

ИНСТИТУТ ЗА ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ ПРИ БАН

ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ

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ИНСТИТУТ ЗА ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ НА БЪЛГАРСКАТА АКАДЕМИЯ НА НАУКИТЕ
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BLOCKCHAIN TECHNOLOGY IN THE FISCAL PROCESS OF UKRAINE OPTIMIZATION

The problem of corruption in Ukraine has been examined, as well as Blockchain technology application feasibility in combating the phenomenon has been analyzed in the article. Blockchain instrumental features and properties, making the technology unique and determining its potential applications in many sectors of the economy, have been covered with much attention. The authors have analyzed both advantages and obstacles for a distributed data registry implementation. Analysis of benchmarks and application of the best practices of Blockchain technology in the public sector, including the fiscal process, have been presented in the study. Profound interest in exploring the technology feasibility has been emphasized on the part of the world's leading governments. Information on pilot Blockchain projects in the public sector of Ukraine has been presented. The article focuses on the fact that alongside with the technology area and ways of scaling its application, a new era of digital society development is emerging.

JEL: L86; O33; E62; H26

1. Introduction

Macroeconomic stabilization in Ukraine is directly correlated with the country's corruption level. The importance and urgency of addressing the corruption issue in the public finance sector are due to its complex destructive influence. Thus, corruption, encouraging favorable developments for evasion from financial liabilities (taxes, fees), deforms budget revenues pumping up process. And on the other hand, corruption distorts competitive conditions of doing business, demotivates entrepreneurial activity in the country, promotes capital outflow and adversely affects the created jobs growth. Ultimately, the corruption-based behavior stereotype makes exit from the “institutional trap” and overcoming crisis phenomena in the national economy impossible.

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In our view, the problem solution is not in the plane of the mechanisms for corrupt activities facts disclosure and responsibility, but in development and implementation of the mechanisms for the corruption area suppressing and minimization. Application of the Blockchain technology in the public sector, including the fiscal process, may become a radical tool in the stated objectives achievement. According to V. Buterina, the Ethereum blockchain platform creator, it will enable to "... eradicate corruption and leave the bureaucracy behind" (Dubovoy, 2017).

2. Purpose of the Article

The purpose of the article is to study the instrumental value of the Blockchain technology in the fight against corruption in public sector, particularly in the fiscal process, as well as to analyze the best practices of distributed data registry application for developing recommendations for its optimization in Ukraine.

The need for management mechanism in the fight against corruption in the public sector optimization is due to the fact that it can have a positive impact on solution of the other systemic problems in the fratricide effect form: promote the supremacy of the law, improvement efficiency of the implemented system innovations and reforms, stability of democratic processes, formation of favorable investment climate, and free and fair competition in the country's economic area.

3. Research Methodology

The authors used formal-logical methods, empirical research and theoretical knowledge, as well as special scientific methods as the research methodological basis. Among the formal-logical methodological tools, the authors used dialectics, analysis, synthesis, generalization, analogy and modeling methods. From the group of research and theoretical knowledge methods, comparison, description, measurements, and hypothetical-deductive methods were used in the process of work on the publication. In addition to the above mentioned, synergetic, cybernetic, systematic, comprehensive, information, optimization of methodological approaches were used when writing the article.

4. The Research Results

Corruption has existed in all forms of government without exception and manifests itself both at the ruling establishments levels and in all spheres of the society. This social phenomenon is inherent to the most world countries in one way or another, and is characterized by overall negative impact; that is becoming a threat to national security and a socio-economic global problem. It was noted in the VIII UN Congress resolution "Corruption in the field of public administration" back in 1990 (Symonenko, 2006).

An analysis of historical development suggests that the most dangerous forms of crime and large-scale corruption in the financial sector are characteristic of the countries in socio-political and/or economic and financial crisis situation. All this is inherent to the Ukrainian

state. Its evolution over the last 27 years (since Ukraine's independence – auth. note) has resulted in the fact that the country is increasingly referred to as one of the most corrupt world countries in the studies of various international organizations.

According to the information, posted on the World Bank website: “Management weaknesses are governance, defined as the way in which public institutions perform their functions in a country which is strongly correlated with deficiencies in development. Poor governance is associated with corruption, distortion of state budgets, inequitable growth, social exclusion and distrust in the authorities. The inefficiency of the government formal institutions results in creation of informal institutions that substitute the functions that the first-mentioned can no longer perform” (3).

