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Market Efficiency Assessment for Multiple Exchanges of Cryptocurrencies

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Introdução

In recent years, the cryptocurrencies have been showing significant expansion in the capital market. Despite being quite new, the literature on the subject is prolific and shows a great diversity of analyses. On one hand, there are scholars who defend the existence of an efficient cryptocurrency market; on the other hand, there are those who believe that there is still no consensus on the results, since cryptocurrencies are traded in multiple databases and, for each exchange, asset prices undergo intense variations.

Problema de Pesquisa e Objetivo

We aim to analyze the Efficient Market Hypothesis of cryptocurrencies on multiple platforms, observing whether there is a divergence in the degree of efficiency between the different exchanges. Additionally, this evaluation will be expanded in a multivariate way, by testing whether the prices of the main cryptocurrencies traded on different exchanges are temporally related to each other, verifying evidence of cross information. If this occurs, evidence of possible arbitrage within the cryptocurrency market will remain.

Fundamentação Teórica

Even though this market may be new, the scientific literature on the subject is prolific, allowing in-depth analyzes of its political and economic uncertainties. There are many scholars (e.g. Tiwari et al., 2018; Vidal-Tomás & Ibañez, 2018) who seek to define whether there is an efficient market in cryptocurrencies. However, there is still no consensus on the results. This picture is aggravated by the existence of multiple databases with real-time variations in asset prices in each of the existing exchanges. Thus, the need to analyze the informational divergence between them emerges.

Metodologia

For univariate series, the Random Walk hypothesis is evaluated using ADF and KPSS tests. For multivariate system, it is estimated a vector autoregression model of order p, VAR(p).

Análise dos Resultados

Initially, each dimension was evaluated alone, in which we found evidence that pointed to market efficiency in its weak form, both through the KPSS and ADF tests. This evidence is in line with the most recent results in the literature. However, when evaluating the problem in multiple dimensions, from other exchanges, we found evidence that the market is not efficient, because the interrelationships between these exchanges present causality in the Granger sense. These results expand the literature, which is mostly focused on the analysis of the crypto assets market in a single dimension.

Conclusão

Both Bitcoin and Ethereum show efficiency in the weak form on the main platforms in each market alone. However, when estimating a VAR(p) between prices among exchanges, it was found evidence of Granger causality between cryptocurrencies in all exchanges, suggesting that EMH is not adequate due to evidence of cross information.

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