Analysis of the Impact of International Energy Price Fluctuation on China's Shale Gas Market

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Overview

The fluctuation of international energy prices has a potentially significant impact on China's shale gas market. This article selects the international oil spot price (WTI), the international oil market futures price (WTIF), the international natural gas market spot price (HH), the Chinese stock market shale gas plate index (SGI), the Chinese stock market new energy concept stocks plate index (NEI), the exchange rate (UC) between China and the U.S., established the DCC-Garch model to analyze the impact of international energy price fluctuations on China's shale gas market.

Methods

In this subsection we calculate and analyze the correlations among energy stock index, oil spot and shale gas markets from CCC and DCC models, respectively. Both of the two models include a constant in the mean equation and a GARCH(1,1) variance equation. Then, in the next subsection, we look at the volatility spillover effect among the markets in China by fitting a VAR(1)-BEKK-GARCH(1,1) model.

Results

This paper contributes to study the relationships over the period from August 26, 2004 to July 21, 2017. Since shale gas is one of the most important raw materials in industrial economy, its price is mainly influenced by production, real demand and speculative demand.In this paper we investigate the dynamic correlations and volatility spillover effects among China's fuel oil spot, shale gas price and energy stock markets by using the DCC-GARCH and VAR-BEKK-GARCH models, and compare the results with those among American corresponding markets.

Conclusions

Our main findings can be summarized as follows. Firstly, the correlations among the markets in China are very low comparing with those among American corresponding markets because of Chinese oil price control policy. Secondly, the fuel oil spot prices are less marketization while fuel oil futures prices absorb more marketization information. Thirdly, there are some obvious changes in the three correlation series we considered before and after the financial crises.

More specifically, the correlations were higher before a crisis than after the crisis, because we think the oil markets are financialized before a crisis and then out of financialization after the crisis. Fourthly, there are bilateral volatility spillover effects between fuel oil spot, shale gas price and energy stock markets, while only one-way effect from energy stock market to shale gas market. The possible reason is that the shale gas price is mainly influenced by speculative demand and cash flow from the stock market.

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