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## Article

# Blockchain and cryptocurrencies

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Editorial

# Blockchain and Cryptocurrencies

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**Abstract:** Cryptocurrencies are essentially digital currencies that use blockchain technology and cryptography to facilitate secure and anonymous transactions. Many institutions and countries are starting to understand and implement the idea of cryptocurrencies in their business models. With this recent surge in interest, we believe that now is the time to start studying these areas as a key piece of financial technology. The aim of this Special Issue is to provide a collection of papers from leading experts in the area of blockchain and cryptocurrencies. The topics covered in this Special Issue includes the economics, financial analysis and risk management with cryptocurrencies.

**Keywords:** Blockchain; Cryptocurrencies; Digital Currencies; Risk management; Bitcoin; Financial analysis

Blockchain and cryptocurrencies have recently captured the interest of academics and those in industry.

Cryptocurrencies are essentially digital currencies that use blockchain technology and cryptography to facilitate secure and anonymous transactions. The cryptocurrency market is worth over USD 500 billion. Many institutions and countries are starting to understand and implement the idea of cryptocurrencies in their business models. The aim of this Special Issue is to provide a collection of papers from leading experts in the area of blockchain and cryptocurrencies. This volume includes a wide variety of theoretical and empirical contributions that address a range of issues and topics related to blockchain and cryptocurrencies. Short abstracts of the articles in this Special Issue are presented below:

Trabelsi (2018) investigates the connectedness of the cryptocurrency markets, with other traditional currencies, stock market indices, and commodities using the spill over index approach. The results show no significant spillover effects between the cryptocurrencies and other financial markets. This suggests that cryptocurrencies pose no danger to the stability of financial systems and is seen as an independent financial instrument.

Luu Duc Huynh (2019) analyses the spillover risks among cryptocurrency markets using the VAR (Vector Autoregressive Model)-SVAR (Structural Vector Autoregressive Model) Granger causality and Student's-t Copulas. The results show that Ethereum is likely to be the independent coin in this market, while Bitcoin tends to be the spillover effect recipient. Furthermore, the study sheds light on investigating the contagion risks among cryptocurrencies by employing Student's-t Copulas for modelling the joint distribution. The result suggests that all coins negatively change in terms of extreme value and the investors are advised to pay more attention to 'bad news' and moving patterns in order to make timely decisions.

Kyriazis (2019) provides a systematic survey on whether the pricing behavior of cryptocurrencies is predictable, through centering the investigation on the Efficient Market Hypothesis. It is observed that the majority of academic papers provide evidence for the inefficiency of Bitcoin and other digital currencies. Furthermore, studies over the past few years have shown market efficiency in cryptocurrencies, which suggests less profitable trading strategies for speculators.

Munim et al. (2019) provide forecasts of Bitcoin prices using the autoregressive integrated moving average (ARIMA) and neural network auto regression (NNAR) models. The forecast provides next-day Bitcoin price predictions both with and without re-estimation of the forecast model for each step. Training and testing samples are implemented to cross-validate the forecast results. The results show, in the first training sample, that NNAR performs better than ARIMA, while ARIMA outperforms NNAR in the second training sample. Furthermore, the superiority of forecast results from the ARIMA model over NNAR in the test-sample periods is confirmed by the Diebold Mariano test. Despite the sophistication of NNAR, this paper demonstrates ARIMA's enduring power of volatile Bitcoin price prediction.

Ferreira and Pereira (2019) evaluate the contagion effect between Bitcoin and other major cryptocurrencies, using the Detrended Cross-Correlation Analysis correlation coefficient ( $\Delta\rho\text{DCCA}$ ), and compare the periods before and after the crash. The results find evidence of a contagion effect, with the market being more integrated now than in the past.

(Kyriazis and Prassa 2019) investigate the level of liquidity of digital currencies during the intense bearish phase (April 2018 until January 2019) in their markets. The Amihud's illiquidity ratio is employed in order to measure the liquidity of these digital assets. The results indicate that the most popular cryptocurrencies exhibit higher levels of liquidity during periods of market stress. Furthermore, the results support the findings of relevant literature about strong and persistent positive or negative herding behavior of investors based on Bitcoin, Ethereum and highly capitalized cryptocurrencies in general.

Zhang et al. (2020) provide the first high-frequency analysis of cryptocurrencies in terms of bull and bear markets. Algorithms are implemented for detecting the turning points to identify bull and bear phases in cryptocurrencies, and during these periods the market efficiency and liquidity are investigated. The findings show that the hourly returns of cryptocurrencies during a bull market indicate market efficiency when using the detrended-fluctuation-analysis (DFA) method to analyze the Hurst exponent with a rolling window approach. However, when conditions turn and there is a bear-market period, we see signs of a more inefficient market. Furthermore, the results indicated differences between the cryptocurrencies in terms of their liquidity during the two market states. Moving from a bull to a bear market, Ethereum and Litecoin appear to become more illiquid, as opposed to Bitcoin, which appears to become more liquid.

Şcheau et al. (2020) provide a literature review on empirical studies related to the interferences between cryptocurrency and cybercrime.

Ibrahim et al. (2020) investigate the Bitcoin market mechanics through using the vector autoregression (VAR) and the Bayesian vector autoregression (BVAR) prediction models. The analysis provides an in-depth understanding of what drives Bitcoin price and capitalize on market movement and identifies the significant price drivers, including stakeholders impacted, effects of time, as well as supply, demand, and other characteristics. The experimental results show that the vector-autoregression-based models achieved better performance compared to the traditional autoregression models and the Bayesian regression models.

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