Lower Oil Prices and the U.S. Economy: Is This Time Different?

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## A Look at the Facts

<table>
<thead>
<tr>
<th></th>
<th>2012Q1-2014Q2</th>
<th>2014Q3-2016Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>1.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Private Consumption</td>
<td>1.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Nonresidential Investment</td>
<td>5.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Exports</td>
<td>3.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Imports</td>
<td>2.3</td>
<td>2.9</td>
</tr>
</tbody>
</table>
How Does an Unexpected Oil Price Decline Affect the Economy?

• Reduction in firms’ costs of production
  Industry-level analysis of excess stock returns:
  ▪ Oil-intensive sectors did at best only marginally better
  ▪ Sectors sensitive to consumer demand did far better than average

• Changes in spending
  ▪ Consumption
  ▪ Investment
  ▪ Petroleum trade balance
How Much Consumption Stimulus?

• Oil price decline fully passed through to retail gasoline prices
• Regression model:

\[ \Delta c_t = \alpha + \sum_{i=1}^{6} \beta_i \Delta c_{t-i} + \sum_{i=0}^{6} \gamma_i PP_{t-i} + u_t \]

• Cumulative effect of purchasing power shocks on U.S. real private consumption since June 2014: 1.2%

Breakdown:
1. Operating cost effect: 0.15%
   Increase in purchases of new motor vehicles of 6.7% weighted by the share of 2.3% in total consumption
2. Discretionary income effect: 1.05%
How Much Consumption Stimulus?

- Back-of-the-envelope calculation

  - The share of gasoline expenditures in total expenditures was 3.17% in June 2014.
  - Crude oil only accounts for a fraction of the cost of gasoline, so the oil price drop of 66% led to a drop of 44.94% in real gasoline prices.
  - Gasoline consumption increases after price drop given a price elasticity of gasoline demand of -0.37 (Coglianese et al. 2016)

\[
(1 - 0.0317) \times 1 + 0.0317 \times (1 - 0.4494)(1 + 0.37 \times 0.4494) = 0.9887
\]

\[
\frac{\text{Other items}}{\text{Fuel}} \quad \frac{\Delta P^{gas}}{\Delta C^{gas}}
\]

\[\Rightarrow\] yields an increase in discretionary income of 1.13%
Did Other Forces Hold Real GDP Growth Back?

Asymmetry hypothesis:
- Oil price increases are unambiguously bad for growth
- Oil price decreases may have no effect since stimulus is offset by
  1. Costly reallocation of resources
     (Hamilton 1988, Bresnahan and Ramey 1993)
     Evidence:
     - Decline in the share of jobs in mining and logging
     - Unemployment rate declined in most oil-producing states
     - Increase in labor force in 4 of the 7 oil-producing states
  2. Higher uncertainty about future oil and gasoline prices
     (Bernanke 1983, Pindyck 1991)
     Evidence:
     - Increase in consumers’ uncertainty about gasoline prices
     - Better current conditions for buying a vehicle in late 2014
     - Sales of less fuel-efficient light trucks increased faster than overall vehicle sales
How Much Does the Shale Oil Sector Matter?

- U.S. domestic crude oil production increased as a result of the fracking revolution since late 2008

- How different would growth have been without the oil sector?

<table>
<thead>
<tr>
<th></th>
<th>2014Q3-2015Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP (Value Added)</td>
<td>2.4</td>
</tr>
<tr>
<td>Excluding Mining Sector</td>
<td>2.4</td>
</tr>
<tr>
<td>Mining Sector</td>
<td>2.4</td>
</tr>
<tr>
<td>Real GDP</td>
<td>2.4</td>
</tr>
<tr>
<td>Excluding Oil-Producing States</td>
<td>2.3</td>
</tr>
<tr>
<td>Oil-Producing States</td>
<td>2.7</td>
</tr>
</tbody>
</table>
## Oil and Investment Spending

<table>
<thead>
<tr>
<th>Private Fixed Nonresidential Investment</th>
<th>2014Q3-2016Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excluding Oil Investment</td>
<td>4.6</td>
</tr>
<tr>
<td>Oil Investment Only</td>
<td>-48.2</td>
</tr>
</tbody>
</table>

- Spillovers to investment in other sectors?
  - Only investment in railroad equipment

- Effect of reduced oil-related investment on real GDP growth

<table>
<thead>
<tr>
<th>Real GDP</th>
<th>2014Q3-2016Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excluding the Change in Investment in Oil and in Railroad Equipment</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Were There Other Structural Changes?

• Financial contagion
  ▪ Lending to shale oil producers exposed banks to oil price risks
    ⟷ No evidence that financial fragility slowed down growth

• Shift in consumers’ behavior
  ▪ Instead of spending, consumers could use discretionary income to
    ➢ pay off mortgage or credit card debt
    ➢ increase their savings
    ➢ acquire financial assets
    ⟷ No empirical support for these hypotheses
Effects of Shale Oil on Real GDP through the Petroleum Trade Balance

- Petroleum trade balance improved as exports of refined products were growing faster than oil imports

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<tr>
<td>Real GDP</td>
<td>2.19</td>
</tr>
<tr>
<td>Excluding the Change in the</td>
<td>2.16</td>
</tr>
<tr>
<td>Petroleum Trade Balance</td>
<td></td>
</tr>
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</table>
The Net Stimulus from Unexpectedly Lower Real Oil Prices

<table>
<thead>
<tr>
<th>Component of Real GDP</th>
<th>Percentage of Cumulative Real GDP Growth (2014Q3-2016Q1)</th>
</tr>
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<tbody>
<tr>
<td>Discretionary Income Effect on Private Consumption</td>
<td>+0.61</td>
</tr>
<tr>
<td>Operating Cost Effect on Private Consumption</td>
<td>+0.09</td>
</tr>
<tr>
<td>Oil-Related Private Nonresidential Investment</td>
<td>-0.62</td>
</tr>
<tr>
<td>Petroleum Trade Balance</td>
<td>+0.04</td>
</tr>
<tr>
<td><strong>Net Stimulus</strong></td>
<td><strong>+0.12</strong></td>
</tr>
</tbody>
</table>
Is This Time Different From 1986?

Overall, more similarities than differences

• U.S. real GDP growth relative to trend is similar
• Pattern of consumption and investment responses is similar

Differences:

• Recent oil price decline twice as large as in 1986
• Composition of investment
  ➢ Now: stronger contraction of oil-related investment
  ➢ 1986: both oil and non-oil investment declined
• Recent oil price decline reflected in part a global economic slowdown which also slowed growth of U.S. real exports