The Corruption Perception Index of Transparency International (CPI) is one of the public administration efficiency measures. CPI is essentially a composite indicator that annually describes the quality of public sector management for most countries of the world (180 out of a total of 197 recognized countries – auth. note) since 1996.

According to Transparency International experts, Ukraine has very modest Corruption Perception Index rates in the field of fight against corruption. Thus, in 2015, the country scored 27 points out of 100 possible, in 2016 – 29 points, and in 2017 – 30 points and took the 130th place. It is noteworthy that the points 0 to 30 indicate a significant level of corruption, and 31 to 60 – the government is trying to fight against corruption. Countries that ranked the same number of points are Myanmar, Gambia and Iran. Virtually all bordering Ukraine countries rank much higher: Poland – 36, Slovakia – 54, Romania – 59, Hungary – 66, Belarus – 68 and Moldova – 122 (4).

Among the reasons that influenced the rating increase in 2017, the following were noted in the report. Anti-corruption authorities (SAP/NABU) launched their investigative work in the reporting year and filed the first cases on suspicion of top corruption to the court. Electronic declarations register operation was continued. A year had already passed since the public procurement reforms with mandatory use of the ProZorro system implementation. Gas market reform was implemented. Ukraine had taken some positive measures towards deregulation.

In turn, TI Ukraine recommends the government to take the following measures to improve the country's performance in 2018: 1. Launch the Anti-Corruption Court and continue judicial reforms; 2. Strengthen the investigative bodies' power and stop the inter-agency struggle; 3. Recommission the National Anti-Corruption Bureau of Ukraine (NABU); 4. Deprive law-enforcement agencies of the right to interfere in economic activities; 5. Implement a new electronic public information system.

For example, according to the latest data on the Economic Freedoms Ranking published by the Wall Street Journal experts and the Heritage Foundation's analytical center, Ukraine ranked the 166th out of 180 countries in 2017, being in the group of countries with non-free economies, while gaining a slightly higher scores than in 2016. Angola (165th) and the Republic of Suriname (167th) became Ukraine's nearest neighbors (5).

The report authors set the lowest ratings for the following parameters of the Ukrainian economy: the government fair practices, freedom of investment, government spending, financial freedom and legal effectiveness (Table 1).

Dynamics of Economic Freedom Index in Ukraine (%)

Table 1

Parameter	2016	2017
Freedom of doing business	56.8	62.1
Freedom of trade	85.8	85.9
Tax burden	78.6	78.6
The government fair practices	26.0	29.2
Government spending	30.6	38.2
Monetary freedom	66.9	47.4
Freedom of investments	20.0	25.0
Financial freedom	30.0	30.0
Financial soundness	-	67.9
Property rights protection	25.0	41.4
Legal effectiveness	-	22.6
Freedom of employment relations	47.9	48.8
TOTAL SCORE:	46.8	48.1

Source: Markushevskiy, Ryabova, Kuharchik, 2017.

In the context of the phenomenon under study, the rating parameters dynamics indicates a low assessment of the business climate and significant obstacles to the revitalization of business activities, including the corruption component. As a result, corruption remains one of the main problems for businesses and ordinary citizens.

According to the Ministry of Economic Development and Trade of Ukraine, the losses from corruption and inefficient use of budget funds in the public procurement sphere account for about 20% of the annual volume, and amount to about 50 billion Hryvnia per year (Zinchenko, 2017).

The fact that corruption in Ukraine has penetrated virtually in all spheres of public relations and has become one of the fundamental reasons of the Ukrainian statehood crisis should be stated. As a result of defeat by the corruption virus, the socio-economic sphere is being destructed, degradation of law enforcement and judiciary, healthcare and educational systems, as well as budgetary-financial sphere of the country is observed.

Corruption leads to losses of the state and population due to inefficient use of budget funds, poor quality of public services, as well as increases uncertainty in business entities' operation environment.

Along with this, there is no denying that corruption and power are both antagonists and satellites. After all, corruption generates power, in the absence of which it becomes impossible as a phenomenon. Corruption gradually "erodes" state structures like a social "corrosion", and the government, respectively, seeks to eradicate the corruption.

The main incentive for corruption is the potential of obtaining economic or any other benefits associated with the use of authoritative powers. The main deterrent is the risk of disclosure and punishment. The most dangerous forms of corruption constitute criminal offenses. These ultimately include embezzlements (thefts) and obtaining of improper benefits. The embezzlement is an expenditure of resources, entrusted to the officers, for personal use.

