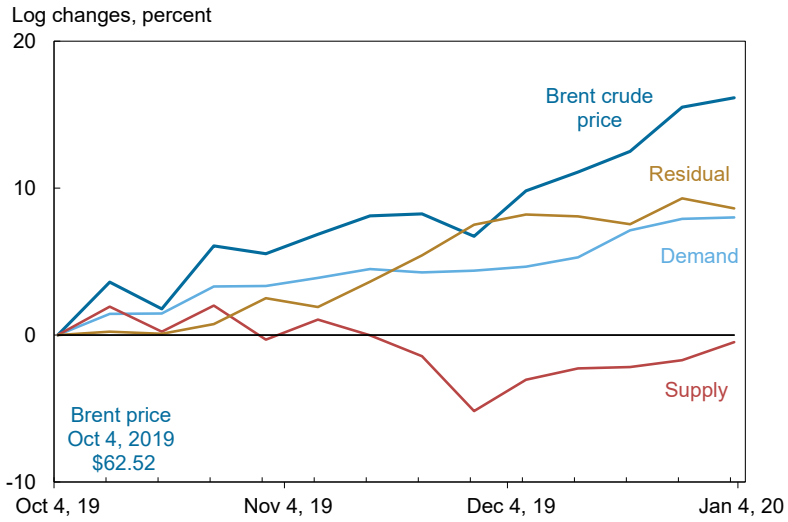
OIL PRICE DYNAMICS REPORT

Updated: January 6, 2020

Oil prices rose over the past week owing to decreased supply.

- Over the past week, lower anticipated supply and slightly higher demand expectations resulted in higher 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-Jan 03, 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.

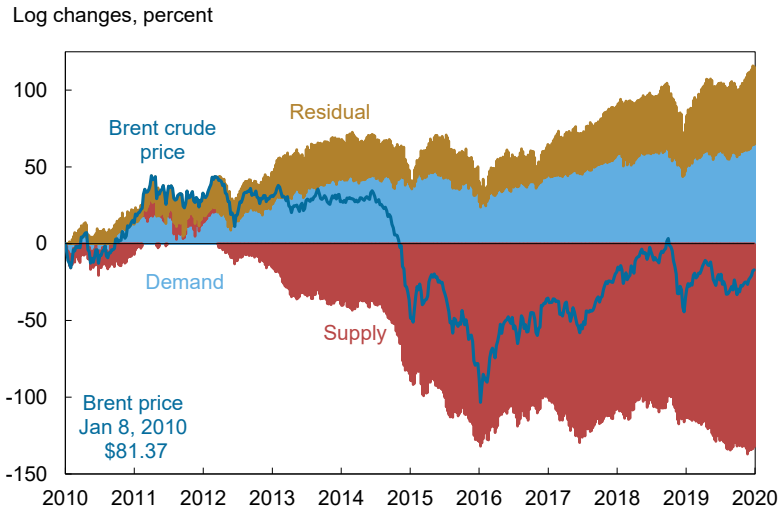
Recent Decomposition Data

- 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
Dec 20, 2019	7.1	-2.2	7.5	12.5
Dec 27, 2019	7.9	-1.7	9.3	15.5
Jan 03, 2020	8.0	-0.5	8.6	16.1

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

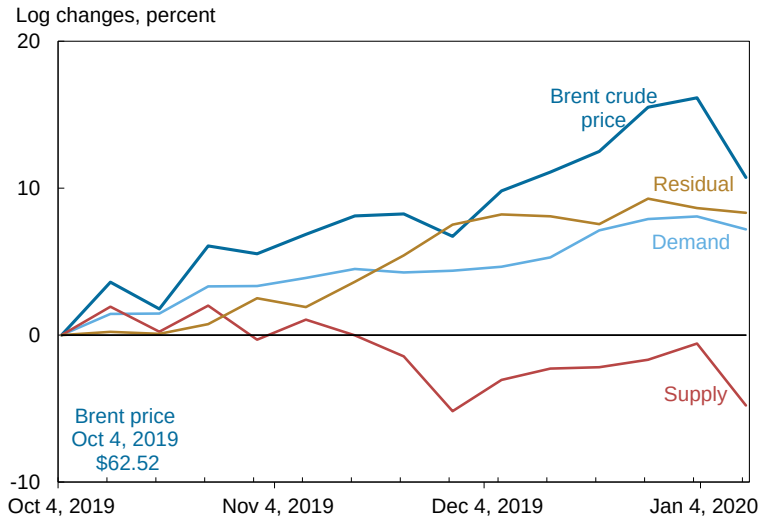
OIL PRICE DYNAMICS REPORT

Updated: January 13, 2020

Oil prices fell over the past week owing to increased supply.

- Over the past week, higher anticipated supply and slightly lower demand expectations 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-Jan 10, 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.

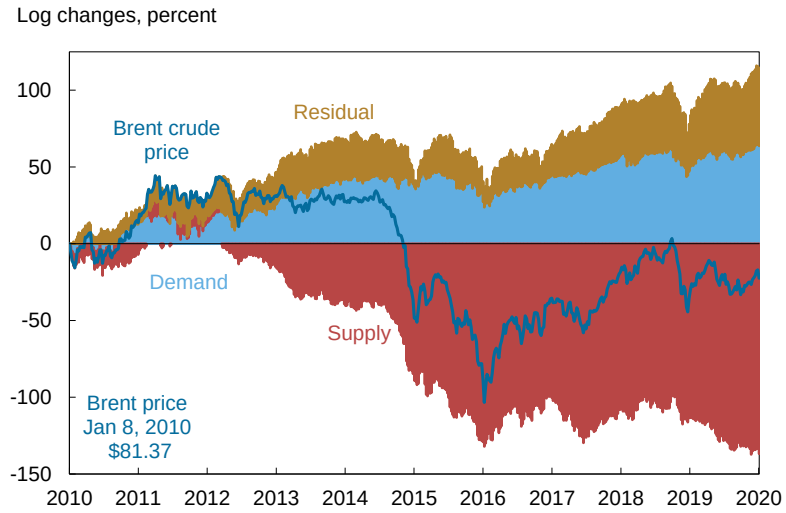
Recent Decomposition Data

- 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
Dec 27, 2019	7.9	-1.7	9.3	15.5
Jan 03, 2020	8.1	-0.6	8.6	16.1
Jan 10, 2020	7.2	-4.8	8.3	10.7

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

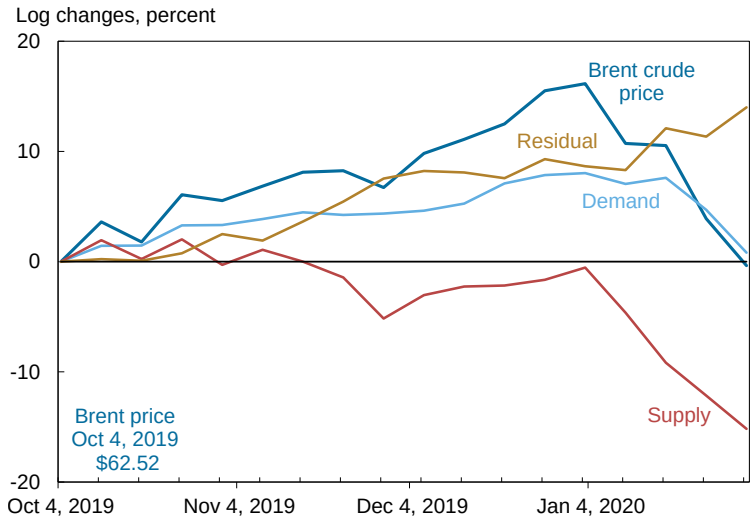
OIL PRICE DYNAMICS REPORT

Updated: February 3, 2020

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

- Over the past three weeks, higher anticipated supply and lower demand expectations 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-Jan 31, 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.

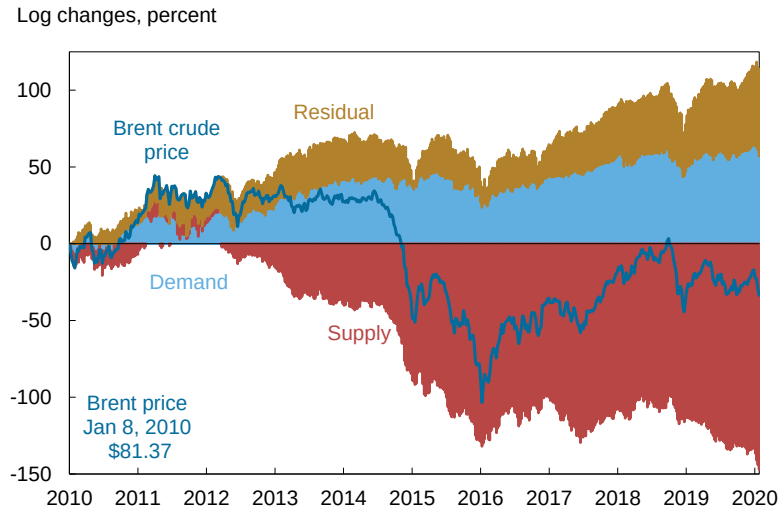
Recent Decomposition Data

- 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
Jan 17, 2020	7.6	-9.2	12.1	10.5
Jan 24, 2020	4.7	-12.2	11.3	3.9
Jan 31, 2020	0.8	-15.2	14.0	-0.4

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

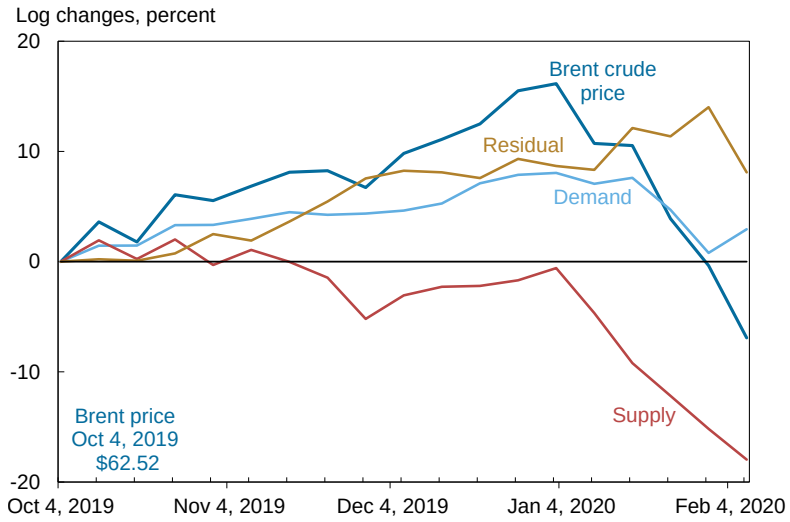
OIL PRICE DYNAMICS REPORT

Updated: February 10, 2020

Oil prices fell over the past week owing to increased supply.

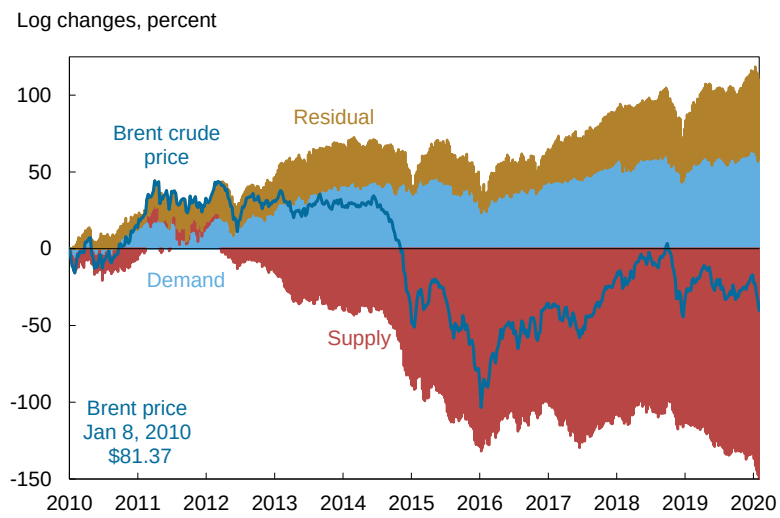
- Over the past week, higher anticipated supply offset higher demand expectations, resulting in lower oil prices. In 2019:Q4, oil prices rose owing to an increase in demand.
- In 2018, strengthening global demand expectations drove oil prices higher. This trend reversed in 2018:Q4, when weaker expected 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-Feb 07, 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.

Cumulative Weekly Decomposition, 2010-Present



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
Jan 24, 2020	4.7	-12.2	11.4	3.9
Jan 31, 2020	0.8	-15.2	14.0	-0.4
Feb 07, 2020	2.9	-18.0	8.1	-6.9

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

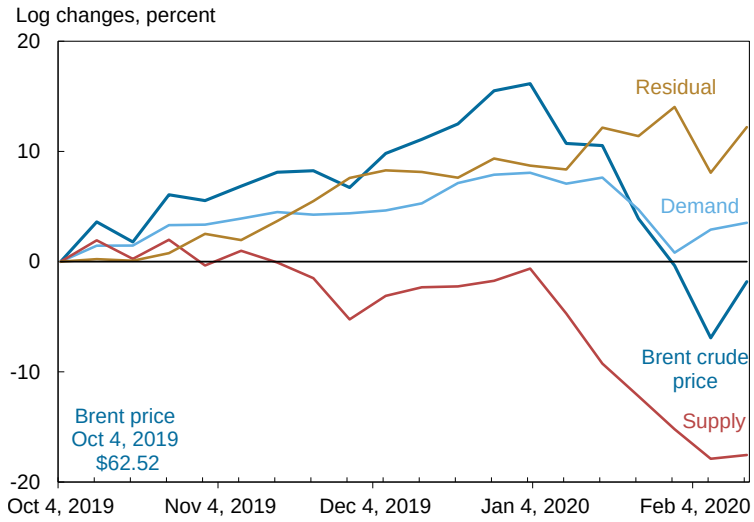
OIL PRICE DYNAMICS REPORT

Updated: February 18, 2020

Oil prices rose over the past week owing to increased demand.

