HERALD

of Kyiv National University of Trade and Economics

Scientific journal

It is published six times a year
First was published in February 1998

№ 6(134)2020

To October 2000 had been published under the title "Herald of Kyiv State University of Trade and Economics"
The journal is recognized by the Ministry of Education and Science of Ukraine as the professional edition in economic sciences of Category "B"

Founder, edition,
publisher and manufacturer
Kyiv National University of Trade and Economics

Managing Editor – OLIUNINA S.
Editors: KYRYCHENKO E., RASSKAZOVA I.
Artistic and Technical Editor
ANDRUSHKO S.

State registration certificate
Series KV № 13100-1984PR of 23.08.2007.

Index of the magazine in Catalogue
of publications in Ukraine in 2021 – 21910

Signed 14.12.2020.
Conventional print. pages. 10.
Circulation 250. Order 613.

Address of the Editorial board,
publisher, manufacturer:
st. Kyoto, 19, Kyiv-156, Ukraine 02156.
Contact us at 529-50-24, fax: 513-85-36,
e-mail: visnik@knute.edu.ua.

Printed on equipment of KNUTE.
Certificate of subject of publishing industry
series DK № 4620 of 03.10.2013.

Published on the recommendation
of the Academic Council of KNUTE
(minutes № 4 of 26.11.2020).

Kyiv · KNUTE · 2020

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UDC 339.5:338.3=111
JEL Classification: O33, O57, L86
DOI: http://doi.org/10.31617/visnik.knute.2020(134)01

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GLOBAL TRENDS OF DIGITALIZATION: POTENTIAL OF UKRAINE

The tendencies of digitalization of Ukraine based on research of the international ratings concerning development of digital transformation of a society are analysed. The most common indicators of international rankings which reflect digitalization level of countries are described. The place of Ukraine in the international rankings of digitalization is investigated. The key directions for the realization of Ukraine's digital potential to ensure the growth of the country's indicators in the world digitalization rankings have been identified.

Keywords: digitalization, digital economy, international rating, digitization indexes, digital potential.

Background. Information about various aspects of socio-economic life is received by society from international rankings which characterize the development of countries, their place in the world economy. The relevance of the study of Ukraine's position in the world coordinate system is due to the fact that the ratings are an indicator of the necessity to develop measures for overcoming shortcomings and creation of opportunities to increase competitive advantage. The digitalization of society is not an exception which significantly changes all spheres of life, constitutes a new valuable essence, contributes to the growth of efficiency and productivity of labour reducing the demand for human resources.

The global trend has tightly affected business, society, and government agencies of all countries. Digital industries have become one of the most dynamic and promising in the global economy. In many developed countries the growth rate of digital industries exceeds the growth rate of GDP. However, the digital divide between countries and regions, national approaches to information security, asymmetric opportunities and risks of the digital economy are hampering the introduction of breakthrough technologies and digital transformation. World experience shows that digitalization accelerates the processes of regional integration. In a pandemic, the struggle for survival has forced almost all countries to self-isolation, which has created the necessary and previously unused conditions for the digital transformation of the economies of all countries.

Analysis of recent research and publications. The research of domestic and foreign scientists is devoted to the methodology of assessing the development of digital transformation of countries based on international rankings. Thus, the works of G. Golovenchyk [1], S. Mărginean, and O. Ramona [2] analyzed the theoretical approaches to assessing the level of development of the digital economy and the degree of digital globalization. In the studies of O. Pizhuk [3], A. Semenoga [4] and N. Chesnokova [5] the modern methodological approaches of international organizations to the assessment of the level of digital transformation of the economy and society are systematized, generalized, and analysed. The level of digitalization of the Ukrainian economy, the peculiarities of its development are considered in the works of A. Mazaraki [6], L. Boyko, N. Belyaeva, S. Bay [7], V. Voitenko [8], G. Duginets [9]. The works of S. Krynytsia [10] and M. Rudenko [11] are devoted to the study of the role of the state in the transformational processes of digitalization of the Ukrainian economy, analysis of the possibility of obtaining a positive effect from digitalization for the domestic economy. Development trends and the current state of information and communication technologies in Ukraine were considered by M. Markov [12].

