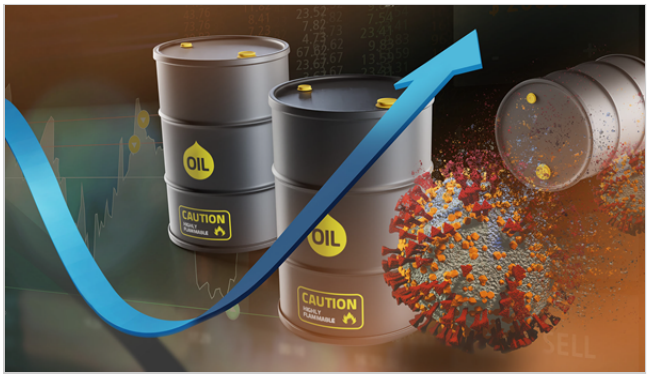
Monthly Labor Review

BLS

October 2020

From the barrel to the pump: the impact of the COVID-19 pandemic on prices for petroleum products

This article details price movements for petroleum products in the context of the coronavirus disease 2019 (COVID-19) pandemic. The pandemic affected energy prices for products ranging from crude oil to various refined petroleum products, such as heating oil, jet fuel, diesel fuel, retail gasoline, and gasoline at the pump. The onset of the pandemic led to an initial drop in prices for petroleum-based products, and then, just as abruptly, prices rose sharply as producers limited production and demand increased.



Kevin M. Camp
camp.kevin@bls.gov

Kevin M. Camp is an economist in the Office of Prices and Living Conditions, U.S. Bureau of Labor Statistics.

David Mead
mead.dave@bls.gov

David Mead is a supervisory economist in the Office of Prices and Living Conditions, U.S. Bureau of Labor Statistics.

Stephen B. Reed
reed.steve@bls.gov

Stephen B. Reed is an economist in the Office of Prices and Living Conditions, U.S. Bureau of Labor Statistics.

Christopher Sitter
sitter.christopher@bls.gov

On January 7, 2020, officials in China announced that they had identified a new virus in the Hubei region.[1] By the end of the month, the virus, designated coronavirus disease 2019 (COVID-19), had spread to other countries in Asia. In February, cases were reported throughout Europe and the United States, prompting the World Health Organization to declare a global emergency. On March 3, the United States followed suit by declaring a national emergency, a move that resulted in lockdowns across the country.

As economic activity slowed sharply across the globe, demand for petroleum and petroleum products plummeted. The drop in demand, coupled with an unexpected increase in supply, led to a collapse in crude oil prices and subsequent impacts on prices for refined petroleum products and other downstream items, notably gasoline. As economies reopened, the initial price downturn gave way to reduced oil production and some renewed demand. As a result, prices for oil products partially recovered.

Crude petroleum prices

This section discusses how the U.S. Bureau of Labor Statistics (BLS) measures crude oil prices and how these prices have changed over the course of the COVID-19 pandemic.

Christopher Sitter is an economist in the Office of Prices and Living Conditions, U.S. Bureau of Labor Statistics.

Derek Wasilewski
wasilewski.derek@bls.gov

Derek Wasilewski is an economist in the Office of Prices and Living Conditions, U.S. Bureau of Labor Statistics.

BLS measures of crude oil prices

The Producer Price Index (PPI) measures the average monthly change in selling prices received by domestic producers of goods and services. The Import Price Index measures the average monthly change in prices of foreign goods purchased by domestic consumers and producers. For crude oil, the Producer Price Index measures the change in prices that U.S. crude oil producers receive from purchasers, and the Import Price Index measures the change in prices that U.S. purchasers pay for crude oil imported into the United States. The calculation of the PPI for crude petroleum is based on monthly price data from a sample of petroleum producers in the United States and uses a midmonth reference period. BLS revises the producer price data 4 months after their initial publication. Unlike the PPI for crude petroleum, which is calculated with data for domestic prices, the Import Price Index for crude petroleum is calculated with data from two U.S. Energy Information Administration (EIA) sources. The first source is the EIA *Monthly Foreign Crude Oil Acquisition Report* (EIA-856), which is a listing of the price and quantity of crude oil involved in nearly all import transactions in a given month. BLS uses these data to calculate a weighted average of import prices throughout the month, and this average is then compared with the average for the previous month. For the month of initial data publication and the previous month, BLS calculates a preliminary import index measure, because not all import transactions data are available. BLS supplements the data by estimating regression models, which use information from the preliminary EIA-856 report and EIA weekly crude oil average contract values weighted by estimated import volumes. BLS revises import prices in each of the first 3 months after initial publication.[2]

The sharp drop in prices: COVID-19 and a price war

In January 2020, after seeing a customary decline due to business shutdowns for the Chinese New Year celebration, oil demand from China continued to fall because of economy-wide pandemic-related closures. Demand for oil decreased by 3 million barrels per day, which represents approximately 20 percent of the country's overall oil consumption.[3] In February, China's Purchasing Managers' Index fell nearly 49 percent, reaching its lowest level since it was first measured in 2005. Given that China overtook the United States as the world's top oil importer in 2016, the sudden decrease was the largest demand-side shock to the market since the 2008–09 global recession.[4] In January, BLS producer and import oil price measures declined modestly, by 2.5 and 0.3 percent, respectively. Price declines continued in February, with producer prices for crude petroleum falling 14.3 percent and import prices declining 10.9 percent.

