Oil prices continue to fall owing to lower demand and expanding supply.

- Oil prices fell again over the past week, at an accelerated pace relative to the previous week. This price decrease stemmed more or less equally from declining anticipated global demand, larger perceived supply, and a lower residual. In 2016:Q2, reassessment of global demand expectations and tighter supply conditions both exerted upward pressure on oil prices.

- These developments follow the temporary demand-driven oil price weakness of early Q1. Tighter supply conditions, however, exerted upward pressure during this period, leaving oil prices up modestly.

- Overall, since the end of 2014:Q2, both lower global demand expectations and looser supply conditions have held oil prices down—a trend that has been reversing since the end of 2016:Q1, but now seems to be reasserting itself again.

Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.
Cumulative Weekly Decomposition, Apr 01-Sep 02, 2016

The chart at left depicts the cumulative oil price decomposition from April 1, 2016. The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 1, 2016

<table>
<thead>
<tr>
<th>Date</th>
<th>Demand</th>
<th>Supply</th>
<th>Rest</th>
<th>Brent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 19, 2016</td>
<td>15.9</td>
<td>6.5</td>
<td>5.1</td>
<td>27.4</td>
</tr>
<tr>
<td>Aug 26, 2016</td>
<td>14.6</td>
<td>6.5</td>
<td>4.4</td>
<td>25.5</td>
</tr>
<tr>
<td>Sep 02, 2016</td>
<td>12.4</td>
<td>4.5</td>
<td>2.2</td>
<td>19.1</td>
</tr>
</tbody>
</table>

Recent Decomposition Data

- Sources: Authors’ calculations; Haver Analytics; Thomson Reuters; Bloomberg.
- Notes: Residual reflects price movements unexplained by supply and demand factors. Supply, demand, and residual sum to Brent crude price.

Longer-Term View of Oil Price Movements

- The analysis shows that excess supply became a significant driver of oil prices in mid-2012 and generally dominated price dynamics after mid-2014.
Oil Price Decomposition Q&A

1) What is the goal of the oil price decomposition?

Our aim is to determine how much of the observed oil price change has been driven by demand and supply factors.

2) What is the modeling strategy?

Using a statistical model and a large number of financial variables, we decompose weekly oil price changes into demand effects, supply effects, and an unexplained residual.

Sparse partial least squares regression allows us to construct linear combinations from the variables in our financial market data set—called factors—which have maximum explanatory content for oil price changes. We first use this procedure to generate factors that best capture the patterns in the data, and then examine the estimated factors to determine how they reflect demand or supply dynamics.

The model is re-estimated every week using weekly data from January 1986 through the close of business on Friday of the most recent week. Over this sample, the model can explain about two-thirds of the weekly oil price dynamics.

3) How to interpret the results?

The output of the model is used to decompose weekly changes in an accounting sense. More specifically, the weekly Brent crude price change always equals the change explained by demand factors plus the change explained by supply factors plus a residual (the weekly change unexplained by the sum of the estimated demand and supply factors).

Given the noise in weekly price changes, we choose to show the results as a cumulation from a certain starting point (usually the start of the previous quarter).

References


Authors

Brandyn Bok, Jan Groen, and Patrick Russo