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Information content of commodity futures prices for monetary policy ☆

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Abstract

This paper empirically examines the information content of commodity futures prices for monetary policy. We use the cross correlation function approach to empirically analyze the relationship between commodity futures prices and economic activities (*e.g.*, consumer prices and industrial production) between January 1957 and February 2005. Empirical results show that commodity prices can serve as information variables for monetary policy not only in mean, but also in variance.

JEL classification: G12

Keywords: Information variable; Commodity futures prices; CCF approach

1. Introduction

Commodity prices and the general price level tend to be closely related, with movements in the former leading movements in the latter. At least two reasons can be proffered to explain this relationship. First, primary goods are inputs for manufactured goods, hence changes in commodity prices directly influence production costs and the general price level. Second, most commodity prices are determined in auction markets, hence they reflect demand or supply shocks more rapidly than do the prices of manufactured goods. For these reasons, commodity price changes resulting from speculative purchases or sales of commodities can be leading indicators of general price level changes. If the goal of monetary policy is stability in the general price level, monetary policy authorities can therefore refer to commodity price indices in making policy decisions. Garner (1989) introduced two concepts on relationships between commodity price indices and monetary policy.

Garner's (1989) first concept holds that commodity price indices can be used as intermediate targets for monetary policy. Given the close relationship between commodity price indices and the general price level, Garner (1989) posits

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that the general inflation rate can be controlled by achieving commodity price targets. Though of course powerless to directly intervene for the control of commodity prices, monetary authorities can maintain commodity prices within a certain range through open market operations and other traditional monetary policy tools.

Garner's (1989) second concept holds that commodity price indices can be used as information variables in managing monetary policy. Under this concept, increases in commodity prices can be interpreted as a sign that the economy is at risk of overheating and unacceptably high inflation. When monetary authorities perceive this sign, they can respond by tightening the money supply in order to stave off higher inflation.

These concepts show that commodity price indices can play a certain role in the policy process. Under an intermediate target strategy, commodity prices act as proxies for the general price level, thereby satisfying the ultimate policy objective of the central bank. As intermediate targets, commodity price indices must be closely related to both the general price level and the policy tools of the central bank. In contrast, commodity price indices used as information variables need only convey valuable information on the future movements of the general price level. If a solid relationship between commodity price indices and the general price level remains elusive, or if the central bank has difficulty in appropriately managing commodity price indices, the latter would be more appropriately used as an information variable rather than as an intermediate target.

Garner (1989) empirically analyzed the relationships between commodity price indices and the consumer price index using monthly U.S. data for the period between 1951 and 1987. The study produced two conclusions: 1) commodity price indices do influence the consumer price index, and 2) there are no cointegrating relationships between commodity price indices and the consumer price index. On this basis, Garner (1989) took the position that commodity price indices can be appropriately used as information variables, but are in no way suited for use as intermediate targets. This meant that in the absence of cointegrating relationships between commodity price indices and the consumer price index, the use of commodity price indices as intermediate targets in monetary policy management will not lead to stability in the consumer price index over the long run. Garner (1989) used the Engle–Granger test to test for cointegration.[1] Two years later, Sephton (1991) used the Johansen test to produce results that basically supported Garner's (1989) empirical results.[2]

Cody and Mills (1991) studied quarterly U.S. data for the period 1959–1987 to examine relationships between commodity price indices and monetary policy. Their results led them to the following conclusions: 1) if the policy target of the central bank is real growth in the short term, the bank need not react to changes in commodity price indices; 2) if the policy target of the central bank is price stability, the bank should react to rises in commodity prices by tightening money, regardless of the time horizon. Cody and Mills (1991) thus found that the use of commodity prices as information variables in monetary policy management can boost economic performance. Bernanke et al. (1997) focused on the oil price shocks to analyze the role of monetary policy in postwar U.S. business cycles. They reported that an important part of the effect of oil price shocks on the economy results not from the change in oil prices, *per se*, but from the tighter monetary policy resulting from the change in oil prices.[3]

There have been others, however, who reject the idea that commodity price indices can be used as information variables. Cody and Mills (1991) pointed out that commodity prices change as a reflection of market-specific shocks unrelated to the macroeconomy. Similarly, Hua (1998) demonstrated that commodity price indices change partly in response to macroeconomic factors. By their reasoning, the causal relationship is one in which macroeconomic variables engender changes in commodity price indices. Barsky and Kilian (2001), meanwhile, argued that the increases in commodity prices during the 1970s were the result of monetary policy.

Awokuse and Yang (2003) used the LA-VAR (lag-augmented vector autoregression) method from Toda and Yamamoto (1995) to analyze monthly U.S. data for the period between 1975 and 2001, in search of causal relationships between commodity price indices and macroeconomic variables. Their results identified a one-way causality: commodity price indices impact both the consumer price index and industrial production index, but neither the consumer price index nor industrial production index impacts commodity price indices. Awokuse and Yang (2003) thus concluded that commodity price indices serve as important information variables for monetary policy management as signals of future movements in macroeconomic variables.[4]

[1] See Engle and Granger (1987).

[2] See Johansen (1988) and Johansen and Juselius (1990).

[3] Also see Bernanke (2004) for the discussion of inflation targeting.

[4] Gorton and Rouwenhorst (2006) also report that commodity futures are positively correlated with inflation, unexpected inflation, and changes in expected inflation during the period between July 1959 and March 2004.