As the COVID-19 pandemic continued to spread across the world, Saudi Arabia, the world's second-largest oil producer behind the United States, urged fellow Organization of the Petroleum Exporting Countries (OPEC) members and Russia to cut production.[5] Having formed a 2016 alliance with OPEC to control the price of oil through production cuts, Russia, the world's third-largest oil producer, now resisted the call for further reductions in

response to the pandemic. Russia sought to gain market share in anticipation that the U.S. shale industry's profitability and output would fall in the face of lower prices.[6]

On March 5 and 6, 2020, OPEC and Russia met in Vienna in an effort to iron out their differences. On the OPEC side, Saudi Arabia was upset that Russia had not previously met production cut agreements, causing the Kingdom to assume a disproportionate share of the cuts.[7] At the meeting, OPEC members threatened to cancel cuts altogether unless Russia agreed to reduce production by a further 1.5 million barrels per day. Despite ending on a hopeful note, the meeting did not produce results; Saudi Arabia and fellow OPEC members Iraq and the United Arab Emirates began reversing production cuts.

By the beginning of April, OPEC had raised output by 1.7 million barrels per day, up to a level of 30.4 million barrels per day, the largest production jump since September 1990. According to *Bloomberg*, Saudi Arabia alone reached a record production of 12.3 million barrels per day on April 1, an output exceeding the pre-pandemic consumption levels of Japan, Germany, France, the United Kingdom, Italy, and Spain combined.[8] The production boom coincided with an International Energy Agency (IEA) estimate that global demand for oil was down by almost 30 million barrels per day because of the shutdowns in response to the COVID-19 pandemic.[9] With demand down, the addition of petroleum to an already saturated market led to a near-record level of 535.2 million barrels of crude petroleum stockpiles in the United States on May 1.[10]

Prices dropped precipitously in March and April 2020. The combination of falling demand, rising supply, and diminishing storage space caused such a pronounced crude petroleum price plunge that, on April 20, crude petroleum traded at a negative price in the intraday futures market. Producer prices for crude petroleum declined 34.0 percent in March and 48.8 percent in April. In all, the PPI for crude petroleum fell 71.0 percent from January to April. The March and April decreases were the two largest monthly declines since the index was first published in July 1991. The trend was similar for U.S. import prices. The Import Price Index for crude petroleum declined 34.1 percent in March and 36.6 percent in April. In all, prices for crude petroleum imports fell 62.8 percent from January to April. As was the case with producer prices, the March and April declines in the Import Price Index were the largest 1-month decreases since the index was first published on a monthly basis in September 1992.

The rebound: partial recovery and production cuts

After falling sharply during the early months of the pandemic, crude petroleum prices began advancing at the end of April 2020. Producer prices for crude petroleum partially recovered from April to June, and import prices recorded a similar recovery from April to July. The price upturn began with a supply decrease, with a positive shock to demand eventually contributing as well.

Facing pressure from the United States and having no place to store any further petroleum surplus, Saudi Arabia called an emergency meeting of OPEC+ from April 9 to 12, 2020.[11] During the meeting, OPEC+ members agreed to record production cuts and, this time, Russia complied as well.[12] The agreement called for a composite cut of 9.7 million barrels per day through the end of June, the largest production cut ever.[13] (At a followup meeting, the cuts were extended through the end of July.) Following the agreement, OPEC production fell to its lowest level since May 1991. In the end, Saudi Arabia, Kuwait, and the United Arab Emirates cut production beyond the amounts that were negotiated, and production cuts were also adopted by non-OPEC+ countries. From January to

May, the United States and Canada—the first- and fourth-largest global oil producers, respectively—reduced output by a combined 3 million barrels per day.

By May 2020, amid partial business reopenings in the United States and abroad, petroleum demand was showing signs of a rebound. The IEA estimated that the number of people under some form of lockdown peaked at around four billion in late April, even as restrictions in some countries began to ease.[14] The first to emerge from the demand slump was China, where petroleum demand in April was almost back to levels seen 12 months prior.[15] In May, crude petroleum inventories in the United States fell for the first time since January, indicating that demand was starting to outpace reduced supply.

Crude petroleum prices responded quickly. Producer prices for crude petroleum rose 35.9 percent in May 2020, before jumping 74.0 percent in June. Prices for import crude petroleum also advanced in both months, although low import demand kept these advances below those for producer prices. The Import Price Index for crude petroleum increased 18.9 percent in May and 33.3 percent in June. Just as April saw record monthly declines in both the producer and import price indexes for crude petroleum, June recorded the largest 1-month increases in the indexes since either of them was first published on a monthly basis.

World petroleum supplies recovered somewhat after July, as the OPEC+ cuts were reduced from 9.7 million to 7.7 million barrels per day. In addition, the countries that had previously cut production beyond agreed amounts reversed those cuts. With prices up in May and June, U.S. and Canadian production increased as well.

The recurrence of COVID-19 cases in the United States and other countries, as well as travel restrictions, led to a slower-than-expected recovery. Both the IEA and OPEC made downward revisions to their earlier demand forecasts for 2020. For both 2020 and 2021, world petroleum demand is projected to decline from 2019 levels.[16] One factor bolstering demand expectations is the commitment by China to increase imports of petroleum from the United States as part of a trade agreement—a signal for continued demand recovery in the Asian country.

Table 1 shows the V-shaped price movements of crude petroleum for both domestic producers and importers. In both cases, prices fell sharply in February, March, and April 2020, before increasing in May and June. Movements in the producer and import price indexes for crude petroleum diverged in July. Producer prices for crude petroleum, which had risen by a greater percentage than import prices in May and June, declined 13.7 percent in July. The Import Price Index for crude petroleum continued to rise, increasing 21.2 percent. In August, producer crude petroleum prices rose 11.4 percent and import crude petroleum prices advanced 3.1 percent. Producer prices fell 71.0 percent from January to April, before rising 104.2 percent from April to July. The Import Price Index for crude petroleum declined 62.8 percent in the 3 months ended in April, before rising 92.0 percent in the following 3 months.

