

A study of formation trends and innovative features of cryptocurrencies in the digital economic environment

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ABSTRACT

The article studies formation trends and innovative features of digital assets and cryptocurrencies in economic processes in the context of building an information society. The relevance of formation and regulation of new directions of effective development of the economic environment with the widespread use of digital technologies is justified. Possibilities of formation and application of cryptocurrencies in economic processes are studied, their formation factors, essence, content and innovative features were included in the research process. The scientific-methodological bases of studying the impact of the application of electronic money on the economy and business process are explored. Operation characteristics of currencies and digital assets in the virtual economic environment are explained. Formation and development stages of digital currencies according to the market value are analyzed, the main features are mentioned. The process of conducting transactions using them is presented schematically. The operation mechanism of the utilization process of blockchain technology was created. The main elements of trading with cryptocurrency market are identified based on its structural scheme. Alongside Bitcoin, the features of other alternative cryptocurrencies are analyzed. Their comparative advantages, similarities and differences, application aspects are studied. The market capitalization of cryptocurrencies is demonstrated schematically. Proposals and recommendations are developed for consideration of trends and innovative features of cryptocurrencies in new economic platforms.

1. Introduction

The analysis of successful results achieved by advanced economic systems demonstrates that current global development is based on innovative technologies, knowledge and information. At present, achievement of robust and sustainable economic development is a key factor. The formation of a socially oriented, diversified national economy is one of the most relevant issues in most developing countries. In terms of economic and social development, their digital transformation has become one of the priority issues facing the regional and national economies in recent years [1]. Internet and network technologies, that establish the basis of the regional Information and Communication Technologies (ICT) infrastructure, are being developed in this regard. "Government Cloud" (GCloud), "Big Data", "Smart City-Village" and other promising digital projects are being

implemented. Further expansion of the use of digital technologies in various sectors of the economy has become a necessity in order to improve quality. Improvement of regulatory mechanisms and formation of a healthy competitive environment is of great importance in the development field of high information technologies [2].

Since early 21st century, the formation of rapidly developing ICT, telecommunications and computer technology, as well as science-intensive high-tech products in accordance with the platform of the 4.0 Industrial Revolution has become one of the main trends in the global economic development. Therefore, application of the 4.0 Industrial Revolution and the components of artificial intelligence technologies to the digitization of the economy and taking them into account during formation of a new digital economic environment is very significant in the current period.

New trends, methods and concepts of

development regulation of the economic environment are established with widespread application of digital technologies. In recent decades, the concepts of information, knowledge, digital, electronic economy, cryptocurrency, blockchain have become more extensive in economics. There are increased opportunities for the application of cryptocurrencies in the economic processes and high-level management processes in advanced countries. Therefore, coordinated activities for the use of cryptocurrency in economic processes is one of the most topical issues of our time. Consequently, it is important to study formation factors, essence, content, innovative features of cryptocurrencies and research the scientific and methodological bases of the impact of its application on the economy and business processes. Currently, development and use of various cryptocurrencies is becoming more dynamic, and in recent years, these trends are significantly boosting the development of the digital economy.

Study object is accepted as the new digital economic environment established as a result of digital transformation of regional and national economy.

Study subject includes cryptocurrencies with new commodity and currency qualities in the emerging digital environment, their innovative features and formation trends.

Fundamentals of the *study methodology* consist of systematic approach and analysis methods, statistical analysis methods, correlation and component analysis, synthesis and generalizations. Scientific works of many researchers, priorities of state policy, normative-legal acts, documents of relevant ministries, methodical materials of research institutes are used in the study of theoretical-methodological characteristics during the research process in this field.

Regarding the *originality of the study*, note that a new approach to the study subject is proposed. Results obtained in regard to the stated problem are specific. Conclusions of the research have scientific and practical significance. It is recommended to take them into account within country's prospective economic reforms, decision-making processes, economic and business operations and development of statutory instruments.

2. Problem statement and research conditions

As a new development ideology of the third millennium, the National Information Society is

being established in the developed countries in accordance with the construction of the Global Information Society. The information economy is formed as the basis of the new society. As a consequence of digital transformation of new economic processes and structures, there is an urgent need to study establishment conditions, formation stages, and essence and content characteristics of cryptocurrencies and systematic generalization of obtained results. The aim of the study is to explore this problem. To achieve this goal, the main scientific works related to cryptocurrencies and their field structure are studied. The formation features, advantages, similarities and differences of cryptocurrencies in the digital economic environment, structure of the cryptocurrency market and exchanges, etc. are comprehensively studied.

