

Vanguard®

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 U.S. economy's cyclical thrust above 2% trend growth should endure, underscoring the economy's resiliency.
- A deflationary threat still hovers over a world with excess capacity, despite continued monetary stimulus and a tightening U.S. labor market. This will lead to divergent monetary policies. In addition, the U.S. Federal Reserve will likely be one of the few central banks to raise rates in 2015.
- Although not bearish, Vanguard's outlook for global stocks 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 of September 30, 2014. Results from the model may vary with each use and over time. For more information, see the appendix.

All investing is subject to risk, including the possible loss of the money you invest. Past performance is no guarantee of future returns. Investments in bond funds are subject to interest rate, credit, and inflation risk. Foreign investing involves additional risks, including currency fluctuations and political uncertainty. Diversification does not ensure a profit or protect against a loss in a declining market. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

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

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

Contents

Global market outlook summary.....	4
I. Global economic perspectives.....	6
Global economic outlook: Is the world in secular stagnation?	6
Europe: Can a Japanese-style 'lost decade' be avoided?.....	10
Asia-Pacific: Will China's rebalancing dilemma show in the growth numbers?.....	12
Americas: In the United States, growth tailwinds and full-employment in 2015.....	13
II. Global inflation and policy focus.....	16
Global inflation outlook.....	16
Global interest rates and central bank outlook.....	18
III. Global capital markets outlook.....	20
U.S. interest rates and bonds.....	20
Global fixed income markets.....	22
Global equity markets.....	24
Balanced portfolios.....	28
IV. Appendix.....	30

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 U.S. investor with a dollar-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 U.S. 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 characterized 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 postfinancial 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 U.S. 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

U.S. 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 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 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 through 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 taxable fixed income market is centered in the 2%–3.5% 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. Centered in the 5%–8% 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% stock/bond portfolio tending to center 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 stocks and bonds.

Indexes used in our historical calculations

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

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

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

Global bonds: Before 1985, 100% U.S. bonds, as defined above. After 1985, 80% U.S. bonds and 20% ex-U.S. bonds, rebalanced monthly.

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

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

Global equities: Before 1970, 100% U.S. equities, as defined above. After 1970, 70% U.S. equities and 30% ex-U.S. equities, rebalanced monthly.

I. Global economic perspectives

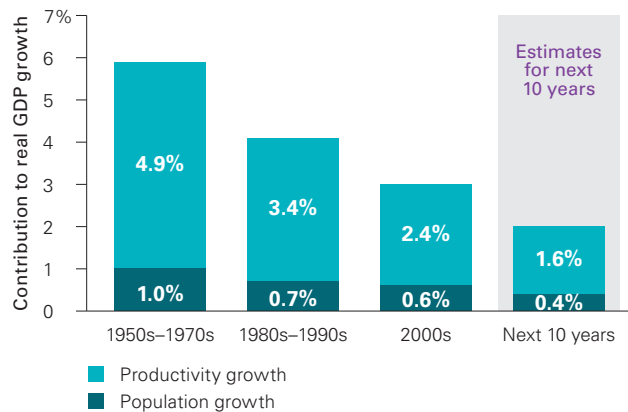
Global economic outlook: Is the world in secular stagnation?

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 unfavorable 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).

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 nonrecessionary 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 annualized real potential GDP growth from IMF WEO. For developing countries, we projected the sum of ten-year annualized 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 1991. For Russia, data begin in 1993.

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

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 U.S. 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.)

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.

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 30.

Source: Vanguard.

**2015 global growth outlook:
U.S. 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 U.S. leading indicators dashboard points toward a slight acceleration. The most positive indicators are those associated with manufacturing activity, financial conditions, consumer and business confidence, and the labor 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.

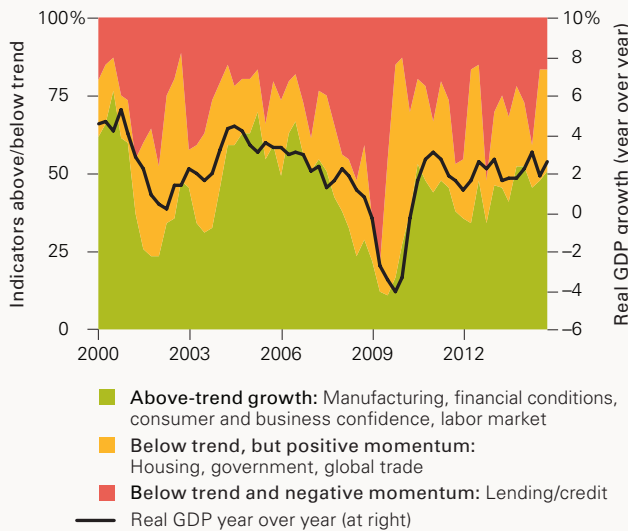
Using simple regression analysis, we mapped our proprietary indicators to a distribution of potential scenarios for U.S. economic growth in 2015, as shown in **Figure I-4b**. The odds of growth at or exceeding 2.5% in 2015 (47%) are significantly higher than the potential for growth to stagnate and fall 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. 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 toward the lower end of the middle range, around 7%.

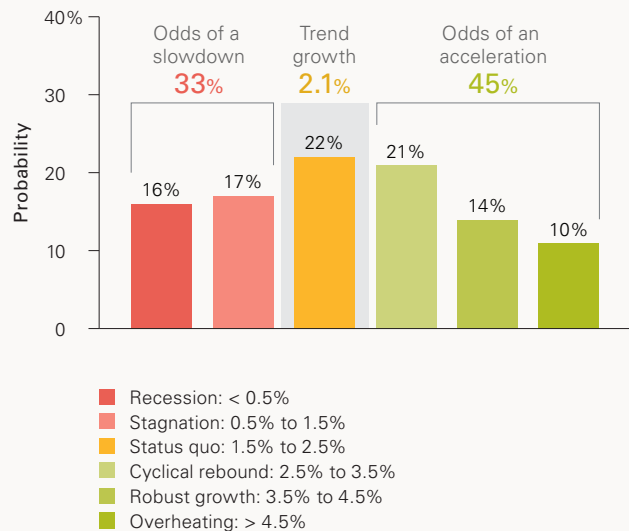
Figure I-4. Vanguard global dashboard of leading economic indicators and implied economic growth for 2015

a. United States: Economic indicators



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

b. Estimated distribution of U.S. growth outcomes, 2015

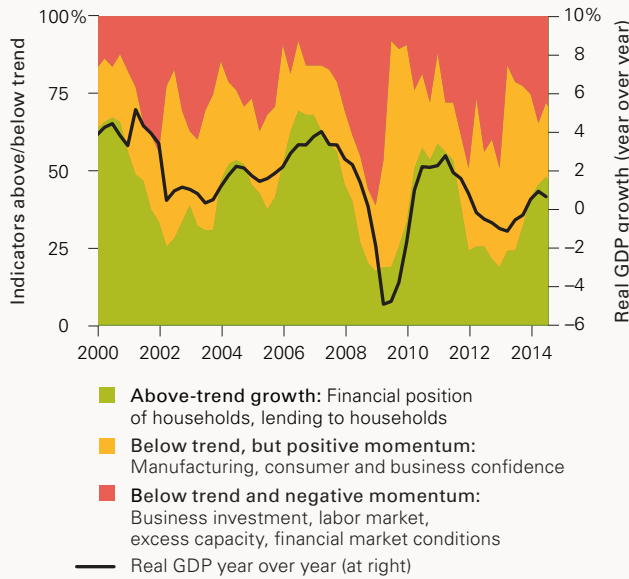


Notes: Distribution of growth outcomes generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2014 and adjusting for the time-varying trend growth rate. “Trend growth” represents “Projected future” estimated trend growth presented in Figure I-2.

