

Digital investment mechanisms in the cryptocurrency market: content, problems, and development prospects

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Abstract – The subject of the study is the economic relations arising in the process of sale and purchase of cryptocurrencies using digital mechanisms. New technologies in the field of currency circulation, the emergence of new types of currencies—cryptocurrency—lead to the emergence of a new economic reality of digitization. Cryptocurrencies change the usual idea of how money can be. In the traditional view, a currency is always emitted by a specific state represented by a national or state bank, but the cryptocurrency is decentralized, it is a non-state, more precisely, supranational structure. It can be said that cryptocurrency is the digital currency of the new industrialization of the cryptocurrency market. In developed countries, state borders are becoming increasingly transparent, the population is becoming more mobile, and the processes of digital finance globalization make universal money in demand that allow instant transactions on the Internet. Thus, the emergence of cryptocurrency is a kind of indicator of digital transformations occurring in the whole society.

Keywords – *cryptocurrency, investment, digital currencies, digitization.*

I. INTRODUCTION

Purpose of the study: to analyze investment opportunities in the cryptocurrency market, including: speculative cryptocurrency trading and long-term investments through participation in the ICO; to identify problems and suggest ways to improve.

The methodological background of the study includes such methods of scientific research as statistical and comparative analysis, generalization, forecasting of economic and financial indicators of investment processes related to cryptocurrencies.

Key results: 1. A comparative analysis of the increase in the cryptocurrency market capitalization with an increase in

the number of coins was carried out, which showed that there is no direct correlation between the growth in the number of cryptocurrencies and the growth of their total capitalization. 2. The causal relationships of cryptocurrency market capitalization in general and Bitcoin in particular have been studied, causing the greatest trust from both individuals who use it as a medium of circulation and those who invest in Bitcoins as a virtual asset. 3. A typology of cryptocurrency exchanges depending on the operations and trading volumes on the market is presented. 4. The factors that determine cryptocurrency as an investment asset are identified. 5. The directions that cause the high volatility of cryptocurrency rates in relation to each other and to fiat currencies.

Key findings of the study: 1. A comparative analysis of cryptocurrency taxation in countries with developed and progressive economies has been carried out. 2. The problems of regulation of cryptocurrency markets and ICO in the tax and legal context have been revealed.

Goal setting and updating. An effective system of organization and management of the new industrialization processes should be created to carry out the scientific, technological, and industrial development of the country's economy.

The key feature of cryptocurrencies is the lack of any internal or external administrator, as a result of which it is impossible to directly or indirectly private organizations' influence on the transactions of participants. Digital technology is based on the absence of a trusted host. For making financial decisions in the context of mistrust of any message on the network (member), the blockchain is used [4].

Currently, most people use a trusted intermediary, such as a bank, to complete a transaction [6], and the blockchain allows consumers and suppliers to carry out

calculations directly with each other, eliminating the need for a third party. Using cryptography to secure the exchange, the blockchain provides a decentralized database or “digital registration” of transactions that everyone can see on the network [3]. This network is essentially a chain of computers that should approve the exchange before it can be checked and registered. In the case of Bitcoin, the blockchain stores information about each digital currency transaction and the technology does not allow one Bitcoin to be spent several times.

Cryptocurrencies take their name from the use of cryptography. Cryptography is the study of information encryption methods, primarily with the purpose of sending messages safely and confidentially, as well as for such tasks as data protection and authentication. Cryptocurrencies include many technologies and theories developed by cryptographers to create a digital money exchange system that is resistant to both censorship and fraud [5].

Cryptocurrencies are designed to be difficult to extract and deflate in nature [8], but, as you know, they are unstable, since the size of their market is still relatively small. As the market capitalization of cryptocurrency grows, their stability will also increase.

At the moment, there are about 1,500 cryptocurrencies (cryptocoins) in free circulation. Cryptocurrencies other than Bitcoin are often called “altcoins” [9]. Although there are many altcoins that are simple clones based on a Bitcoin system, the most successful of them have a unique advantage that Bitcoin either cannot or does not want to provide. Altcoins appear through “forced branching” (Hardforkes), also called forks.

