

Forming of Organizational and Economic Mechanism of the Cryptocurrency Market for the Countries with Position of Anticipation

Makarchuk Inna, Perchuk Oksana, Yaremenko Liudmyla

Abstract: *The article reveals the economic essence of cryptocurrency as an information and technological innovation. The authors have determined that cryptocurrency is a universal global means of payment, exchange, and investing, which exists in the form of a highly protected software code and is characterized by a free market exchange rate. Having considered technical, technological, and organizational aspects of using cryptocurrencies, the authors carried out the comparison of electronic money and cryptocurrency. The done analysis of markets and types of cryptocurrencies has enabled to form a ranking of cryptocurrencies by level of capitalization. The article describes the dynamics of the growth of cryptocurrency market capitalization and the domination of a Bitcoin's market share. The authors have ascertained strengths of Bitcoin, which had allowed this cryptocurrency to become a useful international means of payment with the high investment potential. The article examines weaknesses of the exchange of cryptocurrency both ordinary consumers and governments. The authors have proven that institutionalization ensured by the formal and informal establishment of rules for functioning of cryptocurrency is necessary for effective functioning of cryptocurrency. The authors have substantiated three positions of institutional support describing the attitude of countries to functioning of a cryptocurrency market: a loyal position, categorical position, and position of anticipation. The authors have developed an organizational and economic mechanism for forming a cryptocurrency market based on functions, methods, and tools of management and suggested directions for undertaking a policy in the sphere of functioning of a cryptocurrency market for countries with the position of anticipation. The process of virtualization of modern society is inevitable. Countries with the position of anticipation should support the course on innovation by solving a range of regulatory, technical and information issues on the development of the cryptocurrency market, based on leading international experience. The primary tasks should be: granting the legal status of cryptocurrency and developing rules for its circulation, introduction of technological innovations with the participation of the state, large corporations and venture funds, creation of an open ecosystem for interaction of all participants, as well as wide information support at all levels.*

Keywords: *Bitcoin, capitalization, cryptocurrency, electronic money, information technology, mining, virtual currency.*

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I. INTRODUCTION

The rapid development of information technologies transforms the contemporary economic system. It is estimated that an amount of online trading in 2019 exceeded \$2.5 trillion USD dollars. Online trading is only an alteration of a way of the sale whereas novelties of the past decades in the sphere of information technologies, namely cryptocurrencies, challenge the existing monetary system and its basic principles. Almost nine years ago, alongside the first Bitcoin transactions – “the first decentralised digital currency”, economists and scientists introduced a notion of cryptocurrency. Investors and entrepreneurs throughout the world have recognized cryptocurrency. It has played the important role within the financial system in general and within banking systems of many countries in particular. Thus, since 2009, cryptocurrency has been referred to as a new and prospective innovative financial instrument of information economy. Cryptocurrency as an information and technological innovation in developing contemporary payment systems has gained popularity in a relatively short term. Therefore, it has taken the leading positions in the global financial market and become a part of the daily life of an ordinary person.

II. METHODS AND LITERATURE REVIEW

The use of contemporary statements of economics, the theory of finance, concepts of a currency system, as well as open-access data underpin the methodological framework of the research. The authors apply general scientific methods for the cognition of phenomena of the objective reality, other general scientific and special methods, which are as follows: the method of formal logical analysis (in the process of determining the economic essence of cryptocurrency as an innovative means of payment), comparative historical method (in the process of determining the genesis of a category of cryptocurrency), system analysis (in the process of assessing prospects for using Bitcoin cryptocurrency in financial relations), comparative method (for general analysis of a cryptocurrency market), statistical method (for building a ranking of cryptocurrencies), and method of logical generalization (for developing the organizational and economic mechanism for forming a cryptocurrency market).



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Most notable among the main regularities in the financial sphere related to a new stage of development of the information economy is the development of processes of financial innovations. Ukrainian, as well as foreign scientists such as M. Andrukhovych, S. Kapkun, A. Kvitka, M. Kutsevolva, M. Lykhachova, I. Lubenets, N. Polyvka, M. Roeschlin, Yu. Solodkovskiy, et al. have researched the development of processes of financial innovations.

A number of well-known foreign scholars, namely R. Böhme, N. Christin, B. Edelman, T. Moore (2015) [2], R. Schultz (2016) [3], S. Vassiliadis, P. Papadopoulos, M. Rangoussi, T. Konieczny, J. Gralewski (2017) [4], O. Nikolaichuk (2017) [5], have focused on examining this sphere.