Table 1. Producer and import price indexes for crude petroleum, monthly percent changes, January–August 2020

Category	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020	3-month change (January– April)	3-month change (April– July)
PPI for crude petroleum	-2.5	-14.3	-34.0	-48.8	35.9	74.0	-13.7	11.4	-71.0	104.2

See footnotes at end of table.

Table 1. Producer and import price indexes for crude petroleum, monthly percent changes, January–August 2020

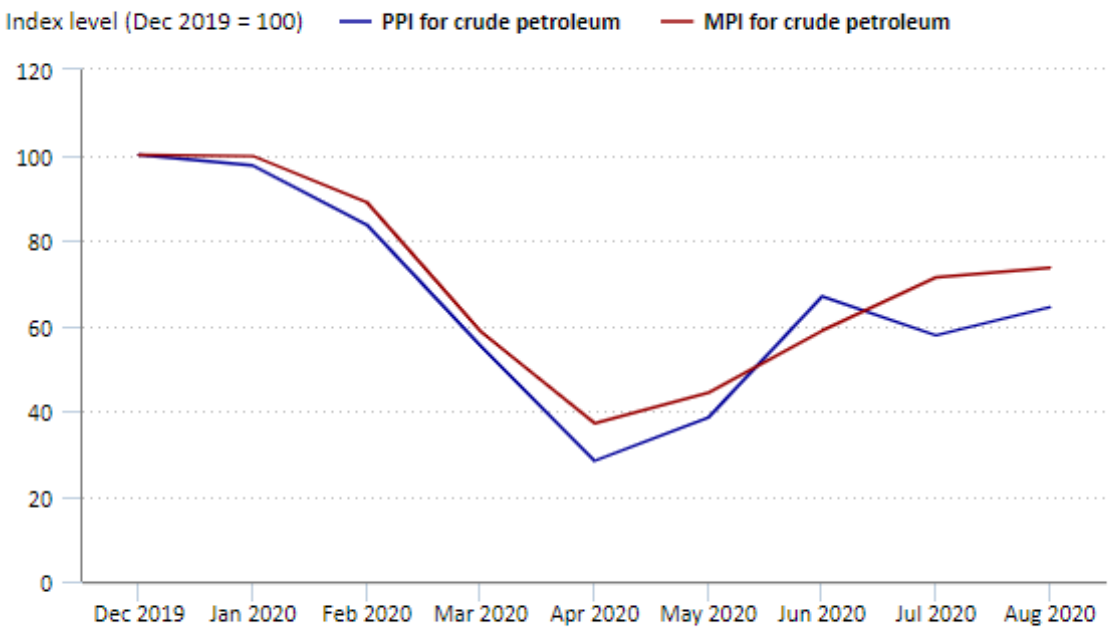
Category	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020	3-month change (January– April)	3-month change (April– July)
MPI for crude petroleum	-0.3	-10.9	-34.1	-36.6	18.9	33.3	21.2	3.1	-62.8	92.0

Note: PPI = Producer Price Index; MPI = Import Price Index.

Source: U.S. Bureau of Labor Statistics.

Figure 1 shows the producer and import price indexes for crude petroleum from December 2019 to August 2020. Despite the partial recovery in crude petroleum prices, both indexes remained below their January 2020 levels. The volatile movement in crude petroleum prices affected prices for items down the supply chain.

Figure 1. Producer and import price indexes for crude petroleum, December 2019–August 2020



Click legend items to change data display. Hover over chart to view data.
Note: PPI = Producer Price Index; MPI = Import Price Index.
Source: U.S. Bureau of Labor Statistics.

The producer perspective: refined petroleum products

The COVID-19 pandemic contributed to large fluctuations in the prices for all refined petroleum products during the first half of 2020. However, changes in demand and refiners' reactions aiming to reduce output and shift toward more profitable fuels resulted in differences in the timing and severity of the pandemic's impacts on specific petroleum products, such as jet fuel, diesel fuel, and gasoline. Decreased fuel demand due to voluntary consumer choices, state-mandated stay-at-home orders, and international travel restrictions—combined with crude oil

oversupply resulting from the OPEC–Russia price war—produced record declines in the PPIs for jet fuel and gasoline in April 2020. Then, three factors caused prices to rebound: OPEC+ agreeing to limit crude production (as described previously); refiners reducing production capacity utilization rates to near-minimum viable levels and shuttering some plants; and demand rising as travel and business restrictions were lifted. These factors resulted in record 1-month increases in the PPI for gasoline in May and the PPI for jet fuel in June.[17]

Jet fuel was the first refined petroleum product affected by the COVID-19 pandemic. At the onset of 2020, continued growth in air travel demand led to optimistic long-term forecasts for jet fuel prices. However, as news of the pandemic spread, global jet fuel prices began falling in January.[18] Travel demand in Asia quickly declined, leading to more pessimistic forecasts and prompting Asian airlines to cut flight capacity. In turn, Asian refiners began shipping unneeded jet fuel to the United States.[19] As the virus spread, bleaker forecasts for air travel demand spread beyond Asia. The United States announced travel restrictions from China on January 31 and extended restrictions to dozens of countries, including most of Europe, soon thereafter.[20]

Table 2 shows that jet fuel prices declined 18.9 percent in February. As more flights were canceled, global jet fuel storage capacity continued to fill up.[21] Prices continued to fall in March, decreasing 14.5 percent. By April, jet fuel demand was down by nearly 1 million barrels per day, or 62 percent, from the 2019 average.[22] The U.S. Transportation Security Administration reported that, in April 2020, passenger checkpoint throughput was 95 percent lower than it was in 2019.[23] Demand for air travel was so low that some airlines experimented by filling unused passenger jets with cargo, and the PPI for jet fuel fell a record 48.6 percent in April.[24] Refiners also reacted to the record low demand, reducing domestic production of jet fuel to record lows in the first week of May.[25] By June, some travel demand returned, and the combination of rising crude oil prices and declining supply contributed to jet fuel prices rising 51.7 percent in June and 15.0 percent in July.[26] Prices leveled off in August, but remained 41.3 percent below January 2020 levels.