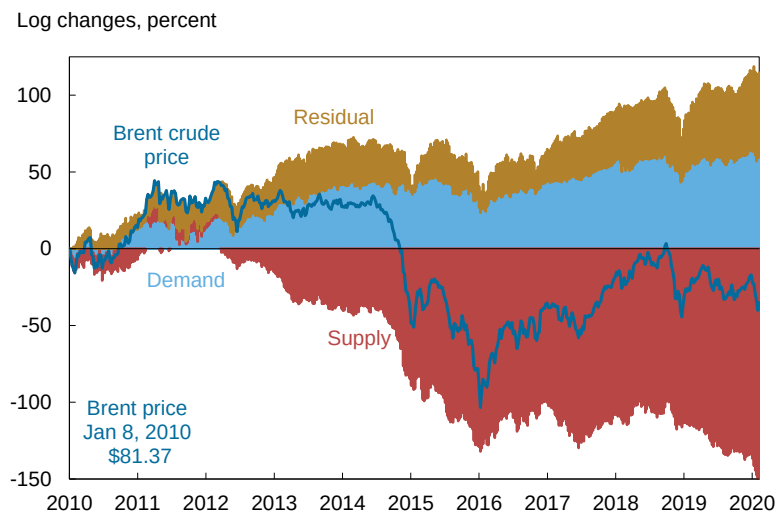
- Over the past week, an uptick in demand expectations, in addition to an increase in the residual, resulted in higher oil prices. Anticipated supply was essentially unchanged. In 2019:Q4, oil prices rose owing to an increase in demand.
- In 2018, strengthening global demand expectations drove oil prices 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-Feb 14, 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.

Cumulative Weekly Decomposition, 2010-Present



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
Jan 31, 2020	0.8	-15.2	14.0	-0.4
Feb 07, 2020	2.9	-17.9	8.1	-6.9
Feb 14, 2020	3.5	-17.5	12.2	-1.8

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

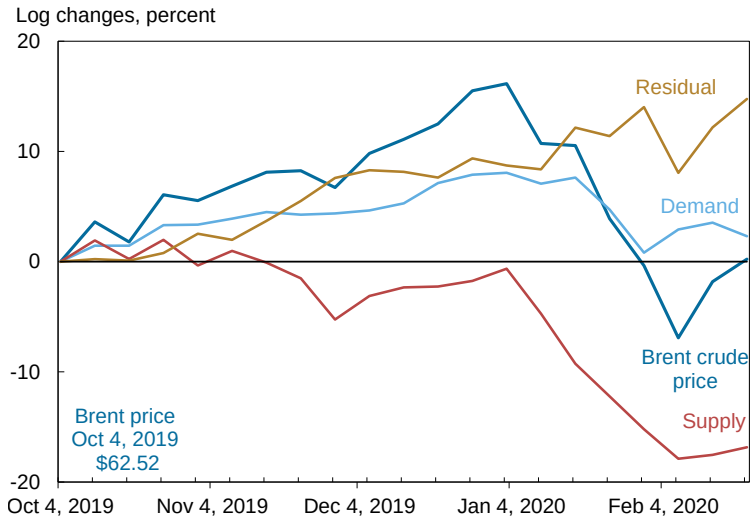
OIL PRICE DYNAMICS REPORT

Updated: February 24, 2020

Oil prices rose over the past week owing to decreased supply.

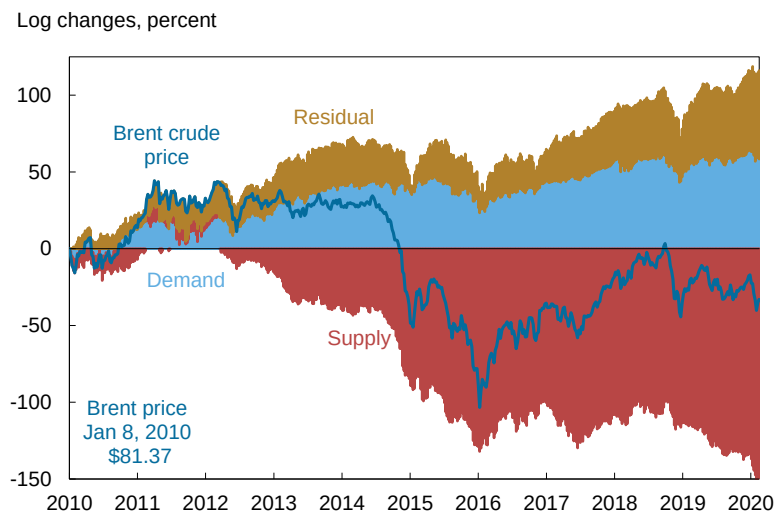
- Over the past week, a decrease in anticipated supply offset a decline in demand expectations, resulting in higher oil prices. In 2019:Q4, oil prices rose owing to an increase in demand.
- In 2018, strengthening global demand expectations drove oil prices higher. This trend reversed in 2018:Q4, when 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-Feb 21, 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.

Cumulative Weekly Decomposition, 2010-Present



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
Feb 07, 2020	2.9	-17.9	8.1	-6.9
Feb 14, 2020	3.5	-17.5	12.2	-1.8
Feb 21, 2020	2.3	-16.8	14.8	0.2

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: March 2, 2020

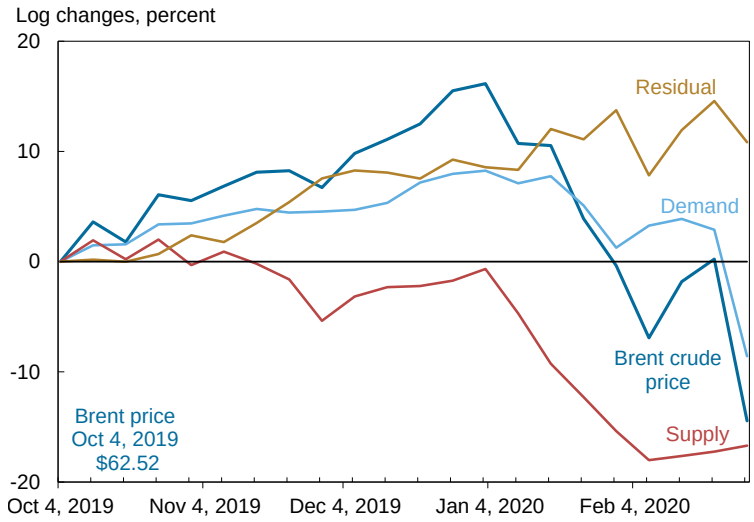
Oil prices fell over the past week owing to decreased demand.

- Over the past week, a decrease in demand expectations offset a decline in anticipated supply, resulting 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.

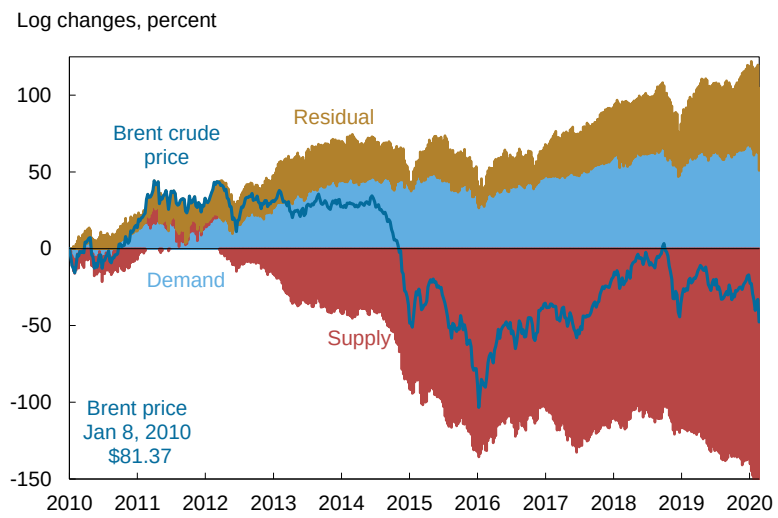
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend has reversed as stronger demand expectations and stabilizing anticipated supply have driven oil prices higher.

Cumulative Weekly Decomposition, Oct 04-Feb 28, 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.

Cumulative Weekly Decomposition, 2010-Present



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
Feb 14, 2020	3.9	-17.6	11.9	-1.8
Feb 21, 2020	2.9	-17.2	14.6	0.2
Feb 28, 2020	-8.6	-16.7	10.8	-14.4

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

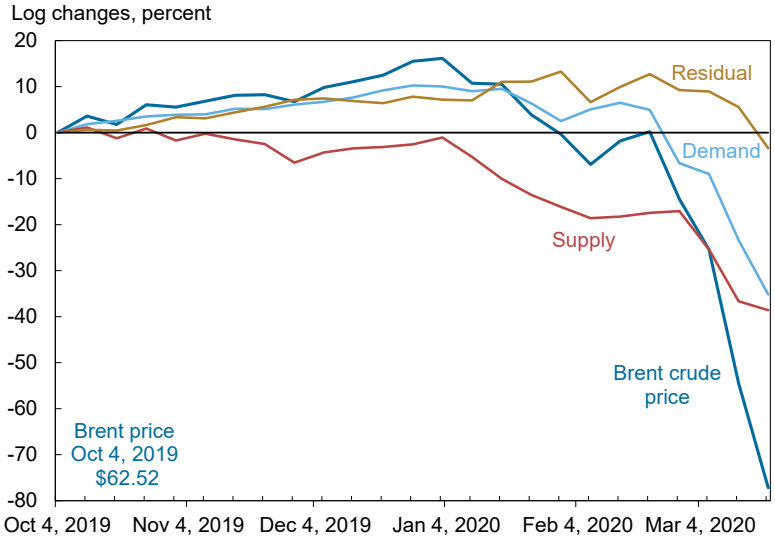
OIL PRICE DYNAMICS REPORT

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.

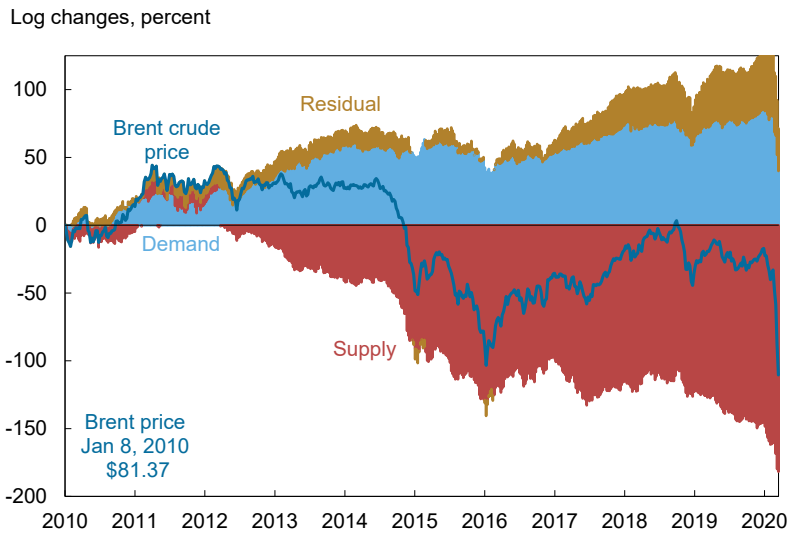
Recent Decomposition Data

- 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.
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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

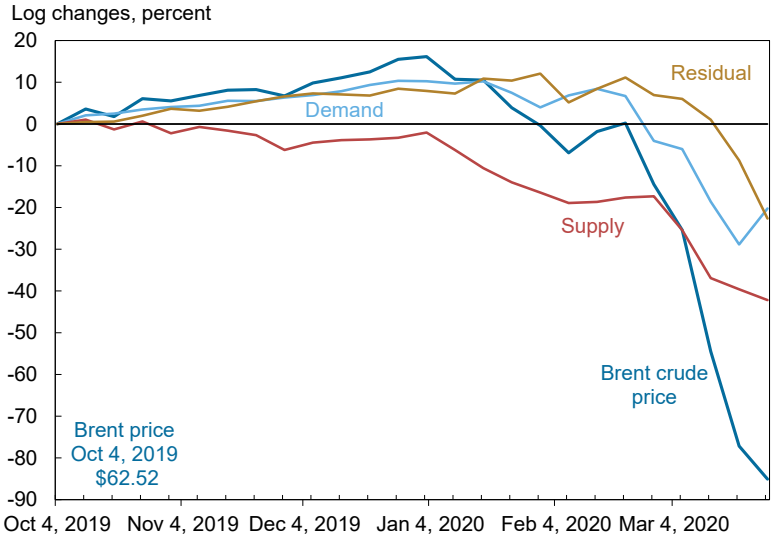
OIL PRICE DYNAMICS REPORT

Updated: March 30, 2020

Oil prices fell over the past week owing to increased supply.

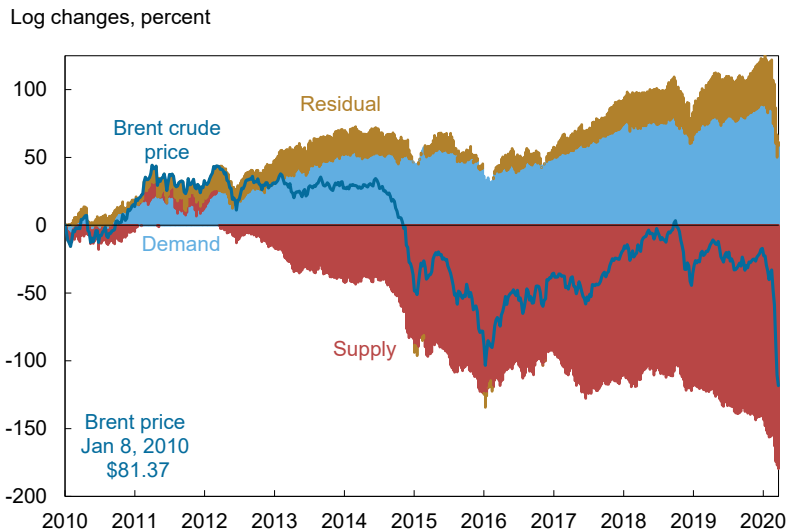
- Over the past week, an increase in anticipated supply offset higher anticipated demand, resulting in lower oil prices. In 2019:Q4, oil prices rose owing to an increase in demand.
- In 2018, strengthening global demand expectations drove oil prices higher. This trend reversed in 2018:Q4, when weaker 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 27, 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.

Cumulative Weekly Decomposition, 2010-Present



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 13, 2020	-18.6	-36.9	1.0	-54.5
Mar 20, 2020	-28.9	-39.6	-8.7	-77.2
Mar 27, 2020	-20.2	-42.2	-22.6	-85.1

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

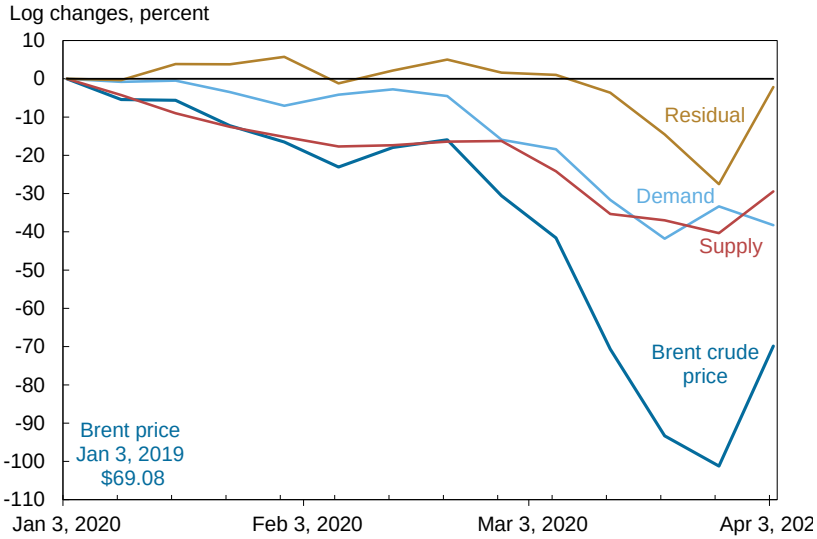
OIL PRICE DYNAMICS REPORT

Updated: April 6, 2020

Oil prices rose over the past week owing to decreased supply.

