Kyiv National University of Trade and Economics
The World Economy Department

FINAL QUALIFYING PAPER (PROJECT)
on the topic:

The role and importance of cryptocurrencies in financing the development of the world economy (focusing on European, Asian, and North American regions)

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Kyiv, 2021

АНОТАЦІЯ

Грабовська Марія Юріївна. Роль та значення криптовалют у фінансуванні розвитку світової економіки (на прикладі європейського, азіатського та північноамериканського регіонів). Випускна кваліфікаційна робота присвячена актуальній проблемі залучення фінансування через криптовалюти та пов'язаним ризикам.

В роботі проведено комплексний аналіз інвестиційних можливостей використання криптовалюти у світовій економіці, проаналізовано форми існування криптовалют в економічній системі. Розглянуто спосіб залучення інвестицій шляхом використання криптовалют. На прикладі європейського, азіатського та північноамериканського регіонів досліджено динаміку залучення інвестицій у сферу виробництва та послуг шляхом проведення ICO (*прим. автора: ICO - initial coin offering – первинне розміщення монет*). Досліджено проблеми та перспективи залучення інвестицій в економіку України шляхом використання криптовалют.

Ключові слова: криптовалюта, залучення інвестицій, смарт-контракти, проведення ICO, регулювання криптовалют

ANNOTATION

Hrabovska Mariia. The role and importance of cryptocurrencies in financing the development of the world economy (focusing on European, Asian, and North American regions). The final qualifying paper is devoted to the current problem of attracting funding through cryptocurrencies and the risks associated with it.

A comprehensive analysis of investment opportunities for the use of cryptocurrency in the world economy as well as analysis of the forms of existence of cryptocurrencies in the economic system was carried out. The method of attracting investments through the use of cryptocurrencies was researched. The dynamics of attracting investment in production and services through ICO were studied based on the example of European, Asian, and North American regions. Problems and prospects of attracting investments into the economy of Ukraine through the use of cryptocurrencies were analyzed.

Keywords: cryptocurrency, investment attraction, smart-contracts, ICO, cryptocurrency regulation

CONTENT

INTRODUCTION

The relevance of the topic is that year-by-year the market capitalization of cryptocurrency has grown steadily, according to analytical agencies, it is now equal to USD 3 trillion. This unprecedented demand is due to the worldwide use of cryptocurrency in everyday life, the introduction of state regulation of cryptocurrency in foreign countries, and the growing interest of the world's most influential financial companies in the possibility of storing assets in cryptocurrency. Ukraine is currently developing legislation to use cryptocurrency. The introduction of blockchain technology in public and private enterprises will not only solve the problems of inefficient management and the presence of corruption elements in the chain of life of enterprises but also will attract significant investment in the development of the Ukrainian economy.

Analysis of recent research and publications. Among the scientists who studied the development and impact of cryptocurrencies on the world economy, we can highlight I. Lubenets, A. Ovcharenko, A. Polchanova, N. Polyvka, M. Roeschlin, Y. Solodkovsky and others.

The **purpose** of the paper is to study the theoretical grounds of the use of cryptocurrency in investment activities, analyze the dynamics of investment attraction through cryptocurrency in North America, Asia, and Europe and define the problems and prospects of attracting investment in Ukraine in form of cryptocurrencies.

According to the purpose, the following **objectives** were set:

- to identify the economic essence and forms of development of cryptocurrencies in the modern world economy;
- to identify the methods of using cryptocurrencies or cryptocurrency systems in investment activities;
- to analyze the dynamics and structure of investment attraction through ICO into industries of countries of North America, Asia, and Europe;
- to research the use of cryptocurrencies in international investment in services;
- to identify the perspectives and risks of attracting foreign investment in the form of cryptocurrencies;

- to analyze problems and prospects of cryptocurrency regulation in Ukraine.

The **object** of the topic is the relations arising from the use of cryptocurrency as an investment tool.

The **subject** of the topic is the theoretical understanding and features of attracting investment through initial coin offering, and problems and perspectives of use of such type of funding in Ukraine.

Research methods. The methods used during research could be divided into general and particular. General methods include analytics, classification, and synthesis which were used to decompose the object of the final qualifying paper into features and properties to study it more specifically in the theoretical part of the research. The particular methods include conducting statistical analysis used to collect information on comparable countries to prepare conclusions on the dynamics of the use of the object of study.

The scientific novelty follows from collecting, processing, and summarizing data from foreign and domestic resources. The conclusion made in the research could be used for the practical implementation of recommendations on the use of cryptocurrency in Ukraine.

The practical novelty is the introduction of recommendations on legal regulation of attraction investment in form of cryptocurrency in Ukraine.

Approbation and utilization of research results: article «The role and importance of cryptocurrencies in financing the development of the world economy» in the collection of scientific articles «International relationships», KNUTE, Kyiv, 2021.

Structure and volume of the final qualifying paper. The project consists of an introduction, three parts, general conclusions, and references. The study materials are presented on 52 sheets, in 7 tables, in 1 picture. The list of used references contains 54 names.

In the first part, we identified the essence of blockchain technology and cryptocurrency as well as analyses the types of cryptocurrencies and their differences. We also analyzed the ways of attraction of investments in form of cryptocurrencies, their

advantages, and related risks. As a result, we defined the theoretical base of cryptocurrencies' use in investment activity.

In the second part, we analyzed the dynamics of attraction of investment through cryptocurrencies by companies based in North America, Asia, and Europe over the last 4 years and the legal framework of such attraction. The summarized analysis was represented in table format.

In the third part, the prospects and problems of attraction of investment in form of cryptocurrencies in the Ukrainian economy were defined. The development of a legal framework was proposed.

The conclusions and recommendations' part summarizes the conducted research and outlines the topic of the final qualifying paper.

PART 1

THEORETICAL GROUNDS OF THE USE OF CRYPTOCURRENCIES IN THE INVESTMENT ACTIVITIES

1.1. Economic essence and forms of development of cryptocurrencies in the modern world economy

A cryptocurrency is a form of digital currency that is created, maintained, and secured by cryptographic recording.

Initially, cryptocurrency was conceived as a means of payment. Nevertheless, the use of cryptocurrencies is not limited only to payment, as of now, cryptocurrencies allow start-ups to attract funding for projects, use tokens as a means of voting in the project, and much more. Every year more and more companies around the world are introducing cryptocurrency's use to provide their goods and services. The reason for this widespread use is several advantages that cryptocurrencies have over the traditional banking system. These include the decentralization nature of cryptocurrencies, the lack of commissions inherent in bank transfers, the protection of transactions using a cryptographic method. The cryptocurrency does not have a single issuer and is not backed by the national currency of any country, so it is not subject to regulation by central banks. It also follows that cryptocurrency cannot be counterfeited. This makes cryptocurrency transactions extremely difficult to hack or manipulate. Unlike other forms of digital assets - such as gold traded on exchanges, gambling assets such as equipment or artifacts - cryptocurrency is generally not subject to censorship because it is not controlled by a central government. This overturns the old currency paradigm, according to which currency was created and issued by government monetary authorities and controlled by central banks such as the US Federal Reserve.

In recent years, the spread of cryptocurrencies has been exponential (figure 1.1).

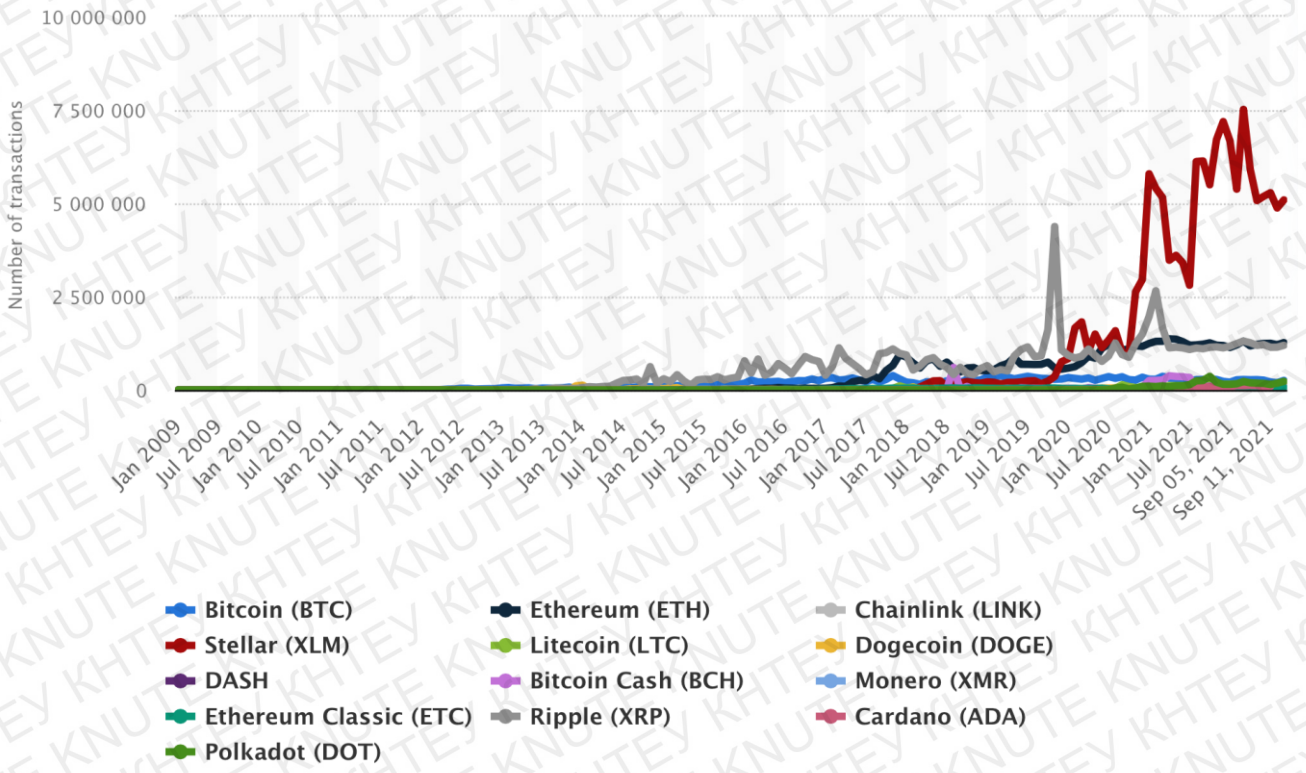

Figure 1.1. The number of daily transactions in Bitcoin, Ethereum, and 11 other cryptocurrencies from January 2009 to September 11, 2021. Source: [40]

Blockchain. Each cryptocurrency is built on blockchain technology. Gareth White in his publication defines a blockchain as a form of digital register consisting of «blocks» of information (White, 2017). Each «block» contains a record of transactions occurring in the network. Each «block» of information is added to the register, thus forming a «chain of blocks», which is translated from English as a blockchain. An important element from a technical point of view that supports the functioning of the blockchain is «hashing». Each newly added block is encoded with a hash. This is arithmetically generated code that is generated from the data contained in the block. In addition, the hash of the new block contains the hash of the previous block, which makes it extremely difficult to falsify new or existing blocks, because the hash of the previous block partially determines the hash of future blocks. In order to change one block, the whole chain of blocks will need to be rewritten.