Investing in cryptocurrencies and using cryptocurrencies is a new financial instrument, which investors have recently been able to use. Over the past 2-3 years, cryptocurrencies have grown into the role of simple, despite all their technical complexity, means of circulation and have become a full-fledged investment tool, thus, creating a completely new, booming market with unknown potential [7]. In order to define the concept of Initial coin offering or abbreviated ICO, the easiest way to draw a parallel with the initial public offering of the company’s shares on the exchange (IPO). In both cases, the investor gets the opportunity to make a profit and take part in the management of the organization in proportion to the funds invested. However, if an organization needs to meet a number of fairly stringent financial and legal requirements for an IPO, and an investor needs access to an exchange, the ICO simplifies the process of raising (investing) funds for both parties due to the opportunities provided by cryptocurrencies.

Since this market does not have a centralized regulator, it has evolved to some self-regulation. Given the fact that an investor votes for a particular project directly with their money, developers come to maximum openness and transparency [10].

II. THEORY AND METHODS

The concept of digital currency was first introduced by Dutch mathematician David Chaum in *Blind Signatures for Untraceable Payments* [11]. The scientist has invented a technology that combines the characteristics of cash (anonymity) with the features of electronic payments (security). Then, in 1990, Wei Dai, an expert in cryptography, proposed the B-money technology [18]. It was this technology that inspired one of the “fathers” of the new philosophy of crypto-anarchism, a leading Intel employee Timothy May, to become an ardent supporter of cryptoanarchy. The term “crypto-anarchism” first appeared in 1994 in the pages of the *Time*. Cryptanarchists prioritize the privacy of personal information and the inviolability of personal freedoms. Currently, many of those who use Bitcoin are committed to this ideology.

Bitcoin is a digital currency through which the cryptocurrency market had appeared, then developed, and gained popularity. It was thanks to Bitcoin that the technology of a distributed registry or blockchain became known to the public, the appearance of which is put by scientists on a par with the invention of the Internet [2].

At the moment, 1BTC costs \$9,283.93, and the market capitalization amounted to \$157,892,373,114. The dynamics of the Bitcoin exchange rate against the US dollar can be seen in Figure 1.

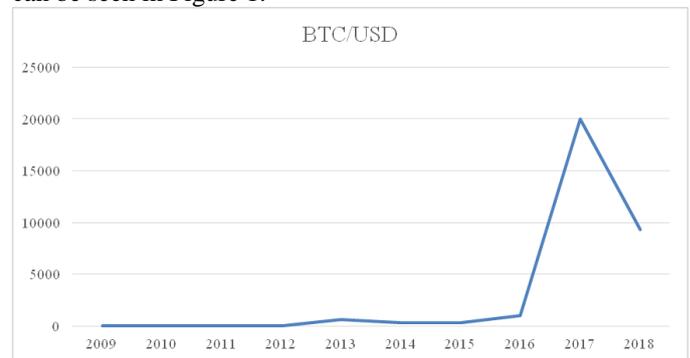


Fig. 1 The dynamics of the Bitcoin exchange rate in 2009-2018, \$ [13]

Figure 2 shows the dynamics of the Litecoin rate.

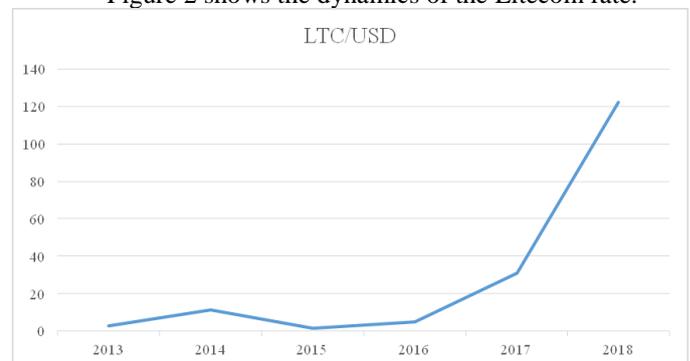


Fig. 2 – The dynamics of the Litecoin rate in 2013-2018, \$ [21]

The subsequent emergence of new cryptocurrencies and their development have gradually led to the formation of a cryptocurrency market, which, in turn, has attracted the attention of investors.

III. PRACTICAL ANALYSIS

For 5 years—from June 2013 to the current moment—the capitalization of the entire market has grown more than 250 times. This can be explained by the stable and productive work of the leaders of the cryptocurrency sphere, who issue their own coins; independence and anonymity, which were the original hallmarks of cryptocurrencies; as well as the increasing desire of investors to earn in the new, developing market (Table 1).