- Over the past week, a decrease in anticipated supply offset lower anticipated demand, resulting in higher oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- In 2019, oil prices rose in 2019:Q1due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-Apr 03, 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.

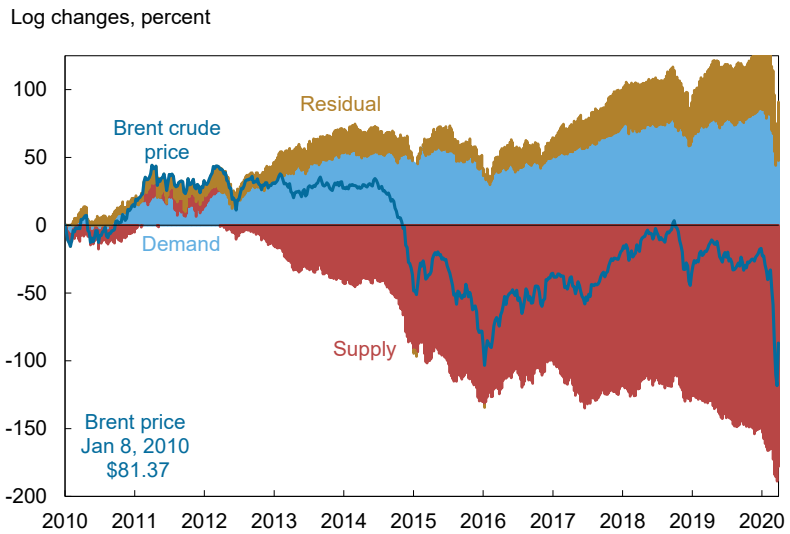
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Mar 20, 2020	-41.8	-37.0	-14.5	-93.3
Mar 27, 2020	-33.3	-40.3	-27.5	-101.2
Apr 03, 2020	-38.3	-29.4	-2.2	-69.9

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: April 13, 2020

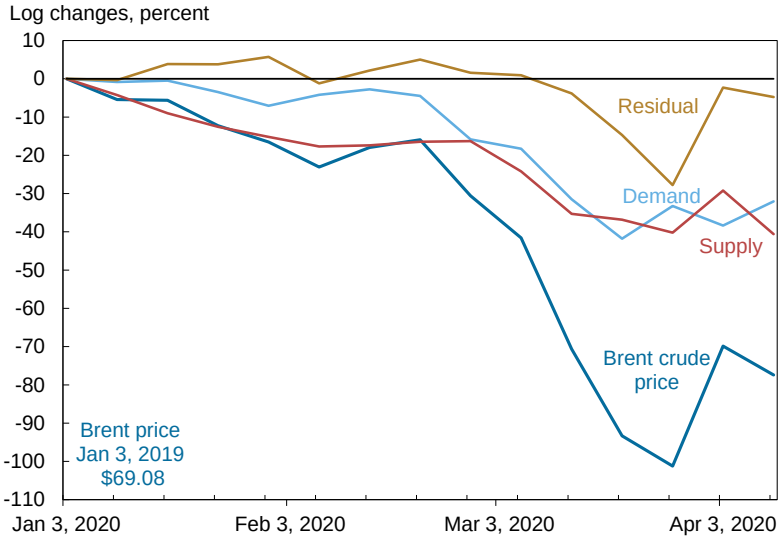
Oil prices fell over the past week owing to increased supply.

- Over the past week, an increase in anticipated supply offset higher anticipated demand, resulting in lower oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

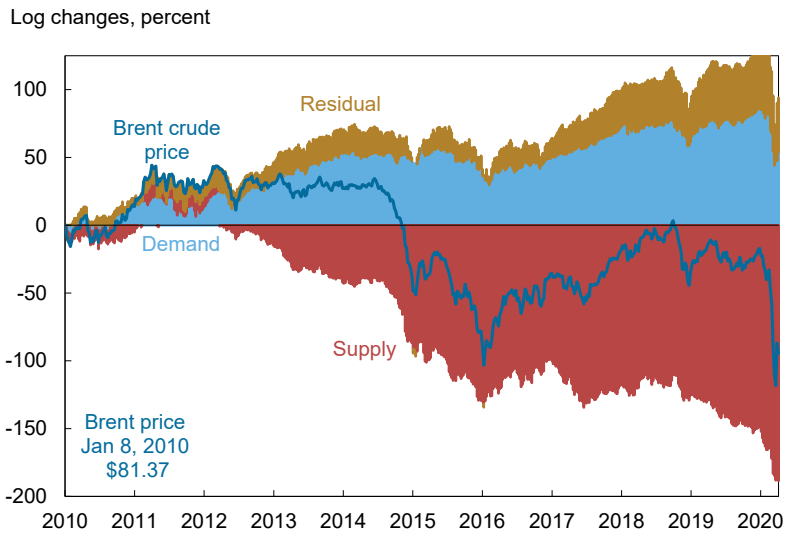
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-Apr 10, 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.

Cumulative Weekly Decomposition, 2010-Present



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 January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Mar 27, 2020	-33.3	-40.2	-27.8	-101.2
Apr 03, 2020	-38.3	-29.2	-2.3	-69.9
Apr 10, 2020	-32.1	-40.6	-4.8	-77.4

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

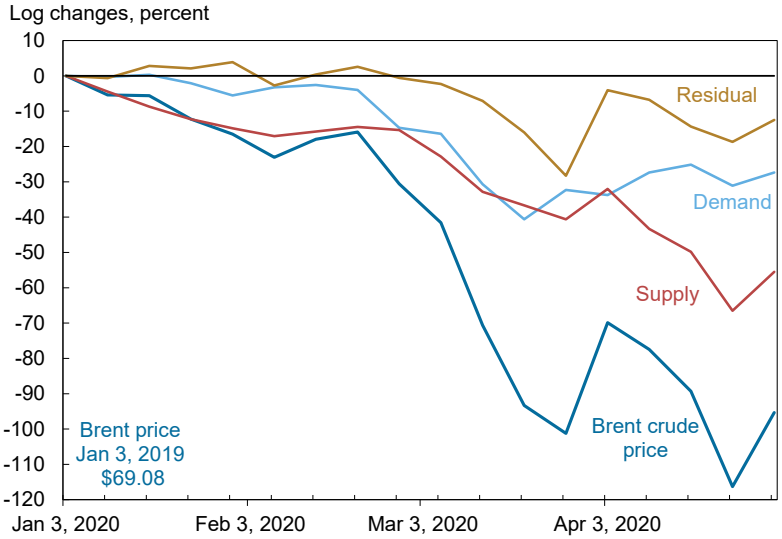
OIL PRICE DYNAMICS REPORT

Updated: May 4, 2020

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

- Over the past three weeks, an increase in anticipated supply resulted in lower oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-May 01, 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.

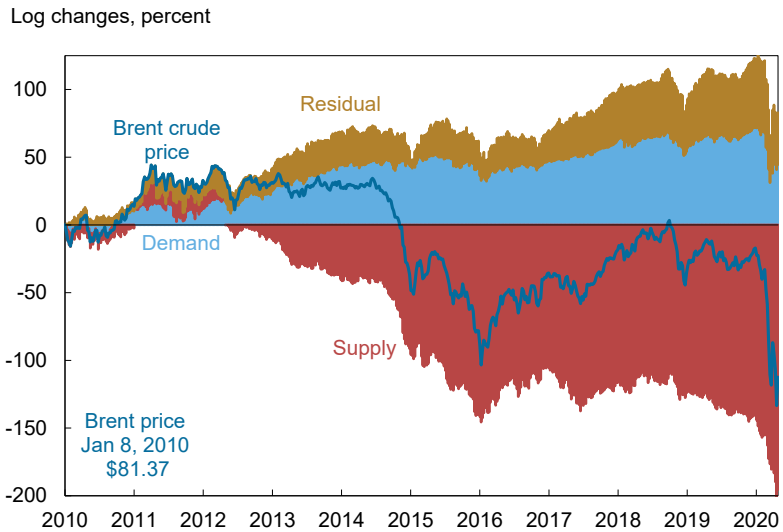
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Apr 17, 2020	-25.1	-49.8	-14.4	-89.3
Apr 24, 2020	-31.1	-66.5	-18.7	-116.3
May 01, 2020	-27.4	-55.5	-12.5	-95.3

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

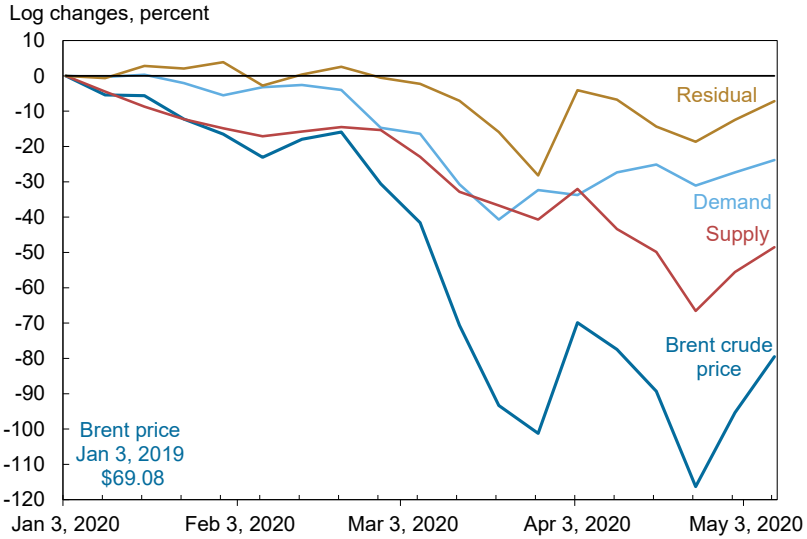
OIL PRICE DYNAMICS REPORT

Updated: May 11, 2020

Oil prices rose over the past week owing to decreased supply and increased demand.

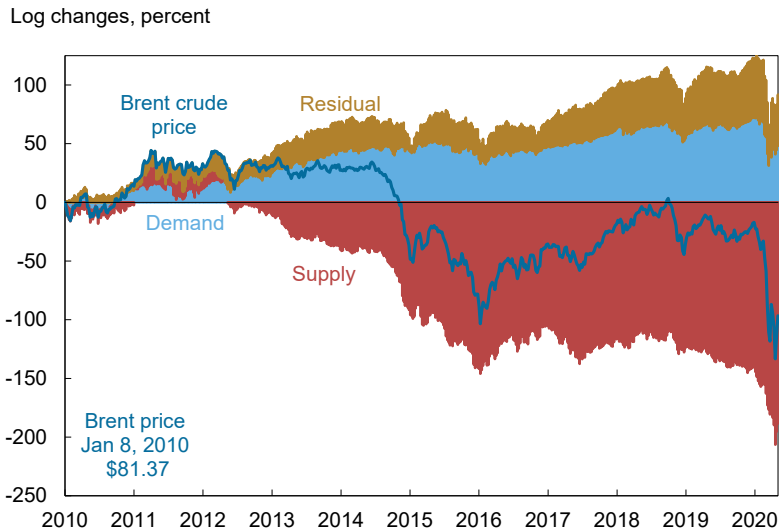
- Over the past week, a decline in anticipated supply and an increase in demand expectations resulted in higher oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-May 08, 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.

Cumulative Weekly Decomposition, 2010-Present



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 January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Apr 24, 2020	-31.1	-66.6	-18.7	-116.3
May 01, 2020	-27.3	-55.5	-12.5	-95.3
May 08, 2020	-23.8	-48.5	-7.2	-79.5

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

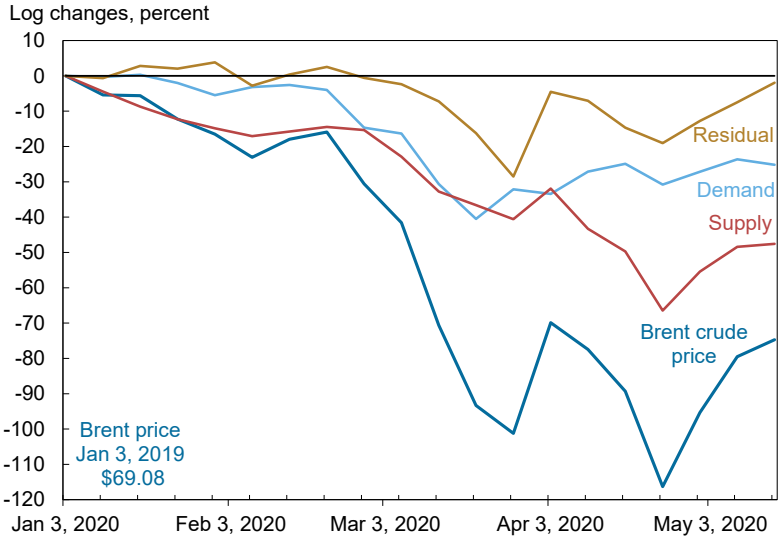
OIL PRICE DYNAMICS REPORT

Updated: May 18, 2020

Oil prices rose over the past week owing to decreased supply.

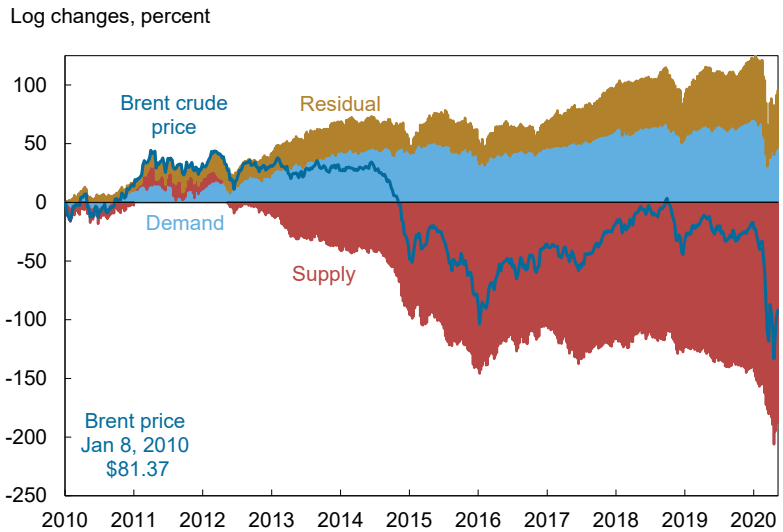
- Over the past week, a decline in anticipated supply as well as a reversal in the residual offset a decrease in demand expectations, resulting in higher oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-May 15, 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.