Concerning the study of trends and innovative features of cryptocurrencies, it must be noted that over the past decade, research and discussions on blockchain technology and cryptocurrencies around the world have attracted international financial institutions, scientific community, public and private institutions [3]. These processes are influenced by various factors such as global instability of economic relations, the dominance of other currencies over national currencies, global digitalization of the economy and the violation of borders, the crisis of confidence in existing financial and payment systems etc. In these conditions, the participants of the economic process began to look for answers to some questions. The emergence of new virtual payment instruments such as cryptocurrencies has become one of the answers to these challenges.

The study of innovative features of cryptocurrencies and their application is a complex issue. It is affected by many internal and external factors. The research is mainly aimed at studying the innovative features of cryptocurrencies, which are digital money in the technological economy, identifying their application prospects and improving their sustainability. The innovative features of cryptocurrencies and their application problems have been studied to some extent by a number of foreign and local researchers so far [3, 5- 11, 14, 15, 19-23].

These studies review the formation and use of digital currencies, as well as their constitutional regulation on global and regional levels. However, there are many obstacles, alongside with potentials on the way to solving many problems in this area. It is very important to identify these factors and their potential solution opportunities and to direct them towards the problem-solving process.

3. Currencies in digital economy environment

In recent decades, establishment of an information society at the global and national levels has become widespread. The informatization level of economic processes and structures has grown, the level of application of e-commerce systems has increased [4]. Integration problem of economic information spaces has become relevant.

The rapid development of ICT i.e., formation of a new technological environment has consequentially led to the formation of a new digital economic environment. In such an environment, the emergence of electronic, digital money [5] and assets was inevitable as a result of technological development. In the new economic environment, a digital asset consists only of an asset that is expressed in digital form, put into circulation, or digitally (electronically) represents of another physical asset.

Crypto asset is a digital asset issued using active cryptographic methods. Digital financial assets include 1) monetary claims, 2) the ability to exercise rights on equity security units, 3) the right to

participate in the capital of a non-public joint stock company, 4) the right to demand the issuance of equity securities, etc. such as digital rights [6].

Digital financial assets do not include the right to participate in the capital of an open joint stock company, to participate in a limited liability company, or to participate in other economic companies.

Performance of direct cryptocurrency transactions between organizations, without the involvement of intermediaries and financial institutions became the key attractive factor.

As a result of influence of this factor popularity of cryptocurrency began to increasingly grow on the global market.

This is evidenced by the fact that the capitalization of cryptocurrency market reached 200 billion USD by 2020. Many virtual currencies have different relative values based on different variables (Table 1).

Bitcoin, Ethereum, Tether, Binance Coin, Cardano, XRP, USD Coin, Dogecoin, Polkadot are included in digital currencies according to the market value [7]. Table 1 is based on study [7].

Table 1. Digital currencies in accordance with market value (2021)

Position	Name	Market value	Price	Current shares
1.	Bitcoin	\$750,600,171,509	\$39,959.72	18,770,200 BTC
2.	Ethereum	\$271,733,293,394	\$2,325.39	116,889,042 ETH
3.	Tether	\$61,828,690,396	\$1.00	61,796,971,748 USDT
4.	Binance Coin	\$52,857,378,310	\$314.44	168,137,036 BNB
5.	Cardano	\$41,218,509,234	\$1.29	32,065,792,346 ADA
6.	XRP	\$32,843,217,941	\$0.7071	46,312,443,360 XRP
7.	USD Coin	\$27,363,663,734	\$1.00	27,354,066,325 USDC
8.	Dogecoin	\$26,668,380,056	\$0.2044	130,639,341,482 DOGE
9.	Polkadot	\$14,779,410,550	\$15.10	979,197,585 DOT
10.	Binance USD	\$12,228,250,268	\$1.00	12,224,571,047 BUSD

4. Formation and development stages of cryptocurrencies

Formation and development of cryptocurrencies can be divided in several stages [8]:

1) *Creation stage (2009-2010 y.)*. Although bitcoin was formed at this stage, significant weaknesses were later found in its protocol. During this period, the bitcoin cryptocurrency was attacked and more than 180 bitcoins were created and sent to two addresses. Within hours, these bitcoins were tracked and deleted from the blockchain.

2) *Formation stage (2011-2013 y.)*. At this stage, bitcoin was allowed to be linked to DNS, and Namecoin was created. As a result, other alternative currencies were created. Bitcoins Mobile, the first bitcoin application for the iPad,

was introduced. Development of Litecoin cryptocurrency started and Ripple cryptocurrency emerged as its alternative.

