CRYPTOCURRENCIES: PERSPECTIVES OF A DIGITAL-ECONOMIC PHENOMENON

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Abstract: *Cryptocurrencies are a digital-economic phenomenon that appeared in the last 6-7 years and attracted considerable attention. From the seemingly worthless concept of so-called „cryptocurrencies", they gained tremendous value and thus challenged some of the fundamental settings of the ruling economy. Their value is not determined by some monetary institution as it is with the euro, the dollar or some other currency. However, the seemingly stable value of the cryptocurrency has, over the period of its existence, been substantially oscillated several times, suggesting certain elements of risk in terms of future investment in them. The trend of the cryptocurrency value is currently unfavorable. Does this mean that a complete concept of cryptocurrencies will come to an end? What is the perspective? Can we expect the re-increase of the value of the cryptocurrency? Will the cryptocurrencies replace the existing money in recent time? This and many other issues are awaiting their answers in the upcoming period. This paper seeks to provide some guidelines based on the analysis of the previous trend of cryptocurrency value and to provide answers to some of these questions.*

Keywords: *cryptocurrencies, financial market, finance*

1. INTRODUCTION

Cryptocurrencies are a digital-economic phenomenon that has emerged in the last 6-7 years and announced the emergence of new trends in the field of electronic business and the digital economy. The cryptocurrencies were formed as a complement to one another invention. Satoshi Nakamoto (2008) is considered to be the founder of the first true and still current cryptocurrency Bitcoin. At the heart of Satoshi's invention there is a way to build a decentralized digital money system. In the nineties, there were many attempts to create digital money, but all failed.

One of the main features of cryptocurrency is the fact that it is not controlled by a single monetary institution. The issuance of the cryptocurrency is performed on a private basis. It is nothing new in itself. In the past, private-owned currencies were used and they worked well. However, for example, unlike bank deposits, they are not mandatory and cannot be redeemed [1]. Because of this, cryptocurrencies bear a sign of something speculative [2]. Due to the speculative nature, the value of the cryptocurrencies through their existing lifetime has on several occasions significantly oscillated, which seriously challenged credibility with regard to further investments. The main objective of this paper is to analyze the fluctuations of prices and to explore the correlation between these fluctuations and levels of volume and market capitalization at the cryptocurrency market. This paper consists of an introduction, literature reviews, methodology, results and conclusion.

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2. LITERATURE REVIEW

The simplest definition of the concept of cryptocurrencies would be that it is only a limited set of data inputs into a database that no one can change without meeting the required conditions. Cryptocurrencies are an alternative to existing types of payments. The technology that is in the background of cryptocurrencies allows the sending of cryptocurrencies directly to other persons without the intermediation of a third institution such. A business that takes place in such a manner ensures a certain degree of anonymity.

Cryptocurrencies can be understood as a form of virtual accounting systems. Within these systems, records are kept of each transaction. Cryptocurrencies are primarily used for the purchase and sale of goods and services, although some new cryptocurrencies also work to provide a set of rules or obligations to their owners. They have no intrinsic value because they are not redeemable for other goods, such as gold. [3]

The cryptomarket represents a total volume of all transactions that take place using cryptocurrencies. Since cryptocurrencies business is undertaken for the same reason as any other business, which is a profit, it is impossible to avoid linking them to the financial market. The very fact that cryptocurrencies can be converted into real money, gives a new dimension to the financial market.

The market of cryptocurrencies has become a phenomenon because of its capitalization rate. According to data from 2017, Bitcoin has reached a market capitalization of over $ 300 billion (coinmarketcap.com 2018). After the emergence of Bitcoin, a further 1,000 new cryptocurrencies emerged. [4] Each cryptocurrency uses a slightly different method of implementation that makes it unique enough to be a separate currency. Each cryptocurrency has a separate estimate and there have been numerous exchanges for the purchase, sale and trade of such cryptocurrencies. Coinbase.com, Binance.com, Abra.com and Kraken.com are some of the cryptocurrency exchanges. [5]

Despite so much capitalization, the market of cryptocurrencies has not become the subject of regulation of government institutions. [6]. Frequent significant fluctuations and some data show that the cryptomarket is still inefficient and still in its infancy. [7]. Cryptocurrencies enabled some lucrative investment options for investors who are prepared to bear high risk. Bitcoin ranged from several cents per unit and jumped to $ 20,000 (Quandl.com). If investors could capitalize on a sharp increase in prices and avoid falling, they could make huge returns. Due to investment opportunities, different hedge funds, investment funds and individual investors have emerged.

