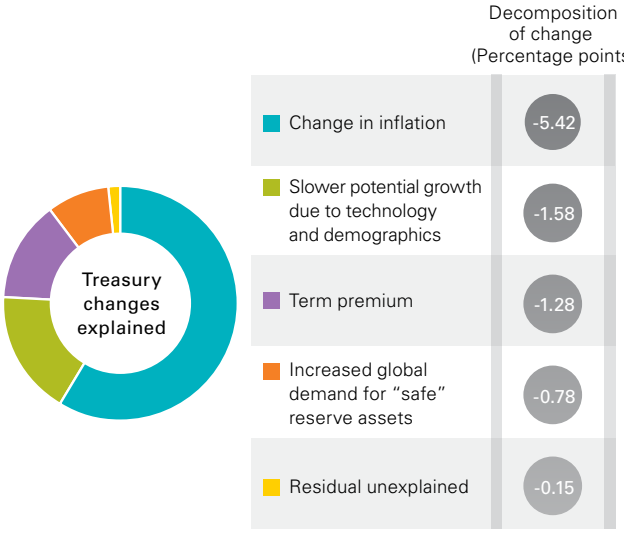
In Japan, where unemployment is already low, the extensive use of aggressive cyclical policies has done little to spur growth or inflation. It may be time to put these policies away and focus on structural issues such as a bifurcated labour market (see *Vanguard Global Macro Matters – Japan: The Long Road Back to Inflation*, 2015). In Europe, by contrast, high unemployment and low capacity utilisation suggest there may still be opportunities for aggressive stimulus to awaken the economy from its cyclical slumber.

However, our outlook for long-term interest rates depends more on the direction of these structural forces than on the next move in central bank policy rates (see **Figure I-3**). When we evaluate the forces' longer-term paths, we see that although they will most likely keep interest rates considerably lower than in the past three decades, these drivers are unlikely to drive rates lower.

We believe that potential global growth could pick up modestly over time. Our expectation is based on the potential for a rebound in productivity growth as new digital technologies are better utilised and a slight recovery in the labour force as the baby-boom generation finishes transitioning to retirement. Meanwhile, the combination of an aging population entering the spend-down phase of its investment life cycle (see **Figure I-4a**), the secular slowdown in emerging markets and China resulting in lower trade surpluses and less accumulation of US Treasury reserves (**Figure I-4b**), and a continued increase in global debt levels (**Figure I-4d**) could put some upward pressure on rates. At the same time, the ever-falling cost of technology could serve to put downward pressure on both inflation and yields in the short-term. (**Figure I-4c**).

Figure I-3. Drivers of US interest rates since the 1980s

Decline in inflation has been the key



Notes: The decomposition of changes in real equilibrium interest rates is based on the sequential application of three models, which are presented in the sources.

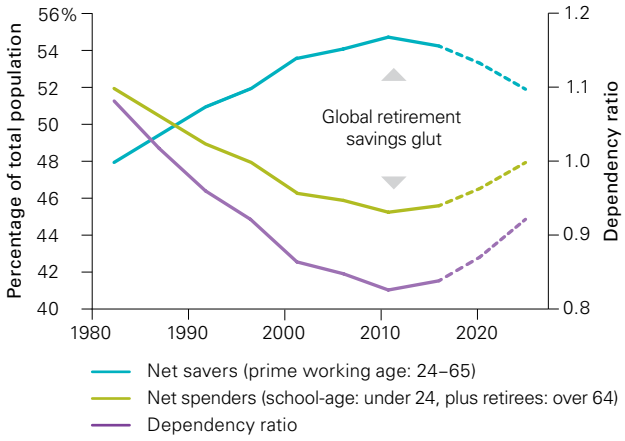
Source: Vanguard Investment Strategy Group calculations based on data from Holston, Laubach, and Williams (2016) and the US Congressional Budget Office *Budget and Economic Outlook* (2016).

The central tendency of our projections does not include a significant departure from past norms, but world real interest rates somewhere near the 115-year historical range of 0.6%–1.4% are entirely possible in years to come.[2] Despite potentially heightened volatility during the transition from today's extreme levels of policy rates toward modestly higher rates, we remain cautiously optimistic about the long term. An equilibrium interest rate that is positive in inflation-adjusted terms means that investors should be reasonably compensated for saving and investing, justifying our modest, yet positive, long-term real return outlook for cash and bonds.

2 The 0.6%–1.4% range corresponds to the interdecile range around the historical median estimate of 1%, based on Dimson Marsh Staunton data for real cash rate for the 115-year period 1900–2015.

Figure I-4. Structural drivers could nudge interest rates higher

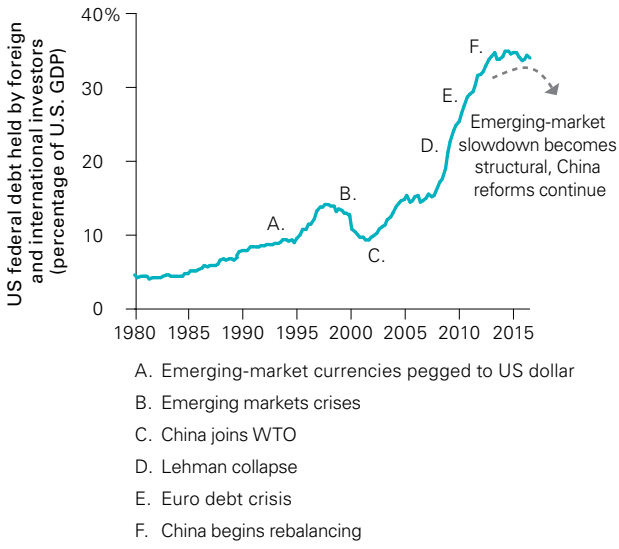
a. Global baby boomers begin to spend net savings



Bond yields impact:	Next 3 years ◀▶	Subsequent decade ▲

Source: Vanguard calculations based on data from the US Census Bureau.

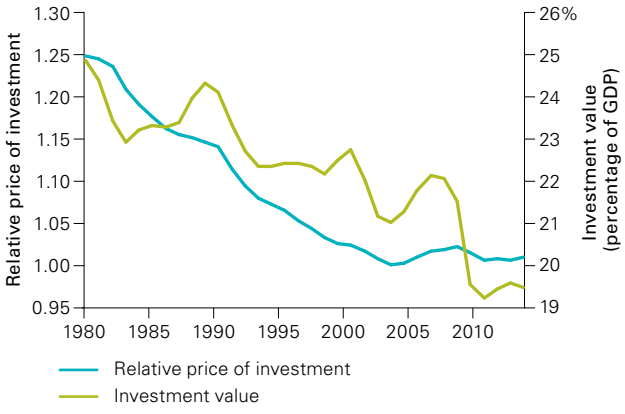
b. Emerging markets' structural reforms may alleviate global imbalances



Bond yields impact:	Next 3 years ◀▶	Subsequent decade ▲

Source: Vanguard calculations and US Department of the Treasury.

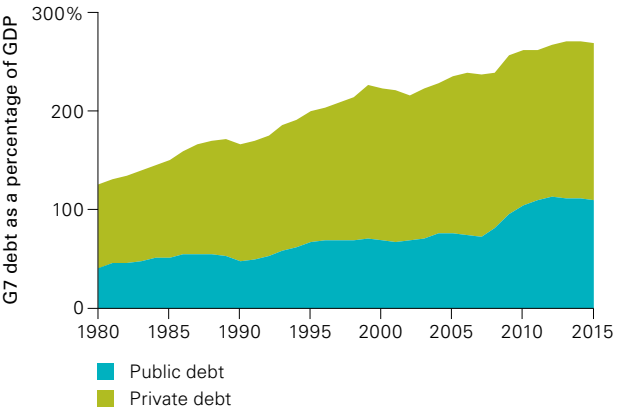
c. Cheaper technology lowers investment cost



Bond yields impact:	Next 3 years ▼	Subsequent decade ▼

Source: Vanguard calculations based on data from the Bureau of Economic Analysis and the IMF.

d. A large debt overhang persists



Bond yields impact:	Next 3 years ▲	Subsequent decade ▲

Source: Vanguard calculations based on data from the IMF *World Economic Outlook* (2016) and The World Bank World Development Indicators database.

Global growth outlook: Policy risks on the rise

We expect the global economy to continue growing around its recent trend of about 3%–4% amid geopolitical uncertainties and long-term structural challenges such as slowing productivity growth and demographic headwinds in many advanced economies. Our proprietary global leading indicators dashboard is a statistical model based on over 1,000 economic indicators from 24 countries covering 80% of the world's GDP. As **Figure I-5a** shows, it points to continued modest growth.

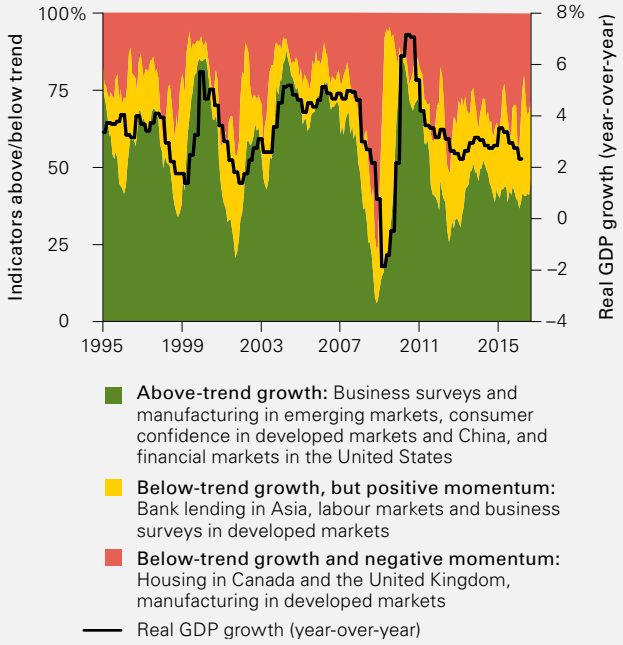
Geopolitical and policy uncertainty in developed markets could weigh on sentiment and investment. We expect advanced economies to continue their low-growth trend in 2017. We expect lower but more stable growth to persist in emerging markets. Loose monetary policy, combined with expansionary fiscal policy, should support growth in emerging Asian economies. Growth in emerging European economies should improve, as Russia may emerge from recession, while Latin American economies may have found a bottom in 2016.

We use our proprietary indicators to estimate a distribution of potential scenarios for global growth in 2017, as shown in **Figure I-5b**. The central tendency falls a bit below the International Monetary Fund (IMF) forecast of 3.4%. The odds of growth falling below the central tendency are higher than the odds of a sustained rebound above 4%.

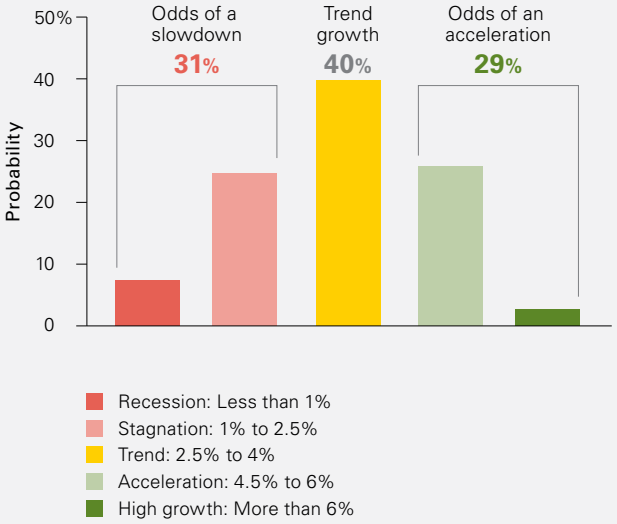
Key tail risks to watch for are policy-related events in developed markets (European elections, Brexit negotiations, and the rollout of a US trade renegotiation agenda) and the geopolitical environment in emerging markets (for instance, unpredictable policies in the Philippines, Russia's foreign policy adventures, political uncertainty in South Africa, and ongoing political and economic uncertainty in Venezuela).

Figure I-5. Vanguard's proprietary economic indicators dashboard implies global growth slightly below consensus

a. Global economic indicators point to modest growth



b. Global growth estimate is slightly below broad expectations



Note: The distribution of growth outcomes was generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data estimated from 1990 to 2015 and adjusting for the time-varying trend growth rate.

Source: Vanguard calculations based on data from the IMF and Thomson Reuters Datastream.

Europe: Year 1 AB (After Brexit)

Britain's decision to leave the European Union (EU) will have a significant influence on the UK economy, not only in 2017, but for many years to come.

The long run impact of Brexit on UK living standards is likely to be significantly negative according to the majority of economists' estimates. But there is considerable uncertainty because the effect will importantly depend on the terms of the UK's departure from the EU. A 'soft' Brexit would likely be less costly, involving a scenario where the UK retains access to the EU single market, which is based on the freedom of labour, goods, services and capital within the EU. A 'hard' Brexit, on the other hand, would likely be more costly, involving an outcome where the UK partially or completely loses access to the EU single market. This would likely be associated with immigration controls, tariffs on goods and services, and restrictions on the ability of UK firms to sell products into the EU. This more severe scenario would likely lead to an eventual drop in GDP of 5% or more (see **Figure I-6a**). At this stage, a 'hard' Brexit seems more likely but we will not know what version of Brexit is adopted until the UK concludes negotiations with the EU, probably in 2019.