3) *Growth stage (2014-2016 y.)*. At this stage, the exchange rate of bitcoin changed a lot and important events took place in the world of cryptocurrencies. Major global businessmen started accepting cryptocurrencies. Bitcoin startups began to attract large investments in hundreds of millions of dollars. Collapse of the Japanese bitcoin exchange Mt. Gox was one of the main events. Experts believe that the main reason for the closure of the exchange was the constant hacker attacks on servers, as well as the tightening of legislation on cryptocurrencies in various countries around the world. During this period, a bill on the status of bitcoins and other cryptocurrencies as a means of

payment came into force in Japan. In Japan, the domestic turnover of bitcoin, as well as Ripple, Litecoin and other cryptocurrencies reached 185 billion yen (USD 1.67 billion) in 2015.

4) *The stage of initiation of recognition and regulation of cryptocurrencies by Central banks (2017-present)*. At this stage, Central banks actively studied and tested blockchain technology (masterchain). Some countries also began to introduce their own cryptocurrency on their territories. It must be noted that at this point cryptocurrencies were actively traded. The Hong Kong-based Bitfinex exchange was included in the list of world leaders in terms of volume of transactions as one of the largest cryptocurrency trading services.

5. Essential and contextual characteristics of cryptocurrencies

Cryptocurrency is created in a virtual environment based on mathematical principles and cryptographic methods as a decentralized convertible currency. It participates in the formation of a secure digital economy in a distributed and decentralized form, ensuring its protection from external influences [9].

Cryptocurrency issuance and accounting is a decentralized digital financial unit not governed by one center. It is a virtual currency issued by various users of the network, which is reliably protected from fraud and hacking by encryption using cryptographic methods [10]. Cryptocurrency was first introduced in 2008 by an unknown programmer or group of programmers under the pseudonym Satoshi Nakamoto, who revolutionized the global financial system. In the developing countries, cryptocurrencies and their trade are being developed as an important research field with notable progress.

Essentially, cryptocurrency is an innovative monetary aggregate capable of destroying cash by eliminating the possibility of inflation. [11] The essence of cryptocurrency is to be a decentralized medium of exchange based on the use of cryptographic functions for financial transactions. Cryptocurrencies use Blockchain technology to achieve decentralization, transparency and immutability. Security of cryptocurrencies is not ensured by humans, but by building appropriate mechanisms on cryptography. Cryptocurrencies are not governed by any central government.

Many modern researchers call the cryptocurrency “the first pure digital asset.” Pure

digital asset can be in digital format and carry the right to its use. At present, the elements such as digital documents, movies, etc. can be included in digital assets. The digital asset market was established in 2009. Since then, Bitcoin has been formed and developed as the first digital asset. There are 4950 cryptocurrencies and 20 325 cryptocurrency markets as of 2019. The market value accounts for about 190 billion USD. Following the global COVID-19 pandemic, cryptocurrencies began to escalate sharply in 2020. In 2021, there were many fluctuations in the market value of cryptocurrencies, which led to its historically high level of development.

The main types of cryptocurrencies are Bitcoin (BTC), Ethereum (ETH) and Litecoin (LTC). Bitcoin technology was created in 2009 and is one of the key technologies of the new economy, becoming very popular as digital money technology.

Some characteristics of cryptocurrencies are listed below [12]:

1) Decentralization means that digital currency is not issued by a single center, government or company. It is a distributed payment system where each member of the network monitors the legality of the transaction by obtaining a copy of the register record.

2) The security feature is based on the fact that many participants independently verifying the authenticity of transactions are physically unable to make changes to the program code, counterfeit or steal the cryptocurrency.

3) The anonymity of a cryptocurrency means that it is not tied to a specific person. Access to the Bitcoin wallet can only be obtained with a password. It is impossible to obtain the information of the recipient and the sender.

4) Transparency seems to contradict anonymity, but since the information about transactions is freely available, it is possible to accurately track all cash flows by knowing the participants in the transaction.

5) Majority of limited cryptocurrencies are issued once. Over time, the process of issuing new coins becomes more problematic and mining slows down. Thus, the coin is not subject to inflation.

6) There is no commission fee. The transaction fee is paid voluntarily, depending on how urgent the transfer must be completed. Transactions require the approval of miners. They record blocks with transaction groups. There is a commission fee for this work. Since the transfer itself does not require payment, it is possible to transfer money abroad free of charge.

There are three legal ways to obtain cryptocurrencies:

1) Mining using server farms designed to perform calculations according to a given algorithm. In Bitcoin, miners receive a bonus of 6.25 bitcoins for each block acquired (salary changes every 4 years).