III. RESULTS OF RESEARCH

The intensive development of information technologies and expansion of globalization processes have fostered the emergence of new types of digital currency, which offer advantages such as decentralisation of payments and full freedom for conducting transactions.

Cryptocurrency is a cheap, useful, and technological way of conducting transactions throughout the world, as well as a prospective form of investing. According to CoinMarketCap statistical data [1], as of 02 November 2019, cryptocurrency market capitalization accounted for approximately \$247.77 billion USD. Taking into account tendencies of the contemporary development of cryptocurrency in the world, the authors may conclude that Blockchain technology and Bitcoin cryptocurrency being the most expensive one among existing cryptocurrencies attract the most attention in the global financial market. All around the world, the interest of the economically active population in financial innovations in the sphere of information economy increases every year.

Bitcoin has become the first result of implementing a concept of cryptocurrency, principles of which have been described in 2008 [6]. Satoshi Nakamoto is referred to as a founder of Bitcoin. Satoshi Nakamoto outlined technical aspects of functioning of the future cryptocurrency in the end of October 2008 and made the first version of a code of this electronic currency publicly available in January 2009. It is worth mentioning that a set of tremendous researches have preceded the emergence of Bitcoin and other cryptocurrencies.

Nowadays, there is no common vision on defining a notion of cryptocurrency. Some scientists classify cryptocurrency under category of virtual currency and call it innovative network of payments and a new type of money. Others deny belonging of cryptocurrency to money and call it “digital asset”.

Generalizing various definitions, the authors offer to perceive cryptocurrency as a universal global means of payment, exchange, and investing, which exists in the form of a highly protected software code and is characterized by a free market exchange rate.

In case of using traditional monetary funds, an interrelation between buyers and sellers occurs according to the money – commodities principle. This provides promptness of transactions under similar localization of counteragents but

impedes conducting transactions in the opposite case. The application of digital currency, which may be generally described as a set of bits, has become a solution for the mentioned problem. Such payment system should obligatory use a mediator – an electronic payment system. Its goal is centralised management of financial transactions aimed at avoiding the duplication of a set of bits, i.e. – accounting control. Nowadays, there are a number of such payment systems. This increases a risk of fraud and threat to data. Bitcoin does not contemplate involving third persons in making monetary transactions.

Cryptocurrency systems seek to ensure adhering to several principles: consensus; security and uniqueness; proper verification of transactions. A process of “mining” is considered as a basis for implementing these principles in the practice. Persons, who provide “mining”, conduct expensive computational operations competitively: a winner is eligible for the creation of new history in the network, updating a “blockchain”. In the broad sense, this notion encompasses a set of all the past transactions, or rather – identification in formation about them. A notion of block means current transactions based on demand and supply of cryptocurrency. A set of such “blocks” forms “blockchain” transaction history. Obviously, under such conditions, returning to the past transaction is practically impossible.

In the world, blockchain technology can be actively used in the prospect for Internet technologies and cybersecurity, as well as for preserving data in the sector of the sale of real estate, property registration, cadastre systems, public administration, baking systems, education, health care, trading, insurance, court case management, etc. Therefore, blockchain technology is self-contained, safe, decentralised, reliable, and cheap technology.

Technical, technological, and organizational aspects of the use of cryptocurrency indicate that they are almost identical to the cashless circulation of electronic money. Nevertheless, comprehensive identification of cryptocurrency with cashless transactions in general and its certain type – electronic money in particular is an erroneous suggestion. Cryptocurrency and electronic money are considered similar because both of them are non-personified payment instruments (i.e. they do not need identification of an owner) and circulate outside the banking system in the electronic form. Issuers of electronic money

have to closely interact with banks to ensure the free exchange of electronic money for traditional one and vice versa. At the same time, cryptocurrency is not “banking money”, cryptocurrency assets are not taken into account in the process of calculating monetary aggregates and cannot be used for rendering banking services (accepting deposits and making loans) [7]. Table 1 shows the comparison of electronic money and cryptocurrency.

