Vanguard economic and market outlook for 2018: Rising risks to the status quo

Vanguard Research
December 2017
Market consensus has finally embraced the low secular trends

**Note:** The Group of Seven (G7) countries are the industrialized democracies Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

**Source:** Vanguard, based on data from the International Monetary Fund.
A too-narrow range of inflation expectations

Note: Distributions represent bell curves created by using the standard deviation of survey respondents' forecasts for U.S core Personal Consumption Expenditures (PCE) under the assumption of normal distribution.

Help wanted: 80% of major economies at full employment

Source: Vanguard, using data from the Organization for Economic Cooperation and Development and the International Monetary Fund.
The inflation-unemployment link may surprise markets in 2018

Source: Vanguard.
Vanguard dashboards of leading economic indicators and implied economic growth for 2018

United States: Slightly above consensus

a. Economic indicators outcomes, 2018

b. Estimated distribution of U.S. growth outcomes, 2018

Notes: The distribution of growth outcomes is generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2017 and adjusting for the time-varying trend growth rate. Trend growth represents projected future estimated trend growth.

Source: Vanguard calculations, based on data from Moody’s Analytics Data Buffet and Thomson Reuters Datastream.
Vanguard dashboards of leading economic indicators and implied economic growth for 2018

Euro area: Slightly above consensus

c. Economic indicators

d. Estimated distribution of euro-area growth outcomes, 2018

Notes: The distribution of growth outcomes is generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2017 and adjusting for the time-varying trend growth rate. Trend growth represents projected future estimated trend growth.

Source: Vanguard calculations, based on data from Thomson Reuters Datastream.
Vanguard dashboards of leading economic indicators and implied economic growth for 2018

China: Slightly above consensus

e. Economic indicators

f. Estimated distribution of China outcomes, 2018

Notes: The distribution of growth outcomes is generated by bootstrapping the residuals from a regression based on a proprietary set of leading economic indicators and historical data, estimated from 1960 to 2017 and adjusting for the time-varying trend growth rate. Trend growth represents projected future estimated trend growth.

Source: Vanguard calculations, based on data from Thomson Reuters Datastream and CEIC.
A more optimistic outlook

Notes: The chart depicts consumer and business sentiment indicators from the Vanguard Leading Economic Indicators Index, an aggregation of the signals of a proprietary set of leading economic indicators that is further filtered to include only sentiment and survey measures.

Source: Vanguard calculations, based on data from Moody’s Data Buffet.
Lower unemployment rates = higher business capital spending

Source: Vanguard, based on data from Moody’s Data Buffet, the U.S. Bureau of Economic Analysis, and the Bureau of Labor Statistics.
Back from hibernation: Sub-4% unemployment rates should boost wage growth

Notes: The y-axis represents the Atlanta Fed’s Wage Growth Tracker nine months from the date of a specific unemployment rate. This captures the potential lag with which wages may react to changes in unemployment.

Source: Vanguard, based on data from the Federal Reserve Bank of Atlanta.
U.S. inflation: Secularly low, but cyclically rising

Source: Vanguard, based on data from the U.S. Bureau of Economic Analysis.
The unwind is expected to be more measured than the buildup

Notes: Excess reserves represent the amount of reserves held at the Federal Reserve Bank in excess of the amount required based on the deposits held at banks. Vanguard projections based on Fed stated caps and mortgage pre-payment model as described in Syron Ferris, et al. (2017).

Source: Vanguard, based on data from the Federal Reserve.
Low-volatility environment is not unprecedented

Note: The CBOE Volatility Index, or VIX, is a key measure of equity market volatility, specifically the 30-day implied volatility from options activity for the S&P 500 Index.

