U.S. Economic Outlook

West Virginia University Economic Outlook Conference
November 8, 2017

R. Andrew Bauer
Senior Regional Economist
Real Gross Domestic Product

<table>
<thead>
<tr>
<th></th>
<th>2016 Q3</th>
<th>2016 Q4</th>
<th>2016 Q1</th>
<th>2017 Q2</th>
<th>2017 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHANGE FROM PREVIOUS QUARTER AT COMPOUND ANNUAL RATE [Percent]:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Domestic Product</td>
<td>2.8</td>
<td>1.8</td>
<td>1.2</td>
<td>3.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Personal Consumption Expenditures</td>
<td>2.8</td>
<td>2.9</td>
<td>1.9</td>
<td>3.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Nonresidential Fixed Investment</td>
<td>3.4</td>
<td>0.2</td>
<td>7.2</td>
<td>6.7</td>
<td>3.9</td>
</tr>
<tr>
<td>Structures</td>
<td>14.3</td>
<td>-2.2</td>
<td>14.8</td>
<td>7.0</td>
<td>-5.2</td>
</tr>
<tr>
<td>Equipment</td>
<td>-2.1</td>
<td>1.8</td>
<td>4.4</td>
<td>8.8</td>
<td>8.6</td>
</tr>
<tr>
<td>Intellectual Property</td>
<td>4.2</td>
<td>-0.4</td>
<td>5.7</td>
<td>3.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Residential Fixed Investment</td>
<td>-4.5</td>
<td>7.1</td>
<td>11.1</td>
<td>-7.3</td>
<td>-6.0</td>
</tr>
<tr>
<td>Exports of Goods &amp; Services</td>
<td>6.4</td>
<td>-3.8</td>
<td>7.3</td>
<td>3.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Imports of Goods &amp; Services</td>
<td>2.7</td>
<td>8.1</td>
<td>4.3</td>
<td>1.5</td>
<td>-0.8</td>
</tr>
<tr>
<td>Government Consumption Expenditures &amp; Gross</td>
<td>0.5</td>
<td>0.2</td>
<td>-0.6</td>
<td>-0.2</td>
<td>-0.1</td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Sales to Domestic Purchasers</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>2.7</td>
<td>1.8</td>
</tr>
</tbody>
</table>

**LEVEL IN QUARTER AT SEASONALLY ADJUSTED ANNUAL RATE [Billions of Chained (2005) Dollars]:**

<table>
<thead>
<tr>
<th></th>
<th>2016 Q3</th>
<th>2016 Q4</th>
<th>2016 Q1</th>
<th>2017 Q2</th>
<th>2017 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Private Inventories</td>
<td>17.6</td>
<td>63.1</td>
<td>1.2</td>
<td>5.5</td>
<td>35.8</td>
</tr>
<tr>
<td>Net Exports of Goods &amp; Services</td>
<td>-557.3</td>
<td>-631.1</td>
<td>-622.2</td>
<td>-613.6</td>
<td>-595.5</td>
</tr>
</tbody>
</table>

Source: Bureau of Economic Analysis via Haver Analytics
Real Gross Domestic Product

Note: Projection is the median, central tendency, and range from the September 2017 Summary of Economic Projections. Red dots indicate median projections. Projections of change in real gross domestic product (GDP) are from the fourth quarter of the previous year to the fourth quarter of the year indicated.

Source: Bureau of Economic Analysis via Haver Analytics & Federal Reserve Board
Decomposition of Real GDP

Note: Productivity is calculated as real GDP per employee, from the Household Survey.

Source: Bureau of Economic Analysis and Bureau of Labor Statistics via Haver Analytics
Retail Sales

Note: Retail sales includes food services.

Source: Census Bureau via Haver Analytics
Consumer Spending and Income

12 Month % Change

Real Disposable Personal Income

Real Personal Consumption Expenditure

Month over Month % Change

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>August</th>
<th>September</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>0.1</td>
<td>-0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Expenditures</td>
<td>0.3</td>
<td>-0.1</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Note: Income has been adjusted to account for temporary fiscal actions in 2008 and 2012-2013.