An unconditional advantage of using blockchain technology is its adaptability to different areas of activity, built on large databases (Vorobets, 2020). For example,

according to DHL's 2018 report, blockchain technology is used by the company to increase the transparency of the supply chain. Such a data chain automatically accumulates information on how goods are manufactured, where they are delivered from, whether the conditions for proper storage of goods are met, and so on. This information becomes permanent and accessible to all participants in the supply chain, giving them enhanced opportunities to track supplies. Counterparts may use this information to confirm, for example, the originality of pharmaceutical products (DHL Report, 2018).

Due to the ability to store data without a centralized server, transparency, and reliability, blockchain technology has become the basis of cryptocurrencies.

There are four types of blockchain:

1. The public blockchain network is one that anyone can join and participate in, such as Bitcoin. Drawbacks might include substantial computational power required, little or no privacy for transactions, and weak security. These are important considerations for enterprise use cases of blockchain.

2. The private blockchain networks are decentralized peer-to-peer networks. However, one organization governs the network, controlling who is allowed to participate, execute a consensus protocol, and maintain the shared ledger. Depending on the use case, this can significantly boost trust and confidence between participants. A private blockchain can be run behind a corporate firewall and even be hosted on-premises.

3. The permissioned blockchain networks are usually set up by businesses that use a private blockchain. It is important to note that public blockchain networks can also be permissioned. This places restrictions on who is allowed to participate in the network and in what transactions. Participants need to obtain an invitation or permission to join.

4. Consortium blockchains are permissioned blockchains governed by a group of organizations, rather than one entity, as in the case of the private blockchain. Consortium blockchains, therefore, enjoy more decentralization than private blockchains, resulting in higher levels of security. However, setting up consortiums can be a fraught process as it requires cooperation between several organizations, which presents logistical challenges as well as potential antitrust risk (which we will examine in an upcoming article). Further, some members of supply chains may not have the needed technology nor the

infrastructure to implement blockchain tools, and those that do may decide the upfront costs are too steep a price to pay to digitize their data and connect to other members of the supply chain (IBM, 2020).

History of cryptocurrency. Bitcoin was not the very first attempt, although it was the most successful, to introduce digital money and change the world of conservative payments. For example, in the early 1990s, the founder of the DigiCash company, the famous American specialist in cryptography and computer science, David Chaum, created the first electronic currency Cyberbucks, which was encrypted using cryptography, while its emission was not controlled by the bank. At the same time, the electronic currency was issued by DigiCash, which became its main drawback. The bankruptcy of the company in the late 1990s led to the collapse of the system. Improvements in encryption methods and secure transmission modes have been implemented in such projects, including «Hashcash», which is a proof-of-work system used to reduce the number of spam and DoS attacks. The system was proposed in May 1997 by Adam Back and later became used in Bitcoin and other cryptocurrencies as part of a data analysis algorithm [1]. In 2008, a person or a group of people under the pseudonym Satoshi Nakamoto published a file describing the protocol and the principle of operation of the payment system in the form of a peer-to-peer network [32]. Development began in 2007 and in 2009 he finished developing the protocol and published the white paper of the project containing the program code of Bitcoin. Ultimately, proof-of-work became the cornerstone of the Bitcoin network, and Hashcash was mentioned in Satoshi Nakamoto's white paper [32].

Types of cryptocurrencies. Even though Bitcoin is the most famous cryptocurrency, the crypto market is quite diverse. The first cryptocurrency developed (including Bitcoin) was based on blockchain technology, which uses a concept known as proof-of-work («**PoW**») to process transactions. The concept of PoW is to compete with miners in solving complex mathematical problems. When the correct answer is found, the miner loads the block to the network, where it is checked by other members of this network. If the correct answer is confirmed, the block is added to the chain of blocks, the miner receives a reward. The main problem with the PoW concept is the fact that the

cryptocurrency that is built on this concept is poorly scalable — the mining process requires significant resources. To overcome this problem, another blockchain model known as proof-of-stake («**PoS**») has been developed. Unlike PoW, in the PoS concept, the person who confirms the correctness of the transaction is chosen at random, based on the percentage of coins that such person has provided to process the transaction, of the total number of coins. Thus, these two types of cryptocurrencies differ from each other based on the technology on which they work. There are also differences in the purpose of placing cryptocurrencies on the market. For example, stablecoins are cryptocurrencies designed to securely store the value of an asset to which the value of a stablecoin is pegged, such as Teather (USDT), pegged to the US dollar. The reason for their creation was a strong fluctuation in the value of standard cryptocurrencies, such as Bitcoin and Ethereum, for a short period, which made their use difficult. Thus, stablecoins combine the features of both tokens and standard cryptocurrencies, as they are built on existing blockchains, but can be exchanged for currency. In the market, they play a vital role, allowing you to perform daily operations in the absence of high volatility. Typically, the value of stablecoins is pegged to one or more currencies, so the value of the token is backed by reserves of those currencies (Kovačević, 2020).

Another form of a digital asset is a token. Tokens are difficult to classify as «cryptocurrencies» because they differ in the way they are issued (they cannot be mined, each token has an issuer), purpose (no purchasing power, used according to the rights granted to the investor during the initial coin offering) and technology, which ensures the functioning of the token (do not have their own blockchain and are based on the blockchain of the issuing platform). The token is an important element in the conduct of the initial coin offering («**ICO**»), which provides the investor with a guarantee of obtaining certain rights as a result of participation in the ICO of a particular project.

1.2. Methods of using cryptocurrencies or cryptocurrency systems in investment activities

Blockchain as a driver of transaction cost economy. The theory of transaction costs was formulated by the Nobel laureate in economics Ronald Coase in his paper The

Nature of the Firm. These include the costs of organizations to ensure conditions for economic exchange (in other words, the costs of current activities). There are four types of transaction costs: costs of collecting and processing information, costs of negotiations and decision-making, control costs, costs of the legal protection of contract performance. Another common name for them is «blank costs», as they do not lead to added value [16].

In a stable company, the share of such costs gradually increases, making the system less efficient and competitive. Conversely, lowering costs leads to higher profits, which is the main goal of most companies. A significant part of the transaction costs of a business falls on various types of intermediaries, which are necessary to clarify all the circumstances of doing business. For example, if a disputable situation arises when counterparties interpret an event in different ways, then clarifying the true version requires agreeing on the chronology and circumstances of the event.

Some processes that are important for the company go beyond its boundaries: for example, the supply chain management process affects suppliers, logistics companies, insurers, and financial companies that provide factoring services or offer other financial instruments to replenish the working capital of suppliers.

All this activity is carried out at the junction of various corporate information systems, which are implemented in each of the listed companies in their way. An individual participant in the process can trust the data in his system, but he has no reason to trust the data from the counterparty's system, since they may contain an error or be fabricated. If there is a discrepancy in the data in the ERP systems of several participants, finding out the true version of events can take a lot of time, be accompanied by a complex document flow, and, possibly, will also entail legal costs.

Blockchain is a technology for maintaining replicated distributed ledgers (databases) that provides transactions by peers in a digital format without the involvement of intermediaries. Although in the mass consciousness blockchain is primarily associated with cryptocurrencies (primarily with Bitcoin) and their mining, this technology is already going far beyond the boundaries of the financial sector and in the future will cover most multilateral transaction systems. Blockchain is a disruptive institutional technology because it disrupts the order in which transactions are carried out in almost all markets

and requires the presence of intermediaries. The blockchain will liquidate (in the future) the very system of intermediation in the markets as an institutional fact [21].

Smart-contracts, asset tokenization, and decentralized applications which are the most striking technologies in the blockchain ecosystem are capable of causing many changes in the organization of business processes, the activities of government institutions, and the daily life of people. Mainly, such changes are associated with the decentralization of transactions, their automation (more precisely, algorithms, since the blockchain is based on consensus algorithms), and a dramatic reduction in transaction costs.

Smart-contracts. For the first time, the idea of a smart-contract was proposed by an American scientist in the field of computer science, cryptography, and law Nick Szabo in 1996. Smart-contracts were defined as automatically executable agreements between parties based on pre-defined codified criteria. The full contractual process is codified and excludes renegotiation of terms unless the smart-contract specifically prescribes such an opportunity. The execution of the agreement is automatically enforced when the terms and obligations of the parties codified with the blockchain technology are fulfilled (Szabo, 1996).

As of now, the Ethereum platform is the largest tool for the creation of smart-contracts.

The creation and subsequent execution of a smart-contract, as a rule, proceed according to a certain scheme:

1) coordination and consolidation of the terms of the transaction between the participants, conclusion/creation of a smart-contract;

2) connecting a smart-contract to internal systems (systems of banks, financial or other organizations) and external systems - oracles;

3) the expectation of the events described in the contract and the assessment by the smart-contract of its status at a certain point of time (to what extent both parties have fulfilled certain conditions);

4) self-execution of a smart-contract when the participants fulfill the established requirements.

There are several types of smart-contracts in terms of the execution of agreements:

- Control over property relations - ownership and operations with digital assets (including cryptocurrencies and tokens).
- Financial services - trading on the stock exchange, participation in auctions, trade financing, etc. (large platforms allow banking transactions on the blockchain).
- Loan obligations - execution of agreements on various forms of bank loan products.
- Social services - insurance processes, voting, and election procedures.
- Management of delivery and storage of goods.

One of the most promising applications for smart-contracts is the automation of the provision of banking services, such as supply chain financing, mortgage lending, and small business lending. Smart-contracts will automate payments and reduce uncertainty and credit risks.