2) Connection to cloud services with a small subscription fee for mining operations. Mining is the rule of obtaining cryptocurrency based on mathematical calculations using computers.

3) Making purchases at the current exchange rate or directly from dealers.

The procedure for conducting a transaction when paying a cryptocurrency for a particular product is as follows: 1. The buyer sends a certain amount of cryptocurrency from his wallet to the network in the form of an encrypted transaction block. 2. The new block is sent to all network participants to check its validity. 3. If the transaction is approved by all network participants, the new block is added to the previous blocks, which contain information about all previous transactions [3]. 4. Upon completion of these procedures, the cryptocurrency is transferred to the seller (Fig. 1).

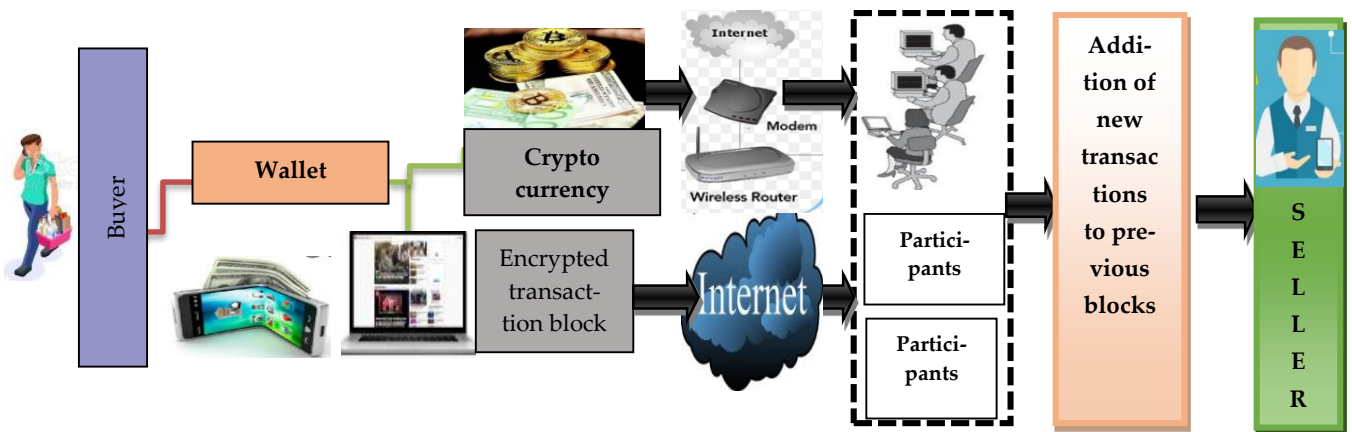


Fig.1. Transaction process

(Fig. 1 was designed based on the analysis of scientific literature)

Operational sequence of cyclical transitions to cryptocurrencies using blockchain technology can be expressed as Fig. 2.

Cryptocurrencies can be classified according to various characteristics. Thus, they can be classified as secured tokens, utility tokens and asset-backed

tokens [12]. Secured tokens are investment tokens that act as securities of the issuing organization. There are two types of them: 1) stock tokens analogous to traditional stocks, and 2) debt obligations certifying the right to a portion of assets or profits from the use of capital.

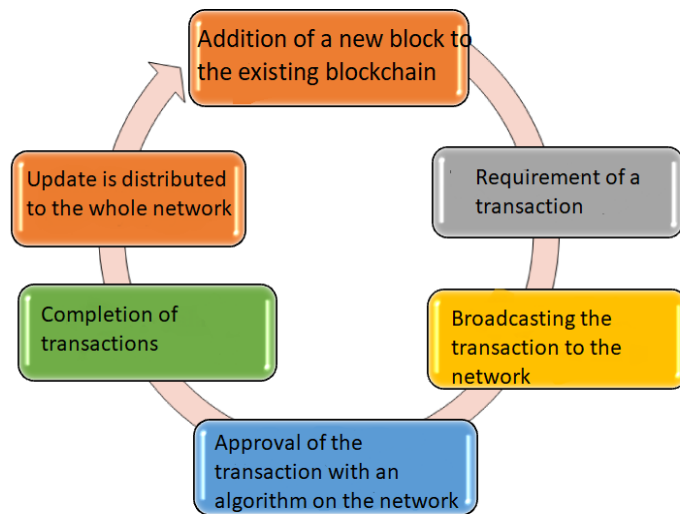


Fig. 2. Operational mechanism of blockchain transactions
(Fig. 2 is designed based on the analysis of scientific literature)

Utility tokens are provided by services or service companies. These are the types where all the functions of a cryptocurrency are performed. Asset-backed tokens are those supported by real value, assets or services. They must be considered as digital liabilities for assets with an actual financial component [12].

