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Indiana Economic OUTLOOK
2017 Economic Forecast for United States & Indiana

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Economic Growth Factors

Economic growth, as measured by inflation adjusted changes to gross domestic product, averaged 3.5 percent from the end of World War II through 2007. Since the end of the Great Recession, in 2009, GDP growth has averaged less than 1.5 percent. To better understand this, it is helpful to review how economists think about the factors that cause economic growth. It is embedded in this equation:

\[ Y = AK\alpha N\beta \]

...where GDP (Y) is a function of overall technological change (A), while K is productive capital, with \(\alpha\) a measure of its productivity or quality. N is a measure of the total amount of labor available, while \(\beta\) is its productivity or quality. Growth occurs due to increases in any one or combination of these variables.

It is not clear whether technology or the quality of capital has changed significantly in the wake of the Great Recession. Clearly, an extended period of near zero interest rates offers the potential for significant increases in capital. However, changes to the quantity of labor appears to be a significant factor in slow growth. A declining labor force participation rate, which is mostly a consequence of demographic changes, has caused labor supply to grow slowly. With a slow growing labor demand, the economy has slowly moved to full employment. See Figure 1.

An important concern regarding slow growth accompanied by a high money supply, is naturally inflation. Though such broad measures of inflation, such as the Consumer Price Index, remain muted, core inflation (measured as CPI minus food and energy, see Figure 2) has accelerated in recent months. General decreases in energy and commodity prices have accompanied a slower world economy, thus lessening measured inflation. However, the core inflation measures have been in excess of 5.0 percent for a full 12 months.

The only recent period in which core inflation reached these levels resulted in significant tightening of monetary policy by the Federal Reserve. It is worth noting that the round of interest rate increases accompanying this higher core inflation rate helped precipitate the bursting of the housing market bubble. However, there are many other considerations other than core inflation, which itself poorly represents actual price level changes. Also, the most critical problems with inflation are not changes to actual price levels, but heightened expectations about future inflation, which influence contracts and
price setting into the long run. The lengthy period of low inflation suggests that it would be some time before actual inflation alters expectations with a resulting impact on the economy. For these reasons, inflation remains only a modest future concern at this time.

**Performance of Economic Indicators**

A useful way of organizing data about the recovery is to focus on several related indicators of a particular part of the economy. Comparing the most recent available data to the same period just prior to the start of the Great Recession (which began in 4th Quarter 2007) offers comparisons of the ensuing nine years of economic change. We begin with indicators of labor markets. See Figure 3a. In recent years, employment levels and the unemployment rate have offered some of the strongest indicators of a recovery. In comparison to 3rd Quarter 2007, initial jobless claims and mass layoffs are meaningfully lower now than in 2007. However, the unemployment rate, and real weekly wages are roughly the same over the same period. Labor force participation rates are also lower than in 2007, though much of this is due to demographic changes. Moreover, the median duration of unemployment, the share of unemployed who have been jobless for more than 27 weeks (long-term unemployed) is dramatically higher. Also, those unemployed involuntary (for economic reasons) is also much higher than in 2007.

Labor markets have slowly, but steadily improved since the end of the Great Recession, and the economy approaches full employment. However, labor market conditions are not as robust as they were at the height of the last business cycle, and there remains the very real possibility of significant unobservable slack in labor supply.

Financial markets have largely recovered. See Figure 3b. The Financial Stress Index is profoundly lower than at the peak of the last recovery, and interest rates (both policy and market) are more favorable to borrowers. Business debt to equity is effectively at the 2007 level, and home prices have largely recovered in the 20 large metropolitan areas surveyed by the S&P/Case-Shiller Index.

Equity markets have also recovered, and are now at or near record levels. One troubling area is the federal debt, which has doubled since 2007 and rose from just over 60 percent to more than 100 percent of US GDP.

