The Current State of Development and the Impact of Cryptocurrency on the Global Economy

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Abstract: One type of digital money is cryptocurrency, the creation and control of which are based on cryptographic methods. Its development has led to the emergence of a huge number of additional institutions, financial instruments, and new forms of interaction between people in our society. The article aims to deepen the theoretical and practical provisions of the characterization and development of cryptocurrency as a phenomenon of the modern world economy. The study applied the method of cognition of phenomena and processes, which allows us to consider them in development and interrelation, as well as to identify established patterns and trends. In the course of proving the key theoretical positions, deductive and inductive methods have been applied. Dialectical and systemic-structural approaches were used to clarify certain provisions. At the theoretical level, in addition to the above, we used such methods as conceptual (terminological), formalization, and axiomatic, since some theoretical statements were accepted without evidence. The synthetic method was used to summarize various subjective ideas and theories of researchers in the field of economics. The analytical method was used to analyze scientific sources on economics in the economic research space. The practical significance of the research results lies in the possibility of their use for further development of theoretical and practical approaches to forecasting the impact of cryptocurrency on the global economy in the future.

Keywords: Electronic money, digital currency, cryptocurrency industry, global market, crypto market, Bitcoin, blockchain, volatility, digitalization, mining.

In the information economy, new objects and structures of monetary relations are emerging and developing. Discussions about blockchain technology and cryptocurrencies are of interest not only to the professional community but also to all market players. This interest is driven by various factors: global digitalization, distrust of existing payment systems, and instability of economic relations. As a result, cryptocurrency has emerged as an attractive means of payment. The capitalization of the cryptocurrency market is constantly growing, therefore, the demand for it is constantly increasing.

As a result, investments in cryptocurrencies have recently attracted the attention of financial markets in many countries. It is not surprising that financial analysts are quite concerned about the active "invasion" of an unproven means of payment. Some people are extremely cautious about this cryptographic tool, while others, on the contrary, see cryptocurrency as a new type of profitable business and build a financial portfolio, confident that cryptocurrency will contribute to the development of the shadow global market.

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In the theoretical part of this study, the author examines the concept and aspects of the formation and development of cryptocurrency as a financial instrument. The analytical part of the study highlights the impact of cryptocurrencies on the state of the global economy today. At the same time, further prospects, directions, and forecasts of this impact on the global economy in the future are identified.

Based on the results of the study, conclusions are drawn regarding the further vector of cryptocurrency behavior and its development in the global financial and economic arena. The research aim is to determine the impact of cryptocurrencies on the global economy.

LITERATURE REVIEW

The economy of the 21st century can be characterized by the processes of increasing economic integration between countries. This leads to the merger of separate national markets into one global market, where information has become the main resource in recent years. This is made possible through computerization and telecommunications, which provide fundamentally new opportunities for economic development, multiple growths in labor productivity, solving social and economic problems, and establishing a new type of econom-

ic relations. With the help of the model of sharing in the economy of determining the features of rational use in sustainable production (Atstaja, D., Koval, V., Grasis, J., Kalina, I., Kryshtal, H., & Mikhno, I., 2022), and assessment of investment attraction in the economy in the context of the introduction of Industry 4.0 (Nikonenko, U., Shtets, T., Kalinin, A., Dorosh, I., & Sokolik, L., 2022). Using the conceptual analytical model of decentralized management for energy efficiency of the national economy (Borodina, O., Kryshtal, H., Hakova, M., Neboha, T., Olczak, P., & Koval, V., 2022), and reducing multimodal transportation in conditions of economic transformation for climate neutrality (Dvigun, A., Datsii, O., Levchenko, N., Shyshkanova, G., Platonov, O., & Zalizniuk, V., 2022).