Table - I: Comparison of electronic money and cryptocurrency

Characteristics	Electronic money	Cryptocurrency
Issuer	central banks	miners
Form	digital	digital
Essence	liabilities of an issuer	independent intangible asset
Way of contribution	contribution to a banking account	generating in the network by using mathematical methods
Risks	controlled by institutions	non-controlled
Transaction speed	slower	maximal
Transaction costs	comparatively high	minimal
Protection	sufficient, controlled by government agencies	High ,provided by cryptographic methods
Anonymity	partial	full
Control and management	centralised	decentralised
Expansion	broad expansion	inner circle of participants
Accessibility	access to mobile devices and agent networks	access to the Internet
Value	equals value and the number of fiat currency	determined by demand and supply

*Source: personally developed by authors

According to Dr Garrick Hileman, cryptocurrency becomes a more and more important element of the society and functioning of equipment all over the world. Drawing on the research, the number of persons using cryptocurrency has increased and approaches population size of a small country – from 2.9 to 5.8 million persons. The majority of them are North American and European citizens.

Bitcoin is the most widespread cryptocurrency in the world. It continues to develop owing to the consistent growth of users of this system. Popularity of Bitcoin has also conducted to creating other cryptocurrencies developing alongside Bitcoin. However, their popularity and opportunities are much smaller yet. Government agencies of certain countries have begun to tackle Bitcoin, describing this as care about people, to warn them against investing money in the “monetary surrogate”, and to inform them about the possibility of the loss of money in case of a failure of Bitcoin. However, such tackling has been actually caused by a desire to concentrate functions of the money emission and, therefore, power in the hands of governmental officials and to prevent creating alternative sources of the emission of means of payment because they are not amenable to government regulation [8].

Analyticians point out that the cryptocurrency market is useful for large companies because the possession of considerable capital, which is not pegged to local currencies, throughout the world leads to the interest in the market of virtual money [9].

In 2019, the cryptocurrency-generating market has been divided in such a way: China – 60 %, the USA and Canada – 16 %, Georgia – 6 %, Europe – 5 %, Iceland – 4 %, India – 3 %, Russia – 2 %, Australia – 2 %, and South America – 2 %. The world’s biggest exchanges such as “Bitfinex”, “Poloniex”, “Kraken”, “Shapeshift”, “Changelly”, CHBTC, “Bitsquare”, “Bittrex”, “BitMEX”, BTER, “Yobit”, “CoinExchange”, “LiteBit”, “Btc Markets”, etc. conduct

transactions concerned with the digital exchange of cryptocurrencies [10].

As of 07 February 2019, the general number of cryptocurrencies accounts for 1112 names. The increment of capitalization of the top five companies is estimated to be at least \$253 million USD per day (Table 2).

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Table - II: Ranking of cryptocurrencies by capitalization as of 07 February 2019

No	Currency	Capitalization, USD	Price, USD	Amount, USD
1	<u>Bitcoin</u> (BTC)	60 029 341 962	3 425,28	1 261 204 342
2	<u>Ripple</u> XRP	12 165 424 283	0,30	141 215 377
3	<u>Ethereum</u> ETH	10 947 799 823	104,50	638 892 278
4	<u>EOS</u> EOS	2 121 033 969	2,34	230 233 178
5	<u>Tether</u> USDT	2 069 220 178	1,02	946 339 017
6	<u>Bitcoin Cash</u> BCH	2 144 276 404	121,77	79 502 037
7	<u>Litecoin</u> LTC	2 002 547 136	33,17	158 265 106
8	<u>TRON</u> TRX	1 728 407 725	0,0259	51 637 100
9	<u>Stellar Lumens</u> XLM	1 430 158 443	0,07	43 757 318
10	<u>Binance Coin</u> BNB	1 120 313 983	7,94	68 904 79

*Source: authors' calculations based on the data from [1]

Analysing the dynamics of prices for cryptocurrencies over the past years, the authors may summarize that cryptocurrency primarily is a classical “pyramid”. Although the United Kingdom government in a document “Digital Currencies: Response to the Call for Information” outlines that the use of digital currencies pose minimal risks to financial stability and a monetary system of the country.