Corruption in budget legal relations and in the budget field, in general, is the use of official position and excess of power for the purposes of unjustified enrichment by subjects of these relations, as well as budget process participants (both own and collective – author's note). It is about personal enrichment of a person or a group of persons, as well as about the facts when misconduct of a public official or officials results in illegal obtaining of funds to the banking accounts of budget institutions, managers and recipients of budget financing (Bodnar, 2016:300).

We fully agree with the scientific position of O. A. Musica-Stefanchuk who highlights the following key areas of anti-corruption activities in the fiscal area:

- ensuring maximum regulation of all budget process practices and procedures in the form of laws, regulations and instructions; full regulation of the officials' activities, enshrined in job descriptions and provisions;
- ensuring budget process and budget information maximum transparency and openness, i.e. their accuracy and availability for all parties involved for analysis and use purposes;
- increase of control and optimization of the mechanism for performing control functions for obtaining and use of budget funds at all levels of the hierarchy: departmental, interdepartmental, public;
- development and introduction of ethical codes for public officials, as well as monitoring their compliance with the requirements of anti-corruption behavior (Bodnar, 2016:304).

Technological innovations, including blockchain technology, in the public finance field, are a multi-functional tool of public administration in the information society, as well as a means of combating corruption in the process of media convergence.

In respect to the media space development the “convergence” concept “... means an erosion of traditional boundaries in the process of technological changes, which is accompanied by duplication of content and/or creation of alternative media sites” (Chernyih, 2007).

In our opinion, the modern stage of media convergence has entered into its active phase, which is consonant with the introduced “Web 2.0.” term, proposed and described by Tim O'Reilly in the early 2000s. The process described by the scientist means “... independent production of content by a mass of users and active exchange of information between them” (Timofeeva, 2012: 42). It is fair to say that scientific works presented to the public by foreign and domestic authors do not fully reveal all aspects of the multidimensional phenomenon of media convergence in the increasingly complex conditions of civilizational development. This fully applies to the blockchain technology. According to the article authors, the technology has a huge potential for application, which can dramatically change modern management methods.

The blockchain technology is a distributed database that is formed as a continuously growing chain of blocks of recorded information on all previous transactions. The given technology emerged in the cryptocurrency market field. The technological basis of the Bitcoin transactions accounting system is in its functioning as an independent financial system. It has no center of influence, there is no organization or person who would manage it. The system is absolutely transparent and operates according to the principles laid in its basis from the very beginning. The entire transaction history is available to everyone, but it cannot be changed.

Further, blockchain-based solutions have spread to other sectors of the economy. Application of the technology elements in the future will allow for a certain decentralization of processes and increase of inclusivity while reducing maintenance costs.

The very Blockchain technology paradigm is based on any transaction data fixation in a public and safe for all participants' registry. It stores the transaction history with all amendments and modifications from the start to the finish. At that, the registry with amendments introduction update is only possible in the case if other members of the integrated system confirm the entry correctness or the transaction is authorized by the digital code. The Blockchain algorithm is based on all copies of the register constant synchronization after each update operation. That is, all transactions in a grouped form – blocks – are generated every 10 minutes, and each subsequent block of information contains a digital fingerprint of the previous one. Thus, a chain of blocks is generated, which represents inextricably linked transactions, where each new block is inextricably linked with the previous ones, and the previous ones can in no way be changed without changing the new (subsequent) one. By analogy, blocks can be compared with a notebook pages, where each entry made is assigned a sequence number. If the notebook page with the entries ends, the numbering of entries is continued on the next page. Thus, connectivity and integrity of all records starting from the first to the last is checkable. At that, all users of the integrated system have free access to the information contained in it virtually any time (Kravchenko, 2017).