Table 2. Producer price indexes for selected petroleum products, monthly percent changes, not seasonally adjusted, January–August 2020

Category	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020
Gasoline	2.3	-6.4	-20.2	-53.0	45.0	37.1	9.7	-2.7
No. 2 diesel fuel	-7.2	-9.9	-12.2	-27.2	-12.4	27.3	31.5	5.9
Jet fuel	4.6	-18.9	-14.5	-48.6	-6.8	51.7	15.0	1.5

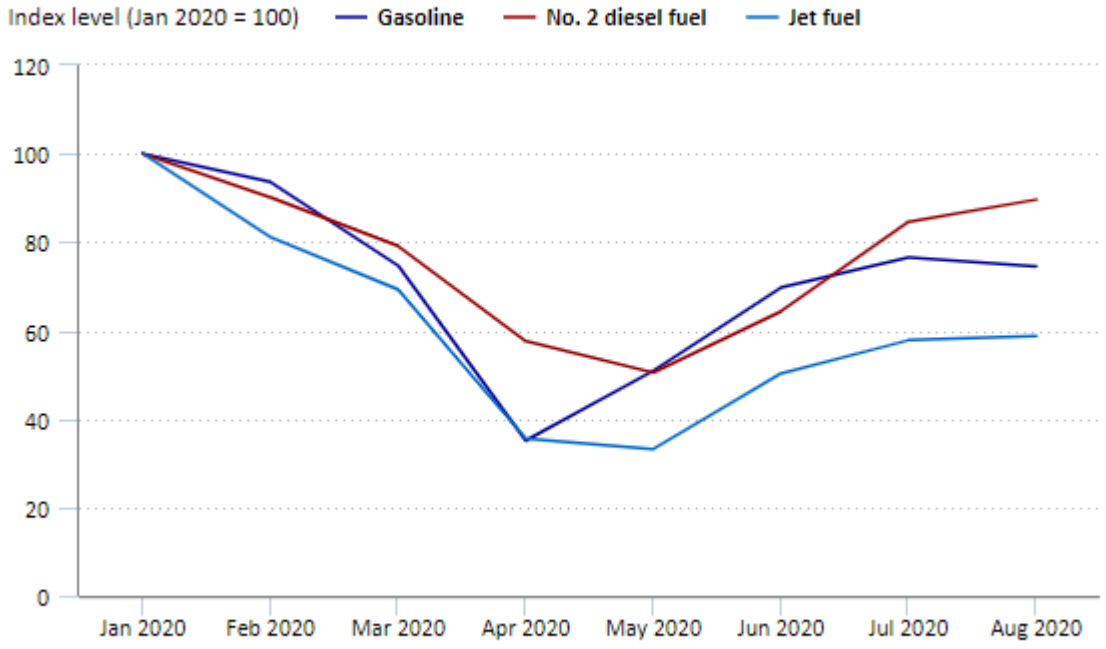
Source: U.S. Bureau of Labor Statistics.

The pandemic affected not only demand and prices for jet fuel, but also demand and prices for diesel fuel—although to a lesser extent. Diesel maintained more stability because of its industrial and commercial uses.[27] On April 23, 2020, EIA stated the following: “The decline in distillate fuel oil consumption so far has been less severe than the changes in motor gasoline and jet fuel. Distillate fuel oil is primarily consumed as diesel fuel, the predominant fuel of the trucking, locomotive, and agricultural sectors. Continued demand for distribution of necessities such as food and medical supplies and increased home deliveries for goods likely contributed to relatively stable demand for distillate fuel in the initial weeks following the shutdown.”[28] The American Trucking Associations reported that its For-Hire Truck Tonnage Index rose 1.8 percent in February and 1.2 percent in March, attributing those increases mainly to trucks hauling consumer staples.[29] Chasing better margins, refiners

shifted output toward diesel.[30] This led to a glut of diesel fuel, with inventories reaching their highest levels since 1982.[31] Still, because of comparatively stable demand for diesel fuel, diesel prices declined less than other fuel prices: the PPI for diesel fuel decreased 42.4 percent from January to April 2020, compared with 64.4 percent for the PPI for jet fuel and 64.9 percent for the PPI for gasoline. Recording increases in June, July, and August, the PPI for diesel fuel surpassed its March 2020 level.

In absolute terms, COVID-19 affected demand and prices for gasoline more than demand and prices for other refined petroleum products. In April 2020, when 90 percent of the U.S. population was under some type of stay-at-home orders, demand for gasoline (measured by EIA as “product supplied”) fell by 3.5 million barrels per day, or 37 percent, below its April 2019 level.[32] This low demand, the lowest in over 50 years, led to a 53.0-percent decline in the PPI for gasoline—the largest 1-month decline since the series began in February 1947.[33] Meanwhile, gasoline stocks reached record highs, and the U.S. Environmental Protection Agency extended deadlines for the switch to summer-grade gasoline as storage tanks were still full of winter-grade gasoline.[34] Refiners hoped to take advantage of low crude petroleum prices to supply diesel, but meanwhile they continued to produce unwanted gasoline. As a result, producers occasionally resorted to selling a barrel of gasoline for less than the cost of a barrel of crude petroleum.[35] However, low gasoline prices, the Memorial Day holiday, and loosened lockdowns put more drivers on the roads in May, reviving demand for gasoline. This brought attention to some novel real-time proxies for rising gasoline demand, such as an uptick in the relative number of cellphone navigation app requests.[36] EIA statistics also indicated that demand in May reached pre-pandemic levels. Still, according to EIA, demand for the summer driving season remained about one-fifth below its historical average.[37] As crude oil prices and demand rebounded, the PPI for gasoline jumped 45.0 percent in May, a record 1-month increase. Some U.S. regions recorded gasoline blendstock spot price increases of more than 100 percent from the previous month.[38] Producer gasoline prices continued their advance, rising 37.1 percent in June and 9.7 percent in July, before leveling off in August at 25.5 percent below their January 2020 level. (See figure 2.)