The development of information technologies and infrastructure of cashless payments lead to principal changes in a mechanism of money emission. Thus, features of the official recognition of cryptocurrency by the financial establishment gradually begin to emerge. The largest investment banks (“Goldman Sachs”, “Merrill Lynch”, and “Bank of America”) issue reviews of perspectives of various cryptocurrencies. This indicates that cryptocurrencies have nearly “fit” in the traditional financial industry. Six large international banks (“Barclays”, “Credit Suisse”, “Canadian Imperial Bank of Commerce”, HSBC, MUFG, and “State Street”) have organized a project regarding the creation of new cryptocurrency – utility settlement coin (USC). After “Deutsche Bank”, “Banco Santander”, “BNY Mellon”, and NEX had joined the project, it got to the next level, which contemplates a discussion of this idea with central banks and refinement of a system for protecting confidentiality of data and protecting from cyberattacks [10].

Mining is the most widespread method for obtaining cryptocurrency. Mining operations are conducted at the expense of computational capabilities of computer equipment.

A goal of equipment is to select one right hash-code, which will form a title block in a blockchain, out of millions of combinations. As soon as a required number is generated, a block together with all the transactions closes and miners move forward to searching for the next one. Miners obtain 12.5 bitcoins as a reward for a right hash-code. There are also

forging being a special form of mining complemented with voting and initial coin offering (ICO) [11].

There are many ways of earning cryptocurrency other than mining. The main ways are as follows:

1. Service countries – services for the distribution of Bitcoin and other coins for doing small jobs: captcha solving, web-surfing, etc.

2. Bounty – a process of advertising new ICO-projects through posting, reposting, and translations. Initially, you obtain tokens free of charge. After a while, tokens will become fully fledged cryptocurrency.

3. Posting / copywriting – members of Steemit and Golos services obtain a reward in the form of internal cryptocurrency. Furtherly, it will be exchanged in a marketplace. Bitcoin and other coins can be easily purchased through exchanges, trading platforms, cryptomats, or even directly. To begin using cryptocurrency, participators should create a digital wallet [12].

At the beginning of 2017, capitalization of all cryptocurrencies accounted for approximately \$18 billion USD. In December 2017, capitalization of the cryptocurrency market exceeded \$500 billion USD. As of 02 November 2019, it reduced to the level of \$247.77 billion USD [1].

To ensure effective functioning of cryptocurrency, it is necessary to seek institutionalization, which may be attained by applying two methods: firstly, legal institutionalization; secondly, market institutionalization attained owing to the formal and informal establishment of rules for functioning of cryptocurrency.

There is a need to emphasize that the position of cryptocurrency in the international market of payments depends on an approach governments choose to regulate cryptocurrency transactions. Table 3 shows institutional frameworks for cryptocurrency in the world illustrated by the example of Bitcoin.

Table - III: Institutional frameworks for cryptocurrencies in the world illustrated by the example of Bitcoin

Attitude to cryptocurrency	Institutional frameworks	Country
Loyal	Private money, payment unit	Germany
	Circulation is permitted but Bitcoin is considered to be an illegal means of payment	Croatia
	Exchange commodity	Norway
	The 10% tax is imposed on cryptocurrency transactions	Bulgaria
	Foreign currency	Switzerland
	Primary commodity	Finland
	Legal means of exchange	the USA, New Zealand, Singapore, Spain, Australia, the Netherlands
	Legal means of payment	Japan
	Taxed as providing services	Denmark
Categorical	Prohibition of cryptocurrencies	Vietnam, Bangladesh, Bolivia, Thailand, Ecuador
Anticipation	Absence of the prohibition for cryptocurrency transactions; considered as a risky and speculative financial instrument	India, the Russian Federation, Cyprus, France, Ukraine, China

*Source: personally developed by authors

Applying financial regulators, the countries with loyal position regarding cryptocurrency tax, license, or restrict payments based on this currency.

For instance, in the USA, there are two approaches to taxation of Bitcoin transactions:

- 1) taxation of capital asset (long-term investments) at the rate of 15% of received incomes and short-term investments at the rate of 35%;
- 2) taxation of bitcoin currency transactions at the rate of 23%.

Denmark and Japan regulate activities of exchanges selling digital currency. In Germany, government agencies license cryptocurrency transactions and permit payments in Bitcoins throughout the country [13]. For example, in a number of countries, Bitcoin transactions are officially permitted. Usually, governments consider Bitcoins as a commodity or investment asset and subordinated to corresponding legislation for tax purposes. In certain countries (Germany, Japan), Bitcoin is called a monetary unit [14].

The countries with categorical position prohibit any cryptocurrency transactions as a threat to stability of financial systems of national economies. The Central Bank of Bolivia considers currency being issued and controlled by non-government or unauthorized agencies as illegal one.