The **aim** of the study is to analyse the current state of digitalization of Ukraine and assess its digital potential through indicators of international rankings for an objective view of the opportunities and challenges of digital transformation.

Materials and methods. The information base of the article is presented by analytical reports of international organizations and statistical data. The research was carried out with implementation of general scientific methods: system analysis, synthesis, theoretical generalization, and comparison.

Results. Domestic and foreign works note that the digitalization of the economy is an integral part of modern innovative development. Accelerated implementation of digital technologies in the economic and social spheres is also one of the national goals of modern Ukraine. Ranking positions of Ukraine are also recorded in the "Concept of Development of the Digital

Economy and Society of Ukraine for 2018–2020". The main rating goals of the implementation of this Concept are to achieve the following indicators in 2020 [13]: 50th place in the rating of *ICT Development Index*; 30th – in the *Networked Readiness Index* rating; 40th – in the *Global Innovation Index* rating; 60th – in the *Global Competitiveness Index*.

At the international level, institutions and organizations research and publish various digitalization indices. However, there is no single and internationally recognized methodology for measuring digital orientation of countries. Most indices focus on indicators such as digital infrastructure and indicators of access to the *Information and Communication Technology Development Index (ICT).* It is advisable to explore other components of the use of digital technologies and skills.

The most common indicators of international rankings reflecting the level of digitalization of countries are given in *table*.

One of the complex international indicators of digitalization of the country is the *Index of development of information and communication technologies* – a combined indicator that characterizes the level of development of information and communication technologies of the country and is calculated as the arithmetic mean of three sub-indices: public access to ICT; use of ICT on the territory of a country; ICT skills of the population. In the latest ranking of 2017, published in the annual report "Measuring the Information Society", prepared by the International Telecommunication Union, the level of ICT development in Ukraine remained at the level of 2015, but the assessment of ICT development increased from 5.23 to 5.62 points (maximum – 10 points).

Ukraine has the highest score in the ICT sub-index of skills. At the same time, the level of ICT use remains low (*figure 1*).

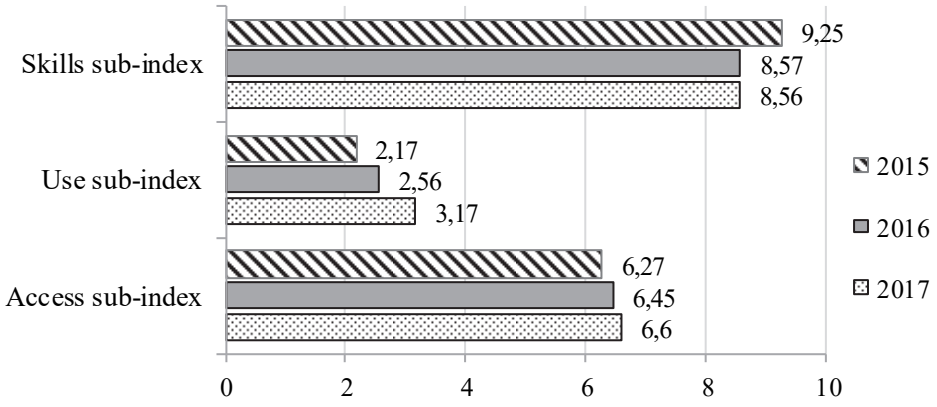


Figure 1. Positions of Ukraine in the "ICT Development Index", 2015-2017

Source: compiled by the authors [14].

Table

Place of Ukraine in international digitalization rankings, 2015–2020

Ranking	2015			2016			2017			2018			2019			2020		
	Mark	Rank	Number of countries	Mark	Rank	Number of countries	Mark	Rank	Number of countries	Mark	Rank	Number of countries	Mark	Rank	Number of countries	Mark	Rank	Number of countries
ICT Development Index	5.2	79	167	5.3	78	175	5.6	79	176	–	–	–	–	–	–	–	–	–
Network Readiness Index	4.0	71	143	4.2	64	139	–	–	–	–	–	–	48.9	67	121	49.4	64	134
Global Opportunity Index	4.7	88	136	–	–	–	88	81	147	80	76	147	98	99	144	–	–	–
Global Innovation Index	36.5	64	141	35.7	56	128	37.6	50	127	38.5	43	126	37.4	47	129	36.3	45	131
E-Government Readiness Index	–	–	–	0.6	62	193	–	–	–	0.62	82	193	–	–	–	0.7	69	193
E-Participation Index	–	–	–	0.8	32	193	–	–	–	0.69	75	193	–	–	–	0.8	46	193
Global Connectivity Index	32	56	79	35	55	79	38	55	79	40	54	79	44	50	79	–	–	–
Global Competitiveness Index	4.0	79	140	4.0	85	138	4.1	81	137	57	83	140	57	85	141	–	–	–
World Digital Competitiveness Index	n/a	59	63	н/д	59	63	44.0	60	63	51.3	58	63	55.3	60	63	48.8	58	63
Global Cybersecurity Index	–	–	–	–	–	–	0.50	58	193	0.66	54	193	–	–	–	–	–	–