Figure 2. Producer price indexes for selected petroleum products, monthly percent changes, not seasonally adjusted, January–August 2020



Click legend items to change data display. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

Margins for gasoline stations: a response to energy market shocks

A portion of refined oil products flows to retailers, a group facing related but distinct impacts from the pandemic. The PPI for automotive fuels and lubricants retailing measures the average change in margins that fuel retailers receive for the sale of automotive fuel. These margins are measured as the difference between the average selling and acquisition prices for fuel products. For U.S. fuel retailers, early 2020 was just as volatile as it was for many other businesses. Fuel retailer costs depend heavily on global crude oil prices, and retail firms generally use a "sticky price method" to set prices. As oil prices decrease, retailers hesitate to adopt commensurately lower selling prices because of future market uncertainty. The result is higher margins when crude oil prices fall, as the gap between acquisition and sales prices widens. Likewise, as crude oil prices increase, fuel retailers often are slower to raise selling prices. This dynamic is generally driven by local competition: if a retail price increase is not matched locally, customers will go to competing gas stations. As a result, fuel retailers often post lower margins when oil prices rise.[39]

With the small decrease in crude oil prices reported in January 2020, retail margins increased as costs fell. Over the month, the PPI for automotive fuels and lubricants retailing increased 2.1 percent. The crude oil price decrease extended into February, driving fuel retailer input costs further downward. As a result, the margins for automotive fuel and lubricant retailers increased an additional 2.7 percent in February.

In March 2020, rising COVID-19 cases, particularly in the United States, coupled with the OPEC–Russia price war, further disrupted crude petroleum markets. Several European countries and some areas in the United States

imposed mandatory lockdowns, substantially decreasing demand for crude oil. The large demand drop allowed automotive fuel and lubricant retailers to expand margins, which increased 24.0 percent in March.

In April, widespread stay-at-home orders and business closures in the United States continued to drive down refined fuel demand and crude oil prices. Fuel retailers took advantage of input price decreases by further expanding margins. In April, the PPI for automotive fuels and lubricants retailing increased an additional 33.4 percent.

By May, several countries had started to reopen their economies, increasing global demand for fuel. The resulting crude oil price increase raised the cost of fuel for U.S. fuel retailers. The retailers increased selling prices to compensate for the rising cost, but they did so slowly because of the higher-than-average margins received over the previous few months. As summer began, fuel retailers continued to report lower margins amid a continued recovery in oil prices. The PPI for automotive fuels and lubricants retailing declined 9.1 percent in May, 12.8 percent in June, and 5.2 percent in July. (See table 3.)

Table 3. Producer price indexes for automotive fuels and lubricants retailing, monthly percent changes, not seasonally adjusted, January–August 2020

Category	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020
Automotive fuels and lubricants retailing	2.1	2.7	24.0	33.4	-9.1	-12.8	-5.2	-3.5

Source: U.S. Bureau of Labor Statistics.

Consumer gasoline prices

This section discusses how BLS measures consumer gasoline prices and how these prices have changed over the course of the COVID-19 pandemic.

BLS measures of consumer gasoline prices

The Consumer Price Index (CPI) measures the average monthly change in prices that U.S. consumers pay for a representative market basket of goods and services. To calculate the CPI for gasoline, BLS samples gasoline prices in 75 metropolitan areas across the country, collecting about 3,800 prices each month. At all gas stations sampled, BLS collects prices for regular, midgrade, and premium gasoline, publishing price indexes for each category. In addition, BLS publishes a gasoline (all types) price index, which is based on prices for all three grades, and a price index for other motor fuels, which includes sampled prices for diesel and alternative motor fuels.

The average prices captured by the consumer price indexes reflect what consumers pay at the pump per gallon, including all sales and excise taxes. Besides taking into account the specific grade or octane level of the fuel purchased, gasoline prices in the CPI reflect specific levels of service (full service or self-service) and brand name.

Normally, BLS economic assistants collect gasoline prices in person across the country. Since March 16, 2020, when COVID-19 concerns prompted the suspension of in-person data collection, BLS has transitioned to alternative methods for collecting all gasoline price data. After encountering problems during initial attempts at

collection by telephone, economic assistants shifted to collecting data from websites, supplementing them with a third-party source. However, the outlets and specific prices in the sample remained unchanged; only the method of collection varied.