Cumulative Weekly Decomposition, 2010-Present



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 January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
May 01, 2020	-27.1	-55.4	-12.8	-95.3
May 08, 2020	-23.6	-48.4	-7.5	-79.5
May 15, 2020	-25.2	-47.6	-2.0	-74.7

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

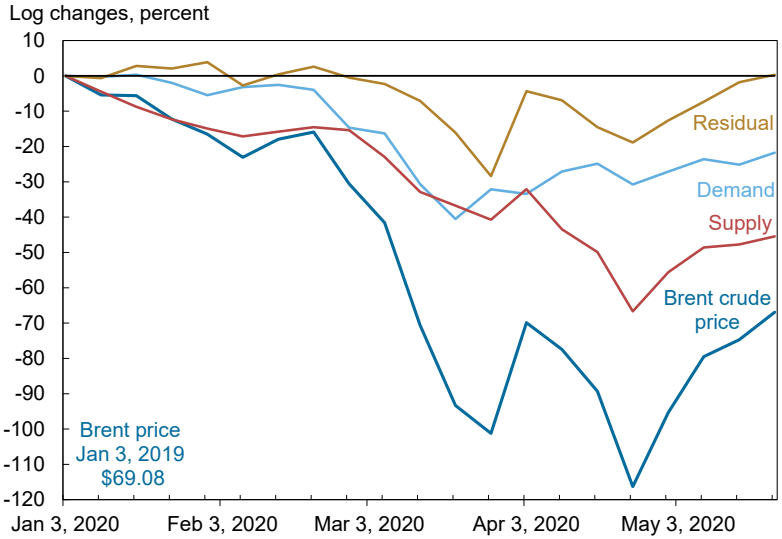
OIL PRICE DYNAMICS REPORT

Updated: May 26, 2020

Oil prices rose over the past week owing to decreased supply and increased demand.

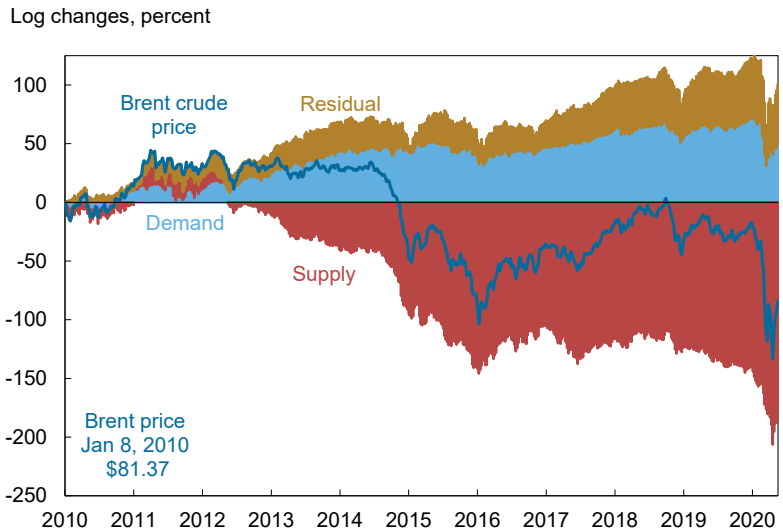
- Over the past week, a decline in anticipated supply as well as an increase in demand expectations resulted in higher oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-May 22, 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.

Cumulative Weekly Decomposition, 2010-Present



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 January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
May 08, 2020	-23.6	-48.6	-7.3	-79.5
May 15, 2020	-25.1	-47.8	-1.8	-74.7
May 22, 2020	-21.8	-45.5	0.3	-66.9

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

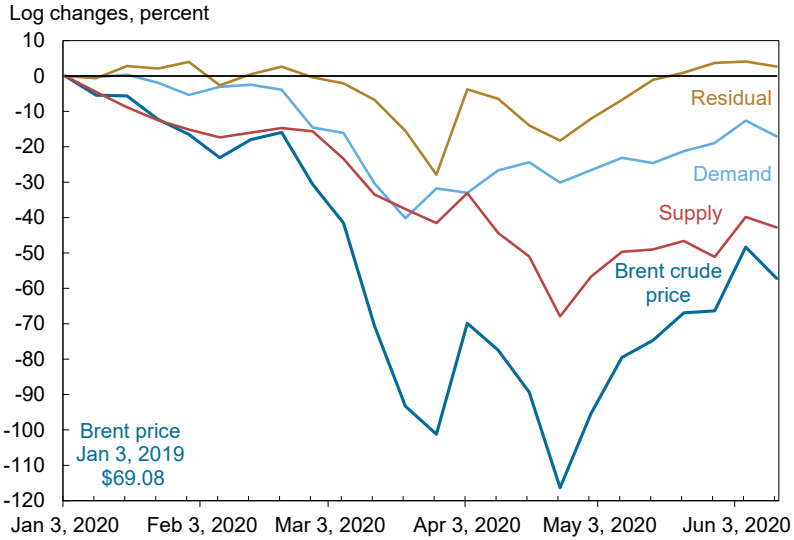
OIL PRICE DYNAMICS REPORT

Updated: June 15, 2020

Oil prices increased over the past three weeks owing mainly to decreased supply.

- Over the past three weeks, a decrease in anticipated supply resulted in increased oil prices amplified by an increase in demand expectations. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jan 03-Jun 12, 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.

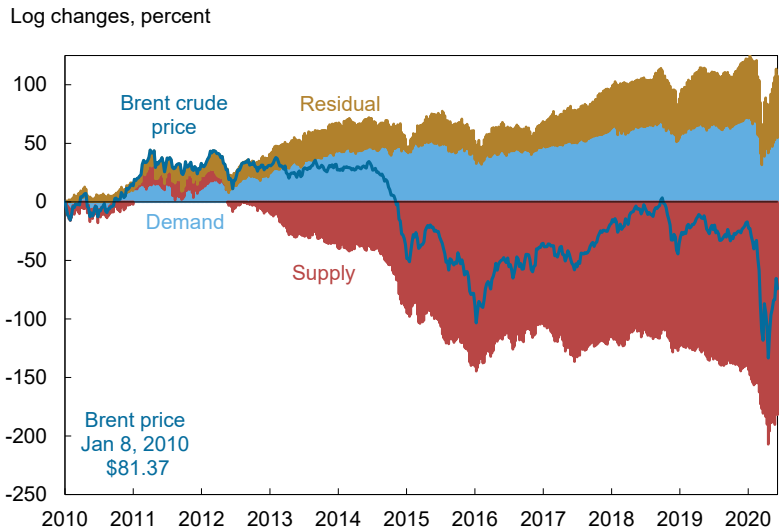
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
May 29, 2020	-18.9	-51.1	3.7	-66.4
Jun 05, 2020	-12.6	-39.8	4.1	-48.4
Jun 12, 2020	-17.1	-42.8	2.7	-57.2

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: June 22, 2020

Oil prices increased over the past week owing to increased demand and decreased supply.

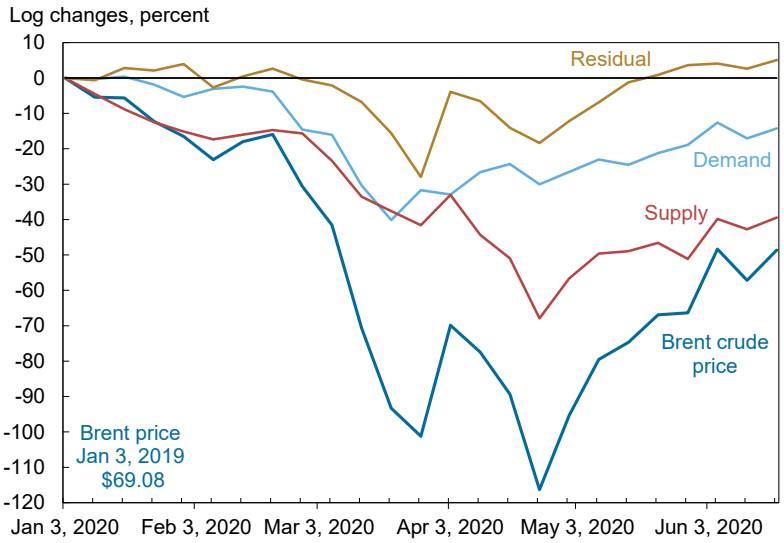
- Over the past week, an increase in demand expectations and a decline in anticipated supply resulted in increased oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

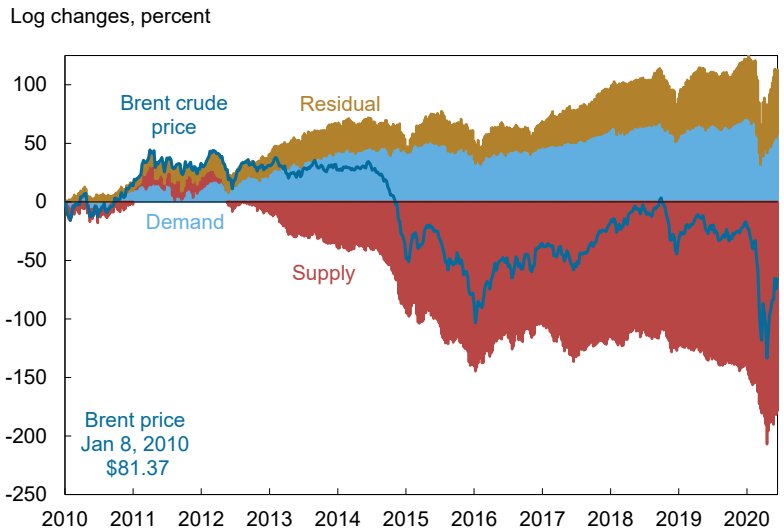
Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.

Cumulative Weekly Decomposition, Jan 03-Jun 19, 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.

Cumulative Weekly Decomposition, 2010-Present



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 January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Jun 05, 2020	-12.6	-39.8	4.1	-48.4
Jun 12, 2020	-17.0	-42.8	2.6	-57.2
Jun 19, 2020	-14.2	-39.4	5.1	-48.6

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: June 29, 2020

Oil prices decreased over the past week owing to decreased demand and increased supply.

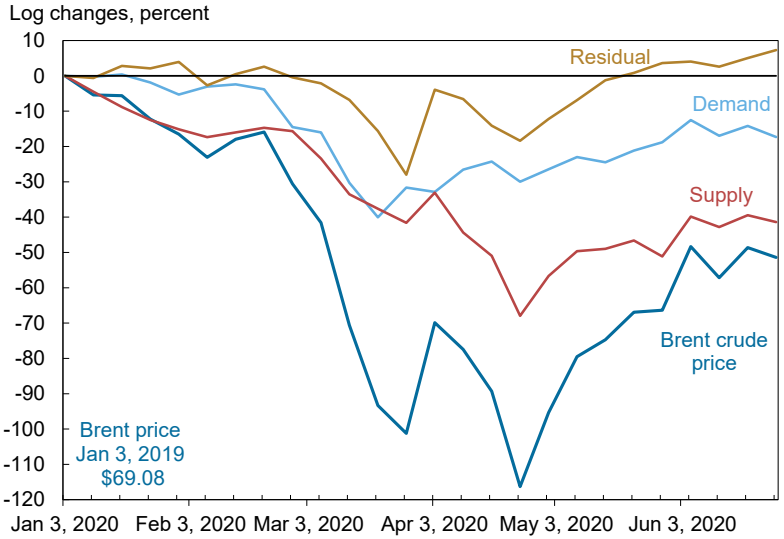
- Over the past week, a decline in demand expectations and an increase in anticipated supply resulted in decreased oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

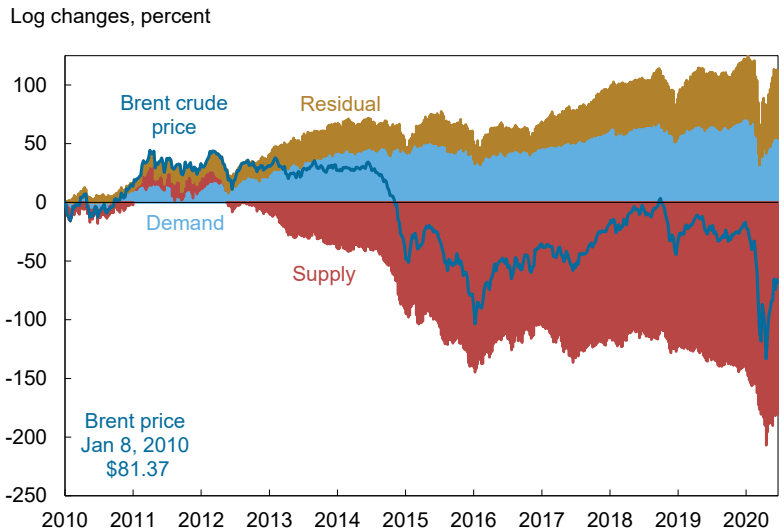
Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.

Cumulative Weekly Decomposition, Jan 03-Jun 26, 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.

Cumulative Weekly Decomposition, 2010-Present



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 January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Jun 12, 2020	-17.0	-42.8	2.6	-57.2
Jun 19, 2020	-14.2	-39.5	5.0	-48.6
Jun 26, 2020	-17.3	-41.4	7.3	-51.4

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

OIL PRICE DYNAMICS REPORT

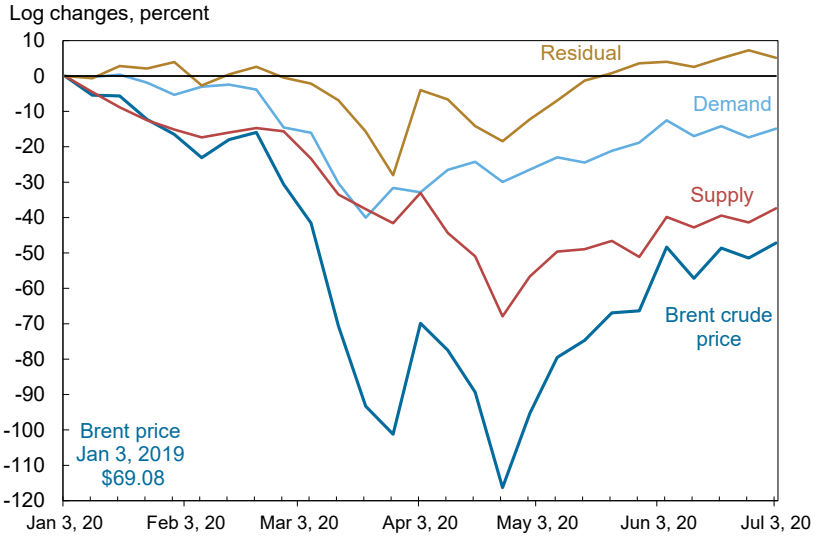
Updated: July 6, 2020

Oil prices increased over the past week owing to increased demand and decreased supply.

