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### **THE PROSPECTS OF USING CRYPTOCURRENCY BITCOIN AS A FINANCIAL INNOVATION IN THE INFORMATION ECONOMY OF UKRAINE**

**Abstract.** We have established that a relatively new market of cryptocurrency is the subject of great interest for research under the current conditions of financial innovations in payment services. Our findings have revealed objective prerequisites for creating cryptocurrency as an innovative means of information-based payment. Cryptocurrency poses a challenge to the financial system of Ukraine since both the central bank and other state regulators can not control its emission and circulation. They show the growth dynamics in cryptocurrency market capitalization where Bitcoin predominates. Although cryptocurrency is not included in the National Register of payment systems and it is officially prohibited for circulation in Ukraine, our country ranks among the world's top five countries by number of users of different bitcoin-wallets.

We have examined the strengths of Bitcoin that have made this cryptocurrency a convenient means of international payment with a high investment potential. The results show disadvantages to using cryptocurrency for both the whole country in general and ordinary consumers in particular. We have defined main threats that national governments can face in case of an unregulated spread of cryptocurrency. Also this study, based on the works of leading foreign scientists and financial market experts, systematizes factors that influence the price of Bitcoin. It substantiates opportunities and prospects for the cryptocurrency market development in Ukraine.

The study has shown that cryptocurrencies have their own niche in payment systems; they are quite competitive and reliable financial instruments. The growth dynamics of cryptocurrency market capitalization in the world makes Bitcoin the most successful example of the use of virtual currency in the information economy. As the modern society is being inevitably virtualized, our country's economy should follow the path of innovations by finding solutions to a number of technical, economic and legal issues on the cryptocurrency market development in Ukraine through involving the experience of the leading European countries.

**Keywords:** bitcoin, cryptocurrency, virtual currency, payment system, financial innovation.

**JEL Classification** E42, F33

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## **ПЕРСПЕКТИВИ ВИКОРИСТАННЯ КРИПТОВАЛЮТИ БІТКОЇН ЯК ФІНАНСОВОЇ ІННОВАЦІЇ В ІНФОРМАЦІЙНІЙ ЕКОНОМІЦІ УКРАЇНИ**

**Анотація.** Встановлено, що у сучасних умовах розвитку фінансових інновацій у сфері платіжних послуг предметом наукових дискусій є відносно новий і малодосліджений ринок криптовалют. Розкрито об'єктивні передумови створення криптовалюти як інноваційного платіжного засобу заснованого на інформації. Криптовалюта стала викликом для фінансової системи України, оскільки її емісію та обіг не може контролювати центральний банк та інші державні регулюючі органи. Показано динаміку зростання капіталізації ринку криптовалют із домінуючою часткою біткоїна. І хоча криптовалюта не внесена до національного Реєстру платіжних систем, і є офіційно забороненою для обігу на території України, наша держава ввійшла до п'ятірки країн світу за кількістю користувачів різних біткоїн-гаманців.

Визначено сильні сторони біткоїна, які зробили цю криптовалюту зручним міжнародним платіжним засобом з високим інвестиційним потенціалом. Висвітлено недоліки обігу криптовалюти як для пересічних споживачів, так і держави в цілому. Виокремлено основні загрози нерегульованого поширення криптовалюти для національних урядів. Ґрунтуючись на працях провідних зарубіжних науковців і експертів фінансового ринку, систематизовано фактори впливу на ціну біткоїна. Обґрунтовано можливості та перспективи розвитку ринку криптовалют в Україні.

У результаті дослідження встановлено, що криптовалюти зайняли свою нішу в платіжних системах і є конкурентоспроможними та надійними фінансовими інструментами. Зважаючи на динаміку росту капіталізації ринку криптовалют у світі, біткоїн є поки що найуспішнішим прикладом використання віртуальної валюти в інформаційній економіці. Оскільки процес віртуалізації сучасного суспільства невідворотний, економіка нашої держави має підтримувати курс на інноваційність шляхом вирішення низки технічних, економічних та правових питань щодо розвитку ринку криптовалют в Україні, спираючись на досвід провідних європейських країн.

