Vanguard’s economic and market outlook

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Vanguard’s distinct approach to the economic and investment outlook

- In this presentation, Vanguard presents our perspectives on the future of growth, inflation, interest rates, and the returns on stocks, bonds, and other asset classes.

- 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 of the next year.

- Vanguard firmly believes that the principles of portfolio construction remain unchanged given our expected outlook for stocks and bonds.

- For further details not addressed in this presentation, please refer to the full Vanguard research paper (cover shown here).
### Themes and outlook

#### Growth:

- **World:** Frustratingly fragile
- **U.S.:** Remains resilient with slightly above 2%-trend growth, but not immune to poor outlook overseas
- **Europe:** Still very weak, but improving outlook fueled by QE, Euro weakness and oil prices
- **China:** Permanently slower, but hard landing unlikely
- **Japan:** Growth rebound constrained by VAT. Should fall short of Abenomics goals

#### Inflation and interest rates:

- Global deflationary pressures continue, but stable oil prices and global QE should help
- U.S. wage growth should rise, but strong dollar may keep inflation < 2% for some time
- Fed to liftoff: Likely 2015, but slower and lower, with pause around 1% possible
- A marked rise in global bond yields unlikely
- Divergent monetary policies: ECB and BoJ may not raise rates this *decade*

#### Asset returns:

- A marked rise in global bond yields unlikely; risk premiums remain compressed
- Credit and equity risk may be higher than duration risk
- Outlook for equity risk premium remains formative; central tendency of 6%–8% nominal 10-year returns
- In near term, equity returns biased lower
- Lowest projected expected returns since 2006 for balanced portfolios
U.S. growth outlook:
Modest cyclical thrust above low 2%-trend

Vanguard's U.S. dashboard of leading economic indicators

Vanguard’s 2015 U.S. growth outlook (2.5-3.0%)
Estimated distribution of growth outcomes

Note: 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 which is presented in Figure 1B.
Sources: Vanguard calculations, based on data from U.S. Bureau of Economic Analysis and Federal Reserve.

- **Above-trend growth**: Housing, labor market, consumer confidence
- **Below trend, but positive momentum**: Government, financial conditions, business confidence, manufacturing
- **Below trend and negative momentum**: Lending/credit

Real GDP year of year (at right)


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Fundamentals of consumer spending in place, but with no leverage

Main drivers of consumer spending are up

Financing costs down and deleveraging slowing


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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, growth rates across the 5 Asian economies.
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Europe: Inflationary expectations are below target and Euro area growth is worse than Japan’s in the 1990s

Euro Area Core HICP

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

Note: HICP = Harmonized Index of Consumer Prices.
Global monetary policies diverging

Global central bank assets as a percentage of a regions 2008 GDP

Break even inflation (BEI)

Notes: Total assets for each central bank are shown as percentage of that country’s or region’s 2008 GDP. Data as of March 2015.
Sources: Vanguard calculations, based on data from Federal Reserve, Bank of England, ECB, Bank of Japan, and IMF.

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Fed outlook: Terminal rate more important than liftoff date

Theoretical policy rate paths under cyclical and structural slack assumptions

- **Cyclical view** = *later* lift off
  - *Structural* slack = *earlier* lift off

- **Cyclical view** = *higher* long-term rate
  - *Structural* slack = *lower* long-term rate

- **Secular stagnation** slack = *much later* liftoff and a *much lower* long-term rate

4.5–5% (Fed “dots”)

~3.0% (Vanguard)

~1.0%

Note: Hypothetical illustration of path and end point of federal funds rate.
Source: Vanguard.
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Wage pressures and core inflation


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.

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Projected U.S. Consumer Price Index (CPI) inflation rate, current and 2013 ten-year outlooks

VCMM-simulated distribution of annualized expected average

Annualized inflation: 1950–2014…….. 3.6%
Annualized inflation: 2000–2014…….. 2.2%
10-year TIPS break-even inflation as of December 31, 2014…….. 1.7%

IMPORTANT: The projections or other information generated by the Vanguard Capital Markets Model® (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 Global equity returns and fixed income returns. Simulations as of December 31, 2014.
Results from the model may vary with each use and over time. For more information, please see the Important information slide.
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Projected global fixed income ten-year return outlook

VCMM-simulated distribution of expected average annualized return of the global fixed income market, estimated as of December 2013 and December 2014

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Note: Figure displays projected range of returns for a portfolio of 80% U.S. bonds and 20% ex-U.S. bonds, rebalanced quarterly. For details, see Vanguard’s economic and investment outlook (Davis, Aliaga-Diaz, Patterson, and Ahluwalia 2014).

