



Editorial

Recent Developments in Cryptocurrency Markets: Co-Movements, Spillovers and Forecasting

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The emergence of Bitcoin and other cryptocurrencies has led to an explosion of trading and speculation in once nontraditional markets. There is a large number of cryptocurrencies in existence; see, for example, the website Coin Market Cap, which has a complete list: <https://coinmarketcap.com/all/views/all/>. Of those, four stand apart from the rest in terms of market capitalization and volume. These are Bitcoin, Ethereum, XRP, and Litecoin, and as of 27 March 2019, their market capitalizations stood at USD 71.9 billion, 17.8 billion, 13.0 billion, and 3.8 billion, respectively. Each of these has its own unique features and purpose, and even though there is a huge and ever-growing literature on their individual behavior, there has been considerably less work on investigating their interactions and interrelationships when taken together as a group. In this Special Issue, the emphasis is primarily on investigating the relationship between the different cryptocurrencies over time, by identifying the co-movement patterns, forecasting ability, and leading trends of individual currencies that cause spillover effects. The papers in the Special Issue bring together different aspects of the above research questions and relationships from different perspectives using some of the most up-to-date statistical and econometric techniques. Below, I will briefly summarize the main points raised by these papers, not necessarily in the order that they have been published but mostly by their thematic connection.

The papers by [Rambaccussing and Mazibas \(2020\)](#) “True versus Spurious Long Memory in Cryptocurrencies” and [Soylu et al. \(2020\)](#) “Long Memory in the Volatility of Selected Cryptocurrencies: Bitcoin, Ethereum and Ripple” examine the behaviour of certain cryptocurrencies by testing for the presence of long memory behavior. The former paper does not find much evidence in the returns for long memory, and any persistence found in volatility is borderline nonstationary, while the later paper finds that the squared returns of three cryptocurrencies have a significant long memory, supporting the use of fractional generalized auto regressive conditional heteroscedasticity (GARCH) extensions as a suitable modelling approach. Similarly, the paper by [Jha and Baur \(2020\)](#) “Regime-Dependent Good and Bad Volatility of Bitcoin” analyzes high-frequency estimates of the good and bad realized volatility of Bitcoin and finds that any volatility asymmetry depends on the volatility regime and the forecast horizon, and compared with stock markets, the persistence and predictability of the volatility is low. The paper by [Ozturk \(2020\)](#) “Dynamic Connectedness between Bitcoin, Gold and Crude Oil Volatilities and Returns” examines the connectedness among Bitcoin, gold, and crude oil between 3 January 2017 and 31 December 2019 based on the argument that Bitcoin can be similar to gold in terms of its hedging properties and that it can be used for hedging for different assets. The results indicate that the volatility connectedness is higher than the return connectedness among these assets, suggesting that although diversification among these three assets is more difficult in the short- and medium-term, investors may benefit from diversification in the long run. In a similar vein, the paper by [Hoang et al. \(2020\)](#) “Does Bitcoin Hedge Commodity Uncertainty?” examines the connectedness between Bitcoin and commodity volatilities, including those of oil, wheat, and corn, during the period Oct. 2013–Jun. 2018, using time- and frequency-domain frameworks, also finding that Bitcoin could be a hedger for commodity volatilities. Finally, the paper by [Kyriazis \(2020\)](#) “Is Bitcoin Similar to Gold? An Integrated Overview



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of Empirical Findings” explores whether Bitcoin can be considered as a globally accepted asset that has a resemblance to gold, which is widely considered to be the safest choice. The majority of evidence reveals that Bitcoin has a long way to go before it will acquire the same characteristics as the safe-haven asset of gold, and even though Bitcoin is found to be an efficient hedge against oil and stock market indices, it is so to a lesser extent than gold, which turns out to be a better and more stable safe-haven investment than Bitcoin.

The [Vaz de Melo Mendes and Carneiro \(2020\)](#) paper “A Comprehensive Statistical Analysis of Six Major Crypto-Currencies from August 2015 through June 2020” presents a comprehensive statistical analysis of the six most important cryptocurrencies from the period 2015–2020. Using daily data, their analysis indicates that the strength of the dependence among the cryptocurrencies has increased over the recent years in the co-integrated crypto market, something that may be of help to investors for managing risk while identifying opportunities for alternative diversified and profitable investments. Similarly, [Xiao and Sun \(2020\)](#), in the paper “Forecasting the Returns of Cryptocurrency: A Model Averaging Approach”, investigate major cryptocurrencies’ return determinants and forecast their returns using methods that deal with model uncertainty. In particular, they propose a shrinkage Mallows model averaging (SMMA) estimator for forecasting, and they find that the returns for most cryptocurrencies are sensitive to volatilities from major financial markets. [Deniz and Stengos \(2020\)](#), in “Cryptocurrency Returns before and after the Introduction of Bitcoin Futures”, also examined the behaviour of Bitcoin returns and those of several other cryptocurrencies in the periods before and after the introduction of the Bitcoin futures market by using a principal-component-guided sparse regression (PC-LASSO) model to analyze several sample sizes for the before and after periods, and they found that the top-five cryptocurrencies were substitutes before the launch of Bitcoin futures. However, this effect was lost, and moreover, there were spillover effects on altcoins during both the after and the recovery periods. Similarly, [Panagiotidis et al. \(2020\)](#), in the paper “A Principal Component-Guided Sparse Regression Approach to the Determination of Bitcoin Returns”, examined the significance of forty-one potential covariates of Bitcoin returns for the period 2010–2018, and they found that economic policy uncertainty and stock market volatility are among the most important variables for Bitcoin; they also traced strong evidence of bubbly Bitcoin behavior in the 2017–2018 period.