The use of smart-contracts gives users several advantages at once.

Firstly, it is the transparency of the contract: the parties of the transaction can control its execution at all stages and make sure that the counterparty has fulfilled its part of the contract.

Second, a smart-contract provides for enforcement mechanisms, such as fines and sanctions.

Another advantage of smart-contracts is their verifiability, which allows parties to determine the participants and the sequence of their actions, forming an audit trail. Also, the value of smart-contracts in the security of their conditions and data from third parties. The privacy of a smart-contract insulates it from external influences, and liability is limited to the parties to the transaction.

But, despite all the advantages, working with smart-contracts has its difficulties associated with technical features, as well as the relative youth of the technology:

– Automatic execution of a smart-contract. On the one hand, this is an obvious plus. But in the world of living people and objective factors affecting business processes, the same item can receive a minus sign. It is impossible to «negotiate» with a smart-

contract. In case of automatic self-fulfillment, it will not take into account arguments about a shortage of goods, a flood, or everyday troubles, and for violation of the terms of the deal will inevitably be followed by a fine.

– A wary attitude towards the new technology on the part of traditional, heavy-handed enterprises, accustomed to working in an old-fashioned way. Such a counterparty may refuse to conclude a deal in a new way or, since it is used to constant postponements, will violate the regulations established by the smart-contract.

– So far, in the world legislative practice, the status of a smart-contract is not regulated. In some cases, this can make it difficult to resolve disputes in case of violation of the terms of the transaction. In addition, the question of jurisdiction to resolve such issues remains open. Among other things, smart-contracts are concluded within the framework of cross-border relations - and here difficulties may arise in the field of substantive and procedural law.

For example, the European Central Bank released a report in 2017 highlighting several challenges associated with the use of smart-contracts:

• The complexity of determining the legal status for the program code, which is the basis of the smart-contract;

• The code may contain errors, which will be more difficult to eliminate due to the interconnection of various elements within the distributed ledger;

• Execution of a smart-contract is tied to external events, about which incorrect information may be received.

Despite some difficulties as discussed above, smart-contracts are widely used for conducting ICO to secure the transactions between the two parties (entrepreneurs and investors). Smart-contracts allow making information on ICOs transactions publicly available [2].

The essence of ICO. Initial Coin Offering is an unregulated way in which a newly created company raises funds. ICOs are used by startups to circumvent strict and over-regulated investment processes [10].

The use of smart-contracts makes it possible to automate the issue of new tokens: information on the size and senders of funding sums is entered into the contract, the

contract itself charges tokens, and also enables each participant to transfer and sell these tokens. No fiddling with email addresses, credit cards, card verification, investor authorization, or the like. In addition, everyone can see how many tokens were issued in total and how they were distributed among the participants. The blockchain protects from the hidden emission of tokens and the sale of one token several times.

Investors wishing to finance a project based on blockchain technology provide financial resources in exchange for further receipt of tokens that can be used as project currency (i.e., a new cryptocurrency), exchanged for fiat funds, other cryptocurrency, goods, and services, or will be traded as digital financial assets on stock exchanges.

The fundraiser, in turn, issues tokens using blockchain technology, sets the placement price in cash and sells tokens for cryptocurrency or fiat money to investors on certain terms.

Technically, tokens are issued by adding a transaction record to the blockchain, providing their number, description and assigning a unique identification code. Each token placed during the ICO corresponds to a constant record in the blockchain, which ensures its easy exchange and storage. After issuance, tokens can be sent to any e-wallet in the blockchain system (Lukasevich, Kozenkova, 2018).

Therefore, the ICO process usually consists of the following steps:

• at the first stage, developers issue a technical document that describes the program or protocol, their features, and implementation;

• in the second stage, they conduct pre-sales, usually available to investors or people close to the project team;

• in the third stage, the actual distribution of tokens takes place on a pre-announced date in accordance with the investor’s share in project financing.

Tokens issued through the ICO can be endowed with different characteristics and give the owner various rights (Schückes, Gutmann, 2020), for example:

• the right to own an asset, i.e., to secure ownership or a claim for a physical product on a blockchain — for example, the token of the Swiss startup Orocrypt secured ownership of a gold bar;

• the right to use, i.e., consolidate access to the service — for example, the token of the Irish startup Cloud With Me provided access to cloud services;

• the right to develop, i.e., enshrine the right to develop in a decentralized network - for example, the token of the startup Protocol Labs, based in the US, allowed the service provider by providing its assets to support transactions («staking») to gain the right to develop online (work right).

Regarding the value of tokens, it should be noted that J. Conley considers five basic models of token valuation, among which he singles out the application of the quantitative theory of money, behavioral theory, reduction to present value, use of market efficiency theory, and even metagame theory. Meanwhile, the evaluation of tokens is carried out taking into account the political, legal, and economic conditions - both national and global, and special attention is paid to the project itself and its potential (Conley, 2017).

There are several types of ICO, which include:

1. Initial Coin Offering is a term describing a limited period, in which a company sells a predefined number of digital tokens (coins) directly to the public, in exchange for cryptocurrencies or fiat currencies.

2. Security Token Offering («**STO**») is a sale of tokens with features comparable to normal securities, i.e., fully regulated and approved within at least one jurisdiction.

3. Initial Exchange Offering («**IEO**») is an ICO (or STO), which is exclusively conducted on the platform of a cryptocurrency exchange. IEOs are administered by the crypto exchange on behalf of the issuing company, which seeks to raise funds with its newly issued tokens.

Prospectively, ICOs / STOs / IEOs are alternatives to classic debt / capital-funding as performed today by Venture Capital / Private Equity firms and banks [4].

Due to the lack of regulatory levers for the ICO process, this method of raising funds is becoming increasingly popular among small and medium-sized businesses. The most successful ICOs based on ROI are described in table 1.1 below.

Table 1.1

The most successful ICOs based on ROI

No.	Name	Funds raised (US Dollars)	Number of tokens sold	Token ICO price (US Dollars)	Current price (US Dollars)	ROI since ICO (%)
1	NXT	17k	1,000,000,000	0.000016	0.019	1,130,800
2	Ethereum	15m	50,000,000	0.31	4,781	1,542,100
3	IOTA	435k	999,999,999	0.0004	1.40	350,000
4	Neo	556k	17,500,000	0.03	51.95	173,000
5	Stratis	611k	84,000,000	0.007	2.22	31,600
6	Cardano	62m	45,000,000,000	0.0024	2.24	93,200
7	BNB	15m	100,000,000	0.15	658	438,500
8	Filecoin	257m	40,000,000	1	68	6,700

Source: created by the author based on date from coin desk, icodrops, icodata

From the analysis of the data given in the table, it follows that attracting investment through the ICO procedure is a promising form of financing for startups.

For example, one of the most successful ICOs was the blockchain storage platform Filecoin. The essence of the project was that users rent out their computers and receive rewards. As participating in the Filecoin network through mining and storage is directly linked to winning more block awards, Filecoin encourages participants to act honestly and store as much data as possible [47]. The tokens were sold in August 2017 on the CoinList platform according to the rules of the US Securities and Exchange Commission. 30 minutes after the start, the project raised a record amount of USD 200m. The total amount, including the previous sale of tokens, amounted to USD 257m [41].

Conclusions to Part 1

The cryptocurrency was initially created to solve the problem with financial security and independence. The first attempts to use cryptographic technologies in

processing payments were made in the 1990s, however, the only method which succeed resulted in the launch of the first cryptocurrency - Bitcoin - in 2009. Even though the process of cryptocurrency's adoption has not been precipitous, the gradual expansion of blockchain technology into the business process all around the world has resulted in increasing interest in cryptocurrencies and the way they could improve the antiquated financial system.

By eliminating the need for intermediaries (government, banks, notaries, auditors, brokers, insurers, accountants, lawyers, etc.), blockchain can radically reduce the costs of transactions and increase the efficiency of all economic processes and systems, regardless of their scale and specifics. Blockchain destroys paper traces and speeds up transactions, facilitates asset verification and contract tracking. Basically, smart-contracts are self-executing contracts between buyers and sellers in a decentralized blockchain network. These entities allow anonymous parties to carry out transactions and agreements among themselves. One of the key applications of smart-contract is to control the transfer of digital assets between the parties within the fundraising during the ICO process. ICOs are capital-raising activities in the cryptocurrency and blockchain ecosystem. They are similar to initial public offerings, except they use cryptocurrencies instead of traditional securities. ICOs are advantageous because they eliminate intermediaries from the capital-raising process and establish direct links between investors and companies. In addition, both parties benefit from a direct connection.

PART 2

THE MAIN AREAS OF CRYPTOCURRENCY INVESTMENT IN THE WORLD ECONOMY

2.1. Dynamics and structure of investment attraction through ICO into industries of foreign countries

The various ICOs are attempting to digitalize aspects of networks and communications, allowing different models of monetization, with pricing driven by an external market rather than internal marketing functions. Some link to an existing cryptocurrency and blockchain like Ethereum, while others are trying to create something new.

ICO funding started gaining traction in 2016 and exploded in 2017, where the funding increased from USD 228m to USD 2.6m [13].

According to the ICOBench website, 5,470 campaigns were completed by November 2019, of which 1,785 were successful and 3,685 failed [20].

The USA, UK, Singapore, and Hong Kong are among the main countries based on several conducted ICOs throughout 2018 and 2019 (table 2.1) which indicates a strong positioning of these countries in the offer of tokens (PwC, 2020).

Table 2.1

Breakdown of the number of ICOs conducted within 2017-2020 per selected countries of North America, Asia, and Europe

Country	2017	2018	2019	2020
United States of America	87	96	75	124
United Kingdom	26	93	100	95
Singapore	35	147	98	151
Hong Kong	N/A	39	39	67
Switzerland	33	69	55	89
Germany	N/A	N/A	22	N/A

Continuation of table 2.1

Country	2017	2018	2019	2020
Canada	10	17	2	4
Total number of ICOs per year	**191**	**461**	**391**	**530**

Source: created by the author based on data from ICOBench, ICOdata.io, Crunchbase

As follows from the table. 2.1 the number of ICOs conducted in North America, Asia, and Europe has been growing from year to year. The total number of ICOs conducted in the considered countries in 2020 has increased by approx. 177% compared to 2017. The statistics on ICOs conducted in the USA as well as Singapore in 2019 and 2020 confirm that despite the deterioration of financial performance in many sectors of the economy during pandemics caused by coronavirus disease the companies have actively attracted investments in form of ICO.

