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Evolution of Commodity Price Sensitivity to Central
Banks' Monetary Policy

MASTER'S THESIS
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Executive Summary

This paper examines whether the monetary policy of the Federal Reserve Bank (FED) still has impact on global commodity prices such as oil, nickel, gold, the Commodity Research Bureau (CRB) index and coal with data from 1980Q1 to 2017Q2 and whether that impact has changed over time. Previous literature suggests that prices respond inversely to interest rate shocks. Assuming that there is one world interest rate, a GDP weighted average interest rate of all economies worldwide as described by Barro and Sala-i Martin (1990) and given the shrinking US GDP contribution to global GDP, leads to the assumption that commodity price responses to Federal Funds Rate (FFR) shocks are nowadays weaker than they were in previous decades. Further, as the Chinese economy has grown tremendously in recent decades and given the official introduction of the Euro in 1999, the People's Bank of China's (PBoC) and the European Central Bank's (ECB) monetary policies might nowadays also have impact on global commodity prices, which is also examined in this paper.

To find a change of the FED's monetary policy impact on commodity prices, I applied the Gregory and Hansen (1996) test, which proposes a most probable structural break date of cointegration in the data. The test result proposes the break date 2002Q4 and thus, the sample is divided into two subsamples, into a pre- and post-break 2002Q4 sample to compare commodity price sensitivities to Federal Funds Rate shocks via structural vectorautoregression estimations (SVAR), calculations of impulse response functions (IRF), and forecast error variance decompositions (FEVD). Several unit root tests, lag order selection test, and conditions are set to estimate reliable results.

There is evidence that a contractionary monetary policy of the FED still depresses commodity prices. The general economic understanding of rising commodity prices due to a looser monetary policy of the Federal Reserve Bank is shown, and the general overshooting behavior, as described by Dornbusch (1976), of commodity prices is found. Further, commodity price responses are stronger during the pre-break period from 1980Q1 to 2002Q4 than during the post-break period from 2002Q4 to 2017Q2. For the European Central Bank and the People's Bank of China, the results show that there are some signs that their monetary policies also have impact global commodity prices (from the consumer perspective of the respective economy). However, due to restricted data (ECB

examination period 1999Q1-2017Q2, PBoC examination period 2004Q1-2017Q2), economic restrictions in China, and the assumption of other simultaneous global impacts (e.g. the FED's monetary policy impact) on commodity prices, the ECB's or PBoC's monetary policies' impacts on global commodity prices are neither clearly evidenced, nor can they be rejected. Further examination with additional data in the future is required.

Summarized, the main findings of this paper are: First, a contractionary monetary policy of the FED depresses commodity prices. Second, commodity price responses to an FFR shock show overshooting behavior as described by Dornbusch (1976), also for recent data. Third, for the examination between 1980Q1 and 2017Q2, the most probable structural break of cointegration between commodity prices and macroeconomic variables, including the FFR is around 2002Q4, the end of the dot-com crisis. Fourth, the impact of the FED's monetary policy on commodity prices has decreased and is lower during the post-break period (2002Q4-2017Q2) compared to the pre-break period (1980Q1-2002Q4). This is shown with several criteria, such as number of quarter of significant price changes after an FFR shock, magnitude of first quarter response, maximum response magnitude, and average percentage contribution of commodity price changes explained by the FFR. Further, significant commodity price responses and overshooting behavior of certain commodities due to ECB's or PBoC's monetary policies can neither be proven nor refuted, more data and further examination is necessary. Finally, to the best of my knowledge, there is a lack in literature to statistically compare not only different impulse response functions with each other, but also forecast error variance decompositions.