Notes: "–" – the study was not performed; n/a – data are not available

Source: compiled by the authors [14–22].

The 2018 report does not rank countries according to this index but provides profiles and conclusions on the achievements and potential of the studied countries. The report states that "Ukraine has great potential for the development of the mobile and fixed broadband connectivity market. Operators seek to introduce new services and attract new subscribers. New digital transformation strategies, big data, blockchain and agile are being discussed at the state level" [23].

The Network Readiness Index reflects the level of countries' ability to use ICT for socio-economic development and is one of the most important indicators of innovation and technological potential of the countries, their development in the field of high technology and digital economy. Previously, this figure was calculated by the World Economic Forum and the International School of Business INSEAD. In 2019, the index was thoroughly revised and transferred to the non-profit organization Portulans Institute which conducts this study together with the World Alliance of Information Technologies and Services.

In 2020, Ukraine reached the level of 2016 on this index and took 64th place out of 134 countries which is 3 points higher than in 2019. The growth was due to strengthening sub-indexes of management and technology development which is partly explained by significant potential in software development for the creation of digital technologies. The weakest sub-index is the impact of digitalization on the socio-economic life of the country (*figure 2*).

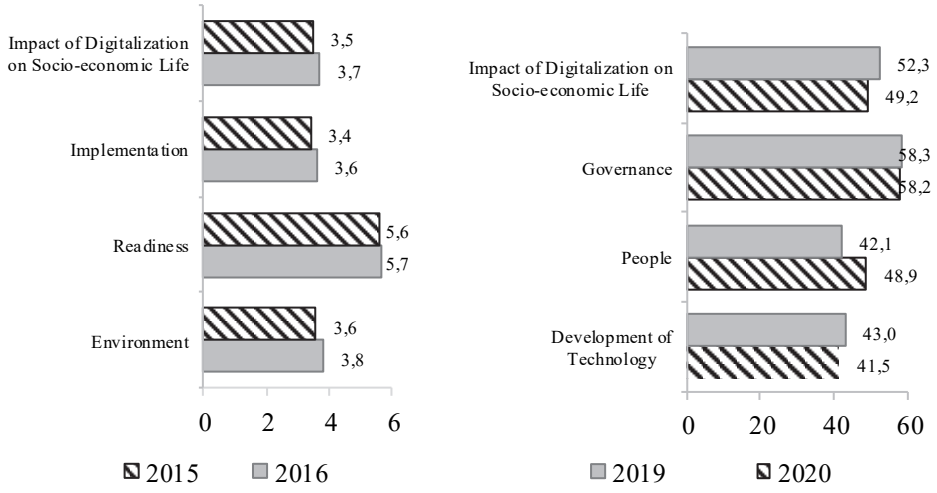


Figure 2. Positions of Ukraine in the Network Readiness Index, 2015–2019

Source: compiled by the authors [15].

Experts emphasize that there is a need to address the health issues, well-being, and stability of society to improve its quality of life and sustainnable development. Such results indicate the necessity to continue emphasis on efforts of increasing the level of digitalization of the national economy which will have a positive impact on all areas of activity, as well as on the growth of the professional level of management personnel.

The Global Opportunity Index reflects a set of factors that contribute to attracting foreign direct investment to the country: ease of doing business; quality of state regulation; rule of law. According to this index Ukraine took 99th place in the 2019 ranking (88th place in 2015).

