OIL PRICE DYNAMICS REPORT

Updated: March 23, 2020

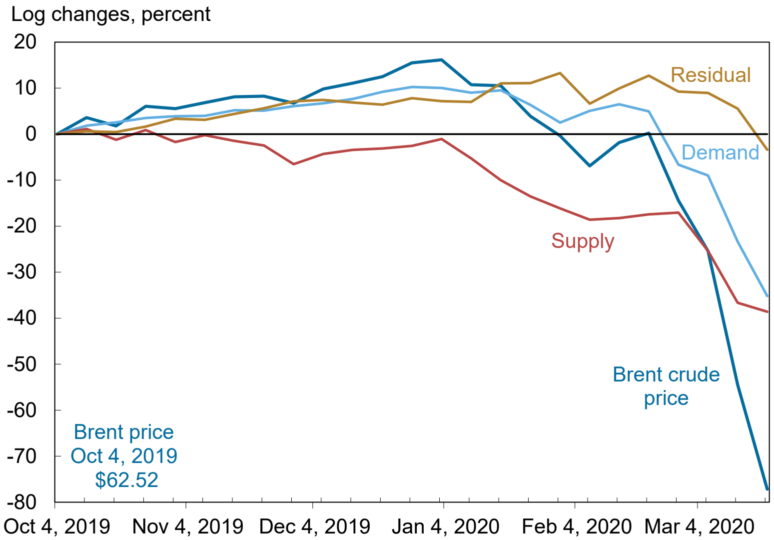
Oil prices fell over the past three weeks owing to decreased demand and increased supply.

- Over the past three weeks, lower demand expectations and an increase in anticipated supply resulted in lower oil prices. In 2019:Q4, oil prices rose owing to an increase in demand.

- In 2018, strengthening global demand expectations drove oil prices higher. This trend reversed in 2018:Q4, when weaker expected demand and higher anticipated supply lowered prices. In 2019:Q1, oil prices rose due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend has reversed as stronger demand expectations and stabilizing anticipated supply have driven oil prices higher.

Cumulative Weekly Decomposition, Oct 04-Mar 20, 2020



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

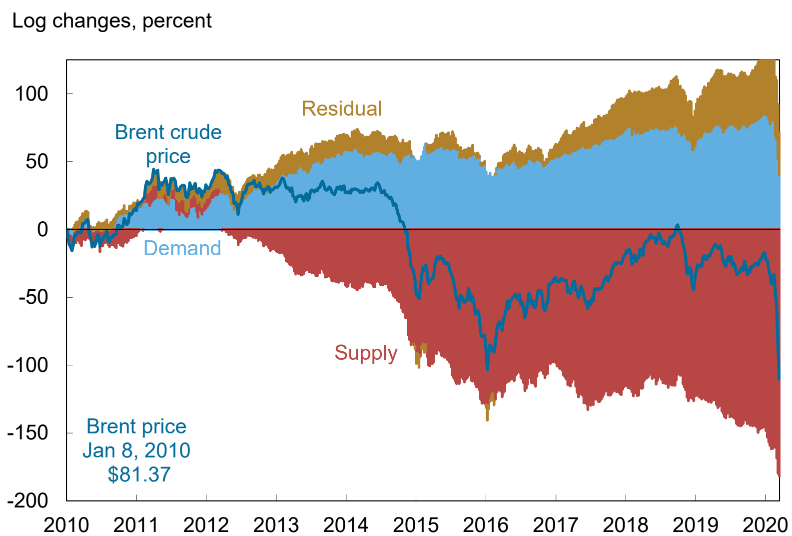
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from October 4, 2019.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since October 4, 2019

	Demand	Supply	Rest	Brent
Mar 06, 2020	-9.0	-25.4	9.0	-25.4
Mar 13, 2020	-23.4	-36.7	5.5	-54.5
Mar 20, 2020	-35.2	-38.6	-3.4	-77.2

Cumulative Weekly Decomposition, 2010-Present



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

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- *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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