According to the Atomico report *«The State of European Tech»* (2017), ICOs conducted by European countries in 2017 received 46% of all funding invested in ICO or approximately USD 1.7m, a major part of which of received by companies based in Switzerland. Hong Kong and Singapore are leading ICO hubs in the Asian region based on the amount of funding in the considered years. By 2020 in the North American region, the USA remains the leading country by the funds raised through ICO, since Canada recognized tokens sold in ICO as securities which caused more restrictive regulation of this process (table 2.2).

Table 2.2

Top countries by the funds raised through ICO in 2017-2020 (in US dollars, millions)

Country	2017	2018	2019	2020
United States of America	1.7	1.5	66	127
United Kingdom	372	916	98	224
Singapore	641	2.1	110	1.8
Hong Kong	65	223	1.9	1.2

Continuation of table 2.2

Country	2017	2018	2019	2020
Switzerland	1.4	894	N/A	1.3
Germany	105	187	57	160
Canada	163	248	N/A	57
Total amount of funds raised per year	**4.5**	**6.1**	**2.2**	**4.9**

Source: created by the author based on data from ICOBench.com, ICOdata.io, TokenData.io, crunchbase.io

Countries in the Asia region (i.e., Singapore and Hong Kong) are leading by the amount of funds raised in 2020. This means that ICO hubs in Asia are developing more rapidly than those in North America and Europe. One of the key features of countries of the Asia region compared to such countries as the USA is the more permissive regulatory policy.

In the USA, the belonging of an asset to securities is determined by the Howey test, which is also used by the Securities and Exchange Commission («**SEC**»).

In particular, when passing this test, the following questions are answered:

1. Is there a joint venture?
2. Whether money is invested in this enterprise?
3. Are there grounds for a reasonable expectation of profit from this enterprise?
4. Is the profit achieved through business or management efforts of third parties?

Most ICOs meet all the conditions since they belong to investments. Almost any transaction with tokens is suitable for Howey's criteria since it is carried out in a market with high volatility.

The SEC recognizes coins as securities if the issuing company gives investors a vote right, shares in a business, or simply promises a profit. Representatives of the SEC warn about the need to keep financial statements, to disclose the details of the proposal. Even if the owner of the cryptocurrency keeps it for resale, it is considered as portfolio securities.

Despite tight regulation, the United States remains at the forefront of attracting ICOs. According to Coindesk, in the first half of 2017, more than USD 729m was raised

as an investment through ICOs, compared to USD 192.3m which is the total amount of funds raised through an IPO worldwide during 2017 (Coindesk, 2017). Despite the fact that the amount of funds raised from the IPO grew from year to year until 2020, it is still not comparable to the amount of funds raised through the ICO (table 2.3).

Table 2.3

Total number of IPOs conducted and amount of funds raised (in US dollars, millions) within 2017-2020

Indicator	2017	2018	2019	2020
Amounts raised (US dollars, millions)	192.3	205.8	208.3	268
Number of IPO	1713	1383	1146	1363

Source: created by the author based on EY report on IPO.
Internet source: https://www.ey.com/en_gl/ipo/trends

The correlation between the number of IPOs conducted within 2017-2020 and the total amount of funds raised with the same in ICOs shows that despite the fact that the number of IPOs carried out within 2017-2020 is greater than the number of ICOs within the same period in ICO hubs in North America, Asia, and Europe region, the amount of funds raised is higher in the case of ICO.

Countries in Asia have had varied stands on cryptocurrencies with nations like China and South Korea emerging amongst the most rigid jurisdictions, while countries such as Singapore and Japan have opted for a more *laissez-faire* approach.

China has been taking ever-increasing steps to curb cryptocurrencies trading and has been amongst the most stringent regulators regarding cryptocurrencies.

This started by banning ICOs in September 2017, followed by ordering a bank account freeze associated with exchange platforms, kicking out Bitcoin miners in January 2018, and most recently, instituting a nationwide ban on the Internet and mobile access to cryptocurrency trading, blocking domestic and foreign services to «prevent financial risk».

South Korea too banned ICOs as well as margin trading of cryptocurrencies in September 2017. Regulators cited the unprecedented number of frauds in the ICO sector.

Contrary to mainland China, Hong Kong's Securities and Futures Commission has confided itself to publishing a set of rules for companies looking to launch an ICO.

Meanwhile, Singapore has emerged as a hub for ICOs, thanks to its convenient taxation rules and supportive government stand towards fintech. The city-state's central bank and financial regulator the Monetary Authority of Singapore issued a set of guidelines for token sales in November 2017, noting that the regulator does not regulate virtual currencies. The regulator stated that it welcomes ICOs as an innovation that can potentially reduce the cost of financial transactions. But the activities that surround virtual currencies if these activities pose specific risks should be subject to regulation.

The Atomico report *«The State of European Tech»* (2017) also stipulates that almost half of the funds raised in Europe went to Swiss companies, mainly those based in Zug where the so-called Crypto Valley Association is located.

Crypto Valley Association was chosen by hundreds of fintech and blockchain startups, including Ethereum, ShapeShift, Cosmos Network, and many more. The Tezos Foundation is also registered in Zug, which raised a record USD 232m for ICO as of August 2017.

The canton itself has traditionally been considered one of the best places to do cryptocurrency business due to its friendly regulatory environment and policies regarding attracting tech startups to do business in the canton.

Bitcoin and other cryptocurrencies are considered assets in Switzerland by the report of the Swiss Federal Council (clause 2.2.1), and therefore they are neither securities nor financial contracts (e.g., futures, options, etc.), nor property rights. Cryptocurrency activities are also governed by the provisions of the Swiss Criminal Code («**SCC**»), for example, a person is liable for money laundering using cryptocurrencies by Article 305bis SCC.

For legal regulation in Switzerland, cryptographic tokens can be:

• Securities if the appropriate rights are assigned to token-holder, such as the provision of a share in the company's profits, the right to receive profits in general, voting rights, etc.

• Assets in case the tokens do not fall under the definition of securities.

Switzerland does not establish special rules for the conduct of token sales, although it does require adherence to the provisions of the legislation in the field of combating money laundering and terrorist financing, such as «Know Your Client» and Anti-Money Laundering Policy.

On February 16, 2018, the Swiss Financial Market Supervisory Authority published recommendations for the ICO where the regulator divided all token sales into three main categories:

1. Payment ICO. Tokens sold as part of the Payment ICO can be transferred and act as a means of payment. They must be sold under the Swiss Anti-Money Laundering Act, but they are not considered securities. As a rule, they mean familiar cryptocurrencies.

2. Utility ICO. Such tokens do not qualify as securities if their sole purpose is to provide digital access to an application or service.

3. Asset ICO. Tokens are considered as stocks or bonds if, for example, dividends, interest are paid on tokens, or tokens give the right to receive part of the profit. Such ICOs are carried out within the framework of the strict requirements of the legislation in the field of securities and the stock market.

ICOs can also exist in a hybrid form of these three categories. For example, anti-money laundering legislation applies to utility tokens, which can also be widely used as a means of payment (Swiss Financial Market Supervisory Authority, 2018).

In its resolution on ‘Further development of the capital markets union’ improving access to capital market finance, in particular by small- and medium-sized enterprises («**SME**»), and further enabling retail investor participation, adopted in October 2020, European Parliament stressed that that crypto-assets are becoming a non-traditional financing channel for SMEs, notably ICOs that have the potential to fund innovative start-ups and scale-ups. In this context, Parliament insisted that clear and consistent guidance

at the EU level is needed on the applicability of existing regulatory and prudential processes to crypto-assets that qualify as financial instruments under EU legislation, in order to provide regulatory certainty and avoid a non-level playing field, forum shopping and regulatory arbitrage in the internal market (European Parliament, 2020).

2.2. The role of cryptocurrencies in international investment in services

Considering the distribution of the projects funded by ICOs during 2019, the industries that attracted the most investment are the sectors closer to the development of the core of the blockchain economy: platforms allowing the interaction among networks of users, smart-contracts, internet-based products, and other types of infrastructure relating to some IT network environment. These accounted for about 30% of the funds gathered during 2019. The same tendency continued in 2020 (Table 2.4).

Table 2.4

Breakdown of services' sectors attracted funds through ICO during 2019-2020 (in US Dollars, millions)

Services' sectors	Total funds raised during 2019	Total funds raised during 2020
Blockchain	14.8	16.2
Platform	12.6	13.1
Business Services	4.3	5.1
Software	2.9	3.2
Banking	3.7	2.2
Investment	3.4	4.5
Entertainment	1.5	4.3
Internet	2.3	1.6
Infrastructure	3.7	4.2
Total funds raised	**49.2**	**54.4**

Source: created by the author based on data from cointelegraph.com, statista.com, ICOBench.com

The business services' funding increased from 2019 to 2020 which proves the continuous implementation of the use of cryptocurrencies in business processes. On the other hand, the fintech sector, which includes both banking and financial investment, amassed USD 6.7m in 2020, which is slightly less than 2019, this is due to the increased interest of regulators in the cryptocurrency, which is used in the banking sector and protracted litigation between the SEC and Ripple in the USA. However, many new projects didn't complete their ICOs with economic success.

Other industries that achieved positive results during 2019-2020 were positioned in the IT sector and included such businesses involved with software, big data, or artificial intelligence. However, some relevant investments were aimed at applications in other sectors, such as business-oriented services, with USD 5.1m in funds raised, and entertainment- and media-related industries, with USD 4.3m.

The presence of other sectors further away from IT or high-tech industries is of little significance.

Asian countries are leaders in the use of cryptocurrency for the provision of financial services.

Thailand has become one of the leaders in digital payments. It has specifically focused on immediate interbank transfers between individuals and at Point of Sale (POS) through the utilization of QR codes, mobile, and account numbers. It was as recent as 2017 when the Bank of Thailand supported the «PromptPay» initiative which encouraged Thai banks to realize large cost savings from the lowering of the use of cash. Meanwhile, approximately 70% of Thai bank account holders signed up for «PromptPay», and this is also currently used by small retailers, who no longer need to handle cash.