The current discussion of the impact of Brexit has been focusing on the immediate short-run effects. This impact depends largely on how firms and households respond to the uncertainty caused by Brexit. For them, it may be sensible to hold off or possibly abandon plans to hire new staff or make new investments in the UK until there is more clarity about the future. Early evidence suggests that business hiring and investment have slowed marginally after the vote, and household spending has been resilient. The UK, however, is certainly not out of the woods and we anticipate a deterioration in business investment and hiring as Brexit approaches. Overall, we anticipate that the short run impact of the Brexit vote will be negative, with a 2-3% drop in GDP by 2019 relative to a scenario where the vote did not occur (refer **Figure I-6b**). This outcome would be better than we and other commentators had initially feared, in part due to the large fall in sterling which has boosted tourism and exports, and in part due to the large monetary and fiscal stimulus provided by the Bank of England and UK Treasury. At this stage we do not anticipate any further monetary or fiscal stimulus unless economic conditions should worsen.

Figure I-6a. – Long run estimated effects on GDP

Total impact on GDP by year-end 2030 relative to a no Brexit scenario

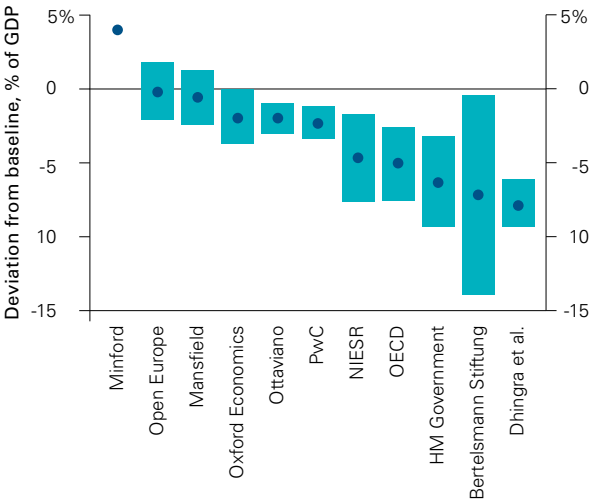
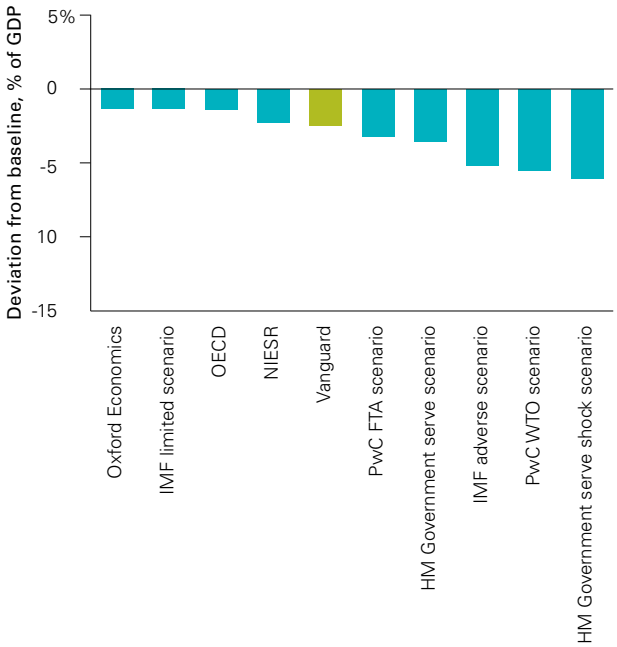


Figure I-6b. – Short run estimated effects on GDP

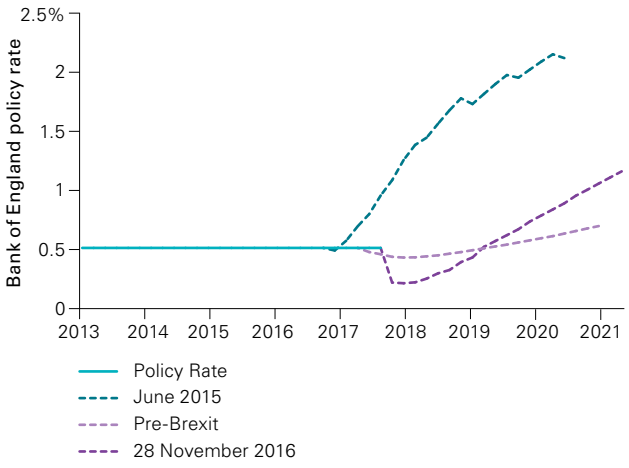
Total impact on GDP by year-end 2018 relative to a no Brexit scenario



Source: International Monetary Fund 2016 Article IV Consultation for the United Kingdom, OECD (2016) "The consequences of Brexit: a taxing decision", HM Government (2016d) "HM Treasury analysis: the long-term economic impact of leaving the EU", PwC (2010) "Leaving the EU: Implications for the UK Economy", NIESR (2016) "The short-term economic impact of leaving the EU".

Notes: (RHS) All values for 2018, except HM Govt scenarios, which are for fiscal year 2017/18 and PwC scenarios which are for 2020.

Figure I-7. – UK interest rate expectations

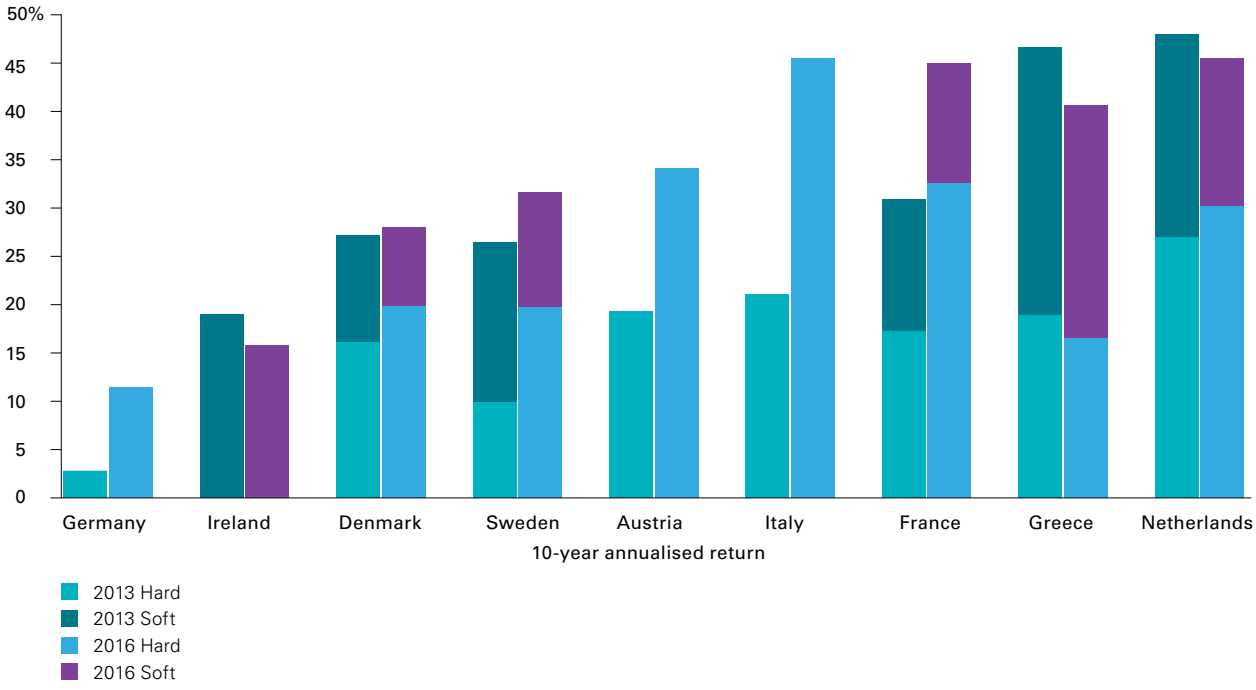


Source: Bloomberg data on overnight index swaps as of 28 November 2016

The euro area economy will certainly be affected by the impact of the Brexit vote, directly due to lower UK activity, and indirectly because of similar but smaller uncertainty effects. We have accordingly marked down our growth forecast for the euro area by around 0.2 pp in 2017 to 1.5%. The more important consequences for the euro area are primarily political, however, if other countries are minded to break away from the EU, an outcome that could become more likely if the eventual settlement between the UK and the EU was deemed favourable for the UK. So far, at least, there has been no concrete indication that this is happening, indeed if anything the remaining EU 27 have tended to present a united front in their response to Brexit. Even so, as **Figure I-8** shows, anti-EU sentiment has been increasing in recent years in a range of countries from the periphery to large core EU countries such as the Netherlands and France. General elections in France and Germany in 2017 will provide a more definitive indication of how serious this risk is to the integrity of the euro area.

Figure I-8. – Anti-EU sentiment is on the increase in the euro area too

Current % of poll for hard and soft Eurosceptic parties vs 2013 by country



Note: Soft eurosceptic defines those parties who are against certain aspects of the EU. Hard eurosceptic defines those parties who wish to leave either the euro area or the EU. All data Q3 2013 and Q3 2016, except France Q2 2012 and Italy Q3 2012.

Source: Wikipedia.

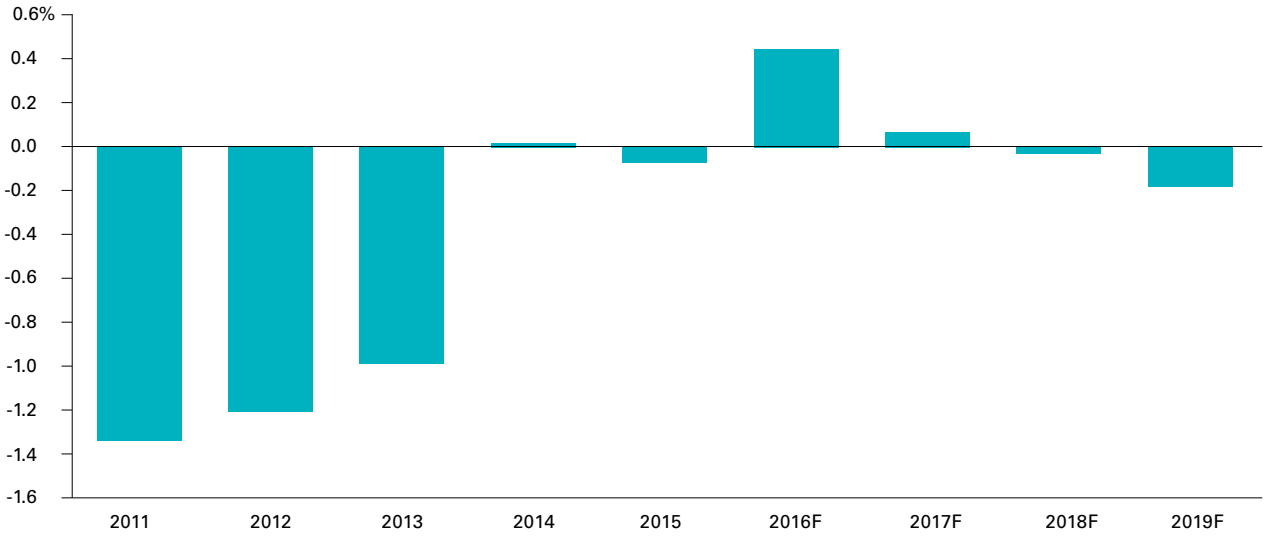
Ironically, the euro area's slow and incomplete recovery from the sovereign debt crisis would be enhanced by more integration not less. Instead, a number of policy developments which might be expected to strengthen the long-run sustainability of the euro area – more fiscal co-ordination, increased moves towards banking and capital markets union, improved political governance, accelerated structural reforms – will most likely be side-lined while political attention is diverted by Brexit.

The burden of policy stimulus in the euro area is currently being borne almost exclusively by the European Central Bank (ECB) whose programme of quantitative easing is providing a weak but positive stimulus to euro area growth, with sovereign yields falling markedly from June 2014 to today, and bank lending to firms and households gradually moving into positive territory. Even so, headline inflation still remains below 1%, partly depressed by the temporary effect of low oil prices, but more importantly, core inflation is not expected by the ECB to return to the 2% inflation target until beyond their 3 year forecast horizon. As a consequence, the ECB is expected to continue their asset purchase programme for the foreseeable future.

Doubts about the continuing efficacy of monetary policy in a low interest rate world are often over-exaggerated but there is no doubt that policy outcomes would be improved if fiscal policy played a more supportive role. In fact, as **Figure I-9** shows, after earlier years of acting as a strong drag the net impetus from fiscal policy has been positive in 2016, partly because some countries such as France and Italy were allowed to under-deliver on their deficit reduction programmes. We believe there is a good case for additional stimulus to be provided for the years ahead but the likelihood of this happening is lowered by the reality that those countries with most fiscal headroom, notably Germany, are typically the countries with the least political appetite to adopt this policy stance.

