

2.2. Positive and negative implications of development of cryptocurrency market

Introduction. The virtual currencies, including cryptocurrencies have been developing rapidly over the last years, becoming an outstanding phenomenon of information technologies and innovations across the global financial markets. Matters related to the emerging trends of the cryptocurrency market, as well its perspectives and challenges, are high on both political and academic agenda.

The concept and the framework associated with cryptocurrencies introduce the innovations into financial technology sector due to its unique set of features, but also pose a challenge for the state and society for the same reasons. For example, studies show that cryptocurrency exchange rates cannot be affected directly by the activities of national central banks, as the rate in this case largely depend on private demand and supply [7]. At the same time, the volume of demand for a specific cryptocurrency also depends on whether it is publicly adopted, which also means its liquidity, whereas the volume and velocity of supply will be limited. These and many other features spur the academic interest in further analysis of multiple matters concerning the cryptocurrencies and provide for a vast area of research to be undertaken.

Theory and practical issues related to various virtual and digital currency, including the cryptocurrencies, have been actively pursued by many researchers, including A. Berentsen [1], D. Birch [2], J. Chiu [3], M. Frunza [5], I. Motsi-Omojiade [9], S. Nakamoto [10], A. Phillip, J. Chan, S. Peiris [12], V. Sapovadia [13]. Cryptocurrencies have also been the focus of study of E. Felten, A. Narayanan, J. Bonneau, A. Miller, S. Goldfeder [4], Xin Li, C. Wang [7], D. Morris [8] and others.

Although the subject of cryptocurrencies is in the spotlight of researchers' pursuit and the number of dedicated academic papers is growing, there is a potential for further research of the following:

- ✓ Current and potential future implications of the cryptocurrency market (crypto market) evolution may be analysed in continuity with its latest trends;
- ✓ Risks of crypto market development, as compared to the conventional foreign exchange market, can be evaluated from statistical and empirical viewpoint to provide the overarching quantitative perspective;
- ✓ The international currency market and the cryptocurrency market can be compared from, *inter alia*, their reactions to external shocks.

Following the above, the objectives of this study are to provide an overview of the key features of cryptocurrency market evolution; to analyse the market's responses to the external shocks and challenges, and to test from empirical viewpoint the hypothesis of the autonomy of the crypto market as compared to foreign exchange market, which should overall reflect the academic novelty of the research.

Main results. The currency market is closely integrated with the other markets: specifically, it features international trade, international capital movements, labour

migration, movement of currency liquidity etc. Crypto market, like the traditional currency market, is often considered an integral part of the financial market, the scheme of which is shown in Figure 1.

The key feature of the cryptocurrency market is the characteristics of its organization, which is based on advanced innovative technology – blockchain. A blockchain is a decentralized database (similar to a virtual public ledger) which includes a steadily increasing list of transactions [5]. Blockchain technology enables the global exchange of data through a peer-to-peer network without an intermediary. Despite the fact all transactions carried out with cryptocurrency are public, they remain anonymous, as nothing links a person or organization to the account recorded in the transaction. Such decentralization and anonymity, on the one hand, provides advantages for the blockchain users; on the other hand, it creates the risks, since the anonymity of most transactions with virtual currency hinders the identification of participants to criminal arrangements, including money laundering and financing of terrorism.

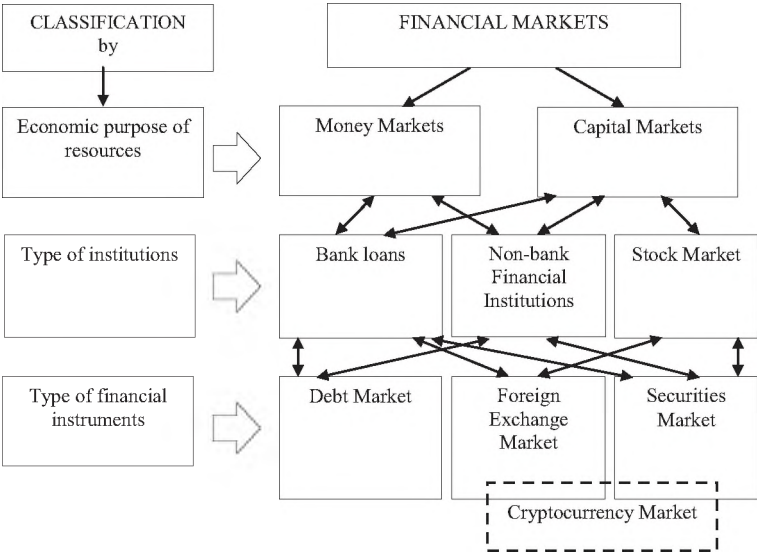


Fig.1. Classification of financial markets
Source: made by authors based on the source [6]