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

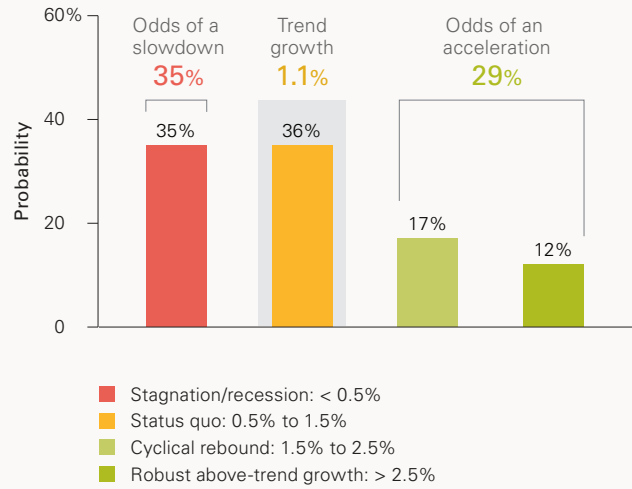
Figure I-4 (continued). Vanguard global dashboard of leading economic indicators and implied economic growth for 2015

c. Euro area: Economic indicators



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

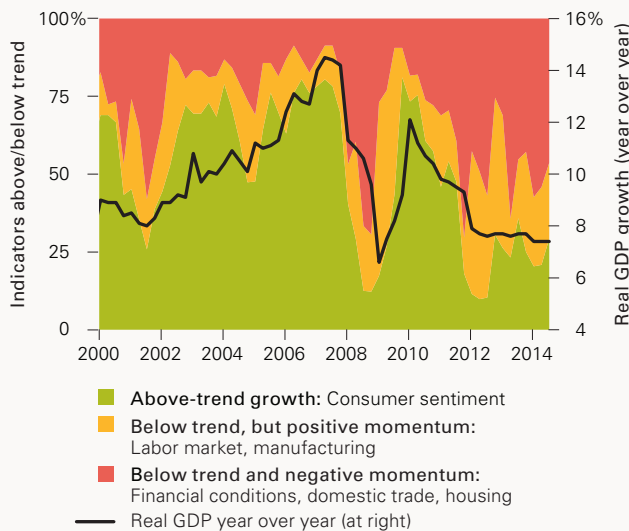
d. Estimated distribution of Euro area's growth outcomes, 2015



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.

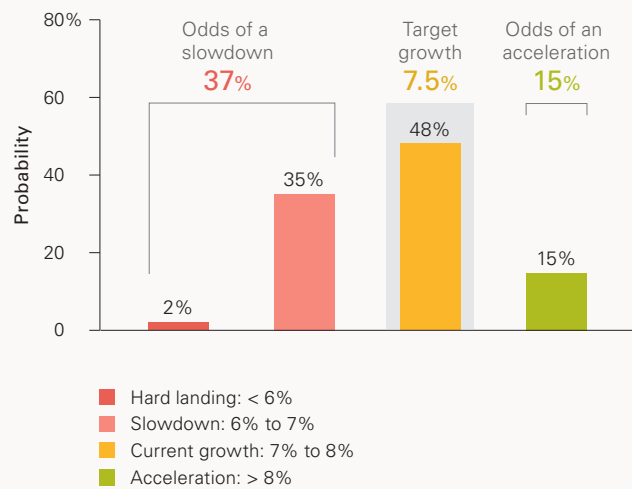
Sources: Vanguard calculations, based on data from Eurostat, Destatis (Federal Statistical Office of Germany), French National Institute of Statistics and Economic Studies (INSEE), Italian National Institute of Statistics (ISTAT), Instituto Nacional de Estadística (INE), Spanish Statistical Office, Statistics 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.

Current developments in the euro area, such as entrenched deflationary forces and persistent underutilization 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, in spite 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 jeopardize 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 toward 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.

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

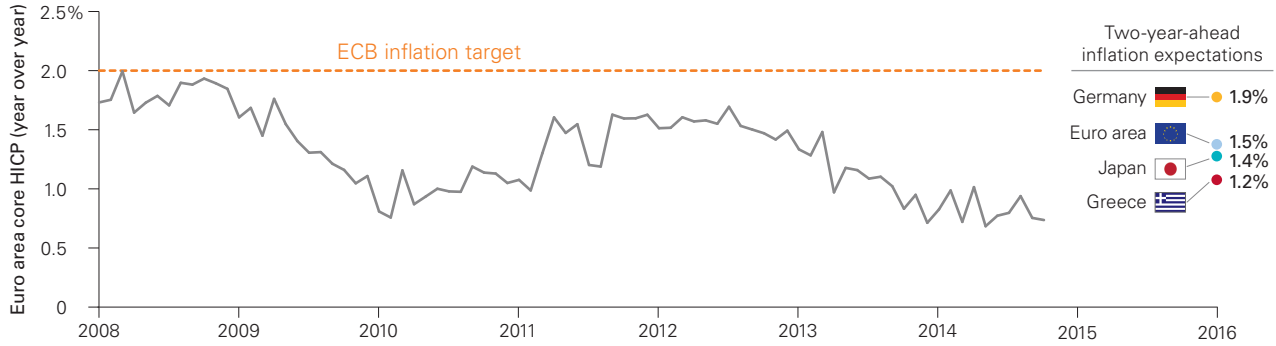
The euro area economy is struggling to recover from the downturn caused by the double shock of the global financial crisis followed by the sovereign debt crisis and an insufficiently robust response by European policymakers, especially in the face of a renewed slowdown in 2014. This has raised the risk that the economy could fall back into recession or suffer from falling prices in the region as a whole.¹ We believe the euro will survive intact, although a more vibrant and balanced European economy still seems several years away.

In October 2014, the euro area posted an annualized inflation rate of 0.4%, marking the 13th straight month of sub-1% inflation and well below the ECB's target of 2%. Neither market-based inflation expectations nor the ECB's own forecasts reflect an expectation that inflation will return to target levels in the immediate future (see **Figure I-5**). This has led to concerns that the euro area will slip into outright deflation, as occurred in Japan during 1998–2002 and has already occurred in some periphery countries that have been required to undergo internal price devaluation to restore price competitiveness. For

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

Figure I-5. Inflationary expectations below target

Euro area core HICP



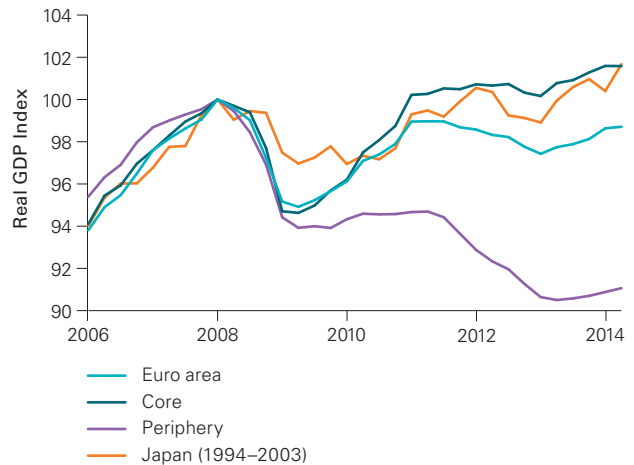
Note: HICP = Harmonized Index of Consumer Prices.

Sources: Vanguard calculations, based on data from Bloomberg, Thomson Reuters Datastream, ECB, Deutsche Bundesbank, IMF, and Eurostat.

now, outright deflation is not our base-case scenario; rather, we are concerned that the persistence of significant spare capacity will keep underlying price pressures subdued. It is striking that the level of economic activity in the euro area is still about 1% beneath its previous peak level in 2008 when the global financial crisis began. Indeed, even Japan during its so-called lost decade recorded positive growth, as Figure I-6 illustrates. We believe it unlikely that the European economy as a whole will grow sustainably above 1% in the near future, due to the restraining effects of fiscal restructuring and banking-sector deleveraging, although this should ease in the next few years. In some peripheral economies, unemployment rates of more than 20%, particularly for younger workers, present risks of social unrest and political instability. Given the inexorability of electoral cycles, the implication could be a rejection of current administrations for more populist movements. Although we expect Europe to continue to sluggishly maneuver through its challenges, investors should prepare for periodic market volatility driven by political flare-ups and concerns over the capitalization of the European banking system. We believe the odds of the ECB pursuing outright QE are about 80%.

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.

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

Although Chinese economic growth is likely to continue trending toward a lower but more sustainable pace, given years of overinvestment, we do not foresee an emerging-market-style hard landing as likely.² China is likely to grow at a 6%–7% pace over the next two to three years (see **Figure I-7**), in line with market expectations but notably slower than its previous trend.

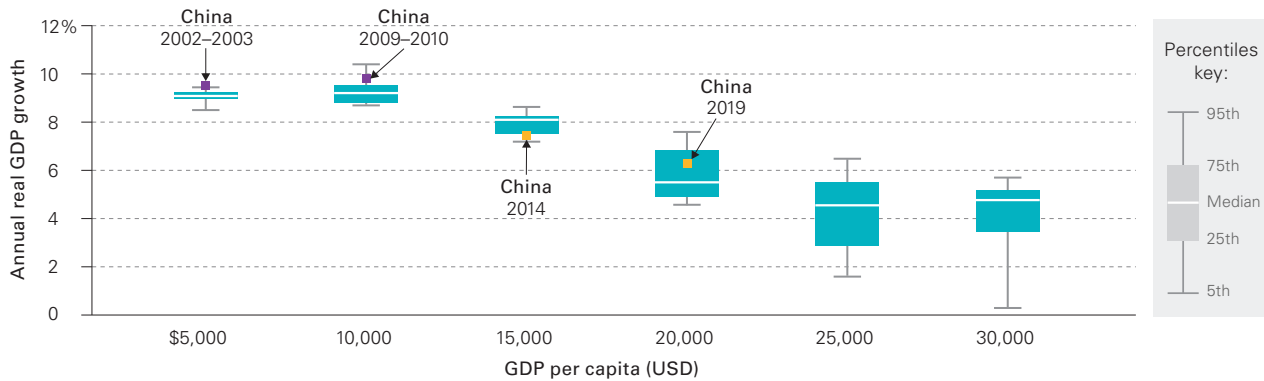
In the bigger picture, the prolonged downshift in China’s economic growth in recent years is due to a combination of factors. From a cyclical perspective, the tepid recovery in the global economy, the significant appreciation of the renminbi in REER³ terms, the government’s anticorruption and austerity 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 labor force, falling return on capital, and moderating total factor productivity growth, the economy’s growth potential could gradually fall toward 5% in 2020, absent meaningful progress on structural reforms. In fact, the other wealthy Asian economies all experienced a slowdown on the pathway from low to high income.