Figure I-9. – Euro area fiscal policy is expected to boost growth in 2016 after years of austerity

Change in cyclically adjusted primary balance (Percent of potential GDP)



Source: IMF fiscal monitor, October 2016.

United States: Resilience in the midst of global weakness

In spite of a rocky start to 2016, and even recession fears, the US economy remains firmly on a long-term growth path of about 2% a year. We maintain our long-held view of resilience for the US economy.

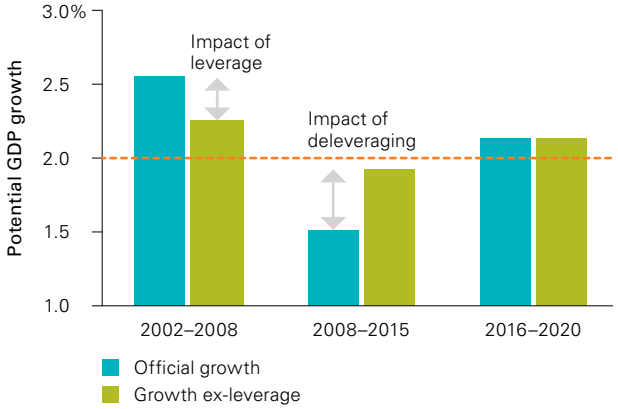
We continue to believe it is important to disentangle the structurally lower trend growth of 2% (compared with 3.25% average growth since 1950) from the short-term cyclical concerns of a weak economic recovery and the need for more policy responses. As previously mentioned, cyclical policy responses, such as monetary policy, are not well-equipped to influence the economy's structural forces in a meaningful way.

Lower-than-historical growth in the United States is our base case for 2017 and beyond. Such growth, however, should be viewed as fundamentally sound rather than abnormally low after accounting for structurally lower population growth and excluding the consumer debt-fueled boost to growth between 1980 and the Global Financial Crisis (see **Figure I-10**).

With the United States already at full employment, we expect the unemployment rate and other broader measures of labour market slack to remain tight in 2017 (see **Figure I-11** on page 15), while the pace of employment growth (currently averaging 180,000 jobs a month) continues to moderate to a level closer to the net flow of entrants to the labour force (80,000–100,000, based on population growth and labour force participation trends).

A slowdown in job growth through 2017 may raise some recession concerns, but a decrease in job growth is expected at this stage of the US business cycle. Under this view, a job-growth slowdown would be offset by a much-needed increase in labour productivity growth, resulting in stable GDP growth in 2017. As productivity increases, workers may continue to experience modest gains in terms of inflation-adjusted wage growth. Core inflation should rise to 2% and wage growth to 3% this year (see **Figure I-12a** on page 15).

Figure I-10. Debt distorts: Without leverage 2% growth is normal

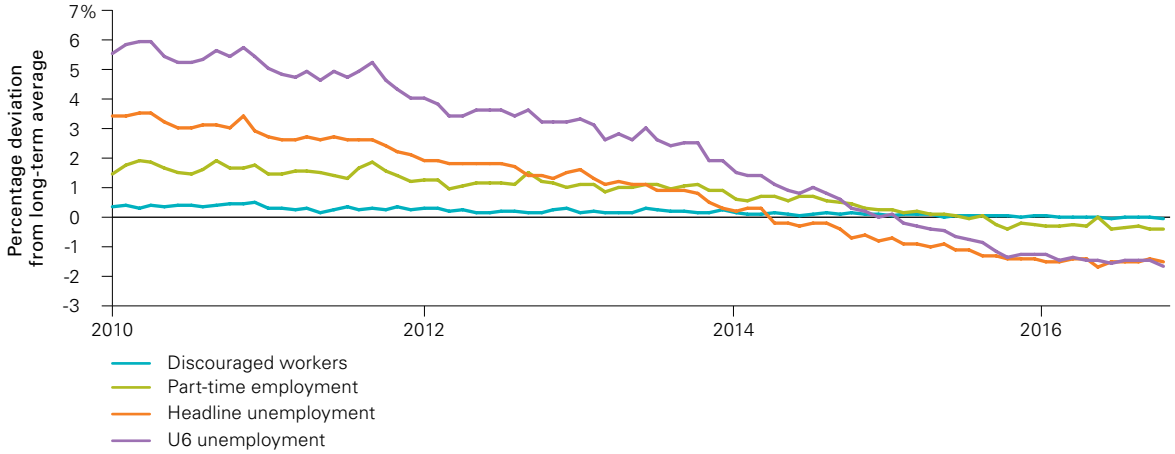


Notes: The official potential GDP growth estimate reflects US Congressional Budget Office data. The potential GDP growth ex-leverage estimate factors in the estimated effects of consumer debt on private domestic demand components of the GDP.

Source: Vanguard calculations based on data from the US Congressional Budget Office and the US Bureau of Economic Analysis.

Our tame inflation outlook derives also from weighing the effect of the long-term structural forces of technology and globalisation on consumer prices. In the short term, inflation drags from oil prices and a stronger dollar continue to abate. However, long-term structural trends reflected in falling prices for technology and imports, particularly tradable goods, continue to restrain overall core inflation metrics. As **Figure I-12b** shows, the impacts of technology and globalisation have been in play since well before the Global Financial Crisis and are not expected to abate any time soon.

Figure I-11. The labour market should remain tight; a slight slowdown in jobs is to be expected



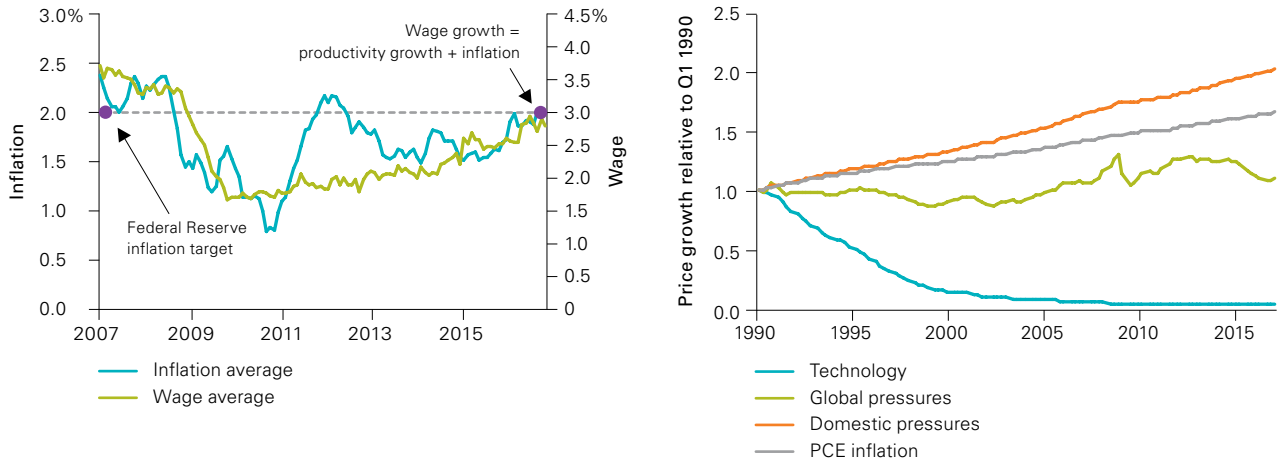
Note: The long-term average for discouraged workers represents the period from 31 January 1994, through 31 October 2016; for all other categories, the period begins 31 January 1980.

Source: Vanguard calculations based on data from the US Bureau of Labor Statistics and Moody's Analytics.

Figure I-12. Inflation heating up, but not too hot

a. Real wage gains and inflation are closing in on long-term trend

b. Structural drags resulting from technology and globalisation will persist



Notes: The wage average represents the monthly mean of year-on-year percentage changes in total private hourly earnings, Atlanta Federal Reserve Bank wage tracker, and the Employment cost index: wage and salaries index. The inflation average is the monthly mean of year-on-year percentage changes in core CPI and core PCE. The axes are aligned according to estimates of the inflationary level of wage growth. The productivity growth and inflation target represents a 2% inflation target plus a hypothetical 1% growth in productivity.

Source: Vanguard calculations based on data from the US Census Bureau, the US Bureau of Labor Statistics, the US Bureau of Economic Analysis, the Federal Reserve Bank of Atlanta, and Moody's Analytics.

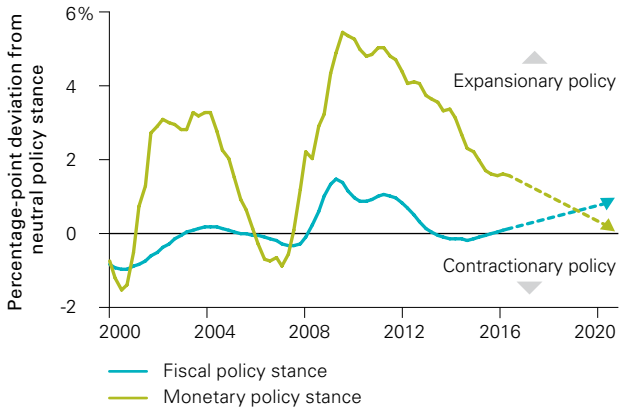
These forces, along with the Fed's hard-won credibility for anchoring inflation expectations, have resulted in the US economy spending most of the time below the 2% inflation target since the 1990s (in 64% of the core personal consumption expenditure monthly inflation readouts since January 1990). This fact should not be overlooked when evaluating adequate timing for the Fed's rate normalisation.

The appropriate course for the Fed is to further its pursuit of a "dovish tightening" by raising short-term rates deliberately to 1.5% in 2017, while also lowering its long-term "dots" closer to 2.5%.[3] This approach should short-circuit the negative feedback loop of the prospects for an even-stronger US dollar undercutting growth and rattling global financial markets.

A gradual increase in the federal funds rate would not be a real tightening but rather would be a removal of monetary accommodation. As illustrated in **Figure I-13**, monetary policy will remain expansionary even as rates increase. Meanwhile, the easing of fiscal policies, either tax cuts or infrastructure spending, may help support the transition over the medium term.

Our 2017 US outlook is not without tail risks (see **Figure I-14**). Although the US economy is unlikely to accelerate materially above 3%, the short-term risks to both inflation and growth are tilted toward the upside, given the fading effects of weaker commodity prices, inventory overhang, the stronger dollar, and the prospects for fiscal stimulus.

Figure I-13. Time to pass the baton of policy support



Notes: Monetary policy stance is measured by the percentage-point difference between the neutral real short rate and the real effective federal funds rate. Fiscal policy stance is based on the standardised budget deficit (excluding automatic stabilisers). Fiscal policy stance is measured as the percentage-point deviation of this deficit from its historical average.

Source: Vanguard Investment Strategy Group calculations based on data from Holston, Laubach, and Williams (2016), the Board of Governors of the Federal Reserve System, and the US Congressional Budget Office.

At the same time, the odds of a recessionary scenario are not negligible, particularly as the US economy enters its eighth year of expansion since the cycle trough in the summer of 2009. Although "expansions don't die of old age," markets will remain highly sensitive to unexpected shocks that could bring about recessionary fears. (See the text box "What could trigger the next US recession?")

Figure I-14. A probabilistic view of the US outlook: Tail risks have increased

Scenarios	Cyclical acceleration	Status quo	Recession	Stagflation
Probabilities	35%	35%	20%	10%
Growth	~3.0%	2.0%	Less than 0%	~1.0%
Core inflation	2%–2.5%	1.5%–2%	Less than 1%	3% or more
Federal funds rate (year-end 2017)	>1.5%	1.5%	Back to 0%	1.5%

Source: Vanguard.

3 "Dots" refers to charts published by the Federal Open Market Committee (FOMC) in the Fed's Summary of Economic Projections, showing points where FOMC participants, who are kept anonymous, believe the federal funds rate should be over the next few years, in the absence of economic shocks.

What could trigger the next US recession?

The US economy has been expanding for seven years, more than doubling the average length of an expansion (38 months).

However, as the saying goes, "expansions don't die of old age," meaning that recessions are more than just statistical regularities of a predetermined business cycle. In reality, recessions are brought about by shocks that amplify the dislocations and excesses that build up over time during the expansion. In some instances, it takes just a relatively small shock to prick the bubble and kick-start the unwinding of such misallocations in one sector of the economy; this in turn typically spills over into broader demand weakness and pessimistic business sentiment, affecting hiring and investment decisions across the economy.

But what could be some economic triggers? Here are three possibilities, in no particular order:

The collapse of global trade

Causes could be a sharp move toward trade protectionism in the US and a trade war; gridlock and the breakdown of Brexit negotiations within the EU; and uncertainty surrounding anti-EU movements in euro-area countries, particularly the French and German elections.

Aggressive monetary policy

A sharp acceleration of rate hikes into 2017 could be triggered by an unforeseen flare-up in inflationary pressures and a rise in long-term rates due to expansionary fiscal policy (extensive infrastructure spending and tax cuts). This in turn could cause dislocation in asset markets and affect investor sentiment and confidence.

