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Modelling Volatility Spillovers for Bio-ethanol, Sugarcane and Corn

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Abstract

The recent and rapidly growing interest in biofuel as a green energy source has raised concerns about its impact on the prices, returns and volatility of related agricultural commodities. Analyzing the spillover effects on agricultural commodities and biofuel helps commodity suppliers hedge their portfolios, and manage the risk and co-risk of their biofuel and agricultural commodities. There have been many papers concerned with analyzing crude oil and agricultural commodities separately. The purpose of this paper is to examine the volatility spillovers for spot and futures returns on bio-ethanol and related agricultural commodities, specifically corn and sugarcane, using the multivariate diagonal BEKK conditional volatility model. The daily data used are from 31 October 2005 to 14 January 2015. The empirical results show that in 2 of 6 cases for the spot market, there were significant negative co-volatility spillover effects, specifically corn on subsequent sugarcane co-volatility with corn, and sugarcane on subsequent corn co-volatility with sugarcane. In the other 4 cases, there are no significant co-volatility spillover effects. There are significant positive co-volatility spillover effects in all 6 cases, namely between corn and sugarcane, corn and ethanol, and sugarcane and ethanol, and vice-versa, for each of the three pairs of commodities. It is clear that the futures prices of bio-ethanol and the two agricultural commodities, corn and sugarcane, have stronger co-volatility spillovers than their spot price counterparts. These empirical results suggest that the bio-ethanol and agricultural commodities should be considered as viable futures products in financial portfolios for risk management.

Keywords Biofuel, spot prices, futures prices, returns, volatility, risk, co-risk, bio-ethanol, corn, sugarcane, diagonal BEKK model, co-volatility spillover effects, hedging, risk management

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