The paper by [Venter and Maré \(2020\)](#) “GARCH Generated Volatility Indices of Bitcoin and CRIX” examines the pricing performance of the GARCH option pricing model when applied to Bitcoin (BTCUSD) and the implied volatility indices (30, 60 and 90 days) of BTCUSD and the Cryptocurrency Index (CRIX). The findings suggest that the GARCH option pricing model produces accurate European option prices when compared to market prices, and the term structure of the volatility indices indicates that the short-term volatility (30 days) is generally lower when compared to longer maturities. Finally, [Kyriazis \(2019\)](#), in “A Survey on Empirical Findings about Spillovers in Cryptocurrency Markets”, offers a comprehensive survey of the return and volatility spillovers of cryptocurrencies based on the empirical results of relevant academic literature. The overall evidence reveals that Bitcoin is the most influential among digital coins, mainly as a transmitter toward digital currencies but also as a receiver of spillovers from virtual currencies and alternative assets. This survey provides useful guidance regarding the hotly debated issue of the reform and decentralization of financial systems.

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References

- Deniz, Pinar, and Thanasis Stengos. 2020. Cryptocurrency Returns before and after the Introduction of Bitcoin Futures. *Journal of Risk and Financial Management* 13: 116. [[CrossRef](#)]
- Hoang, Khanh, Cuong C. Nguyen, Kongchheng Poch, and Thang X. Nguyen. 2020. Does Bitcoin Hedge Commodity Uncertainty? *Journal of Risk and Financial Management* 13: 119. [[CrossRef](#)]

- Jha, Kislay Kumar, and Dirk G. Baur. 2020. Regime-Dependent Good and Bad Volatility of Bitcoin. *Journal of Risk and Financial Management* 13: 312. [[CrossRef](#)]
- Kyriazis, Nikolaos A. 2019. A Survey on Empirical Findings about Spillovers in Cryptocurrency Markets. *Journal of Risk and Financial Management* 12: 170. [[CrossRef](#)]
- Kyriazis, Nikolaos A. 2020. Is Bitcoin Similar to Gold? An Integrated Overview of Empirical Findings. *Journal of Risk and Financial Management* 13: 88. [[CrossRef](#)]
- Ozturk, Serda S. 2020. Dynamic Connectedness between Bitcoin, Gold, and Crude Oil Volatilities and Returns. *Journal of Risk and Financial Management* 13: 275. [[CrossRef](#)]
- Panagiotidis, Theodore, Thanasis Stengos, and Orestis Vravorinos. 2020. A Principal Component-Guided Sparse Regression Approach for the Determination of Bitcoin Returns. *Journal of Risk and Financial Management* 13: 33. [[CrossRef](#)]
- Rambaccussing, Dooruj, and Murat Mazibas. 2020. True versus Spurious Long Memory in Cryptocurrencies. *Journal of Risk and Financial Management* 13: 186. [[CrossRef](#)]
- Soylu, Pinar Kaya, Mustafa Okur, Özgür Çatıkkaş, and Z. Ayca Altintig. 2020. Long Memory in the Volatility of Selected Cryptocurrencies: Bitcoin, Ethereum and Ripple. *Journal of Risk and Financial Management* 13: 107. [[CrossRef](#)]
- Vaz de Melo Mendes, Beatriz, and André Fluminense Carneiro. 2020. A Comprehensive Statistical Analysis of the Six Major Crypto-Currencies from August 2015 through June 2020. *Journal of Risk and Financial Management* 13: 192. [[CrossRef](#)]
- Venter, Pierre J., and Eben Maré. 2020. GARCH Generated Volatility Indices of Bitcoin and CRIX. *Journal of Risk and Financial Management* 13: 121. [[CrossRef](#)]
- Xiao, Hui, and Yiguo Sun. 2020. Forecasting the Returns of Cryptocurrency: A Model Averaging Approach. *Journal of Risk and Financial Management* 13: 278. [[CrossRef](#)]