A US stagflation scenario

Depending on the extent and timing of US immigration and antitrade policies, a supply-side negative shock with higher labour costs and higher imported input costs could lead to cost-push inflation. Adding cost-push inflation to the potential demand-pull inflation from expansionary fiscal policies and rising budget deficits could result in rising inflation and long-term interest rates.

China "hard landing " and systemic financial crisis

Capital outflows intensify in spite of capital controls, leading to a collapse in the yuan and affecting key sectors of the Chinese economy, such as real estate, local government finances, and the stock market. Global spillovers affect emerging markets via trade linkages and developed markets via financial volatility and increased risk aversion.

China: Balancing the risks of its rebalancing

On the back of the aggressive credit extension and infrastructure spending in 2016, economic growth in China has stabilised, led by a modest recovery of the "old economy" such as metals and real estate (**Figure I-15**). Nonetheless, the protracted slowing trend of recent years is unlikely to be reversed any time soon, given secular and structural drags including industrial overcapacity, unfavourable demographics, and falling productivity growth. Thus, we expect real GDP growth to fall further in 2017, especially as the authorities restrain China's credit growth amid property market restrictions.

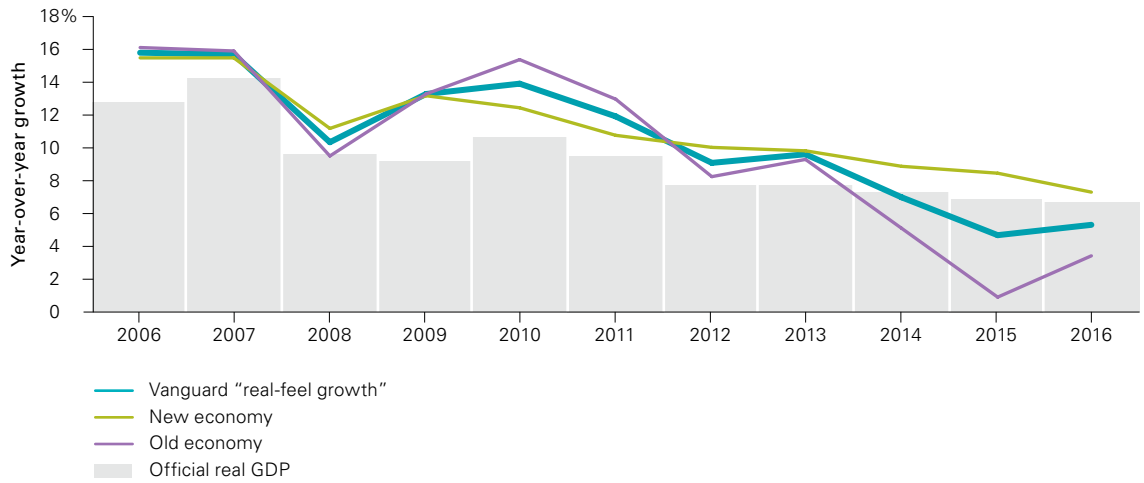
Although the official growth target is likely to hover around 6%–7%, our underlying proprietary indicators are pointing to a 5% "real-feel" growth. The slower pace would also be healthier, as the economy would continue to rebalance away from investment and manufacturing toward the "new economy," a consumption and service-driven growth model.

Although market concerns about China's weak growth outlook and elevated debt level could re-emerge, the likelihood of a hard landing is relatively low in the near term, as the debts are largely domestically owned and China has a strong policy buffer to mitigate the downside risk (**Figure I-16**). The policy agenda remains in a "fighting retreat" mode. Recognising the secular and structural nature of the slowdown, Chinese policymakers are more amenable to a lower but gradual growth trajectory. They would remain vigilant and ready to fight when downside risk emerges, but they would hold off or even withdraw some stimulus when the growth picture stabilises. Therefore, macroeconomic volatility would stay low in the near term.

The true risk lies in the medium to long term. Policymakers' ammunition could gradually be exhausted, and they have arguably the most difficult task of engineering a soft landing by lowering real borrowing costs and the real exchange rate without accelerating capital outflows.

So far, China has chosen to tighten control on capital outflows. However, this does not offer a permanent solution, and capital account liberalisation remains a crucial part of China's structural reforms. Indeed, without effective market-oriented reforms to ensure that investment spending flows toward the most

Figure I-15. The Chinese economy is experiencing a protracted slowdown and a gradual rebalancing



Notes: *New economy* refers to sectors that require higher skill levels and are more private-led and less capital-intensive. *Old economy* refers to sectors that require relatively low skill levels and are more state-led and more capital-intensive. *Vanguard real-feel growth* is the average of the new and old economy indices, assuming equal weight to the aggregate economy. Data for 2016 represent the simple average from January to September 2016.

Sources: Thomson Reuters Datastream, CEIC Data, Bloomberg, and National Bureau of Statistics of China.

Figure I-16. Most of China's debt is held domestically and has a sufficient near-term policy cushion

	External vulnerability				Domestic policy cushion			
	External debt (% of GDP)	Total reserves (% of GDP)	Current account balance (% of GDP)	Currency peg	Nominal policy rate (%)	Inflation (%)	Fiscal balance (% of GDP)	Government debt (% of GDP)
Average during past emerging markets crises	42.8	7.7	–2.5	Y	27.5	20.6	–1.8	57.8
Worst 25th percentile	52.0	4.0	–3.7	Y	16.0	16.9	–4.1	71.2
China today	15.9	29.6	2.1	N	1.5	1.8	–2.3	43.5

Notes: Emerging markets crises and years are: Brazil in 2002, Hungary, Malaysia, South Africa, Turkey, Indonesia, and South Korea in 1997, Mexico in 1994, Argentina in 2001, and Russia in 1998. Fiscal balance data for Turkey are for 1998. Malaysia central government debt data are for 1995. China nominal policy rate is one-year deposit rate. China fiscal deficit is central government fiscal deficit.

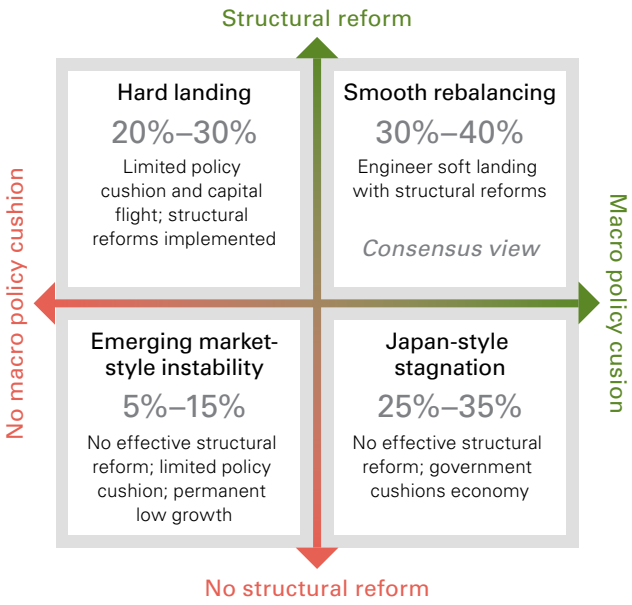
Sources: World Bank, national central banks, national government websites, and Vanguard.

productive uses of capital, avoiding misallocation and overinvestment in certain sectors, higher financial risk will be pushed into the future.

China has approached a crossroads in its transition, as it must balance near-term economic and social stability against long-term growth sustainability while keeping financial risk at bay. The tension between the short-term policy cushion and the long-term necessity for structural reforms can easily tip China from one growth scenario to another, as detailed in **Figure I-17**.

We see an above 50% chance that China will be able to avert a hard landing or a systematic financial crisis down the road, and an above 50% probability that the government will successfully push for structural reforms in a timely manner. Although we are cautiously optimistic about China's future in the long term, the outlook for its economy will be a consequence of many complex, deep-rooted factors both domestic and external that will continue to become clearer with time. Thus, close monitoring of China's development on the economic, financial, policy, and social fronts is warranted.

Figure I-17. Four scenarios and probabilities for China's medium-term growth outlook



Source: Vanguard.

Although any large-scale stimulus plan appears unlikely in 2017, Chinese authorities are likely to provide some monetary and fiscal support, in a bid to cushion against the downside risks and avert a hard landing. The government could continue to focus on the fiscal side, especially on infrastructure investment through various funding channels, including public-private partnership and policy bank lending, to offset part of the weakness in business spending.

Despite modest depreciation of the renminbi against the US dollar, the authorities could be more prudent on the monetary front. In particular, the room for further interest rate and required reserve ratio cuts is limited, given higher commodity prices, a housing market rally, an expected Fed rate hike, and persistent capital outflow pressure. Meanwhile, China's 19th National Party Congress will be held in the second half of 2017; it concludes the current round of leadership turnover at both the central and local government levels. Hopefully, this could enable the government to lean toward addressing long-term issues rather than focusing on maintaining short-term stability.

Japan: Fighting against looming policy limits

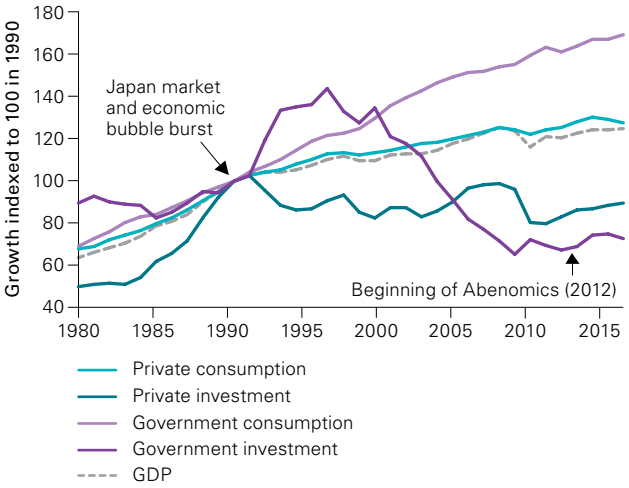
Nearly four years into its bid to reflate the Japanese economy, Abenomics has reached a critical stage as the overreliance on monetary policy has generated diminishing benefits and increasing risks. Despite further asset purchases and the introduction of a negative interest rate policy (NIRP) this year, the yen strengthened against the US dollar early in the year, economic growth remains sluggish, and deflation risk is on the rise again.

For 2017, we expect the economy to grow at 0.7%, modestly above its long-term 0.4% trend, and inflation could recover gradually toward 1%. Any rebound is unlikely to be significant, given the persistently strong structural headwinds, which include a declining and ageing population, excessive labour market duality, weak productivity growth, and high debt levels.

As the authorities remain committed to reviving economic growth and inflation, we expect further monetary easing and fiscal stimulus next year. However, those stimulus measures are likely to remain modest, given limited room for policy maneuvering, and their cost effectiveness will be questionable.

As the BoJ is quickly approaching the limit of its monetary easing, it could take a more gradual and flexible approach in 2017, trying to strike a balance between accelerating inflation and ensuring financial stability. We expect modest expansion of purchases of risky assets such as ETFs and J-REITs, but further interest rate cuts appear less likely.

Figure I-18. Japanese fiscal policy is unlikely to provide a strong boost to private demand



Sources: CEIC Data, Vanguard.

Meanwhile, the fiscal stimulus package announced in August 2016 is likely to have only a moderate impact on real economic growth in 2017. In fact, a closer look at Japan's fiscal stimulus programs since the early 1990s reveals that they have been increasingly reliant on public consumption rather than investment, with little impact on private investment growth (**Figure I-18**). Research found that the marginal productivity of capital and hence fiscal multipliers for public investment have declined over time in Japan, given the overinvestment and the relatively large preexisting public capital stock.

While the more radical policy of providing "helicopter money" is still on the table and could more effectively change the inflation expectation, the probability of this happening in our view is small in the near term as it would entail unpredictable economic risks, legal and political pressure, and significant damage to central bank independence and long-term fiscal discipline.

Cyclical policies, either on the monetary or fiscal front, are unlikely to offer the right solution to Japan's deep-rooted structural problems. More structural reforms, by raising the medium-term growth and inflation expectations and accelerating private credit and investment growth, could improve the effectiveness of fiscal and monetary policies. Unless there is a breakthrough on structural reforms, we don't expect to see a significant boost to the growth outlook over the medium term.

