

The Link Between Higher Commodity Prices and Inflation

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Since the summer of 2020, many commodity prices have surged—some, like steel and lumber, to record-high levels. The figure shows 12-month percent changes in four well-known commodity price indexes. Although down from their peaks earlier this year, the average of the four indexes through August is up by about 38 percent from a year earlier.

The linkage between commodity price changes and the changes in prices that consumers pay for goods and services is intuitive: If the price of steel increases, consumers will pay more for durable goods such as motor vehicles and appliances, which will tend to lift the measure of inflation that the Fed targets (the personal consumption expenditures price index, or PCEPI). So, perhaps not surprisingly, the surge in commodity prices has occurred in tandem with higher consumer price inflation. In July, the PCEPI rose 4.2 percent from 12 months earlier, which was the largest 12-month increase since January 1991.

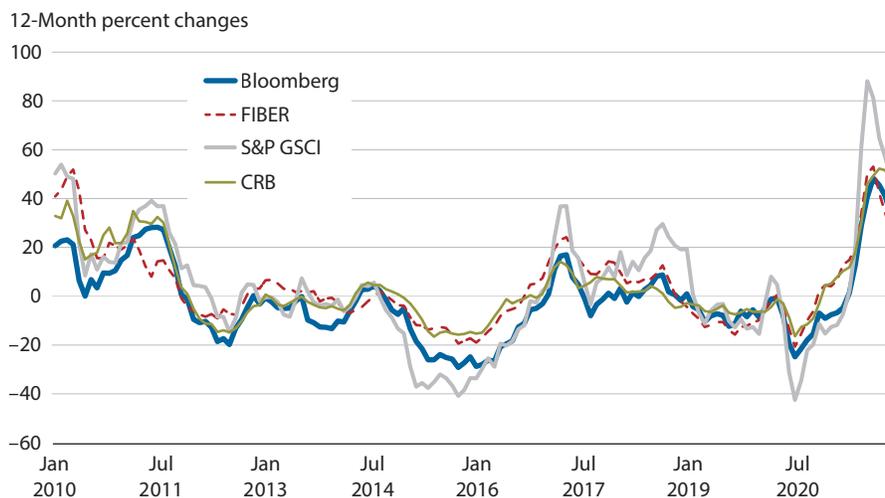
However, as many Federal Reserve officials have stressed, higher inflation this year also reflects other factors generally not related to rising commodity prices.¹ In particular, the challenges stemming from the pandemic appear to be key factors. The pandemic was a global event that triggered

widespread disruptions in supply chains and business operations that affected the prices of many goods and services. A reasonable assumption is that these disruptions will prove to be temporary once the pandemic ends. Accordingly, this essay reports simple correlations between commodity price indexes and consumer price inflation measures from January 1995 to December 2019. Reporting correlations during the nearly 25-year period prior to the pandemic might be a better gauge of the comovement between key measures of consumer price inflation and changes in commodity prices if the pandemic effects are temporary.

Price indexes with a larger energy component—such as the Bloomberg and Goldman Sachs–Standard & Poor’s—are more highly correlated with headline inflation.

The table shows the correlations² between the 12-month percent changes in four well-known commodity price indexes and the same changes in six measures of PCEPI

Selected Commodity Price Indexes



NOTE: See appendix for more details.

SOURCE: Haver Analytics.

Final observation is August 2021.

Correlations Between Commodity Price Changes and Measures of Personal Consumption Expenditures Inflation

12-Month percent changes, Jan 1995 to Dec 2019

Commodity price index	Energy weight in index	Personal consumption expenditures inflation measures					
		Headline (all items)	Durable goods	Nondurable goods	Services	Core	Trimmed mean
Bloomberg	36.1	0.79	0.17	0.76	0.60	0.55	0.21
FIBER	8.1	0.58	0.07	0.61	0.35	0.39	-0.15
S&P GSCI	53.9	0.83	0.18	0.87	0.49	0.52	0.17
CRB	0.0	0.59	0.13	0.58	0.40	0.44	0.00
Average correlations		0.70	0.14	0.70	0.46	0.47	0.06

NOTE: See appendix for more details.