6. Structural analysis of cryptocurrency market and stock markets

Following different aspects of cryptocurrency trading can be found in the scientific literature: 1) Cryptocurrency trading software systems, 2) Real-time trading systems, 3) Technical analysis, attached trading and other systematic trading methods, 4) Econometric trading methods, 5) Trading methods using machine learning technology, 6) Emergency trading technologies; 7) Portfolio and cryptocurrency assets, 8) Study of the market situation under extreme conditions.

Issues such as cryptocurrency trading blockchain, access to cryptocurrency markets, cryptocurrency trading, software systems, system trading, trading technologies, real estate market research, etc. are studied [11]. It must be noted that the basis of cryptocurrency trading are the cryptocurrency markets, cryptocurrency trading strategies and blockchain technologies.

Cryptocurrency exchanges or digital currency exchanges operate as a space enabling the customers to trade cryptocurrency. A cryptocurrency exchange is any organization or digital trading platform that buys and sells crypto and digital assets. Cryptocurrency trading is the act of buying and selling cryptocurrencies for profit.

Cryptocurrency exchanges can be market makers. They typically use the distribution of supply-demand as a commission for services or simply as an appropriate platform for charging fees [11]. The state of the cryptocurrency market can be expressed as in Fig. 3 [13].

As seen from the graph, the market is led and controlled by Bitcoin with a major 53.6% share, Ethereum with 18.15% and Ripple with 6.2%.

Currently, the popular cryptocurrency with highest capitalization is Bitcoin. However, other cryptocurrencies are also gaining popularity in the network, such as Ethereum, Ripple, Litecoin, Bitcoin Cash, Ethereum Classic, DigitalCash, Monero, ZCash, IOTA and others [10].

The first cryptocurrency was created in 2008. Since then, a large number of cryptocurrencies have emerged. However, some changes have taken place in the financial sphere [14]. Bitcoin is created based on blockchain technology. The potential of bitcoin and blockchain that was discovered in 2015, is being used in other areas. Specifically, there are stages of Blockchain 1.0 technology (cryptocurrencies), Blockchain 2.0 technology (smart contracts) and Blockchain 3.0 technology (government agencies, education, science, culture, etc.) and so on. The advantage of blockchain is its security, transparency, anonymity and data integrity. These have been proven over a long operation period. Because of the close relationship between blockchain and Bitcoin, there are certain difficulties for decision makers to differentiate them - that is, the infrastructure from the product [15]. Therefore, there is still a great need for regular scientific and practical research on blockchain in new technological areas.

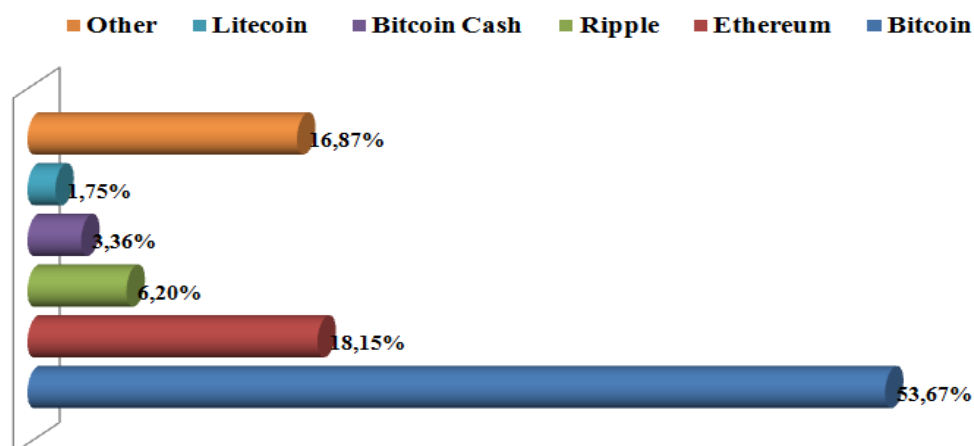


Fig. 3. State of the cryptocurrency market
(Fig. 3 was designed based on the analysis of scientific literature)

Bitcoin introduces a fundamentally new digital financial environment. Operating processes are monitored by miners. Transactions are formed in the form of a block and are recorded in an open registry called a blockchain. The title of the block contains a double-hash with the cryptographic function of the previous title. Thus, transactions in the Bitcoin network are linked in the form of a chain. To change any transaction in the chain, you

need to change all the blocks in the chain. This is practically impossible. As you can see, the blockchain (“block” + “chain”) operates in the form of a chain of information blocks. By breaking any chain, the integrity of the block is lost [14].