In the last decade, due to technological progress, such trends as globalization, accessibility and completeness of information, and creation and development of new markets have intensified, which in turn have generated new economic processes and changed the traditional monetary economy (Irkhin, Y.B., Chystovska, Y., Pits, I.I., Ryk, H.S., 2020). For instance, one of the most striking forms of "new" money has become a cryptocurrency and the corresponding technologies and financial instruments that may eventually replace their traditional equivalents. It is necessary to take into account the international experience of national security in public administration (Akimov, O., Troschinsky, V., Karpa, M., Ventsel, V. & Akimova, L., 2020) and adaptive enterprise management as a resource component of planning (Akimova, L., Akimov, O., Maksymenko, T., Hbur, Z. & Orlova, V., 2020). Taking into account the potential of safety based on the simulation process as applied in engineering enterprises (Kryshtanovych, M., Akimova, L., Akimov, O., Kubiniy, N. & Marhitich, V., 2021). It is also necessary to take into account the development of the average beauty and its regional aspects (Klymenko, V.V., Akimova, L.M. & Korzh, M.V., 2016), and pay attention to the formation of regional characteristics of marketing in tourism (Deyneha, I.O., Akimova, L.M. & Kratt, O.A., 2016).

Cryptocurrencies are virtual money that has no physical expression as such. The basic unit of such currency is a "coin", which means "coin" in English. The main feature of these monetary units is protection against counterfeiting, as they contain encrypted data that cannot be duplicated. In addition, modern cryptocurrencies do not have any internal or external administrator. Therefore, no public or private bodies can influence the transactions of any participants in the payment system (Belinska, 2018, Balci, M.A., Akgüller, Ö., Kaya, E., Rzhevska, N., Dobroskok, I., Basiuk, L., Kosa, T. 2021).

As early as 1875, F. Hayek in his monograph "The pure theory of capital" attempted to justify the need for purely market-based world currencies free from any government influence. The technique of handling one type of cryptocurrency (bitcoin) was probably developed by the Japanese scientist Satoshi Nakamoto.

No one knows who exactly is hiding behind the pseudonym Satoshi. Nakamoto can be either an individual or an organized group. The main fact remains that he developed the cryptocurrency protocol (bitcoin) and created the first version of the software in which this protocol was implemented. On October 31, 2008, Nakamoto published the article "Bitcoin: A Peer-to-Peer Electronic Cash System", in which he described Bitcoin (BTC) as a fully decentralized electronic cash system that does not require trust from third parties. In early 2009, Nakamoto released the first version of the Bitcoin wallet and launched the Bitcoin network (Derun & Sklyaruk, 2018; Akimova, N., Barabash, V., Usyk, O. 2020).

Therefore, cryptocurrencies are a revolutionary new type of money. Like any other currency, it has value only because people believe it has value as a unit of exchange. A currency can be backed by gold or other precious metals, or vice versa, it can be backed by nothing, although it will have value.

Cryptocurrencies were developed as a unit of exchange and as a place to store assets that are independent of central banks. The following characteristic features are distinguished (Gurina, 2020):

1. Decentralized operation. Any cryptocurrency does not have a centralized governing body, issue, or control, and can be issued in unlimited quantities, etc. A cryptocurrency is a certain cipher that is calculated according to a certain algorithm. However, the calculation of such ciphers (i.e., the issuance) is not carried out by a single body, but by a group, a community of computing power, for example, operating in a network. In other words, by computers.

2. Anonymity of cryptocurrency transactions. In other words, any user of an electronic wallet with cryptocurrency can pay for various services and goods on the Internet.

3. Convertibility and irreversibility of transactions. That is, cryptocurrencies are not backed by any guarantees.

4. Cryptocurrencies are based on a peer-to-peer scheme. That is a system of peer-to-peer client programs.

Based on this, cryptocurrency is a decentralized convertible digital currency (money) based on mathematical principles, the creation and control of which are based on cryptographic methods.

Thus, the cryptocurrency market is a certain set of all cryptocurrencies and the infrastructure that ensures their existence. In this case, the infrastructure includes exchanges (buying and selling cryptocurrencies), investors, and the state, which is trying to limit access to cryptocurrencies and their distribution (Bezverkhy & Kuvshinova, 2018). Thus, the structure of the cryptocurrency market is as follows (Fig. **1**).

