Commodity market volatility in the presence of U.S. and Chinese macroeconomic news

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ABSTRACT

Utilising a comprehensive sample of U.S. and Chinese macroeconomic news announcements, we determine that volatility in commodity prices is significantly impacted by news that conveys information regarding prospective demand for commodities. This includes news regarding U.S. employment and economic output together with the purchasing intentions of Chinese manufacturers. Commodity price volatility is also closely related to the cost of credit. Much of this effect appears to be driven by volatility in the Energy markets. During the 2007-09 crisis, commodity markets appear to pay more attention to forward-looking macroeconomic news, such as PMI surveys.

1. Introduction

Commodities are essential inputs in the production of other goods, and commodity prices play an important role in the determination of both economic output and general inflation in the world economy. Commodity indices represent a convenient method to gauge how global commodity prices are changing, and are used to indicate changes in economic conditions. Commodity prices are forward-looking variables that should respond rapidly to worldwide economic news. For instance, Kilian (2009), demonstrates that commodity prices are determined by shocks resulting from changes in macroeconomic activity and fluctuations in the business cycle.

The volatility of commodity prices changes over time (Fig. 1) and can be related to uncertainty in demand, supply, and inventories. For instance, volatility is significantly higher during the financial crisis of 2007-09. This can be linked to deterioration in the macroeconomic environment and the effect on uncertainty over demand for commodities. Understanding what drives volatility in commodity markets is important for investors seeking to optimise portfolio decisions, producers making supply-chain decisions, and policymakers wishing to assess how investors interpret new information in order to determine appropriate policy choices.

In recent times, China has become a major influence on both global output and demand for commodities. In 1980 Chinese GDP in Purchasing Power Parity terms accounted for just 5.2% of global GDP, while the U.S. had 21.1%. By 2015, Chinese GDP had grown to $19.5 trillion1 (17.2% of world total) compared with $17.9 trillion (15.8%) in the U.S. However, while an extensive literature has developed regarding the impact of U.S. macroeconomic announcements on a variety of assets (including commodities) there is a dearth of studies concerning Chinese announcements. We seek to rectify this omission.

U.S. macroeconomic data releases have been shown to have a significant effect on return volatility in stock (e.g. Cutler et al., 1989; Flannery and Protopapadakis, 2002; Miao et al., 2014), bond (e.g. Ederington and Lee, 1993; Balduzzi et al., 2001; Green,
The literature regarding the asset price response to macroeconomic news suggests that the relationship is more acute during recession and financial crisis (e.g. Hess et al., 2008; Chatrath et al., 2012). This could be because the announcements provide information about the likely direction of monetary policy (Cook and Korn, 1991), and may be perceived as signs of future economic growth. Alternatively, this could be owing to extreme changes in investor sentiment during recession or crisis periods (Garcia, 2013; Wolff, 2013). A third explanation is offered by the increased financialization of commodity markets (Caporale et al., in press). Adams and Glück (2015) suggest that this has resulted in higher volatility owing to increased co-movements between stock and commodity markets. Cheng and Xiong (2014) suggest that financialization has created a time-varying risk appetite that was not apparent before. Together with evidence of greater information sharing this explain higher levels of volatility in the 2007-09 crisis than previously.

This leads to the second research question addressed in this paper: Do macroeconomic announcements have a greater impact during the financial crisis? Does this lead to higher commodity price volatility?

This paper fills an important gap in the literature, contributing to the discussion on the effect of macroeconomic announcements on financial markets (and commodity markets in particular). In addition, it is the first paper to examine the impact of Chinese macroeconomic news on the volatility of commodity price indices, and determine the relative importance vis-à-vis U.S. economic news.

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2 See Neely (2011) for a comprehensive summary of this literature.
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