Cryptocurrency market can be visually forecasted through the share of the 10 most popular currencies in the market [16] as in Fig. 4.

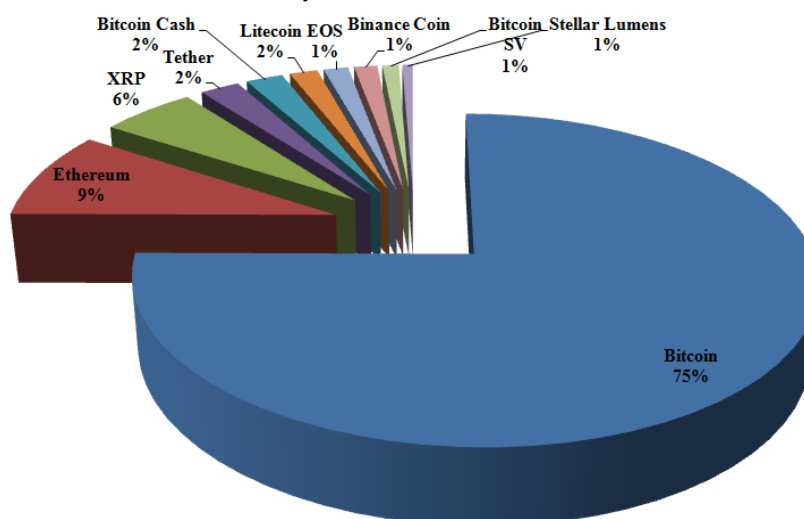


Fig. 4. Market capitalization of cryptocurrencies

(Fig.4 was designed based on the analysis of scientific literature for 2019)

Based on the information presented on the piechart, market shares are as follows: Bitcoin 135.3 billion (75%), Ethereum 13 billion (9%), XRP 9.8 billion (6%), Tether 4.1 billion Bitcoin Cash 3.9 billion, Litecoin 2.9 billion, EOS 2.6 billion, Binance Coin 2.4 billion, Bitcoin SV 1.7 billion, Stellar Lumens 1.1 billion.

7. Advantages, similarities and differences of cryptocurrencies

The analyses demonstrate that *the most important features of cryptocurrencies* are: 1) decentralization; 2) cryptographic methods and capabilities of the entire network are used in “manufacturing” of virtual currency; 3) anonymity; 4) not secured, there are no guarantees; 5) virtual currencies can operate in almost all countries without any restrictions [17].

In addition, the advantages of cryptocurrencies include: 1) decentralized nature of the hardware that ensures robustness and stability of the network; 2) lack of necessary infrastructure and support of central and commercial banks; 3) easy use of personal computer or modern mobile technology; 4) brief time required to accelerate the

turnover of commodities in the economy as a whole; 5) low operating costs and high investment attractiveness [18].

Following must be taken into account when working with cryptocurrencies [12]: 1) There are no special requirements for ordinary citizens when buying cryptocurrencies. When registering on the website of the exchanger or cryptocurrency, it is enough to enter personal data: confirmation of passport data; in some cases - video registration may be required. 2) Cryptocurrency is defined as a means of payment and savings, as well as a digital code to be used as an investment. 3) Use of cryptocurrency as payment for goods and services is prohibited. 4) It is also necessary to inform the regional tax service about the existence of cryptocurrency and transactions performed with it. 5) Regional legislation allows companies to issue their own tokens. The first tokens issued to digitize a part of contracts with major industry partners were on the digital blockchain platform. As a reminder, in the Russian tax code, cryptocurrency is considered a property, not securities.

There are some positive aspects to the use of cryptocurrency, which is an innovative financial instrument [19]:

1) Due to the anonymity of participants in the distributed ledger of digital transactions, the state does not and cannot control the owners of digital wallets that create cryptocurrency or contain information about the number of digital codes.

2) Using mathematical algorithms, buyer of the cryptocurrency has the opportunity to convert the generated digital codes into national or foreign currency.

3) The owner of the cryptocurrency has the opportunity to anonymously change the digital codes for objects of economic activity withdrawn from civil circulation in the territory of the state.

In addition to these advantages, there are disadvantages and drawbacks that significantly limit the application of cryptocurrencies on a global scale [17].

- Opportunity to develop the shadow economy through cryptocurrency;
- Ability to hide a part of the income, which allows to develop a tax evasion system;
- Ability to conduct illegal anonymous transactions;
- Impossibility to freeze accounts etc.