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 toward 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 liberalization) 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

Figure I-7. 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.

² For more perspective on Vanguard’s views on China, see *Global Macro Matters—China: Slowdown Possible, Financial Crisis Less So* (Davis, 2014a).

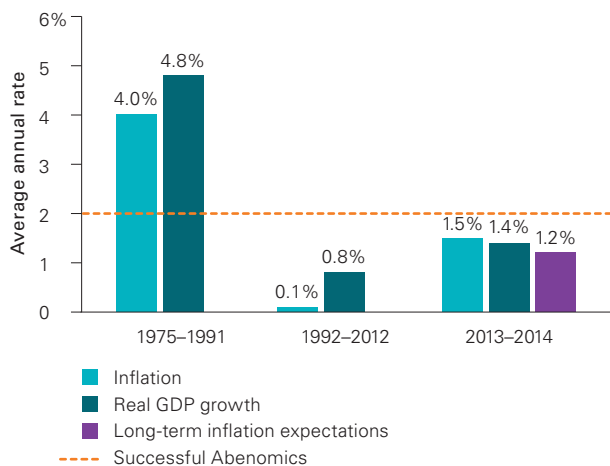
³ REER is the real effective exchange rate.

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”⁴ so far represents a reflation of prices, rather than a lift to real economic growth (Figure I-8).

Figure I-8. ‘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 U.S. break-even inflation less ten-year yield differential between United States and Japan through October 31, 2013, and ten-year U.S. 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.

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

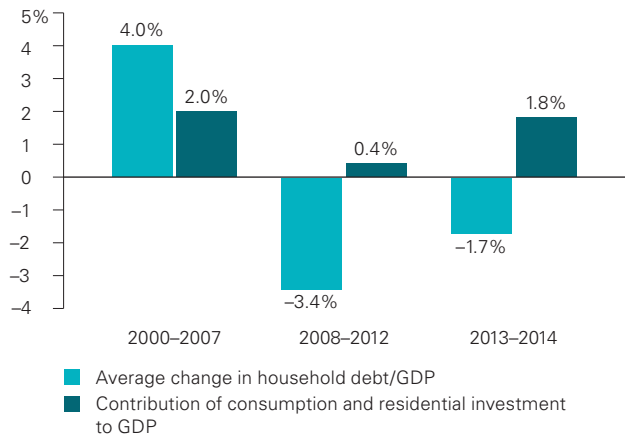
As in past outlooks, we maintain that U.S. trend growth (in terms of real GDP) is near 2%, versus its historical average of 3.0%–3.5% since 1947. This projection is based on several headwinds—including slower labor force and population growth, and higher levels of structural unemployment—than were the 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 U.S. economic outlook for 2015 is best described as one of resiliency, with the ongoing cyclical thrust expected to continue in the near term, as outlined in the paragraphs following.

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.

⁴ “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.

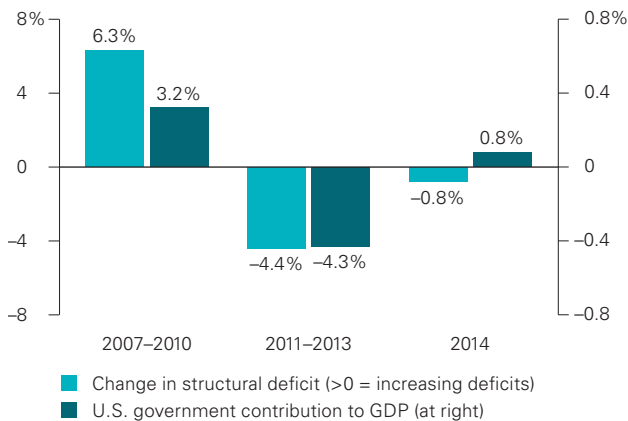
For economic growth to occur, the pace of consumer deleveraging matters most, not the absolute level of debt outstanding; that pace has continued to slow in 2014. **Figure I-9** shows that the contribution of consumer spending and residential investment to GDP growth has been increasing as the pace of 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-9. Slower U.S. 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.

Figure I-10. Slower pace of fiscal contraction also supports U.S. growth



Sources: Vanguard calculations, based on data from Moody’s Analytics Data Buffet, IMF, 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-10**). 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-11**) indicate that this acceleration is feasible, albeit at a moderate pace, so long as policy uncertainty does not spike over the coming year.

Figure I-11. U.S. businesses starting to expand as revenue growth takes hold



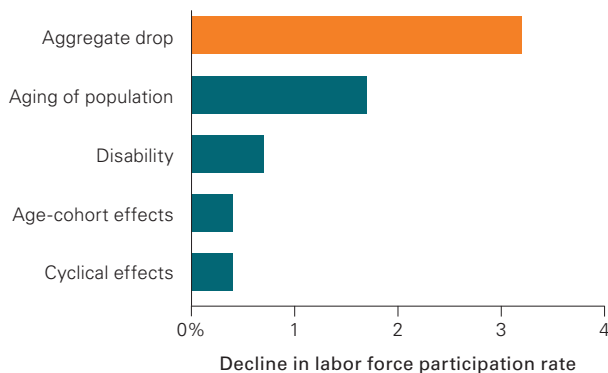
Sources: Vanguard calculations, based on data from Moody’s Analytics Data Buffet, U.S. Census Bureau, and U.S. Bureau of Economic Analysis.

Based on these positive tailwinds, we expect the recent cyclical thrust in the U.S. 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.

However, notice that under our structural deceleration view, the definition of *full employment* is a bit different than in previous periods. The unemployment rate falls if people find jobs, but it also falls if people just drop out of the labor force (i.e., when they stop looking for jobs). **Figure I-12** shows the estimated impact of various structural factors on the drop in the labor force participation rate from more than 66% in 2007 to less than 63% today. An aging population and increased use of the federal disability program could have lasting impacts on workforce participation. By our estimates (in **Figure I-12**),

Figure I-12. Lower labor force participation is mainly a structural issue . . .

Decomposition of change in labor force participation (2007–2014)



Notes: Figure displays results of a decomposition of factors contributing to the decline in U.S. labor force participation rate (source: Federal Reserve Bank of Atlanta, <https://www.frbatlanta.org/chcs/LaborForceParticipation>). “Age-cohort effects” include those defined by Atlanta Fed as “prime age in school or training, prime age taking care of family, schooling among young, prime age retired, and later retirement.” “Cyclical effects” include those defined as “prime age other reason and want a job.”

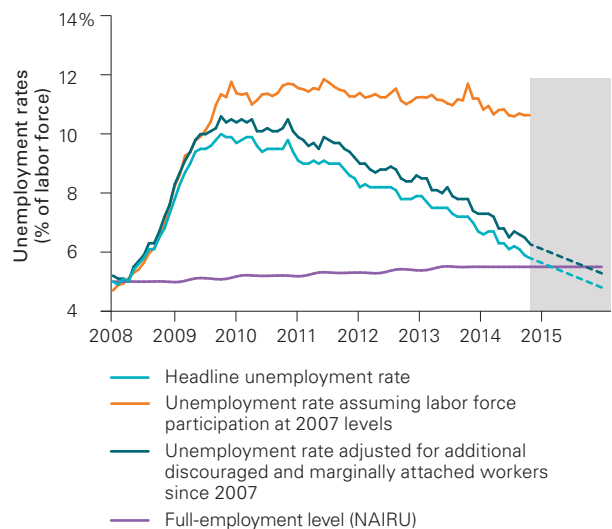
Sources: Vanguard calculations, based on data from Federal Reserve Bank of Atlanta.

more than 80% of the drop in labor force participation is structural in nature and thus is most likely permanent. Much of the progress in a falling unemployment rate is explained by these structural changes in the labor force.

