This paper presents Vanguard’s global perspectives on the future of growth, inflation, interest rates, and stock and bond returns over the next ten years. As in past outlooks, we anticipate that the modest global recovery will likely endure at a below-average pace through a period of low interest rates, continuing high unemployment and debt levels, and elevated policy uncertainty.

We detail how, after years of slightly disappointing 2% real growth, the U.S. in 2014–2015 faces cyclical risks tilted toward better-than-trend growth for the first time since the onset of the global financial crisis. Our economic outlook, in short, is one of resiliency.

We also explain why last year’s unease about the “reach for yield” is now joined by concern about “froth” in certain equity markets. Market volatility is likely as the Federal Reserve undertakes the multistep, multiyear process of unwinding its extraordinarily easy monetary policy. Rather than frame this process as a negative, we view it as an indication of increasing economic strength.

Note: The authors would like to thank the members of Vanguard’s Investment Strategy Group for their valuable feedback and contributions, in particular Harshdeep Ahluwalia, Vytautas Maciulis, Christos Tasopoulos, and Ravi Tolani.
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. For the first time since the financial crisis, our leading indicators point to a slight pickup in near-term growth for the United States, parts of Europe, and other select developed markets. Continued progress in U.S. consumer deleveraging, strong corporate balance sheets, firmer global trade, and less fiscal drag indicate U.S. growth approaching 3%. That said, this cyclical assessment should be placed against a backdrop of high unemployment and government debt; ongoing structural reforms in Europe, China, and Japan; and extremely aggressive monetary policy with exit strategies that have yet to be tested.

Inflation. In the near term, reflational monetary policies will continue to counteract the deflationary bias of a high-debt world still recovering from a deep financial crisis. As was suggested in previous outlooks, consumer price inflation remains near generational lows and, in several major economies, below the targeted rate. Key U.S. drivers generally point to higher but modest core inflation trends in the 1%–3% range for the next several years. For now, the risk of returning to the high inflationary regime of the 1970s is low despite the size of central bank balance sheets; in parts of Europe and in Japan, the specter of deflation remains a greater risk.

Monetary policy. Tapering of the Federal Reserve’s quantitative easing (QE) program has begun, although an actual tightening is likely some time off. The Fed’s forward guidance implies that the federal funds rate will remain near 0% through mid-2015; the risk that this “lift-off” date will be further delayed is notably lower than it was in prior periods. However, real (inflation-adjusted) short-term interest rates will probably remain negative through perhaps 2017. Globally, the burdens on monetary policymakers are high as they contemplate exiting from QE policies to prevent asset bubbles on one hand and remain mindful of raising short-term rates too aggressively on the other. The exit may induce market volatility at times, but long-term investors should prefer that to no exit at all.

Interest rates. The bond market continues to expect Treasury yields to rise, with a bias toward a steeper yield curve until the Federal Reserve raises short-term rates. Compared with last year’s outlook, our estimates of the “fair value” range for the 10-year Treasury bond have risen; the macroeconomic environment justifies a ten-year yield in the range of 2.75%–3.75% at present. However, we continue to hold the view that a more normalized environment in which rates move toward 5% based on stronger growth, inflation, and monetary tightening may be several years away. We maintain that the odds of a U.S. fiscal crisis and a sharp spike in yields are less than 10% at the moment, although they rise later in the decade based on the expected trajectory of U.S. federal debt.

Global bond market. As in past editions, the return outlook for fixed income is muted, although it has improved somewhat with the recent rise in real rates. The expected ten-year median nominal return of a broad, globally diversified fixed income investment is centered in the 1.5%–3.0% range, versus last year’s expected range of 0.5%–2.0%. It is important to note that we expect the diversification benefits of fixed income in a balanced portfolio to persist under most scenarios. We believe that the prospects of losses in bond portfolios should be weighed against the magnitude of potential losses in equity portfolios, because the latter have tended to exhibit much larger swings in returns.
Global equity market. After several years of suggesting that strong equity returns were possible despite a prolonged period of subpar economic growth, our outlook for global equities has become more guarded. The expected ten-year median nominal return is below historical averages and has shifted toward the bottom of the 6%–9% range compared with this time last year, a reflection of less constructive market valuations (i.e., price/earnings ratios) in the United States and some other developed markets. A notably wide range of outcomes is possible, even over long horizons, making us hard-pressed to identify market “bubbles.” However, we are uneasy about signs of froth in certain segments of the global equity market. Because the premium compensating increased equity risk appears to have come down recently, we would encourage investors to exercise caution in making strategic or tactical portfolio changes that increase this risk.

Asset allocation strategies. Broadly speaking, the outlook for risk premiums is lower across a range of investments than was the case just two or three years ago. Our simulations indicate that balanced portfolio returns over the next decade are likely to be below long-run historical averages, with those for a 60% stock/40% bond portfolio tending to center in the 3%–5% range, adjusted for inflation. Even so, Vanguard still firmly believes that the expected risk-return trade-off among stocks and bonds leaves the principles of portfolio construction unchanged. Specifically, our simulated mean-variance frontier of expected returns is upward sloping—it anticipates higher strategic returns for more aggressive portfolios, accompanied by greater downside risk. We believe that a long-term, strategic approach with a balanced, diversified, low-cost portfolio can remain a high-value proposition in the decade ahead.