Source: Vanguard.
Bonds can provide ballast in an equity bear market

Median return of various asset classes during the worst decile of monthly equity returns, 1988–2014

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.
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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.
Hedging currency in fixed income: Why all the negativity?

Regardless of the yield environment the expected hedge return is the difference between the forward curves.

At the time of the hedge, investors are indifferent between domestic and international bonds hedged back to their currency.

This difference is the expected return from hedging: positive for USD, negative for EUR.

A USD investor could achieve a similar yield to Treasuries by hedging bunds. The hedged yield would be identical to the US spot yield under perfect foresight.

Notes: U.S. spot and German yield curve data as of 4/1/2015. Source: Vanguard calculations based on data from Board of Governors of the Federal Reserve and Bundesbank.

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Projected global equity ten-year return outlook

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

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Notes: Figure displays the projected range of returns for a 70% U.S., 30% ex-U.S. equity portfolio, rebalanced quarterly. For details, see Vanguard’s economic and investment outlook (Davis, Aliaga-Diaz, Patterson, and Ahluwalia 2014).

Source: Vanguard.

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Valuations stretched in the US and developed markets

Valuation for global equity indexes
Price over 36-month trailing earnings

Notes: Figure displays the price/earnings ratio with 36-month trailing average earnings. United States is defined as the MSCI United States Index, developed markets ex-U.S. are defined as the MSCI All-World US Index, and emerging markets are defined as the MSCI Emerging Markets Index. Sources: Vanguard calculations, based on data from MSCI Data as of March 31, 2015.

Long-term valuation for US equities,
Selected valuation metrics

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 the market value of domestic corporations from the Federal Reserve Flow of Funds database relative to the trailing four-quarter average of after-tax corporate profits from the BEA’s national accounts. Broad market price/sales displays the market value of domestic corporations from the Flow of Funds database relative to the Gross Value Added of Corporate Business from the BEA’s national accounts. Broad market price/book displays the market value of domestic corporations relative to the net worth at historical cost of Nonfinancial Corporate Business, both from the Flow of Funds database. Shiller CAPE (10-year) is the 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.
The benefits of long term perspective, balance and diversification

A balanced, diversified investor has fared relatively well

Peak to trough return

Source: S&P 500 Index and Barclays U.S. Aggregate Bond Index (rebalanced monthly). Data provided by Factset, as of March 31, 2015.

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Projected ten-year nominal return outlook for balanced portfolios

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Note: Forecast displays 5th/25th/75th/95th percentile ranges of 10,000 VCMM simulations for projected real returns for balanced portfolios in USD. 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. For details, see Vanguard’s economic and investment outlook (Davis, Aliaga-Diaz, Patterson, and Ahluwalia 2014).

Source: Vanguard

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

The Vanguard Capital Markets Model™ is a proprietary financial simulation tool developed and maintained by Vanguard’s primary investment research and advice teams. 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.

All investing is subject to risk, including the possible loss of the money you invest. Bond funds are subject to interest rate, credit, and inflation risk. Investments in stocks and bonds issued by non-U.S. companies are subject to risks including country/regional risk and currency risk. These risks are especially high in emerging markets. Diversification does not ensure a profit or protect against a loss.

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Appendix
Sector dashboard of the U.S. economy


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Structural forces driving trend growth

Developed-market trend GDP growth and components

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).

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### What is causing slower growth: Secular stagnation or structural deceleration?

**Drivers, economic and policy implications**

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

Note: For more details on drivers of each scenario and a full quantitative assessment of various markets, see Vanguard’s economic and investment outlook (Davis, Aliaga-Diaz, Patterson, and Ahluwalia, 2015).
Source: Vanguard.

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Supply and demand both pushing oil prices lower

Decomposition of the largest oil-price drops varies

Five largest declines, 1983–present

Notes: Components of oil-price drop—Supply = 7-month cumulative price change (CPC) in WTI spot oil prices minus 7-month CPC in spot copper prices; Demand = 7-month CPC in spot copper prices minus 7-month CPC in USD; Strength of U.S. dollar = 7-month CPC in USD major currencies index.