**Ключові слова:** біткоїн, криптовалюта, віртуальна валюта, платіжна система, інформаційна економіка.

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## **ПЕРСПЕКТИВЫ ИСПОЛЬЗОВАНИЯ КРИПТОВАЛЮТЫ БИТКОИН КАК ФИНАНСОВОЙ ИННОВАЦИИ В ИНФОРМАЦИОННОЙ ЭКОНОМИКЕ УКРАИНЫ**

**Аннотация.** Раскрыто экономическую природу криптовалюты как инновационного платежного средства. Охарактеризованы возможности и угрозы использования биткоина как финансового инструмента защищенного криптографией и основанного на новейших технологиях. Обоснованы факторы влияния на процесс формирования и динамику цен криптовалюты биткоин. Определены основные направления обеспечения эффективного функционирования рынка криптовалюта в Украине путем определения ее правового статуса и регулирования операций с ней.

**Ключевые слова:** биткоин, криптовалюта, виртуальная валюта, платежная система, финансовая инновация.

Формул: 0; рис.: 2; табл.: 2; библи.: 17.

### **1. Introduction.**

The global financial crisis, which affected the stability of the financial system of Ukraine and the banking sector in particular, shook confidence in traditional financial institutions of the state. The national currency depreciation caused poverty and a need to find alternative ways of saving money. A dynamic development of IT technology and information economy intensified a search for new types of information-based financial instruments. Cryptocurrency has become that kind of financial innovation.

Cryptocurrency is a cheap, convenient and technological means as well as a promising form of investment that provide payment transactions worldwide. According to the statistics by CoinMarketCap [1], the cryptocurrency market capitalization was about USD 166 billion as of 03.09.2017. Since cryptocurrencies are being widely used in the world, the Blockchain technology and Bitcoin cryptocurrency, which is also the most expensive cryptocurrency among currently available ones, are of primary concern. In Ukraine economically active population tends to pay more attention to financial innovations in the sphere of information economy. This makes us believe that the study of economic nature of Bitcoin cryptocurrency and prospects for its circulation in Ukraine are both of great scientific and practical importance.

### **2. Actual scientific researches and issues analysis.**

The issue of cryptocurrency development is quite a new subject of scientific debates. Ukrainian financial market participants and scientists more often explore problems of the cryptocurrency use in the world. We should mention the following scientists: S. Vasylychak, M. Kuniyska-Iliash, M. Dubyna (2017) [2], T. Zheliuk (2016) [3], H. Karcheva (2015) [4], I. Sytnyk, O. Bohdan (2016) [5], V. Soslovskiy [6] and others. S. Volosovych's scientific achievements are particularly noteworthy [7]. She investigated instruments for regulation and participants in the «ecosystem» of virtual currency schemes in different countries. Problems of the Ukrainian cryptocurrency market have not been studied enough. It is necessary to assess positive and negative effects of their use and prospects for their development. At the same time, the world's experience offers a number of theoretical developments in Bitcoin cryptocurrency as a promising financial instrument of the information economy. The best-known foreign authors in this area are: R. Böhme, N. Christin, B. Edelman, T. Moore (2015) [8], R. Schultz (2016) [9], O. Nykolaichuk (2017) [10], S. Vassiliadis, P. Papadopoulos, M. Rangoussi, T. Konieczny, J. Gralowski (2017) [11].

### **3. The research objective.**

The purpose of the article is to study the nature and characteristics of Bitcoin cryptocurrency

economic circulation as an innovative means of payment; to substantiate strengths and weaknesses of cryptocurrency for Ukrainian consumers; to identify threats to the national economy and to define promising areas of its development.

#### 4. Results.

Now there is an ambiguous opinion on the role that cryptocurrency plays in the information economy. Financial market experts consider it to be a financial innovation and the currency of the future which will facilitate payment systems development. However, some of them define it as an instrument for money laundering and terrorism financing in the hands of criminals who try to evade regulator's control and sanctions [7].