The remaining 20% drop in the labor force is attributed to temporary or cyclical factors—for example, discouraged workers and others who would reignite their job search if the prospects of finding a job improved meaningfully. Based on our estimates, the unemployment rate would be about 0.5% higher if these workers were included in the official calculation of unemployment. Our projections in **Figure I-13** show that even if all these workers rejoined the labor force over the next year, headline unemployment would still reach full-employment levels (i.e., officially estimated at 5.5% for the U.S. economy) sometime in 2015.⁵

Figure I-13. . . . which means the United States is closer to full employment than some think

Unemployment rates and adjustments for labor force participation changes



Notes: Figure displays actual unemployment rate along with two adjusted measures. The first assumes the labor force participation rate stays constant at the December 2007 level of 66%. The second assumes that discouraged and marginally attached workers rejoin the labor force, pushing the hypothetical unemployment rate above the actual one. “Full-employment level (NAIRU)” refers to the non-accelerating inflation rate of unemployment, estimated by the U.S. Congressional Budget Office.

Sources: Vanguard calculations, based on data from U.S. Bureau of Labor Statistics, U.S. Census Bureau, U.S. Congressional Budget Office, and Moody’s Analytics Data Buffet.

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

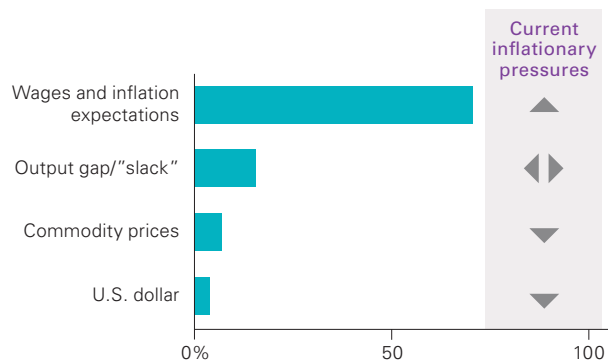
II. Global inflation and policy focus

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 counteracting the deflationary drag of postfinancial 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 U.S. core inflation, 1983–2013



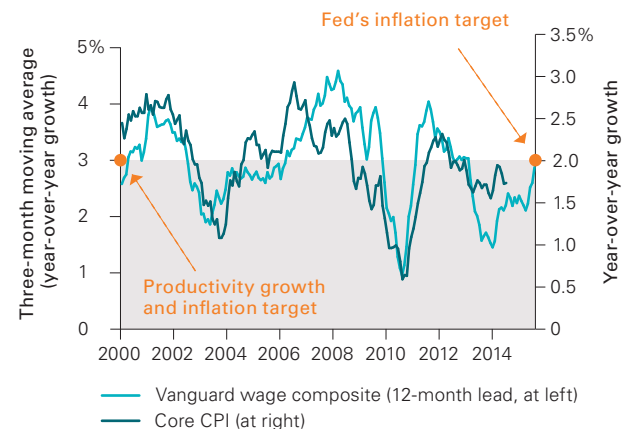
Note: Chart based on inflation-variance decomposition described in Vanguard research (Davis, 2007).

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 U.S. dollar, are tempering the rise in core inflation measures (as shown in **Figure II-1**). However, labor 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 U.S. inflation is likely to approach its 2% target over the next year or so (see **Figure II-2**).⁶

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.

⁶ 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 indexes 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.

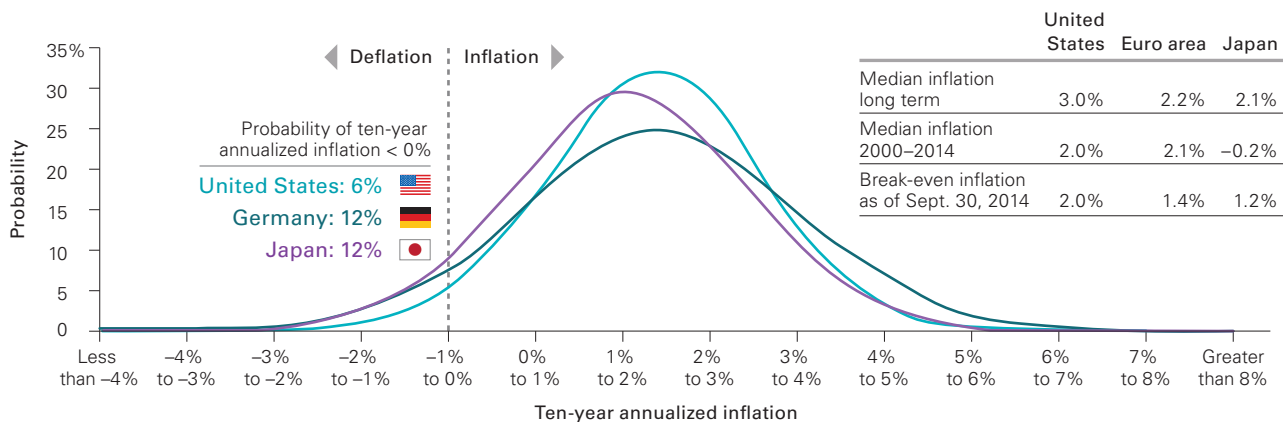
Of note, Vanguard’s median secular inflation expectation for many developed markets is approximately 1 percentage point lower than the historical average inflation rate observed since the 1950s. This is due to the regime change in global central banks’ monetary policy and inflation management that took 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 emphasizing that despite aggressive monetary policy, some developed markets could be a recession away from realizing deflation.

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

Ten-year annualized inflation projections, as of September 2014



Note: Figure displays projected range of ten-year annualized inflation of United States, Germany, and Japan, corresponding to distribution of 10,000 VCMM simulations as of September 30, 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.

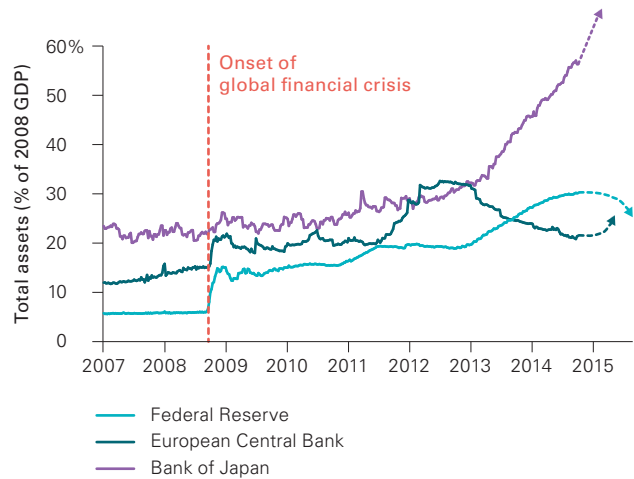
Global interest rates and central bank outlook

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 U.S. Federal Reserve will keep short-term rates near 0% through 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 through 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 program in the United States completed, markets will pay close attention to policy communications from the Fed and other banks in coming years, in hopes of gleaning insights into the timing of the first rate increase. Our perspective on the structural nature of labor 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.

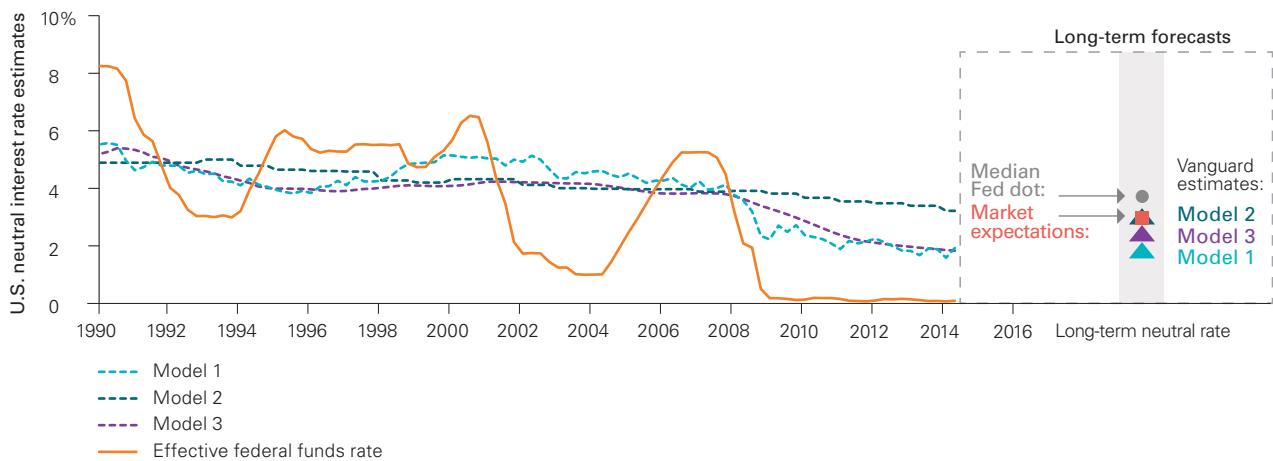
Sources: Vanguard calculations, based on data from Federal Reserve, ECB, Bank of Japan, and IMF.

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 U.S. labor 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 U.S. 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.