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Questions around drivers and implications of strong dollar

Strong dollar in part driven by strong U.S. economy

Magnitude of trade impact is varied


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## Emerging markets dashboard

Emerging markets’ financial systems are much different today

<table>
<thead>
<tr>
<th>Crisis years</th>
<th>External debt (% of GDP)</th>
<th>Total reserves (% of total external debt)</th>
<th>External debt service (% exports)</th>
<th>Years of coverage</th>
<th>Currency peg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil, 2002</td>
<td>47.7</td>
<td>16.2</td>
<td>71.1</td>
<td>4.9</td>
<td>N</td>
</tr>
<tr>
<td>Hungary, 1997</td>
<td>52.1</td>
<td>36.4</td>
<td>32.9</td>
<td>0.5</td>
<td>N</td>
</tr>
<tr>
<td>Malaysia, 1997</td>
<td>36.4</td>
<td>44.0</td>
<td>7.4</td>
<td>3.5</td>
<td>Y</td>
</tr>
<tr>
<td>Mexico, 1994</td>
<td>33.9</td>
<td>4.6</td>
<td>27.0</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>South Africa, 1997</td>
<td>19.7</td>
<td>16.0</td>
<td>17.2</td>
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<td>N</td>
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<tr>
<td>Turkey, 1997</td>
<td>32.1</td>
<td>22.0</td>
<td>22.3</td>
<td>7.1</td>
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<td>Argentina, 2001</td>
<td>57.4</td>
<td>9.7</td>
<td>49.2</td>
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<tr>
<td>Indonesia, 1997</td>
<td>51.6</td>
<td>12.2</td>
<td>30.3</td>
<td>3.3</td>
<td>Y</td>
</tr>
<tr>
<td>Russia, 1998</td>
<td>64.8</td>
<td>6.5</td>
<td>29.0</td>
<td>55.8</td>
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<td>South Korea, 1997</td>
<td>31.8</td>
<td>12.6</td>
<td>N/A</td>
<td>8.5</td>
<td>Y</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Today</th>
<th>External debt (% of GDP)</th>
<th>Total reserves (% of total external debt)</th>
<th>External debt service (% exports)</th>
<th>Years of coverage</th>
<th>Currency peg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>21.5</td>
<td>73.8</td>
<td>28.6</td>
<td>4.4</td>
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</tr>
<tr>
<td>Hungary</td>
<td>147.4</td>
<td>23.6</td>
<td>97.4</td>
<td>8.4</td>
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<tr>
<td>Malaysia</td>
<td>68.1</td>
<td>62.6</td>
<td>3.5</td>
<td>4.4</td>
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<td>Mexico</td>
<td>35.1</td>
<td>39.6</td>
<td>10.3</td>
<td>6.6</td>
<td>N</td>
</tr>
<tr>
<td>South Africa</td>
<td>38.1</td>
<td>32.1</td>
<td>8.3</td>
<td>2.2</td>
<td>N</td>
</tr>
<tr>
<td>Turkey</td>
<td>47.2</td>
<td>28.6</td>
<td>28.7</td>
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<tr>
<td>Argentina</td>
<td>21.9</td>
<td>20.7</td>
<td>13.7</td>
<td>5.9</td>
<td>N</td>
</tr>
<tr>
<td>Indonesia</td>
<td>29.6</td>
<td>37.2</td>
<td>19.4</td>
<td>3.3</td>
<td>N</td>
</tr>
<tr>
<td>Russia</td>
<td>34.8</td>
<td>69.9</td>
<td>32.0</td>
<td>14.9</td>
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<tr>
<td>South Korea</td>
<td>31.9</td>
<td>83.3</td>
<td>N/A</td>
<td>52.5</td>
<td>N</td>
</tr>
</tbody>
</table>

Notes: Data for total reserves as percentage of exports for Hungary begin in 2000. Data for external debt service as percentage of exports for Hungary and Russia begin in 2005. Years of coverage represent total reserves/current account deficit and reflect number of years a nation’s foreign currency reserves could fund a trade deficit. Latest available data for “Today” are as of December 31, 2013.