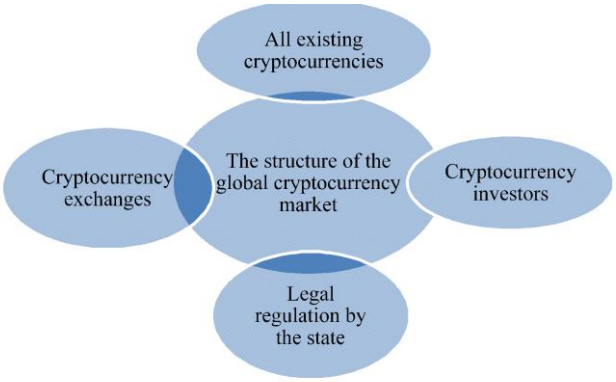

Fig. (1). Structure of the global cryptocurrency market.

Source: built by the authors.

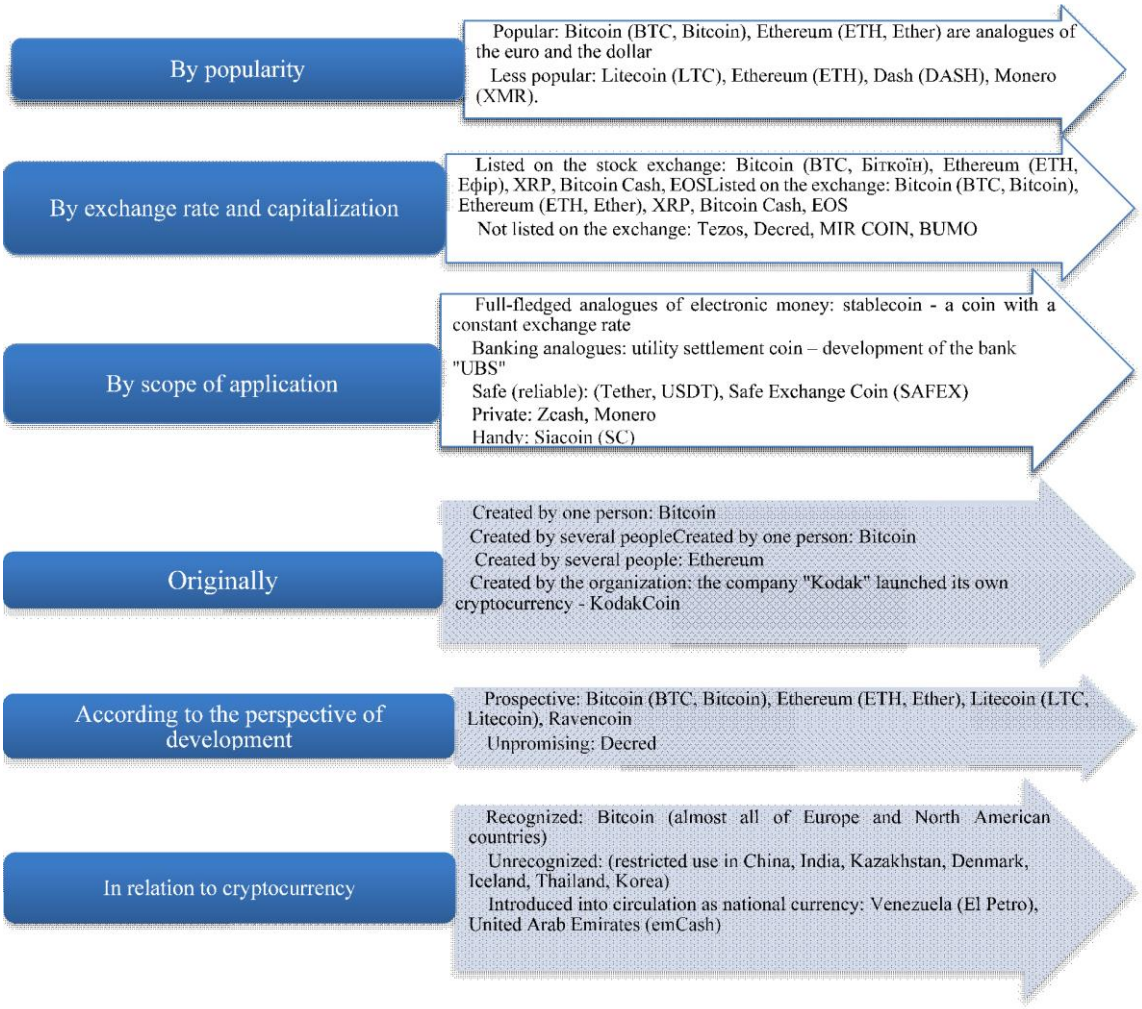

Fig. (2). Classification of cryptocurrencies.