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 VCMM, derived from 10,000 simulations for U.S. equity returns and fixed income returns. Simulations as of November 30, 2013. Results from the model may vary with each use and over time. For more information, please see the appendix on page 30.

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.
Global growth outlook

Similar to our stance last year, we view the global recovery as likely to proceed at a modest pace (Figure 1a). Over the next decade, expansion should occur at varying speeds, with trend growth likely lower than during the past 20 years based on economic, demographic, and other factors that we will discuss later. Figure 1b presents estimates of potential growth rates for the major world economies.

Nevertheless, for the first time since the financial crisis, our leading indicators point to the possibility of a slight cyclical pickup in near-term growth for the United States and other selected economies. Positive factors contributing to this outlook include:

- Continued progress in U.S. consumer deleveraging.
- Rising consumer wealth levels in many markets.
- Firming global trade and manufacturing.
- An aging capital stock and pent-up investment demand.
- Less fiscal drag in 2014–2015 (see Figure 2b on page 6).

This cyclical growth assessment should, however, be placed within the context of a stubbornly lower-growth world marked by high levels of both government and private-sector debt (see Figure 2a on page 6), less favorable demographic trends, and extremely aggressive monetary policy with untested exit strategies.

Downside economic tail risks appear somewhat lower than they were two years ago, although lingering doubts remain regarding the prospects for a hard landing in China and for euro stability. Various other geopolitical risks are inherently difficult to forecast.

Indexes used in our calculations

The long-term returns for our hypothetical portfolios are based on data for the appropriate market indexes through November 2013. We chose these benchmarks to provide the best history possible and 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.


Global bonds: Prior to 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 3, 1957; S&P 500 Index from March 4, 1957, through 1974; Dow Jones Wilshire 5000 Index from 1975 through April 22, 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 Index ex USA thereafter.


1 Fiscal drag occurs when government spending cuts, tax increases, or both reduce the pace of overall spending and GDP growth.
Europe

In Europe, the broad economy is likely to grow at a positive albeit anemic pace after several years of deep, deleveraging-related recession (see Figure 3a on page 7). We believe that the euro is likely to survive intact, although a more vibrant and balanced European economy seems several years away.

Structurally, labor costs within Europe are continuing their painful internal adjustment as the peripheral economies aim to become more competitive relative to the core nations (see Figure 3b on page 7). We believe it is unlikely that the European economy as a whole will grow sustainably above 1% in the near future because significant deflationary competitive adjustment is still occurring on the periphery. Growth is likely to be held back by fiscal restructuring and banking-sector deleveraging, although this should ease in the next few years. Unemployment rates in some peripheral economies of more than 20%, particularly for younger workers, present a moderate risk of social unrest leading to political instability. Although we expect Europe to continue meandering through its quandaries with a modest acceleration in growth over the next few years, investors should still prepare for periodic market volatility driven by flare-ups in political risk, concerns regarding the capitalization of the European banking system, and the potential for further debt write-downs, particularly in Greece.

Notes: World GDP is shown at market exchange rates, in constant U.S. dollars. Data are from World Bank for 1960 through 1969 and International Monetary Fund’s World Economic Outlook (WEO), October 2013, for subsequent years. Projected growth is from the IMF.
Sources: Vanguard calculations, based on IMF and World Bank data.
Debt and fiscal drag are significant factors affecting global growth

a. Debt levels remain high but vary by country and type

Debt dashboard for selected economies as a percentage of GDP

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<tr>
<th>Country</th>
<th>Central government</th>
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<th>Nonfinancial corporations</th>
<th>Financial institutions</th>
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Notes: We caution readers against making concrete assessments based on this general analysis, as the level of debt that a given country or sector may be able to sustain involves many factors. China’s government debt is shown on a gross basis; all others are net. Data show the latest available quarterly value in 2013 as a percentage of the trailing four-quarter average nominal GDP.


b. Fiscal drag is expected to ease over the next two years


Notes: Figure displays the change in the pace of government deficit adjustment, measured as the difference in the change in the primary (excluding interest) structural government balance over the two years through 2013 relative to the expected change in the two years through 2015. Estimates for the next two years are from the IMF’s October 2013 WEO.

Sources: Vanguard calculations, based on IMF data.
Asia

China is likely to grow at a 7% pace over the next two to three years, in line with market expectations but notably slower than its previous trend. Policymakers are attempting through structural supply-side reforms to strategically alter the country’s growth model, which heretofore has relied on investment and exports as its sole drivers. As illustrated in Figure 4a on page 8, investment currently represents a notably high share of Chinese GDP. However, capital-to-labor ratios are fairly low, meaning that although investment is running at a high rate, the country is starting from a low base in its capital stock. With capital per person at less than one-fifth that of the United States, much more investment is still needed.