- Over the past week, an increase in demand expectations and a decline in anticipated supply resulted in increased oil prices. In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

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, Jan 03-Jul 03, 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.

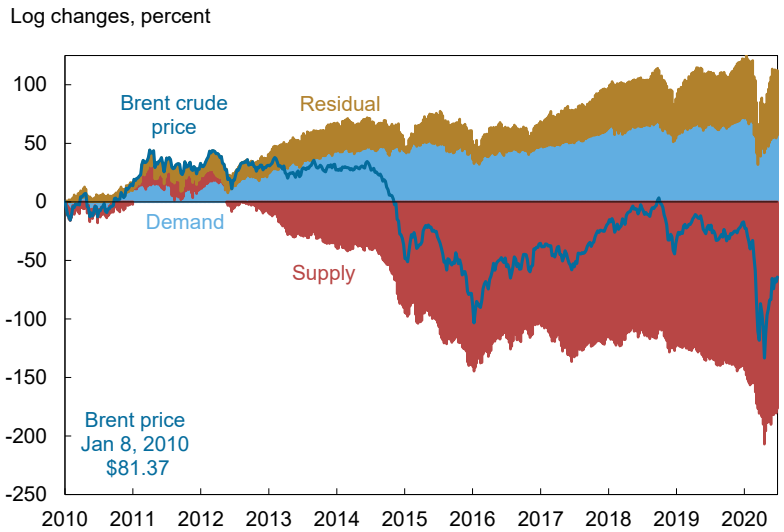
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from January 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since January 3, 2020

	Demand	Supply	Rest	Brent
Jun 19, 2020	-14.2	-39.4	5.0	-48.6
Jun 26, 2020	-17.3	-41.4	7.3	-51.4
Jul 03, 2020	-14.9	-37.4	5.1	-47.2

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

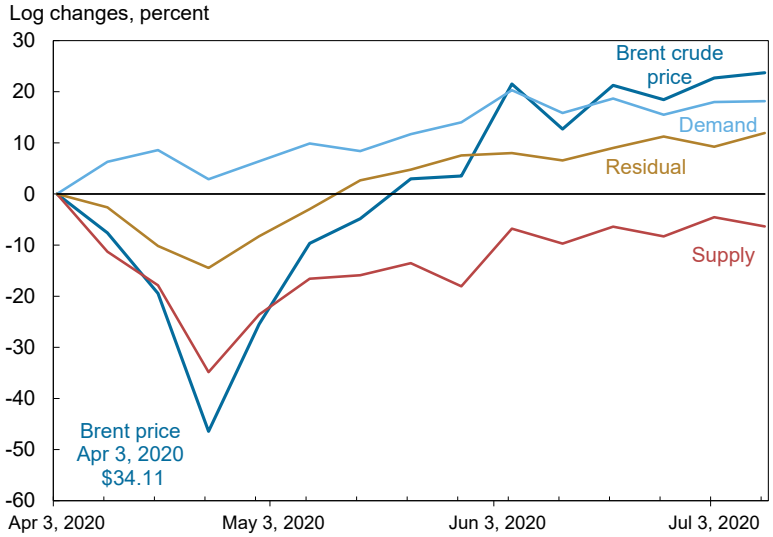
OIL PRICE DYNAMICS REPORT

Updated: July 13, 2020

Oil prices increased over the past week owing to increased demand.

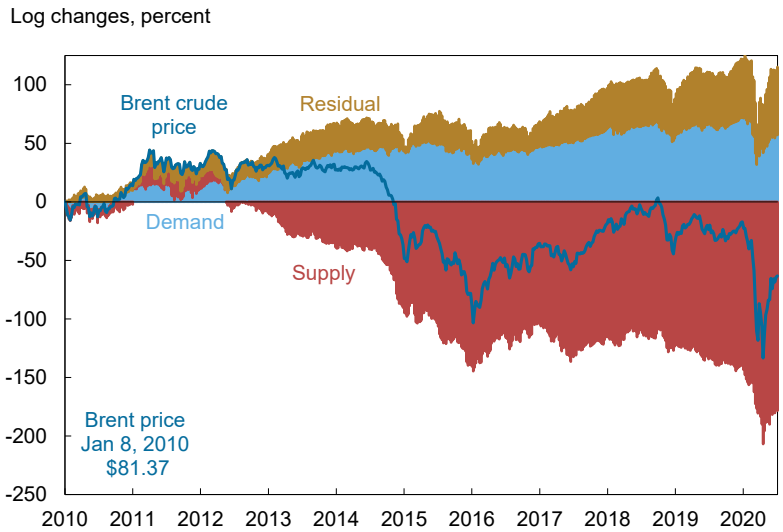
- Over the past week, an increase in demand expectations as well as an increase in the residual offset the increase in anticipated supply, resulting in higher oil prices. In 2020:Q2, oil prices rose owing to increased demand.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Apr 03-Jul 10, 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.

Cumulative Weekly Decomposition, 2010-Present



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 April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Jun 26, 2020	15.5	-8.3	11.2	18.4
Jul 03, 2020	18.0	-4.5	9.3	22.7
Jul 10, 2020	18.1	-6.4	11.9	23.7

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Michael Nattinger, and Adam Noble

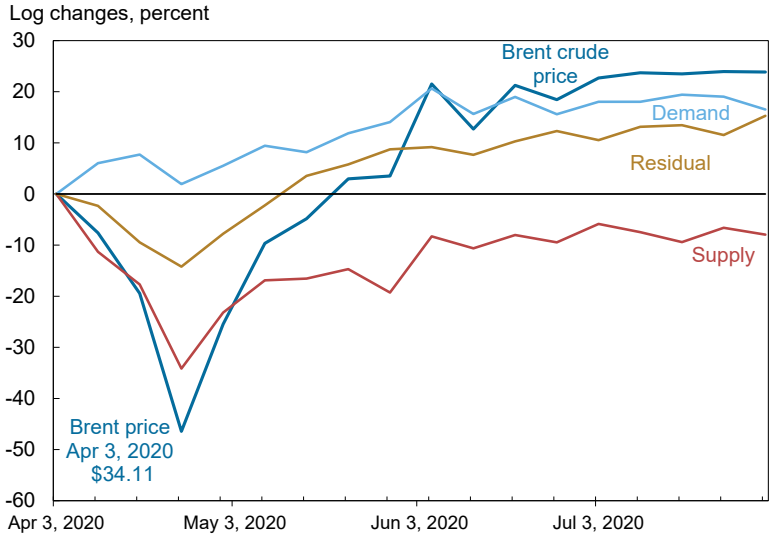
OIL PRICE DYNAMICS REPORT

Updated: August 3, 2020

Oil prices remain unchanged over the past three weeks owing to a decrease in demand and an increase in the residual.

- Over the past three weeks, a decrease in demand expectations was offset by an increase in the residual, resulting in essentially unchanged oil prices. In 2020:Q2, oil prices rose owing to increased demand.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Apr 03-Jul 31, 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.

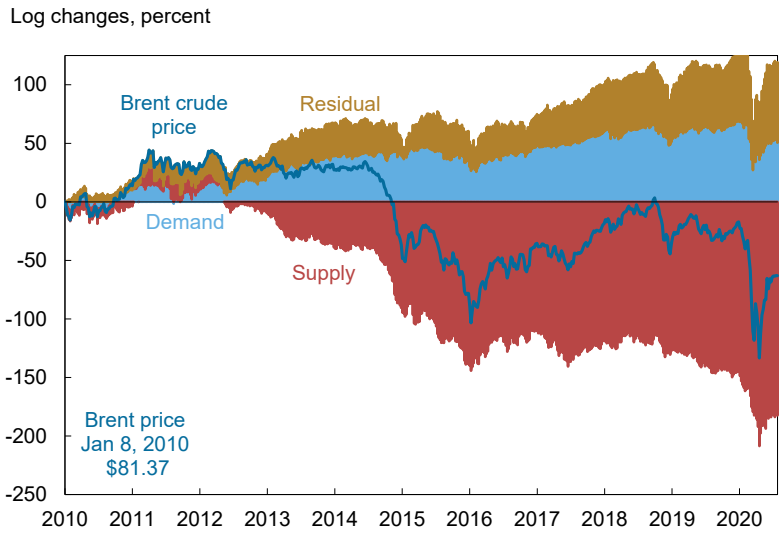
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Jul 17, 2020	19.4	-9.4	13.5	23.5
Jul 24, 2020	19.0	-6.6	11.5	23.9
Jul 31, 2020	16.5	-8.0	15.3	23.9

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen and Adam Noble

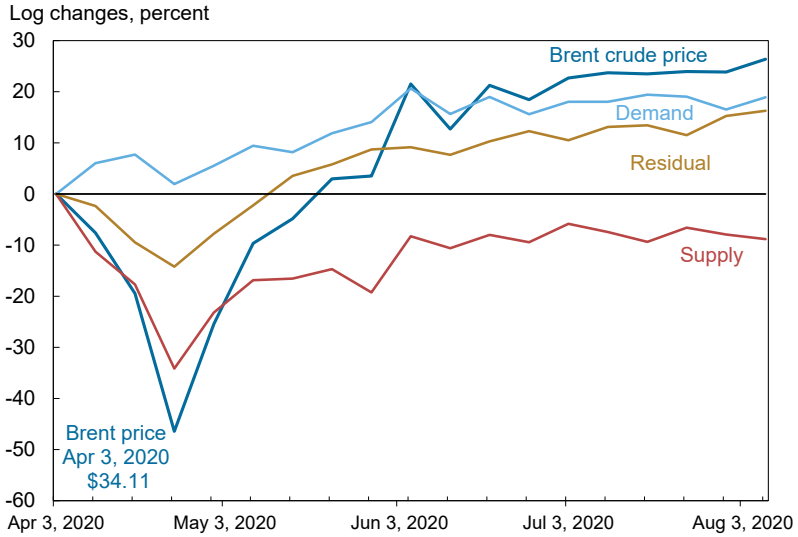
OIL PRICE DYNAMICS REPORT

Updated: August 10, 2020

Oil prices increased over the past week owing to higher demand.

- Over the past week, an increase in anticipated supply was offset by an increase in demand expectations, resulting in increased oil prices. In 2020:Q2, oil prices rose owing to increased demand.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Apr 03-Aug 07, 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.

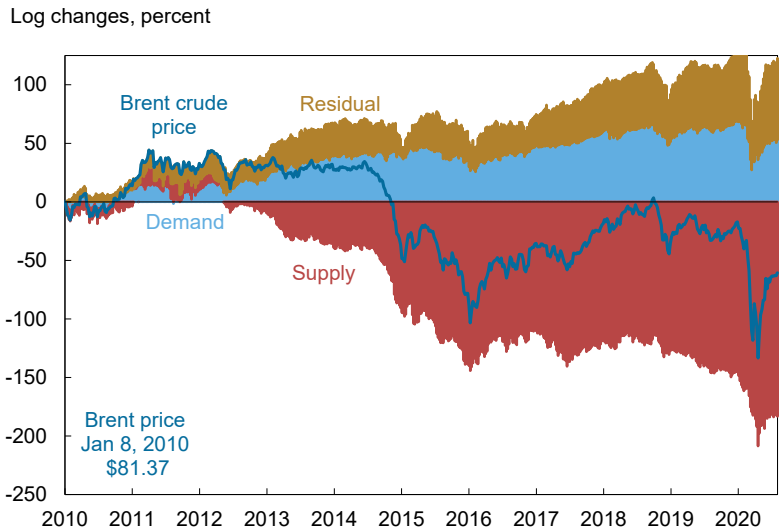
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Jul 24, 2020	19.0	-6.6	11.5	23.9
Jul 31, 2020	16.5	-7.9	15.3	23.9
Aug 07, 2020	18.9	-8.8	16.3	26.4

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: August 17, 2020

Oil prices increased over the past week owing to higher demand.

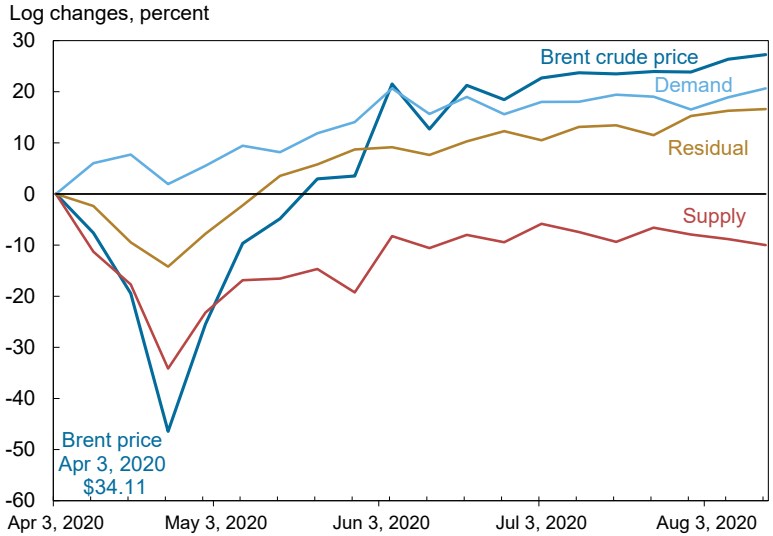
- Over the past week, an increase in anticipated supply was offset by an increase in demand expectations, resulting in increased oil prices. In 2020:Q2, oil prices rose owing to increased demand.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

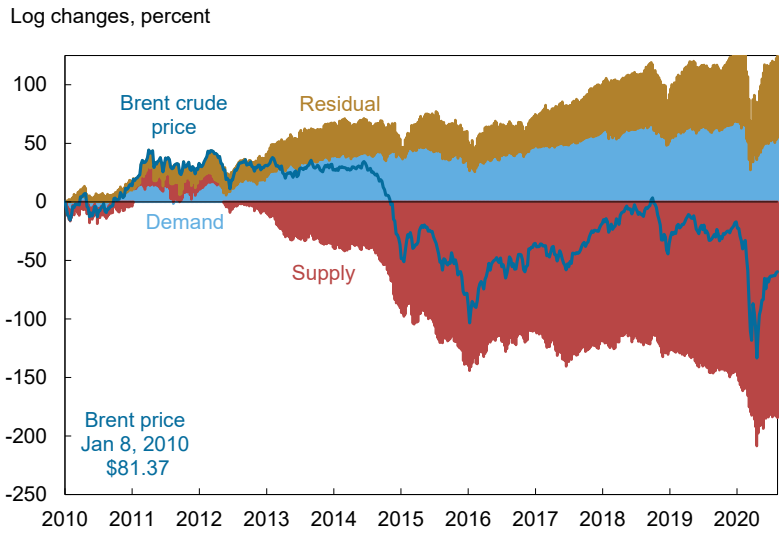
Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.

