An Examination of Current Economic Conditions in the Nation and in the Memphis Area

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Memphis, TN
The views we will express are our own and do not necessarily reflect the positions of the Federal Reserve Bank of St. Louis or the Federal Reserve System.
The Big Picture

• Healthy forward momentum heading into the second half of 2018. Bodes well for 2019.
• But recent data have been partially distorted by Hurricanes Harvey and Irma.
• Solid labor and financial market conditions and low inflation.
• Fed normalization process is underway.
Key Questions in the Outlook

• Is 2% economic growth still the norm.
• Is inflation temporarily low?
• Have we moved to a low interest rate regime?
• If we are in a low interest rate regime, what does that imply for the economy and monetary policy?
A Brief on the U.S. Economy: A Near-Term View

• As usual, there are tensions in the data that influence the near-term outlook.

• First, the outlook for manufacturing and business capital spending is improving.
  
  ○ An improving global economy is a tail wind for the U.S. manufacturing sector.

• Second, labor markets conditions remain solid; the unemployment rate is falling.
Unemployment Rates are Low, Regardless of How They are Measured

The U-3 (Official) and U-6 Unemployment Rates and their Long-Run Median Unemployment Rates

(Dotted Lines are Long-Run Medians)

Inflation-Adjusted Wage Gains Have Accelerated Since 2012.

The Atlanta Fed Wage Growth Tracker and Inflation
Percent change from a year earlier

A positive gap is positive!

Last actual observation is Aug. (Inflation) and Sept. (Wages) 2017.
Third, financial conditions are broadly supportive of continued economic growth.

Fourth, consistent with solid fundamentals, consumer spending growth should remain healthy; auto sales boomed in September.

Finally, there are divergent trends between single-family and commercial and multi-family construction activity.
Starkly Different Trends in Construction Activity

Commercial and Multi-Family Construction
Percent changes from 12 months earlier

Fannie Mae Home Purchase Sentiment Index
Index, March 2011 = 60

NOTE: Commercial defined as sum of office, commercial, and health care.
SOURCE: Haver Analytics and Census

NOTE: Seasonal adjustment by Haver Analytics.

Last actual observation is Sept. 2017.
What’s Up with Inflation? It’s Low

• In 2012, the FOMC established a 2% inflation target.

• But inflation has been below the target for most of this time.

• Gyrations in food and energy prices can cause inflation to deviate temporarily from the target.
  o The collapse in oil prices in June 2014 is an example.
Going nowhere fast—inflation remains below the Fed’s target rate (2%).

The Fed's Preferred Inflation Measure
Percent change from a year earlier

FOMC Inflation Target (2%)

NOTE: Inflation calculated from the personal consumption expenditures price index. Last observation is August 2017. Source is the Bureau of Economic Analysis.
Is There a New Normal for Inflation? Perhaps.

- Some economists are beginning to wonder if 2% is attainable in light of fundamental changes in the economy.
- For example, the fracking revolution in the United States seems to have permanently lowered the price of crude oil ("shale band").
- Others wonder whether the "Amazon effect" has exerted similar effects on retail prices.
The “Amazon Effect?” Falling Prices of Goods Purchased Via Electronic Shopping.

**E-Commerce Implicit Price Deflator**

2009 = 100


**SOURCE:** Bureau of Economic Analysis.
The St. Louis Fed’s Price Pressures Measure Suggests Inflation is Behaving Differently.

<table>
<thead>
<tr>
<th></th>
<th>2016 (A)</th>
<th>2017</th>
<th>2018</th>
<th>Longer run</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real GDP</strong></td>
<td>1.9</td>
<td>2.4</td>
<td>2.1</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Unemployment Rate</strong></td>
<td>4.7</td>
<td>4.3</td>
<td>4.1</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Inflation</strong></td>
<td>1.4</td>
<td>1.6</td>
<td>1.9</td>
<td>2.0</td>
</tr>
</tbody>
</table>

NOTE: FOMC Projections are the median estimates of FOMC participants. The unemployment rate is the average of the fourth-quarter for the year indicated.
A Brief on the U.S. Economy: A Longer-Term View

- We’re into the 8th year of expansion . . . The average expansion lasts about 5 years.

- Real GDP growth during this expansion has been the weakest on record; growth has averaged a little less than 2.25% per year.

- There are many reasons for this: Deleveraging, tighter access to credit, reregulation, higher taxes, demographics.
Real GDP Growth in the Current Expansion is the Weakest on Record.

Average Real GDP Growth During U.S. Business Expansions
Percent change, annualized rate

SOURCE: BEA and author's calculations.
In summer 2016, we argued that the U.S. economy could be characterized by:

– Persistently low real GDP growth.
– Goal variables (unemployment rate and inflation) near targets.
– Low real interest rates.