Although the future of cryptocurrencies as an investment is currently uncertain, some in the investment community consider them as a valid investment option. [5] Initial research has shown that due to the way in which Bitcoin was made and its digital „mining" process its price should be relatively stable.[8] Cryptocurrencies behave according to three currency functions: media exchange, value storing and moderate transfer rates. [9] On the other hand, there is a high likelihood of the existence of speculative bubbles in cryptocurrency prices, and as long as the cryptomarket is not regulated by the legal framework, security of all cryptocurrencies is at high risk for the entire financial system and the world economy. The cryptomarket has become a very complex segment from the aspect of analysis and prediction. There are several papers in the field of analysis and forecasting of the movement of the cryptomarket. One of the first of its kind was LeBron [10], which proposed a model based on heterogeneous agents. After this work, Chakraborti et al. [11] and Chen et al [12] appear with additional modification of the model.

3. METHODOLOGY

The main focus of this research is the exploration of fluctuations on the cryptocurrency market during the 4-year period 2015-2018. Research process included:

- data collection,
- data preparation,
- data analysis and
- results interpretation.

Authors have collected data for 23 cryptocurrencies: Bitcoin, Ethereum, EOS, Litecoin, Binance Coin, Stellar, Cardano, Tether, TRON, Bitcoin SV, Monero, Dash, IOTA, NEO, Ontology, Maker, NEM, Ethereum Classic, Tezos, Basic Attention Token, Zcash, Dogecoin and VeChain. Analyzed data includes the following indicators for each day during the period 2015-2018:

- open daily price,
- close daily price,
- daily close ratio,
- highest daily price,
- lowest daily price,
- daily spread,
- volume and
- market capitalization.

The analysis consisted of a comparison of prices in different periods and exploration of correlation between volume and market capitalization, on one side, and open price, highest price and spread, on the other side. Correlation calculation was based on the Pearson correlation coefficient. Overall analysis has been implemented with the assistance of Tableau, software package for the interactive visual exploration of multivariate data sets.

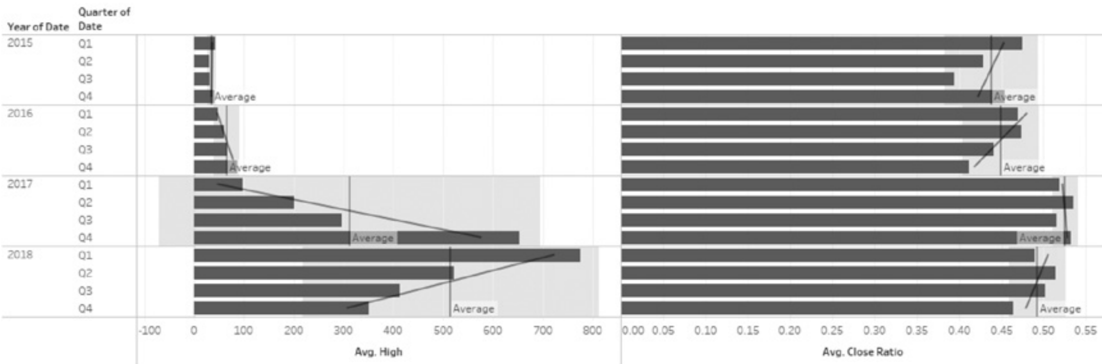
3. RESULTS

Period of 4 years was divided into quarters in order to get the best insight into data dynamics. It can be seen that the highest value of the average highest daily prices occurred from the 4th quarter of 2017 to 2nd quarter of 2018. The average highest daily price achieved the highest value during the 1st quarter of 2018, but the biggest decrease of average highest price was observed during the following quarter of 2018. This was followed by a decrease in market capitalization and volume.

