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Electricity Market Integration, Decarbonisation and Security of Supply: Dynamic Volatility Connectedness in the Irish and Great Britain Markets

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This study investigates the volatility connectedness between the Irish and Great Britain electricity markets and how it is driven by changes in energy policy, institutional structures and political ideologies. We examine volatility connectedness between the Irish and Great Britain wholesale electricity markets from different angles, including static (unconditional) vs dynamic (conditional) and symmetric vs asymmetric, in the interconnected wholesale electricity markets. The paper assesses different aspects of this volatility connectedness including static (unconditional) vs dynamic (conditional), symmetric vs asymmetric characteristics between 2009 and 2018.

Renewable energy is viewed a viable alternative energy in response to the growing concern about climate change, fossil fuel depletion, energy security issues, technology innovation, and high and volatile prices of petroleum-based fuels (Ferrer et al., 2018). At the same time, volatility across wholesale electricity markets is expected to rise with growing shares of renewables with intermittent supply characteristics.

In interconnected electricity markets, examination of volatility connectedness or spillovers and its dynamics facilitate the study of information efficiency by unravelling the different information transmission channels. Studying volatility connectedness or spillovers in interconnected electricity markets contributes to understanding of the volatility transmission mechanism and provides useful information for demand and supply-side market participants.

We find that volatility connectedness is time varying and is significantly affected by important events, policy reforms or market re-designs such as Brexit, oil price slump, increasing share of renewables, and fluctuations in the exchange rates. Our asymmetric analysis shows that the magnitude of the good volatility connectedness is marginally larger than that of the bad volatility connectedness. “Good” volatility is defined as variation caused by the positive changes in electricity prices, while “bad” volatility is associated with uncertainty due to the negative movements in prices.

Our result suggests that good volatility levels would be even higher once the Irish market adopts the carbon price floor. Therefore, supporting renewable generation by setting an appropriate carbon price in interconnected wholesale electricity markets will improve market integration.

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