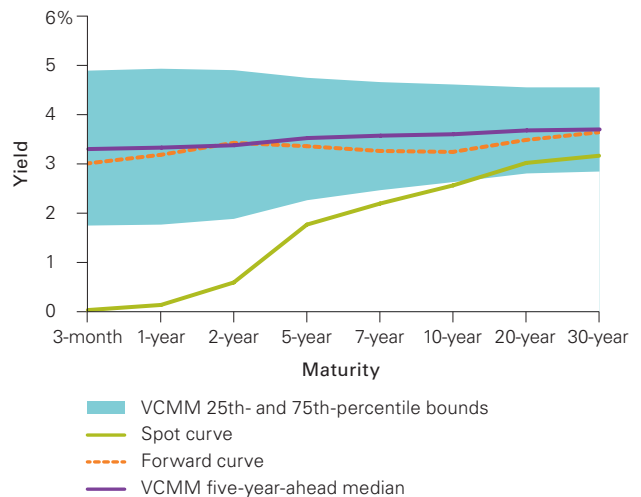
III. Global capital markets outlook

U.S. interest rates and bonds

The bond market continues to expect U.S. Treasury yields to rise, particularly at the short end of the yield–maturity curve and around its medium-term range, as we get closer to a Fed decision to move off the zero floor. This bias toward a “bear flattening” of the curve (a larger increase in short rates than in the long end of the curve) is 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 (purple line) of the yield curve is similar to the rates implied by the forwards (dashed orange line). Our simulations indicate a 50% probability of rates being within the blue band of Figure III-1, representing the 25th and 75th percentile bounds of the simulated interest rates.

Compared with Vanguard’s 2014 outlook, our estimates of the fair-value range for the 10-year Treasury bond have fallen substantially, with the current macroeconomic environment justifying a 10-year yield in the range of 2.5%–3%.⁷ Based on our estimates of the fundamental drivers of Treasury 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 the lower trend growth and inflation, the terminal level for the federal funds rate gets revised downward, and with it all other rates across the maturity spectrum. This is because fair-value estimates of long-term Treasury bond yields are determined by the expected average short-term-rate over the maturity of the bond (plus a small term premium).

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 U.S. Treasury curve as of September 2014.

Sources: Vanguard and Moody’s Analytics.

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

⁷ See Davis et al. (2010) and *Global Macro Matters—Rate Liftoff: It’s Not ‘Easy’ Being the Fed* (Davis, 2014d), for a discussion of the decomposition of the drivers of interest rates and an explanation of the pure expectations hypothesis method for estimating interest rates, respectively.

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 one-half of our VCMM scenarios. In a Fed tightening cycle, 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 result in outperformance of a broadly diversified fixed income portfolio in the years ahead, as supported by the simulations discussed here.

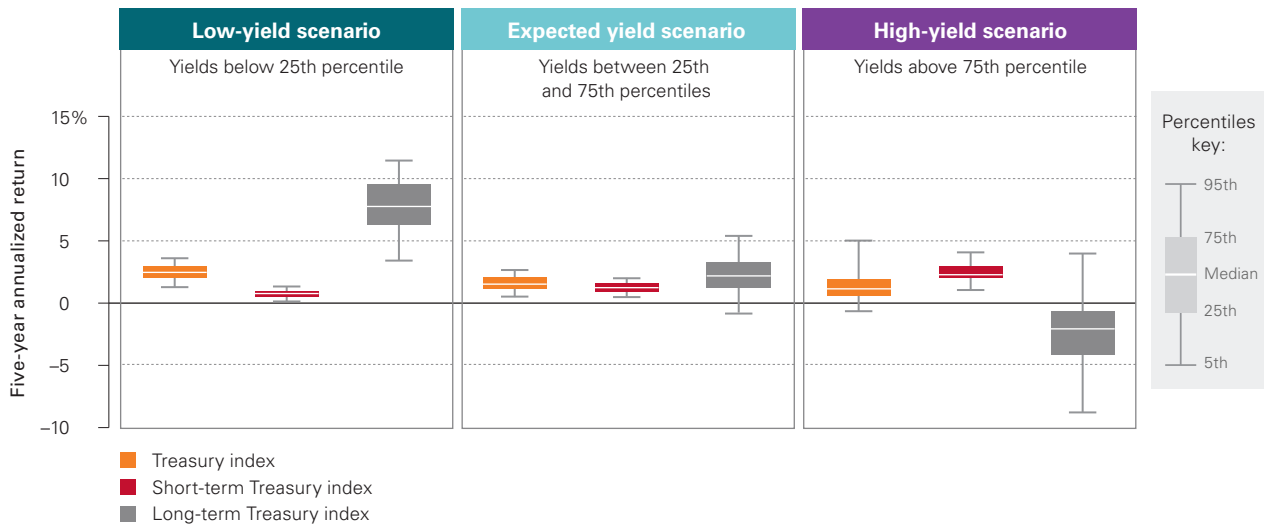
Figure III-2 displays the range of potential returns in three future yield-curve scenarios. Our central tendency is centered on the median interest rate scenario in Figure III-1, but it’s important to note that the scenario captures the (highly likely) possibility that actual rates may rise more or less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

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

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

Across the three scenarios described in Figure III-2, the total Treasury 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



Notes: Forecast displays distribution of 10,000 VCMM simulations for five-year annualized returns of asset classes shown as of September 2014. Scenarios are obtained based on sorting the three-month and 30-year Treasury yields at the end of every year from the VCMM. The three scenarios combined are a subset of the 10,000 simulations from the VCMM. See appendix section titled “Index simulations,” for further details on asset classes shown here.

Source: Vanguard.

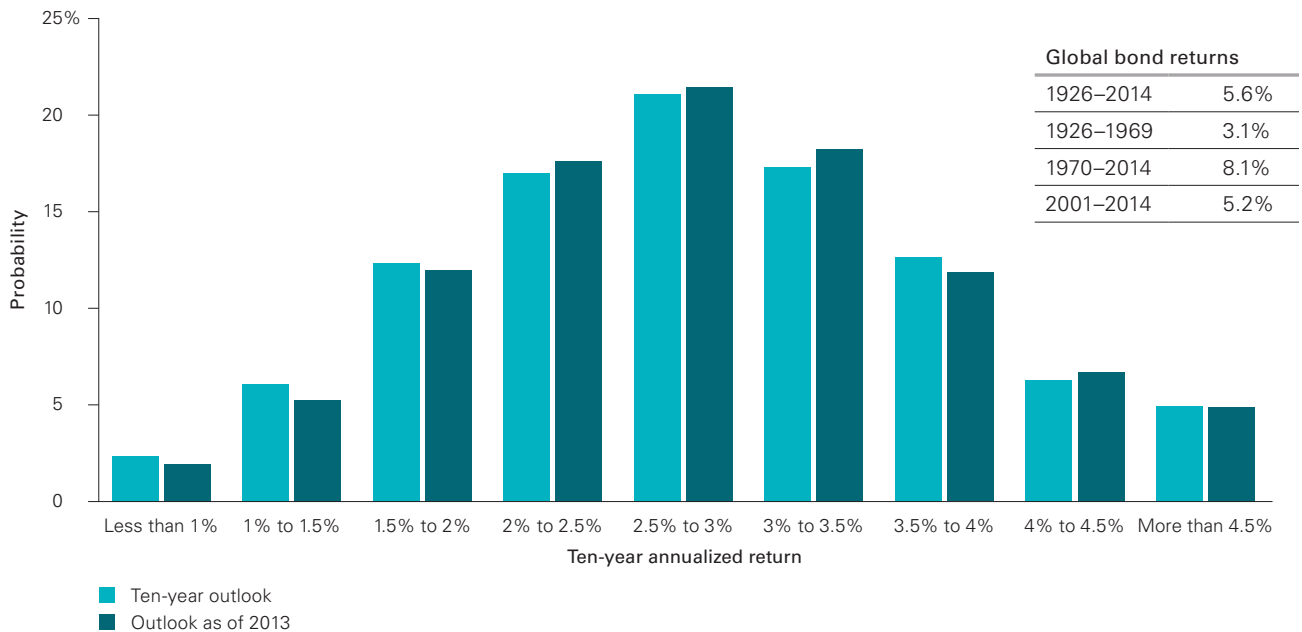
Global fixed income markets

As in past outlooks, the return forecast for fixed income is positive but muted. As displayed in **Figure III-3**, the expected ten-year median return of the broad taxable U.S. fixed income market is centered in the 2.0%–3.5% range. This result is near current benchmark yields and thus most closely resembles the historical bond returns of the 1950s and 1960s.

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 from riskier assets such as equities.

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

VCMM-simulated distribution of expected average annualized nominal return of global fixed income market, as of September 2013 and September 2014



Notes: Figure displays projected range of returns for portfolio of 80% U.S. bonds/20% ex-U.S. bonds, rebalanced quarterly, from 10,000 VCMM simulations as of September 2014. (See “Indexes used in our historical calculations,” on page 5, for details of benchmarks used for historical returns; see appendix section titled “Index simulations,” for further details on asset classes shown here.)