Scientists interpret Bitcoin in many different ways. The most common interpretations include: virtual currency [7; 8], digital currency [3; 12], cryptocurrency [6; 9; 13], e-currency [10] and private digital currency [14].

Bitcoin — a quick decentralized digital payment system secured by cryptography, based on new technologies with the principles of anonymity, limited release and uncontrolled by state institutions.

Today cryptocurrency market is characterized by a dynamic development. It became 14 times larger over the last year. The market with more than 1000 cryptocurrency specifications is dominated by Bitcoin which remains the most common cryptocurrency for many years and holds a market share of around USD 76 billion (46 % as of 03.09.2017) (*Tabl. 1*) [15].

Table 1

Top 5 cryptocurrency's characteristics by market capitalization  
(as of September 3, 2017)

Name	Year of issue	Technological features	Max supply	Price, USD	Market cap, mln USD	Share in total market cap, %
Bitcoin (BTC)	2009	decentralized; mined using proof-of-work; SHA-256 hashing; block every 10 minutes	21 mln	4632,25	76620,46	45,98
Ethereum (ETH)	2015	decentralized; mined using proof-of-work; smart contracts; block every 15 second	no max	352,83	33306,59	19,99
Bitcoin Cash (BCH)	2017	decentralized; mined using proof-of-work; SHA-256 hashing; block size 8 MB; block every 10 min	no data	585,18	9689,22	5,81
Ripple (XRP)	2012	distributed & centralized; settlement process consensus; use all currency, speed 3-6 seconds	100 bln	0,23	8777,44	5,27
Litecoin (LTC)	2011	decentralized; mined using proof-of-work; Scrypt hashing; block every 2,5 minutes	84 mln	79,66	4202,99	2,52

Source: authors' data based on [8; 15].

To demonstrate economic nature of Bitcoin and peculiarities of its circulation, as an innovative means of payment, we offer summarized results of SWOT — analysis (*Tabl. 2*).

Table 2

SWOT-analysis of Bitcoin cryptocurrency circulation

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>– anonymity and users' personal data protection;</li> <li>– decentralized emission;</li> <li>– direct payments;</li> <li>– high speed transactions (compared to fiat money);</li> <li>– low maintenance costs;</li> <li>– no centralized management;</li> <li>– less prone to inflation;</li> <li>– high level security.</li> </ul>	<ul style="list-style-type: none"> <li>– it is used as a means of payment in the market of illegal goods;</li> <li>– technical complexity of use;</li> <li>– no material form;</li> <li>– inability to cancel transactions;</li> <li>– limited use in the consumer area;</li> <li>– heavy dependence on information environment and consumer confidence.</li> </ul>

Opportunities	Threats
<ul style="list-style-type: none"> <li>– convenient means of payment in international online trade;</li> <li>– competition with traditional payment system;</li> <li>– high investment potential;</li> <li>– growing number of consumers in the world.</li> </ul>	<ul style="list-style-type: none"> <li>– high risk of volatility;</li> <li>– unstable income;</li> <li>– legal regulation of national governments; – changes in consumer tastes;</li> <li>– competition from new types of cryptocurrency;</li> <li>– failures in the computer system and hacker attacks;</li> <li>– difficulty in predicting currency exchange rates using traditional methods.</li> </ul>

Source: Author's table.

A high anonymity level is one of the advantages of Bitcoin cryptocurrency because personal data of an electronic purse owner are confidential. To carry out payment transactions one only needs to know a recipient's public identifier. The process of creating a wallet is a randomly generated private key for which a cryptographic function is responsible. It should be mentioned that the anonymous nature of virtual currencies prevents authorities from controlling funds movements and allows taking it out of the country by developing new schemes of money laundering.

After all, despite geographical location, nationality and other factors, an individual can use cryptocurrency without paying import or export taxes, declaring the money or even informing the authorities of both their own country and the country to which the money is transferred. In fact, the use of Bitcoin makes a person independent from financial institutions and law enforcement agencies. Cryptocurrency systems make capital completely free [5]. This is confirmed by the fact that in 2016 the occupied Crimea holds the first place among other regions by the number of searches for the word Bitcoin because sanctions make it difficult for local businesses to make international payments to their partners abroad.

