

Price Dynamics and Structural Breaks in Speculative Markets: A Case Study of Cryptocurrency

Ömer Kara

Eskisehir Osmangazi University, Turkey
okara@ogu.edu.tr

Abstract:

This paper examines how the dynamic relationships between rival cryptocurrencies change over time and are affected by shocks. In particular, using a vector autoregressive model (VAR), Granger–causality test, and impulse response analysis, the price dynamics of Bitcoin, Litecoin, and Ripple are investigated by allowing multiple structural breaks. The data used in the analyses cover daily time-series observations over the period of April 2014-July 2018. Using the Qu and Perron (2007) methodology in a VAR shows that there are two strong structural breaks on November 12, 2015 and September 28, 2016. Thus, the data are split into three segments. The time-series analyses across segments suggest the following results: (1) the Granger–causality from the prices of other coins to Ripple price is gaining strength; (2) the response of each coin to a shock in Bitcoin price is same across segments; (3) in response to a shock in Litecoin price, the impact on Bitcoin price is decreasing over time but the effect on Ripple price is increasing; and (4) the impacts on Bitcoin and Litecoin prices are falling over time in response to a shock in Ripple price.

Keywords: Structural Break, Cryptocurrency, VAR

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