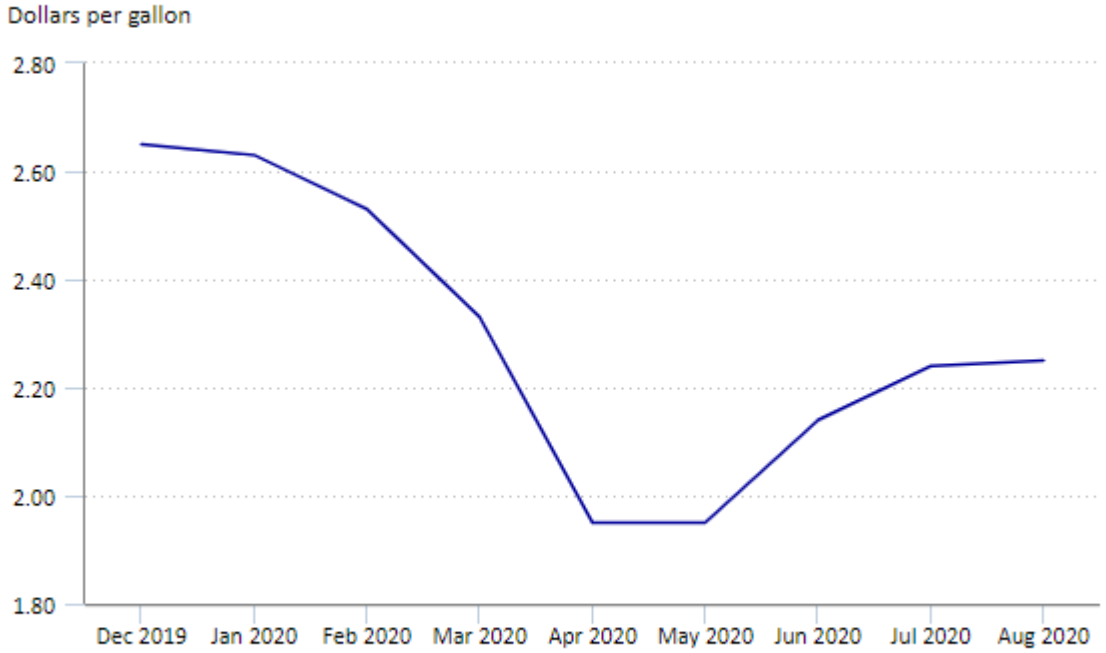
For gasoline, as with most CPI items, BLS collects any given price during one of three specified pricing periods within a calendar month: roughly the first 10 days, the second 10 days, and the final 10 days of the month. Because the process involves collecting a similar number of prices during each period, the gasoline index represents an average of prices over the course of the month.

In addition to publishing the CPI for gasoline, BLS publishes average price data for gasoline. These data include average prices for gasoline (all types), the three individual grades of gasoline, and diesel fuel.

Consumer gasoline prices in 2020: supply and demand factors push gasoline prices to their lowest level since 2009

In December 2019, the average price for gasoline (all types) was $2.65, the highest December level since 2013. (See figure 3.) Historically, gasoline prices have typically risen through the early part of the year, peaking in the summer, but in the first 4 months of 2020, they declined sharply, bottoming out at $1.95 in April and May, the lowest level since January 2009, near the trough of the Great Recession. (In Dallas, prices fell to $1.41 in May, the lowest level across all metro areas for which prices were published.) Prices increased in June and July, but the July figure of $2.24 remained 15.4 percent lower than the December 2019 level and stayed virtually unchanged in August.

Figure 3. CPI average gasoline prices, December 2019–August 2020



Hover over chart to view data.
Note: CPI = Consumer Price Index.
Source: U.S. Bureau of Labor Statistics.

The gasoline price index tells a story similar to that of average price values. (See table 4.) On a seasonally adjusted basis, the gasoline price index fell 34.8 percent from December 2019 to the May 2020 trough. The index rose in June, July, and August, but remained 21.2 percent below its December 2019 level. (The index decline is larger than the average price decline because, for seasonal reasons, gasoline prices are generally higher in December than in July.)

Table 4. CPI for gasoline (all types), monthly percent changes, January–August 2020

Category	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020	3-month change (January– April)	3-month change (April– July)
Gasoline, all types	-1.6	-3.4	-10.5	-20.6	-3.5	12.3	5.6	2.0	-31.4	14.4

Note: CPI = Consumer Price Index.

Source: U.S. Bureau of Labor Statistics.

Examining the series month by month reveals modest initial declines: in January 2020, the CPI for gasoline fell 1.6 percent on a seasonally adjusted basis and the average gasoline price dropped by just over 2 cents. These declines were similar to those in crude oil prices in January. The declines accelerated in February, as the seasonally adjusted gasoline price index dropped 3.4 percent and the average price fell by about 10 cents. However, the February declines were outpaced substantially by the sharp decline in crude oil prices during the month. This pattern is common, because consumer gasoline prices tend to be less volatile than crude petroleum prices, recording similar but more muted movements. While global demand fell in February, economic conditions within the United States remained fairly normal; the brunt of the pandemic-related contraction began in March.

As global crude oil prices continued falling and COVID-19 spread in the United States, gasoline prices at the pump fell sharply in March 2020. The seasonally adjusted CPI for gasoline declined 10.5 percent, and the average price for gasoline fell by nearly 20 cents. The decline accelerated in April. With lockdowns throughout much of the United States reducing driving, and with crude oil prices falling sharply, the average price for gasoline fell by almost 40 cents and the gasoline price index fell 20.6 percent, the largest monthly decline since November 2008.

Despite increases in the producer and import price indexes for crude petroleum in May 2020, the CPI for gasoline declined. The gasoline index fell 3.5 percent, while the average price remained stable, at $1.95. As crude oil prices continued to recover and the economy partially reopened, the CPI for gasoline started to rebound in June and July. The index rose 18.6 percent over the 2 months, and the average price recovered about 30 cents of its 70-cent decline per gallon. A smaller increase of 2.0 percent followed in August. Like the producer and import price indexes for crude petroleum, the CPI and average prices for gasoline remained well below their December 2019 levels.

Conclusion

In early 2020, BLS price indexes for petroleum products reflected the dramatic shift in economic activity caused by the onset of the COVID-19 pandemic. Shocks to demand and then supply pushed prices for petroleum products downward. From January to April, BLS reported substantial decreases in the Import Price Index for crude petroleum; the PPIs for crude petroleum, gasoline, diesel, and jet fuel; and the CPI and average consumer prices for gasoline. PPI margins for automotive fuel and lubricant retailers were driven sharply upward by the decrease in

petroleum prices over the same period. Although pronounced, the market forces driving BLS energy price indexes during the first quarter of 2020 did not persist. The end of the OPEC–Russia price war, coupled with economic reopenings in the United States and abroad, pushed petroleum prices upward from April to July. Notwithstanding the rebound, BLS price indexes for petroleum products recorded lower levels than those prior to the pandemic. In all, the story of the first 8 months of 2020 was one of petroleum price fluctuations starting from the barrel for importers and refiners and extending all the way to the pump for end consumers.

