Submission Summary

Conference Name

44th IAEE International Conference - 2023

Paper ID

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Paper Title

Market integration in the global natural gas market - Empirical evidence on asymmetric price transmission

Abstract

International trade in natural gas is divided into three main regional markets: Asia, Europe, and North America. The segmentation has been settled due to the small availability of natural gas transportation facilities among the three regions. However, the three natural gas markets are gradually becoming more integrated. Based on the law of one price, market integration implies that natural gas prices across those regions should differ by the transaction costs at most. However, the COVID-19 pandemic and the geo-political risks have brought uncertainties and disruptions to the supply and demand sides of the global gas market. This paper aims to estimate the effect of those shocks by conducting our empirical analysis over the sub-sample (2016-2019) and (2020-2021). This allows us to compare our results between a period with relatively stable market conditions and another period with adverse shocks. The paper also examines the causal relationships among the three gas markets using the time-varying Granger causality method. By doing so, we hypothesize that these causal relationships have a dynamic character
and are affected by the uncertainties in the gas markets. Defining the lead-lag relationship may help market participants (i.e., traders and investors) determine their arbitrage and investment strategies.

The empirical analysis uses the daily gas price series for the one-month ahead futures for the North American, European, and Asian gas markets from 01/01/2016 to 31/12/2021. Our findings show an asymmetry in the market integration process before and after the pandemic. Our results suggest that the Granger causality between the gas price series exhibits a dynamic behavior. We found that the leading role of a market in price discovery depends on some factors, including demand growth due to economic growth or policy changes, supply disruptions due to infrastructure failures and disruptions, LNG imports, and geopolitical risks that may lead to a change in procurement structure. For example, the European market seems to lead the market since 2020, revealing how the geopolitical risks and adverse shocks caused in one region can affect the global gas market. These results provide relevant implications for regulators and portfolio risk managers in the gas market.

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Primary Subject Area

Natural Gas