Labor and financial market recoveries have been sufficient to boost the confidence of both businesses and consumers. See Figure 3c. In every measure of confidence about the current and future conditions of the economy we are at or better than the 2007 level. On surveys on consumer confidence, and on leading indicators
index data, recession probability and economic uncertainty are now better than in 2007. Workers are now as likely to leave a job as in 2007, and business confidence leading to hires remains at the same level as 2007. Both jobs vacancies and overall capacity utilization remain much the same as in 2007.

The manufacturing sector has also rebounded briskly. See Figure 3d. Though the first half of 2016 showed some slowing of global demand for goods, this came on the back of the record US manufacturing year of 2015. This modest slowdown is reflected in inventories, and inventory to shipment ratios in these data. With the exception of employment cost, which is heavily driven by health care-related non-wage compensation, manufacturing looks much like it did in 2007 and 2015, the previous two record years.

2016 Summary

The economy has made major strides since the depths of the Great Recession. Consumer and business confidence now exceed that of the pre-recession period, and manufacturing achieved its record production year (in inflation-adjusted terms) by 2015, though it has slowed modestly in the first half of 2016. Financial markets are strong, both in the indicators provided and in nearly every other measure of financial and capital stability. Labor markets have also recovered some of their top line numbers, and are, by any measure, close to full employment. However, it will require some months of tight labor markets around the nation to fully absorb the higher number of long-term unemployed and to boost the labor force participation rate. While the recovery is occurring, it has been a record slow recovery and we are not yet at the wage and labor market conditions that would typically be associated with a recovery that is now 66 months old. It is in that context that we turn our attention to a forecast of 2017.

"It will require some months of tight labor markets around the nation to fully absorb the higher number of long-term unemployed and to boost the labor force participation rate."

Sidebar: What Is the Federal Reserve Thinking?

Many folks in the media and financial sectors closely watch the Federal Reserve. For these observers, the inflation rate seems to dominate concern over rate changes. Economists generally worry also about other factors, and a formula known as the Taylor Rule has come to provide the best insight into the Fed’s thinking on interest rates, by combing the most salient elements of the decision into a single equation. The Taylor Rule suggests that interest rates should be set by taking into account actual inflation, the real market interest rate, excess inflation and the output gap. Excess inflation is the degree to which observed inflation differs from target inflation and the output gap is the difference between the size of the actual and potential economy. So what would that tell us should be the optimal interest rate as set by the Fed?

The US economy appears to be effectively at full employment, thus the amount of goods and services which could be produced is roughly the same as is being produced. There is no output gap, and that value is zero in the Taylor equation. Likewise, the actual inflation rate is effectively beneath the target rate of 2.0 percent (CPI). That leaves us with just two major factors to consider; inflation and the real equilibrium interest rate. There are a number of alternative proxies for each of these elements of the Taylor Rule. As an example, we choose the i value as the GDP deflator, which has currently enjoyed a one-period change of 1.07 percent. For real equilibrium interest rates, one alternative is the 5-year Treasury Inflation Indexed Security, which currently has a yield of -0.29. This implies a target policy rate of roughly 75 basis points, or effectively one more rate increase.

Assuming a modest inflation gap (where actual is beneath the target rate) would accommodate a slightly higher rate, but less than 50 basis points above the current target rate. At the high end of assumptions, using an annual core inflation rate, might accommodate a 150 basis point increase at the current level of output and employment. However, the object lesson from this calculation is that a 75 basis point target policy rate is well within the appropriate range, with 200 basis points at the high end. So, Fed policymakers are clearly thinking about these conditions when crafting a policy rate response at their Open Market meetings.

One further consideration which the Federal Reserve has outlined involves monetary policy influence on labor markets. While most of the current decline in labor force participation involves the broad sweep of demographic change, long term unemployment remains high. This suggests that the currently observed full employment may underestimate available labor supply. This would mean the output gap is greater than zero, and that the target policy rate should be more accommodative.