Bitcoin has no centralized management and issuers. Digitally signed transactions between two nodes are transmitted to all nodes of peer-to-peer network, and the data on the movement of money are stored in a distributed database. Virtual currency payments are made directly without any intermediaries; financial institutions do not affect the participants' transactions [8]. Both the absence of intermediaries and the use of Blockchain technology promote low transaction costs and a high speed of transactions.

Bitcoin cryptocurrency is less prone to inflation because unreasonable increase in money supply by setting a fixed Bitcoin value with an algorithmic method is impossible [3]. This makes it attractive for Ukrainian consumers during the national currency depreciation. A technical difficulty in using Bitcoin limits consumers' wide access to it because one can only use cryptocurrency if there are some technical possibilities for this (Internet, special software). Bitcoins can be bought for the Ukrainian national currency through the service btcu via payment terminals, through Privat24, Bitxfy mobile wallet and on some bitcoin exchange platforms that are available in the country, e.g. BTC Trade and Kuna [16].

Over the lifespan of Bitcoin, its exchange rate ranged from a few cents (2009) to five thousand dollars per unit (August 2017) [15]. The value of Bitcoin grows year after year (Fig. 1).

We believe that it is positive information environment that has a significant influence on its price and increases the demand for this cryptocurrency. The exchange rate of Bitcoin has shown an active growth since 2016 after the U.S. Commodity Futures Trading Commission officially recognized Bitcoin as an exchange commodity. Bitcoin transactions are free of VAT in the EU countries since October 2015 and in 2016 Bitcoins were declared as a legal means of payment in Japan. In addition, about 260 thousand stores worldwide accept Bitcoin [16].

Rises and falls in cryptocurrency exchange rates are mostly related to the political situation in the world, conditions in international financial markets, the activities of supranational institutions, performances of world politicians and financiers. This volatility of the exchange rate makes it difficult to use it, especially in the short term. The growth of Bitcoin exchange rate is sometimes exponential i.e. it suddenly creates a financial «bubble» which allows you to get a profit [2]. On January 1, 2017 a Bitcoin cost USD 963, and since September 3, 2017 — USD 4632 [15]. This exchange rate growth is associated with an activity in the Asian markets, particularly Japanese

exchange bitFlyer, Korean bithumb and Chinese OKCoinHuobi. They have the main demand for Bitcoin due to which the price on these trading platforms is significantly higher than in the European and American markets. A bad news, dated September 4, 2017, that the People’s Bank of China banned operations related to the ICO was behind Bitcoin’s falling price to USD 3112 [15].

The study of process of Bitcoin price formation allows us to state that it is rather difficult to predict a cryptocurrency price using traditional methods.