TABLE I. THE NUMBER OF CRYPTOCURRENCIES AND THEIR CAPITALIZATION IN 2013-2018 [21]

Date	Number of cryptocurrencies	Total market capitalization
June 2013	14	\$1,487,465,388
September 2013	49	\$1,703,496,662
December 2013	40	\$14,812,595,351
March 2014	138	\$8,047,576,170
June 2014	298	\$8,899,300,428
September 2014	441	\$7,002,651,139
December 2014	529	\$5,916,603,550
March 2015	522	\$4,192,958,202
June 2015	542	\$3,728,604,309
September 2015	565	\$4,141,119,952
December 2015	580	\$6,453,204,158
March 2016	516	\$7,746,669,089
June 2016	593	\$11,143,206,542
September 2016	651	\$11,840,864,472
December 2016	645	\$14,279,353,037
March 2017	689	\$23,814,432,204
June 2017	809	\$90,745,343,290
September 2017	1077	\$166,570,480,396
December 2017	1273	\$334,093,623,110
March 2018	1522	\$456,560,645,210
June 2018	1562	\$347,237,272,781

If the market capitalization of a company in the stock market is an indicator characterizing the total market value of the circulating securities of a particular company, then the capitalization of cryptocurrency is the total value of all issued coins [1]. However, unlike the classic tools of the stock market, cryptocurrencies can be irretrievably lost. This happens due to the loss of data required to access a cryptocurrency wallet.

Capitalization of the first and most popular cryptocurrency—Bitcoin—has the greatest impact on the total capitalization of the cryptocurrency market, as Figure 3 clearly demonstrates.

capitalization, \$ bn

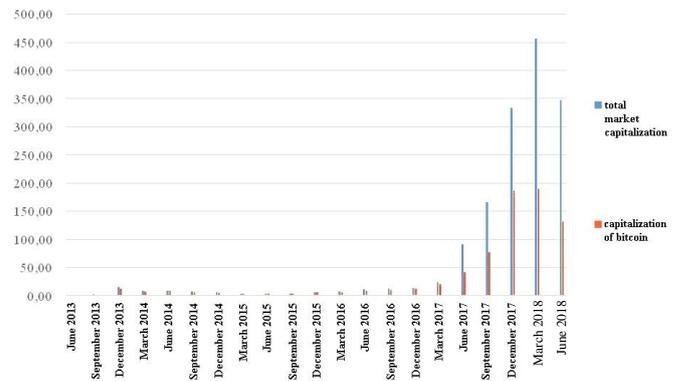


Figure 3 – The total cryptocurrency market capitalization in general and Bitcoin in particular for 2013-2018, \$ billion [12]

The leader in both the cost of one unit and the total value, of course, is Bitcoin, which is the pioneer and founder of the entire market. Obviously, it is precisely Bitcoin, despite the differences of the miner’s community, that has the greatest trust both from individuals who use it as a medium of circulation and from those who invest in Bitcoins as a virtual asset.

The second largest by capitalization is the Ether currency from the Ethereum site. The Ethereum technology makes it possible to register any transactions with any assets based on a distributed base of blockchain-type contracts, without resorting to traditional legal procedures. This feature is competitive with the existing transaction registration system.

Ripple, a cryptocurrency platform for payment systems that focuses on currency exchange operations without chargebacks, is in third place with a capitalization of \$25.6 billion. The system was launched in 2012. The protocol supports “tokens” representing fiduciary money, cryptocurrency, exchange commodities, or other objects, such as miles of passengers who fly frequently or mobile phone minutes [16]. Essentially, Ripple is based on an open, distributed database and uses a reconciliation process that allows exchanges in a distributed process.

The expert community expects EOS to become a major competitor to the Ethereum platform. Additionally, the EOS team notes that the tokens themselves are neither securities nor any other financial instruments; they are not intended for investment or speculative purposes and should not be considered as investments [14].

Traditional stocks are growing due to the stable and successful operation of a company, while the cost of cryptocurrency is also increasing due to the ever-growing interest in the market itself.

The average daily trading volume in the entire cryptocurrency market is currently estimated at \$15 billion. 10 cryptocurrency exchanges with the highest trading volume are shown in Table 2.