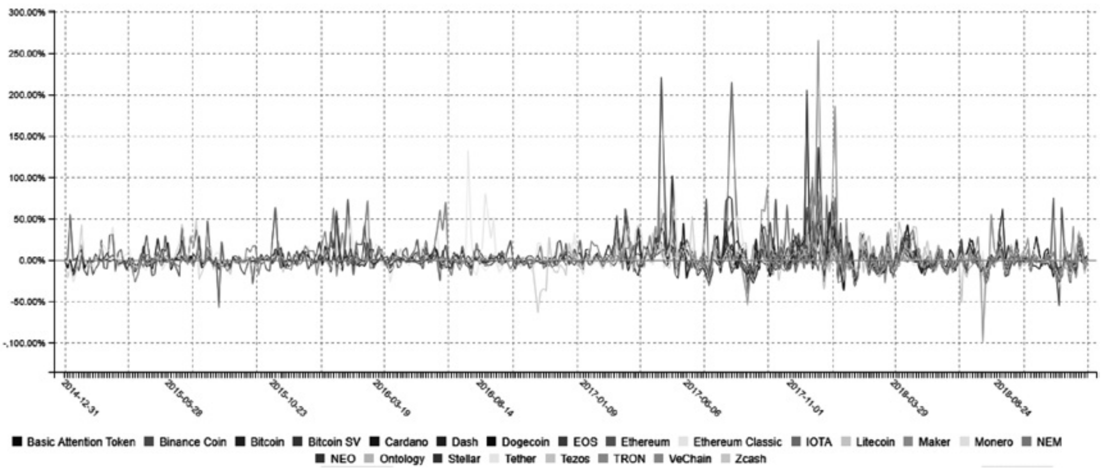
Further analysis showed that the most intense (individual cryptocurrency daily price change higher than 50%) and frequent daily price variations occurred from the 1st quarter of 2017 to 1st quarter of 2018. During this period there were more daily price changes higher than 50%, than during the rest of the remaining period 2015-2018. In addition, the period between the 1st quarter of 2017 and the 1st quarter of 2018 is the only period in which daily price changes higher than 150% have happened.

The next step in the analysis was an observation of market capitalization and volume. Market capitalization was at the highest level from the 4th quarter of 2017 to the 2nd quarter of 2018. Value of market capitalization, during the previously mentioned period, was equal to 62.27% of total market capitalization for the whole period 2015-2018. This situation was just a continuation of constant growth of market capitalization from the 3rd quarter of 2015 to 1st quarter of 2018. On the other side, from 2nd to 4th quarter of 2018 market capitalization value was constantly reduced. This value was 47.7% lower during the 4th quarter of 2018 comparing to the 3rd quarter of 2018.

The same situation can be seen when analyzing volume during the observed period. The only difference occurred during the 4th quarter of 2016 when the volume was decreased, but market capitalization was increased. During all other periods, volume and market capitalization have followed the same pattern.



Graph 1: Average highest prices and average close ratio

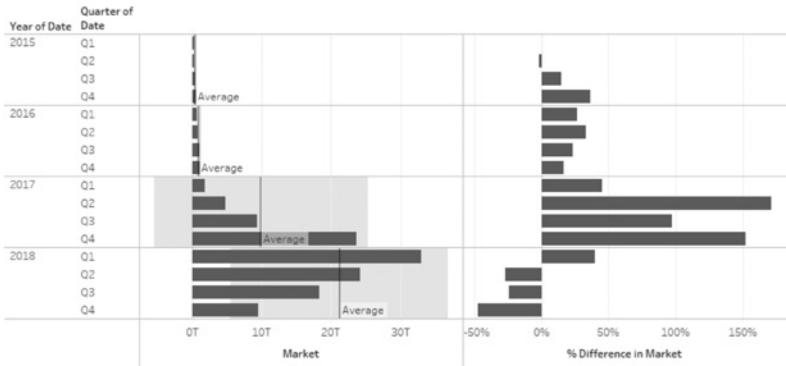


Graph 2: Daily price changes

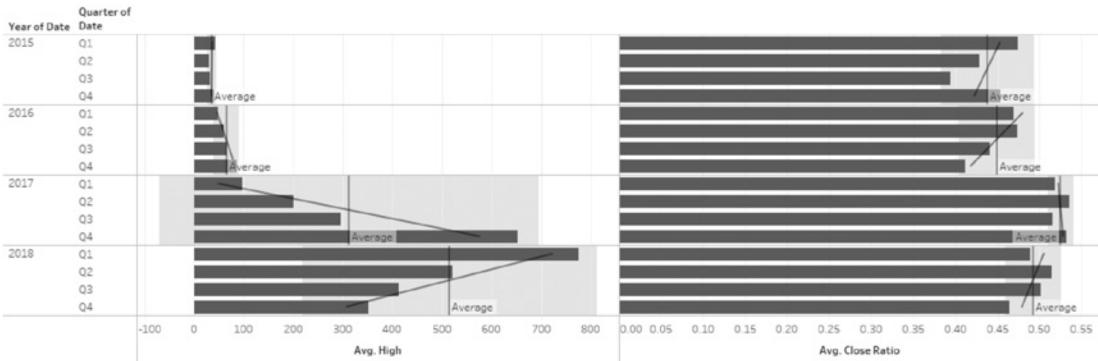
Additionally, the average open daily price, highest daily price, average daily spread, market capitalization and volume are compared in the following graph. This was conducted in order to explore connection between higher levels of prices and volume of transactions at the cryptocurrency market. Analysis showed that there is a strong positive correlation between average volume and average daily spread (correlation coefficient= 0.7662), average open daily price (correlation coefficient= 0.8363) and average highest daily price (correlation coefficient= 0.84). The same conclusions can be made when comparing average market capitalization and average daily spread (correlation coefficient= 0.7301), average open daily price (correlation coefficient= 0.9449) and average highest daily price (correlation coefficient= 0.9455).