The challenge for China is to ensure that such fast-paced investment spending flows toward the most productive uses of capital, avoiding misallocation and overinvestment in certain sectors. Some of the recently announced pro-market reforms are promising, because 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 spending in GDP growth could easily cause a sharp economic slowdown. Gradual and flexible implementation of the reforms will be critical. Under a multiyear schedule, a growth guideline of about 7% to 7.5% for 2014 should be within reach.
a. China’s investment spending: An unsustainable rate, but unlikely to soon collapse

Investment as percentage of GDP and capital-to-labor ratios for selected countries and time periods

Notes: Investment as a percentage of GDP is from the IMF’s October 2013 WEO and April 2002 WEO for the stated time periods. “Today” is defined as the average for 2013. Asia Tigers comprise South Korea, Hong Kong, Taiwan, and Singapore when each was at China’s 2013 real per capita GDP level ($6,500 in 2013 U.S. dollars). The 15 largest economies are defined using 2013 GDP. Capital-to-labor ratio is from the Penn World Tables, in 2005 U.S. dollars, with “today” defined as the average for 2011.

Sources: Vanguard calculations, using data from the IMF and Penn World Tables.

b. “Abenomics” in Japan: More reflation than real growth

Japan’s historical and Abenomics real GDP growth and inflation

Notes: Figure assumes that Abenomics achieves its goals of 2% inflation and 3% nominal GDP per capita growth by 2015. Transition assumes IMF’s WEO October 2013 baseline is realized in 2013–2014.

Sources: Vanguard calculations, based on data from Thomson Reuters Datastream and IMF.
Japan’s aggressive Abenomics initiative aimed at jump-starting its economy is promising, although real growth will be challenged to exceed 1% for some time. The main goal of Abenomics seems to be reflation of prices rather than real economic growth. Even assuming full success of its policies, by 2015 Japan would be growing at a pace not much higher than its average for the last 20 years. However, if successful, Abenomics would bring inflation to a significantly higher level than it has been in the recent past (see Figure 4b). This would be an encouraging development, although as displayed in Figure 4b, it will be a difficult task after two decades of deflation.

**United States**

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% to 3.5% since 1947. This projection is based on several structural headwinds, including slower labor force and population growth, the potential for continued consumer deleveraging, and higher levels of structural unemployment and debt than was the case over the past three decades.\(^2\) Indeed, actual real GDP growth has averaged 2.3% since the recovery began in 2009, well below the experience in previous recoveries (see Figure 5a on page 10). Nevertheless, we believe that our U.S. economic outlook can best be described as one of *resiliency* rather than of *secular stagnation*, for the reasons outlined below.\(^4\)

Significant progress has been made to date in reducing consumer debt (see Figure 5b on page 10). Although this debt may not reach more sustainable levels of 60%–70% of GDP until 2016 or so, lower interest rates to service it combined with rising stock and home values have substantially aided the transition to a “passive deleveraging” phase of the cycle (see Figure 5b).

For growth, it is the pace of consumer deleveraging that matters most, not the absolute level of debt outstanding, and that pace is slowing. As a result, the consumer need not “lever up” and save less in order for the country to achieve stronger growth in 2014–2015. Rather, this can emerge from fewer drags and shocks hitting the economy. In fact, the U.S. private sector (real GDP excluding the government sector) grew at a 2.9% pace in the four quarters through September 2013.

Over the next two to three years, further acceleration of business investment (potentially driven by an unleashing of so-called animal spirits) is critical if U.S. economic growth is to exceed its recent threshold. The health of corporate balance sheets and profit margins (see Figure 5c on page 11) indicate that this is feasible, albeit not assured. The biggest risk is that policy uncertainty spikes and again exerts an “uncertainty tax” on the economy (similar to that surrounding, say, the debt-ceiling debate in mid-2011). Figure 5d, on page 11, shows that lower levels of uncertainty may be associated with a further pickup in capital spending over the next 12 to 18 months.

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2 Japanese Prime Minister Shinzo Abe has announced targets of 3% growth of nominal income per capita and 2% inflation by 2015.

3 For more on the prospects for U.S. growth over the next decade, see Davis (2012) on a potential “third industrial revolution.” In that presentation, we discuss how the factors that could contribute to better-than-expected growth may be driven by marked increases in capital investment. This could be sparked by the widespread adoption of cost-saving technologies, increased housing and infrastructure spending after a prolonged period of depressed activity, substantial U.S. energy independence from rising domestic production, and a lower trade deficit.

4 See Summers (2013) and Gordon (2012) for in-depth discussions supporting the view of secular stagnation.
Figure 5. In the United States, a modest recovery may be set to accelerate

a. Deleveraging and fiscal belt-tightening have led to a modest recovery

Contribution to growth in real U.S. GDP

![Graph showing contribution to annualized real GDP growth](image)

Sources: Vanguard calculations, based on data from U.S. Bureau of Economic Analysis.

b. Consumer deleveraging is past the worst, but not over

Household debt as a percentage of GDP and of assets

![Graph showing household debt as percentage of GDP and of assets](image)

Sources: Vanguard calculations, based on data from Moody’s DataBuffet.com, Federal Reserve, and U.S. Bureau of Economic Analysis.
Figure 5. In the United States, a modest recovery may be set to accelerate continued

c. Businesses are positioned to expand and hire . . .