In order to analyze the degree and direction of the impact of cryptocurrencies on the banking system, it is necessary to fully review their advantages and disadvantages [24]. First of all, the disadvantages are related to the possibility to evade the principles of modern statehood and total control: 1) Cryptocurrency can become a new tool for the development of “black markets” with a great potential; 2) Cryptocurrency contributes to the emergence of innovative schemes for money laundering; 3) Cryptocurrency is an excellent tool for committing possible taxation crimes; 4) government agencies lose the ability to freeze the account of any citizen. One of the serious drawbacks for the user is the complete loss of money in case of problems with access to e-wallet.

Following can be added to the advantages of cryptocurrency: 1) Cryptocurrency accelerates money transactions to the maximum. 2) Cryptocurrency is not subject to inflation due to its general limitations. 3) Cryptocurrency has maximum protection against hacker attacks involved in a large number of electronic frauds. When working with cryptocurrency, no financial transaction can be cancelled and is carried out in only one direction. 4) There is no need to pay commissions and taxes for operations when working with such a monetary unit. 5) Cryptocurrency has maximum simplicity for

creating charity projects related to collection and sending of donations [24].

It must be noted that, during cryptocurrency trade, involved parties have an opportunity to earn large sums of money as a result of the rapid change of its daily prices.

Unlike buying and selling stocks and commodities, the cryptocurrency market is not physically a single place. Cryptocurrency transactions can be carried out between individuals in different parts of the world. Purchases of goods and services using cryptocurrencies close to anonymity are carried out online and do not require public identification. Cryptocurrencies can give users some privileges in terms of privacy [11].

In agreement with some researchers, we can point out following disadvantages: 1) lack of technological control by government agencies over the use of cryptocurrencies, 2) the anonymity of cryptocurrencies do not allow the identification of operators, 3) lack of a regulatory framework for the circulation of cryptocurrencies, etc. [18]

Disadvantages of the cryptocurrency trade include: 1) Scalability problems of cryptocurrencies have led to the weakening of daily trading from 2020, which affects traders who want to transfer their personal money and savings to the stock exchanges [11]. 2) Cybersecurity issues, that is cryptocurrencies, like digital technology, can be attacked by hackers as a result of cybersecurity breaches. 3) Regulations. Because some parts of the system and the risks associated with it are largely unknown, the authorities around the world face difficult challenges about the nature and regulation of cryptocurrency. Currently, three types of regulatory systems are used to control digital currencies: 1) a closed system for the Chinese market, 2) an open and liberal system for the Swiss market, and 3) an open and stern system for the US market (UKTN 2021).

8. Conclusion and proposals

In the current complex geopolitical environment, ensuring and comprehensively reconciling economic interests is one of the top priorities. Ensuring the security of national currencies in many respects has a direct impact on the sustainability and continuous development of the regional economy [25]. Diversified and sustainable development of the regional economy, including its cyber-sustainability, is conditioned by both the current state of ICT infrastructure and modern information technologies, as well as the technical and technological sovereignty of the

region [26]. Taking into account the systematization of formation and development trends of digital assets, digital currencies, cryptocurrencies created by the digital economic environment in such conditions, it is possible to determine economic orientations and priorities.

Based on performed research and analysis, it can be concluded that 1) in medium-term perspective, financial and economic structures and trade organizations can achieve the mass distribution of potential opportunities inherent in blockchain technology and cryptocurrencies. In this regard, it is possible to predict their wider use in the financing of terrorism, along with traditional methods of use. 2) The possibility of converting cryptocurrency into money is of interest for financing of terrorism. It can be used by terrorist organizations to organize covert operations or to sponsor such organizations in line with their own interests.

It is possible to achieve some progress in the management of economic processes and correct decision-making by benefiting from both advantages and disadvantages of cryptocurrencies and their innovative and comparative characteristics.