II. Global Capital Markets Outlook

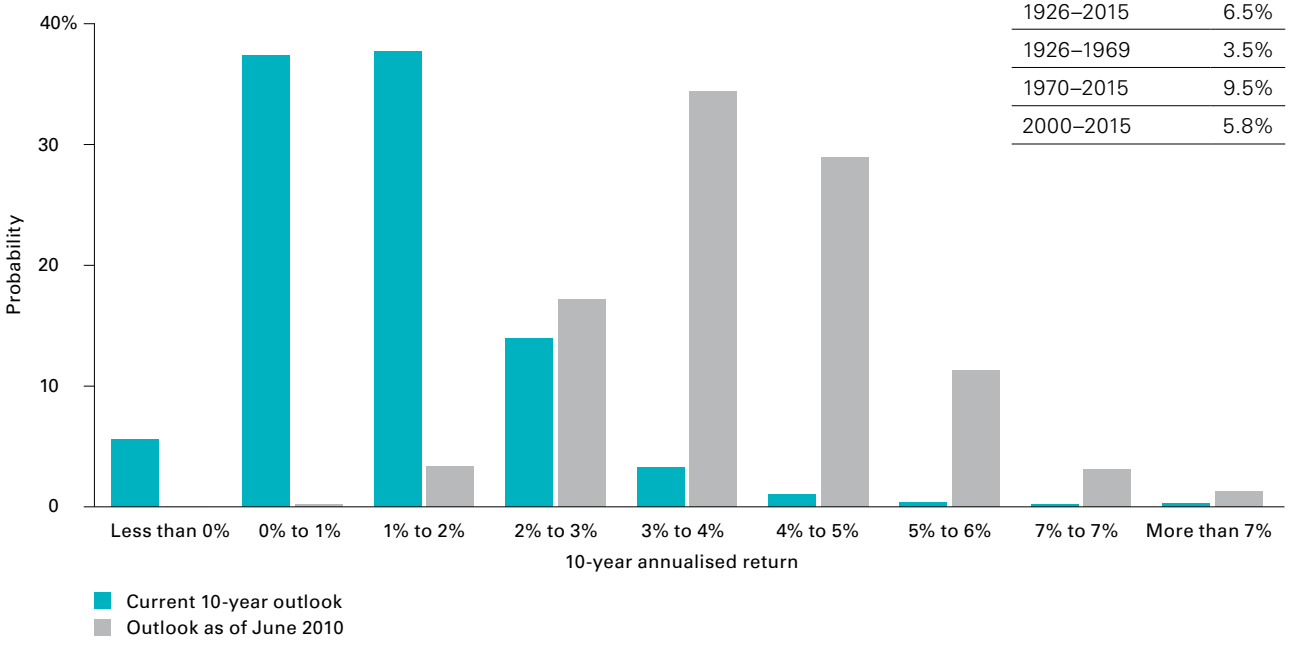
Vanguard's outlook for global equities and bonds remains the most guarded since 2006, given the low-interest-rate and low-earnings-yield environment. We view the global low-rate environment as secular, not cyclical. Although low rates are the anchor for the asset class forecasts, our outlook also includes simulations of portfolio performance in alternative interest rate regimes. We encourage investors to evaluate the role of all asset classes from a perspective of balance and diversification rather than outright return.

Global fixed income markets: Positive but muted

As in our past outlooks, the return forecast for fixed income is positive, but muted. As displayed in **Figure II-1**, the expected ten-year median return of the global fixed income market is centred in the 0%-2% range. This result is lower than our return expectations just six years ago. High-grade or investment-grade bonds act as ballast in a portfolio, buffering losses from riskier assets such as equities. Several segments of the UK bond market, such as UK Sterling Aggregate and non-Gilts, have ten-year median expected returns centred in the 1%–2% range (**Figure II-2**).

Figure II-1. Global fixed income outlook: Muted returns projected relative to the past

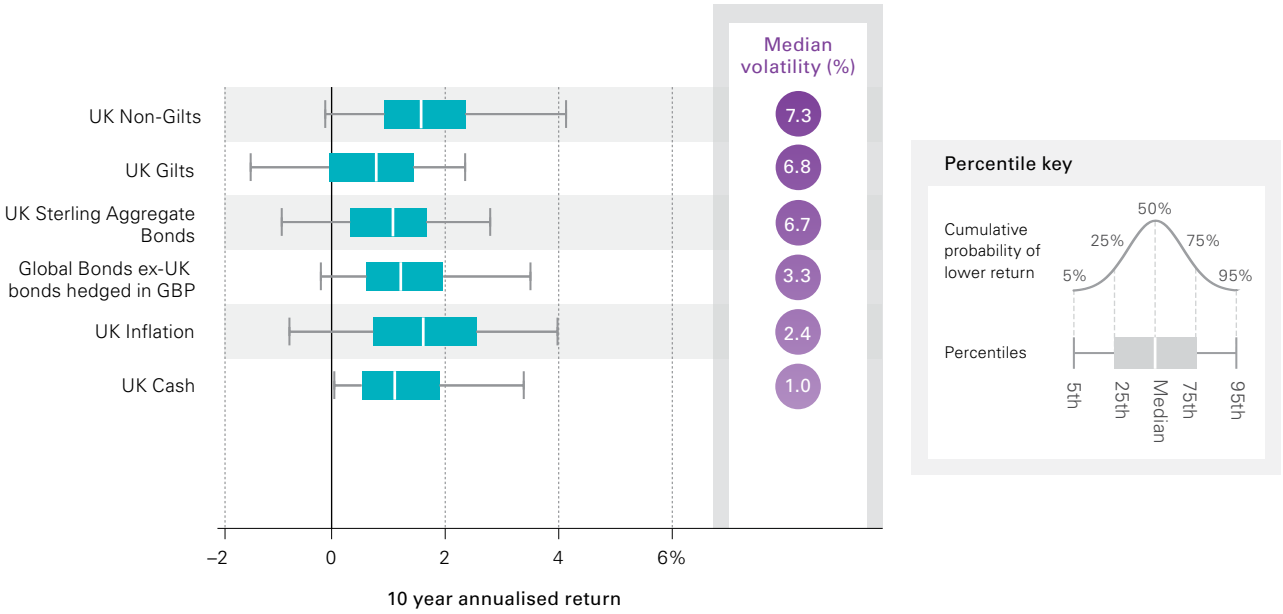
Global bond returns	
1926–2015	6.5%
1926–1969	3.5%
1970–2015	9.5%
2000–2015	5.8%



Notes: Figure displays projected range of returns for potential returns for portfolios of 35% UK bonds / 65% ex-UK bonds, rebalanced quarterly, from 10,000 VCMM simulations as of September 2016 in GBP. See page 38 for details of indices used for historical returns and simulations.

Source: Vanguard.

Figure II-2. Bond market outlook: Rates and risk premia add up to modest returns



Notes: Forecast corresponds to distribution of 10,000 simulations from VCMM for the 10 year annualised returns as of September 2016 in GBP for asset classes shown above. See page 38 for details of indices used.

Source: Vanguard.

UK interest rates: Unlikely to rebound to post 1970s average

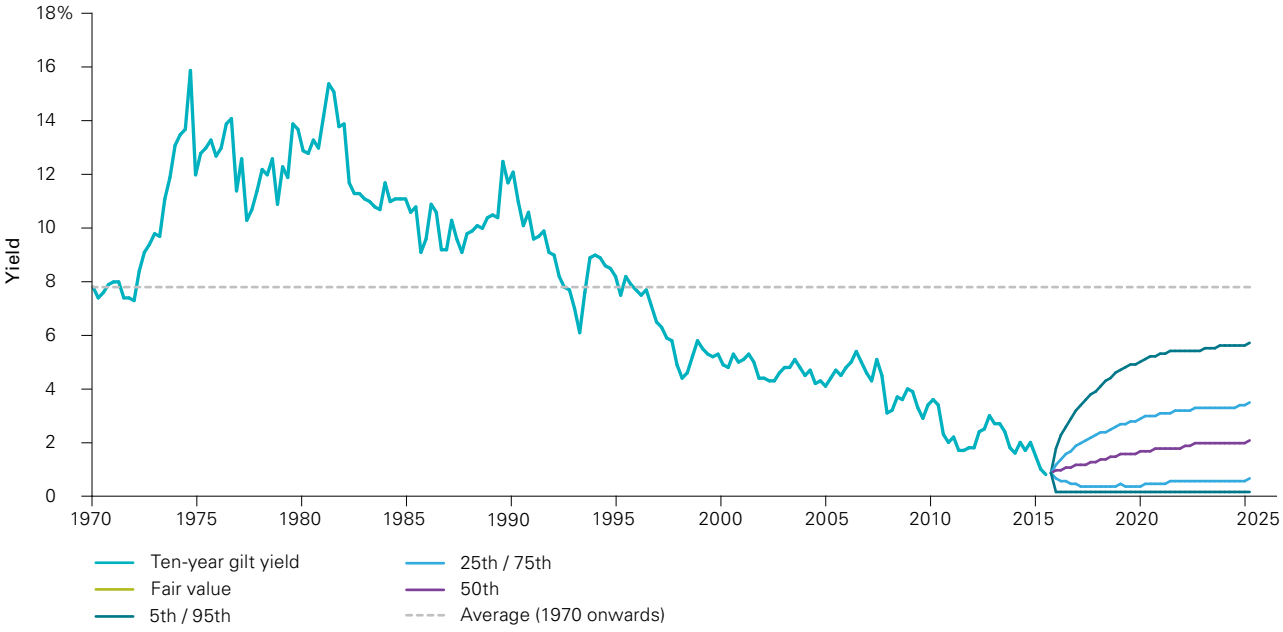
Compared with our 2015 outlook, our estimates for the fair-value range for 10-year gilts have fallen, with the current macroeconomic environment justifying the 10-year yield near 1.5%. Based on our estimates of the fundamental drivers of gilt yields, the main factor behind this lowered expectation for longer-term rates is the structural deceleration scenario discussed throughout this paper. As the markets price in the lower trend growth and inflation, the terminal level for the Bank of England policy rate gets revised downwards, and with it all other rates across the maturity spectrum. This is because fair-value estimates of long-term bond yields are determined by the expected average short-term rate over the maturity of the bond (plus a term premium).

Our forward-looking view for ten-year gilts is lower than the long-term historical average and is illustrated in **Figure II-3.** Based on Vanguard Capital Markets Model (VCMM) projections, the ten-year yield should rise slowly over the next few years, with the central tendency at the end of five years at about 1.7%, well below the recent average (1970 onwards) of 7.8%.

Cash and gilts: The term premium makes a difference

The bond market continues to expect a slow and gradual rise in gilt yields, particularly at the short end of the yield–maturity curve and around its medium-term range (**see Figure II-9a**). The long end of the yield curve is typically anchored to long-term inflation expectations, and hence the long-term rates are not expected to rise nearly as much as the short-term rates. Our VCMM simulations show the ten-year return distribution of cash and gilts (see **Figure II-2**), with the medians appearing to be very similar, but with the median volatility projection for cash being lower than that of the gilt index. This might make the return outlook for cash appear more attractive than that of gilts on a risk-adjusted basis. However, cash will likely yield a negative real return over the next few years, while the term premium of gilts is likely to generate a low, yet positive, real return. In general, 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. A second benefit of holding high-quality fixed income (as represented by the gilts index) in a portfolio is that the bonds act as ballast, buffering losses from riskier assets such as equities.

Figure II-3. Rates unlikely to rebound to post 70s average



Notes: Ten-year gilt yield projections based on 10,000 simulations from VCMM as of September 2016.
Source: Vanguard calculations, based on data from Thomson Reuters Datastream

Non-gilts: Risk premium still comes with equity correlation

The central tendency for the UK non-gilts (specifically, Barclays Sterling Non-Gilt Index) is in the 1%–2% range, slightly higher than that of the gilt index. This reflects the accumulation of liquidity and default risk premia that accompanies the higher risk of credit bonds (Figure II-2 shows a median volatility of 7.3%). However, one must keep in mind that spreads tend to widen in times of equity market stress, a reflection of the relatively high correlation with equities.

Aggregate fixed income markets:

Domestic versus international: Benefits of diversification remain

The central tendency of expected return for global ex-UK bonds appears to be similar to that of UK aggregate bonds (**Figure II-2**) and 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 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.[4]

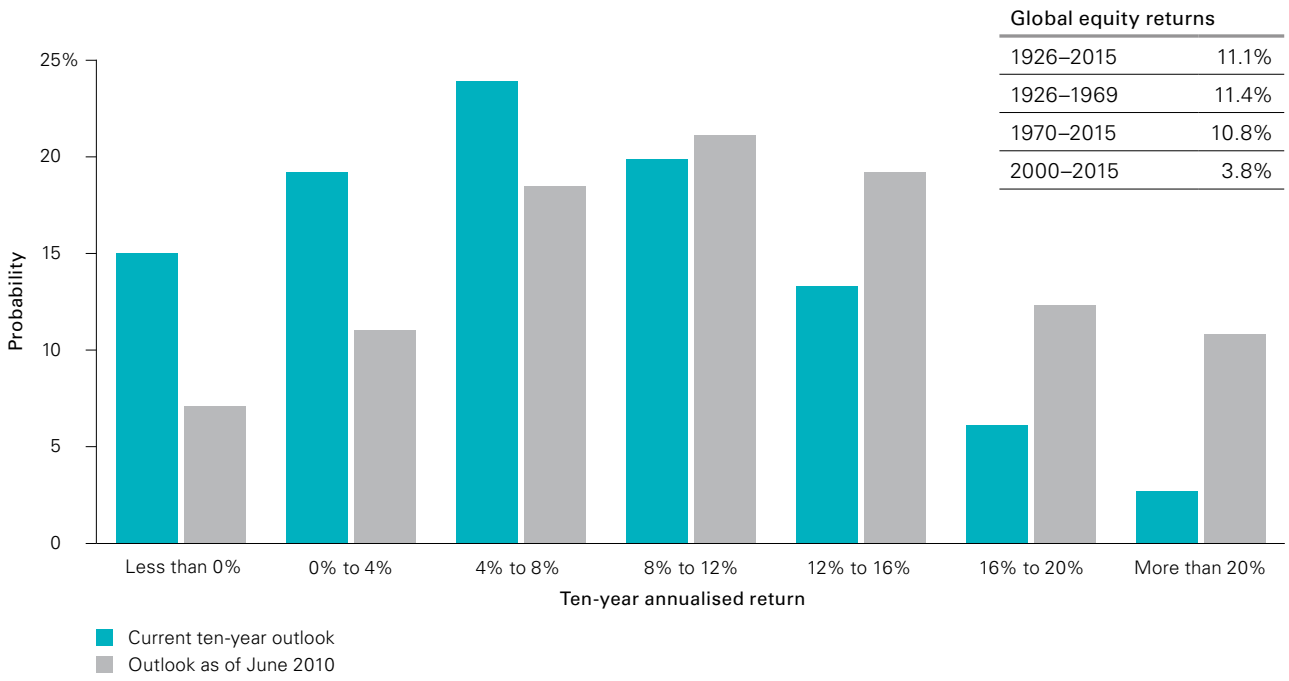
Global equity markets: Still guarded, but not bearish

Over the past several years, some investors have hypothesised that low economic growth would equate with poor equity returns. Vanguard's past outlooks have taken issue with this notion, which we have referred to as an investment fallacy of the economic new normal. Our research shows that market valuations are more important than economic growth to future expected stock returns. And despite tepid global growth, global equity returns have been robust in the five years through September 2016. Recent market performance has rewarded long-term investors who remained invested in the global equity market.