Source: Vanguard, using data from Thomson Reuters Datastream, the Chicago Board Options Exchange (CBOE), and the Federal Reserve Board.
No evidence of QE’s effect on…

a. … Market prices' sensitivity to economic surprises

b. … Lower market volatility; higher conviction is the status quo

Notes: For Figure I-12a: We used a process in which a time-varying coefficient is attached to an index of macro variables so that deviations above (or below) 1 represent heightened (or dampened) sensitivity of the S&P 500 Index to surprises in macro variables. The index for macro surprises was developed using daily data from the following U.S. macro announcements: retail sales, Institute for Supply Management (ISM) Non-Manufacturing Index, ISM Manufacturing Index, Philadelphia Federal Reserve Survey, industrial production, construction spending, capacity utilization, consumer credit, core Consumer Price Index, Treasury budget deficit, Empire State Manufacturing Survey, and wholesale sales. For Figure I-12b: “Economic uncertainty” represents the 12-month moving average equally weighted standardized cross-sectional dispersion metric of survey respondents’ projections for U.S. real GDP growth, the unemployment rate, inflation, and the 3-month Treasury bill rate one year into the future over time. “Market volatility” represents the 12-month moving average standardized value of the CBOE Volatility Index, which measures the 30-day implied volatility from options activity for the S&P 500 Index.

Source: Vanguard, based on data from Thomson Reuters Datastream, Moody’s Data Buffet, the Chicago Board Options Exchange, and the Federal Reserve Bank of Philadelphia’s Survey of Professional Forecasters.
China’s debt-to-GDP ratio has stabilized on financial tightening and better growth

Source: Vanguard, using data from the People’s Bank of China (PBoC) and the National Bureau of Statistics of China (NBS).
Rapid destocking has taken place in smaller cities

Source: Vanguard, using data from the People’s Bank of China (PBoC) and the National Bureau of Statistics of China (NBS).

The peak of industrial capacity reduction has passed

Source: Vanguard, using data from NBS.
## Priority and progress of structural reforms to date

<table>
<thead>
<tr>
<th>Reform</th>
<th>Target</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcapacity and environmental protection</td>
<td>Improve the quality of growth by reducing excess capacity and highly polluting investment.</td>
<td>Supply-side reforms have played a key role in reducing overcapacity.</td>
</tr>
<tr>
<td>Financial</td>
<td>Foster development of domestic capital markets and improve the resilience of the financial system.</td>
<td>A proposal for a registration-based IPO system was recently approved; regulation and financial tightening have restricted shadow banking activity.</td>
</tr>
<tr>
<td>Fiscal</td>
<td>Redefine central/local government responsibilities and centralize spending on basic pension and public security.</td>
<td>&quot;Lifelong accountability&quot; for local government officials will help control financial risk.</td>
</tr>
<tr>
<td>State-owned enterprises (SOEs)</td>
<td>Finish restructuring and deleverage.</td>
<td>Trials are ongoing in mergers and acquisitions and mixed ownership, but nonperforming loan disclosure is still low as banks support SOE debt rollover.</td>
</tr>
<tr>
<td>Urbanization</td>
<td>Loosen household registration restrictions and even out the urbanization process.</td>
<td>Quality lags quantitative improvement: Most new urban residents are still not legally allowed to access services.</td>
</tr>
<tr>
<td>Service sector</td>
<td>Lower entry barriers to introduce competition.</td>
<td>Barriers are lower, but further deregulation is needed for fair competition.</td>
</tr>
<tr>
<td>Capital account</td>
<td>Achieve IMF classification of capital account transactions, expand cross-border portfolio investment schemes, and relax rules on cross-border financing.</td>
<td>Special Drawing Right inclusion, stock and bond connection, a Shanghai free-trade zone, a wider yuan daily trading band, and one-way asymmetric capital account liberalization have been implemented. More must be done to allow two-way capital flows.</td>
</tr>
</tbody>
</table>

*Source: Vanguard.*
Expansion has yet to extend into private demand in Japan

Source: Vanguard, using data from Thomson Reuters Datastream.
Part-time wages to accelerate, although full-time wage growth remains subdued

The Bank of Japan’s ‘tapering’ is not ‘tightening’

Source: Vanguard, using data from CEIC.
Anti-euro sentiment: Is the tide turning?

Percentage of population in favor of a single currency—the euro

Source: Eurobarometer.
Four Brexit scenarios

Our probabilities

35% Crash Brexit
The U.K. fails to reach a deal and effectively falls out of the EU with no backstop. The U.K. moves to World Trade Organization rules.