Like any other digital currency, cryptocurrency raises many questions about how reliable it is and how prone it is to the risk of breakdown. For example, the National Bank of Ukraine identified 6 major challenges of using cryptocurrencies, including:

- ✓ Possibility of theft;
- ✓ Lack of guarantee on refund of funds invested in cryptocurrency;

- ✓ Possibility of fraud;
- ✓ Complexity of estimating the market value of cryptocurrency;
- ✓ Dramatic price fluctuations and related risks, such as speculative and unregulated levels of commission for transactions;
- ✓ Lack of established infrastructure [11].

Despite the risks associated with the use of cryptocurrencies, blockchain technology provide the new opportunities for the quick execution of transactions while lowering the operating cost. Due to its reliance on mathematical algorithm, cryptocurrency is often be considered less prone to the risk of counterfeiting than any other currency. Another positive side of the algorithm-based currency is that the supply of most cryptocurrencies is limited, thereby reduces the risk of inflation. Hence, the cryptocurrency is a financial innovation that has the potential for widespread use leading to optimization and lowering the cost of transactions. Despite the risks, e.g. the potential for use in various illegal arrangements with little trackability, there is an increasing integration of virtual currencies into the economies of many countries around the world.

The combined market capitalisation¹ of all cryptocurrencies has increased more than 11 times since May 2017 and has reached \$415.53 billion in May 2018 (Figure 2).

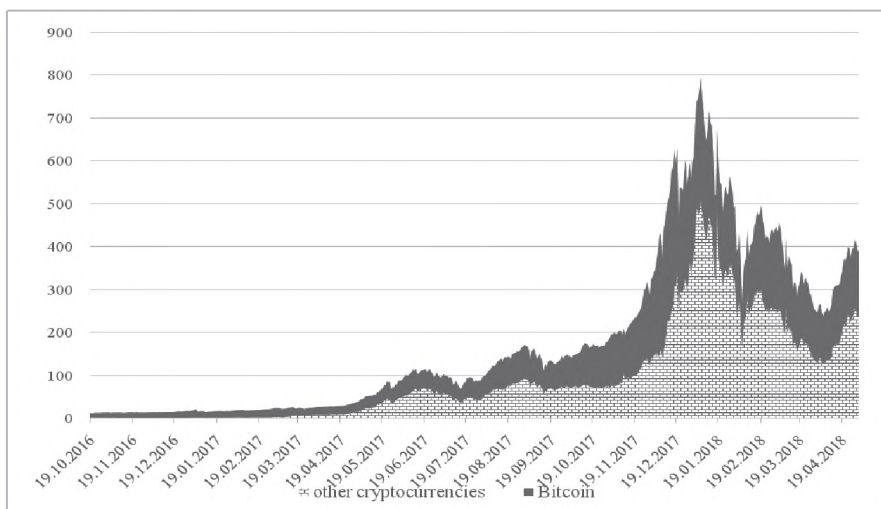


Fig.2. Dynamics of total cryptocurrency market capitalisation
Source: made by authors based on the source Coinmarketcap.com

¹“Market capitalization” here is calculated as a market price multiplied by the number of existing currency units

The highest value was achieved in January 2018: the total market capitalization reached \$793 billion. This happened mainly due to the rise in Bitcoin price at the end of 2017, which became a marker for the market. Bitcoin is the first and most well-known cryptocurrency. It was created by a scientist with the Japanese pseudonym of Satoshi Nakamoto in 2008 [10]. He published the concept of Bitcoin in a whitepaper called “Bitcoin: A Peer-to-Peer Electronic Cash System”. During its first few years Bitcoin had only a shadowy existence. The break-through happened in 2013, after the number of Bitcoin users grew and the theme was picked up by the media.