Source: Bureau of Economic Analysis via Haver Analytics
Sales of Automobiles & Light Trucks

Source: Autodata Corporation via Haver Analytics
Personal Saving Rate

Source: Bureau of Economic Analysis via Haver Analytics

Note: Income has been adjusted to account for temporary events.
Household Net Worth

Source: Z.1 Financial Accounts of the United States via Haver Analytics
Existing Single-Family Home Sales

Source: National Association of Realtors via Haver Analytics
New Single-Family Home Sales

Source: Census Bureau via Haver Analytics
Private Single-Family Housing Starts & Permits

Millions of Starts & Permits, Annual Rate

Source: Census Bureau via Haver Analytics
Real Investment in Nonresidential Structures

Percent change from previous quarter at annual rate

Source: Bureau of Economic Analysis via Haver Analytics
Real Private Construction Put In Place

Notes: Private nonresidential construction deflated using the price index for private fixed investment in nonresidential structures and private residential construction deflated using the private residential investment chain price index.

Source: Census Bureau via Haver Analytics
Real Nonresidential Fixed Investment

Percent change from previous quarter at annual rate

Source: Bureau of Economic Analysis via Haver Analytics
Real Investment in Equipment

Percent change from previous quarter at annual rate

Source: Bureau of Economic Analysis via Haver Analytics
Real Investment in Intellectual Property

Source: Bureau of Economic Analysis via Haver Analytics
Balance of International Trade

Note: Customs Value of Trade Balance

Source: Census Bureau via Haver Analytics
Exchange Value of the USD

Index, March 1973 = 100

Notes: Measured as the real broad trade-weighted exchange value of the United States Dollar.

Source: Board of Governors via Haver Analytics
Industrial Production

Source: Board of Governors via Haver Analytics
Capacity Utilization Rate: Manufacturing

Source: Board of Governors via Haver Analytics
Indexes of Manufacturing Activity

Source: Institute for Supply Management & Richmond Fed via Haver Analytics
Indexes of Non-Manufacturing Activity

Diffusion Index, percent

ISM (Left Axis)

Richmond Fed Service Sector Index: Revenues (Right Axis)

September 59.8

Source: Institute for Supply Management & Richmond Fed via Haver Analytics
## ISM: Business Survey Indexes

<table>
<thead>
<tr>
<th>MANUFACTURING BUSINESS:</th>
<th>NON-MANUFACTURING BUSINESS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Aug.</strong></td>
</tr>
<tr>
<td>Purchasing Managers Index</td>
<td>58.8</td>
</tr>
<tr>
<td>Production</td>
<td>61.0</td>
</tr>
<tr>
<td>New Orders</td>
<td>60.3</td>
</tr>
<tr>
<td>Employment</td>
<td>59.9</td>
</tr>
<tr>
<td>Supplier Deliveries</td>
<td>57.1</td>
</tr>
<tr>
<td>Inventories</td>
<td>55.5</td>
</tr>
<tr>
<td>Prices</td>
<td>62.0</td>
</tr>
<tr>
<td>Backlog of Orders</td>
<td>57.5</td>
</tr>
<tr>
<td>New Export Orders</td>
<td>55.5</td>
</tr>
<tr>
<td>Imports</td>
<td>54.5</td>
</tr>
</tbody>
</table>

DIFFUSION INDEXES: Numbers above 50 percent indicate more favorable responses towards economic activity.

Source: Institute for Supply Management via Haver Analytics
Manufacturers’ New Orders

Source: Census Bureau via Haver Analytics
Core Capital Goods

Notes: Core capital goods are nondefense capital goods excluding aircraft.

Source: Census Bureau via Haver Analytics
Business Inventory/Sales Ratio

Source: Census Bureau via Haver Analytics
Nonfarm Payroll Employment

Source: Bureau of Labor Statistics via Haver Analytics
Nonfarm Payroll Employment

Quarterly average of monthly changes, thousands of persons

Monthly Change
Sep  -33
Aug  169
Jul  138
Jun  210
May  145

Source: Bureau of Labor Statistics via Haver Analytics
Unemployment Rate

Notes: FOMC projection is the median, range, and central tendency for the Q4 levels, from the September 2017 meeting. Red dots indicate median projections.