Although the countries with the position of anticipation warn their citizens against the use of cryptocurrency because of its riskiness and speculative nature, they do not prohibit cryptocurrency transactions. A cryptocurrency market of Ukraine exists in the legal vacuum. Nowadays, a mechanism for implementing a notion of cryptocurrency in the national legislation through accepting corresponding provisions in the sphere of tax, banking, civil, and economic law is the most urgent matter for Ukraine. More and more Ukrainian consumers use cryptocurrency for the online trading goods and services or use it as highly capitalized investments [14; 9].

Obviously, it is necessary to use the liquid potential of cryptocurrency for developing national economies. A

majority of developed countries adapts own legislation to regulate digital currency. This will enable to gradually adjust cryptocurrency as innovations of the financial market to the modern realities. It is time for obtaining a functional, transparent, cheap, generally accessible, and world-shaping monetary instrument. Hence, governments should exert maximal efforts to ensure the juridical substantiation and technical support of the activity of this financial market instrument in order to achieve the highest benefit and utility [15; 16]. To provide efficiency of functioning of the cryptocurrency market, it is expedient to develop the organizational and economic mechanism for forming the cryptocurrency market for the countries with the position of anticipation (fig. 1).

Efficiency of functioning of the cryptocurrency market, to a greater extent, depends on its structure and interaction, as well as the coherence of its elements (methods, functions, and instruments of management), which manifest themselves as a comprehensive complex. The above-mentioned peculiarities of functioning of cryptocurrency, peculiarities of its emission and purchase significantly differ from peculiarities of functioning of fiat currencies. In 2019 (02 November 2019), market capitalization of cryptocurrency in the world was estimated at \$247.77 billion USD. Simultaneously, the top ten of the digital currency ranking such Bitcoin, Bitcoin Cash, Ethereum, Ripple, EOS, Litecoin, Stellar lumens, Neo, Dash, and TRON account for 80% of the above-mentioned sum. Nevertheless, like any other new phenomenon, cryptocurrency is a matter of concern due to possibilities of the loss of a password or access to a digital wallet, possibilities of cyberattacks, or the impossibility of using cryptocurrency as an equity contribution. Despite these weaknesses, ordinary consumers continue to invest in this currency, increasing its capitalization.

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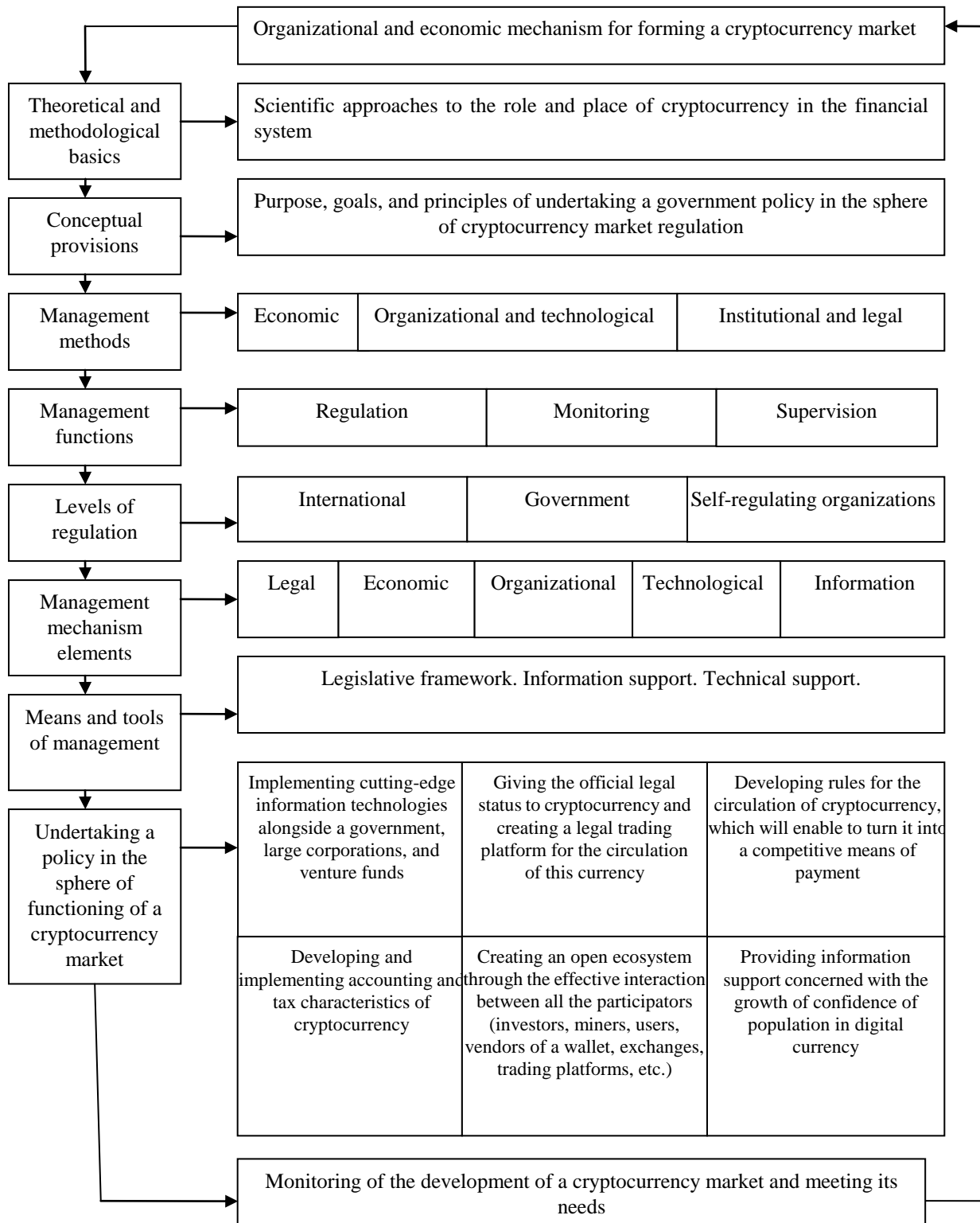


