

Measurement of volatility spillovers and asymmetric connectedness on commodity and equity markets

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We study volatility spillovers among commodity and equity markets by employing a recently developed approach based on realized measures and forecast error variance decomposition invariant to the variable ordering from vector-autoregressions. This enables us to measure total, directional and net volatility spillovers as well as the asymmetry of responses to positive and negative shocks. We exploit high-frequency data on the prices of Crude oil, Corn, Cotton and Gold futures, and the S&P 500 Index and use a sample which spans from January 2002 to December 2015 to cover the entire period around the global financial crisis of 2008. Our empirical analysis reveals that on average, the volatility shocks related to other markets account for around one fifth of the volatility forecast error variance. We find that shocks to the stock markets play the most important role as the S&P 500 Index dominates all commodities in terms of general volatility spillover transmission. Our results further suggest that volatility spillovers across the analyzed assets were rather limited before the global financial crisis, which then boosted the connectedness between commodity and stock markets. Furthermore, the volatility due to positive and negative shocks is transmitted between markets at different magnitudes and the prevailing effect has varied. In the pre-crisis period, the positive spillovers dominated the negative ones, however, in several years following the crisis, the negative shocks have had a significantly higher impact on the volatility spillovers across the markets, pointing to an overall increase in uncertainty in the commodity and equity markets following a major crisis. In recent years, the asymmetric measures seem to have returned to their pre-crises directions and magnitudes.