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US monetary policy and sectoral commodity prices



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ABSTRACT

Using a Structural VAR (SVAR) model, we examine the effects of the monetary policy of the United States on sectoral commodity prices (including the non-fuel commodity prices, food prices, beverage prices, prices of agricultural raw materials, prices of metals and prices of fuel (energy) commodities) and macroeconomic activity. The empirical evidence suggests that a U.S. monetary contraction leads to an immediate rise in the broad commodity price index, which possibly reflects an aggregation bias, greater expected inflation and speculation, high production costs or some overshooting due to overreactions. Then, the response erodes after six quarters as the positive interest rate shock vanishes and higher interest rates and liquidity drainage take traction. Despite this, the aggregate price response masks the existence of significant heterogeneity in the price responses of the different types of commodity sectors. More specifically, a positive interest rate shock leads to: (i) an initial pop in the price returns of the non-fuel commodities, which later reverses path and becomes negative (as in the case of the prices of agricultural raw materials); (ii) a positive and persistent rise in the volatile food prices; (iii) a fall in the beverage prices; and (iv) a persistent reduction in the prices of metals and the prices of energy prices. Our results also remain globally intact with respect to alternative specifications and identification schemes as well as to unconventional monetary policy effects. Similar results are also found when commodity futures prices are used. We conclude that policymakers should recognize the source of sector inflation before embarking on contractionary monetary policy. The design of core inflation targeting is also preferable to headline inflation targeting.

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1. Introduction

Periods of changes in global liquidity and dispersions in interest rates have generally coincided with variations in commodity prices. The expansions in global liquidity and the falls in interest rates have been dynamic since 2001 and are a result of increased activity in the carry trade that moved liquidity from the United States to emerging markets and expanded investments in several asset classes including stocks, real estate and commodities (Batten et al., 2010; Belke et al., 2010b, 2014; Brana et al., 2012; Frankel, 2013; Hammoudeh and Yuan, 2008; Ratti and Vespignani, 2013, 2015). The impact on commodity prices has however been heterogeneous. For example, Brana et al. (2012) investigate the impact of global excess liquidity on goods and asset prices for a sample of emerging market economies. The authors find that excess liquidity at global level has spillover effects on output and price levels, but the impact on real estate, commodity and share prices is less clear. Similarly, Belke et al. (2010b) show that while monetary aggregates in OECD countries provide leading information on property prices and gold prices, shocks to liquidity do not seem to have impacts on equity prices.

The recent influence of the U.S. monetary policy on asset prices dates back to the early years of the last decade when the Federal Reserve opened the liquidity spigot to combat the Dot com recession and kept interest rates low, which created a bubble in asset prices that burst in 2008. In the period 2001–2008, the Brent oil prices tripled and reached their record level of \$147 a barrel before they burst near the end of this period. The CRB (Commodity Research Bureau) commodity price index surged by 105 percent, the housing prices increased by 40–60 percent in a number of OECD countries and the stock prices more than doubled in nearly all major markets (Belke et al., 2010a).¹

The above discussion shows that the U.S. monetary policy is a major driver of global asset prices. Other drivers that influenced commodity prices during this period include economic activity and speculation (Frankel, 2013). Overall, the anecdotal evidence points to the importance of the U.S. monetary policy as a common macroeconomic factor that drives the movement of commodity prices, despite its varying and heterogeneous impacts on the dynamics of those prices.

This study adds to the existing literature on the interactions between global liquidity and commodity prices by focusing on the effects of the U.S. monetary policy on the commodity prices of different sectors. In particular, it uses a Structural VAR (SVAR) model to identify shocks to the federal funds rate and evaluate their impacts on the all-(broad) commodity price index as well as on the prices of different types of sector commodities, which include non-fuel commodities, food, beverage, agricultural raw materials, metals and fuel (energy) commodities.

While there is no consensus about whether commodity prices should be included in the formulation of optimal monetary policies as they may be subject to large and idiosyncratic shocks with no fundamental macroeconomic implications (Bernanke et al., 1997; Cody and Mills, 1991; Marquis and Cunningham, 1990; Pindyck and Rotemberg, 1990), the empirical evidence undoubtedly supports the view of a strong and negative impact of monetary contractions on the aggregate commodity price index (Christiano et al., 2005; Leeper and Zha, 2003; Mallick and Sousa, 2012; Sims and Zha, 2006a, 2006b; Sousa, 2010; Jawadi et al., 2014).

The main contribution of our study to the existing literature lies in evaluating the effects of the U.S. monetary policy not only on the aggregate commodity price index but also on different commodity prices, ranging from energy and precious metals to agricultural and food commodities. The study enables one to investigate which types of commodities are the most sensitive to changes in the U.S. short-term interest rates and in which directions. Moreover, the diversified results have implications for policymakers to take into account when setting monetary policy because of the heterogeneous impacts of changes in different commodity prices on general inflation, for commodity producers to be prudent in designing proper hedging strategies against volatile prices, and for investors to be sanguine in selecting the commodities that are indexed to inflation.

Using quarterly data for the period from 1957:1 to 2008:3, which excludes the recent years that are dominated by the unconventional monetary policy (e.g., quantitative easing), our major empiri-

¹ For a recent assessment of the duration of periods of booms and busts in the housing market and a discussion of the relevance of the duration analysis, see Agnello et al. (2013, 2015).

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