Source: built by the authors.

At the same time, it should be noted that the functions of cryptocurrency are not equated with the functions of money, but in the context of the development of market relations and electronic payment systems, it is quite possible that the understanding of the economic essence of digital currency may change, and then cryptocurrency may take a different place in the global economy. Yes, there are already examples of bitcoin being used as payment in companies operating on the Internet. But it is unlikely that cryptocurrency will become cash. Most likely, it will be an analog of electronic money, thereby displacing conventional fiat currency.

The adoption of digital coins in everyday life will undoubtedly grow. In the coming years, new products such as bank cards and apps are expected to emerge that will allow for cryptocurrency payments. As for the types of cryptocurrencies, there are about 200 of them today. The most popular (and in demand) are the following: Bitcoin (BTC), Litecoin (LTC), Ethereum (ETH), Dash (DASH), and Monero (XMR).

The exchange rate, market volume, and capitalization (the value of one coin) distinguish between listed and unlisted cryptocurrencies. The higher the rate, the clearer the volatility of the cryptocurrency. How cryptocurrencies will be used (the scope of application) depends on the developers. Someone makes a full-fledged analog of electronic money, someone decides to make a "Stablecoin" - a coin with a constant exchange rate, and someone makes money exclusively for banks. There are also safe (having a stable price and growth), private, convenient (cheap and promising in their investment) cryptocurrencies.

Developers improve the code, speed up transactions, and make cryptocurrencies cheaper. With the improvement of the technical part, they become more popular and understandable (development perspective) (Ihnatenko, M., Antoshkin, V., Lokutova, O., Postol, A., Romaniuk, I. 2020). These prospects include the legal status of cryptocurrencies: governments of many countries plan to create regulatory bodies to protect citizens from fraudsters and legalize a fair and transparent cryptocurrency market.

A detailed classification of cryptocurrencies is shown in Fig. (**2**).

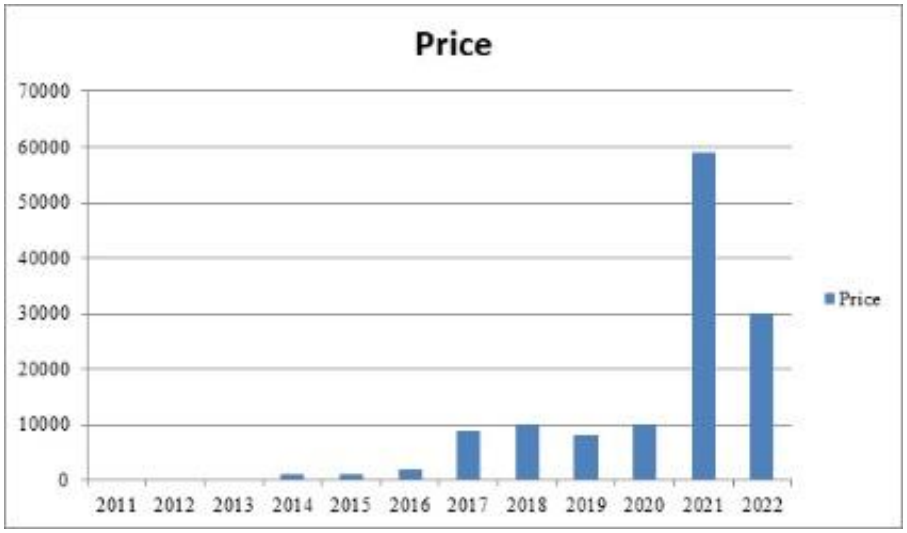

Fig. (3). Bitcoin volatility in 2011-2022, USD.

Source: built by the authors.

Thus, the emergence of different types of cryptocurrencies significantly complicates the current global economic system. Therefore, there is a need to analyze each of them and develop measures to control their use.