As a consequence of this strong past performance, our outlook for global equities remains guarded, in the 5%–8% range. As shown in **Figure II-4**, the central tendency of our VCMM simulations for ten-year expected returns on a global equity portfolio is below both the

4 See Philips and Thomas (2013).

Figure II-4. Global equity outlook: Muted returns projected relative to the past



Notes: Figure displays projected range of returns for potential returns for portfolios of 25% UK / 75% ex-UK equity portfolio, rebalanced quarterly, from 10,000 VCMM simulations as of September 2016. See page 38 for details of indices used for historical returns and simulations.

Source: Vanguard.

long-run historical annualised average return (11.1%) and our own forecasts from just five years ago (based on the June 2010 distribution, in the figure).

When returns are adjusted for future inflation, we estimate a 50% likelihood that a global equity portfolio will produce a 5% average real return over the decade ending 2026, in contrast with 6.3% per year over 1926 - 2016. As such, our long-term outlook is not bearish, and can even be viewed as constructive when adjusted for the low-interest-rate environment.

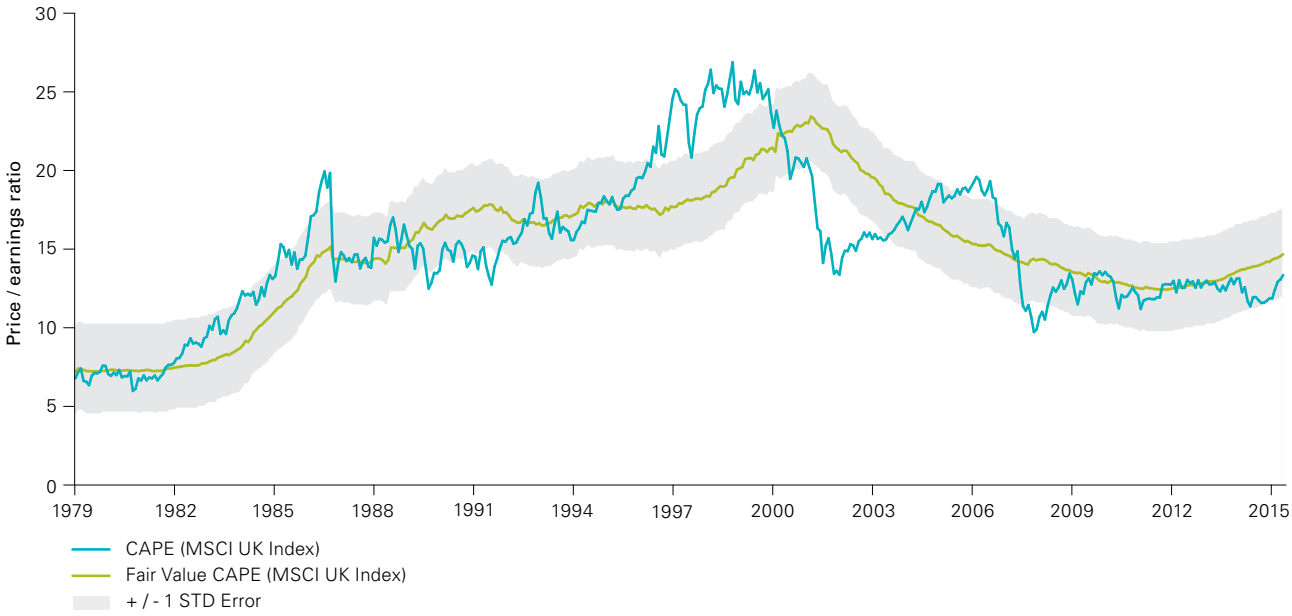
Equity valuations:

Vanguard's proprietary 'fair-value' CAPE looks beyond historical averages

Our conservative outlook for the global stock market is based primarily on market valuations, such as price/earnings (P/E) ratios. Some may wonder why our outlook is not more bearish. After all, widely followed market valuation metrics such as the Shiller (2000) cyclically adjusted price/earnings, or "CAPE" are significantly higher than historical levels. When adjusted for lower expected growth, low interest rates, and low inflation, however, we would expect slightly higher equilibrium P/E ratios. This higher equilibrium level is the right benchmark for determining whether the market is over- or undervalued.

Figure II-5 compares Shiller's (2000) CAPE multiple (for the MSCI UK Index) with Vanguard's proprietary fair-value CAPE estimate, which is based on the fundamental drivers of equity-market earnings yields, namely, interest rates and inflation expectations. In the late 1990s, for instance, the spread between our fair-value model and Shiller's CAPE estimate would have suggested a "bubble," in the same way that comparing Shiller's CAPE to its own long-term average would have. Today, on the other hand, we find that the traditional CAPE estimate is at a level slightly below that of Vanguard's model that adjusts for inflation expectations and low interest rates. Although conventional P/E ratios are high relative to historical averages, this historical comparison exaggerates signals of extreme stock market overvaluation; rather, our framework suggests a central tendency for below-average nominal returns.

Figure II-5. Equity market appears close to fairly valued



Notes: "Fair-value CAPE" is based on statistical model that corrects CAPE measures for the level of inflation expectations and for interest rates. The statistical model specification is a five-variable vector error correction (VEC), including equity earnings-yield (MSCI UK index), UK ten-year trailing inflation, ten-year gilt yield, 10 year trailing equity and bond volatility estimated over the period January 1970 – September 2016.

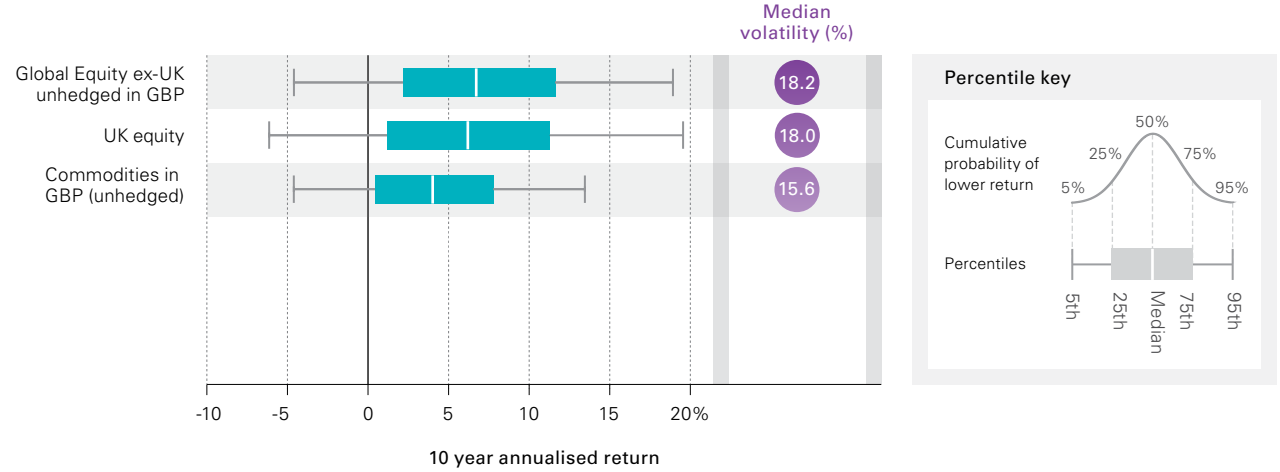
Source: Vanguard calculations, based on data from Thomson Reuters Datastream and Factset.

Global equities: Diversification benefits and attractive valuations

The expected return outlook for non-UK equity markets is modestly higher from a UK investor's perspective. A closer look at the long-term median expected return for UK equity versus global ex-UK equity (see **Figure II-6**) suggests that the expected UK equity market return may fall short of both its own historical average and the expected global ex-UK equity return. This result is a function of the current starting level of valuations (as shown in **Figures II-5** and **II-7**) as well as long-term trends indicating a decline for sterling priced in by the markets, especially with respect to other developed markets such as Europe and Japan. A future decline in sterling boosts international equity return projections (in GBP).

Emerging market valuations are low relative to developed markets, but this phenomenon is typical of riskier markets as illustrated in **Figure II-7**. Thus, we caution investors against characterising emerging market equities as "cheap." Rather, we would encourage equity investors to stake their case for emerging markets in long-term portfolios on diversification benefits.

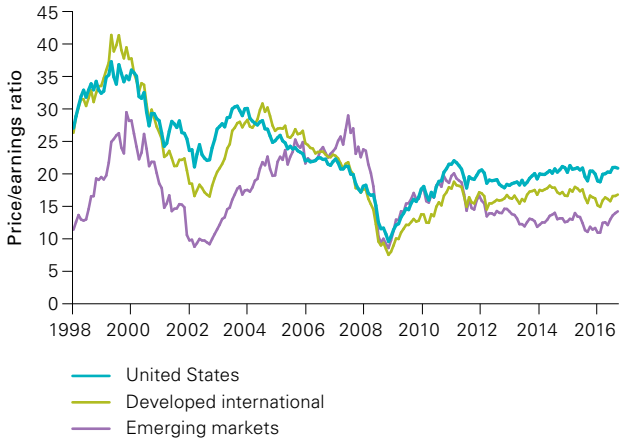
Figure II-6. Widely dispersed potential returns necessitate setting reasonable expectations



Notes: Forecast corresponds to distribution of 10,000 simulations from VCMM for the 10 year annualised returns as of September 2016 in GBP for asset classes shown above. See the appendix section titled "Index simulations" on page 38 for further details on asset classes shown here.

Source: Vanguard.

Figure II-7. Emerging market valuations discount economic challenges



Notes: Figure displays price/earnings ratio with 36-month trailing average earnings. US equities represented by MSCI US Index, "Developed International" represented by MSCI World ex USA Index and "Emerging markets" represented by MSCI Emerging Markets Index.

Source: Vanguard calculations based on data from Thomson Reuters Datastream.

Implications for balanced portfolios and asset allocation: Expect modest real returns

To examine the potential portfolio construction implications of Vanguard's range of expected long-run returns, **Figure II-8** presents simulated real return (inflation-adjusted) distributions for 2016–2026 and historical performance 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 results have several important implications for strategic asset allocation, as discussed below.