The following main properties and characteristics of the Blockchain can be summarized:

- 1) *Sustainability* – lack of organization and management center, which administer the distributed data registry and have the key to their correction;
- 2) *24/7/365 operation mode*, that is, around the clock and all-the-year-round. Since the registry databases contents are copied to all computers on the network, even in the case if 99% of them are not online at some point, the data will still be recorded to the remaining computers and then updated to all without exception when they are back online. The only way to stop the technology is the power and the Internet outage worldwide;
- 3) *Security*, which is based on the application of the reliable cryptographic methods, namely, data hashing through different algorithms. The hashing essence in the Blockchain is in converting a set of information into a hash function, which represents the public key to the block. The hashing method peculiarity is in the fact that solving the function and converting it back to the source code is impossible. Accordingly,

knowledge of the transaction blocks public keys will in no way help the cybercriminals to gain access to the information recorded in the blocks. The fact that it is a clearly distributed database stored immediately at each member of the system, and not in a single copy on the server, is also a reliable method of protection from hacking. Copies are constantly updated, so if someone tries to record false information, it will immediately be rejected by the database and deleted. To hack the Blockchain, attackers need immediate access all database media, which is physically impossible;

- 4) *Transparency.* The Blockchain information blocks sequence cannot be changed, thus, tracking the entire chain of transactions made with any currency or other value through the database is very easy. It is due to this technology feature, cryptocurrency systems are open and transparent on the one hand, and completely anonymous on the other (10).

Due to the above-described properties, the introduction of Blockchain technology will achieve the following financial-economic effects:

- reduction of principal financial statements by 70% as a result of data quality and transparency optimization and the need for continuous financial control lack;
- compliance with regulatory requirements by 30-50% due to the increased transparency and simplicity of financial transactions;
- reduction in the total cost of centralized activities by 50% due to the improved digital identity mechanisms and simplified sharing of customer data for all participants of the process;
- reduction in the cost of business transactions, including mandatory procedures for monitoring, verification, clearing and settlement by 50% due to full or partial automation of all transactions and access to information (Volosovich, 2017).

Thus, the Blockchain can quite reasonably be considered as a multifunctional technology capable of forming a decentralized financial system, which correctness could be verified by any participant.

Based on this, the distributed registries technology is an ideal tool in the following cases of data accounting:

- offsets between financial institutions;
- state registers;
- public auctions;
- control over the use of budgetary funds;
- implementation of social assistance to the population programs;
- implementation of state policy in the social insurance sphere, etc.

The authors' position is consonant with V. Zolotukhin opinion, CRM on the distributed registry of EvoDesk founder, who believes that "... the Blockchain can and should be considered as a tool to fight against corruption. One of the first destinations of its

implementation should become the public procurement system. In addition, a chain of tracking the funds movement from allocating from the budget to particular estimates and expert assessments on their effective development building is feasible on its basis. And the information can neither be faked nor changed retroactively. Additionally, the results of supervisory authorities, law enforcement agencies, courts of law and other institutions operation can be tracked in distributed registries and this information will be available to everyone. This will improve the rating of public confidence in state structures and prevent many unpleasant events” (Lihodey, 2018).

It should be recognized that the state financial system of Ukraine subsystems, implementing the above objectives, is almost completely centralized and rather opaque at the moment. It is the very circumstances that make the corrupt practices possible.

The blockchain eliminates the influence of egoistic factors that lead to creation of fraudulent and corrupt schemes undermining public interest and state sovereignty. At the same time, an incentive to act and behave honestly emerges for participants of the unified system, since the rules are uniform and apply equally to everyone. In this way a new form of social responsibility arises.

In this context, the feasibility of creating a reputation system for public officials on the Blockchain basis should be mentioned. Implementation of the Revain project, accumulating reviews on crowdfunding campaigns and cryptocurrency exchanges on its platform can be considered as a successful example of such a reputation system functioning. Users leave their reviews, which cannot be falsified or deleted. User comments are available for review by everyone interested. The developers are planning to expand the technology to evaluate the scope of public services as well.

Revealing the technology importance in the fiscal process of Ukraine, the following can be designated: the Blockchain is an invariant tool of commitment economic transactions, enabling to eliminate information transparency barriers for the system entities, thereby making deliberate hiding of information impossible. Its main characteristics as a management tool, and at the same time advantages, are publicity and “integrity”.

It should be noted that the practical implementation of the Blockchain technology in the public finance sector implies, above all, a change in management paradigm and transition from a hierarchical model to a flat one, and merely a political will is not enough. The key reasons that may hinder the introduction of this technology in our country are quite obvious. The point at issue is the difficulties in reaching a consensus of a large number of the process participants, lack of appropriate legislative framework, as well as inertia and just the reluctance of the main corruption subjects for the very fact of its implementation (Dubovoy, 2017).