RESULTS

The modern cryptocurrency market includes hundreds of various digital coins and shows constant growth. On the economic side, the market can be characterized by the following features:

1) Decentralization. All data is stored in an encrypted, well-protected form, by each investor, and is subject to relevance checks.

2) Anonymity. The data about the person who made the transaction cannot be obtained. All data is stored in wallets and is a set of numbers.

3) Limited issue. Cryptosystems issue a limited number of internal tokens (compact devices designed to ensure the user's information security are also used to identify the owner).

4) Profitability. Selling cryptocurrency brings profit to its owners.

If the existing markets and crypto markets are compared, they differ significantly from each other:

1. The cryptocurrency market is characterized by diversity and chaos. Its structure is heterogeneous.

2. The fundamental difference between cryptocurrencies, money, and securities is that cryptocurrencies do not have a single issuer (they are issued according to decentralization standards).

As mentioned earlier, the crypto market tends to grow rapidly and constantly. Thus, the total capitalization of this market at the end of 2021 reached almost $3 trillion, while at the end of 2020, it was at the level of about $600 billion, and as of January 1, 2017, this indicator was around $15 billion. (Bitcoin, 2022).

It is worth noting that bitcoin, in turn, is in free float. The various events that affect it can be interpreted in a variety of ways. Since its inception in the aftermath of the 2008 global financial crisis, bitcoin, which was known only to a few at the time, has turned out to be one of the most promising projects in the world. The extraordinary growth after 2017 was since from every corner of the Internet one could hear: "...if you had bought bitcoins in 2010, you would be millionaires now..." and so on (Fig. **3**).

Cryptocurrencies lack liquidity, but in general, this indicator is not bad. The volume of cryptocurrency transactions is growing every day. The number of participants is also increasing due to the ease of entry. Investments in cryptocurrencies in 2019, 2020, and 2021 gave significant impetus to the development of not only blockchain as a technology but also coins for speculative purposes.

The volatility of cryptocurrencies can be assessed both positively and negatively. Due to high volatility, there is no constant growth or constant decline of assets, but they mutually limit each other. Of course, volatility plays a different role for different players in the cryptocurrency market. For a trader, it has a positive effect; he or she makes money on volatility. For an investor, it is a frightening thing that can bring both positive and negative emotions.

High volatility means a rapid decline or rapid rise in asset prices, which in turn creates a lot of risks associated with such fluctuations. The global trend in cryptocurrencies is to reduce volatility. First of all, this trend is promoted by institutional investors in cryptocurrencies, because they are not interested in losing everything they have gained in one second. Although investments always involve risk, most people always try to protect themselves.

The life of a market consists of alternating periods of rising and falling prices so that within each period a dominant trend develops and exists until the market begins to develop in the opposite direction. The volatility of cryptocurrencies can be assessed both positively and negatively. Due to high volatility, there is no constant growth or constant decline of assets,