35% Hard Brexit
The U.K. leaves the EU Single Market and the Customs Union and reintroduces immigration controls.

20% Soft Brexit
The U.K. joins the European Economic Area and retains access to the EU Single Market and the Customs Union.

10% No Brexit
Article 50 is revoked and Brexit does not take place.

Source: Vanguard.
Underemployment is still very high in the euro area

Source: Capital Economics.

Trade union membership has declined across developed markets

Source: Macrobond.
Economic growth prospects

Source: IMF World Economic Outlook.
Divergence in global equity valuations

a. CAPE for the U.S. S&P 500 Index is approaching overvalued territory

Notes: 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–September 2017. Source: Vanguard calculations, based on data from Robert Shiller Online Data, the U.S. Bureau of Labor Statistics, and the Federal Reserve Board.

b. Other developed markets appear to be fairly priced

Notes: The U.S. valuation measure is the current CAPE percentile relative to fair-value CAPE for the S&P 500 Index estimated over the period January 1940 to September 2017. The developed markets valuation measure is the weighted average of each region’s (Australia, United Kingdom, Euro-area, Japan, and Canada) current CAPE percentile relative to each region’s own fair-value CAPE. The fair value CAPE for Australia, the U.K., the Euro area, Japan, and Canada is a five variable vector error correction (VEC) model with equity earnings yield (MSCI index), ten-year trailing inflation, ten-year government bond yield, equity volatility, and bond volatility estimated over the period January 1970 to September 2017. The emerging markets valuation measure is a composite valuation measure of EM to U.S. relative valuations and current U.S. CAPE percentile relative to its fair value CAPE. The relative valuation is the current ratio of EM to U.S. P/E metrics relative to its historical average, using three-year trailing average earnings from January 1990 to September 2017. Source: Vanguard calculations, based on data from Robert Shiller Online Data, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Thomson Reuters Datastream.
The outlook for equity markets is subdued

a. Exposure to non-U.S. equities may be beneficial

Notes: Data for the last 30 years are from January 1987–December 2016, in U.S. dollars. Next-ten-year data are based on the median of 10,000 simulations from VCMM as of September 30, 2017, in U.S. dollars. Historical returns are computed using indexes defined in “Indexes used in our historical calculations” on page 5. Historical cash returns are from Dimson-Marsh-Staunton data. See Appendix section “Index simulations” for further details on the asset classes shown.

Sources: Vanguard, Dimson-Marsh-Staunton Dataset, FactSet, Morningstar Direct, and Thomson Reuters Datastream.
The outlook for equity markets is subdued

b. Equity market ten-year return outlook: Setting reasonable expectations

![Box plots of ten-year annualized return for different asset classes with median volatility annotations]

Notes: This forecast corresponds to the distribution of 10,000 VCMM simulations for ten-year annualized nominal returns as of September 30, 2017, in U.S. dollars. Median volatility is the 50th percentile of an asset class’s distribution of annual standardized deviation of returns. See Appendix section “Index simulations” for further details on the asset classes shown.

Source: Vanguard.
Rates and risk premiums add up to modest returns

Notes: This forecast corresponds to the distribution of 10,000 VCMM simulations for ten-year annualized nominal returns as of September 30, 2017, in U.S. dollars. Median volatility is the 50th percentile of an asset class’s distribution of annual standardized deviation of returns. See Appendix section “Index simulations” for further details on the asset classes shown.