The Global Innovation Index reflects the innovation potential of the world countries. The index consists of 82 different variables and is calculated according to the methodology of the International Business School INSEAD (France) and is the most complete comprehensive indicator of innovative development of the world countries which are at different levels of economic development. In the last five years Ukraine has signifycantly strengthened its position in this ranking: in 2020 it rose by 19 points and took 45th place among 131 countries. Ukraine achieves better performance in the field of innovation (71st place) than in innovation (37th place) (*figure 3*). The increase is mainly due to growth in the sub-indices of education (+ 20 positions) and R&D (+10 positions).

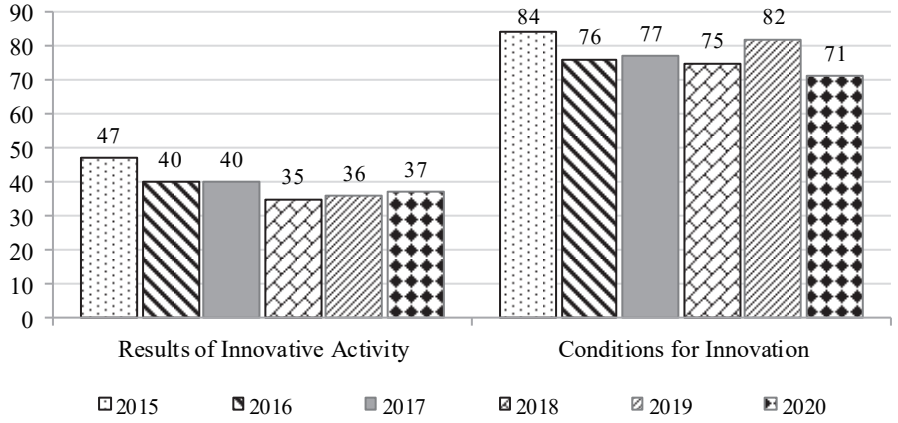


Figure 3. Positions of Ukraine in the ranking "Global Innovation Index", 2015–2020

Source: compiled by the authors [17].

Regarding Huawei *Global Connectivity Index* which tracks the impact of ICT on the national economy, digital competitiveness and future growth, Ukraine has improved this indicator by 12 points in 5 years and in 2019 took 50th place in this ranking against 56th place in 2015. The study, which covers 79 countries, which generate 95% of world GDP and represent 84% of the world's population [21], is based on four elements of ICT development and digitalization: the level of existing supply of ICT products and services; the level of demand for network interaction; experience in digital technologies implementation; the potential for digital transformation. Ukraine has the highest indicator in terms of sub-indices of experience in digital technologies implementation and demand for networking (*figure 4*).

