

The use of transfer entropy to analyse the comovements of European Union stock markets: a dynamical analysis in times of crises

O uso da entropía de transferencia para analizar os comovements dos mercados bolsistas da Unión Europea: unha análise dinámica en tempos de crise

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Abstract

Understanding the linkages among stock markets holds great importance for investors, policymakers and portfolio managers. When considering the integration of international stock markets and given they are complex systems, it is important to understand how they are related and how they influence each other. Studying data from 25 European Union stock market indices, this piece of research aims to evaluate the dynamics of influence among them. In terms of method, a non-linear approach has been applied, based on transfer entropy with static and dynamic analysis. As the main finding, a strongly influential relationship between some indices should be highlighted. The static analysis allows us to infer that central and western European Union countries are the main influencers, while the dynamic analysis leads us to the conclusion that the relationships between the stock markets have changed over time, revealing their dynamism. The results obtained have several implications. For instance, for investors and portfolio managers, the information about comovements is relevant for diversification purposes and for their decisions on where to make their investments, build portfolio strategies and manage risks; however, for policymakers, the constant monitoring of stock markets may detect increases in the connection between markets, which could be understood as signs of instability.

Keywords: bidirectional influence; European stock markets; net transfer entropy; stock market integration; transfer entropy.