Source: Vanguard.
Frothy credit valuations

Notes: Valuation percentiles are relative to 30-year VCMM projections. Intermediate credit and U.S. aggregate bond valuations are current credit spreads relative to Year 30. Duration valuation is the expected return differential over the next decade between the long-term Treasury index and short-term Treasury index, relative to that of Years 21–30. TIPS valuation is the ten-year-ahead annualized inflation expectation relative to Years 21–30.
Source: Vanguard.
Asset allocation for a challenging decade

a. A lower return orbit ...

b. ... that popular “active tilts” will likely fail to escape

- 1970 – present
- 1990 – present
- Next decade

- Global 60% equity / 40% bond portfolio
## Asset allocation for a challenging decade

### c. Projected ten-year annualized nominal returns as of September 2017

<table>
<thead>
<tr>
<th>Porfolios</th>
<th>5th percentile</th>
<th>25th percentile</th>
<th>Median percentile</th>
<th>75th percentile</th>
<th>95th percentile</th>
<th>Median volatility</th>
<th>Risk-adjusted return</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% bonds</td>
<td>1.3%</td>
<td>2.0%</td>
<td>2.6%</td>
<td>3.3%</td>
<td>4.3%</td>
<td>4.5%</td>
<td>0.59</td>
</tr>
<tr>
<td>20/80 stock/bond</td>
<td>1.8%</td>
<td>2.7%</td>
<td>3.3%</td>
<td>4.0%</td>
<td>5.1%</td>
<td>4.2%</td>
<td>0.80</td>
</tr>
<tr>
<td>60/40 stock/bond</td>
<td>1.3%</td>
<td>3.2%</td>
<td>4.5%</td>
<td>5.8%</td>
<td>7.8%</td>
<td>9.2%</td>
<td>0.48</td>
</tr>
<tr>
<td>80/20 stock/bond</td>
<td>0.7%</td>
<td>3.2%</td>
<td>4.9%</td>
<td>6.6%</td>
<td>9.1%</td>
<td>12.4%</td>
<td>0.39</td>
</tr>
<tr>
<td>100% equity</td>
<td>0.0%</td>
<td>3.0%</td>
<td>5.2%</td>
<td>7.2%</td>
<td>10.5%</td>
<td>15.7%</td>
<td>0.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Portfolios with common 20% tilts relative to 60/40 stock/bond</th>
<th>60/40 stock/bond</th>
<th>1.3%</th>
<th>3.2%</th>
<th>4.5%</th>
<th>5.8%</th>
<th>7.8%</th>
<th>9.2%</th>
<th>0.48</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-yield tilt</td>
<td>1.4%</td>
<td>3.4%</td>
<td>4.7%</td>
<td>6.0%</td>
<td>8.0%</td>
<td>10.1%</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Inflation protection tilt</td>
<td>1.3%</td>
<td>3.1%</td>
<td>4.4%</td>
<td>5.7%</td>
<td>7.7%</td>
<td>9.1%</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>Emerging markets equity tilt</td>
<td>1.4%</td>
<td>3.3%</td>
<td>4.6%</td>
<td>5.9%</td>
<td>7.9%</td>
<td>10.4%</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>U.S. intermediate credit tilt</td>
<td>1.4%</td>
<td>3.3%</td>
<td>4.6%</td>
<td>5.9%</td>
<td>7.9%</td>
<td>9.3%</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>60/40 without ex-U.S. equity</td>
<td>0.1%</td>
<td>2.4%</td>
<td>3.9%</td>
<td>5.6%</td>
<td>8.0%</td>
<td>10.1%</td>
<td>0.38</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Summary statistics of 10,000 VCMM simulations for projected ten-year annualized nominal returns are as of September 2017 in U.S. dollars before costs. Historical returns are computed using indexes defined in “Indexes used in our historical calculations” on page 5. The global equity portfolio is 60% U.S. equity and 40% global ex-U.S. equity. The global bond portfolio is 70% U.S. bonds and 30% global ex-U.S. bonds. Portfolios with tilts include a 20% tilt to the asset specified funded from the fixed income allocation for the fixed income tilt and the equity allocation for the equity tilt.