One likely mechanism to close the output gap through higher demand would be to raise target inflation, so that nominal wage increases would increase labor supply. While it remains uncertain whether the Fed will adopt this approach it is surely consistent with their dual mandate to balance inflation and unemployment. It is also a method suggested by economic analysis which identifies wage rigidities within labor markets as a barrier to equilibrium levels of labor force participation. Both of these considerations have their genesis in policy and research dating back several decades.

Note [1]: The Taylor Rule is formally:

\[ r_t = \gamma_1 + r^* + \alpha_1 (1 - \gamma_0) + \alpha_2 (\gamma_0 - y^*_t) \]

...where \( r_t \) is the policy interest rate, \( \gamma_0 \) inflation \( r^*_t \), the real assumed equilibrium interest rate (typically the market funds rate in inflation adjusted terms), and \( y^*_t \) is output (GDP). The model assumes \( \alpha > 0 \) to promote adjustment under conditions of inflation or output gap conditions.

The 2017 Forecast

Our forecast is derived from three models. See Table 1. The 2017 Indiana Econometric Model combines national and state economic data, including forecasts from the FAIR Model to construct a forecast of select economic variables. We also include a naïve forecasting model of GDP (the Santoni Model, see Table 2), the unemployment rate, the 10-year US Treasury note and inflation. We begin with US forecasts.

Our model predicts the US economy will grow, in inflation adjusted terms, by 2.1 percent in 2017. That is better than the the growth of the national economy in 2016, and effectively identical to the OECD forecast for the year at 2.2 percent. The naïve models predict growth at 2.3 percent, with an unemployment rate for 2017 of 4.7 percent.

The statistical distribution of these forecasts (see Figure 4) offers a visual insight into the levels of forecasts made by different organizations. We plot the forecast value on the horizontal axis. The bars depict the number of forecasts at each value (scale on the right axis), and the normal distribution around the mean is depicted in the curve, with values on the left axis. Accounting for each of the observed forecasts, the mean is 2.3 (incidentally identical to the Santoni Model forecast) with a standard deviation of 0.4 percent. Applying the characteristics of a normal distribution to these data, we can interpret the probability of the point forecasts for each.

Table 1. National Forecast Comparison
Source: Various listed below

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAIR Model</td>
<td>US GDP growth</td>
<td>3.4%</td>
</tr>
<tr>
<td></td>
<td>US inflation (GDP Deflator)</td>
<td>1.1%</td>
</tr>
<tr>
<td>Indiana Econometric Model</td>
<td>US GDP growth</td>
<td>2.1%</td>
</tr>
<tr>
<td></td>
<td>US unemployment rate</td>
<td>4.8%</td>
</tr>
<tr>
<td>Naïve Model (Santoni)</td>
<td>US GDP growth</td>
<td>2.3%</td>
</tr>
<tr>
<td>OECD Forecast</td>
<td>US GDP growth</td>
<td>2.2%</td>
</tr>
<tr>
<td>IMF Forecast</td>
<td>US GDP growth</td>
<td>2.5%</td>
</tr>
<tr>
<td>UBS</td>
<td>US GDP growth</td>
<td>2.5%</td>
</tr>
<tr>
<td>World Bank</td>
<td>US GDP growth</td>
<td>2.2%</td>
</tr>
<tr>
<td>Federal Reserve</td>
<td>US GDP growth</td>
<td>2.0%</td>
</tr>
<tr>
<td>Economist Intelligence Unit</td>
<td>US GDP growth</td>
<td>2.3%</td>
</tr>
<tr>
<td>European Union</td>
<td>US GDP growth</td>
<td>2.7%</td>
</tr>
<tr>
<td>Kiplinger</td>
<td>US GDP growth</td>
<td>2.0%</td>
</tr>
<tr>
<td>Trading Economics</td>
<td>US GDP growth</td>
<td>1.9%</td>
</tr>
<tr>
<td>Statista</td>
<td>US GDP growth</td>
<td>2.5%</td>
</tr>
<tr>
<td>CBO</td>
<td>US GDP growth</td>
<td>1.7%</td>
</tr>
<tr>
<td>Average</td>
<td>Mean GDP growth rate</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Table 2. Results from the Naïve Forecasting Model (Santoni Model)
Source: Author calculations using Bureau of Economic Analysis