Note that both cryptocurrency and Blockchain technology are in a legal vacuum in a number of countries, including Ukraine: they are neither allowed nor prohibited, their turnover is not officially recorded, and thus, remains in the gray background. However, the essential difference is in the fact that the Blockchain is not money, which issuance is monopolized by the State, but a technology that can be used by both the state and the citizens.

In addition to the above mentioned, the fact that the process of transformation and transition to the full implementation of the distributed data registry technology can be greatly stretched in time should be taken into account. It is logical enough that complication of mechanisms for data security, storage and transmission, as well as new options for scaling and transactions privacy will occur parallel to this. All this requires liability, reactivity and adaptation activity from the government structures in the face of growing risks and threats to national economic security.

But at the moment, the Blockchain technology is gaining ever-increasing global popularity, is rapidly expanding its scale and is gaining momentum of its implementation into many areas of economic activity.

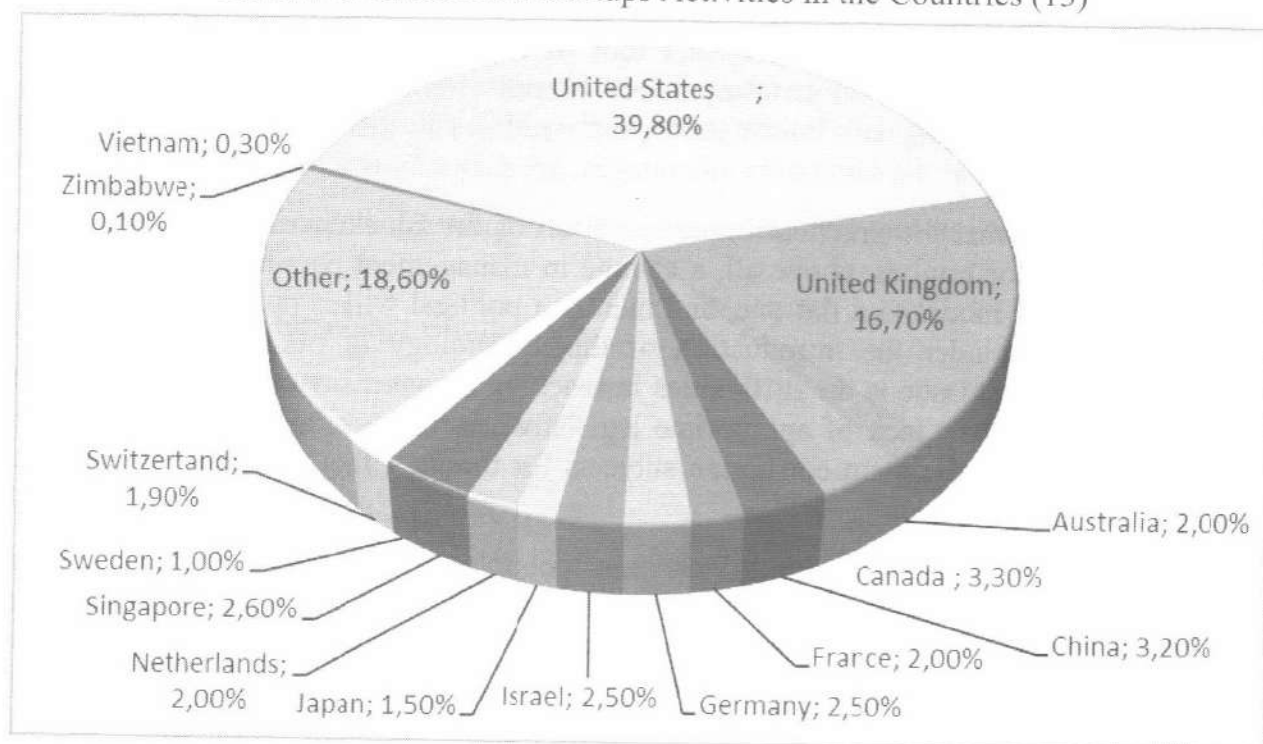
General analytical insights of the Blockchain startups distribution and their branch representation are presented in Figures 1 and 2.

Statistics of Outlier Ventures, a European venture capital company, which monitors Blockchain startups in the world and is engaged in their development has been used in the article.

Thus, according to the data presented, the United States is the leader in the Blockchain technology market, where 38.9% of the total number of Blockchain startups has been implemented. The United Kingdom occupies the second place in the structure with 16.7%, Canada is the third – 3.3% is concentrated there, while China occupies the fourth place with 3.2% of all start-ups located on its territory. Singapore (2.6%), Germany and Israel (slightly more than 2%) have not reached the 3% level (13).