Source: Bureau of Labor Statistics & Board of Governors via Haver Analytics
Measures of Labor Utilization

- **U3:** Official Unemployment Rate
- **U5:** U3 + Discouraged + Marginally Attached
- **U6:** U5 + Involuntary Part-Time

Source: Bureau of Labor Statistics via Haver Analytics
Non-Employment Index

Non-Employment Index Including People Working Part-Time for Economic Reasons

Labor Market Flows

Note: *Percent of total employment. **Percent of total employment plus job openings.

Source: JOLTS via Haver Analytics
Average Hourly Earnings

12 Month % Change of 3-Month Moving Average

Monthly % Change
- Oct: 0.0%
- Sep: 0.5%
- Aug: 0.1%
- Jul: 0.5%
- Jun: 0.2%
- October: 2.6%

Source: Bureau of Labor Statistics via Haver Analytics
Labor Productivity, Nonfarm Business

Year over Year % Change

Quarterly Change at Annual Rate
- Q2 17  1.5%
- Q1 17  0.1%
- Q4 16  1.3%
- Q3 16  2.5%

Post-War Average (Labor Productivity)

Source: Bureau of Labor Statistics via Haver Analytics
Unit Labor Cost, Nonfarm Business

Year over Year % Change

Quarterly Change at Annual Rate
Q2 17 0.2%
Q1 17 4.8%
Q4 16 -5.7%
Q3 16 0.1%

Notes: Alternate series is derived from the Employment Cost Index.

Source: Bureau of Labor Statistics via Haver Analytics
# Gauges of Inflation

<table>
<thead>
<tr>
<th>Expenditure Price Indexes</th>
<th>[Percent Change from Previous Month at Annual Rate]:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aug.</td>
</tr>
<tr>
<td>Personal Consumption Expenditures</td>
<td>2.5</td>
</tr>
<tr>
<td>Core (excludes Food and Energy)</td>
<td>1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consumer Price Indexes</th>
<th>[Percent Change from Previous Month at Annual Rate]:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aug.</td>
</tr>
<tr>
<td>All Items</td>
<td>4.9</td>
</tr>
<tr>
<td>Core (excludes Food and Energy)</td>
<td>3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Producer Price Indexes</th>
<th>[Percent Change from Previous Month at Annual Rate]:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aug.</td>
</tr>
<tr>
<td>Finished Goods</td>
<td>5.6</td>
</tr>
<tr>
<td>Core (excludes Food and Energy)</td>
<td>1.2</td>
</tr>
<tr>
<td>Core Intermediate Goods</td>
<td>4.5</td>
</tr>
<tr>
<td>Crude Goods</td>
<td>-7.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spot Commodity Price Index</th>
<th>[Percent Change from Previous Month]:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aug.</td>
</tr>
<tr>
<td>CRB Spot Commodity Price Index</td>
<td>-1.4</td>
</tr>
</tbody>
</table>

Notes: Core PCE Price Index includes expenditures on food services.

Source: BEA, BLS, & Commodity Research Bureau via Haver Analytics
Personal Consumption Expenditure Price Index

Notes: FOMC projection is the median, range, and central tendency for Q4/Q4 percent changes, from the September 2017 meeting. Red dots indicate median projections.

Source: Bureau of Economic Analysis & Board of Governors via Haver Analytics
Core Personal Consumption Expenditure Price Index

Notes: FOMC projection is the median, range, and central tendency for Q4/Q4 percent changes, from the September 2017 meeting. Red dots indicate median projections. Core PCE Price Index excludes expenditures on gasoline and food services.

