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Oil Price Shocks and Inflation Risk

The significant rise in the world price of oil since the end of the recession has renewed fears of consumer price inflation. Because oil is used as a direct input for many consumer items, it seems reasonable to assume that higher oil prices will ultimately lead to higher prices for at least some goods and services. These include gasoline, airfare, and utility bills and may also include consumer items, such as food and clothing, since energy is used as an indirect input in just about everything.

Economists call the effect that oil price shocks have on inflation a "pass-through" effect. Evidence of a pass-through effect appears strong during the oil price shocks in the 1970s but seems to have disappeared since the mid-1980s. In fact, empirical research consistently shows that oil price shocks have not significantly affected the general prices of consumption goods—except energy prices—since the mid-1980s.

What this suggests is that if we examine the behavior of "core inflation"—a measure of inflation that ignores food and energy prices—we should find little or no evidence of a significant pass-through effect.[1] Indeed, this is what Evans and Fisher (2011) find.[2] These authors use an econometric model to estimate the impact of oil price changes on core personal consumption expenditures inflation. They find that between 1982 and 2008, core personal consumption expenditures inflation did not respond to oil price shocks, although there is evidence of a significant response prior to 1980. To examine the pass-through effect, we use a similar methodology but a different price index—the consumer price index (CPI).

Using data for the period 1985-2011, we find that oil price shocks have had little effect on core CPI, consistent with the findings of Evans and Fisher (2011). We find significant effects, however, on CPI inflation—the so-called "headline" inflation rate.

Specifically, we estimate that a $1/barrel *permanent* increase in crude oil has virtually no effect on core CPI but causes a 0.03 percent (one-time) increase in the monthly CPI. So, for example, a permanent $50/barrel increase in the world price of crude oil is estimated to increase headline inflation by 1.5 percent. Moreover, the effect is estimated to be very *transitory*.[3]

Our results suggest that oil prices primarily affect energy prices but not the prices of other components in the CPI. Indeed, our estimation shows that a $1/barrel permanent increase in crude oil can cause an immediate $0.03/gallon permanent increase in gasoline. It is not fully understood, however, why energy prices no longer pass-through to other consumer goods and services as they once did. One possible explanation is that the share of oil (or energy in general) in total production costs has declined significantly since the first two oil shocks in the 1970s, owing to the adoption of energy-saving technologies.

Therefore, oil price shocks appear to have only transitory effects on headline inflation and virtually no impact on measures of underlying trend inflation. These empirical findings provide some support for the use of core inflation (or some other measure of trend inflation) over headline inflation for the purpose of guiding monetary policy.

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[1] Economists sometimes like to use core inflation as a measure of trend inflation. Food and energy prices are typically very volatile, so their short-run changes are not necessarily good indicators of trend inflation, which is of most concern to monetary policymakers.

[2] Evans, Charles L. and Fisher, Jonas D.M. "What Are the Implications of Rising Commodity Prices for Inflation and Monetary Policy?" Federal Reserve Bank of Chicago *Chicago Fed Letter*, No. 286, May 2011; www.chicagofed.org/digital_assets/publications/chicago_fed_letter/2011/cflmay2011_286.pdf.

[3] Although the effect on inflation is transitory, the effect on the price level is not, because inflation is defined as the rate of change in the price level, not the price level itself.