<table>
<thead>
<tr>
<th>2017 Forecast</th>
<th>2017 Q1</th>
<th>2017 Q2</th>
<th>2017 Q3</th>
<th>2017 Q4</th>
<th>2017 Avg</th>
<th>Blue Chip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in GDP</td>
<td>2.3</td>
<td>2.1</td>
<td>2.2</td>
<td>2.7</td>
<td>2.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>1.6</td>
<td>2</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td>2.1</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>4.8</td>
<td>4.8</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Interest Rates</td>
<td>1.7</td>
<td>1.5</td>
<td>1.5</td>
<td>1.4</td>
<td>1.5</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Figure 4. US Forecast Distribution
Source: Author calculations using Table 1

One useful (though not precisely correct) inference of this is that about seven out of 10 times, we would expect the actual GDP growth to fall within the values of 1.9 percent and 2.7 percent. The imprecision of this interpretation is that the historical distribution of the forecasts most likely converge on the mean, so that the error is exaggerated. However, economic forecasting in the wake of the Great Recession has proven far more error prone across the board than the pre-recession period, that a full 0.8 percent range of a forecast estimate is not unreasonable.

Thinking About the Business Cycle

The current expansion dates to July 2009, making it the third longest in US history. Only the expansions starting in March 1991 and November 1970 are longer. However, longer recoveries and shorter recessions are a clear trend over the past few decades, signaling more effective policy intervention and more stable employment structure in the United States. However, there are signs for concern. Domestic investment has just experienced a decline consistent with all other post World War II recessions. Industrial production has seen a full year’s decline, however, other common indicators of a business cycle, such as employment, retail sales, and...
real personal income (excluding transfers) have experienced many consecutive quarters of growth. Thus, as with earlier forecasts, the economy appears to be growing slowly, but consistently, with mixed indicators about future performance. See Figure 5.

The Local Forecast

Turning our attention to Indiana, we note three things. First, while the Indiana economy differs from that of the typical state in many aspects, we generally track the national economy. Second, the most obvious difference between Indiana and the national economy is our large manufacturing and logistics shares. And finally, these sectors are more sensitive to the business cycle than most services. Thus, Indiana tends to have a more volatile economy than most. However, that does not appear to be a concern at this point in the business cycle. See Table 3.

As of 4th Quarter 2016, Indiana’s economy appears to have weathered 2016 well, with employment growth at a higher rate than the nation as a whole. We expect 46,000 new jobs in 2017, and a further 37,500 in 2018. The overall economy will grow by 2.1 percent in Indiana in 2017, slowing only slightly in 2018. Personal income growth in Indiana should outperform the nation as a whole, led by manufacturing, logistics, health care, and professional services. See Table 4. We predict real estate will have a slower recovery than other sectors.

As in previous years, the east central Indiana region will experience slower growth than Indiana as a whole. Population declines in most counties prevent more robust economic growth within the region. See Table 5.

Table 3. Growth Forecast, USA & Indiana
Source: Author calculations using Table 1

<table>
<thead>
<tr>
<th></th>
<th>2017 Growth</th>
<th>2018 Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>US GDP</td>
<td>2.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Indiana GDP</td>
<td>2.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Indiana Personal Income</td>
<td>2.3%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Employment Growth</td>
<td>46,000</td>
<td>37,500</td>
</tr>
</tbody>
</table>

Table 4. Personal Income Growth, Indiana
Source: Author calculations using Table 1

Table 5. Personal Income Growth, East Central Indiana
Source: Author calculations using Table 1
Credits

References & Additional Readings
Hicks, Michael J. 2015. “Annual Indiana Economic Outlook.” Muncie, IN: Center for Business and Economic Research, Ball State University.

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