Source: Vanguard.

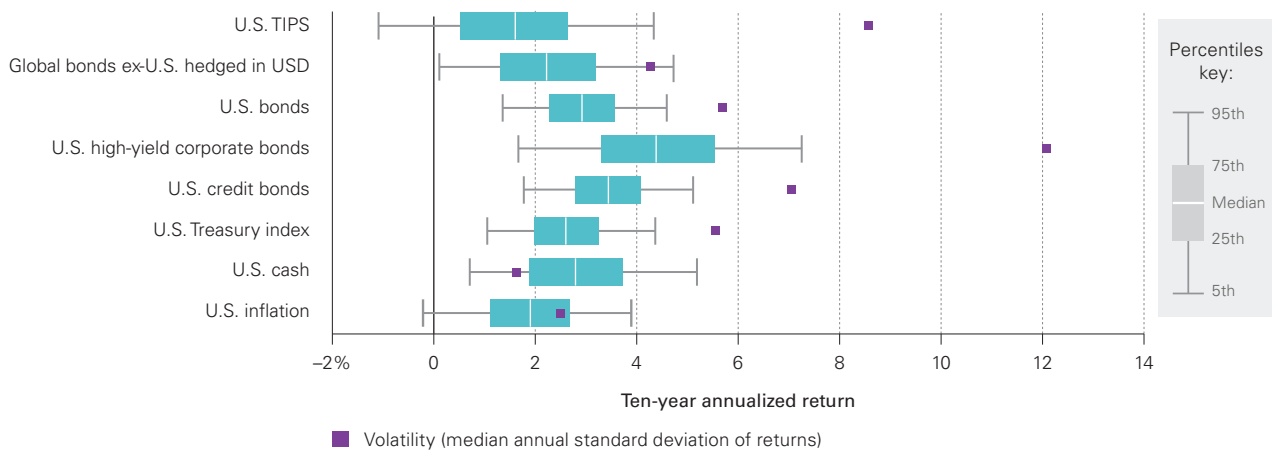
Several segments of the U.S. bond market, such as credits, Treasuries, and high-yield corporates, have ten-year median expected returns centered in the 2%–4% range (Figure III-4). We urge investors to be cautious in reaching for yield in segments like high-yield corporates, not only because of the higher expected volatility that accompanies the higher yield but also because of the spread compression currently observed. Current yields of U.S. credit bonds and high-yield corporate bonds 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 high-yield corporate bonds than for other higher-quality segments of the U.S. fixed income market, which also contributes to an increased investment risk. From a strategic asset allocation point of view, credit and high-yield bond spreads tend to widen along with spikes in equity volatility and reduce the diversification benefit with equities when compared with Treasury bonds.

In the inflation-linked segment of the bond market, the distribution in our VCMM scenarios of TIPS returns is wider than that of nominal Treasury bonds. The expected median long-term return on a U.S. TIPS portfolio is lower than that of a similar-duration nominal Treasury portfolio

by a modest amount that represents the estimated inflation-risk premium. As expected, TIPS generally outperform nominal Treasuries in scenarios featuring higher-than-average inflation rates over a ten-year outlook. On a more cautionary note, TIPS have displayed a higher probability of negative returns over shorter investment horizons because of their sensitivity to a rise in real rates. Balancing these considerations, investors should continue to evaluate the role of TIPS in their portfolios by balancing their inflation-risk protection quality against the inflation-risk premium “given up” relative to nominal bonds.

Although the central tendency of expected return for global ex-U.S. bonds appears to be slightly lower than that of U.S. 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 bonds should help offset some risk specific to the U.S. 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-return outlook: Setting reasonable expectations



Notes: Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualized nominal returns as of September 2014 in USD for asset classes highlighted here. See appendix section titled “Index simulations,” for further details on asset classes shown here.

Source: Vanguard.

⁸ See Philips and Thomas (2013).

Global equity markets

U.S. equity valuations

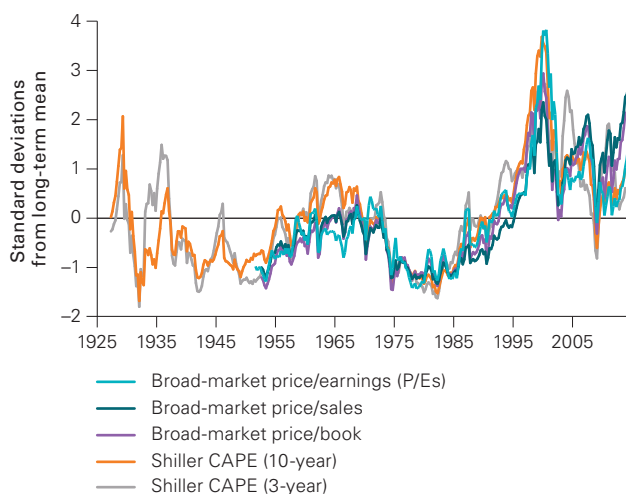
Most valuation metrics for the broad U.S. equity market (see **Figure III-5**) and its segments are elevated compared with their historical averages. That said, the long-term outlook for the global equity risk premium endures in an environment of muted expectations for global inflation and interest rates.

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 earning 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/E)s may not be just signaling 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/E)s may have become the norm going forward. However, even with no or muted multiples contraction, forward-looking equity returns may still be lower than the historical average if earnings yields (and the two components of the earnings yield: dividend yields and reinvestment of earnings) remain compressed.

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

Selected valuation metrics, 1926–2014

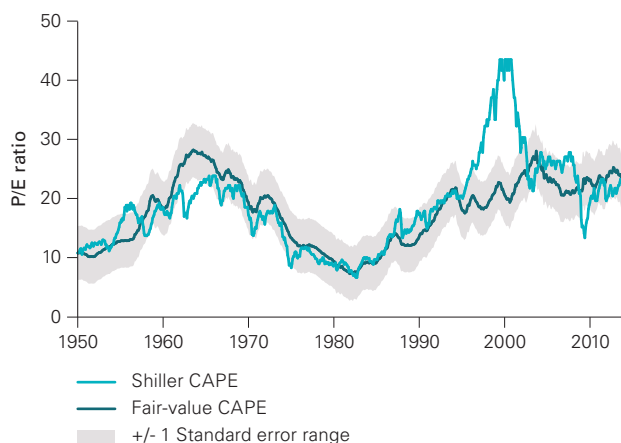


Notes: Figure displays valuation metrics standardized to have a long-term average of 0.0 and a standard deviation of 1.0. “Broad-market price/earnings” displays market value of domestic corporations from Federal Reserve Flow of Funds database relative to trailing four-quarter average of after-tax corporate 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 U.S. 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.

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.

The P/E ratios for certain segments of the U.S. equity market—such as small-caps and dividend- or income-focused equity strategies—point to valuations that appear to be frothy relative to the broad equity market. However, it is important to note that today's valuation levels have been associated with lower average returns, but with a significant range around the average.

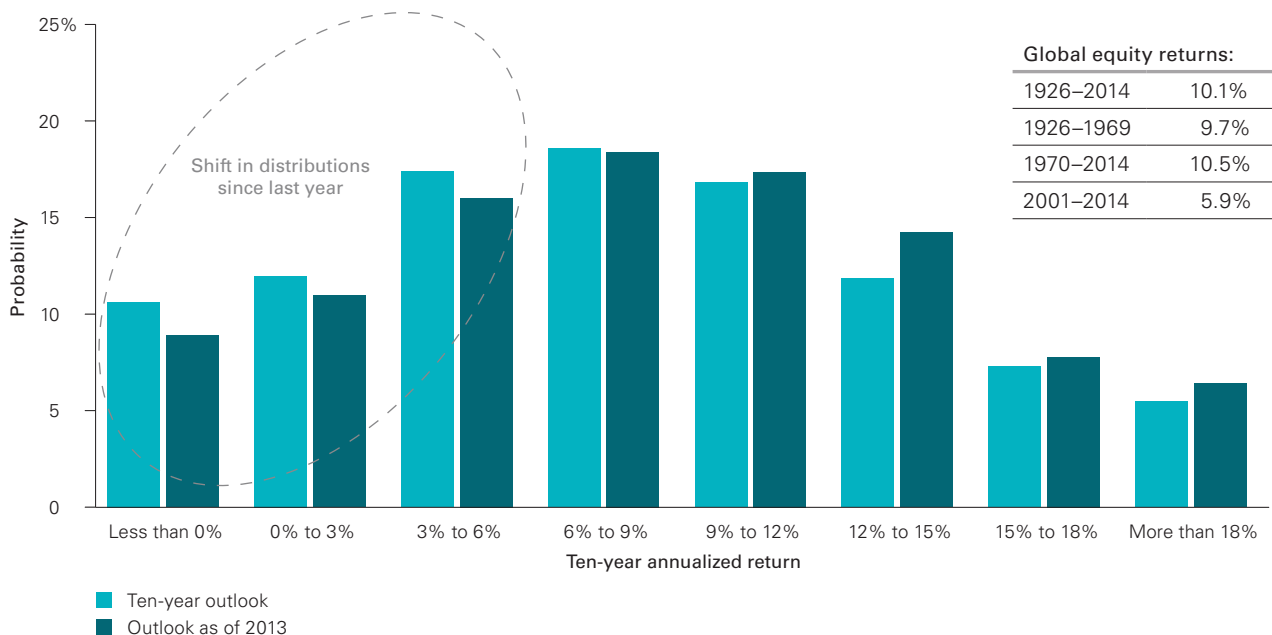
Long-term global equity return outlook

VCMM simulations for ten-year returns of a global equity portfolio are centered in the 5%–8% range, a median expectation below the historical average and revised slightly downward from this time last year (see **Figure III-7**). 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 50% 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 U.S. equity versus global ex-U.S. equity in **Figure III-8** may suggest that the expected U.S. equity market return may undercut both its own historical average *and* the expected global ex-U.S. equity return. This result is a function of the current starting level of valuations as