TABLE II. TOP 10 CRYPTOCURRENCY EXCHANGES IN TERMS OF TRADING VOLUME IN MAY 2018 [22]

No.	Name	Daily trading volume, \$ bn
1	OKEx	1,459.4
2	Binance	1,388.8
3	Huobi	1,199.9
4	Bitfinex	452.5
5	Bithumb	331.3
6	Upbit	309.1
7	HitBTC	288.2
8	Bibox	175.4
9	Bit-Z	174.5
10	BCEX	144.6

This Table contains 10 cryptocurrency exchanges with the highest trading volume per day. Binance stands out favorably from competitors by low fees for trading on the platform (0.1%) and fast transaction processing. Binance technology allows the exchange to process up to 1.4 million orders per second, which is already becoming insufficient, and now this exchange has temporarily suspended the registration of new users in order to update the infrastructure and ensure uninterrupted work with an ever-increasing number of operations per second. Another advantageous feature of this exchange is the fact that the headquarters of the Binance exchange is located in Hong Kong, whose legislation in the field of cryptocurrency ensures stable and reliable operations [17].

The current leader in daily trading volume is OKEx exchange, which is a subsidiary of another Chinese stock exchange—OKCoin. A distinctive feature of this exchange, in addition to many technical innovations based on the blockchain, is the ability to trade cryptocurrency futures [20].

The third on the list of cryptocurrency exchange Huobi was founded in Beijing, and for 5 years of its existence, it has firmly established itself in the global TOP of sites, especially after the acquisition of the powerful international platform BitYes, which opened the maximum access for investors from Western countries. The system uses the SMART-Chain asset valuation model and offers a range of services that will maximize user support, including real offices in a number of major Asian countries. The exchange interface is translated into 12 languages, including Russian [19].

Overall, all exchanges have the functionality that allows traders to receive all the necessary information in a timely manner. Also, many exchanges have mobile apps, the ability to invest in ICO, and other various additional options. The majority of players in the market focus on about 30 sites. At these sites, fees are about the same and range from 1% to 5% for replenishing wallets and withdrawing funds, depending on the external counterparty, and 0.1%–0.3% for each transaction.

IV. RESULTS

Over the past 2-3 years, cryptocurrencies have grown into the role of simple, despite all their technical complexity, means of circulation and have become a full-fledged investment tool, thus, creating a completely new, booming

market with unknown potential. If 5 years ago, the most active users of cryptocurrency were various criminal elements engaged in illegal traffic of drugs, weapons, and people, now the market is waiting for another leap in development in the form of the arrival of the largest institutional investors and international corporations as borrowers.

To begin with, let us see how this transition from the electronic version of money to the electronic version of the stocks has occurred.

The first of this direction was J. R. Willett, who invented using the Bitcoin protocol as the basis for writing protocols for new currencies. He has launched his project on July 31, 2013, creating MastercoinFoundation to raise funds for development. The main idea was that Mastercoin coins would be used by the protocol to manage transactions, and after the platform was created, the invested coins would become more valuable. So, during the first month, anyone could purchase Mastercoins by sending the amount in Bitcoins to ExodusAddress (the address of the outcome). Despite warnings about possible fraud, about 500 people have invested an amount of around 5,000 BTC, which at the time was equivalent to \$500,000. And they did not lose—now the market capitalization of the Omni platform (former Masterchain) is more than 13.5 million US dollars.

The dynamics of ICO over the past two and a half years is extremely vivid: if in total 43 ICOs were held and a little over 95 million dollars were collected, then in 2017, 210 initial offerings took place, which in total attracted almost 3.9 billion dollars. This year, the multiple growths in the number of projects entering the ICO and the funds raised by them will continue. In the first 4 months of 2018, 229 projects have already managed to raise more than \$6.5 billion. The dynamics of the change in the number of completed ICOs in months are shown in Figure 4.

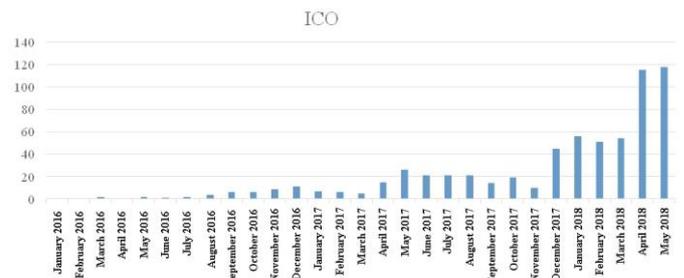


Fig. 4 – Number of ICO for 2016-2018 by month [23]

The authors propose to analyze the ICO of the EOS project, which began a year ago and how this project has developed these 12 months, in more detail. The starting point should be considered on May 3, 2017, when Dan Larimer, who successfully worked in the blockchain development field for 4 years, published a post describing the new project in the social network Steemit, created by him based on the blockchain. This was followed by a speech at the Consensus 2017 blockchain conference with the EOS concept, the publication of White paper, and the launch of the ICO in less than 2 months—on 26 June. The technical feature of the project is that the EOS.IO software represents a new

blockchain architecture designed for vertical and horizontal scaling of decentralized apps. This is achieved by creating a construction in the form of an operating system on which applications can be built. The software offers accounts, authentication, databases, asynchronous communication, and application dispatching across hundreds of CPUs or clusters. The resulting technology is a blockchain-based architecture that scales to millions of transactions per second, eliminates user fees, and enables the quick and easy deployment of decentralized applications [15].

