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Drivers of Price Volatility in Brazilian Pork Market, Internal and External Effects – DCC GARCH Approach

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Abstract

Pork is the most consumed meat worldwide, and Brazil is one of the major producer and exporter countries. The pork market is affected by a number of factors that cause price volatility at national and international level. These price volatilities can affect many agents in the pork supply chain dramatically. Researchers over the last past years have studied food price volatility. Although the literature on food price volatility has been increasing since the food price crisis of 2008/09, there are still only a few studies, which are analysing the combination of drivers and spillovers of volatility. Existing studies mainly focus on a limited number of countries, commodity market, and spillovers along the supply chain. To understand the price dynamics and the effects of these drivers in the Brazilian pork market, the price volatility, its drivers, and spillovers are analysed in this study along the supply value chain, across the meat markets and in the context of the spatial market relationships. Since Russia is a major importer of Brazilian pork meat, the impact of two Russian trade policies (WTO accession in 2012 and meat import ban in 2014) are taken into consideration. A seasonal ARMA, univariate GARCH and EGARCH models are used to estimate the volatility development in nine different markets. Moreover, a multi-variate DCC-GARCH model is estimated to examine the dynamic price relationships between Brazilian live swine and the other components of the Brazilian pork market (e.g., input prices and substitute commodities). The results suggest that the live swine price volatility is mainly driven by domestic rather than by external factors. The price of substitute commodities (live chicken and cattle) present higher volatility correlations than the prices of input commodities (corn and soybean). The two analysed Russian trade policies had a significant short-run effect on changes of price volatility of live swine. They affected the dynamic correlations with the domestic price volatilities, too. Furthermore, market structure and possible market power might affect the price volatility transmission in Brazilian live swine, live chicken, and corn prices.

Keywords: Brazil, DCC-GARCH, food price volatility, market power, pork market, Russia, trade policies, volatility spillover

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