Figure 1

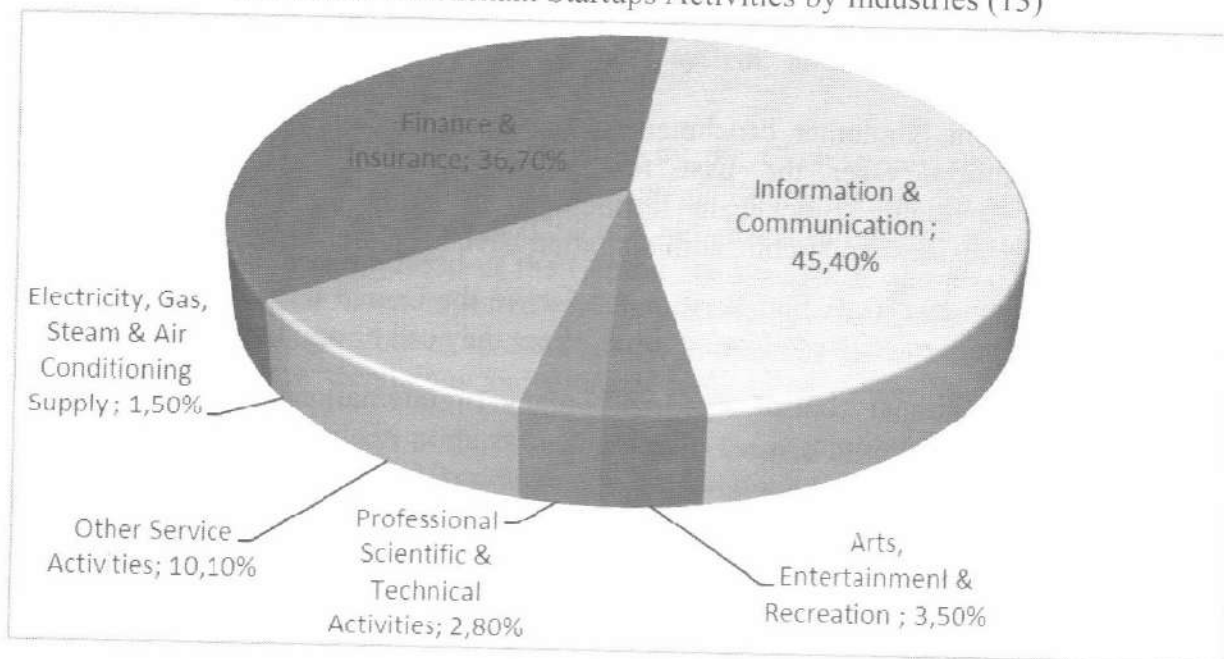
Review of Blockchain Startups Activities in the Countries (13)



Analyzing distribution of Blockchain startups by industries, it should be noted that 45.4% of their total number operate in information and communication field, 36.7% – in finance and insurance, 4.7% – other service activities, 3.5% – arts, entertainment and recreation.

Figure 2

Review of Blockchain Startups Activities by Industries (13)



A forecast for the period of up to 2020, in which dozens of key trends in the development of the international economy and finance were presented, was published by Gartner, an international analytical agency, in 2016. Agency analysts associate all of them with the increasing scale of the digital revolution taking place in the world, which cumulative gain area will only increase over time. Blockchain technology as a new technology that can change global economics and finance was named the first in rating. Agency analysts predict that blockchain-based business turnover will amount to USD 10 billion by 2020. Along with that, the technology insufficient maturity level at the moment is noted and the huge potential in terms of cost savings in the field of financial services in the future is emphasized in the published document (Veynberg, 2016).

According to the World Economic Forum participants survey, it is expected to be actively used by the leading countries and about 10% of global GDP (according to the OECD estimates) will be created with its direct application by 2023. The technology advantages are: reduction in operating expenses (73% of the survey participants), reduction of computation time (69% of respondents), risk reduction (57% of all respondents), the possibility of obtaining additional income (51% of respondents) (15, 16).

Estonia is a benchmark of the Blockchain technology application, where the integrated state electronic system is functioning successfully. The system's performance results in 2016 confirm its effectiveness: 94% of citizens had an electronic ID that allows them to use the system; 2% of GDP savings on the state paperless operations; over 4,000 services provided

electronically; Estonia is No. 1 world country in terms of fiscal performance and E-Economy Index (17, 18).

