Frank Asche and Roy Endré Dahl

Oil Price Shocks and the Effect on the Price of Other Commodities

Frank Asche, University of Stavanger,
4036 Stavanger, Norway
e-mail: frank.asche@uis.no
Roy Endré Dahl, University of Stavanger,
4036 Stavanger, Norway
e-mail: roy.e.dahl@uis.no

Overview

In this paper we study the effect of oil price and oil price shocks on the price of other commodities. Recent years have seen an increase in both the price of oil and the price of other commodities, like agricultural products and industrial metals. Oil is a necessary input for commodity suppliers in production and transportation and consequently, a shift in the price of oil may change the production cost of the commodity and subsequently cause an adjustment to the price of the commodity produced. Moreover, as an important energy resource, a shift in the oil price may cause expectations of an increase in the price of other commodities in general. To further investigate this relationship, the paper identifies oil price shocks and analyses the effect on the price of other commodities.

Methods

The paper considers a set of commodities with monthly observations over 20 years, providing us with 240 observations per product. We calculate the daily log-returns of the prices and apply a vector autoregression (VAR)-model to study the relationship between oil price and other commodity prices. Further, we include lagged variables to control for postponed effects up to 12 month. This helps us study the interdepencies between both the oil price and the lagged commodity prices. In addition to comparing the relationship of the entire sample period, the paper identifies periods with oil price shocks and assess the immediate importance of an oil price shock to commodity prices. While previous papers have considered the effect of oil price shocks on the macro economy, this allows us to address the effect on a commodity level.

Results

Although there is some correlation between spot prices of oil and other commodities, our study shows that the relationship is stronger when considering a set of lagged prices. The cause of this may be the lead time from the input cost found in production and transportation, to the output price from the commodity suppliers. On the other hand, when considering the periods experiencing oil price shock, the effect is seen with fewer lags, indicating that a considerable shift in the price of oil is expected to create a shift for commodity prices in general.

Conclusions

While previous papers have studied the relationship between the oil price and the macro economy either using GDP or stock indices, this paper studies the correlation between the oil price and other commodities. We find that there is a significant link between several of the commodities when applying lags, which may be explained by the lead time from input to output for producers. More interestingly we find some evidence of a more direct relationship in periods experiencing oil price shock, where price shifts influence commodity prices with fewer lags.

References

Hamilton, J. D. 2003. “What is an Oil Shock?” Journal of Econometrics 113: 363-398.
Hamilton, J. D. 2009. “Understanding crude oil prices” Energy Journal 30 (2): 179-206.
Hamilton, J. D. 2011. "Historical Oil Shocks" NBER Working Paper No. 16790.
Kilian, L. 2008, “Exogenous Oil Supply Shocks: How Big Are They and How Much Do They Matter for the U.S. Economy?” Review of Economics and Statistics 90: 216-240.
Kilian, L. 2009. "Not All Oil Price Shocks Are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market." *American Economic Review*, 99(3): 1053-69.
Mork, K. A. 1994. "Business Cycles and the Oil Market." Energy Journal 15: 15-37.
Pindyck, R. S. 1980. "Energy Price Increases and Macroeconomic Policy." Energy Journal 1(3): 1-20.
Mallory, M., Irwin, S., Hayes D. 2012. “How Market Efficiency and the Theory of Storage Link Corn and Ethanol Markets.” Energy Economics 34: 2157-2166.
Tyner, W.E. 2010. “The Integration of Energy and Agricultural Markets.” Agricultural Economics 41: 193-201.