

DYNAMIC INTEGRATION OF THE WORLD OIL PRICES: A REINVESTIGATION OF GLOBALIZATION VS. REGIONALIZATION

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Overview

Oil market, as an indispensable part of the economic system, is of importance to the whole industrial chain, and thus is widely concerned in the world. Due to the development of oil industry globalization and success of oil futures trading, the various types of crude oil located in different regions often move together. Entering the 21st century, the judgment that the world crude oil market is integrated seems to be recognized in most literatures. However, the price fluctuations of different crude oils are not always in line with each other due to the adjustment of local fundamental, specific geopolitical risks, energy policies and so on. Within one great pool, oil markets are not necessarily integrated in every time period. Therefore, a reinvestigation of whether the world oil market is globalization including some specific regional characteristics has important economic implications. Under this new market circumstance, two main issues should be investigated. 1) Whether the main crude oil prices have diverged and 2) Which crude oil price has played like a price setter.

In this paper, in order to capture the possible changes of the relationship among regional crude oil prices, WTI, Brent, Dubai, Nigeria and Tapis crude spot prices are selected as representatives of five different regions for analysis and comparison. By this way, the dynamic relationships among crude oil prices can be well understood, which provide an insight into international market rules and have potentially important implications for risk management and hedging strategies involved in the world crude oil market.

Methods

To better understand the dynamic relationships between the five regional crude oil prices and disclose the internal changes of integration in the world crude oil market, twofold response has been made. First, a time-varying average distance measurement is constructed to supply new evidence for market convergence or divergence; second, an error correction model (ECM) combined with a directed acyclic graph (DAG) technique is built to disclose their contemporaneous causal structure and leading/lagging relationship.

Results

The degree of integration for the world crude oil market has not always kept at a relative high-level, which tends to present transitory divergent characteristics under the specific global economic and local energy situation. A very obvious phenomenon is that the world crude oil market began to diverge since September 2010. WTI has been separated from the world crude oil market system, which reflects more local supply and demand situations. However, excluding WTI, the rest world crude oil market has still kept a strong integration, which is mainly attributed to frequently geopolitical unrest, such as “Arab Spring” of revolutionary wave in the Arab world in North Africa and West Asia since the end of 2010 and Libya war in 2011, and so on.

In particular, there is a long-term equilibrium relationship among the major crude oil markets during the period from 2000 to 2010, which also verifies that the world crude oil market is unified and homogenous before 2010. This finding can support the argument to some extent that the world crude oil market is “one great pool”. Furthermore, through the results of directed acyclic graph and variance decomposition, we can conclude that crude oil benchmarks have played the leading role in crude oil pricing system. More precisely, WTI was the price setter leading other crude oils before 2010, while Brent has become the most influential crude oil prices since 2011. Besides, the influence of Nigeria prices on other crude oil prices has augmented after 2010, while Tapis always behaves as price taker rather than price setter.

Conclusions

In summary, the results indicate that there is a long-term equilibrium relationship among the major crude oil markets during the period from 2000 to 2010, which implies that the world crude oil market is integrated. Subsequently, the world crude oil market began to diverge since the end of 2010, which is also verified by the increasing average distance among them. WTI has been separated from the world crude oil market system, which reflects more local supply and demand situations. Moreover, WTI became the price setter before 2010, while Brent has played a leading role in the world crude oil market since 2011. Besides, Tapis always behaves as price taker following other crude oil prices.

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