**Source:** Vanguard.
Cyclical surprises and asset allocation trade-offs

a. Mean-variance optimal portfolios vary for different economic environments

**Scenario 1**
Status quo/baseline (50% probability)

Diversified portfolio

- 36% U.S. equity
- 24% Global ex-U.S. equity
- 10% Global ex-U.S. bonds
- 10% Short-term credit
- 10% Short-term Treasury
- 10% Long-term Treasury
- 0% Short-term TIPS

**Scenario 2**
Recession (19% probability)

Overweight long duration and underweight equity

- 46% U.S. equity
- 4% Global ex-U.S. equity
- 4% Global ex-U.S. bonds
- 0% Short-term credit
- 0% Short-term Treasury
- 46% Long-term Treasury
- 0% Short-term TIPS

**Scenario 3**
High growth (31% probability)

Overweight equity and short duration

- 46% U.S. equity
- 28% Global ex-U.S. equity
- 6% Global ex-U.S. bonds
- 6% Short-term credit
- 14% Short-term Treasury
- 0% Long-term Treasury
- 0% Short-term TIPS

**Notes:** Summary statistics of 10,000 VCMM simulations for projected ten-year annualized nominal returns are as of September 2017 in U.S. dollars before costs. Historical returns are computed using indexes defined in “Indexes used in our historical calculations” on page 5. The global equity portfolio is 60% U.S. equity and 40% global ex-U.S. equity. The global bond portfolio is 70% U.S. bonds and 30% global ex-U.S. bonds. Portfolios with tilts include a 20% tilt to the asset specified funded from the fixed income allocation for the fixed income tilt and the equity allocation for the equity tilt.

**Source:** Vanguard.
Cyclical surprises and asset allocation trade-offs

b. A diversified portfolio is not always the best, but it’s never the worst

Notes: Summary statistics of 10,000 VCMM simulations for projected ten-year annualized nominal returns are as of September 2017 in U.S. dollars before costs. Historical returns are computed using indexes defined in “Indexes used in our historical calculations” on page 5. The global equity portfolio is 60% U.S. equity and 40% global ex-U.S. equity. The global bond portfolio is 70% U.S. bonds and 30% global ex-U.S. bonds. Portfolios with tilts include a 20% tilt to the asset specified funded from the fixed income allocation for the fixed income tilt and the equity allocation for the equity tilt.

Source: Vanguard.
c. Portfolios designed for a single scenario are tempting but can be risky

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status quo/baseline</td>
<td>Recession</td>
<td>High growth</td>
</tr>
<tr>
<td>(50% probability)</td>
<td>(19% probability)</td>
<td>(31% probability)</td>
</tr>
<tr>
<td>Diversified portfolio</td>
<td>Overweight long duration</td>
<td>Overweight equity</td>
</tr>
<tr>
<td></td>
<td>and underweight equity</td>
<td>and short duration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategy upside relative to balanced portfolio</th>
<th>Scenario 2 upside</th>
<th>Scenario 3 upside</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3% higher annualized return with 1.4% lower volatility in a recessionary scenario</td>
<td>Same return with 2.7% higher volatility in a recessionary scenario</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategy downside relative to balanced portfolio</th>
<th>Scenario 2 downside</th>
<th>Scenario 3 downside</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6% lower annualized return with 0.7% lower volatility in a high-growth scenario</td>
<td>Same return with 2.7% higher volatility in a high-growth scenario</td>
<td></td>
</tr>
</tbody>
</table>
Notes: Probability of success is defined as the probability of having a positive balance in a target-date fund at age 95, based on specific savings and spending assumptions. Data show the impact of each factor changing from low (the 25th percentile of broad population data) to medium (the 50th percentile). VCMM simulations are as of March 2016. Investment cost is the relative impact on the probability of success of a target-date fund with a 50-basis-point higher fee or investment cost. For details, see Vanguard Life-Cycle Investing Model: A Framework for Building Target-Date Portfolios (Aliaga-Díaz et al., 2016).

Source: Vanguard.
Notes on asset-return distributions

The asset-return distributions shown here represent Vanguard’s view on the potential range of risk premiums that may occur over the next ten years; such long-term projections are not intended to be extrapolated into a short-term view. These potential outcomes for long-term investment returns are generated by the Vanguard Capital Markets Model® (VCMM) 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 and 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, 2017. Results from the model may vary with each use and over time. For more information, see the Appendix section “About the Vanguard Capital Markets Model.”
Notes on risk

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.