Procivis, a Swiss startup, in collaboration with e-government experts from Estonia, announced the launch of the app store, a blockchain-based e-government pilot version, by the end of 2017. Procivis aims to create applications that implement a full range of services for citizens — such as digital identification, voting, filing tax returns, maintaining inventory, etc [3].

The United Kingdom is another benchmark, which could become the epicenter of the Blockchain revolution. Over the past few years, significant steps to popularize cryptocurrencies, including Blockchain technology, to study the efficiency of their implementation in business and public administration have been taken in the country.

In his report on the issue, the Chief Science Adviser to the United Kingdom Government, Sir Mark Walport suggested the following areas where they can be applied efficiently:

- in ensuring operational control and transparency of international and humanitarian assistance funds expenditure;
- in protecting critical infrastructure;
- during registration and formation of data registers, such as state-owned assets, objects of intellectual property, wills, data on the population health in the national pension and health care systems;
- in order to reduce fraud in obtaining the State social assistance (20).

The Ministry of Labor and Pensions, with the support of GovCoin Systems Limited, has launched a pilot project of a blockchain-based platform for allocation of social assistance. The Cabinet Secretary Matt Hancock issued a statement saying that the Government sees the potential of using the technology for allocation of scholarships and grants. In addition, the country Central Bank has tested several blockchain-based developments and is exploring the project of issuing its own digital currency (Jemima, 2016).

China can be considered the best practice for the implementation of the state policy in the sphere of taxation and social insurance by means of the distributed data registry technology.

For example, a partnership agreement between THEKEY and the Information Center of the Ministry of Social Services and Welfare (MHRSS), as well as the Chinese Social Security Association (CSIA) was concluded on June 20, 2018. The partnership could potentially offer the opportunity to scale up the efforts to implement social security functions using the Blockchain technology and THEKEY's revolutionary digital identification technology to the Chinese authorities. The Chinese government may introduce a blockchain-based system through which it will fulfill its social insurance obligations, such as benefit payments, pension payments, medical insurance, etc. relatively soon. To achieve the objectives, the government will take advantage of THEKEY's developments in the field of digital identification and effecting fast electronic payments. The new collaboration, which implies the use of the technology for the benefit of 1.4 billion Chinese citizens, is an unprecedented case of large-scale application of the Blockchain technology (22).

In China the process of active implementation of the Blockchain technology into the tax system, in particular, in a radical change of the tax documentation filing procedure is being initiated even today. The choice of such introduction priority direction is attributed to the struggle with concealment of income by the taxpayers. Tax documentation procedure and transactions transfer to the Blockchain will contribute to the significant improvement of fiscal performance. Today, China has already transferred about 2.5 million accounts to the new blockchain-based document management system, and this figure is planned to be increased to 55 million by 2022.

The 17th Five-Year Plan, recently published by the Chinese government, positions the Blockchain technology as one of the main strategic directions for the development of the national economy. The Central Bank (CB) of China has also recently reiterated its support for the Blockchain, and the Head of the Central Bank added to the press that “significant resources have already been invested” in the technology research. The government is scheduling to defeat corruption in the country in the 20s of the XXI century through introduction of the new technology and allocates serious investments for this purpose (22).

In the context of Blockchain projects in the public finance sector implementing, the first pilot projects implemented in Ukraine should be mentioned. Thus, on September 6, 2017, the official launch of an electronic auction based on the BitFury distributed registry technology took place in Kyiv. The solution was applied to the system of selling the confiscated property of SE SETAM through the country's largest auction. The online auction, based on the distributed registry technology, held 11 thousand tenders worth almost two billion hryvnas over the past year (23).

SE SETAM issued the first transaction for the sale of lease rights to the public land through the OpenMarket Blockchain platform in October 2018. The total cost of the land lots sold on the OpenMarket reached UAH 348.5 million. It is referred to the arrested land and voluntary sale of the land. In general, there are about 10.5 million hectares of public land in Ukraine. The Cabinet of Ministers Resolution No. 688 dated June 21, 2017 set a procedure for arranging sales of lease rights for the public land through an electronic auction only (Tham, 2017). Implementation of this legislation through the Blockchain platform will facilitate the eradication of abuses in land auctions and ensure transparency in this sector.

The Board of the National Bank of Ukraine approved and presented the Cashless Economy roadmap (25). In particular, plans for the Blockchain technology application in Ukraine were first spelled out.