Cumulative Weekly Decomposition, Apr 03-Aug 14, 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.

Cumulative Weekly Decomposition, 2010-Present



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 April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Jul 31, 2020	16.5	-7.9	15.3	23.9
Aug 07, 2020	18.9	-8.8	16.3	26.4
Aug 14, 2020	20.7	-10.0	16.6	27.3

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: August 24, 2020

Oil prices decreased over the past week owing to increased supply and decreased demand.

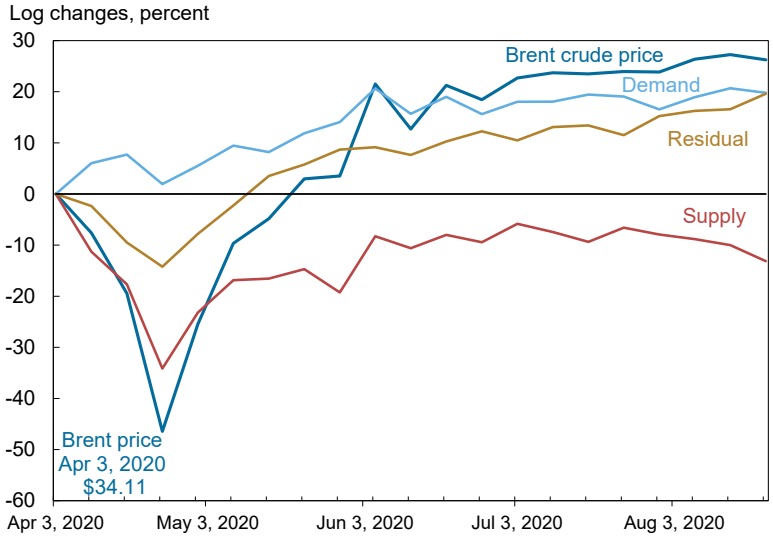
- Over the past week, an increase in anticipated supply and a decline in demand expectations resulted in decreased oil prices. In 2020:Q2, oil prices rose owing to increased demand.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

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 03-Aug 21, 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.

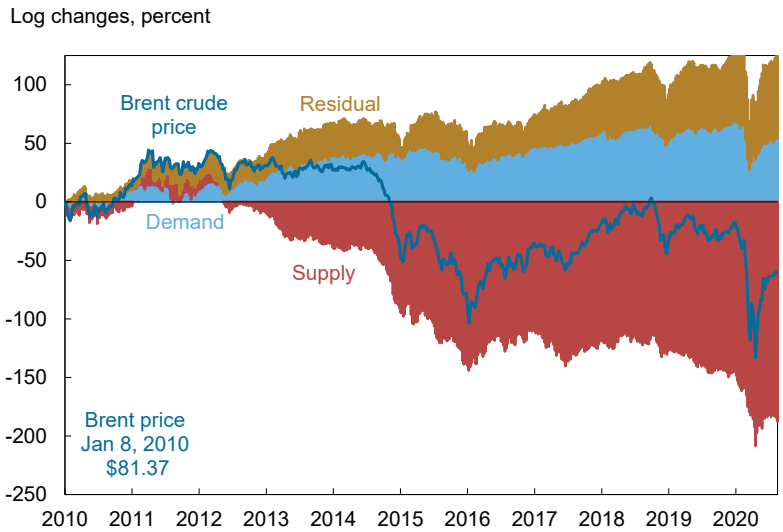
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Aug 07, 2020	18.9	-8.8	16.3	26.4
Aug 14, 2020	20.7	-10.0	16.6	27.3
Aug 21, 2020	19.8	-13.1	19.6	26.3

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: August 31, 2020

Oil prices increased over the past week owing to increased demand.

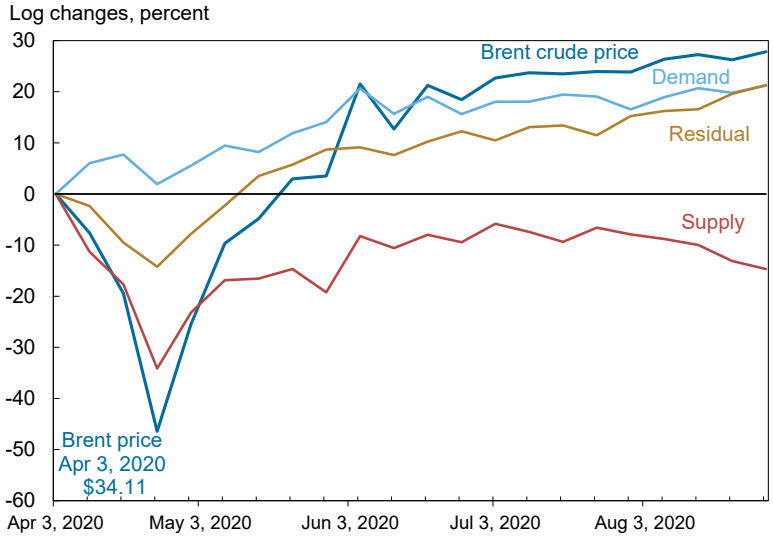
- Over the past week, an increase in anticipated supply was offset by an increase in demand expectations, resulting in higher oil prices. In 2020:Q2, oil prices rose owing to increased demand.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

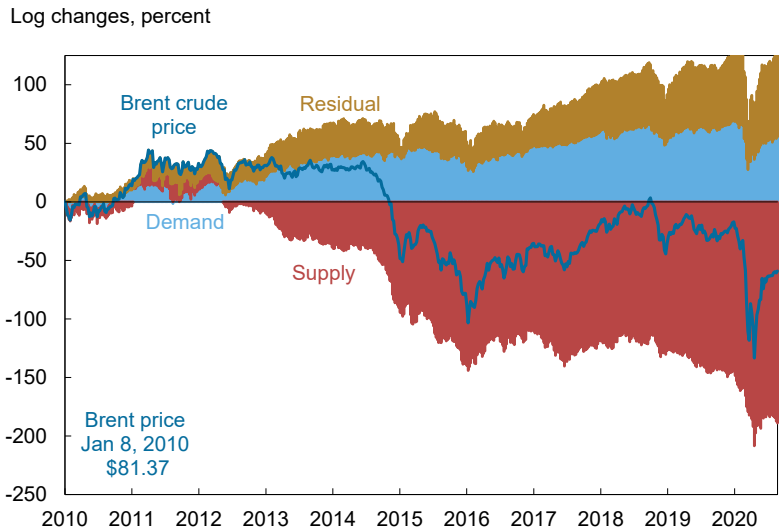
Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.

Cumulative Weekly Decomposition, Apr 03-Aug 28, 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.

Cumulative Weekly Decomposition, 2010-Present



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 April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Aug 14, 2020	20.7	-10.0	16.6	27.3
Aug 21, 2020	19.8	-13.1	19.6	26.3
Aug 28, 2020	21.2	-14.7	21.3	27.8

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Adam Noble, and Lawence Lin

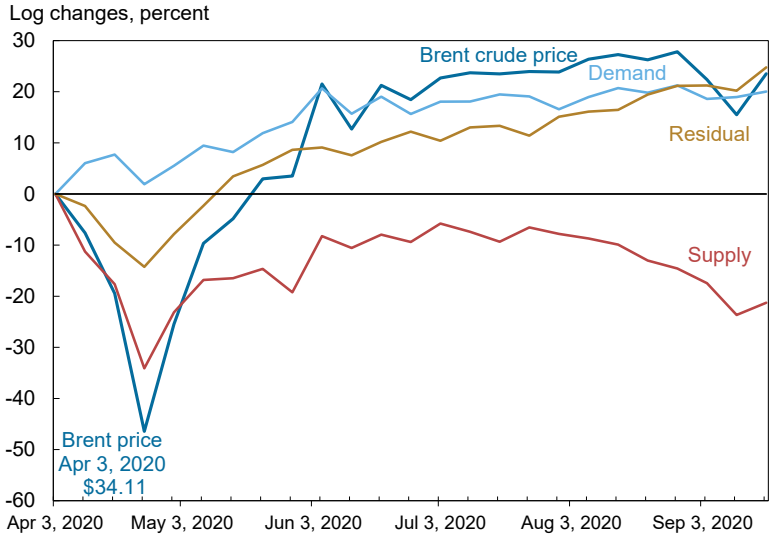
OIL PRICE DYNAMICS REPORT

Updated: September 21, 2020

Oil prices decreased over the past three weeks owing to lower demand and higher supply.

- Over the past three weeks, a decrease in demand expectations and an increase in anticipated supply resulted in lower oil prices. In the last week, however, some rebound in prices occurred as perceived supply started to deteriorate again. In 2020:Q2, oil prices rose owing to increased demand.
- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Apr 03-Sep 18, 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.

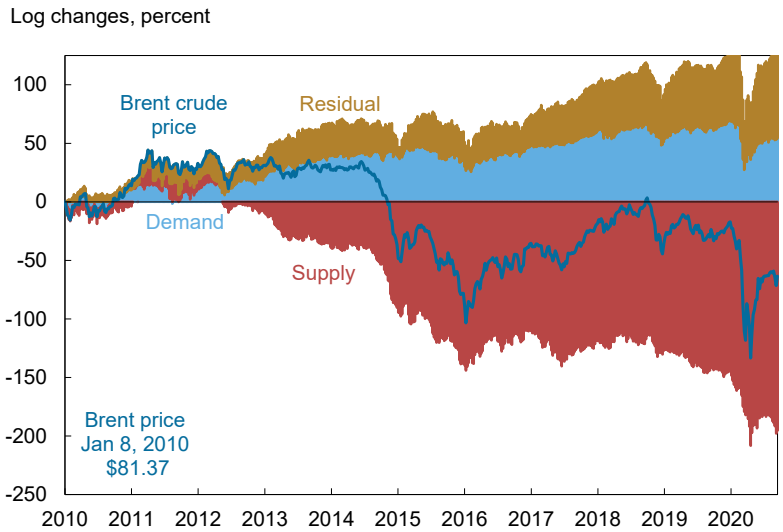
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Sep 04, 2020	18.6	-17.5	21.2	22.4
Sep 11, 2020	19.0	-23.7	20.2	15.5
Sep 18, 2020	20.0	-21.3	24.8	23.5

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawence Lin, and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: September 28, 2020

Oil prices decreased over the past week owing to lower demand and higher supply.

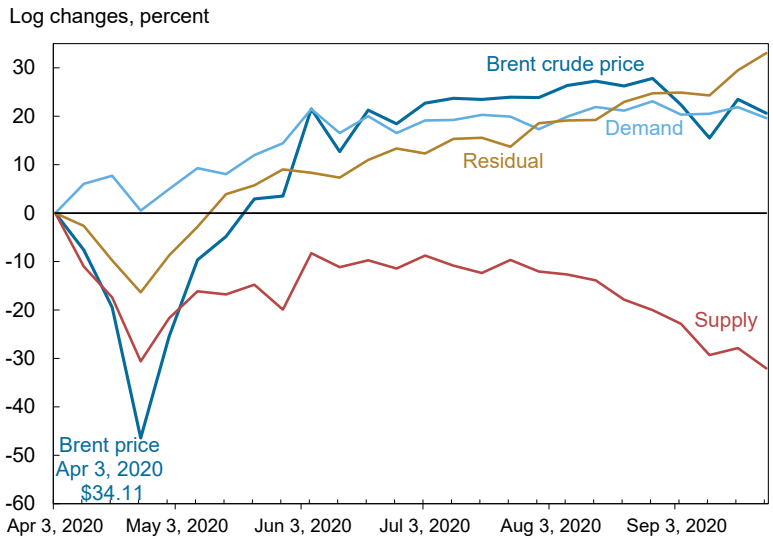
- Over the past week, a decrease in demand expectations and an increase in anticipated supply resulted in lower oil prices. In 2020:Q2, oil prices rose owing to increased demand.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

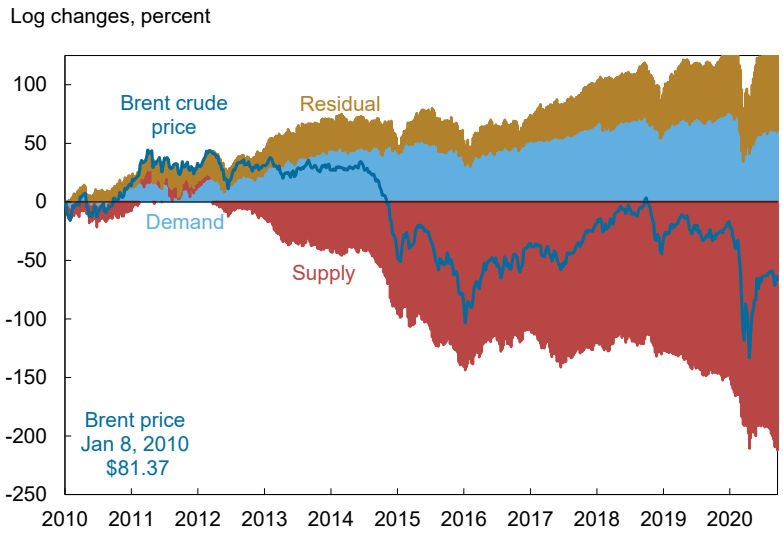
Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.

Cumulative Weekly Decomposition, Apr 03-Sep 25, 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.

Cumulative Weekly Decomposition, 2010-Present



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 April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Sep 11, 2020	20.5	-29.3	24.3	15.5
Sep 18, 2020	21.9	-27.9	29.5	23.5
Sep 25, 2020	19.6	-32.1	33.0	20.6

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

OIL PRICE DYNAMICS REPORT

Updated: October 5, 2020

Oil prices decreased over the past week owing to higher supply.

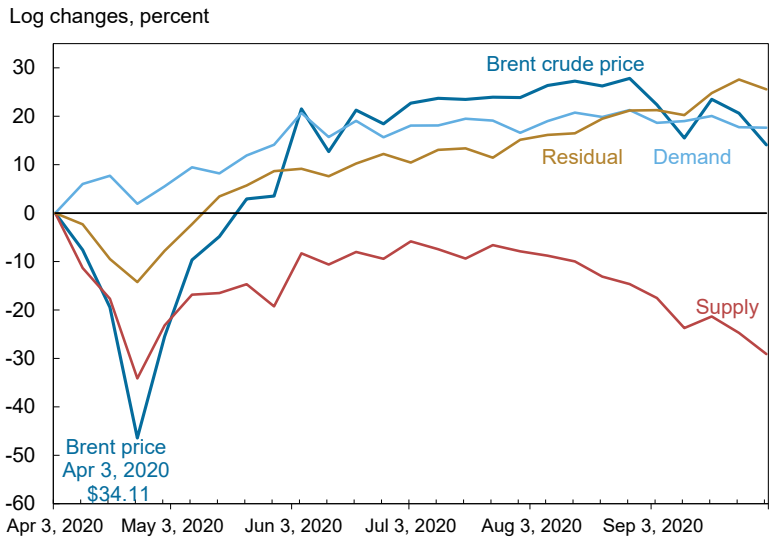
- Over the past week, an increase in anticipated supply resulted in lower oil prices. In 2020:Q2, oil prices rose owing to increased demand.