Corporate profits and cash balances

![Chart showing corporate profits and cash balances as percentage of GDP from 1970 to 2012.]


d. . . as long as uncertainty doesn’t crimp confidence

Policy Uncertainty Index and business investment as a percentage of GDP

![Chart showing the Policy Uncertainty Index and fixed business investment as a percentage of GDP from 1985 to 2012.]

Note: For additional information on the Policy Uncertainty Index, including the methodology behind its construction, see Baker, Bloom, and Davis (2012).

2014 U.S. economic outlook: improving odds of above 2% growth

After years of disappointing 2% real growth, the U.S. in 2014–2015 faces cyclical risks tilted toward better-than-trend growth for the first time since the onset of the global financial crisis. As evident in Figure 6a, our proprietary U.S. leading indicators dashboard points toward a slight acceleration. The most positive leading indicators are those associated with the housing market, manufacturing activity, and financial conditions (especially those tied to the stock market). The “red signals,” associated with credit growth, confidence, and excess capacity, exemplify the lingering effects of the global financial crisis.

Using simple regression analysis, we can map our proprietary set of indicators to a distribution of potential scenarios for U.S. economic growth as shown in Figure 6b. We estimate a 25% probability that U.S. real GDP growth preserves the status quo and averages 1.5%–2.5% in 2014. The odds of growth exceeding 2.5% in 2014 (48%) are roughly double that of the potential for it to stagnate and fall below 1.5% (27%). Our base case is a cyclical rebound in 2014, with growth in real GDP of close to 3% on average over the course of the year.
Outlook for inflation

In the near term, reflationary monetary policies will continue to counteract the deflationary bias of a high-debt world still recovering from a deep recession. Although central bank balance sheets have risen to a combined total of more than $8 trillion since the onset of the financial crisis (see Figure 7a), core inflation trends are low (see Figure 7b). Indeed, recent consumer price inflation remains near generational lows and, in several major economies, below the targeted rate. In the United States, the year-over-year CPI inflation rate lingered at about 1% as of late 2013.

As stated in previous Vanguard outlooks, trend inflationary pressures in the United States and most other developed markets are modest. The recent patterns in key drivers such as labor costs, economic slack, commodity and import prices, and the velocity of money suggest that core U.S. inflation is likely to stay within its recent range of 1%–3% for the next one to two years (see Figure 8 on page 14). For now, the risk of returning to a high inflationary regime is low, despite the size of central bank balance sheets; in parts of Europe and in Japan, the specter of deflation remains a greater risk.

For the next ten years, our VCMM simulations project a median inflation rate averaging close to 2.0%–2.5% per year for the U.S. Consumer Price Index (see Figure 9 on page 15). This is roughly consistent with the Federal Reserve’s long-term goal of inflation stability and is also near longer-term break-even rates in the Treasury Inflation-Protected Securities (TIPS) market.

Of note, Vanguard’s median secular inflation expectation is approximately 1% lower than the average U.S. CPI inflation rate observed since 1950. 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 section on stocks, bonds, and asset allocation strategies.
Looking ahead, we continue to believe that the countervailing forces of fiscal deleveraging and monetary-policy reflations in the United States and Europe will reinforce an “inflation paradox.” On the one hand, we expect that some investors will continue to have significant concerns about future inflation. We estimate a nearly one-third probability that the trend inflation rate runs above 3% over the next ten years. 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, Aliaga-Díaz, Thomas, and Zahm, 2012).

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. Indeed, our VCMM simulations reveal that the prospects of secular Japan-style deflation (in which the average CPI inflation rate over the next decade is −1% or less) are approximately 10%. It is worth emphasizing that despite aggressive monetary policy, some developed markets would be a recession away from realizing deflation.
Outlook for U.S. monetary policy and interest rates

Global monetary policy has been extremely aggressive over the past several years. Central banks have lowered short-term interest rates close to zero and, with their traditional policy tool thus constrained, expanded the size and composition of their balance sheets. At the same time, they have provided a new level of communication about the length of time markets can expect short-term rates to remain unchanged. The Bank of Japan, the Bank of England, and the European Central Bank have all, to some extent and in various forms, adopted policies similar to those pursued by the U.S. Federal Reserve. Based on our economic outlook, it seems reasonable that the Fed was the first of those four banks to begin to exit these very accommodative policies.

Tapering of the QE program has begun, although actual monetary tightening is likely some time off. The unwinding of the Fed’s extraordinarily easy monetary policy will be a multistep, multiyear process, with the initial taper only the first in a series of actions on the road to normalization.

Stronger forward guidance will likely be used, for example by pairing the 6.5% unemployment threshold with, perhaps, a “floor rate” for core inflation or by lowering the unemployment threshold itself. New policy tools such as the interest paid on excess reserves and reverse repo operations are also likely to make an appearance. We believe such actions may be effective at the margin in anchoring long-term interest rates, but ultimately the future pattern of job growth and the unemployment rate will dictate when the Fed raises short-term rates, probably sometime in 2015.