In the public finance area, the distributed data registry technology application concerns the following:

- Transparent Budget electronic system, which will contribute to strengthening public control over the use of budgetary funds. Thus, the operation of the i.data system module will allow any user to see data on public finance expenditure. The given module complies with the World Bank and the IMF standards. It will integrate information from the National Bank of Ukraine, the State Fiscal Service of Ukraine, the State Treasury Service and the ProZorro system;

- public procurement system, which is represented by the Ukrainian public e-procurement ProZorro system, which, according to the prestigious Open Government Awards, was recognized as the best in the world (Volosovich, 2017:20).

Definitely, some of the described above examples of the Blockchain technology application can be considered as the distributed registry projects testing and the first step towards constructing a new public administration system. It is about a fundamental restructuring of the very activity of the State, its total immersion in the Blockchain digital ecosystem. As a result, the State will gain a significant reduction in bureaucracy, practical elimination of paper documentation procedure, significant reduction in transaction costs, full control over the officials' activities, and, most importantly, creation of a favorable environment for the development of business and public life.

5. FINDINGS. Taking into account the above, it is necessary to state that the technology, if introduced into the fiscal process of Ukraine, will significantly increase the government spending accountability, make further legalization of the illegally received budgetary funds impossible and ineffective and will allow identifying the ultimate beneficiary of each national hryvnia at any time and also to visualize the full chain of transactions for the receipt of a monetary unit to such a beneficiary (Zinchenko, 2017).

Abhi Dobhal, Vice President of Business Development for Factom, said that from the State perspective the Blockchain has three "distinct advantages": "It has a distributed architecture, cannot be changed and is transparent. These features allow blockchain-based applications to fight against fraud and corruption. Alongside, they are more efficient" (26).

Thus, due to technological properties, Blockchain technology can become that invariant tool for the fiscal process efficiency improvement and corruption factors impact in Ukraine as a whole elimination, which will lead the country to the economic stability trajectory.

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of integrated reporting for countries with economies in transition. Approaches to assessing the quality of integrated reporting with the help of an econometric model are proposed. The obtained results are the basis for the output of integrated reporting of business entities to a qualitatively new level. The scope of research results is recommended to all economic entities during the preparation, compilation, submission and disclosure of integrated reporting. The conclusions and prospects of further researches in the direction of use of three other criteria for constructing an econometric model of estimating the quality of integrated reporting, namely: 1) disclosure of information on activities in the field of sustainable development; 2) compliance with the recommendations of the International Council for Integrated Reporting; 3) Interaction with stakeholders.

JEL: M40; M41; M49

Igor Britchenko
Tetiana Cherniavska

BLOCKCHAIN TECHNOLOGY IN THE FISCAL PROCESS OF UKRAINE OPTIMIZATION

The problem of corruption in Ukraine has been examined, as well as Blockchain technology application feasibility in combating the phenomenon has been analyzed in the article. Blockchain instrumental features and properties, making the technology unique and determining its potential applications in many sectors of the economy, have been covered with much attention. The authors have analyzed both advantages and obstacles for a distributed data registry implementation. Analysis of benchmarks and application of the best practices of Blockchain technology in the public sector, including the fiscal process, have been presented in the study. Profound interest in exploring the technology feasibility has been emphasized on the part of the world's leading governments. Information on pilot Blockchain projects in the public sector of Ukraine has been presented. The article focuses on the fact that alongside with the technology area and ways of scaling its application, a new era of digital society development is emerging.

JEL: L86; O33; E62; H26

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FORECASTING OF GROSS AGRICULTURAL OUTPUT OF AGRARIAN ENTERPRISES OF UKRAINE: CASE STUDY WITH STELLA SOFTWARE

The article is devoted to the forecasting of gross agricultural output of agrarian enterprises of Ukraine with an application of STELLA program. The STELLA economic modelling program, which combines mathematical differential equations with a developed graphical interface, has been used in the article. In this program a model was created and an attempt was made to forecast the gross agricultural output of agrarian enterprises of Ukraine by 2030. It has been the possible growth up to UAH 147319 mln UA of output of agricultural enterprises (PRODUCTION) with a slight reduction and further stabilization of the agricultural land (AREA) at the level of 22600 thousand hectares, a constant increase in fertilizers to 135 kg per hectare (FERTILIZATION) and a steady growth of

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