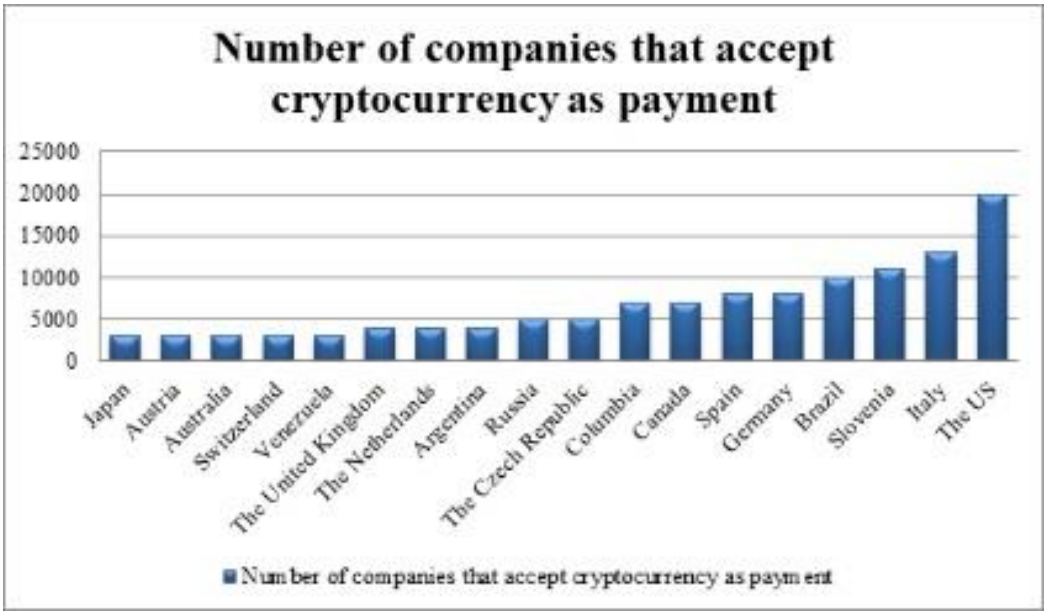

Fig. (4). Quantity of companies accepting payments in the cryptocurrency by country.

Source: built by the authors.

but they mutually limit each other. Of course, volatility plays a different role for different cryptocurrency market players. High volatility means a rapid decline or rapid rise in asset prices, which in turn creates a lot of risks associated with such fluctuations.

Stablecoins are also volatile. It is not always possible to link the rate exactly 1:1 to a particular coin. The situation with the USDT stablecoin is illustrative when on May 12, 2022, the USDT/USD exchange rate dropped to less than 0.94 USDT per 1 USD (Bitcoin, 2022). Involvement of the banking sector in the field of blockchain technologies will increase efficiency in the use of cash flows, financing of certain projects, and counteraction to dishonest cryptocurrency users, as it is also worth mentioning the disadvantages associated with money laundering and terrorist activities through the anonymity of cryptocurrencies. However, these are solvable issues that require time and specialists to resolve.

The majority of people believe in cryptocurrency, although there are also many skeptics. Figure 4 below shows the companies that recognize and accept cryptocurrency as payment for their services or goods in certain countries.

The modern cryptocurrency industry is highly liquid and volatile due to the following factors (Fedorova, 2018):

1. The relatively small size of the cryptocurrency market. At the end of December 2020, the market capitalization of cryptocurrencies reached $800 billion. At the beginning of January 2021, this figure exceeded USD 1 trillion and was gradually growing, with the first cryptocurrency, bitcoin, accounting for more than 70% of capitalization. At the same time, the total capitalization of all stock markets slightly exceeds $100 trillion. US dollars.

2. Dependence on the development of technology, since a significant part of blockchain developments is only at an early stage of development. The extraordinary potential of the blockchain can be both justified and unjustified. In general, the main problem associated with the rapid development of digital technologies is the deterioration of network performance due to a disproportionate decrease in capacity and an increase in the number of active users. But this problem is gradually disappearing, precisely because of the growing popularity of cryptocurrencies.

3. Pricing cryptocurrencies based solely on supply and demand without any real assets to back it up. Of course, it should be noted that real money is also not backed by anything other than trust in the state that is its issuer. That is, cryptocurrencies, like fiat money, are based primarily on trust (or we can say that the former is a common bubble).

4. Speculative features of the cryptocurrency industry, which are recognized as the main type of earnings in it. They may be considered unjustified, but in fact, it is speculation that shapes the supply and demand for a particular asset. Extremely high volatility is the main feature of the cryptocurrency market. Large players (the so-called whales) sometimes manipulate the market, primarily since a significant portion of crypto assets (70-80%) is held by a small number of market players (10-20%). This relationship is fully consistent with the Pareto principle.

5. A low entry threshold to the cryptocurrency market, which allows you to start by buying cryptocurrency for as little as $10. This does not require any licenses or other legal documents, and even verification is not required. Technically, anyone with an Internet connection can start trading cryptocurrencies.