Reference

- Decree of the President of the Republic of Azerbaijan on improvement of administration in digital transformation field. Baku, April 27, 2021. <https://president.az/articles/51299> (in Azerbaijani).
- Decree of the President of the Republic of Azerbaijan on some measures related to improvement of administration in digitalization, innovation, high technologies and communications field. Baku, October 11, 2021. <https://president.az/articles/53407> (in Azerbaijani).
- Zeynelhabdin, A.B. & Ahmetbek, E.E. (2020). Cryptocurrency and blockchain technology – new realities of the modern economy. *Economics: Strategy and practice*, 3(15), 111-125 (in Russian).
- Aliyev, A.G., Abbasova, V.A. & Abidini, M. (2010). Regulation issues of implementation of electronic commerce technologies. *Problems of Information Society*, 1, 41-47 (in Azerbaijani).
- Aliyev, A.G. (2011). Significance and development trends of electronic money systems in economic processes. *Silkway Journal*, 2, 72-80 (in Azerbaijani).
- Ageev, V.N. & Vlasov, A.V. (2020). Application potential of digital financial assets. *Finance Journal*, 12(6), 100-112 (in Russian).
- García-Corral et al. (2022). A bibliometric review of cryptocurrencies: How have they grown? *Financial Innovation*, 8(2), 1-31.
- Babkin, A.V., Burkaltseva, D.D., Pshenichnikov, V.V. & Tyulin, A.S. (2017). Cryptocurrency and blockchain technologies in digital economy: Development genesis. *Scientific-technical news of Peter the Great St. Petersburg Polytechnic University. Economic Science*, 10(5), 9-22 (in Russian).
- Metelkov, A.N. (2021). Cryptocurrency: Financing terrorism and protecting the digital code. *Sciencesphere*, 7(1), 274-279 (in Russian).
- Zharina, N.A. (2018). Cryptocurrency in Russia: Modern state and prospects of development. *Socio-economic and technical systems: Research, Design, Optimization*, 1(77), 80-90 (in Russian).
- Fan Fang, Carmine, Ventre, Michail, Basios, Leslie, Kanthan, David, Martinez-Rego, Fan, Wu & Lingbo, Li. (2022). Cryptocurrency trading: A comprehensive survey. *Financial Innovation*, 8(13), 1-59.
- Lyudvig, I.A., Zhigas, M.G. & Lavrova, L.A. (2021). Salary in cryptocurrency as a source of increasing the capitalization of the company. *Bulletin of Omsk University, Economics series*, 19(3), 28-37 (in Russian).
- Pavlinov, I.A., Skodorova, L.K., Pavlinova, E.I. [et al]. (2019). Digital economy: Joint monograph. Transnistrian State University named after T.G. Shevchenko, Ribnita branch. Ribnita: TSU, (Tesline), 260 p. (in Russian).
- Imamverdiyev, Y.N. (2019). Blockchain technologies: Components, application and problems. *Problems of Information Society*, 2, 18-32 (in Azerbaijani).
- Zheng, Z., Xie, S., Dai, H.N., Chen, X. & Wang, H. (2018). Blockchain challenges and opportunities: A survey. *International Journal of Web and Grid Services*, 14(4), 352-375.
- Bokhon, K.S. (2019). Current state and prospects of development of the international cryptocurrency market. *Scientific Electronic Journal Meridian*, 15(33), 1-4 (in Russian).
- Rubstova, A.S. (2018). Cryptocurrencies: Target and instrument of the crime. *Vector of legal science*, 12, 172-181 (in Russian).
- Kochetnov, A.V. (2018). Innovative properties, positive and negative effects of cryptocurrency turnover for the economy. *Finances and Credit*, 24(9), 2033-2041 (in Russian).
- Mankovskiy, I.A. (2020). Cryptocurrency as an attribute of digital economy: The legal basis for the introduction to the civil turnover. *On the way to civil society*, 2(38), 24-30 (in Russian).
- Maurice, Omane-Adjepong & Imhotep, P.A. (2020). Dynamic linkages and economic role of leading cryptocurrencies in an emerging market. *Asia-Pacific Financial Markets*, 27, 537-585.
- Carmen, López-Martín, Sonia, B.M. & Raquel, A. (2021). Efficiency in cryptocurrency markets: New evidence. *Eurasian Economic Review*, 11, 403-431.
- Trozze, et al. (2022). Cryptocurrencies and future financial crime. *Crime Science*, 11(1), 1-35.
- Venkata, M., Bikesh, U., Jani, M. & Virpi K.T. (2020). Understanding the creation of trust in cryptocurrencies: The case of Bitcoin. *Electronic Markets*, 30, 259-271.
- Strogonova, E.I. & Burda, A.G. (2019). Introduction of cryptocurrencies in the national payment banking system of the country under the conditions of digitalization of the economy. *Bulletin of Knowledge Academy*, 30(1), 294-297 (in Russian).
- Aliyev, A.G. & Shahverdiyeva, R.O. (2021). Formation of ICT-based technological innovation economy sectors and aspects of their impact on socio-economic processes. *Problems of Information Society*, 1, 94-110 (in Azerbaijani).
- Aliyev, A.G. (2021). Author's summary of the dissertation submitted for obtaining a doctorate in research of problems of formation of information economy sectors and assessment of their innovative perspectives. Baku, 2021 (in Azerbaijani).