Cryptocurrencies are traded on specialized exchanges that provide services to buy and sell cryptocurrencies and other digital assets in exchange of national currencies and other cryptocurrencies. Such exchanges play an essential role in the virtual currency economy, offering a platform for trading, liquidity, and price discovery. A summary of geographical affiliation where cryptocurrency exchanges are based is shown in Figure 3. Analysis shows that the largest number of exchanges is registered in Europe (55% of the total), which includes the UK (18% of the total), followed by Latin America (14%) and the US (12%).

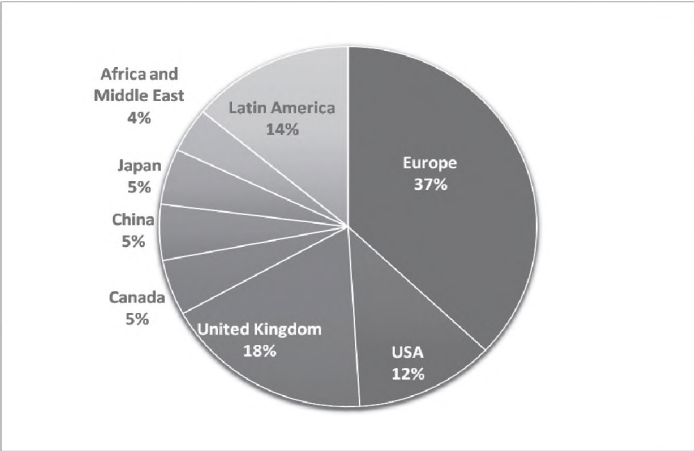


Fig.3. Geographical distribution of cryptocurrency exchanges
Source: made by authors based on the source Bitcoinity.org

At the same time, the mere number of exchanges does not reflect the reality of the volumes of trade per country. Geographic structure of exchanges by market share differs: despite there is a large number of existing platforms (around 200, according to various data), approximately 10-11 exchanges take a major position in terms of transaction volumes. As of May 2018, Hong Kong exchange Bitfinex dominated the cryptocurrency market, grossing the 31% of daily turnover of all cryptocurrency exchanges (Figure 4).

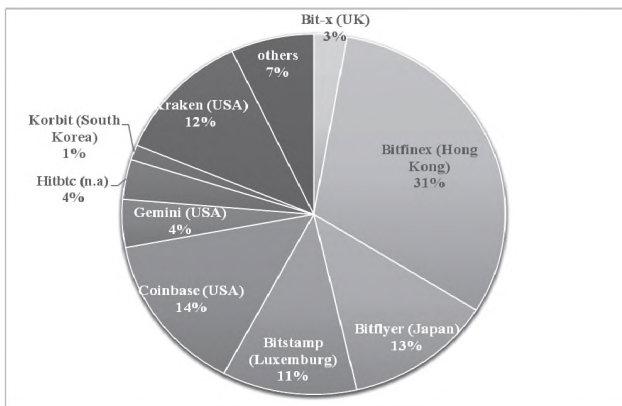


Fig.4. Average market share of cryptocurrency exchanges
Source: made by authors based on the source Bitcoinity.org

Almost equal shares of the market are taken by Coinbase (USA) exchanges – 14%, Bitflyer (Japan) – 13%, and Bitstamp (Luxembourg) – 11%.

The market price surge for cryptocurrencies during the last years has turned crypto exchanges to a popular target for criminals as exchanges handle and store large amounts of cryptocurrencies. A number of events leading to the loss of exchange customer investments was reported, and a variety of schemes were said to be employed, ranging from outside server breaches to insider theft [13]. In many cases, exchanges where losses occurred were forced to close and customer funds were never recovered.

Despite the said risks, cryptocurrencies become more and more popular over time. The consolidated capitalization of new “coins” has increased from 6% in April 2017 to 22% in April 2018. In the structure of daily trading, Bitcoin is a single dominant cryptocurrency accounting for 29% of daily turnover (Figure 5). For comparison, Thether accounts for 15% of daily turnover, EOS – 13%, and Ethereum – 10%, respectively. There is also an expansive trend related to the new coins, as it can be vivid from their share in daily trade turnover, which is 19%.

In terms of trading volumes by national currencies, it is seen that the US dollar (USD) is the most widely supported by exchanges national currency, followed by the Euro (EUR) and the British Pound (GBP). While trading in the Chinese Renminbi (CNY) represented a significant majority of global cryptocurrency trading volumes from 2014 to 2016 (up to 90%), it plummeted in early 2017 after the tightening of regulations by the People's Bank of China [8].