6. The extreme sensitivity of the market to various factors, the archiving of which helps fundamental analysis and forecasting. For example, media reactions are an extremely important point in the fundamental analysis of cryptocurrencies. You need to perceive the trend at a sufficient level to make money. Forecasting prices using the performance of

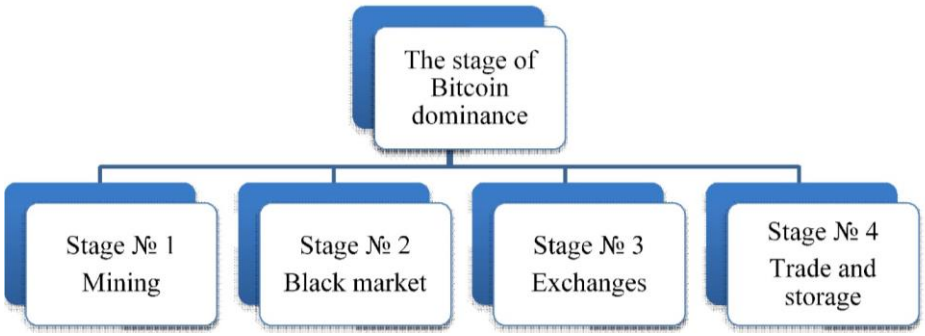

Fig. (5). Stages of Bitcoin dominance

Source: built by the authors.

certain entities at the macro level is extremely important. The main such indicators are news.

All of the above factors lead to high volatility in the cryptocurrency markets, which is justified and predictable, but only partially. The first step in making money in such markets is to understand which way the trend will go. Technical analysis helps to cope with this, first of all, and fundamental analysis - secondly. The role of technical analysis in the cryptocurrency market is more significant than fundamental analysis. But using them in isolation from each other is a very ungrateful thing. Only a combination of technical analysis and fundamental factors allows you to effectively determine the trend of a cryptocurrency.

Since the volatility in this market is extremely high, the risk of investing is correspondingly high. It is also worth mentioning that the main conditional obstacle to the more rapid development of cryptocurrencies is government intervention. Attempts by governments of different countries to take control of so-called digital assets only result in a lot of bureaucratic nonsense. Of course, these procedures are not perfect, but as a result, a new milestone should be formed not only in economic but also in technical terms.

Therefore, the following challenges can be identified from the above:

1. High volatility.

2. State regulation.

3. Market volumes (compared to stock, commodity, and currency markets).

4. Dependence on the technological aspect.

5. Reducing the reward for miners.

6. Sensitivity to fundamental factors and unexpected responses to them.

7. Lack of institutions.

8. Lack of understanding on the part of ordinary citizens.

It can be said that it is the gradual development of bitcoin and other blockchain technologies, the public demand for alternative investment instruments, the preservation of own assets, and disbelief in traditional methods of money functioning that have opened up new horizons for a fairly young industry in the world of economics and finance - cryptocurrency. The existence and operation of cryptocurrency exchanges, in turn, have necessitated the study of tools for their regulation and operation to attract, further improve and fix legal factors in the global financial market. Ordinary people believe in cryptocurrencies, states do not, and they do not want to lose their monopoly on money issuance and regulation due to the unpredictability of the results.

At the same time, we cannot ignore the potential impact of cryptocurrencies on the banking sector. For instance, in 2015, the Bank for International Settlements (BIS), which is jointly owned by the world's leading central banks, noted that bitcoin could interrupt the ability of central banks to control the economy and issue money.

International organizations, such as the Financial Action Task Force on Money Laundering (FATF), the International Monetary Fund (IMF), and the Organization for Economic Cooperation and Development (OECD), are actively studying the impact of cryptocurrencies on the global economy.

Thus, the Financial Stability Board, which consists of 68 institutions, such as central banks, regulators, and ministries of finance, has published a report on this topic. Analysts in the report are confident that virtual currencies do not pose a threat to the economy, but still, recommend that regulators monitor the development of the crypto market.

The cryptocurrency market is still significant in the development of the global economy and various spheres of life and can have both positive and negative effects. American researchers Paolo Tasca, Shawn Liu, and Adam Hayes talk about the actions of the crypto market at different stages of its development. The experts concluded that the first two stages of its formation were dominated by mining procedures and criminal activity. In the third stage, which started in 2016, transactions with exchanges operating within the legal framework are the main focus.

Therefore, the first stage is the "of concept" stage, or the stage of mining dominance; the second is the stage of illegal transactions, or the stage of active use of the black market; the third is the "maturity" stage, or the stage of exchange dominance. Based on their research, we can distinguish another, fourth stage, which falls at present, where bitcoin is actively used in trade as a means of payment (the use of bitcoin on the trading platforms eBay, Amazon, and Shopify) and is an alternative type of money storage (Fig. **5**).