Fig. 1. Organizational and economic mechanism for forming a cryptocurrency market for the countries with the position of anticipation

*Source: personally developed by authors

IV. CONCLUSION

1. Generalizing different definitions, the authors may describe cryptocurrency as a universal global means of payment, exchange, and investing, which exists in the form of

a highly protected software code and is characterized by a free market exchange rate. Cryptocurrency becomes a more and more important element of the society and functioning of equipment all



over the world.

The number of persons using cryptocurrency has increased and approaches population size of a small country – from 2.9 to 5.8 million persons. The majority of them are North American and European citizens.

2. Nowadays, the main features of cryptocurrency are decentralisation, an opportunity to function as a means of payment, a high level of liquidity, divisibility, portability, the absence of features of tangible assets, transparency, and the absence of a single issuer.

The authors have split the main differences between digital money and cryptocurrency into criteria such as accessibility, a degree of consumer identification, value, production, an issuer, and regulation.

To ensure effective functioning of cryptocurrency, it is necessary to seek institutionalization, which may be attained by applying two methods: firstly, legal institutionalization; secondly, market institutionalization attained owing to the formal and informal establishment of rules for functioning of cryptocurrency.

3. The authors have substantiated different approaches countries apply to the legal status of cryptocurrency – some countries have determined the expediency of functioning of cryptocurrencies and refine the legal basis, which would legitimize virtual currencies and others prohibit or restrict the circulation of cryptocurrency.

4. The authors have suggested the organizational and economic mechanism for forming the cryptocurrency market for the countries with the position of anticipation. This mechanism is grounded on functions, methods, and tools of management, which provide functioning of the cryptocurrency market in the form of concerted and mutually complementing elements of the global financial system. This has enabled to propose directions for undertaking a policy in the sphere of functioning of the cryptocurrency market for the countries with the position of anticipation:

- implementing cutting-edge information technologies alongside a government, large corporations, and venture funds;

- giving the official legal status to cryptocurrency and creating a legal trading platform for the circulation of this currency;

- developing rules for the circulation of cryptocurrency, which will enable to turn it into a competitive means of payment;

- developing and implementing accounting and tax characteristics of cryptocurrency;

- creating an open ecosystem through the effective interaction between all the participators (investors, miners, users, vendors of a wallet, exchanges, trading platforms, etc.);

- providing information support concerned with the growth of confidence of a population in digital currency.

Further scientific intelligence should focus on the applied aspects of cryptocurrency market regulation and an effective «ecosystem» consisting of new members, not typical for traditional payment systems.

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