A leader in instant payments, the Monetary Authority of Singapore was among the first Asian central banks to conduct «detailed technical studies on domestic cryptocurrencies». This was dubbed «Project Ubin» and it explored domestic and cross-border clearing and settlement. However, apart from various rumors, the intention to launch Singapore's central bank digital currency remains to be officially announced.

Bakong service which is expected to be launched in October 2022 by the National Bank of Cambodia will make available to retail customers peer-to-peer funds transfer

which supports transactions in Cambodian riel or US dollar. Almost a third of the Cambodian population is already on board with this project. One of the main reasons for this success has been the low barriers to entry, which has the potential to boost financial inclusion, ultimately with real impacts on economic activities.

While many Asian countries are forging ahead with crypto and digital currencies, not all players have expressed a keenness over this monetary solution. India's Parliament, for example, is expected to vote on cryptocurrency regulation soon, with expectations that it will ban all private cryptocurrencies and create «a legitimate framework for a Reserve Bank of India digital currency». Meanwhile, the Philippines, which was the first country in Asia to embrace mobile payments, has not yet capitalized on its initial lead. Finally, Indonesia remains in a waiting position.

Apart from financial services, the ICO is largely used by the healthcare industry, tokens are issued by companies presumably based in the USA.

Healthcare's first ICO company, Patientory, started its crowdsale on 31 May 2017, raising USD 7.2m in just 3 days.

Patientory is a healthcare startup founded in December 2015 by Chrissa McFarlane as part of the 2016 inaugural class of the Boomtown HealthTech Accelerator in Boulder, Colorado. The company is focused on building a central repository for patient information. It uses blockchain technology to safely store and share patient records.

After the Affordable Care Act, all medical providers were mandated to use Electronic Health Records instead of paper files. Many companies developed in the area, each providing a different type of system. However, the systems were unable to communicate with each other, creating new silos of information.

The Patientory team aims to solve 3 well-known challenges of the healthcare industry:

1. The industry lacks a central platform recording all the personal health information («**PHI**»). Currently, medical data is stored and shared in silos. This creates a lack of interoperability and an uneven distribution of the data. Medical tests are therefore duplicated which leads to a considerable loss of time and money.

2. Patients do not have control over their PHI. This means that they are unable to decide with whom they will share their information. This leads to a misuse of medical records and information circulating without the patient's consent.

3. Given the increasing number of data breaches, IT systems are unable to safely and securely store medical records.

Using blockchain technology, data can be collected and shared among the medical community while insuring patient consent. Access to the information would be made easier through a centralized platform, therefore improving care coordination. Finally, Patientory will make the most out of the information it gathers with machine learning and AI techniques that support doctors in making informed decisions.

Today, the Patientory token has a market capitalization of USD 22m and it can be traded on Bittrex, TokenMarket, HitBTC, and ICObazaar. Its usage is summarized in the company's whitepaper: «The primary usage of the token is to regulate network storage allocation, health care quality measures, and revenue payment cycles». Patients are given an allotted amount of space to store information for free on the Patientory network.

Another sector that widely adopts tokenization is the financial sector.

Given that the financial sector is heavily regulated, tokenization has to overcome several impediments before it is accepted widely. Integrating and aligning with the current regulations is an essential thing because these laws exist to protect property owners. Vaultoro is an online cryptocurrency exchange. It is a unique platform designed to enable trade between crypto-assets and physical gold assets. Traders and investors can exchange their Bitcoin and Dash assets to buy and store physical gold assets.

Storage of the gold is securely done at Vaultoro's Switzerland vaults. These vaults store 99.9% pure gold, which is sourced directly from the smelting companies. Vaultoro also works towards storing gold in high-security vaulting facilities.

ProAurum Switzerland is the main storage facility for this platform. The insurance fee on these storage services is 0.4% of the active gold volume. This fee gets revamped after every 15 minutes.

The list of holdings offered by Vaultoro is limited. This exchange is not for those looking to explore a wide range of crypto-to-crypto or crypto-to-fiat trading. Customers can only trade quantities of gold and Bitcoin assets.

The described examples show that ICO hubs as Singapore, Switzerland, and the USA have already proved the advantages of tokenization in different types of services. With this technology, companies can quickly achieve better competitiveness by tapping into the transparency, liquidity, and accessibility provided by asset tokenization.

Conclusions to Part 2

ICOs are a relatively new method of raising capital for early-stage ventures. They allow businesses to raise capital for their projects, by issuing digital tokens in exchange for crypto assets or fiat currencies. They constitute an alternative to more traditional sources of start-up funding such as venture capital and angel finance. ICOs can potentially offer advantages in comparison with traditional ways of raising capital. At the same time, their opacity and the general tendency for issuers to exploit regulatory loopholes can carry significant risk for investors may make ICOs vulnerable to money laundering and terrorist financing and could even create financial stability concerns.

The most favorable European jurisdictions for launching ICO are Switzerland and the United Kingdom with 89 and 95 conducted ICOs respectively which is approx. 35% of the total number of ICOs conducted in world-leading ICO hubs. In Asia, the leading R&D centers specialized in the crypto sphere are Singapore and Hong Kong which share in total ICO conducted amounts to 41%. In North America despite the tough regulatory policy, the number of ICOs launched in the USA is increasing, while in Canada the number of ICOs declined by approx. 40% since 2017.

In financing the services' sector, the projects attracted the most amount of funds during 2019-2020 relate to the field of blockchain and platform services which share constitutes approx. 55% for 2019 and approx. 54% for 2020 approx. of all funds raised within the considered period. Positive results are also traced in the business services and IT sector. As for the fundraising through ICO in traditional financial services with such

sectors as banking and investment sectors, the demand for implementation of cryptocurrency is increasing. Their common share constitutes 12% for 2020.

Each county develops the regulatory burden which affects the ease of doing business, including attracting investments. ICOs have been met with a wide range of initial regulatory responses: from an outright ban in the case of China and South Korea to more supportive approaches in other jurisdictions, with Singapore in Asia and Switzerland in Europe leading the way. As for the European Union and the United States, the relevant regulatory agencies initially published warning notices, reinforced by statements that securities laws could apply, and registration could be necessary. The statistics show that the number of projects that prefer ICO as a way of capital fundraising is increasing from year to year. The USA example shows that increased regulatory complexity will not have a significant impact on the spread of ICO as a way to raise capital. As well as a complete ban, as can be seen in the example of some Asian countries, will not solve the problem. The ICO process must be detailed and clearly regulated in order to protect investors.

PART 3

PROBLEMS AND PERSPECTIVES IN ATTRACTING INVESTMENT IN THE UKRAINIAN ECONOMY

3.1. Perspectives and risks of attracting foreign investment in the form of cryptocurrencies

Until 2021, the use of cryptocurrency in Ukraine was in the so-called gray regulatory area. This means that the issue was not regulated by a normative act of the supreme body of state power, while the use was not formally prohibited. Formally, the citizens of Ukraine had access to cryptocurrencies through world cryptocurrency exchanges, for example, Binance, while Ukrainian investors were not protected by Ukrainian legislation in the event that an investment in ICO turned out to be a scam and a lawsuit was required to return the invested funds.

According to the Chainalysis report for 2020, Ukraine ranked first in the world in terms of overall activity in the use of cryptocurrencies (Chainalysis, 2020). This is primarily because the country has seen a decline in public confidence in the banking system after the bankruptcy of several well-known banks over the past decade. Lack of legislation, distrust of public financial institutions, limited access to traditional investment instruments such as the stock market, and the speed and ease of use of cryptocurrencies will only increase public interest in alternatives for paying for goods/services and storing and accumulating assets such as cryptocurrencies.

The advantages of using cryptocurrency, including ICO projects, such as transparency, speed of operations, reliability and consistency of data, a high level of security of operations, have great prospects. This provides market liquidity and economic potential for the state, creates additional channels for attracting investment to Ukraine, but with careful legal regulation given the widespread use of tokens.

The token can be used to exchange for a service or product of the company that issued it, it is a utility token (service token). Some tokens perform the function of a means of payment (payment token), and security token (tokens that have the characteristics of securities). A newly established or existing company issues its tokens and attracts an

indefinite number of investors to invest through the sale of these tokens. The ICO method for attracting investment makes sense for start-ups or government innovative investment projects. ICO has quickly taken a dominant position in financing startups, including Ukrainian, as investors hope that the cryptocurrencies issued will rise rapidly in value, as has happened with Bitcoin. Due to the simplicity of the procedure, the issuer does not need to bear the transaction costs associated with paperwork, control, and audit of project financing, report on the funds spent, as, for example, in the case of any other funding [18].

Decentralization of the process contributes, on the one hand, to the popularization of such project financing, on the other hand, creates risks both for traditional state institutions and for individuals, potential investors.

In addition, there are many inactive or failed ICO projects. At the same time, the risks borne by both the investor and the owner of the ICO project are currently not taken into account by current Ukrainian legislation. The lack of proper verification of issuers creates risks for investors. ICO projects can also be used to finance terrorist organizations or money laundering. For example, in Ukraine, there were cases when cryptocurrencies were converted by criminals into money, which was transferred to the territories temporarily occupied by terrorists, in particular, to finance illegal armed groups of militants [29].

The development of the Ukrainian ICO market is influenced by various factors, both positive and negative in terms of national well-being. In particular, political factors include bureaucracy and corruption in public and sometimes private financial institutions; non-regulation of ICO at the legislative level, due to which companies may evade taxes. Economic factors include insufficient stability of the national currency, its relative volatility, which provokes the transition to the use of others, including cryptocurrencies; reduction by banks of the allowable amount of lending; there is almost no interest in the stock market for shares of public joint-stock companies due to their moderate liquidity and inadequate protection of minority rights. Socio-cultural factors in our country are characterized by an unfavorable demographic situation, namely - a decrease in the working population of Ukraine, as well as a decrease in its solvency, which encourages organizations to attract foreign investors; the gradual increase of the level of basic

education of the population in the field of IT. Technological factors include high levels of education of IT professionals and their professional competence, which affects the quality of the latest developments; and it should also be noted that the Internet penetration of the population is increasing and, according to the Internet Association of Ukraine, as of the end of 2017, it was already 65% [18].

Existing Ukrainian legislation does not allow for a security to be issued in the form of a token in a blockchain register. Despite the lack of regulation, Ukraine was ranked 16th by the amount of funds raised in ICO rounds conducted in 2017 (EY report, 2017). The most successful ICOs by the amount of funds raised conducted by companies originating from Ukraine are presented in table 3.1.