Figure II-8. Real return analytics for balanced portfolios

a. Projected real returns moderately below long-run historical averages

b. Projected ten-year real return outlook for balanced portfolios

	5th percentile	25th percentile	50th Percentile	75th percentile	95th percentile	History 1926–2015	History 2000–2015
80%/20%	-4.0%	0.8%	4.1%	7.6%	12.7%	5.7%	1.6%
60%/40%	-3.0%	0.6%	3.1%	5.8%	9.6%	4.9%	2.1%
20%/80%	-2.1%	-0.3%	0.9%	2.1%	4.0%	3.0%	2.8%

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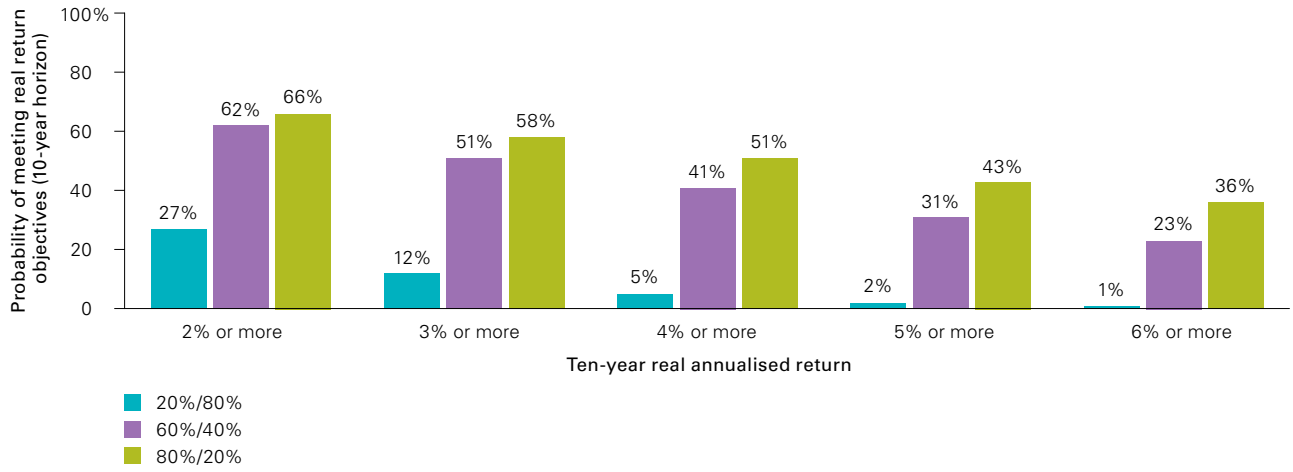
Figure II-8. *(Continued).* Real return analytics for balanced portfolios

c. The higher the real return objective, the lower the probability of success



d. Risky portfolios require risk tolerance

Notes: The figure displays real return analytics based on 10,000 VCMM simulations for projected ten-year annualised real returns as of September 2016 in GBP. Historical returns are computed using indices defined in "Indices used in our historical calculations", on page 5. 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.

Source: Vanguard.

Modest outlook for investment returns

Amid widespread concern over the current low level of dividend and long-term gilt yields, Figure II-8'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 low dividend and gilt yields are, in part, associated with lower expected inflation than was the case 20 or 30 years ago.

Figure II-8 does show that the inflation-adjusted returns of a balanced portfolio for the decade ending 2026 are likely to be moderately below long-run historical averages (indicated by the blue dots for 1926–2015). But 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 2026 are expected to centre in the 2%–4% real-return range, below the actual average real return of 4.9% for the same portfolio since 1926. Viewed from another angle, the likelihood that our portfolio would achieve at least the 1926–2015 average real return is estimated at approximately 31%, while the odds of attaining a higher real return than that achieved since 2000 (2.1%) are near 62% (Figure II-8c).

Economic scenario-based portfolio construction strategies

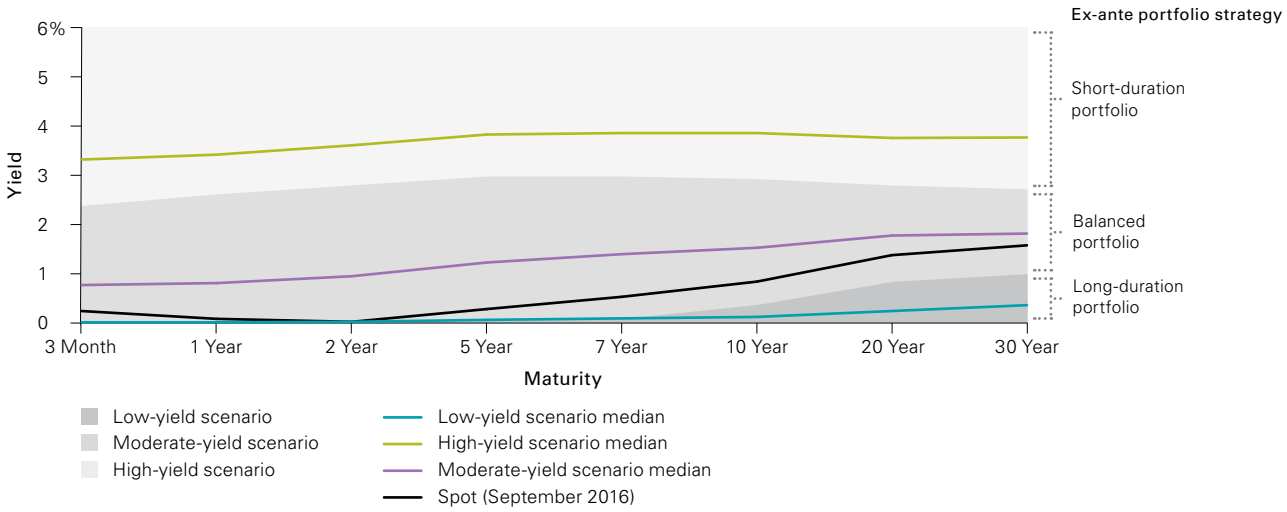
In relation to the global economic perspective expressed earlier in this paper, we examine three yield-curve scenarios (low, moderate and high), occurring over the next five years in Figure II-9a. Using our VCMM simulations, we are able to not only illustrate the effectiveness of various portfolio strategies designed for specific scenarios, but also demonstrate the risks of these strategies when the scenario does not occur.

In a low-yield scenario, a suitable portfolio strategy would be to have a long-duration tilt or additional term premium (UK long-term gilts index) as a drop in long-term rates would result in significant capital gains for the long-duration component of the portfolio. Conversely, a short-duration strategy with a degree of inflation protection would be a suitable strategy for a high-yield scenario, given a sharp rise in interest rates. If rates rise as expected, a diversified portfolio would be a prudent investment strategy.

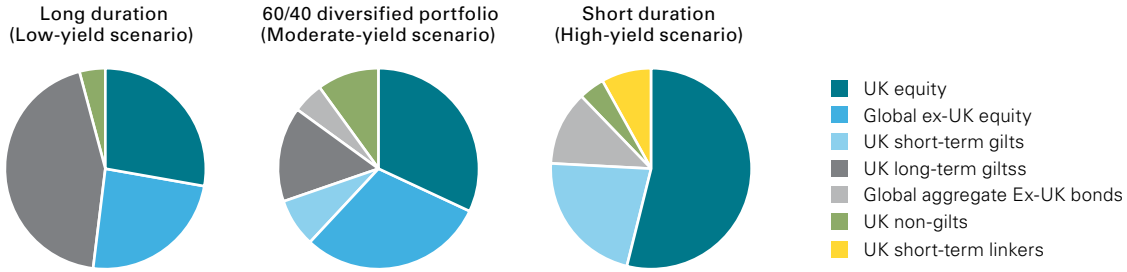
Figure II-9b shows the allocation of optimal portfolios for each of the scenarios and confirms the portfolio strategy discussed above. The optimal portfolios vary exposure to the following four factors or risk premia: 1) equity risk premium, 2) term premium, 3) credit premium and 4) inflation risk premium. The portfolio outcomes relative to an efficient frontier are illustrated in Figures II-9c and Figure II-9d summarises the analysis.

Figure II-9. A five-year look at three economic scenarios

a. Portfolio strategies based on yield-curve scenarios



b. Mean-variance-optimal portfolios for each interest-rate scenario



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

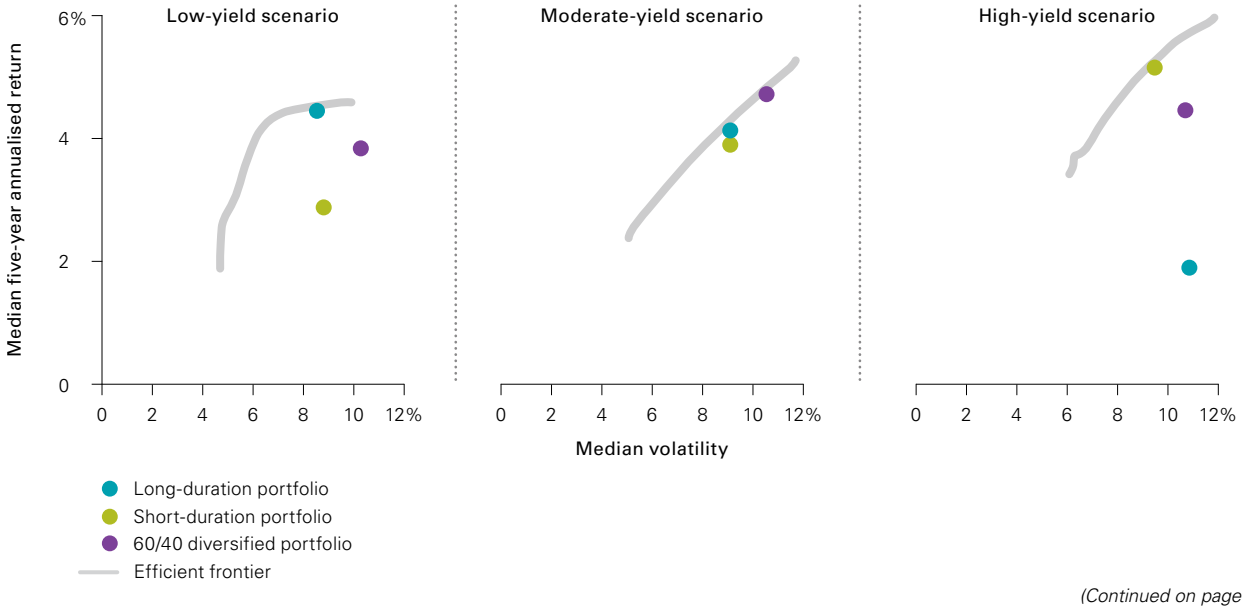


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Figure II-9. *(Continued).* A five-year look at three scenarios

d. Portfolios designed for a single scenario can be risky

	Stagnation / recession (Low-yield scenario)	Status quo (Expected- yield scenario)	Inflation returns (High-yield scenario)
Best performing portfolio	●	●	●
2nd best performing portfolio	●	●	●
Worst performing portfolio	●	●	●
Strategy upside relative to balanced portfolio	0.63% higher annualised return with lower volatility in a low-yield scenario		Same return with slightly lower volatility in a high-yield scenario
Strategy downside relative to balanced portfolio	2.57% lower annualised return with similar volatility in a high-yield scenario		0.94% lower annualised return with lower volatility in a low-yield scenario

● Long-duration portfolio ● Short-duration portfolio ● 60/40 diversified portfolio

Notes: Performance is relative to the efficient frontier. Forecast displays simulation of five-year annualised returns of asset classes shown as of September 2016. Scenarios are based on sorting the VCMM simulations based on the three-month and 30-year gilt yields at the end of every year. The three scenarios are a subset of the 10,000 VCMM simulations. See appendix section titled "Index simulations" on page 38 for further details on asset classes shown here.

Source: Vanguard.

Our VCMM simulations help in assessing the expected performance of the above mentioned portfolio strategies relative to the efficient frontier (**Figure II-9c**). This exercise can be a useful one for investors considering strategic allocation tilts and can assist in assessing risk-return trade-offs among the strategies, especially if an expected scenario does not occur. The following conclusions can be drawn from our analysis:

1 **Portfolios designed for extreme scenarios involve important tradeoffs. The risks are asymmetric.**

- If a low-yield scenario is realised, the short-duration portfolio under-performs the long-duration portfolio by 1.6 percentage points/ year, because of forgone income due to short duration.
- Conversely, the long-duration portfolio under-performs the short-duration portfolio by 3.3 percentage points/ year in a high-yield scenario due to capital losses incurred by long-duration fixed income portfolios. The under-performance of the long-duration portfolio can be attributed to capital losses incurred in a high-yield scenario.

2 **The diversified portfolio works best for investors who do not have strong conviction on the future state of the economy.** Interestingly, across all 3 scenarios, the diversified portfolio is either on the frontier or a close 2nd. In other words, the diversified portfolio exhibits better downside outcomes relative to long- or short-duration portfolio strategies.

Portfolio construction strategies: Time-tested principles apply

Contrary to suggestions that an environment of structural deceleration, subdued inflation pressures, and permanently lower interest rates warrants some radically new investment strategy, Figure II-8 reveals that the simulated ranges of portfolio returns are upward sloping on risk. Simply put, higher portfolio risk accompanies higher (expected) return. Our analysis of equity valuations in Figure II-5 showed that the global equity risk premium endures, when one adjusts for the muted expectations for global inflation and interest rates. Thus, according to our VCMM simulations, the forward-looking equity risk premium expectation over bonds may not be meaningfully lower than it has been in the past.

Nevertheless, although risk–return trade-offs and equity risk premiums may not be different, portfolio return expectations themselves need to be lowered, based on the prospects for lower global trend growth and central banks' lifting of policy rates very gradually over time. 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 behavior, such as savings and portfolio contributions.

We encourage investors to evaluate carefully the trade-offs involved in any shifts toward risky asset classes – that is, tilting a bond portfolio toward corporate and high-yield investments or making a wholesale move from bonds into equities. The global 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. 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 are crucial to maintaining the discipline needed for long-term investment success.

Ultimately, our global market outlook suggests a somewhat more challenging and volatile environment ahead, yet one in which investors with an appropriate level of discipline, diversification, and patience are likely to be rewarded over the next decade with fair inflation-adjusted returns.