inflation from January 1995 to December 2019. The appendix provides more details about these four commodity price indexes. The measures of PCEPI inflation are as follows: The headline measure is a weighted average of prices of durable and nondurable goods and services (listed separately). The core measure, published by the Bureau of Economic Analysis, excludes food and energy. And the trimmed mean inflation rate is calculated by the Federal Reserve Bank of Dallas.³

The table has several takeaways. First, commodity price changes and headline PCEPI inflation are highly correlated. The average correlation of the four commodity indexes and headline inflation is 0.7. Second, price indexes that have a larger energy component—such as the Bloomberg and Goldman Sachs–Standard & Poor’s—are more highly correlated with headline inflation. This finding holds across all measures of inflation in the table and suggests the energy-intensive nature of the production and distribution of a wide array of goods and services.

Third, the average correlation between commodity prices and the prices of types of PCE products is highest for nondurable goods (0.70) and lowest for durable goods (0.14). Energy also helps explain this finding, because rising oil prices are usually quickly passed through to consumers in the form of higher gasoline prices. Higher prices of agricultural commodities can also boost prices of nondurable goods such as bread and hamburgers. However, the commodity price index with the largest agricultural commodity weighting (CRB) also has the smallest correlation with changes in nondurable goods. The relatively high correlation between energy-intensive commodity price indexes and services prices is also not too surprising, since, for example, higher jet fuel or diesel prices tend to increase the prices consumers pay for utilities or air fares or shipping services.

Finally, the correlation between commodity price changes and PCEPI core inflation is much weaker: The average across the four indexes is 0.47. The trimmed-mean inflation rate exhibits an even lower average correlation of 0.06 with commodity price changes. In fact, the last column shows the correlation is even negative in one case.

The main takeaway from this analysis is that commodity prices that have a relatively high energy component are more highly correlated with headline inflation than those commodity price indexes composed mostly of metals or agricultural commodities. ■

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Notes

¹ See Waller (2021).

² The correlation coefficient measures the linear relationship between two variables and ranges from -1 to 1, where -1 indicates a perfect negative relationship, 0 indicates no relationship, and 1 indicates a perfect positive relationship.

³ See <https://www.dallasfed.org/research/pce>.

References

Waller, Christopher J. “The Economic Outlook and Monetary Policy,” Remarks at the Global Interdependence Center’s 39th Annual Monetary and Trade Conference, May 13, 2021; <https://www.federalreserve.gov/newsevents/speech/waller20210513a.htm>.

Appendix: Selected Commodity Price Indexes

Bloomberg Commodity Price Index (BCI)

- It has 23 types of exchange-traded commodity futures prices across five sectors: energy, agriculture, industrial metals, precious metals, and livestock.
- Commodity prices are weighted. In June 2021, gold received the largest weight (11.7%), followed by West Texas Intermediate (WTI) crude oil (9.9%). By sector, energy receives the largest weight (36.1%). Weights change yearly.

SOURCE: <https://assets.bbhub.io/professional/sites/27/BCOM.pdf>.

Foundation for International Business and Economic Research (FIBER) Industrial Materials Price Index

- It has 15 types of commodity spot prices across four sectors: textiles, metals, crude oil and benzene, and miscellaneous such as lumber and rubber.
- Commodity prices are weighted. Structured panel (e.g., plywood) receives the largest weight (9%), followed by copper scrap (8.7%).

SOURCE: Haver Analytics.

Goldman Sachs–Standard & Poor’s Commodity Index (S&P GSCI)

- It has 24 types of commodity futures prices across five sectors: agriculture, livestock, energy, industrial metals, and precious metals.
- This production-weighted index is designed to reflect the relative significance of the commodity in world global trade. In 2021, WTI crude oil received the highest weight (21.8%), followed by Brent crude oil (16.1%). The total energy weight is 53.9%.

SOURCE: <https://www.spglobal.com/spdji/en/documents/methodologies/methodology-sp-gsci.pdf>.

Commodity Research Bureau Spot Commodity Index (CRB)

- It has 22 types of commodity spot prices across six sectors: industrial metals, textiles, raw materials, food-stuffs, fats and oils, and livestock. If a spot price is unavailable, a bid or ask price may be substituted.
- It uses the unweighted geometric mean of individual commodity prices on Tuesdays relative to the base period prices.

SOURCE: <https://www.barchart.com/cmdty/indexes/bls-indexes>.