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5 Balance sheet expansion in most large central banks has occurred through quantitative easing—the purchase of longer-term securities, typically government bonds, financed by creating bank reserves. This policy is intended to influence longer-term interest rates when the traditional short-term policy rate is near 0%. The European Central Bank is an exception—its balance sheet expansion occurred through policies designed to promote liquidity in the banking system, referred to as long-term refinancing operations, or LTROs.
When will the Fed raise rates?
The timing depends on two critical labor-market issues: (1) how quickly the actual unemployment rate falls, and (2) why it falls.

As illustrated in Figure 10a, the unemployment rate may be understated because of the severe drop in the labor force participation rate, as illustrated in Figure 10b. We find it unlikely that this figure is driven solely by an aging population (i.e., the aging and retirement of the baby boomers). In our estimates, approximately one-half of the reduction in the working-age-adjusted labor force is due to cyclical factors (e.g., weak demand, return to schooling) rather than more permanent, structural changes (e.g., skill mismatches, demographics).

Put another way, the “real” unemployment rate, corrected for the cyclical drop in participation, is likely somewhere between the blue and purple lines in Figure 10a, closer to 8.0%–8.5% than to the official 7.0% rate (as of November 2013).

By extension, this implies that the federal funds rate will remain near 0% through mid-2015. However, as noted in Figure 11, the risk that this lift-off date is further delayed to, say, 2016 is lower than it has been in previous years. Correct calibration of monetary policy based on current labor market...
conditions hinges on an accurate portrayal of labor market slack. Wage growth and inflation expectations are critical indicators in light of the marked (and partly cyclical) drop in labor force participation.\(^6\)

Whether or not the Fed raises short-term rates in 2015, real (inflation-adjusted) short-term interest rates are likely to remain negative through perhaps 2017. Globally, the burdens on monetary policymakers are high as they contemplate moving away from QE policies to prevent asset bubbles on one hand and remain mindful of raising short-term rates too aggressively on the other. The unwinding process may induce market volatility at times, but long-term investors should prefer that to no exit at all.

**U.S. Treasury yield curve**

The bond market continues to expect Treasury yields to rise, with a bias toward a steeper curve until the Federal Reserve raises short-term rates. Compared with last year’s outlook, our estimates of the fair value range for the 10-year Treasury bond have risen, with the current macroeconomic environment justifying a 10-year yield in the range of 2.75% to 3.75% (see Figure 12a on page 18). Based on our estimates of the fundamental drivers of Treasury bond yields, we are hard pressed to find a bubble in Treasury securities. With the recent rise in long-term interest rates since summer 2013, we find that bond yields are toward the middle of the range of our fair-value estimates.

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\(^6\) Broad measures of wage growth currently are near 2%; growth above 3% would imply that the amount of slack in the economy is overestimated (i.e., the nonaccelerating inflation rate of unemployment [NAIRU] is higher).
For further detail on the forward curve and the implications of the bond market pricing forward interest rate expectations, see Davis et al. (2010).

The future path for interest rates, including our fair value estimates, will likely change over time in response to growth, inflation, and monetary conditions. In our simulations, the bias is toward a rise over the next several years, a view that is consistent with the forward market and therefore reflected in today’s bond prices.\(^7\) We continue to believe that a bond bear market in which rates move toward 5% based on stronger growth, inflation, and monetary tightening may be several years away. We estimate the odds of a U.S. fiscal crisis and sharp spike in yields at less than 10% at the moment; these odds rise later in the decade based on the expected trajectory of federal debt.

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. This so-called “bear flattening” of the yield curve is typical in a Fed tightening cycle with stable inflation expectations. This has important implications for those inclined to strategically tilt the duration exposure of their bond portfolios away from that of the broad fixed income market. 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 forgone income (see Figure 12b). Focusing solely on avoiding capital losses ignores the fact that a steep yield curve produces significant income differences.

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Figure 12. Think twice before adjusting duration to avoid a bubble in Treasuries

a. Fair value factors suggest that long-term Treasury yields are reasonable, with the market already pricing an increase

Vanguard’s fair value model of the 10-year Treasury yield, with forward-inferred and VCMM-simulated projections

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Notes: Historical fair value is based on a model derived from Warnock and Warnock (2009) and includes expected inflation, expected real GDP growth, expectations regarding monetary and fiscal policy, and domestic and foreign capital flows. Range reflects standard error margin of plus or minus 0.5 percentage points. Forward curve is derived from the Federal Reserve data set provided by Gürkaynak, Sack, and Wright (2006). VCMM projections reflect data through November 2013.

Sources: Vanguard calculations, based on data from the Federal Reserve.

b. Short-duration tilts involve giving up significant income

Difference in yield between a broad-market and a short-duration U.S. bond investment

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Note: Figure displays the difference in yield to worst between the Barclays U.S. Aggregate Bond Index and the Barclays U.S. Aggregate 1–3 Year Index.

Sources: Vanguard calculations, based on data from Barclays.