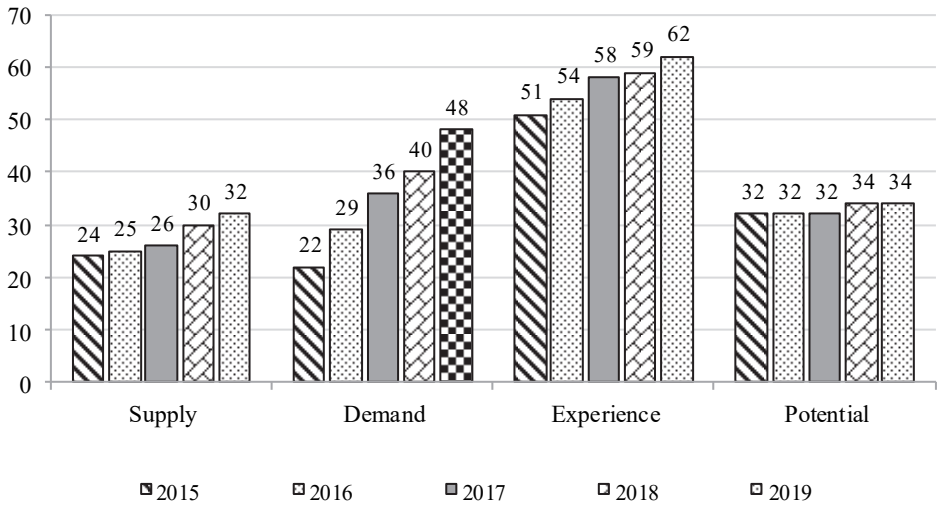


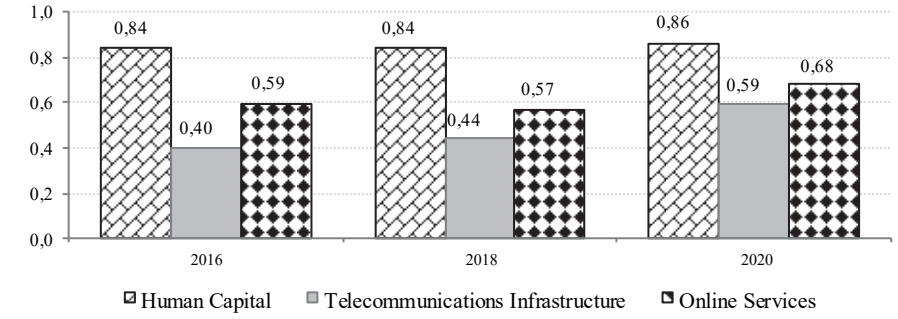
Figure 4. Positions of Ukraine in the rating "Global Connectivity Index", 2015–2019

Source: compiled by the authors for [21].

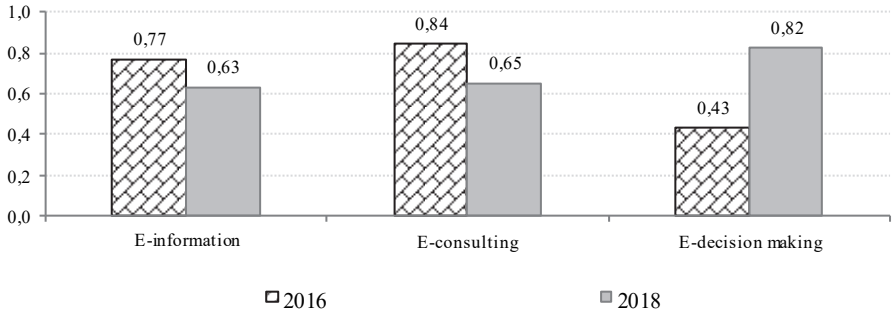
The compilers of the ranking claim that the increase of the global connectivity index by 1 point is equivalent to: the strengthening of the level of competitiveness by 2.1%; accelerating the introduction of innovations at the state level by 2.2%; increase in productivity by 2.3% [17].

According to the E-Government Readiness Index which is updated every two years and is calculated on three indicators: e-services development, human capital and telecommunications infrastructure, in 2019 Ukraine ranked 69th in terms of government readiness to use ICT and the level of quality of public services. The price of 13 positions is higher compared to 2017 which helped Ukraine to join the group of countries with a high level of e-government development. To assess the provision of interactive information services to citizens the Electronic Participation Index is used which assesses the quality and usefulness of e-government programs for engaging citizens in the process of public decision-making and their implementation. The index is based on three components: e-information, e-consulting, e-decision making. According to this indicator Ukraine has made a leap strengthening its position in 2020 by 29 points compared to 2018 (from 75 to 46 places), and, as a result, in 2020 entered the group of countries with the highest index of electronic participation (*figure 5*).

The Global Competitiveness Index shows the ability of national economies to achieve sustainable development in the medium term based on new knowledge and technologies. During 2016–2019 Ukraine weakened its position according to this ranking: in 2015 it took 79th place, and in 2019 – 85 [19].



a) E-Government Readiness Index



b) Electronic Participation Index

Figure 5. Positions of Ukraine in the ratings "Readiness for E-government" and "Electronic Participation Index", 2016-2020

Source: compiled by the authors on [18].

The World Digital Competitiveness Index which ccomplements the Global Competitiveness Index and is developed by the Swiss Business School of the International Institute for Management Development, examines the ability and willingness of 63 countries to implement digital technologies as a key driver of economic transformation. According to the method of calculating this index countries are ranked taking according to three groups of factors which contain three subfactors consisting of 52 criteria (32 statistical and 20 expert). Among them: assessment of the development of educational and scientific potential, availability of regulatory framework, availability of financial capital and technological conditions, ability of business to adapt to a changing environment [4]. In 2020, Ukraine moved up two places in this ranking (from 60th to 58th) compared to 2019, due to the availability of digital / technological skills (40–27), electronic participation (53–39) and manoeuvrability of companies (47–33) (*figure 6*).