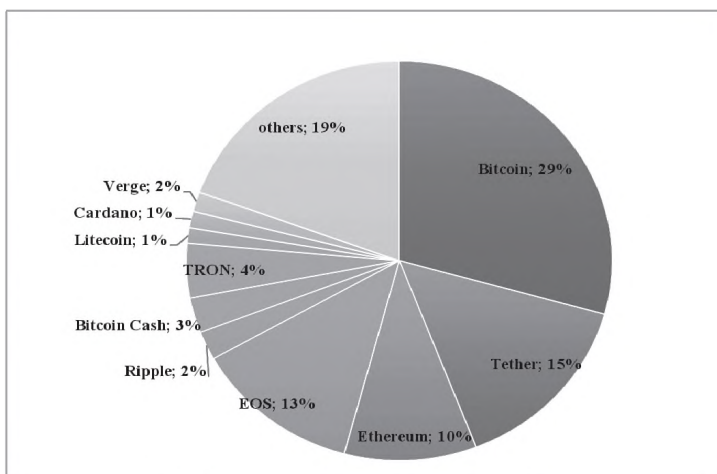


Fig.5. Structure of daily cryptocurrency turnover
Source: made by authors based on the source Coinmarketcap.com

In terms of market capitalization, Bitcoin remains the dominant cryptocurrency, although other cryptocurrencies are increasing their market's share: while Bitcoin's market share accounted for 72% of the total cryptocurrency market in March 2017, it dropped to 45% as of March 2018. Ether (ETH) is the second-largest cryptocurrency by market capitalization, followed by Ripple and Dash (3-10%). Other cryptocurrencies almost tripled their combined share of the total market capitalisation from 6% in 2017 to 22% in 2018.

Importantly, the headcount estimates of cryptocurrency users range from 2.9 million to 5.8 million people in 2017, among which 46% were of age 25-34 and 31% – of age 35-44 years.

The empirical analysis based on vector-autoregression model (VAR) has confirmed the hypothesis that the foreign exchange market and cryptocurrency market are not interconnected and are autonomous of each other which effectively means that the risks leading to destabilization of one of the markets do not affect the other one. From the viewpoint of an investor using the cryptocurrency as an asset, the results of econometric modelling show that, aside from other technical and operational risks, the risk related to macroeconomic shocks (e.g., changes in interest rates, rapid change of inflation rate, expansionary or restraining monetary policy of a national central bank) is not significant for Bitcoin. This conclusion is important because it implies that an investor may reduce the risks of an investment portfolio by acquiring the cryptocurrencies alongside with traditional financial instruments.

Given the rapid development of the cryptocurrencies, it is important to consider the possible options for reducing the associated global risks to the economic system,

emerging with the crypto market evolution. To this end, we have outlined the following prerequisites for the successful development and integration of the cryptocurrency currency market, as well as the measures to reduce risks for the national economies:

- ✓ Targeting the points where the cryptocurrencies are converted into official currencies (i.e., the exchanges);
- ✓ Licensing or registration of cryptocurrency exchanges, application of customer identification/verification and recordkeeping requirements;
- ✓ Cooperation of the private and public sectors in development, implementation, and integration of new technologies, as well as in policymaking aimed at prevention of the use of cryptocurrencies for money laundering and financing of terrorism;
- ✓ Introducing the flexible regulations for a cryptocurrency market, which would integrate it into the national financial system, instead of complete or partial ban;
- ✓ Facilitating the international cooperation and coordination aimed at reduction and prevention of risks associated with use of cryptocurrency for illegal purposes.

The major countries apply varying approaches to regulating the emerging crypto market, ranging from a conservative one (e.g., China) to liberal (e.g., Germany, Switzerland, Japan). Most countries, including Ukraine, have not decided on the legal status of cryptocurrencies and, consequently, have not introduced the legal and oversight framework for their functioning and circulation. There is no single common approach to the regulation of cryptocurrencies in the world, and it may be reasonably doubted that such an approach is ever possible, given the heterogeneous legal systems, practice, and policies across the world.

It may be argued that cryptocurrency should be not considered only as currency or as an asset, but rather as a new disruptive technology, widely implementable in a variety of areas. We are of view that the crypto network decentralization and dehumanization (i.e., the lack of imminent human factor), reducing the need in trust between the transaction parties – and thus the Coasian transaction costs – are the most compelling and potentially lucrative features of cryptocurrency to be further exploited. We believe that at the current pace, the use of blockchain technology in stocks and securities trading may be possible in 5-10 years.