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\(^7\) For further detail on the forward curve and the implications of the bond market pricing forward interest rate expectations, see Davis et al. (2010).
among duration strategies. In other words, “going short duration” may not necessarily outperform a broadly diversified fixed income portfolio in the years ahead.

**Asset-class outlook: Bonds**

**Expected range of returns for the broad taxable bond market**

As in past editions, the return outlook for fixed income is muted, although it has improved somewhat with the recent rise in real rates. As displayed in Figure 13, the expected ten-year median return of the broad taxable U.S. fixed income market is centered in the 1.5%–3.0% range, as opposed to last year’s expected 0.5%–2.0% range. This return is near current benchmark yields and thus most closely resembles the historical bond returns of the 1950s and 1960s.

**Expected diversification effects**

We expect the diversification benefits of fixed income in a balanced portfolio to persist under most scenarios. Although yields in most developed markets are at historically low levels, diversification through exposure to hedged non-U.S. dollar-denominated bonds should help offset some of the risks 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 one potential benefit.8

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8 For additional details, see Philips et al. (2012) and Philips and Thomas (2013).
We define high-grade or investment-grade bonds as those fixed income securities rated Baa3 and above by Moody’s. For additional details, see Kinniry and Scott (2013). For additional details, see Davis (2013b).

We encourage investors to evaluate the role of fixed income from a perspective of balance and diversification rather than outright return. High-grade or investment-grade bonds act as ballast in a portfolio, buffering losses in riskier assets. We define high-grade or investment-grade bonds as those fixed income securities rated Baa3 and above by Moody’s. Figure 14 shows how these bonds have performed during the most significant equity downturns of the past 25 years. They may very well not provide the same magnitude of benefit during periods of flight-to-quality when interest rates are low. However, as shown in Figure 15, the prospects of significant near-term annual losses of −5% or more are higher for equities than they are for investment-grade bonds. Therefore, investors should approach with caution any decision to replace bonds with riskier assets. Although history is not necessarily indicative of future results, 200 instances of rolling 12-month losses of 5% or more occurred in a portfolio of global equities since 1926, compared with 38 in bonds (see Figure 15).

Figure 14. Bonds can provide ballast in an equity bear market
Median return of various asset classes during the worst decile of monthly equity returns, 1988–2012

Notes: U.S. stocks, U.S. bonds, and international bonds represented by indexes listed on page 4. Emerging-market stocks represented by FTSE Emerging Index and emerging-market bonds by Barclays Emerging Markets Tradable USD Sovereign Bond Index. REITs represented by FTSE NAREIT Equity REIT Index, dividend stocks by Dow Jones U.S. Select Dividend Total Return Index, commodities by S&P GSCI Commodity Index, high-yield bonds by Barclays U.S. Corporate High Yield Index, hedge funds by median hedge fund-of-funds return as identified by Morningstar, Inc., corporate bonds by Barclays U.S. Corporate Investment Grade Index, and Treasury bonds by Barclays U.S. Treasury Index.

Sources: Vanguard calculations, based on data from S&P, Citigroup, Barclays, Dow Jones, MSCI, CRSP, and FTSE.

We define high-grade or investment-grade bonds as those fixed income securities rated Baa3 and above by Moody’s.

10 For additional details, see Davis (2013b).

9 We define high-grade or investment-grade bonds as those fixed income securities rated Baa3 and above by Moody’s.

Corporate bonds and TIPS
The median expected total return of an investment-grade corporate bond index in our VCMM scenarios modestly exceeds that of a similar-duration U.S. government bond portfolio. This expected positive risk premium, a function of the current level of corporate bond spreads, is not realized in all scenarios because of corporate bonds’ sensitivity to credit risk.

The probability of realizing a positive “spread return” in investment-grade or high-yield corporate bonds has decreased in the past few years as yield spreads over less risky U.S. Treasury bonds have narrowed (see Figure 16 on page 22). At the same time, real Treasury yields have increased, particularly during the past summer. This indicates that the payoff for tilting bond portfolios to riskier segments of the market is lower than was the case, say, two or three years ago.
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 would be 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 providing protection against inflation risk—that is, the possibility of higher-than-expected inflation.
Asset class outlook: Global equities

Centered in the 6%-9% range, the long-term median expected return for global equity markets is moderately below the historical average and revised downward from this time last year, mainly because of current market valuations and their implications for the equity risk premium (see Figure 18 on page 24). Similar to the situation in riskier segments of the bond market, the premium compensating risk in the equity market appears to have fallen recently. When returns are adjusted for future inflation, we estimate a roughly 40% likelihood that a global equity portfolio will fail to produce a 5% average real return over the decade 2013–2023.

Our return outlook is informed by valuation metrics (such as price/earnings ratios) that relate accounting measures of value to the market’s aggregate price. Valuations today are elevated in relation to both their lows in 2009 and their historical averages (see Figure 18a on page 24). Although Figure 18b (on page 24) shows some divergence across regions, we caution investors against implementing tactical tilts based on this. Historically, emerging-market stocks have tended to possess lower relative market valuations in recognition of their higher perceived investment risk, and divergences today are less pronounced than those in the mid-2000s that led to large return differentials. To account for this, we aggregate our global return outlook in Figure 17. The expected central ranges of long-run returns on various regional equity investments are statistically similar to one another, especially after accounting for differences in expected volatility.