Let us look at several features of the negative impact of cryptocurrencies on the global economy:

1. One of the most negative features of cryptocurrency is its connection with the criminal world: money laundering, and buying weapons and drugs through black markets. The most famous of these are Silk Road and Alphabay. The criminalization of the economy leads to a reduction in production, and public funds and resources are being "siphoned off" into private property, thereby weakening it.

2. Bitcoin is a pyramid scheme. Cryptocurrency platforms are not pyramids, but they are very convenient for building them. This was first noticed by the American Trendon Shavers, who created the Bitcoin Savings and Trust fund. Another giant pyramid scheme appeared in late 2014 in Hong Kong - the pseudo-exchange MyCoin, which raised money by promising payback in a few months and then fabulous profits. The danger of such shadow structures is that they negatively affect the financial market and undermine public confidence in financial instruments, as well as form a negative attitude towards the activities of public authorities. In addition, their activities are not related to the production of goods and services and GDP growth.

3. Decentralization of cryptocurrency as a threat is less discussed, but for the state, it looks much more serious and can bring adverse consequences. If cryptocurrency gains a certain weight (or rather capitalization), its rate will significantly affect the country's economy. This could potentially undermine the sovereignty and economic independence of the state.

4. Cryptocurrencies are a direct threat to the Central Bank and political systems, as further active development of bitcoin will lead to the disappearance of banks as intermediaries.

However, despite their negative features, cryptocurrencies also have a positive impact on the global economy. Namely:

1. Due to the growing popularity of cryptocurrencies, money transfers, and debit cards will become unnecessary. The amount of fees for financial transactions is determined by the sender of the transfer or by special settings of crypto wallets. This makes it possible to significantly save on fees by bypassing intermediary services.

2. Undoubtedly, cryptocurrencies contribute to the emergence of new financial markets and the development of information and communication technologies, as well as to the digitalization of the economy and its transition to another level of development.

3. Cryptocurrencies can be a reliable way to preserve investments. This is another point of influence of the global cryptocurrency market on the economy. The strong growth of some virtual assets brings huge profits to investors, which traditional passive income technologies are not capable of.

The development of cryptocurrencies and blockchain in Ukraine is heavily influenced by government policy. Until the end of 2021, the cryptocurrency market in the country was developing chaotically, which allowed it to use its full potential as it pleased. The events of February 2022 gave a significant impetus to the so-called legalization of cryptocurrencies, the creation of a white market, and the state's transition to innovative technology.

CONCLUSIONS

So, cryptocurrency will be a replacement for gold in the future, as it has similar characteristics. That is, it is limited (21 billion), requires significant energy expenditures to obtain, and is difficult to obtain. John McAfee, the founder of McAfee, an anti-virus software company, shares the same opinion and believes that bitcoin can become a "cryptocurrency standard."

One of the United Nations reports states that the most pressing problem of the global economy is the slowdown in economic growth. Cryptocurrencies and the blockchain system are a way to improve the global economy by enabling universal investment. Blockchain technology and its aggressive popularization through the rapid growth of cryptocurrency prices can help the global financial system solve its main problem - the shortage of long-term financing, and thereby ensure the further global growth of the world economy.

The option of creating state-owned cryptocurrencies, as well as the further development of cryptocurrencies in all countries of the world, is not excluded. Thus, according to the Bank of England, it can bring the state an additional 3% of GDP growth. In this regard, the global economy will change as transactions are increasingly going online and currencies are turning into electronic savings, displacing conventional fiat money. That is why the number of investors in cryptocurrencies continues to grow - in the world of the new economy, electronic assets will be valued much higher than they are now.

Thus, the impact of cryptocurrencies has both positive and negative consequences for the further development of the global economy. This problem requires in-depth study and finding an alternative positive solution. Today, cryptocurrency is steady increase in investment, capitalization, and interest in the industry in general. The best way for any state (regardless of its political situation) to enter into such relations is to create arbitration bodies, regulate at a sufficiently liberal level, create a fair tax system and no pressure, and create a monetary system that is almost impossible to manipulate and can finally form a free global economic market.

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