Sources: Vanguard calculations, based on data from World Bank; International Monetary Fund; Oxford Economics; Bank of Korea, Korea Customs Service; Central Bank of the Russian Federation; Department of Statistics Malaysia; CEIC Data; Central Bank of Hungary; and Ethan Ilzetzki, Carmen Reinhart, and Kenneth Rogoff, 2011, *The Country Chronologies and Background Material to Exchange Rate Arrangements into the 21st Century: Will the Anchor Currency Hold?* (London: London School of Economics).

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Economic growth and equity returns:
Be wary of the allure of high economic growth

Real GDP growth and real stock returns 1970–2014

Notes: Figures display each country’s average annualized real GDP growth rate along with that country’s average annualized real stock return. We include all members of the FTSE All World Index (except the United Arab Emirates, for a lack of return history). The period covered begins in 1970, with the starting point for each country depending on the availability of both returns and GDP data (most developed markets have data from 1970 onward, and most emerging markets have data from 1988 onward). Real growth rates are computed using data from the IMF’s World Economic Outlook database (for data prior to 1980, we use the April 2004 database; otherwise we use the April 2013 database). Return data are based on MSCI country indexes spliced with FTSE indexes once the latter are available. Both growth and return data are in real local terms, with the index returns deflated using the GDP deflator from the IMF databases. The 95% confidence interval for the cross-sectional regression slope of returns on GDP growth is –0.51 to 0.61, with an R-squared of 0.00. Source: Vanguard, based on data from the IMF, MSCI, and FTSE.
Lack of near-term predictability is another reason Vanguard stresses a long-term perspective.

Average return on U.S. stock
VCMM estimated probability distribution

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Market outlook

Bond return math suggests low current yields correlate with low expected returns


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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 December 31, 2014.

Sources: Vanguard calculations based on data from Bloomberg and Moody’s Analytics.

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Correlation of U.S. stock returns with changes in inflation and real rates†

Change in inflation*

Change in real rate**

$R^2 = 0.22$

Source: Investment Strategy Group, data as of March 2015.


** Real rate is the difference between cash and inflation. Cash is defined as U.S. cash reserve annual returns using Ibbotson U.S. 30-Day Treasury Bill Index from Jan. 1931 to Dec. 1977 and the Citigroup 3-Month Treasury Bill Index thereafter.

† U.S. Equities is defined as Standard & Poor’s 90 from Jan. 1931 to Feb. 1957; the Standard & Poor’s 500 Index from Mar. 1957 to Dec. 1974; the Wilshire 5000 Index from Jan. 1975 to Apr. 2005; and the MSCI US Broad Market Index thereafter.

Note: Change in inflation (and real rate) is defined as the difference between two non-overlapping 5-year periods in a 10-year time-frame. The difference is known as “actual” minus “expected”. Beginning in 1931, the annualized geometric return for the first 5-year period beginning Dec. 1931 and ending Dec. 1935 is defined as “expected”. The subsequent 5-year period beginning Jan. 1936 and ending Dec. 1940 is defined as “actual”. Plotted on the y-axis is the geometric annualized returns of U.S. Equities of the “actual” period, first of which is Jan. 1936 to Dec. 1940. Plotted are the results for 73 periods ending March 2015.

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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.


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Bond market ten-year return outlook: Setting reasonable expectations

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Notes: Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualized nominal returns as of December 31, 2014 in USD for asset classes highlighted here. For details, see Vanguard’s economic and investment outlook (Davis, Aliaga-Diaz, Patterson, and Ahluwalia 2014). Source: Vanguard.

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Equity market ten-year return outlook: Setting reasonable expectations, being aware of widely dispersed potential returns

-10% -5% 0% 5% 10% 15% 20% 25%

Global Equity ex-U.S. unhedged in USD
U.S. Equity
U.S. REITs
Commodities Futures

10 year annualized return

Volatility (median annual standard deviation of returns)

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 December 31, 2014. Results from the model may vary with each use and over time.

Notes: Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualized nominal returns as of December 31, 2014 in USD for asset classes highlighted here. For details, see Vanguard’s economic and investment outlook (Davis, Aliaga-Diaz, Patterson, and Ahluwalia 2014).

Source: Vanguard.

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