Our conclusion: It would be a mistake to assume a rapid return to a 4% policy rate.
The FOMC Believes that the U.S. Economy has Transitioned to a Low-Interest Rate Regime.

The FOMC Median Real Long-Term Federal Funds Rate Projection
Percent

NOTE: The real rate is the median nominal rate less the longer-run projected headline PCE inflation rate.
Source: Quarterly Federal Reserve Summary of Economic Projections
Is the Low-Interest Rate Regime Temporary or Permanent?

• Well, nothing is really permanent except death and taxes!

• There are many reasons why the FOMC has steadily lowered its longer-run policy interest rates projection.

• But a key reason is their assessment that the U.S. economy is now stuck in a low economic growth regime ("the new normal").
The Framework for Economic Growth: The Factors that Matter

• Growth arises from a discovery of new ideas.

• Economists focus on four factors:
  – Capital outlays by business and, less so, government.
  – Educational attainment
  – R&D (search for new ideas)
  – Number of people in the economy

• Second and third factors explain about 80% of economic growth from 1950 to 2007.
The Macroeconomic Growth Recipe

• We can boil this framework down to a simple identity that links labor inputs with productivity:

  \[ \text{Real GDP} = \frac{\text{GDP}}{\text{Workers}} \times \frac{\text{Workers}}{\text{Population}} \times \text{Population (age 16+)} \]

• The terms are expressed in growth rates.

• Few metrics in macroeconomics are more important than the growth rate of productivity.
Macro Explanations for Lower Economic Growth: Labor Market Developments

The Labor Force Participation Rate and the Employment-to-Population Ratio

Macro Explanations for Lower Economic Growth: Weaker Labor Productivity

**Growth of Labor Productivity, 1948 to 2017**

Percent change, annual data

- 1948-73 (2.8%)
- 1974-95 (1.5%)
- 1996-2005 (2.6%)
- 2006-2017 (1.2%)

**NOTE**: Labor productivity is output per hour in the nonfarm business sector. Data for 2017 are for the first and second quarters.
Where Might We Be Wrong? Some Considerations.

- Economic growth could be low because we are not measuring productivity accurately.
- How? The Internet of things could have created a series of innovations that are not accurately captured in the data.
- Comprehensive tax reform could spur firms to expand their capital stock, which could raise productivity.
Two Scenarios for Future Productivity Growth

<table>
<thead>
<tr>
<th>Item</th>
<th>Conservative scenario</th>
<th>Optimistic scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual percentage growth in labor productivity (baseline assumption)</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Plus: Sources of additional potential productivity growth (percentage points)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big data in healthcare</td>
<td>0.07</td>
<td>0.14</td>
</tr>
<tr>
<td>Robotics</td>
<td>0.07</td>
<td>0.25</td>
</tr>
<tr>
<td>E-learning</td>
<td>0.15</td>
<td>0.30</td>
</tr>
<tr>
<td>Higher R&amp;D spending in non-Western economies</td>
<td>0.10</td>
<td>0.25</td>
</tr>
<tr>
<td>Equals: Total potential labor productivity growth (percent)</td>
<td>1.89</td>
<td>2.44</td>
</tr>
</tbody>
</table>

Source: Branstetter and Sichel (2017)
Answers to Key Questions in the Outlook

• 2% economic growth is still the consensus forecast, but there are reasons for optimism.

• Inflation is stubbornly low.

• We are still in a low interest rate economy.

• The FOMC is likely to remain cautious without firm evidence of either faster or slower growth and/or inflation.
END
Startups, STEM Jobs, and the Tech Sector

Charles S. Gascon
Regional Economist
October 20, 2017

The views I will express are my own and do not necessarily reflect the positions of the Federal Reserve Bank of St. Louis or the Federal Reserve System.
6% of all US Jobs are STEM Jobs

4% of all Memphis Jobs are STEM Jobs

11% of all US Jobs are at Startups

4% of all US Jobs are in the Tech Sector

2% of all Memphis Jobs are at Startups

1% of all Memphis Jobs are in the Tech Sector
Understanding the intersections

- 13 Million at Startups
- 490,000 Employed in Tech-Startups
- 250,000 Employed in STEM Jobs @ Tech-Startups
- 700,000 Employed STEM Jobs at Startups
- 8.5 Million an STEM Jobs
- 4.6 Million in Tech Sector
- 2.5 Million STEM Jobs in Tech Sector
- 490,000 Employed in Tech-Startups
If these groups are small why do we care?

• Business startup activity key to US job creation and economic dynamism

• STEM job growth is faster than non-STEM growth

• STEM jobs pay higher wages

• Tech sector is small, but innovations are disrupting many other industries
Startups
Is today’s economy less dynamic?