- Oil prices rose in 2019:Q1 due to increasing demand expectations, whereas in 2019:Q2-Q3 higher anticipated supply drove prices down. In 2019:Q4, oil prices rose owing to improving demand expectations.

- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

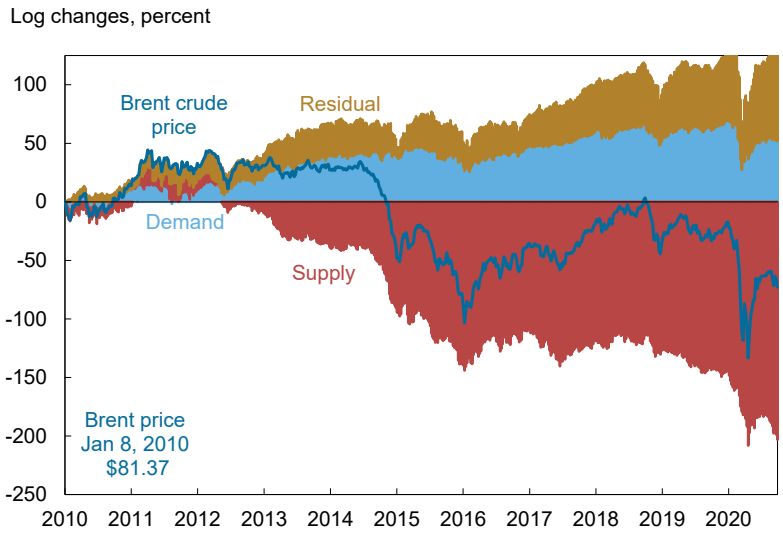
Our analysis of oil price movements does not necessarily represent the views of the Federal Reserve Bank of New York, the Federal Reserve System, or the Federal Open Market Committee.

Cumulative Weekly Decomposition, Apr 03-Oct 02, 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.

Cumulative Weekly Decomposition, 2010-Present



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 April 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since April 3, 2020

	Demand	Supply	Rest	Brent
Sep 18, 2020	20.1	-21.3	24.8	23.5
Sep 25, 2020	17.7	-24.7	27.6	20.6
Oct 02, 2020	17.6	-29.1	25.6	14.1

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

OIL PRICE DYNAMICS REPORT

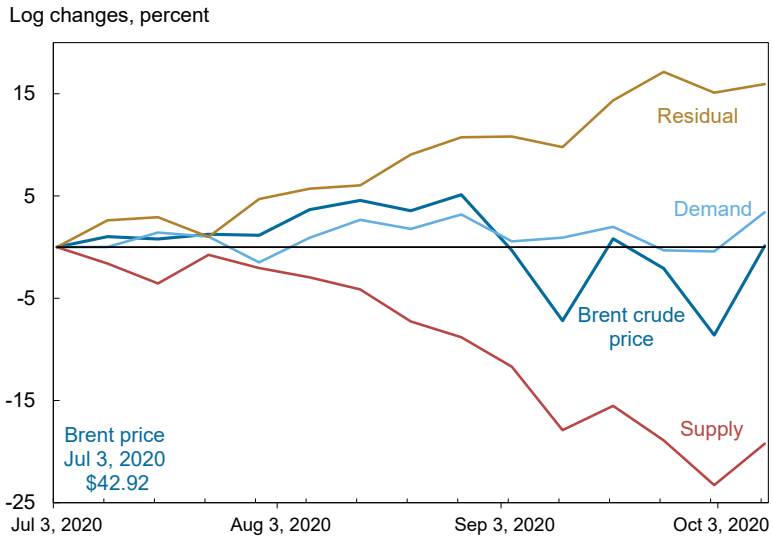
Updated: October 13, 2020

Oil prices increased over the past week owing to higher demand and lower supply.

- Over the past week, an increase in demand expectations and a decrease in anticipated supply resulted in higher oil prices. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

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 03-Oct 09, 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.

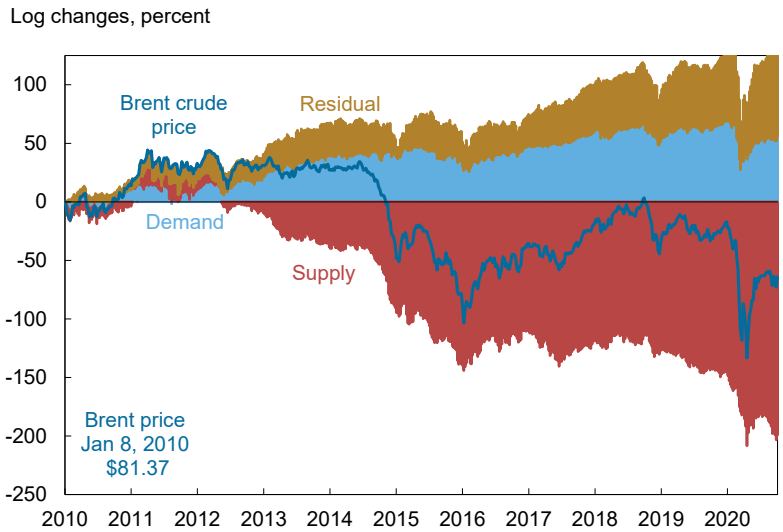
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Sep 25, 2020	-0.3	-18.9	17.1	-2.1
Oct 02, 2020	-0.4	-23.3	15.1	-8.6
Oct 09, 2020	3.4	-19.2	15.9	0.1

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

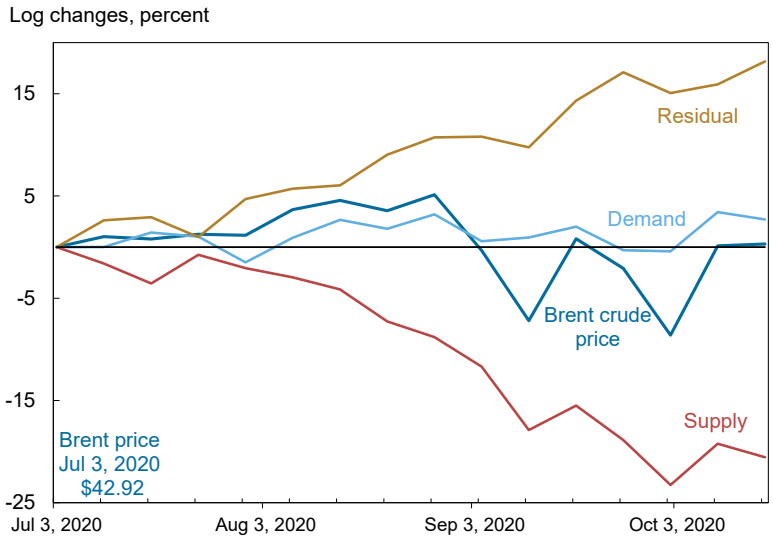
OIL PRICE DYNAMICS REPORT

Updated: October 19, 2020

Oil prices were unchanged over the past week.

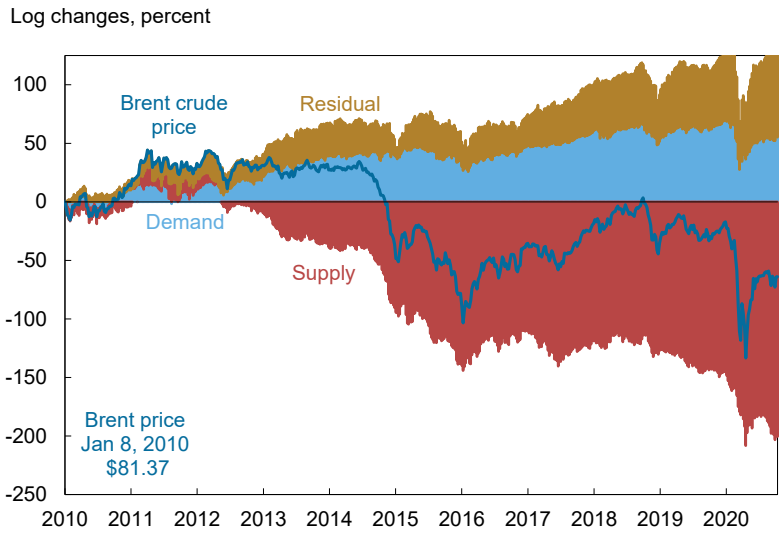
- Over the past week, a decrease in demand expectations and an increase in anticipated supply were offset by an increase in the residual, resulting in unchanged oil prices. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Oct 16, 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.

Cumulative Weekly Decomposition, 2010-Present



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 July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Oct 02, 2020	-0.4	-23.3	15.1	-8.6
Oct 09, 2020	3.4	-19.2	15.9	0.1
Oct 16, 2020	2.7	-20.6	18.2	0.3

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

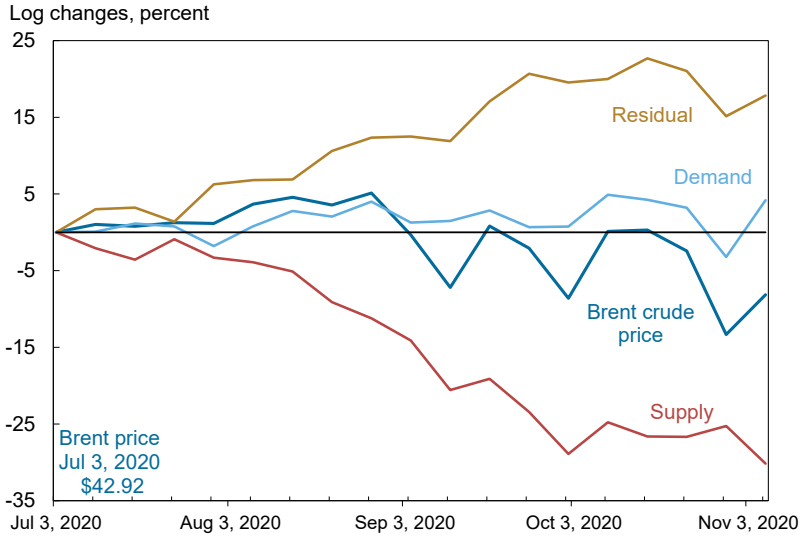
OIL PRICE DYNAMICS REPORT

Updated: November 9, 2020

Oil prices decreased over the past three weeks owing to higher supply

- Over the past three weeks, an increase in anticipated supply resulted in a decrease in oil prices, with a recovery in demand expectations driving the oil price rebound in the final week. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Nov 06, 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.

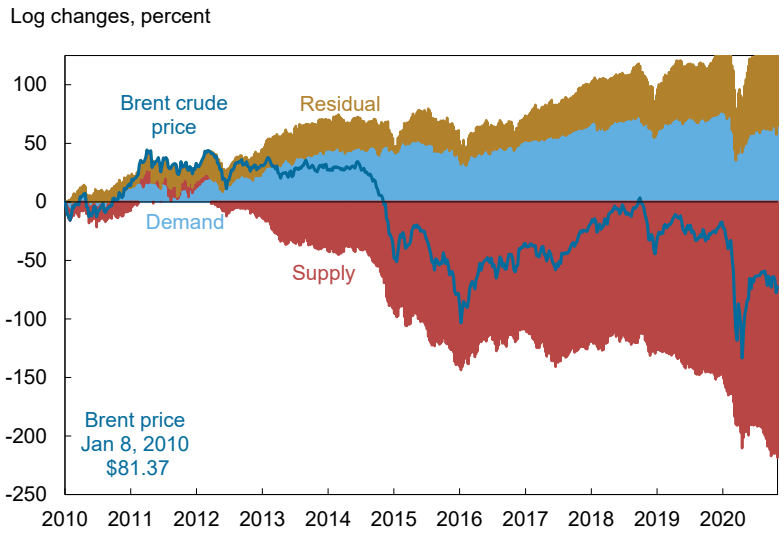
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Oct 23, 2020	3.2	-26.7	21.0	-2.4
Oct 30, 2020	-3.2	-25.3	15.1	-13.3
Nov 06, 2020	4.2	-30.2	17.8	-8.2

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

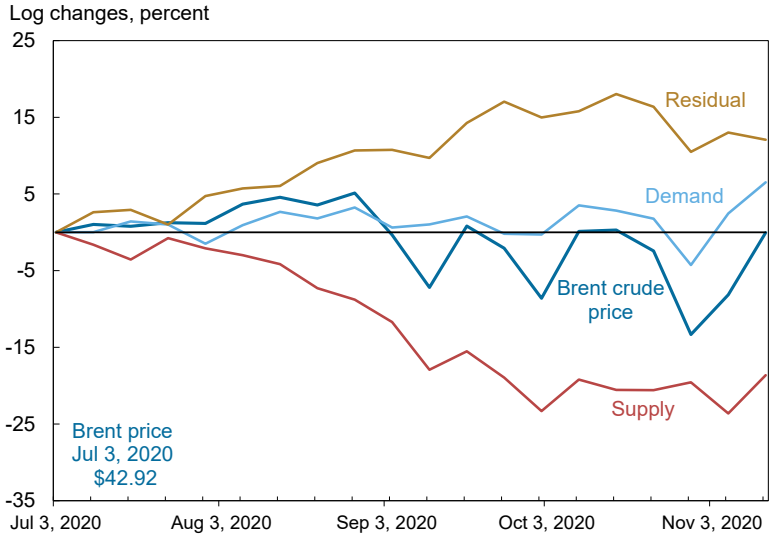
OIL PRICE DYNAMICS REPORT

Updated: November 16, 2020

Oil prices increased over the past week owing to higher demand and lower supply

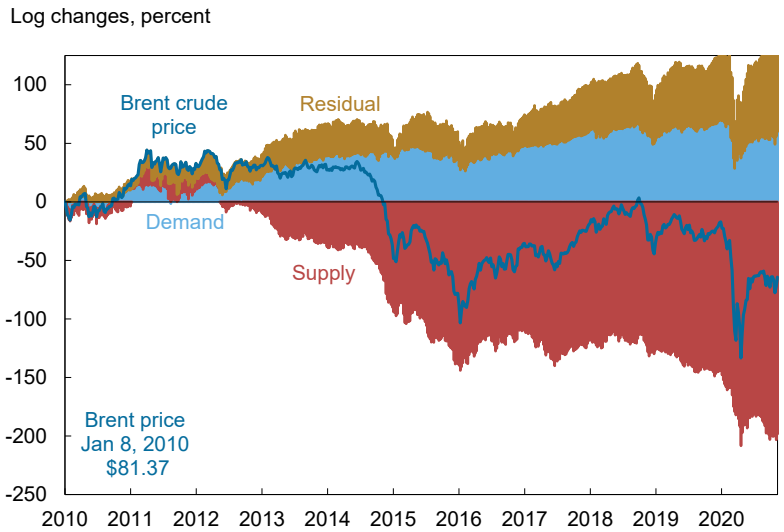
- Over the past week, an increase in demand expectations and a decrease in anticipated supply resulted in an increase in oil prices. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Nov 13, 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.