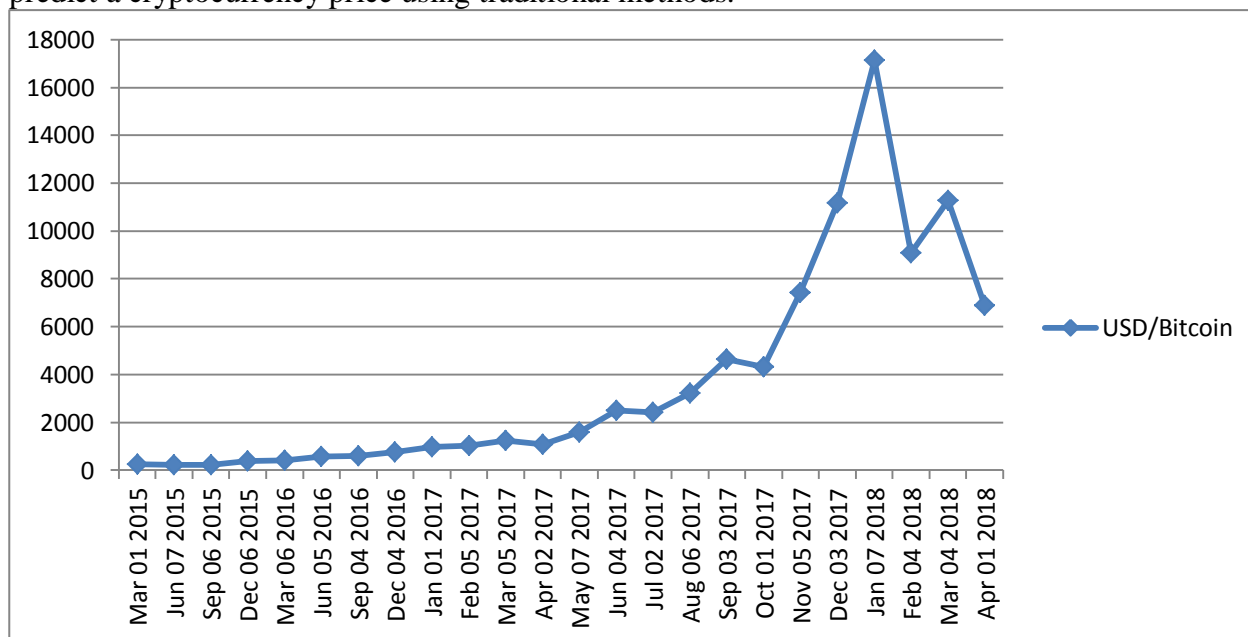


Fig. 1. The dynamics of Bitcoin exchange rate, USD

Source: authors’ data based on [15].

By summarizing foreign research on the problems of price formation in the cryptocurrency market, variability and constant changes of internal and external environment that influence formation and dynamics of prices we can distinguish three groups of factors that affect the Bitcoin price (Fig. 2).

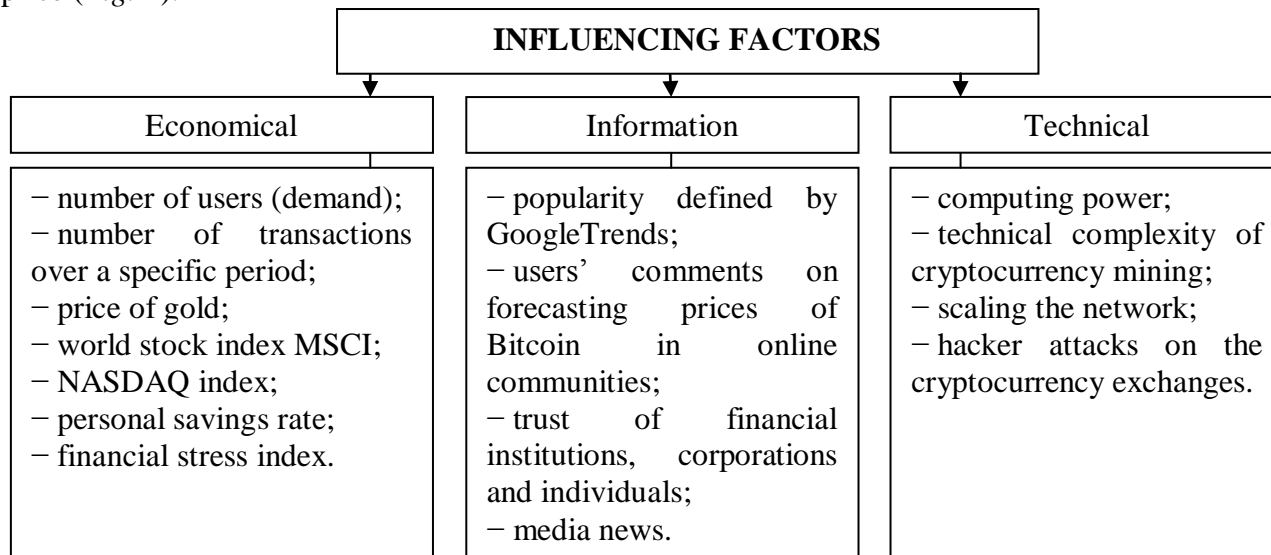


Fig. 2. The classification of factors influencing Bitcoin market price

Source: authors’ data based on [9; 12—14].