Source: Bureau of Economic Analysis & Board of Governors via Haver Analytics
Consumer Price Indexes

Source: Bureau of Labor Statistics via Haver Analytics
Producer Price Indexes

12 Month % Change

September (percent)
All Finished Goods 3.2%
Core Finished Goods 1.7%

Source: Bureau of Labor Statistics via Haver Analytics

FEDERAL RESERVE BANK OF RICHMOND
Richmond • Baltimore • Charlotte

Source: Bureau of Labor Statistics via Haver Analytics
Commodity Price Indexes

<table>
<thead>
<tr>
<th>Year</th>
<th>PPI Core Intermed. Goods</th>
<th>CRBS Spot Commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td>August</td>
<td>3.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>September</td>
<td>---</td>
<td>6.2%</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics & Commodity Research Bureau via Haver Analytics
Notes: Spot and Futures Prices are for Brent Crude Oil.

TIPS Inflation Compensation

Source: Federal Reserve Board /Haver Analytics
Federal Reserve System Assets

Note: Numbers may not add up due to rounding.

Source: Board of Governors via Haver Analytics
Real Federal Funds Rate

Note: The Real Federal Funds Rate is the difference between the effect Fed Funds rate and the lagged year-over-year change in the core PCE price index.

Source: Bureau of Economic Analysis & Board of Governors via Haver Analytics
Information received since the Federal Open Market Committee met in July indicates that the labor market has continued to strengthen and that economic activity has been rising moderately so far this year. Job gains have remained solid in recent months, and the unemployment rate has stayed low. Household spending has been expanding at a moderate rate, and growth in business fixed investment has picked up in recent quarters. On a 12-month basis, overall inflation and the measure excluding food and energy prices have declined this year and are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed, on balance.

Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. Hurricanes Harvey, Irma, and Maria have devastated many communities, inflicting severe hardship. Storm-related disruptions and rebuilding will affect economic activity in the near term, but past experience suggests that the storms are unlikely to materially alter the course of the national economy over the medium term. Consequently, the Committee continues to expect that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace, and labor market conditions will strengthen somewhat further. Higher prices for gasoline and some other items in the aftermath of the hurricanes will likely boost inflation temporarily; apart from that effect, inflation on a 12-month basis is expected to remain somewhat below 2 percent in the near term but to stabilize around the Committee's 2 percent objective over the medium term. Near-term risks to the economic outlook appear roughly balanced, but the Committee is monitoring inflation developments closely.

*In view of realized and expected labor market conditions and inflation, the Committee decided to maintain the target range for the federal funds rate at 1 to 1-1/4 percent. The stance of monetary policy remains accommodative, thereby supporting some further strengthening in labor market conditions and a sustained return to 2 percent inflation.*
Continued…

In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. The Committee will carefully monitor actual and expected inflation developments relative to its symmetric inflation goal. The Committee expects that economic conditions will evolve in a manner that will warrant gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.

In October, the Committee will initiate the balance sheet normalization program described in the June 2017 Addendum to the Committee’s Policy Normalization Principles and Plans.

Voting for the FOMC monetary policy action were: Janet L. Yellen, Chair; William C. Dudley, Vice Chairman; Lael Brainard; Charles L. Evans; Stanley Fischer; Patrick Harker; Robert S. Kaplan; Neel Kashkari; and Jerome H. Powell.
Eurodollar Futures

Source: CME Group via Bloomberg
Summary of Economic Projections: Federal Funds Rate

Note: Each dot in the chart represents the value of an FOMC participant’s judgment of the midpoint of the appropriate target range (or the appropriate target level) for the federal funds rate at the end of the calendar year. Projections made for the September 2017 meeting.

Source: Board of Governors
Monetary Base

Source: Board of Governors via Haver Analytics
Capital Market Rates

Source: BofA Merrill Lynch & Board of Governors via Haver Analytics
Treasury Yield Curve

Source: Board of Governors via Haver Analytics
Risk Premium

Note: Risk Premium is defined as the difference in yields between BofA Merrill Lynch BBB and 10-year Treasury.

Source: BofA Merrill Lynch & Board of Governors via Haver Analytics
The views expressed here are those of the author, and do not necessarily represent those of the Federal Reserve Bank of Richmond or the Federal Reserve System.