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Lead-Lag relationship between Bitcoin and Ethereum: Evidence from hourly and daily data

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ABSTRACT

This paper investigates lead-lag relationship between heavyweight cryptocurrencies Bitcoin and Ethereum. Traditional studies of information flow between markets preponderate on cash vs. futures, whereby researchers are interested in the stabilizing impact of futures on spot markets. While interest in the same relationship in the nascent cryptocurrency sphere is emerging, little is known regarding price leadership between these assets. In this paper, we employ a battery of statistical tests—VECM, Granger Causality, ARMA, ARDL and Wavelet Coherence—to identify price leadership between the two crypto heavyweights Bitcoin and Ethereum. Based on one year hourly and daily data from August 2017 through to September 2018, our tests yield varied results but largely suggest bi-directional causality between the two assets. Moreover, the results indicate that intraday crypto traders can barely exploit Bitcoin-Ethereum hourly or daily price discovery process to their advantage.

1. Introduction

The markets for cryptocurrency assets have experienced staggering capital inflow in the recent years thanks to soaring interest in blockchain technology and gradual embrace of FinTech by legacy financial institutions as well as private equity firms. During this time, the number of cryptocurrencies available for investment skyrocketed to nearly 2000. Despite the popularity of and interest in these digital assets, understanding of their return and co-movement structures has remained under-explored. A few scholars recently posit that the existing systematic variations in crypto-assets' returns could be attributable to factors beyond merely a common market factor. As such, empiricists are attempting to map out the linkages between these digital assets adopting a wide scope approach—trying to accommodate as many cryptocurrencies as data permits. Among the wide variety of cryptocurrencies, two assets stand out in particular due to their mainstream popularity and future prospects. One is Bitcoin (BTC), the undisputed marquee cryptocurrency with the largest asset capitalization ($125 billion). The other is Ethereum (ETH) with a market capitalization of $26 billion. As of May 2019, BTC and ETH account for nearly 65% of the entire crypto-sphere. Despite fundamentally disparate structures, purpose, and functionality, BTC and ETH remain the most liquid avenues for digital asset investors and thus enjoy the most attention from traders and institutions for speculation related activities. Moreover, not only are these assets traded the most in various exchanges, studies hint at the existence of an apparent lead-lag relationship between most crypto assets—BTC and ETH inclusive (Corbet et al., 2018). Though evidence of interconnectedness in cryptocurrency assets mounts, the issue has remained under-

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