This shows that price fluctuations and high price levels are the main motivators for cryptocurrency trade. Since the cryptocurrency market is not regulated by any kind of central authority, such as the central bank, fluctuations and speculations are just some of the expected consequences.

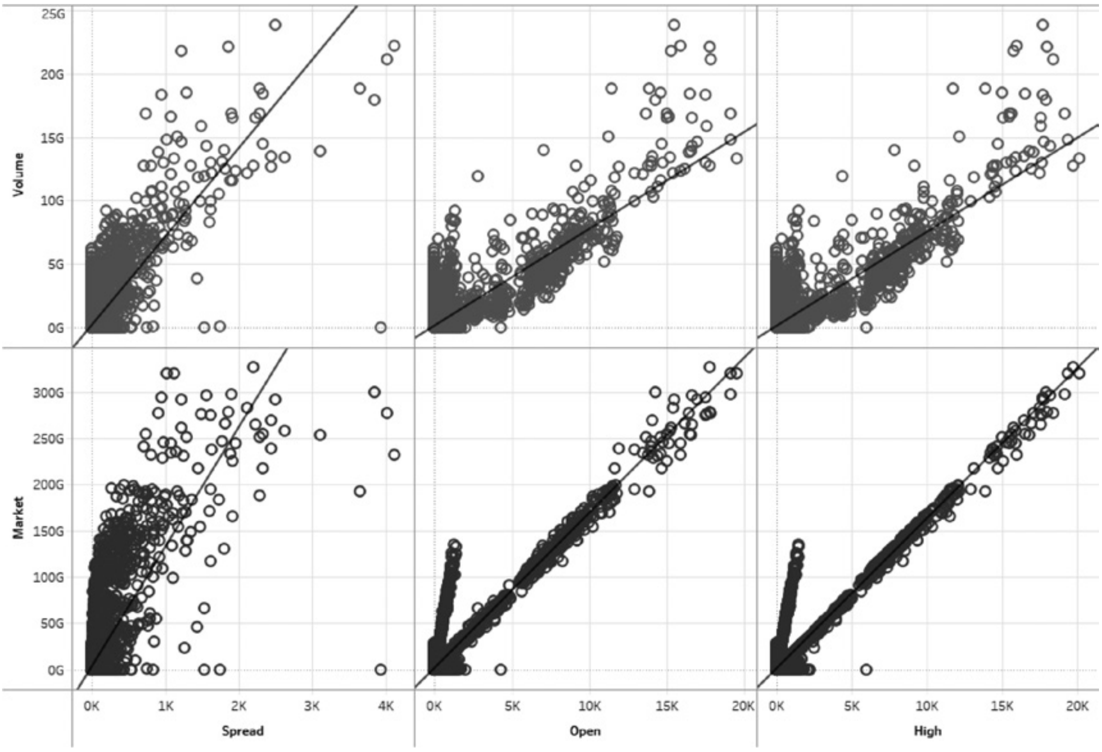
The problem main of the cryptocurrency market is not in the higher or lower level of cryptocurrency prices. The main problem for the future and attractiveness of cryptocurrencies as a more common instrument of exchange is in high levels of fluctuations and uncertainty.



Graph 3: Market capitalization



Graph 4: Market volume



Graph 5: Correlation analysis

4. CONCLUSION

This research showed that there is a high correlation between volume and market capitalization and variations of price levels. That fact defines the state of the cryptocurrency market that enables more frequent price variations. More variations lead to increase of cryptocurrency prices, volume and market capitalization at the beginning. Later, these variations went in the direction of decrease of cryptocurrency prices, volume and market capitalization.

These situations in the short period of 4 years, are a good indicator of weaknesses of the cryptocurrency market. It is not regulated by any kind of central authority. It is decentralized and this strength, as many calls it, becomes a weakness for wider use of cryptocurrencies in regular life.

Results obtained by this research can be used as a base for further research in order to answer some of the following questions. What needs to be done in order to decrease the level of price fluctuations at the cryptocurrency market? Is a big number of cryptocurrencies direct consequence of these fluctuations and will the number drop if this market becomes more regulated? Will some kind of regulation enable wider use of cryptocurrencies in common life?

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