



## How Much Do Oil Prices Affect Inflation?

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People tend to think that oil prices drive inflation. The high inflation rates of the 1970s, which occurred after large increases in oil prices, probably contribute to this perception.

Indeed, it seems to make sense that oil prices explain a lot of the variation in inflation because many industries consume oil, often for transportation—it is used to make gasoline for automobiles and jet fuel for air transport—or as heating fuel for many homes in the Northeast. In 2014, the United States used about 6.95 billion barrels of oil.<sup>1</sup> At a price of \$93 per barrel, the average for 2014, the United States used about \$648 billion dollars' worth of oil, which was about 3.8 percent of U.S. GDP.

**It is puzzling why large monthly or quarterly oil price changes predict very small changes in the CPI but daily oil prices predict large changes in breakeven inflation.**

Economists generally agree that oil prices can drive some variation in inflation, at least over the short and medium runs. The fact that international inflation rates move together (Neely and Rapach, 2011) suggests that international factors, such as commodity prices like oil, might drive a substantial part of inflation. Over the long run, economists think that central banks can use monetary policy to offset such shocks and choose an average inflation rate.

Financial market inflation forecasts do react strongly to changes in oil prices, however, which indicates that financial market participants think that oil prices do substantially predict inflation. One can obtain a market inflation forecast by comparing the yields of bonds with inflation-adjusted payouts (Treasury inflation-protected securities [TIPS]) with yields of bonds whose payouts do not depend on inflation. Such measures of inflation are called “break-

even” inflation. Over the 2004-15 sample period, the correlation between the daily changes in breakeven inflation and West Texas Intermediate (WTI) spot oil prices is positive and substantial, ranging from 0.34 to 0.41, depending on the forecast horizon of breakeven inflation. These correlations don't change much over the sample or with the use of 2-day or 5-day correlations rather than 1-day correlations. Similarly, if one uses WTI spot oil prices to predict contemporaneous changes in breakeven consumer price index (CPI) inflation, then a 50 percent reduction in oil prices would cumulatively reduce expected inflation by 27 basis points per year, or about 2.7 percentage points, over a horizon of 10 years.

Inflation is notoriously difficult to predict, however. The best forecast for inflation over medium horizons is probably a gradual return to the central bank's target from the current rate of inflation (Faust and Wright, 2013). And specific studies of the effect of oil prices on inflation suggest that there is very little “pass-through” of oil prices to inflation. For example, Chen's (2009) estimates with quarterly data predict that a 50 percent decrease in oil prices would reduce the overall price level by less than 0.19 percent, which is far less than the change implied by financial markets.<sup>2</sup>

It is puzzling why large monthly or quarterly oil price changes predict very small changes in the CPI but daily oil prices predict large changes in breakeven inflation. Perhaps financial market participants systematically overestimate the importance of oil prices, or perhaps the econometric studies fail to accurately measure pass-through and oil prices do heavily influence inflation. Or perhaps there is another explanation, such as breakeven inflation causing changes in oil prices. But it is a mystery. ■

### NOTES

<sup>1</sup> Data are from the U.S. Energy Information Administration (<http://www.eia.gov/tools/faqs/faq.cfm?id=33&t=6>).

<sup>2</sup> Chen lists the short-run pass-through for the United States in his Table 3 as 0.00372, so  $0.5 \times 0.00372 = 0.186\%$ .

## REFERENCES

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