Cumulative Weekly Decomposition, 2010-Present



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 July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Oct 30, 2020	-4.3	-19.6	10.5	-13.3
Nov 06, 2020	2.5	-23.6	13.0	-8.2
Nov 13, 2020	6.5	-18.6	12.1	-0.0

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

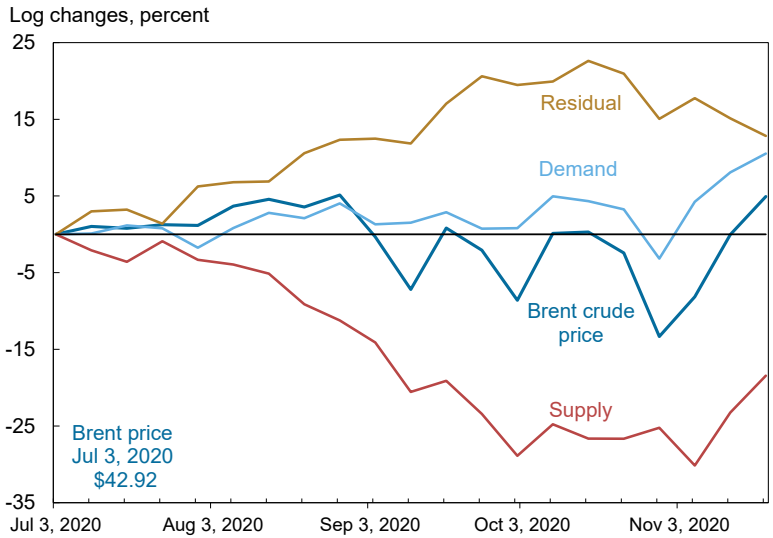
OIL PRICE DYNAMICS REPORT

Updated: November 23, 2020

Higher demand and lower supply again pushed oil prices higher over the past week

- For the second consecutive week, an increase in demand expectations and a decrease in anticipated supply resulted in an increase in oil prices. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Nov 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.

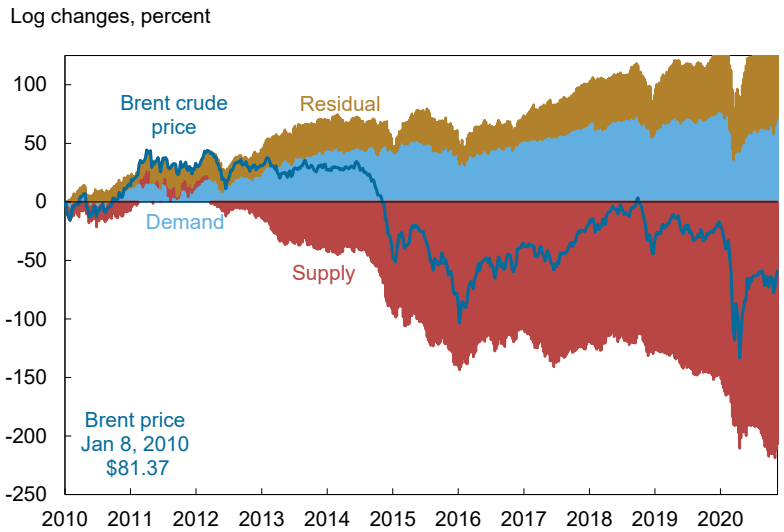
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Nov 06, 2020	4.2	-30.1	17.7	-8.2
Nov 13, 2020	8.1	-23.2	15.1	-0.0
Nov 20, 2020	10.5	-18.4	12.8	4.9

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

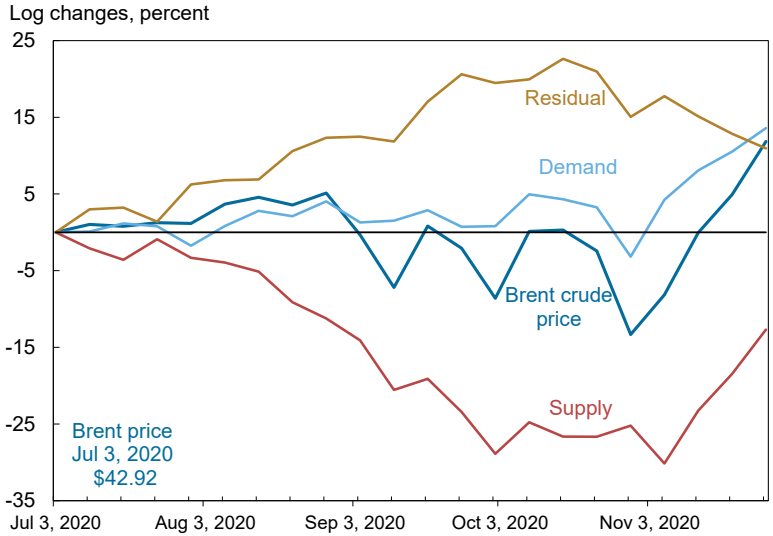
OIL PRICE DYNAMICS REPORT

Updated: November 30, 2020

Higher demand and lower supply again pushed oil prices higher over the past week

- For the third consecutive week, an increase in demand expectations and a decrease in anticipated supply resulted in an increase in oil prices. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4 when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Nov 27, 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.

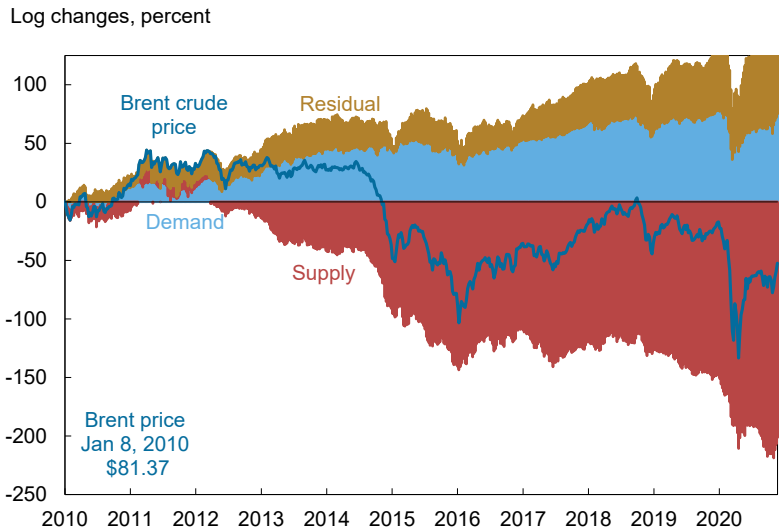
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Nov 13, 2020	8.1	-23.3	15.1	-0.0
Nov 20, 2020	10.5	-18.4	12.9	4.9
Nov 27, 2020	13.6	-12.7	11.0	11.8

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

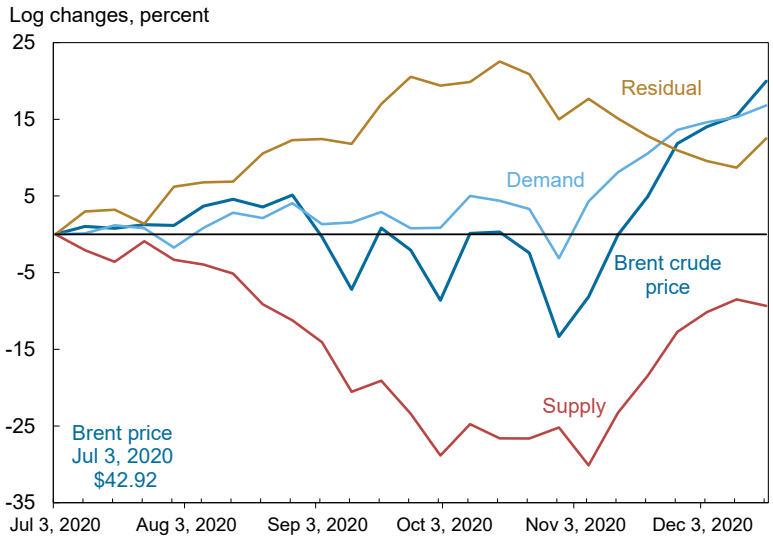
OIL PRICE DYNAMICS REPORT

Updated: December 21, 2020

Higher demand and lower supply pushed oil prices higher over the past three weeks

- Over the past three weeks, an increase in demand expectations and a decrease in anticipated supply resulted in higher oil prices. Despite higher supply expectations over the most recent week, the continued strengthening of demand expectations on net led to higher oil prices for that week. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4, when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Dec 18, 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.

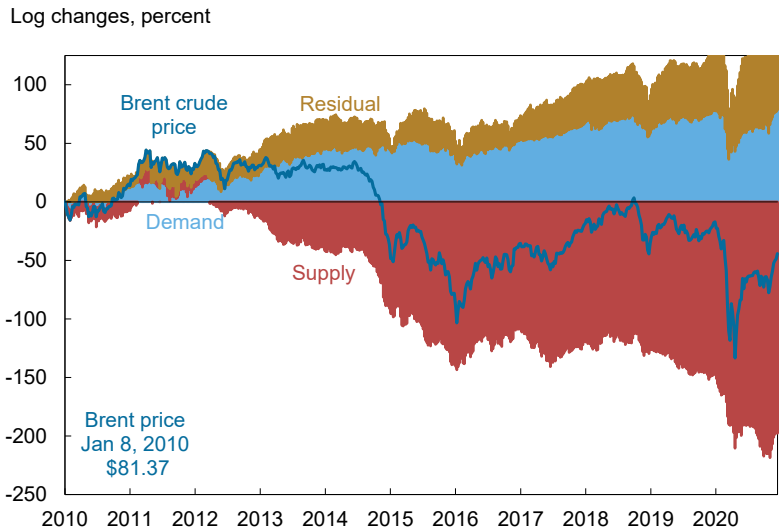
Recent Decomposition Data

- The chart at left depicts the cumulative oil price decomposition from July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Dec 04, 2020	14.6	-10.1	9.6	14.0
Dec 11, 2020	15.3	-8.5	8.7	15.5
Dec 18, 2020	16.8	-9.3	12.5	20.0

Cumulative Weekly Decomposition, 2010-Present



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.

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble

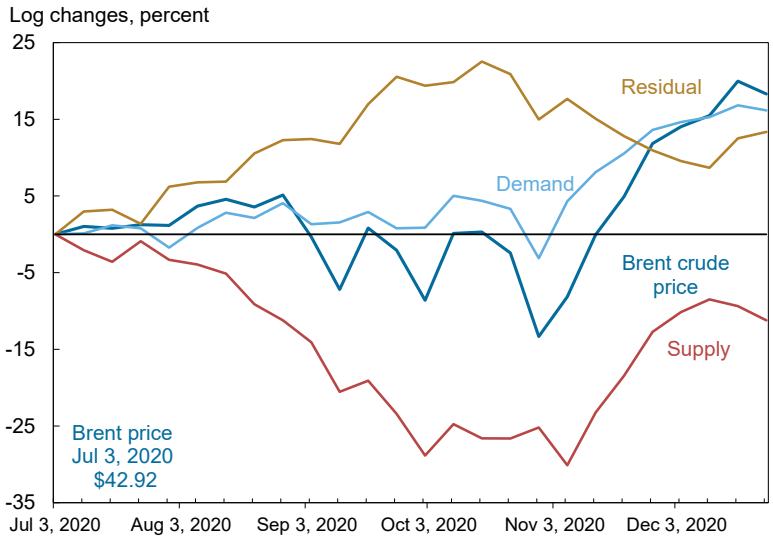
OIL PRICE DYNAMICS REPORT

Updated: December 28, 2020

Lower demand and higher supply pushed oil prices lower over the past week

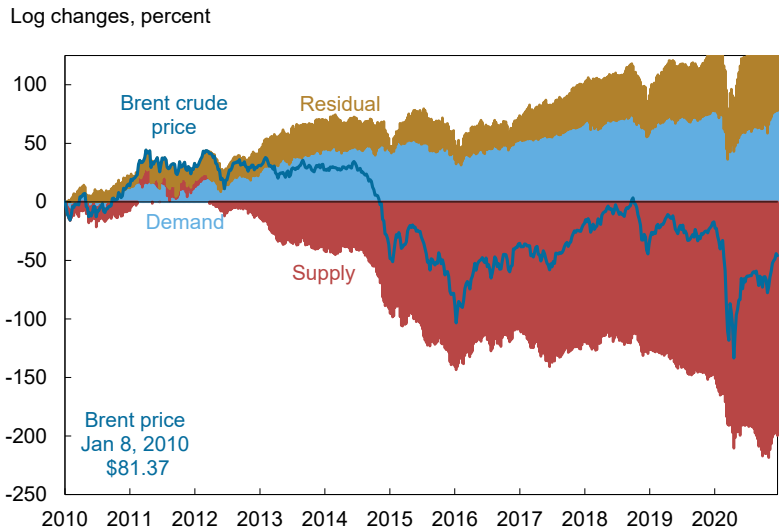
- Over the past week, a decrease in demand expectations and an increase in anticipated supply resulted in lower oil prices. In 2020:Q3, oil prices fell owing to increased supply.
- In 2020:Q1, oil prices plummeted owing to decreased demand and increased supply, whereas in 2020:Q2, oil prices rose owing to increased demand. Oil prices rose in 2019 due to increasing demand expectations.
- Overall, between 2014 and 2017, both lower global demand expectations and higher anticipated supply held oil prices down. Since mid-2017, this trend reversed as stronger demand expectations and stabilizing anticipated supply drove oil prices higher. This lasted until 2018:Q4, when weaker demand lowered prices.

Cumulative Weekly Decomposition, Jul 03-Dec 25, 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.

Cumulative Weekly Decomposition, 2010-Present



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 July 3, 2020.
- The table below presents the most recent cumulative values.

Cumulative Percentage Changes since July 3, 2020

	Demand	Supply	Rest	Brent
Dec 11, 2020	15.3	-8.5	8.7	15.5
Dec 18, 2020	16.8	-9.4	12.5	20.0
Dec 25, 2020	16.2	-11.2	13.4	18.3

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*. 2016. "Lower Oil Prices and U.S. Economic Activity." *Liberty Street Economics*, May 2.
- *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

Jan Groen, Lawrence Lin, and Adam Noble