According to experts of the International Institute of Management [20] strengthening Ukraine's position in the ranking of the global index of digital competitiveness will contribute to: strengthening the rule of law, reforming the legal system and restoring confidence in the judiciary, improving capital efficiency, timely servicing of external and domestic debt; economic development, reducing the flow of labour migration of Ukrainians abroad.

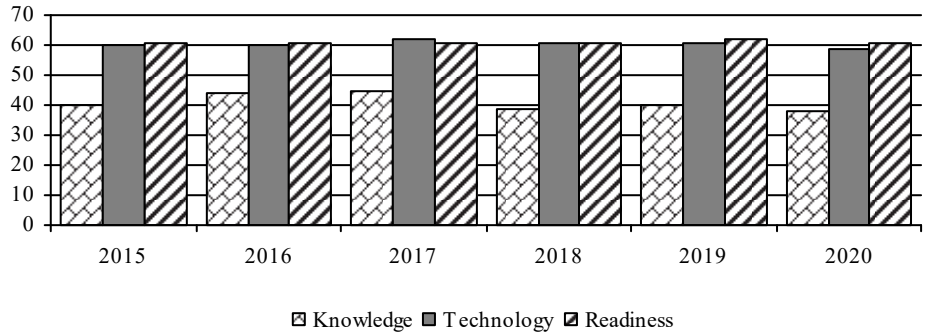


Figure 6. Positions of Ukraine in the *World Digital Competitiveness Index*, 2015–2020

Source: compiled by the authors [20].

The Global Cybersecurity Index calculated by the International Telecommunication Union assesses the level of cybersecurity of countries according to five main indicators: the legal framework for cyberspace regulation, technical infrastructure, organizational issues, quality improvement and cooperation. In the ranking of 2018, Ukraine increased its position by 4 points and took 54th place against 58th place in 2017. Experts emphasized the development of the Law of Ukraine "On Basic Principles of Cybersecurity of Ukraine", which defines the legal and organizational framework for protecting Ukrainian society in cyberspace, directions of state policy in the field of cybersecurity which approximates Ukraine to international standards for the protection of information space.

Conclusion. Negative trends in some indices of digital development of Ukraine are a signal to the leading government agencies and organizations to take appropriate measures to overcome them, positive trends indicate the right choice of digitalization of the economy. Analysis of Ukraine's digital potential revealed that the country has significant resources for digitization. The first stage of accelerating the development of the digital economy is the formation of a modern basic ICT infrastructure and its modernization. The key directions for the realization of digital potential are determined by the existing model of the economy. In Ukraine as in a country with a high share of employment in the agricultural sector there is a need to take measures for the development of digital agriculture to increase productivity. Equally important for the development of the digital direction is a favourable innovation environment which is created primarily with the support of the state. The institutional aspiration to develop the digital economy in combination with the propensity of the private sector to innovate creates synergies for the development of the digital economy. The increase of positions in the world rankings of digitalization is possible not due to local improvement of certain areas and indicators but due to the implementation of a comprehensive public policy covering various areas of activity which will result in impetus to the digital ecosystem.

Ukraine's transition to a digital economy is an inevitable process. The COVID-19 pandemic opens up new opportunities for the development of the state, society and individual economic entities, as well as it identifies problem areas. The study of the national system of indicators of the development of the information society of Ukraine is seen as a promising further exploration in this direction. The development of digital potential will stimulate the interaction of all categories of the population, business, entrepreneurs, and government and within each of the individual categories.

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The article submitted to editor's office on 02.11.2020.

Новікова Н., Дьяченко О., Головня Ю. Глобальні тренди цифровізації: потенціал України.