The COVID-19 pandemic affected the collection of BLS price data, although the impact for price indexes in the energy sector was less pronounced than that in other sectors. Despite the constraints associated with the pandemic, price data collection has continued at a sufficient level, allowing BLS to publish dependable, high-quality price indexes.

SUGGESTED CITATION

Kevin M. Camp, David Mead, Stephen B. Reed, Christopher Sitter, and Derek Wasilewski, "From the barrel to the pump: the impact of the COVID-19 pandemic on prices for petroleum products," *Monthly Labor Review,* U.S. Bureau of Labor Statistics, October 2020, https://doi.org/10.21916/mlr.2020.24.

NOTES

1 For more information, see “Timeline: how the new corona virus spread,” *Al Jazeera*, September 20, 2020, https://www.aljazeera.com/news/2020/01/timeline-china-coronavirus-spread-200126061554884.html.

2 For more information on the import crude petroleum price index, see “Measuring price change for crude oil, gasoline, and fuel oil in the U.S. Import/Export Price Indexes” (U.S. Bureau of Labor Statistics, November 2012), https://www.bls.gov/mxp/publications/factsheets/oil-industry-facts.pdf.

3 Alfred Cang, Javier Blas, and Sharon Cho, “China oil demand has plunged 20% because of the virus lockdown,” *Bloomberg*, February 2, 2020, https://www.bloomberg.com/news/articles/2020-02-02/china-oil-demand-is-said-to-have-plunged-20-on-virus-lockdown.

4 Meng Meng and Florence Tan, “China overtakes U.S. again as world’s top crude importer,” *Reuters*, October 12, 2016, https://www.reuters.com/article/us-china-economy-trade-crude/china-overtakes-u-s-again-as-worlds-top-crude-importer-idUSKCN12D0A9.

5 Grant Smith, Nayla Razzouk, and Matthew Martin, “OPEC tries to force Russia into deeper cuts as oil price slumps,” *Bloomberg*, March 5, 2020, https://www.bloomberg.com/news/articles/2020-03-05/opec-meets-in-effort-to-bridge-saudi-russia-divide-on-oil-cuts.

6 Ibid.

7 Javier Blas, “Trump’s oil deal: the inside story of how a price war ended,” *Bloomberg*, March 13, 2020, https://www.bloomberg.com/news/articles/2020-04-13/trump-s-oil-deal-the-inside-story-of-how-the-price-war-ended.

8 Ibid.

9 For more information on crude petroleum stockpiles, see “U.S. commercial crude oil inventories reach all-time high,” *Today in Energy* (U.S. Energy Information Administration, June 29, 2020), https://www.eia.gov/todayinenergy/detail.php?id=44256.

10 The record was eventually broken on June 26, despite production levels falling after mid-April.

11 OPEC+ is made up of the OPEC member countries and Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan, and Sudan.

12 Blas, “Trump’s oil deal.”

13 Initially, Mexico was reluctant to agree to the entire cut, but it did so after the United States agreed to cut production to cover the remainder of Mexico's obligation.

14 For more information, see *Oil market report—May 2020* (International Energy Agency, May 2020), https://www.iea.org/reports/oil-market-report-may-2020.

15 For more information on petroleum demand, see *Oil market report—June 2020* (International Energy Agency, June 2020), https://www.iea.org/reports/oil-market-report-june-2020.

16 Andres Guerra Luz, "Oil drops with IEA demand outlook pointing to weakness ahead," *Bloomberg*, August 12, 2020, https://www.bloomberg.com/news/articles/2020-08-12/oil-holds-gains-on-rising-u-s-demand-shrinking-stockpiles; and Grant Smith, "OPEC sees weaker outlook as demand falters, shale recovers," *Bloomberg*, September 14, 2020, https://www.bloomberg.com/news/articles/2020-09-14/opec-sees-weaker-oil-outlook-as-demand-falters-shale-recovers.

17 Javier Blas, Salma El Wardany, and Grant Smith, "Oil price war ends with historic OPEC+ deal to slash output," *Bloomberg*, April 12, 2020, https://www.bloomberg.com/news/articles/2020-04-12/oil-price-war-ends-with-historic-opec-deal-to-cut-production; "Weekly U.S. percent utilization of refinery operable capacity" (U.S. Energy Information Administration), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WPULEUS3&f=W; and Barbara J. Powell, "Some of America's oil refineries may be on brink of shutting," *Bloomberg*, April 8, 2020, https://www.bloomberg.com/news/articles/2020-04-08/some-of-america-s-oil-refineries-face-closure-amid-demand-plunge.

18 "Jet fuel price monitor" (International Air Transport Association), https://www.iata.org/en/publications/economics/fuel-monitor/.

19 Elizabeth Low, "Jet fuel's luster tarnished by virus with demand in doubt," *Bloomberg*, February 25, 2020, https://www.bloomberg.com/news/articles/2020-02-25/jet-fuel-s-luster-tarnished-by-virus-with-demand-story-in-doubt.

20 "Presidential proclamations on novel coronavirus" (U.S. Department of State, June 29, 2020), https://travel.state.gov/content/travel/en/News/visas-news/presidential-proclamation-coronavirus.html.

21 Alex Longley, Elizabeth Low, and Jack Wittels, "Glut of jet fuel is on brink of overwhelming global storage," *Bloomberg*, March 22, 2020, https://www.bloomberg.com/news/articles/2020-03-22/a-glut-of-jet-fuel-is-on-brink-of-overwhelming-global-storage.