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

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



Notes: Figure displays projected range of returns for a 70% U.S./30% ex-U.S. equity portfolio, rebalanced quarterly, from 10,000 VCMM simulations as of September 2014. Benchmarks used for historical returns are defined in “Indexes used in our historical calculations,” on page 5; see appendix section titled “Index simulations,” for further details on asset classes shown here.

Source: Vanguard.

well as long-term trends of the U.S. dollar priced in by the markets, as discussed in Davis et al. (2014). This is in spite of our concerns about the economic outlook for Europe and Japan, two key markets for the ex-U.S. equity benchmark. As explained in Davis et al. (2012a, 2013), low economic growth expectations do not always translate into low equity return expectations.

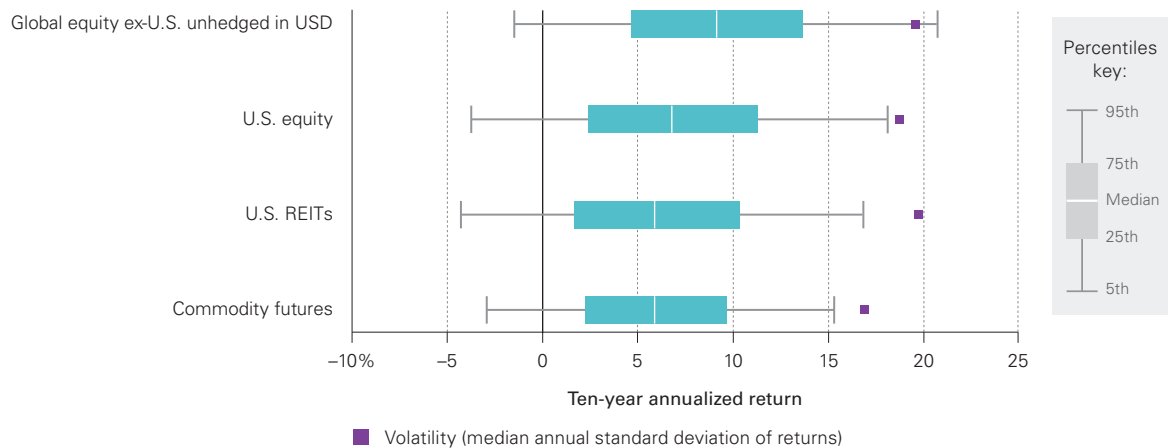
However, for the purposes of asset allocation, we caution investors against implementing either tactical tilts or strategic portfolios based on just the median expected return—that is, ignoring the entire distribution of outcomes and their correlations. We urge caution for the following reasons:

- A large portion of the return distribution is overlapping (which could negate the intended outperformance with significant odds).
- International equities (including emerging markets) and REITs have experienced higher volatility historically than the broad U.S. equity market.

- The projected distributions of long-term returns shown in Figure III-7 and Figure III-8 display wide and fat tails. As discussed in Davis, Aliaga-Díaz, and Thomas (2012b), 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.
- An international equity allocation in the 20%-to-market-cap range of the total equity allocation for a U.S. investor has typically provided reasonable diversification benefits, considering factors such as home country bias, although our “ex-ante” optimal recommendation remains market-cap proportional (Philips, 2014).

Having said this, equity portfolios with a high degree of home bias can always take advantage of global diversification benefits by rebalancing toward non-U.S. exposures.

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



Notes: Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualized nominal returns as of September 2014 in USD for asset classes highlighted here. See appendix section titled “Index simulations,” for further details on asset classes shown here.

Source: Vanguard.

In terms of emerging markets, Vanguard’s research (see Davis et al., 2013) provides perspective on why the currently weak economic growth environment for China and other BRIC countries⁹ should not carry over to our expectations for long-term equity market returns. 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 be based not on any projected return outperformance but, rather, on the diversification benefits of emerging markets.

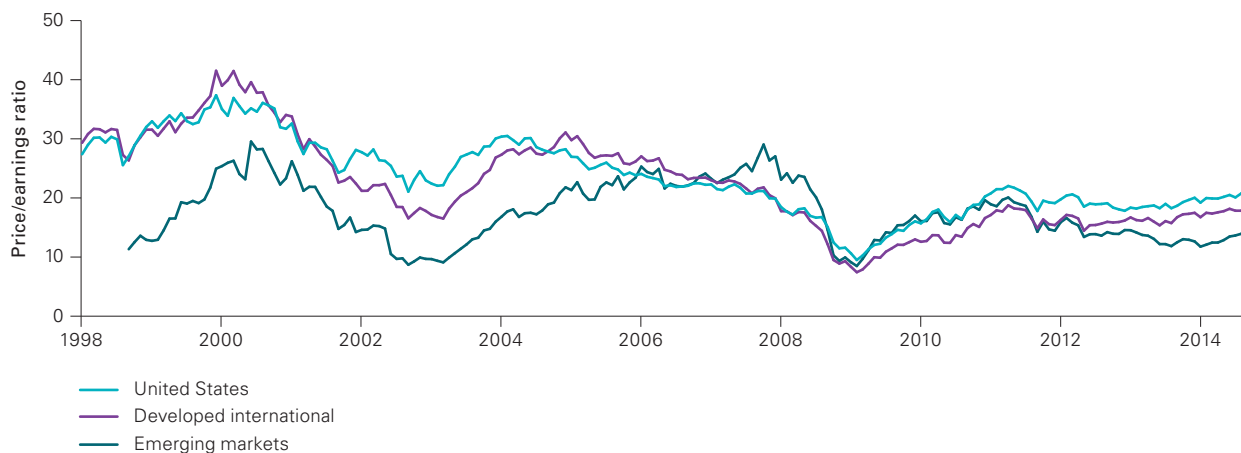
For U.S. REITS, our long-term return simulations indicate that the median return expectation is slightly below that of the broad U.S. equity market, based on relative valuations, and reflects slightly higher volatility. REITS are a subsector of the equity market, so all of REITS’ potential diversification benefits should be already captured in a broad-market portfolio. 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 U.S. 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 that correlations vary over time as they decide on an adequate exposure to commodities.

Figure III-9. Emerging-market valuations holding up versus other global equities

Prices over 36-month trailing earnings for selected equity indexes



Notes: Figure displays price/earnings ratio with aggregate earnings. United States equities 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.

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

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** (right-hand side) 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

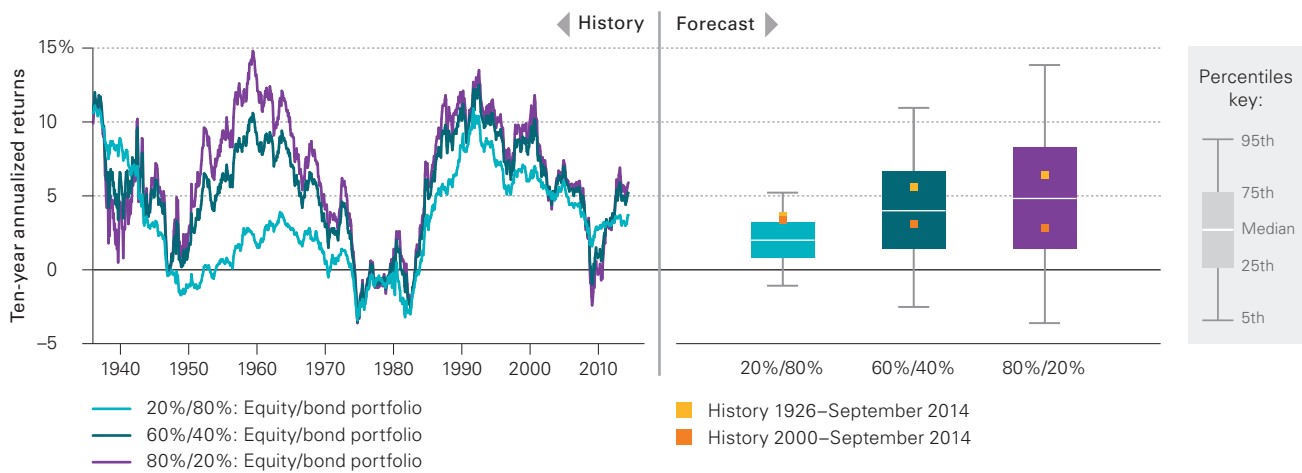
Amid widespread concern over the current low level of dividend and long-term U.S. Treasury yields, Figure III-10’s real long-run return profile for balanced portfolios may seem better than expected. However, Vanguard believes it’s important for investors to consider real-return expectations when constructing portfolios, because

today’s low dividend and Treasury 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 long-run historical averages (indicated by the small boxes for 1926–September 2014). 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 annualized returns of a 60% equity/40% bond portfolio for the decade ending 2024 are expected to center in the 3%–5% real-return range, below the actual average real return of 5.6% 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 30%, while the odds of attaining a higher real return than that achieved since 2000 (3.1%) are near 60%.