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III. Appendix: VCMM and index simulations

About the Vanguard Capital Markets Model

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

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

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

The primary value of the VCMM is in its application to analysing potential client portfolios. VCMM asset-class forecasts – comprising distributions of expected returns, volatilities, and correlations – are key to the evaluation of potential downside risks, various risk–return trade-offs, and the diversification benefits of various asset classes. Although central tendencies are generated in any return distribution, Vanguard stresses that focusing on the full range of potential outcomes for the assets considered, such as the data presented in this paper, is the most effective way to use VCMM output. We encourage readers interested in more details of the VCMM to read Vanguard's white paper (Davis et al., 2014).

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 modeled asset-class returns. Within the range of outcomes, individual experiences can be quite different, underscoring the varied nature of potential future paths. Indeed, this is a key reason why we approach asset-return outlooks in a distributional framework, as shown in **Figure III-1**, which highlights balanced portfolio returns before adjusting for inflation.

Figure III-2 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 III-3 shows some of the fixed income sub-asset class return distributions under each yield-curve scenarios discussed earlier.

Figure III-1. Nominal return analytics for balanced portfolios

a. Nominal returns are likely to be significantly below long-run historical average

b. Projected ten-year nominal return outlook for balanced portfolios

	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	History 1926–2015	History 2000–2015
80%/20%	-2.7%	2.3%	5.7%	9.5%	1.6%	10.5%	4.5%
60%/40%	-1.5%	2.2%	4.7%	7.5%	3.8%	9.7%	5.0%
20%/80%	0.2%	1.5%	2.5%	3.5%	5.2%	7.7%	5.6%

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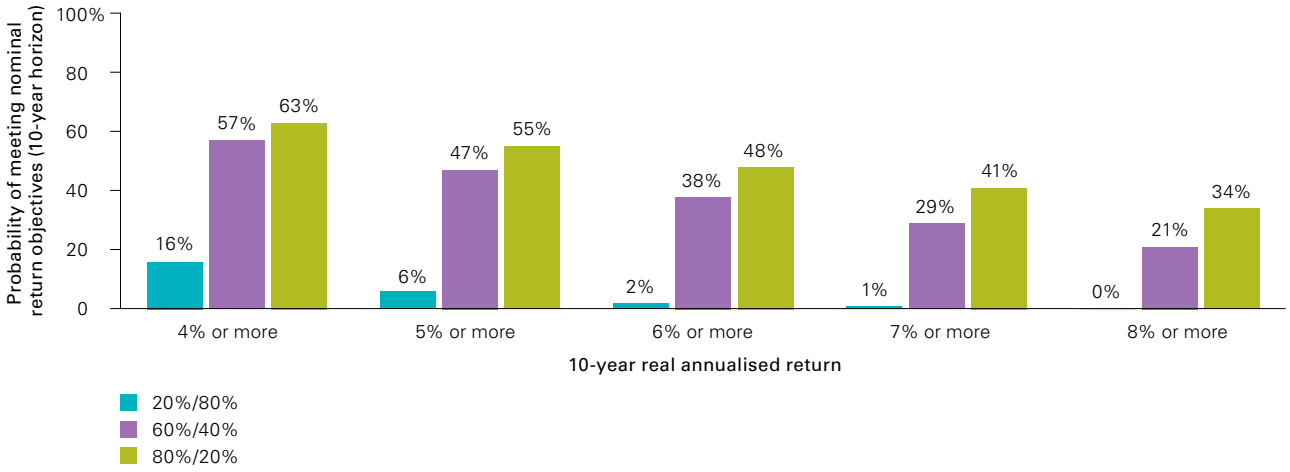
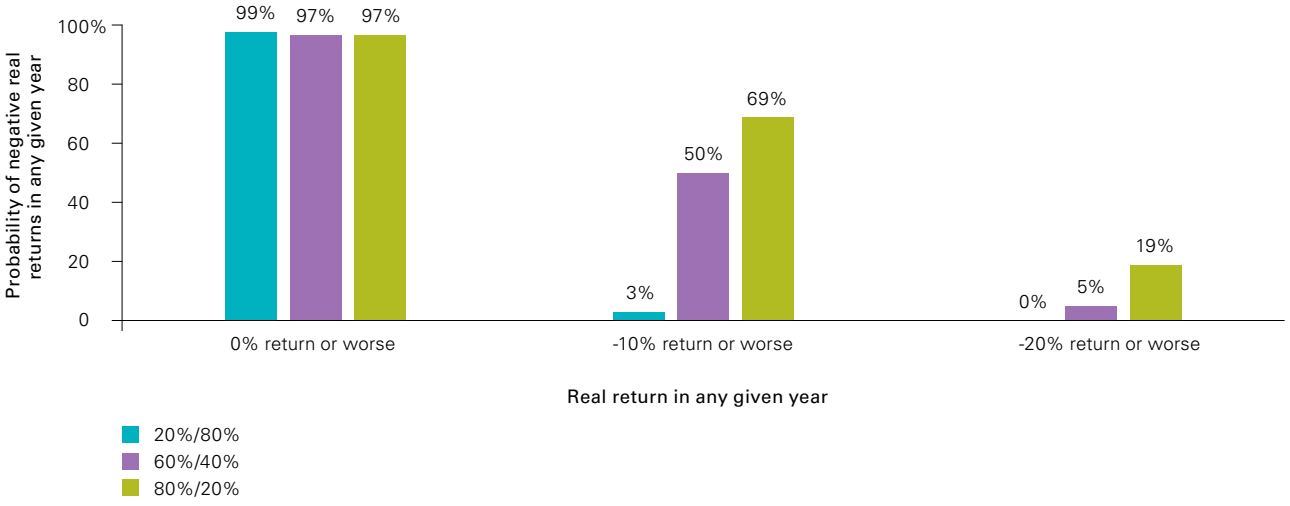
Figure III-1. *(Continued).* Nominal return analytics for balanced portfolios

c. High nominal return objective may not be achievable



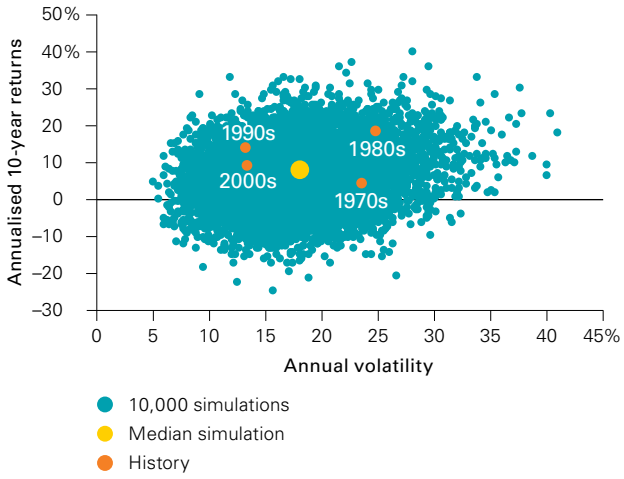
d. Risky portfolios require risk tolerance



Notes: The figure displays nominal return analytics based on 10,000 VCMM simulations for projected ten-year annualised nominal returns as of September 2016 in GBP. Historical returns are computed using indices defined in "Indices used in our historical calculations", on page 5. 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.

Source: Vanguard.

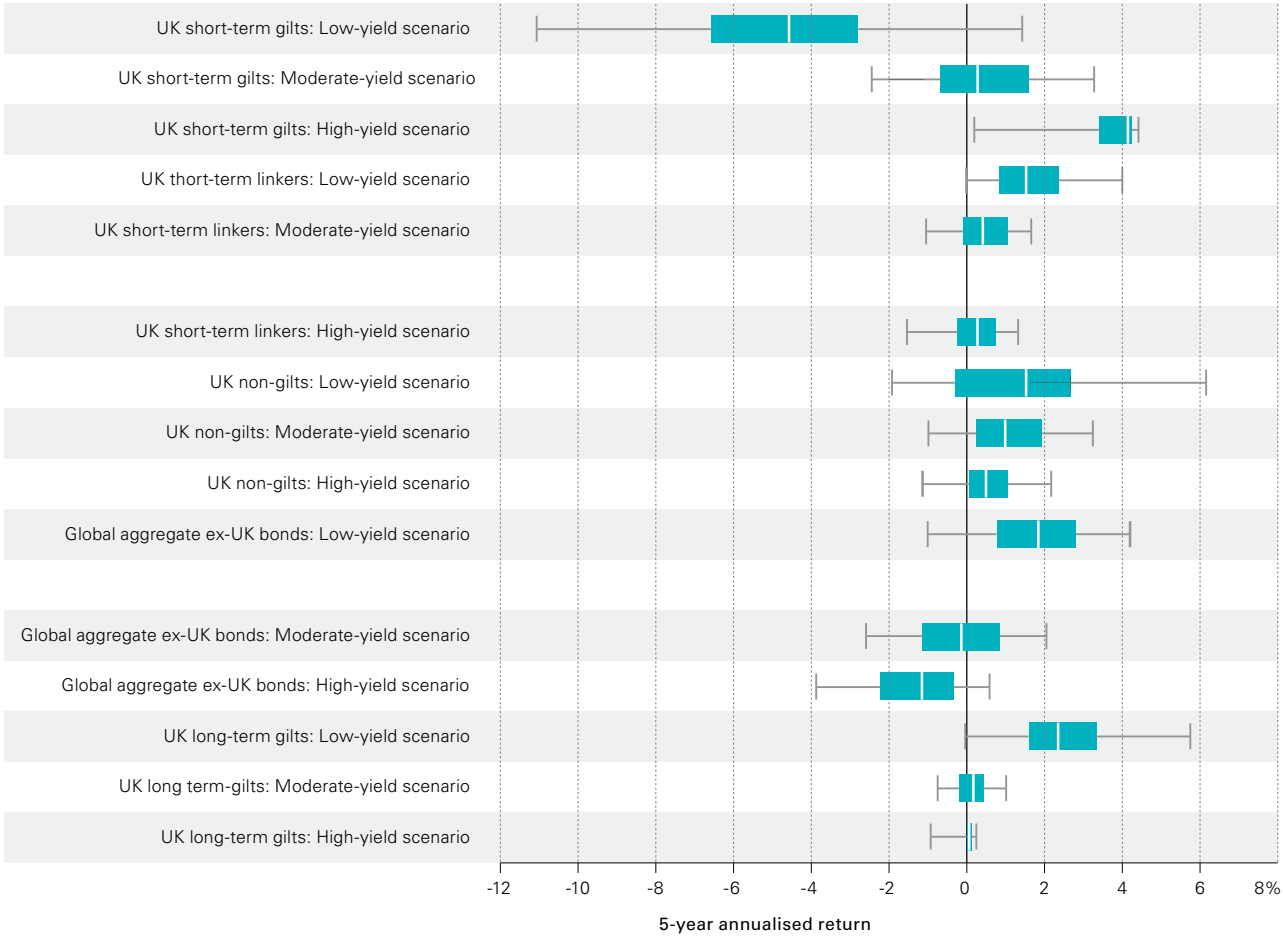
Figure III-2. VCMM simulation output for UK equity market (10,000 simulations)



Notes: Historical returns are computed using indices defined in "Indices used in our historical calculations", on page 5

Source: Vanguard.

Figure III-3. Fixed income tilts are not without risks



Notes: Forecast displays simulation of five-year annualised returns of asset classes shown as of September 2016. Scenarios are based on sorting the VCMM simulations based on the three-month and 30-year gilt yields at the end of every year. The three scenarios are a subset of the 10,000 VCMM simulations. See appendix section titled "Index simulations", on page 38 for further details on asset classes shown here.

Source: Vanguard.

Index simulations

The long-term returns of our hypothetical portfolios are based on data for the appropriate market indices through September 2016. 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 bonds: Barclays Sterling Aggregate Bond Index
- Global ex-UK bonds: Standard & Poor's High Grade Corporate Index from 1926 through 1968, Citigroup High Grade Index from 1969 through 1972, Lehman Brothers US Long Credit A A Index from 1973 through 1975, Barclays US Aggregate Bond Index from 1976 to 1990, Barclays Global Aggregate Index from 1990 to 2001; Barclays Global Aggregate ex GBP Index from 2001 onward.
- UK equity: Barclays Equity Gilt Study from 1900 to 1964, Thomson Reuters Datastream UK Market Index 1965 - 1969; MSCI UK thereafter.
- Global ex-UK equity: S&P 90 Index from January 1926 through March 3, 1957; S&P 500 Index from March 4, 1957, through 1969; MSCI World ex UK from 1970 to 1987; MSCI AC World ex UK from 1988 onward.
- Global equity: 25% UK Equity and 75% Global Ex-UK Equity.
- Global bonds: 35% UK Bonds and 65% Global Ex-UK Bonds.
- UK gilts: Barclays Sterling Gilts Index.
- UK short-term gilts: Barclays Sterling 1-5 year Gilts Index.
- UK long-term gilts: Barclays Sterling 15+ year Gilts Index.
- UK non-gilts: Barclays Sterling Non-Gilt Index.
- UK sterling aggregate bonds: Barclays Sterling Aggregate Bond Index.
- UK inflation: Consumer Price Indices - RPI all items long run series: 1900 to 2014: Jan 1974=100. Code: CDKO. Source: Office of National Statistics.
- Commodity futures: Bloomberg Commodity Index in GBP.

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