Business Startup Rate

Source: Census Bureau, Business Dynamics Statistics
Business Startup Rates (2014)

National Rate: 8.0%

Arkansas: 6.7%
Mississippi: 6.4%
Tennessee: 6.9%

Source: Census Bureau, Business Dynamics Statistics
Startup rates vary across the region

Source: Census Bureau, Business Dynamics Statistics
It is only a small set of “high-growth firms” driving overall job growth

Source: Decker et. al, *Journal of Economic Perspectives (Summer 2014)*
Startups account for a disproportionate share of job creation

Net job creation as share of total employment - US

Source: Census Bureau, Business Dynamics Statistics
Startups account for a disproportionate share of job creation

Net Job Creation as a share of total employment - Memphis

Source: Census Bureau, Business Dynamics Statistics
Young firms driving net job creation

Startup (0 to 5 yr.) firms' contributions to net job creation (2011-2014)

Source: Census Bureau, Business Dynamics Statistics
STEM Jobs
STEM jobs = “Tech Jobs”

- 6% of US Jobs are STEM
- 4% of Memphis Jobs are STEM
- TN STEM Jobs are concentrated in 3 MSAs:
  - 37% in Nashville, MSA
  - 18% in Memphis, MSA
  - 17% in Knoxville, MSA

STEM Jobs are found in all sectors of the economy

Arkansas: 4%
Mississippi: 3%
Tennessee: 5%

Low rates of STEM employment in the region

<table>
<thead>
<tr>
<th></th>
<th>STEM Share</th>
<th>STEM Growth (2014-15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>6.2%</td>
<td>2.9%</td>
</tr>
<tr>
<td>AR</td>
<td>4.0%</td>
<td>3.4%</td>
</tr>
<tr>
<td>MS</td>
<td>3.3%</td>
<td>2.5%</td>
</tr>
<tr>
<td>TN</td>
<td>4.6%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Memphis</td>
<td><strong>3.9%</strong></td>
<td><strong>-3.8%</strong></td>
</tr>
<tr>
<td>Nashville</td>
<td>5.3%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Louisville</td>
<td>4.1%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>6.8%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>6.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td>St. Louis</td>
<td>6.1%</td>
<td>-2.2%</td>
</tr>
</tbody>
</table>

Educational attainment key factor for STEM employment

Source: American Community Survey, BLS Occupational Employment Statistics
STEM wages are 2 times non-stem wages
Tech Sector
The “Tech sector” defined

<table>
<thead>
<tr>
<th>NACIS</th>
<th>Industry Name</th>
<th>Largest Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>334</td>
<td>Computer Manufacturing</td>
<td>Apple</td>
</tr>
<tr>
<td>454111</td>
<td>Electronic Shopping</td>
<td>Amazon</td>
</tr>
<tr>
<td>5112</td>
<td>Software Publishing</td>
<td>Microsoft</td>
</tr>
<tr>
<td>518</td>
<td>Data Processing, Hosting &amp; Related Services</td>
<td>Xerox</td>
</tr>
<tr>
<td>51913</td>
<td>Internet Publishing &amp; Broadcasting and Web Search</td>
<td>Google</td>
</tr>
<tr>
<td>5415</td>
<td>Computer Systems Design</td>
<td>IBM</td>
</tr>
<tr>
<td>5417</td>
<td>Scientific and R&amp;D Services</td>
<td>QuintilesIMS</td>
</tr>
</tbody>
</table>

Source: Compustat and Authors calculations
Tech sector generally concentrated in the northeast and west coast

National Rate: 3.9%

Arkansas: 1.6%
Mississippi: 1.1%
Tennessee: 1.7%

Source: Bureau of Labor Statistics and authors calculations
Growth in the tech sector has outpaced the broader economy since 2010

Source: Bureau of Labor Statistics and authors calculations
Regional performance a bit weaker

Index, Jan. 1990 = 100

Source: Bureau of Labor Statistics and authors calculations
Computer systems focus in regional tech sector

Industry Share of Tech Employment - Memphis

- Computer Manufacturing: 22% (Memphis), 23% (US)
- Computer Systems Design and Services: 41% (Memphis), 51% (US)
- Data Processing and Hosting: 5% (Memphis), 6% (US)
- Electronic Shopping: 6% (Memphis), 4% (US)
- Internet Publishing and Web Search: 1% (Memphis), 4% (US)
- Scientific R&D: 7% (Memphis), 14% (US)
- Software Publishing: 7% (Memphis), 7% (US)
Final thoughts

While employing a relatively small share of workers, these areas are vital to economic prosperity.

• They are key drivers of job growth;
• the jobs provide high wages;
• they can lead to productivity growth and positive spillovers within a region.
Find out more!

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