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%	-1.1%	0.8%	2.0%	3.3%	5.2%	3.6%	3.3%
60%/40%	-2.5%	1.3%	4.0%	6.7%	11.0%	5.6%	3.1%
80%/20%	-3.6%	1.4%	4.8%	8.4%	13.9%	6.4%	2.8%

Notes: Forecast displays 5th/25th/75th/95th percentile ranges of 10,000 VCMM simulations for projected real returns for balanced portfolios in USD as of September 2014. Historical returns are computed using indexes defined in “Indexes used in our historical calculations,” on page 5. The equity portfolio is 70% U.S. equity and 30% global ex-U.S. equity. The bond portfolio is 80% U.S. bonds and 20% global ex-U.S. bonds.

Source: Vanguard.

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 U.S. 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 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 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 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 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.

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

Figure IV-1. Assessing drivers of global slowdown

	 United States	 Euro area	 Japan	 United Kingdom	 Canada	 Australia	 China
Secular stagnation							
<i>Demand-side factors restraining aggregate spending</i>							
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 aging of population	Yellow	Yellow	Red	Yellow	Yellow	Green	Red
Overall assessment	Green	Red	Yellow	Yellow	Green	Green	Green
Structural slowdown							
<i>Supply-side factors impairing potential GDP growth</i>							
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 labor 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 through 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 aging 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 through November 2014; “Additional demographic effects on labor force participation rate” determined by difference between 2000–2007 labor force participation rate and 2008 through November 2014 labor 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 difference between average fixed capital formation as percentage of GDP for 2000–2007 and 2008 through 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.

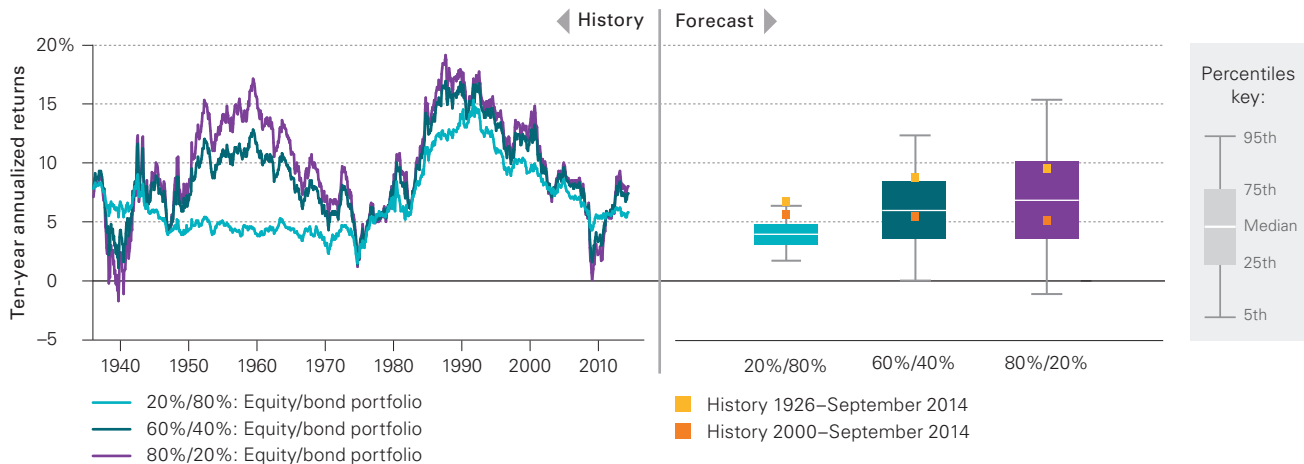
The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation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

The VCMM is a proprietary financial simulation tool developed and maintained by Vanguard’s Investment Strategy Group. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S.

money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

The primary value of the VCMM is in its application to analyzing potential client portfolios. VCMM asset-class forecasts—comprising distributions of expected returns, volatilities, and correlations—are key to the evaluation

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%	1.7%	3.0%	3.9%	4.9%	6.4%	6.7%	5.7%
60%/40%	0.1%	3.5%	6.0%	8.5%	12.3%	8.7%	5.4%
80%/20%	-1.1%	3.5%	6.9%	10.3%	15.3%	9.5%	5.1%

Notes: Forecast displays 5th/25th/75th/95th percentile ranges of 10,000 VCMM simulations for projected nominal returns for balanced portfolios in USD as of September 2014. Historical returns are computed using indexes defined in “Indexes used in our historical calculations” on page 5. The equity portfolio is 70% U.S. equity and 30% global ex-U.S. equity. The bond portfolio is 80% U.S. bonds and 20% global ex-U.S. bonds.

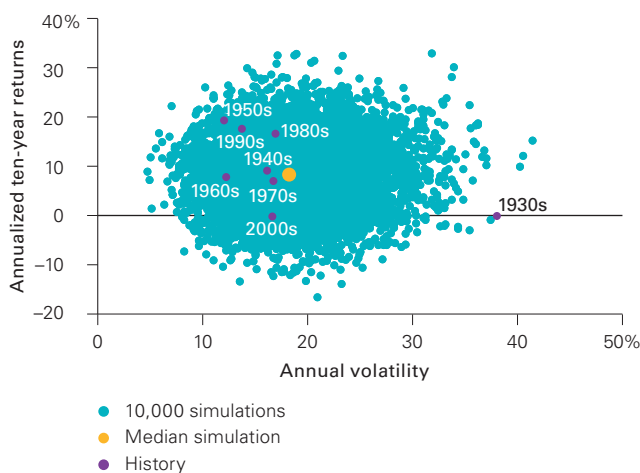
Source: Vanguard.

of potential downside risks, various risk–return trade-offs, and the diversification benefits of various asset classes. Although central tendencies are generated in any return distribution, Vanguard stresses that focusing on the full range of potential outcomes for the assets considered, such as the data presented in this paper, is the most effective way to use VCMM output.

The VCMM seeks to represent the uncertainty in the forecast by generating a wide range of potential outcomes. It is important to recognize that the VCMM does not impose “normality” on the return distributions, but rather is influenced by the so-called fat tails and skewness in the empirical distribution of modeled asset-class returns. Within the range of outcomes, individual experiences can be quite different, underscoring the varied nature of potential future paths. Indeed, this is a key reason why we approach asset-return outlooks in a distributional framework, as shown in **Figure IV-2**, on page 31, 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 U.S. 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 broad U.S. stock market (10,000 simulations)



Note: Historical returns are computed using indexes defined in “Indexes used in our historical calculations,” on page 5.

Source: Vanguard.

Index simulations

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

- **U.S. equities:** MSCI US Broad Market Index.
- **Global ex-U.S. equities:** MSCI All Country World ex USA Index.
- **U.S. REITs:** FTSE/NAREIT US Real Estate Index.
- **Commodity futures:** Bloomberg Commodity Index in USD.
- **U.S. cash:** U.S. 3-Month Treasury–constant maturity.
- **U.S. Treasury index:** Barclays U.S. Treasury Bond Index.
- **U.S. credit bonds:** Barclays U.S. Credit Bond Index.
- **U.S. high-yield corporates:** Barclays U.S. High Yield Corporate Bond Index.
- **U.S. bonds:** Barclays U.S. Aggregate Bond Index.
- **Global ex-U.S. bonds:** Barclays Global Aggregate ex-USD Index.
- **U.S. TIPS:** Barclays U.S. Treasury Inflation Protected Securities Index.
- **U.S. short-term Treasury index:** Barclays U.S. 1–5 Year Treasury Bond Index.
- **U.S. long-term Treasury index:** Barclays U.S. Long Treasury Bond Index.

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