This technology may contribute to improvement of the current financial systems, leading to more efficiency, transparency, and accountability. At the same time, cryptocurrency may become a tool for increasing financial inclusiveness for the countries with low access to financial services. For example, a Kenyan startup BitPesa was initially focused on transfers between the Kenyans and the Kenyan Diaspora in the UK, but over time money transfer services also spread to Nigeria and Uganda, streamlining and easing the international financial flows for individuals. BitPesa services are also popular among companies that transfer funds to foreign partners.

Conclusions

To sum up, aside from the risks of use of cryptocurrency for illegal purposes, it has some positive perspectives, such as the absence of an external or internal administrator, anonymity, relative reliability, non-interference of third parties, independence from the macroeconomic conditions, the possibility of simplifying cross-border payments and granting access to international markets for small and medium businesses. The positive side of the use of cryptocurrency for the investor, as shown by the results of the econometric model, is the possibility of reducing risks by diversification the portfolio with cryptocurrency, as macroeconomic shocks that affect foreign exchange market have no effect on the cryptocurrency market. Overall, cryptocurrency market demonstrates the speed of innovation in the modern world but also poses a challenge for the state and society.

References:

1. Berentsen, A., & Schar, F. (2018). A Short Introduction to the World of Cryptocurrencies. *Review*, 100(1), 1-19. doi:10.20955/r.2018.1-16
2. Birch, D. G. W. (2015). What Does Cryptocurrency Mean for the New Economy? In *Handbook of Digital Currency: Bitcoin, Innovation, Financial Instruments, and Big Data* (pp. 505–517). Elsevier Inc. doi.org/10.1016/B978-0-12-802117-0.00025-4
3. Chiu, J., & Koeppl, T. V. (2017). The Economics of Cryptocurrencies Bitcoin and Beyond. *SSRN Electronic Journal*. doi:10.2139/ssrn.3048124
4. Felten, E., Narayanan, A., Bonneau, J., Miller, A., & Goldfeder, S. (2016). Introduction to Cryptography and Cryptocurrencies. In *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction* (pp. 1–26). Retrieved from <http://assets.press.princeton.edu/chapters/s10908.pdf>
5. Frunza, M. (2016). Cryptocurrencies. *Solving Modern Crime in Financial Markets*, 39-75. doi:10.1016/b978-0-12-804494-0.00005-x
6. Glushchenko, S. (2015). *Money and Credit*. Kyiv: Kyiv-Mohyla Publishing, 153 p. ISBN 978-966-2410-63-1
7. Li, X., & Wang, C. A. (2017). The technology and economic determinants of cryptocurrency exchange rates: The case of Bitcoin. *Decision Support Systems*, 95, 49-60. doi:10.1016/j.dss.2016.12.001
8. Morris, D. Z. (2017, February 12). Bitcoin Markets Slide as China Steps up Regulatory Scrutiny. Retrieved from <http://fortune.com/2017/02/12/bitcoin-markets-china-regulation/>
9. Motsi-Omoijade, I. D. (2018). Financial Intermediation in Cryptocurrency Markets – Regulation, Gaps and Bridges. *Handbook of Blockchain, Digital Finance, and Inclusion, Volume 1*, 207-223. doi:10.1016/b978-0-12-810441-5.00009-9
10. Nakamoto, Satoshi (2008). “Bitcoin: A Peer-to-Peer Electronic Cash System.” Retrieved from <https://bitcoin.org/bitcoin.pdf>.
11. National Bank of Ukraine (2017). Joint statement of financial regulators regarding the status of cryptocurrency in Ukraine [Press release]. 30 November. Retrieved from: https://bank.gov.ua/control/uk/publish/article?art_id=59735329
12. Phillip, A., Chan, J. S., & Peiris, S. (2018). A new look at Cryptocurrencies. *Economics Letters*, 163, 6-9. doi:10.1016/j.econlet.2017.11.020
13. Sapovadia, V. (2018). Financial Inclusion, Digital Currency, and Mobile Technology. *Handbook of Blockchain, Digital Finance, and Inclusion, Volume 2*, 361-385. doi:10.1016/b978-0-12-812282-2.00014-0