Figure 17. Projected global equity ten-year return outlook

VCMM-simulated distribution of expected average annualized return of the global equity market, estimated as of year-end 2013 and 2012

Notes: Figure displays the projected range of returns for a 70% U.S., 30% ex-U.S. equity portfolio, rebalanced monthly. Benchmarks used for historical returns are defined on page 4.
Source: Vanguard.

<table>
<thead>
<tr>
<th>Historical global equity returns</th>
<th>1926–2013</th>
<th>10.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926–1969</td>
<td>9.7%</td>
<td></td>
</tr>
<tr>
<td>1970–2013</td>
<td>10.6%</td>
<td></td>
</tr>
<tr>
<td>2001–2013</td>
<td>5.6%</td>
<td></td>
</tr>
</tbody>
</table>

Probability

<table>
<thead>
<tr>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0%</td>
</tr>
<tr>
<td>0% to 3%</td>
</tr>
<tr>
<td>3% to 6%</td>
</tr>
<tr>
<td>6% to 9%</td>
</tr>
<tr>
<td>9% to 12%</td>
</tr>
<tr>
<td>12% to 15%</td>
</tr>
<tr>
<td>15% to 18%</td>
</tr>
<tr>
<td>More than 18%</td>
</tr>
</tbody>
</table>

Figure 18. VCMM-simulated distribution of expected average annualized return of the global equity market, estimated as of year-end 2013 and 2012

Notes: Figure displays the projected range of returns for a 70% U.S., 30% ex-U.S. equity portfolio, rebalanced monthly. Benchmarks used for historical returns are defined on page 4.
Source: Vanguard.
Of note, the projected distribution of annualized ten-year global equity returns shown in Figure 17 on page 23 displays wide and fat tails. As discussed in Davis, Aliaga-Díaz, and Thomas (2012), valuations are the most useful metric in estimating forward-looking expected returns of equity markets. However, they still leave more than half the volatility of long-run returns unexplained. Although we emphasize a focus on the wide distribution, we note that the central tendency of our projected returns has come down since last year, reflecting the valuation levels shown in Figures 18a and 18b. Figure 19 displays the historical relationship between U.S. valuations and subsequent real ten-year returns. The results underscore the fact that today’s valuation levels have been associated with lower average returns but with a significant range around this average. Indeed, every valuation bucket has been associated with subsequent real returns near the historical average in at least some time periods.
Initial cyclically adjusted price/earnings ratio and subsequent range of ten-year real U.S. equity returns, 1926–2013

The results in Figure 19 are driven by the tendency of valuations to revert to a long-term average level, at least over this sample. In a simple return decomposition, this reversion has been the largest driver of the movement of long-term equity returns over time (see Figure 20 on page 26). This supports our long-held view that valuations, not growth, are the most significant drivers of returns (Davis et al., 2013). But to what level will valuations revert? As shown in Figure 18a, most valuation metrics have been above their long-term averages for more than two decades, raising questions about the potential for structural shifts. Without certainty as to where exactly valuations will move in the future, it is very difficult to pin down a precise estimate of the equity risk premium. This is a key reason for our distributional approach to forecasting.

In short, although we are hard-pressed to identify market bubbles, there is some evidence of froth in global equity markets. The uncertainty associated with forward-looking return estimates underscores the fact that today’s valuation levels present a range of potential outcomes. However, because the premium compensating increased equity risk appears to have fallen recently, we would encourage investors to exercise caution in making strategic or tactical portfolio changes that increase this risk.
Implications for asset allocation strategies

To examine the potential portfolio construction implications of Vanguard’s range of expected long-run returns, Figure 21 presents simulated real (inflation-adjusted) return distributions for 2013–2023 for three hypothetical portfolios ranging from more conservative to more aggressive:

- 20% equities/80% bonds.
- 60% equities/40% bonds.
- 80% equities/20% bonds.

For reference, the figure also shows how the hypothetical portfolios would have performed over two past periods: 1926–2013 and 2000–2013. The results have several important implications for strategic asset allocation, as discussed next.  

Modest outlook for long-run real returns

Amid widespread concern over the current low level of dividend and long-term U.S. Treasury yields, Figure 21’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 those of 20 or 30 years ago.

The figure does show that the inflation-adjusted returns of a balanced portfolio for the decade ending 2023 are likely to be moderately below long-run historical averages (indicated by the small boxes for 1926–November 2013 and 2000–November 2013). But the likelihood of achieving real returns in excess of those since 2000 for all but the most conservative portfolios is considerably higher.

Specifically, our VCMM simulations indicate that the average annualized returns of a 60% equity/40% bond portfolio for the decade ending 2023 are expected to center in the 3.1%–5.2% real-return range, below the actual average real return of 5.5% for the same portfolio since 1926. Viewed from another angle, the likelihood that our portfolio would achieve the 1926–2013 average real return is estimated at approximately 40%, and the odds of attaining a higher real return than that achieved since 2000 (2.1%) are near 70%.