Table 3.1

The most successful ICOs conducted by companies originating from Ukraine

No.	Company name	Country of origin (company/CEO)	Total funds raised (in US dollars)
1	Swiscoin	Ukraine, Russia, Greenland, USA, Poland	500k
2	TAAS	Ukraine	8m
3	Minex	Ukraine	789k
4	Propy	Ukraine, Russia	15m
5	DMarket	Ukraine	19m
6	Snovio	Ukraine	2m
7	Anryze	Ukraine	1,6m
8	Eloplay	Ukraine, Estonia	469m

Continuation of table 3.1

No.	Company name	Country of origin (company/CEO)	Total funds raised (in US dollars)
9	Hacken	Ukraine	5m
10	EMU Project (pre-ICO)	Ukraine, Estonia	109k
11	SocialMedia.Market (pre-ICO)	Ukraine	1,6m
12	DreamTeam	Ukraine	6m
13	Data Trading (pre-ICO)	Ukraine	2,6m

Source: ain.ua

Despite the fact that the issue of holding ICO remains the same gray area as the regulation of cryptocurrencies in general, Ukrainian startups attract raise millions to develop their business. Most likely, the success of Ukraine in the ICO market is due to highly qualified IT specialists, the lack of a clear regulatory framework that provides for more freedom of action and the high public interest in the use of cryptocurrencies.

If the ICO takes place in an EU Member State, companies are required to report it to the European Securities and Markets Authority (ESMA), where the tokens are treated as securities. In particular, ESMA stipulates that ICOs, depending on the area of activity, must comply with EU legislation set out in four directives: EU Directive 2003/71 dated 4 November 2003 «On prospectuses to be published in an open offer of securities or to be issued them for sale» (Prospectus Directive); EU Directive 2011/61 dated 08 June 2011 «On Alternative Investment Management Funds» (AIFMD); EU Directive 2014/65/EU of 15 May 2014 on markets in financial instruments (MiFID); Fourth Anti-Money Laundering Directive of 20 May 2015 «On the prevention of the use of the financial system for the purpose of money laundering or terrorist financing». In particular, the EU Prospectus Directive stipulates the need to provide reliable information to

potential investors through the publication of a prospectus in case of raising capital, i.e., the publication of a prospectus is a mandatory requirement and subject to approval by the competent national authority of the ICO. The MiFID contains licensing rules, product management rules, pre- and post-sale disclosures. The Directive on the Control and Laundering of the Proceeds from Crime contains requirements for the audit of clients, requirements for the system, management and accounting, and notification of suspicious activity [19].

In the US, the ICO procedure has already been settled, and funds are being raised, as in the IPO. Tokens in the United States can be equated to securities or commodities. The cryptocurrency market continues to dominate headlines, and investors pour more cash into ICOs in the hope of turning a quick profit. There are more than 150 scams listed on Deadcoins, a popular website that lists scams aimed at inexperienced investors. The most notable ICOs that turned into scams are presented in table 3.2.

Table 3.2

The most notable ICO scams

Company name	**Amount of money scammed (in US Dollars)**
Pincoin and iFan	660m
Plexcoin	15m
Bitcard	5m
Opair and Ebitz	2,9m
Benebit	2,7m
Bitconnect	700k
Confido	375k
REcoin and DRC	300k
Ponzicoin	250k

Continuation of table 3.2

Company name	Amount of money scammed (in US Dollars)
Karbon	200k
Total	**687m**

Source: finance-monthly.com

Table 3.2 shows that a lack of regulatory framework could result in huge losses of investors' money, the management of scammed ICO project could be subject to international prosecution, however, there is no guarantee that the criminals will be caught, and the funds will be returned. This is one of the main reasons why Ukrainian investors should calculate their risk appetite when participating in any ICO project.

The New York-based Satis Group LLC, a premier ICO advisory company that also works as a digital asset-focused investment bank, conducted the study based on publicly available sources to research the percentage of ICO scams.

The research was conducted on ICOs with a minimum market cap of USD 50m and that were expected to go on active trading. The ICOs were then divided into six categories: Scam, Failed, Gone Dead, Dwindling, Promising, and Successful.

Study results indicate 81% of ICOs turned out to be scams. The remaining 6% listed as Failed, and the remaining 5% as Gone Dead, bringing the overall failure to list percentage up to 92%.

A little more than 8% of the cryptocurrencies were traded on the designated exchanges. Among the 8% of these firms listed for trading, 4.4% were labeled Dwindling companies, 1.8% were Promising and the rest, 1.9%, were Successful (Satis Group LLC Report, 2018).

3.2. Problems and prospects of cryptocurrency regulation in Ukraine

As was mentioned before, the key problem of cryptocurrency use in Ukraine is lack of regulatory guidance in terms of the increased interest of society in the cryptocurrency

issues. In a December 2017 report, Citi estimated that Ukraine has one of the world's largest proportions of wealth in Bitcoin as a percent of GDP, around 2.4% (or USD 2.2m). Citi has calculated its estimate by dividing the total issued Bitcoins value at its price peak in December 2017 (over USD 19k) by country, based on some unidentified data from LocalBitcoins.com (a p2p marketplace). The estimations made in the report may not be completely reliable, and Bitcoin has lost about two-thirds of its value since the December price peak, however, it confirms that cryptocurrency is widely used in Ukraine (City, 2017).

In his publications, A.S. Ovcharenko (2020) raised the question of the complexity of determining the legal status of cryptocurrency as a method of payment in Ukraine. The problem is that cryptocurrency does not fall neither under the definition of electronic money nor under the definition of the payment system contained in the Law of Ukraine «On Payment Systems and Funds Transfer in Ukraine» No. 2346-III dated 5 April 2021. According to the Law of Ukraine «On Currency and Currency Transactions» No. 2473-III dated 21 June 2018, cryptocurrency also cannot be recognized as a foreign currency, in addition, it is not a thing (goods), cash, or non-cash money. In addition, cryptocurrencies do not have the features of a document, in connection with which cryptocurrency cannot be recognized as a monetary surrogate in accordance with its definition in the Law of Ukraine «On the National Bank of Ukraine» No. 679-XIV dated 20 May 1999. The complex nature and legal uncertainty of cryptocurrencies do not allow us to identify them with any of the related concepts (cash, currency, currency value, means of payment, electronic money, securities, monetary surrogates, etc.). The lack of legislative regulation of these issues does not prevent the use of cryptocurrencies in economic relations but causes risks for participants in such relations (Ovcharenko, 2020).

The status of the cryptocurrency in Ukraine, notably Bitcoin, was clarified in 2014 by the National Bank of Ukraine («**NBU**»). It was basically as follows:

- Hryvnia is the only legal mean of payment in Ukraine, one of the functions of the NBU is the monopoly on the issue of national currency and the organization of monetary circulation;

- the issuance and circulation of other monetary units in the territory of Ukraine and the use of money surrogates as a means of payment are prohibited;

- the NBU views Bitcoin's «virtual currency/cryptocurrency» as a monetary surrogate that has no real value and cannot be used by individuals and legal entities in Ukraine as a means of payment, as it is contrary to the current legislation;

- when using «virtual currency/cryptocurrency» or Bitcoin there is an increased risk factor associated with this service, transaction, or supply channel, including the anonymity and decentralization of the transaction;

- the international distribution of such payments makes this category of services attractive for illegal activities, including money laundering or terrorist financing;

- all risks related to the use of «virtual currency/cryptocurrency» and Bitcoin settlements are borne by the participant of such settlements; the NBU, as a regulator, is not responsible for the possible risks and losses.

In 2017, the NBU revised its approach to cryptocurrencies. The NBU, the National Securities and Stock Market Commission (NSSMC), and the National Commission for Financial Services (NCFS) issued a joint press release stating that cryptocurrency cannot be classified as funds, as a currency valuable, as electronic money, as a security, or as a 'surrogate currency'. In March 2018, the NBU repealed its letter of 2014 defining Bitcoin as a 'surrogate currency'.

For the effective functioning of cryptocurrency, their institutionalization is necessary, which can be done in two ways: first, it is legal institutionalization, and secondly, the development of the market, which is carried out through the formal and informal establishment of the rules of cryptocurrency.

It should be noted that the positioning of cryptocurrency in the international payment market depends on the approach taken by national governments in regulating transactions with this currency.

Countries loyal to the cryptocurrency through financial regulators tax, license or restrict payments with this currency.

For example, the United States uses two approaches to taxing Bitcoin transactions:

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

2) taxation of foreign exchange transactions at a rate of 23%.

Denmark and Japan regulate exchanges that trade digital currency. In Germany, cryptocurrency transactions are licensed, and Bitcoin payments are allowed throughout the country. Thus, in several countries, Bitcoin transactions are officially allowed. They are usually treated as a commodity or investment asset for tax purposes subject to the relevant legislation. In Salvador, Bitcoin is recognized as the settlement currency.

Countries with a categorical position prohibit any operations with cryptocurrency, as a threat to the stability of the financial system of national economies. Thus, according to the Central Bank of Bolivia, a currency that is not issued or controlled by the government or an authorized body is illegal.

Expectant countries warn their citizens against using cryptocurrency due to its riskiness and speculation, but do not prohibit transactions with it. The cryptocurrency market in Ukraine is not in a legal vacuum since the adoption of the Law of Ukraine «On Virtual Assets». However, as described below, the Law does not address all the existing risks and grey areas associated with the use of cryptocurrency.

Currently, the most acute problem for Ukraine is the mechanism of implementation of the concept of «cryptocurrency» in national legislation through the adoption of relevant rules in the field of tax, banking, civil and commercial law. More and more Ukrainian consumers use cryptocurrency to buy goods and services online or use it as an investment with a high level of capitalization.

The fact of the need to use the liquid potential of cryptocurrency for the development of national economies is quite obvious. Most developed countries are adapting their legislation to regulate the virtual currency, which will gradually adopt the innovations of the financial market, i.e., cryptocurrency to modern realities.

In September 2021, the Verkhovna Rada supported in the second reading the draft law No. 3637 «On Virtual Assets», which is developed to regulate the market for cryptocurrency and other virtual assets in Ukraine. The corresponding decision on September 8 was supported by 276 deputies.

This law regulates the cryptocurrency industry. However, the NBU clarified that virtual assets after the adoption of the law on them will not become a means of payment in Ukraine.