In Ukraine Bitcoin cryptocurrency became really popular in 2014 when enthusiasts created nongovernmental organization — Bitcoin Foundation Ukraine (BFU) [2]. Cryptocurrency occupied its own niche in payment systems and a significant part of Ukrainian consumers use it for purchasing goods and services on-line or they use it as an investment with a high level of capitalization.

However, Bitcoin cryptocurrency market in Ukraine is currently in a legal vacuum. Today, the most serious problem for our country is the mechanism which allows implementing the concept of cryptocurrency into national law through adopting appropriate standards in tax, banking, civil and commercial law. In 2014 the NBU considered cryptocurrency to be a cash equivalent which is not provided with value and can not be used by physical and legal persons in Ukraine as a means of payment since it contradicts the norms of Ukrainian legislation.

Despite the ambiguous attitude of the National Bank and the central government one can not deny a successful international experience in using cryptocurrency. Ukraine should not avoid using it. It is necessary to learn experiences of the countries like the USA, Denmark, Japan and Germany where Bitcoin is freely used.

In the USA there are two approaches to the taxation of operations where Bitcoin is used:

1) taxation of capital assets (long-term investments) at 15 % of earned income and short-term investments at the rate of 35 %;

2) taxation of currency exchange gains at the rate of 23 %.

Denmark and Japan regulate activities of stock exchanges that sell digital currencies, and Germany licenses cryptocurrency operations [3].

The EU legislation currently classifies Bitcoin as «a digital representation of value which is not confirmed by the central bank or a government agency and is not tied to legally established exchange rates, which can be used as a legal tender for purchasing goods and services, their transmission and storage, and can be acquired electronically». The exchange of traditional currency for a Bitcoin unit is free of a value-added tax.

Major European financial institutions (World Bank, Bank for International Settlements, the European Central Bank) strongly believe that it is necessary to introduce state monitoring, as a function of the central banks, for the use of virtual currency. In this context, they support the liberal monetary concept of using cryptocurrency [2].

Despite the denial law there are about 20 companies using Bitcoin in Ukraine. According to the indicators of an exchange platform the volume of Ukrainian Bitcoin transactions is UAH 8 million per week (in 2017), whereas it was UAH 500 thousand a year ago [17].

In any case, since last December Ukrainian stock exchange has been trading Bitcoin index futures contracts. Specifications of the contracts are registered in SSMNC. In fact, this is the first regulated market in the world that offers Bitcoin futures contracts [2].

## **5. Conclusions.**

The dynamics of the growth of cryptocurrency market capitalization in the world shows that virtual currencies have their own niche in payment systems and are quite competitive and promising financial instruments. Bitcoin is so far the most successful example of the cryptocurrency use in the information economy.

To ensure an efficient cryptocurrency market in Ukraine we can offer the following approaches to solving this problem:

– the financial sector of the national economy should remain innovation-oriented by resolving a number of technical and economic issues about creating a favorable institutional environment for cryptocurrency market development in Ukraine, and this way shadow Bitcoin operations can be prevented;

– determination of the cryptocurrency legal status in Ukraine requires a consolidated approach to its classification and regulation of transactions with it. When appropriate regulation and infrastructure are developed, a cryptocurrency system as well as Blockchain technology will certainly occupy their niche in the payment system of Ukraine. During the first stage this system can be used in the sphere of information services, and then — in the consumers' ones;

– we need to use liquidity potential of this unit at the state level by adopting foreign experience of cryptocurrency market. This will allow the Ukrainian economy to develop by supporting innovative start-ups.

– the conservative model of cryptocurrency market regulation in Ukraine seems to be rather promising. It is the state that ought to license and tax transactions with cryptocurrencies by the means of financial regulators.

In further scientific inquiries attention should be given to applied aspects of cryptocurrency market regulation and an effective «ecosystem» consisting of new members, not typical for traditional payment systems.

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