OIL PRICE DYNAMICS REPORT
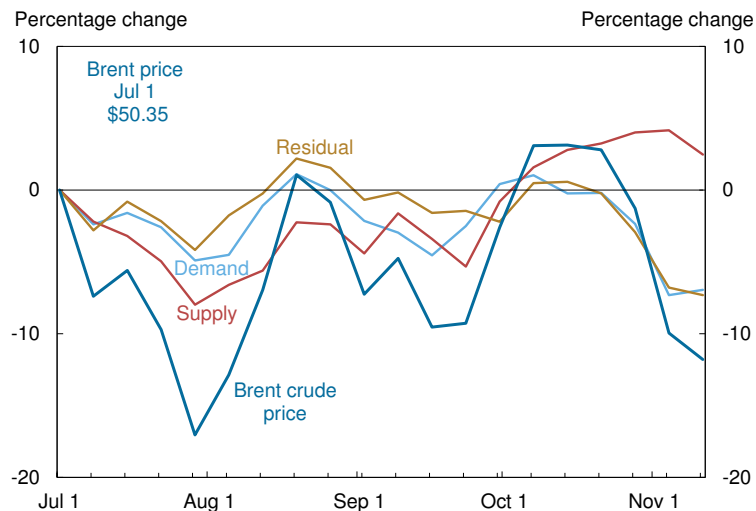
Updated: November 14, 2016

Expanding supply conditions over the past week pushed down oil prices.

- While demand expectations increased slightly over the past week, pressure from a perceived increase in supply resulted in a net decline in oil prices. For 2016:Q3, oil prices were somewhat lower as a result of volatile but weakening global demand expectations as well as looser supply conditions.

- These developments follow the rebound in oil prices in Q2. Upward price pressure from both tighter supply conditions and more upbeat global demand expectations drove this bounce-back.

- Overall, since the end of 2014:Q2, both lower global demand expectations and looser supply have held oil prices down—a trend that appeared to have reversed in 2016:Q2, but reemerged in 2016:Q3.

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, Jul 01-Nov 11, 2016

Percentage change

Percentage change

Brent price
Jul 1
$50.35

Residual

Demand

Supply

Brent crude
price

Jul 1   Aug 1   Sep 1   Oct 1   Nov 1

Sources: Authors' calculations; Haver Analytics; Thomson Reuters; Bloomberg.

Notes: Residual reflects price movements unexplained by supply and demand factors.
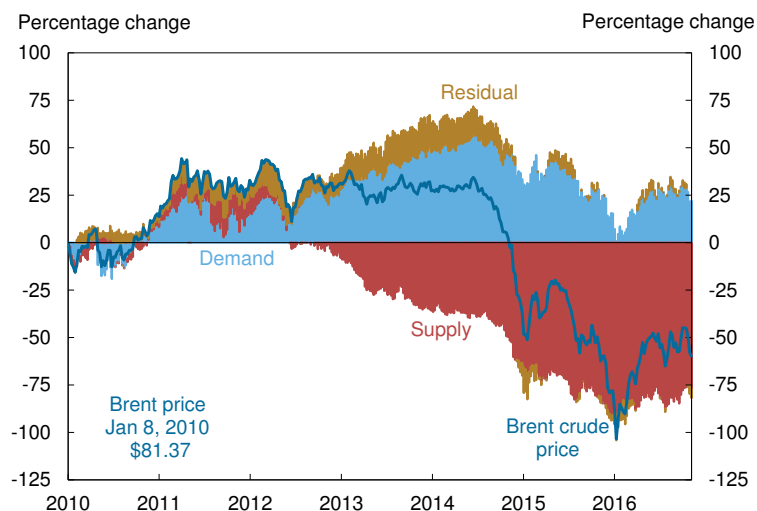Supply, demand, and residual sum to Brent crude price.

Recent Decomposition Data

■ The chart at left depicts the cumulative oil price decomposition from July 1, 2016.

■ The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 1, 2016

	Demand	Supply	Rest	Brent
Oct 28, 2016	-2.4	4.0	-2.9	-1.3
Nov 04, 2016	-7.3	4.2	-6.8	-10.0
Nov 11, 2016	-6.9	2.5	-7.3	-11.8

Cumulative Weekly Decomposition, 2010-16

Percentage change

Percentage change

Residual

Demand

Supply

Brent price
Jan 8, 2010
$81.37

Brent crude
price

2010   2011   2012   2013   2014   2015   2016

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

■ This final chart provides a somewhat longer-term perspective by means of a cumulative decomposition from 2010 onward.

■ 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

■ *Groen, J., and P. Russo.* 2015. "Is Cheaper Oil Good News or Bad News for the U.S. Economy?" *Liberty Street Economics*, June 8.
■ *Groen, J., K. McNeil, and M. Middeldorp.* 2013. "A New Approach for Identifying Demand and Supply Shocks in the Oil Market." *Liberty Street Economics*, March 25.

Authors

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