The law defines the concept of «virtual asset» as an intangible good that is an object of civil rights that has value and is expressed by a set of data in electronic form. The existence and turnover of a virtual asset are ensured by the system for ensuring the turnover of virtual assets. A virtual asset can certify property rights, in particular, the right to claim other objects of civil rights.

Virtual assets are intangible goods, the peculiarities of the turnover of which are determined by the Civil Code and this Law. Virtual assets can be unsecured or secured.

According to law, unsecured virtual assets do not certify property rights. Secured virtual assets certify property rights, in particular, the right to claim other civil rights objects.

The provision of a virtual asset is understood to mean its certification of property rights, in particular, the rights of claim to other objects of civil rights. The collateral for the virtual assets does not constitute collateral for the fulfillment of the obligation. Certification of property rights means confirmation of the right of the owner of the secured virtual asset to claim the collateral.

The object of collateral for a virtual asset is another object of civil rights, the right of claim to which is certified by such a virtual asset. The collateral object of a virtual asset is determined by the transaction according to which such a virtual asset is created. Property rights, in particular, rights of claim, to the object of collateral for a virtual asset are transferred to the acquirer of such a virtual asset.

Financial virtual assets are:

- a secured virtual asset issued by a resident of Ukraine, which is secured with currency values;
- a secured virtual asset issued by a resident of Ukraine, which is secured by security or derivative financial instrument.

Virtual assets are not a means of payment on the territory of Ukraine and cannot be exchanged for property (goods), work (services).

Ownership of a virtual asset is acquired upon the creation of a virtual asset, the conclusion, and execution of a transaction in relation to a virtual asset, based on the law or a court decision, and is certified by the possession of the key of such a virtual asset, except in certain cases.

The terms of the acquisition, the terms of transfer, and the scope of rights to virtual assets can be expressed in the form of algorithms and functions of the system for ensuring the circulation of virtual assets, within which the circulation of virtual assets is carried out.

The owner of a virtual asset key is the owner of such a virtual asset, unless:

1) the key of the virtual asset or virtual asset is kept by a third party in accordance with the terms of the transaction between the custodian and the owner of this virtual asset;

2) the virtual asset has been transferred for storage to any person in accordance with a law or a court decision that has entered into legal force;

3) the key to the virtual asset was acquired by a person illegally.

In the absence of a court decision, which established otherwise and which entered into legal force in Ukraine, it is considered that any person to whom the virtual asset belonged in the past legally had and has the right of ownership to this virtual asset during the entire period of possession of the virtual asset key. asset relative to such an asset.

The content of ownership of a virtual asset includes the right to own, use and dispose of a virtual asset at its own discretion, if it does not contradict the law, in particular by transferring ownership of the virtual asset.

The possession, use, and disposal of a virtual asset are recorded in the system for ensuring the circulation of virtual assets.

The law also defines the general principles of state regulation of the turnover of virtual assets, as well as the powers of the National Bank and the National Commission for Securities and Stock Market in the field of turnover of virtual assets.

The President of Ukraine vetoed the law. The creation of the new body, as transferred by the law, will require significant funds from the state budget. President Volodymyr Zelenskyy proposed to bring the regulation of virtual assets to the competence of the National Commission for Securities and Stock Market.

As discussed above, there are a variety of countries that recognize the prospects and potential of the cryptocurrency market and today create all the conditions needed for its growth. Several countries have legalized digital currency in one way or another, including the United States, Japan, Great Britain, Canada, Estonia, Australia, Denmark, Finland, the Netherlands, Sweden, South Korea, Kazakhstan, and others.

Most of these countries have formed several preferences to attract investors, realizing the attractiveness of this market, are recognizing cryptocurrency as a financial asset, a commodity, or a means of payment.

Ukraine can borrow from the experience of countries that have long adopted cryptocurrency and regulate at the legislative level the following types of preferences:

- government support for the sector;
- simplified regulatory requirements;
- no special taxation or reduced tax rates;
- reduced cost of electricity for the operation of data centers;
- providing companies engaged in conducting crypto activities and mining pools with the opportunity to lease computing power.

Furthermore, data protection and cybersecurity regulations should focus on establishing access and management requirements for user funds and data, intrusion detection, malware protection, and data backup protocols. For crypto exchanges, segregating customer funds may be required; as well as keeping cryptocurrency (private keys) in cold storage that has protected access without the ability to be accessed online. EU GDPR Regulation may be the basis for data protection measures.

In order to establish the rules of smart-contracts form and enforceability in courts, it is necessary to amend the Civil and/or Economic code of Ukraine. It is also proposed that the Law of Ukraine «On Electronic Trust Services» No. 2155-VIII dated 5 October 2017, which defines the requirements for the provision of electronic trust services, including cross-border services, and the requirements for electronic identification, be amended to include electronic keys, verification of parties to smart-contracts.

The development of the cryptocurrency industry gives our country excellent opportunities and prospects for strengthening economic positions. The legalization of cryptocurrency is only the first but important step that can help build a clear and transparent cryptocurrency market system.

This process will bring virtual asset transactions to the open market. Companies specializing in cryptocurrencies will be able to register businesses, officially work with the banking system, and attract foreign investment, and local blockchain specialists will be able to develop an ecosystem of projects in the Ukrainian jurisdiction.

Conclusions to Part 3

Cryptocurrency has an undeniable potential in stimulating the development of both the world economy as a whole and the economy of Ukraine in particular. Absolute transparency of payments, protection by cryptographic means, lack of network control, anonymity, and other useful properties make the use of cryptocurrencies and blockchain technology a more convenient and faster method than those that operate now, and in the future may completely displace them. The key problem of financing projects through ICO in Ukraine is the lack of a legislative framework, thus Ukrainian investors are not protected in the legal field in case the project creators turn out to be scammers and hide in offshore zones.

In November 2014, the NBU issued a statement on the legal regime of Bitcoin in the country. It noted that the use of Bitcoin is associated with increased risks due to the anonymity and decentralization of transactions. This area is attractive for illegal actions, including money laundering and terrorist financing. On the territory of Ukraine, the only legal currency is the Hryvnia, the issuance and circulation of other currencies as a means of payment, as well as the use of monetary surrogates is prohibited.

According to the NBU, Bitcoin is a monetary surrogate that cannot be used by individuals and legal entities in Ukraine as a means of payment, as it contradicts the norms of Ukrainian law.

In September 2021, the Verkhovna Rada passed the Law «On Virtual Assets», which will allow legalizing virtual assets and crypto business in Ukraine. The law

determines the legal status of virtual assets and provides legal protection to users and market participants. Thus, foreign and Ukrainian cryptocurrencies will officially work, and banks will open accounts for crypto companies. The law is currently being vetoed by the President.

This was the first attempt to regulate the use of cryptocurrencies in Ukraine, but the Law does not regulate the issue of ICO and the use of smart-contracts. In the process of introducing further regulation, appropriate changes should be made to the regulations governing the protection of personal data, as well as the Civil and Commercial Codes.

The development of a regulatory and institutional environment that will promote the use of cryptocurrencies in the country will significantly increase budget revenues and help attract investment in promising projects, which will accelerate the development of innovation in Ukraine.

CONCLUSIONS AND RECOMMENDATIONS

Cryptocurrencies have been the subject of uncertainty, skepticism, hype, and frustration since Bitcoin was created in 2008. Although cryptocurrencies are still in the developmental stages of their technology, they are now increasingly mature and have obvious utility. In 2021, cryptocurrency's total market capitalization exceeded USD 3t. Currently, cryptocurrency is widely used in financial and IT services, and some countries accept it as payment. Furthermore, many other areas still need to be researched, such as community governance, file storage, and cross-border payments.

Cryptocurrencies have provided small businesses with an investment tool that could be used to generate money through ICOs.

ICO activity has exploded over the past few years, despite being a relatively new phenomenon. As Bitcoin's rise in 2016-2017 fueled a speculative hype around crypto-currencies, ICO activity increased in tandem with the novelty of such an investment attraction mechanism. Token creation was made much easier with Ethereum's introduction of the ERC20 standard for tokens, also contributing to this growth. In addition to this, early Bitcoin investors' desire to divest part of their massive gains has also become an influential factor in the trend.

ICOs financed primarily IT infrastructure in 2017, followed by trading and investments and general finance applications (OECD, 2018). As blockchain usage increased, more companies were required to be funded, which was beyond the capacity of technology-intensive and specialized venture capital funds (IIF, 2018).

Global ICO volumes reached USD 25m by February 2018 according to Zetzsche et al. (2018), with the trend accelerating in the second half of 2017 (Zetsche et al., 2018). It is noteworthy that the amount raised by all ICOs in the second half of 2017 exceeded the total amount raised by all ICOs combined. Geographically, ICO offerings are global, but the US is the dominant offering jurisdiction, according to the same dataset. Another leader is Singapore which is considered as the ICO hub in Asia. For the European market, Switzerland has developed Crypto Valley Association which is the hub for finch companies specializing in blockchain. However, it should be noted that around 1/3 of the

offerings of the sample used did not contain information on the origin of the issuer or promoter.

Cryptocurrency will occupy a niche in Ukraine's payment system if the appropriate regulations and infrastructure are developed. Initially, this system was applied to information services but has since penetrated consumer services.

It is expected that blockchain technology can be widely used in the future not only to solve cybersecurity and IT problems, but also to serve data storage demands in real estate and property registration, cadastral accounting, banking, education, medicine, trade, insurance, and litigation. This is because blockchain technology is autonomous, secure, decentralized, reliable, and cheap.

In September 2021, the Verkhovna Rada supported in the second reading the draft Law No. 3637 «On virtual assets», which is developed to regulate the market for cryptocurrency and other virtual assets in Ukraine. The Law was vetoed by the President. This was the first and the most important step in regulating the circulation of cryptocurrency in Ukraine. This implies that there is the widespread use of cryptocurrency in Ukraine. Thus, the cryptocurrency industry needs clear regulation, including the ICO.

To become a more attractive jurisdiction for the attraction of cryptocurrency investment Ukraine can learn from the experience of developed countries, such as Switzerland or Singapore, and implement some incentives for companies conducting business in the crypto sphere, such as government support for the sector, simplified regulatory requirements, no special taxation or reduced tax rates, reduced cost of electricity for the operation of data centers, allowing companies engaged in conducting crypto activities and mining pools to lease computing power.