22 Jesse Barnett, "COVID-19 mitigation efforts result in the lowest U.S. petroleum consumption in decades," *Today in Energy* (U.S. Energy Information Administration, April 23, 2020), https://www.eia.gov/todayinenergy/detail.php?id=43455.

23 "TSA checkpoint travel numbers for 2020 and 2019" (U.S. Department of Homeland Security, Transportation Security Administration, updated daily), https://www.tsa.gov/coronavirus/passenger-throughput.

24 Jennifer Smith, "Passenger airlines start shifting idled planes into freight business," *The Wall Street Journal*, March 20, 2020, https://www.wsj.com/articles/passenger-airlines-start-shifting-idled-planes-into-freight-business-11584737793?mod=searchresults&page=1&pos=4.

25 "Weekly U.S. product supplied of kerosene-type jet fuel" (U.S. Energy Information Administration), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WKJUPUS2&f=W; and "Weekly U.S. refiner and blender net production of kerosene-type jet fuel" (U.S. Energy Information Administration), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WKJRPUS2&f=W.

26 In this article, Producer Price Index (PPI) data for June–September 2020 are preliminary. To reflect late reporting by survey respondents, all PPIs are recalculated 4 months after original publication.

27 Ahmad Ghaddar, Koustav Samanta, and Ron Bousso, "Diesel gathers momentum as other fuels bear brunt of coronavirus impact," *Reuters*, March 30, 2020, https://www.reuters.com/article/us-global-oil-refining/diesel-gathers-momentum-as-other-fuels-bear-brunt-of-coronavirus-impact-idUSKBN21H1YY.

28 Barnett, "COVID-19 mitigation efforts result in the lowest U.S. petroleum consumption in decades."

29 "ATA Truck Tonnage Index rose 1.2% in March" (Washington, DC: American Trucking Associations, April 21, 2020), https://www.trucking.org/news-insights/ata-truck-tonnage-index-rose-12-march.

30 Janet McGurty, "US refiners shift into maximum diesel mode as gasoline prices dip below $1/gal," *S&P Global Platts*, April 3, 2020, https://www.spglobal.com/platts/en/market-insights/latest-news/oil/040320-us-refiners-shift-into-maximum-diesel-mode-as-gasoline-prices-dip-below-1gal.

31 Jack Wittels, Jeffrey Bair, and Elizabeth Low, "A glut of diesel is quietly undermining oil price resurgence," *Bloomberg*, June 8, 2020, https://www.bloomberg.com/news/articles/2020-06-08/a-glut-of-diesel-is-quietly-undermining-oil-price-resurgence; and "Weekly U.S. ending stocks of distillate fuel oil" (U.S. Energy Information Administration), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WDISTUS1&f=W.

32 Philip Bump, "Nearly all Americans are under stay-at-home orders. Some may have come too late," *The Washington Post*, April 2, 2020, https://www.washingtonpost.com/politics/2020/04/02/nearly-all-americans-are-under-stay-at-home-orders-some-may-have-come-too-late/; and "This week in petroleum" (U.S. Energy Information Administration, July 1, 2020), https://www.eia.gov/petroleum/weekly/archive/2020/200701/includes/analysis_print.php.

33 Robert Rapier, "Gasoline demand collapses to a 50-year low," *Forbes*, April 9, 2020, https://www.forbes.com/sites/rrapier/2020/04/09/gasoline-demand-collapses-to-a-50-year-low/#283cd784196e.

34 "Weekly U.S. ending stocks of total gasoline" (U.S. Energy Information Administration), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WGTSTUS1&f=W; and Jennifer A. Dlouhy and Jeffrey Bair, "U.S. delays switch to summertime gas after virus reduces driving," *Bloomberg*, March 27, 2020, https://www.bloomberg.com/news/articles/2020-03-27/u-s-delays-switch-to-summertime-gas-after-virus-reduces-driving.

35 Rebecca Elliott and Russel Gold, "Gasoline is cheap, but with coronavirus, nobody's buying," *The Wall Street Journal*, March 30, 2020, https://www.wsj.com/articles/gasoline-is-cheap-but-with-coronavirus-nobodys-buying-11585570263?mod=searchresults&page=1&pos=16.

36 Amrith Ramkumar, "Return of car traffic fuels surge in oil," *The Wall Street Journal*, May 19, 2020, https://www.wsj.com/articles/return-of-car-traffic-fuels-surge-in-oil-11589880602?mod=hp_lead_pos6.

37 "U.S. gasoline demand" (U.S. Energy Information Administration), https://www.eia.gov/petroleum/weekly/images/gtpsusm.gif; and Jeffrey Bair, "U.S. gasoline demand is at pre-pandemic levels. Don't cheer yet," *Bloomberg*, July 8, 2020, https://www.bloomberg.com/news/articles/2020-07-08/u-s-gasoline-demand-is-at-pre-pandemic-levels-don-t-cheer-yet.

38 "Los Angeles reformulated RBOB regular gasoline spot price" (U.S. Energy Information Administration), https://www.eia.gov/dnav/pet/hist/EER_EPMRR_PF4_Y05LA_DPGD.htm.

39 Jeff Rubenstein and Michael Conforti, "As crude oil plunges, retail gasoline margins spike, then retreat," *Beyond the Numbers*, vol. 4, no. 13 (U.S. Bureau of Labor Statistics, December 2015), https://www.bls.gov/opub/btn/volume-4/as-crude-oil-plunges-retail-gasoline-margins-spike-then-retreat.htm.

RELATED CONTENT

Related Articles

A new BLS satellite series of net inputs to industry price indexes: methodology and uses, *Monthly Labor Review*, September 2020.

The impact of the COVID-19 pandemic on food price indexes and data collection, *Monthly Labor Review*, August 2020.

Related Subjects

Imports | Energy prices | Consumer price index | Producer price index | Social issues | Prices | Energy | Industry studies | Global Economy