However, the author considers the development team's approach to raising funds in order to finance the project to be the most interesting for consideration.

Total tokens released—1 billion, and a given number of tokens have been distributed in the following order:

1. 100,000,000 tokens (10% of the total pool) is the property of block.one (the team that deals with EOS). Moreover, they do not receive them immediately. The smart contract describes that the team receives 10% of its pool (10,000,000 tokens) each year, which proves the team's serious intentions for a 10-year work;
2. 200,000,000 tokens (20% of the total pool) have been shared between investors in the 1st ICO round;
3. 700,000,000 tokens (70% of the total pool) have been shared between investors in the 2nd ICO round, divided into 350 parts of 23 hours. Thus, each part of the 2nd ICO round will be offered 2,000,000 (0.2% of the total pool) to investors.

The subsequent growth rate (Figure 5) and total capitalization (Figure 11) is associated with the ICO system itself (350 rounds of 0.2% of the pool) and the competent and responsible behavior of the development team in the media space. Unlike the overwhelming majority of startups who had collected a certain amount of funds through the ICO and dropped out of sight for investors after that, the block.one company regularly reported to the public on its successful work. This strategy has allowed attracting investments in the amount of more than \$4 billion, which is a record figure in the industry, and achieving market capitalization of cryptocurrency in the amount of more than \$12 billion.

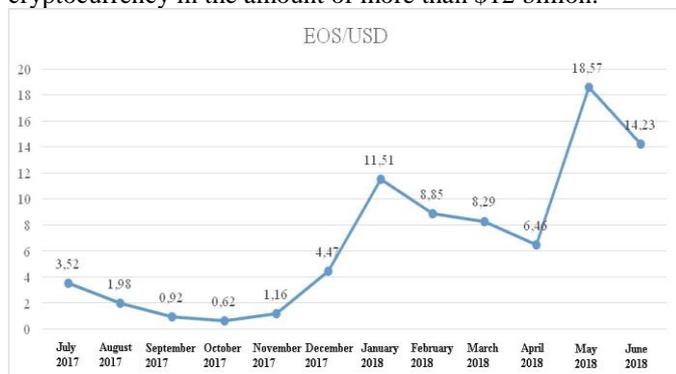


Fig. 5. Dynamics of the EOS rate change for 2017-2018 [15]

Obviously, the risk of investing in ICO is enormous, since a project is often provided only with an idea, and only its uniqueness can lead to significant success. Thus, over 90% of ICO go bankrupt, however, positive examples continue to

attract investors, hence the analogies with the venture business.

V. CONCLUSION

The analysis has shown that in the conditions of the new industry of the financial flow digitization, cryptocurrency remains an unexplored economic phenomenon, therefore this phenomenon does not gain credibility [24], and, as a result, additional support from the authorities. The driving force of the cryptocurrency industry is developers, investors, and ordinary users who believe that cryptocurrency will change the life of society. In their activities, they all face various problems, some of which are considered by the authors.

At the moment, the most important problem in the field of cryptocurrency in general and ICO in particular, the authors consider the issue of legal perception of these phenomena and the subsequent legislative regulation. This problem is relevant for the whole world and for Russia in particular. In proportion to the growing popularity of cryptocurrency among the population, there is an increasing need for government agencies to control both the circulation of cryptocurrencies and the raising of funds with their help in order to curb fraud in this area and develop various criminal structures. Since cryptocurrencies are a new phenomenon, and they have gained general popularity only 2-3 years ago, there is no clear global regulatory system in this sphere. Each sovereign state implements its own approach to the issues of understanding and organizing control over cryptocurrency based on established national principles in the areas of lawmaking, economics, taxation, etc.

In conclusion, the organization of the legal field of cryptocurrency in Russia began to develop under the new industrial era. However, the semantic content of this activity is still far behind the world leaders on the issue of cryptocurrency regulation and ICO.

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