Additionally, measures to develop relevant data protection and cybersecurity framework should be taken. Relevant changes to the Civil and Commercial Code of Ukraine should also be made to address the regulation of the use of smart-contracts.

REFERENCES

1. Adam Back (2017). Hashcash - A Denial of Service Counter-Measure. Technical report. Retrieved from - http://www.hashcash.org/
2. Adhami, S., Giudici, G., & Martinazzi, S. (2018). Why do businesses go crypto? An empirical analysis of initial coin offerings. *Journal of Economics & Business*, 100, 64–75 p.
3. Andrej Glaser, F., Zimmermann, K., Haferkorn, M., Weber, M. C., & Siering, M. (2018). Bitcoin-asset or currency? Revealing Users' Hidden Intentions. ECIS.
4. Blockchain daily news. The first VC/ICO market report Hybrid Capital: The Future of Venture in the ICO Era. Retrieved from - https://www.blockchaindailynews.com/Starta-Ventures-issues-the-first-VC-ICO-market-report- Hybrid-Capital
5. Blockchain in Logistics. Hype or Disruption? Perspectives on the upcoming impact of blockchain technology and use cases for the logistics industry (2018). *DHL Report*. Vol. 1.
6. Bloomberg (2017). Only One in 10 Tokens Is In Use Following Initial Coin Offering. Retrieved from - https://www.bloomberg.com/news/articles/2017-10-23/on.
7. Carnes, B. (2017). Ukraine Is Silently Leading A Digital Currency Revolution. *Forbes*. Retrieved from - https://www.forbes.com/sites/realspin/2017/03/20/ukraine-is-silently-leading-a-digital-currencyrevolution/#4d0ef946465.
8. Ciaian, P., Rajcaniova, M., Kancs, A. (2016). The economics of BitCoin price formation. *Applied Economics*. Vol. 48. Retrieved from - https://doi.org/10.1080/00036846.2015.1109038.
9. CoinMarketCap. Retrieved from - https://coinmarketcap.com/historical
10. Conley, J. (2017). Blockchain and the Economics of Crypto-tokens and Initial Coin Offerings. Vanderbilt University, Department of Economics Working Papers. Retrieved from - http://www.accessecon.com/pubs/VUECON/VUECON-17-00008.pdf
11. Draft Law of Ukraine: On Virtual Assets No. 3637 dated 11 June 2020. Retrieved from - http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=69110

12. Deloitte AG (2015). Industry 4.0. Changes and solutions for the digital transformation and use of exponential technologies. 32 p.
13. EY (December 2017). EY research: initial coin offerings (ICOs). Retrieved from - http:// www.ey.com/Publication/vwLUAssets/ey-research-initial- coin-offerings-icos/$File/ey-research-initial-coin-offerings- icos.pdf
14. Goldman Sachs Global Investment Research (2017). Retrieved from http://www. goldmansachs.com/what-we-do/investment-management/ private-wealth-management/intellectual-capital/isg- outlook-2017.pdf
15. Goldstein, I., Wei Jiang, W., & Karolyi, G. A. (2019). To FinTech and Beyond. The Review of Financial Studies, 32(5), 1647–1661. doi: 10.1093/rfs/hhz025
16. Goorha, Prateek. (2018). The Return of 'The Nature of the Firm': The Role of the Blockchain. The Journal of The British Blockchain Association. DOI: 10.31585/jbba-1-1-(2)2018.
17. Gladkikh, D. (2018). Bitcoin and other cryptocurrencies: risks and prospects of use in Ukraine (2018). Retrieved from - http://www.niss.gov.ua.
18. Guseva, I., Petrova, T. (2017). Trends in the development of cryptocurrencies in the Ukrainian market. *Scientific Bulletin of the International Humanities University*. 48–50 p.
19. Hacker, P., & Thomale, S. (2017). Crypto-securities regulation: ICOs, token sales, and cryptocurrencies under EU financial law. European Company and Financial Law Review, 15(4), 645–696.
20. ICO Bench Weekly Report. Retrieved from - https://icobench.com/reports ICO_Market_Weekly_Review-04_2020.pdf
21. Koldovsky, A., Chernega, K. (2015). Problematic aspects of theoretical understanding of cryptocurrency as a phenomenon of modern information economy. Retrieved from - http://essuir.sumdu.edu.ua/handle/123456789/53441
22. Kostyuchenko, V., Malinovskaya, A., Mamonova, A. (2017). Prerequisites for the introduction of accounting and taxation of transactions with cryptocurrencies in Ukraine. *Modern Economics*. Retrieved from -

https://modecon.mnau.edu.ua/peredumovy-zaprovadzhennia-obliku-ta-opodatkuvannia-operatsii-iz-kryptovaliutamy.

23. Kovačević, A. (2020). 4 Major Types of Cryptocurrency (+What They're Good For) Retrieved from - https://learn.g2.com/types-of-cryptocurrency
24. KPMG (2018). Institutionalization of cryptoassets. Cryptoassets have arrived. Are you ready for institutionalization? Retrieved from - https://assets.kpmg/content/dam/kpmg/us/pdf/2018/11/institutionalization-cryptoassets.pdf.
25. Kud, O., Kucheryavenko, M., Smychok, E. (2019). Digital assets and their legal regulation in the world of blockchain technology development: monograph. *Kharkiv: Pravo*. 216 p.
26. Kvitka, A., Zaitseva, E. (2015). Cryptocurrency: The essence and trends of development in modern conditions. *Economic theory and law*. 111–119 p.
27. Law of Ukraine «On Electronic Trust Services» No. 2155-VIII dated 5 October 2017
28. Law of Ukraine: On payment systems and funds transfer in Ukraine No. 2346-III dated July 3, 2020
29. Lukasevich, I., Kozenkova, T. (2018). ICO Mechanism Essence and Key Concept. *Advances in Economics, Business and Management Research.* Vol.56.
30. Lukyanov, V. (2014). The emergence of the cryptocurrency market in the information and network paradigm. *Current economic problems*. 436–441 p.
31. Madeira, A. (2020, February 2). How Many Cryptocurrencies Are There? in Depth Guide. Cryptocompare. Retrieved from - https://www.cryptocompare.com/coins/guides/how-many-cryptocurrencies-are-there-in-depth-guide.
32. Nakamoto, S. Bitcoin: A Peer-to-Peer Electronic Cash System. Retrieved from - https://bitcoin.org/bitcoin.pdf.
33. Ovcharenko, A. (2018). Accounting for cryptocurrency transactions in Ukraine: current status and prospects. *Scientific Bulletin of Uzhhorod National University. "Law" series*. No. 58.

34. Ovcharenko, A. (2020). Legal regulation of virtual assets and cryptocurrencies in Ukraine: current status and prospects. Retrieved from - https://doi.org/10.32782/2524-0374/2020-4/47
35. Regulation of Cryptocurrency Around the World (2018). The Law Library of Congress, Global Legal Research Center. Retrieved from - https://www.loc.gov/law/help/cryptocurrency/world-survey.php.
36. Rizzo, P. (2017). Ether, Litecoin and More: Overstock Now Accepts Cryptocurrencies as Payment. Retrieved from - https://www.coindesk.com/ether-litecoin-overstock-now-accepts- cryptocurrencies-payment/.
37. Rohr, J. & Wright, A. (2017). Blockchain-Based Token Sales, Initial Coin Offerings, and the Democratization of Public Capital Markets. 115 p. Retrieved from - https://ssrn.com/abstract=3048104).
38. Saidov, U. (2018). Cryptocurrencies: The Rise of Decentralized Money. Retrieved from - https://blogs.cfainstitute.org/investor/2018/04/03/cryptocurrencies-the-rise-of-decentralized- money/.
39. Schückes, M. & Gutmann, T. (2020). Why do startups pursue initial coin offerings (ICOs)? The role of economic drivers and social identity on funding choice. *Small Bus Econ*. Retrieved from - https://doi.org/10.1007/s11187-020-00337-9
40. *Statista*. Retrieved from - https://www.statista.com/
41. The most successful ICOs. *ICO market*. Retrieved from - https://icomarket.io/ru/how-to/samye-uspeshnye-ico/
42. Vorobets, V. (2020). Advantages of using Blockchain technology in terms of digitization of financial instruments. *Banking system and banking services*.
43. Walport, M. (2016). Distributed Ledger Technology: beyond blockchain. A report by the UK Government Chief Scientific Adviser. London: Government Office for Science. 87 p.
44. White, G. (2017). Future Applications of Blockchain in Business and Management: a Delphi study.
45. Williamson, O.E. (1985). The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting. *New York: Free Press*. 450 p.

46. Wollah, R. Barton, R., Ishikawa, M., Quiring, K. (2017). Put Your Trust in Hyper-Relevance: Global Consumer Pulse Research. 13 p.
47. World Economic Forum (2020). Crypto, What Is It Good For? An Overview of Cryptocurrency Use Cases. Retrieved from - http://www3.weforum.org/docs/WEF_Cryptocurrency_Uses_Cases_2020.pdf.
48. Yeliseyeva, O. (2018). Bitcoin as an element of the modern financial system. *Economy and society*. No. 18. 45–49 p.
49. Yushchenko, N. (2018). Distributed registry technology as one of the means of overcoming corruption in Ukraine and promoting additional investment. *National Scientific and Methodological Conference "Digital Economy"*. 393–397 p.
50. Zainuddin, A. (2017). Coins, Tokens & Altcoins: What's the Difference? Retrieved from - https://masterthecrypto.com/differences-between-cryptocurrency-coins-and-tokens/.
51. Zainuddin, A. (2017). Guide on Privacy Coins: Comparison of Anonymous Cryptocurrencies. Retrieved from - https://masterthecrypto.com/privacy-coins-anonymous-cryptocurrencies/.
52. Zajac, E.J., Olsen, C.P. (1993). From Transaction Costs to Transactional Value Analysis: Implications for the Study of Interorganizational Strategies. *Journal of Management Studies*. Vol. 30, No. 1. 131-145 p.
53. Zetzsche, D., Buckley, R.P., Arner, D.W., and Fohr, L. (2017). The ICO Gold Rush: It's a scam, it's a bubble, it's a super challenge for regulators. Retrieved from - https://ssrn.com/abstract=3072298
54. Zhelyuk, T., Brechko, O. (2016). The use of cryptocurrency in the payments market: new opportunities for national economies. *Bulletin of Ternopil National Economic University*. 50–60 p.