Notes: Figure displays the backward-looking return components of the S&P 500 Index. Dividend yield is the average trailing dividend yield of the S&P 500 Index, taking an average of each monthly observation of 12-month trailing yield in each ten-year time period. Earnings growth is the average annualized growth of the ten-year smoothed real earnings for the S&P 500 Index constituents. Valuation adjustment return is the annualized percentage change of the cyclically adjusted price/earnings ratio, as defined in Shiller (2000).

Sources: Vanguard calculations, based on data from Robert Shiller’s website, aida.wss.yale.edu/~shiller/data.htm.

For reference, see the Appendix for the range of returns in nominal terms before adjusting for inflation.
Principles of portfolio construction are intact
Contrary to suggestions that this decade warrants some radically new investment strategy, Figure 21 reveals that the simulated ranges of expected returns are upward sloping. Simply put, higher risk accompanies higher (expected) return. More aggressive allocations have a higher—and wider—range of expected returns, with greater downside risk if the equity risk premium is not realized over the next decade. To put this in context, the risk premium over bonds may be lower than it has been in the past few years, but it is still positive. Indeed, the expected risk-return trade-offs among stocks and bonds show why the principles of portfolio construction remain unchanged, in our view, even if expected returns are lower.

The upward-sloping and wider-tailed pattern in Figure 21 reaffirms the beneficial role that bonds should be expected to play in a broadly diversified portfolio, despite their currently low yields and regardless of the future direction of interest rates. Although our scenarios generate slim, below-average nominal returns for a broad taxable bond index for the next ten years—a central tendency of 1.5%–3.0% annually, on average—bonds should be expected to moderate the volatility in equity portfolios in the years ahead.

Still, we are concerned that the low nominal rate environment may encourage savers and bond investors to very aggressively pursue higher nominal total returns by making investment decisions that

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13 Although the downside tails may appear somewhat similar across the portfolios, we note that these are ten-year distributions. The downside risk for a more equity-oriented portfolio increases substantially over a shorter horizon, as demonstrated in Figure 15 on page 21.
increase risk, often based solely on asset-class yields rather than on a more holistic total return approach. Popular considerations at the moment include moving away from conservative bond portfolios and into either higher-yielding junk bonds or income-oriented equity funds such as dividend-focused equity funds or REIT funds. Recent cash flows suggest that, in addition to focusing on income, investors have begun to move strongly into equities, indicating that risk-taking behavior is increasing.

As discussed throughout, investors reaching for yield and moving out of bonds into equities should realize that risk premia—the compensation for taking on this extra risk—are likely lower now than at any point in the past five years. As the recent performance of stocks and bonds over the 14 years through 2013 reminds us (see Figure 21 on page 27), investors who increase their allocation to riskier segments of the capital markets should realize that portfolio volatility will likely increase as a result.

We encourage investors to evaluate the trade-offs involved in a move toward risky asset classes, whether that means tilting a bond portfolio toward corporate and high-yield investments or a wholesale move from bonds into equities. Having a realistic expectation of the extra return to be gained from such a strategy and an understanding of the implications for holistic portfolio risk is crucial to maintaining the discipline needed for long-term success.

Key terms

**Beta.** A measure of the volatility of a security or portfolio relative to a benchmark.

**Price/earnings ratio.** The ratio of a stock’s current price to its per-share earnings over a designated period.

**Risk premium.** The amount by which an asset’s expected return exceeds the risk-free interest rate.

References


Appendix: 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.

Figure A-1. Projected ten-year nominal return outlook for balanced portfolios

VCMM-simulated distribution of expected average annualized return on balanced global equity and global fixed income portfolios, estimated as of year-end 2013

<table>
<thead>
<tr>
<th>Portfolio stock/bond allocation</th>
<th>20%/80%</th>
<th>60%/40%</th>
<th>80%/20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom 5th percentile</td>
<td>1.5%</td>
<td>0.4%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>25th percentile</td>
<td>2.8%</td>
<td>3.9%</td>
<td>4.2%</td>
</tr>
<tr>
<td>75th percentile</td>
<td>4.6%</td>
<td>8.6%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Top 95th percentile</td>
<td>6.0%</td>
<td>12.2%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Annualized portfolio volatility</td>
<td>6.2%</td>
<td>11.2%</td>
<td>14.4%</td>
</tr>
</tbody>
</table>

Notes: Figure displays the 5th/25th/75th/95th percentile range of VCMM-projected returns for balanced portfolios. Historical returns are computed using the indexes defined on page 4.
Source: Vanguard.
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 of potential downside risks, various risk-return trade-offs, and diversification benefits of various asset classes. Although central tendencies are generated in any return distribution, Vanguard stresses that focusing on the full range of potential outcomes for the assets considered, such as the data presented in this paper, is the most effective way to use VCMM output.

The VCMM seeks to represent the uncertainty in the forecast by generating a wide range of potential outcomes. It is important to 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 A-1, which highlights balanced portfolio returns before adjusting for inflation.

Figure A-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 U.S. equities. The dispersion in returns and volatilities is wide enough to encompass historical market performance for various decades.