Постановка проблеми. *В умовах пандемії COVID-19 боротьба за виживання змусила майже всі країни перейти до режиму самоізоляції, через що склалися певні унікальні умови для цифрової трансформації економіки всіх країн світу. Індикатором необхідності вироблення заходів, спрямованих на подолання недоліків і створення можливостей для нарощування конкурентних переваг країни щодо розвитку цифрової трансформації суспільства є міжнародні рейтинги цифровізації.*

Мета *дослідження. Аналіз сучасного стану цифровізації України й оцінка її цифрового потенціалу через показники міжнародних рейтингів для об'єктивного уявлення про можливості та виклики цифрової трансформації.*

Матеріали та методи*. Інформаційна база статті представлена аналітичними звітами міжнародних організацій, статистичними даними, прогнозами експертів. Дослідження здійснено із застосуванням загальнонаукових методів: системного аналізу, синтезу, теоретичного узагальнення та порівняння.*

Результати дослідження. *Проаналізовано тенденції цифровізації України на підставі дослідження міжнародних рейтингів щодо розвитку цифрової трансформації суспільства. Охарактеризовано найпоширеніші показники міжнародних рейтингів, що відображають рівень цифровізації країн. Досліджено місце України у міжнародних рейтингах цифровізації. Визначено ключові напрями з метою реалізації цифрового потенціалу України для забезпечення зростання показників країни у світових рейтингах цифровізації.*

Висновки. *Негативні тренди окремих індексів цифрового розвитку України є сигналом для керівних державних структур і організацій до вжиття відповідних заходів щодо їх подолання, позитивні – свідчать про правильно обраний напрям цифровізації економіки. Аналіз цифрового потенціалу України виявив, що країна має значні ресурси для цифровізації. Ключові напрями для реалізації цифрового потенціалу обумовлює існуюча модель економіки. Підвищення позицій у світових рейтингах цифровізації можливе не через локальне покращання окремих напрямів і показників, а завдяки реалізації комплексної державної політики, яка має охоплювати різні сфери діяльності, що у результаті надасть поштовх до створення цифрової екосистеми.*

Ключові слова: цифровізація, цифрова економіка, міжнародний рейтинг, індекси цифровізації, цифровий потенціал.

UDC 338.24
JEL Classification E02 DOI: http://doi.org/10.31617/visnik.knute.2020(134)02

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INNOVATIVE ECOSYSTEM IN THE CONDITIONS OF THE COVID-19 PANDEMIC

There is characterized the state of functioning of the innovation ecosystem in the conditions of a pandemic. There is presented the experience of reorganization of highly efficient innovation ecosystems during the crisis, which contributed to the achievement of optimal conditions for functioning and development. There are analyzed the main indicators of the Global Innovation Index 2020 and the main factors influencing the formation of the innovation ecosystem of Ukraine. There are proposed measures to strengthen it.

Keywords: innovation ecosystem, innovations, innovation activity, investments.

Background. Modern scientific research shows that the introductions of innovations is an important factor in improving the efficiency of Human Resources and capital investment and thus promote economic growth. The needs for innovation are growing more than ever, due to the needs to restore economic growth in the financial crisis caused by the COVID-19 pandemic. That is why the ecosystem approach to solving consequential problems and finding new mechanisms for cooperation of efforts of all participants in the innovation process in the chain of transformation of scientific knowledge into innovation and its further commercialization becomes especially important.

An indication of today is the functioning of the innovation ecosystem under the pressure of a number of negative factors that are generated by the spread of epidemic disorganization of the normal course of economic processes. An important issue is to build the capacity of the innovation ecosystem in the process of overcoming the recession caused by the COVID-19 pandemic and ensuring continuity of functioning.

Analysis of recent research and publications. In recent years, research has become significantly more relevant on the theoretical and methodological foundations and mechanisms for ensuring the existence and development of innovative ecosystems, for example, in the works of domestic and foreign scientists and practitioners: A. Marshall, A. Lippa, K. Ikeda, R. Singh [1], T Gurney, J. Dibburn, T. Huber [2], O. Granstrand, M. Holgerson [3], G. Lanovska [4], S. Kravchenko [5], I. Pidorichev [6], I. Fedulova [7], L. Fedulova [8] and others.

The accumulated scientific array of developments and their obvious practical significance do not provide monosemantic approaches in strengthening the influence of external and internal factors on the functioning of innovation ecosystems in the economic crisis of non-cyclical nature caused by the pandemic as force majeure. This fact actualizes the needs to rethink the adopted management models, their modification according to other evaluation parameters.

The **aim** of the article is to identify the main threats to the balanced functioning of innovation ecosystems from the introduction of quarantine measures in relation to the COVID-19 pandemic, to find ways to improve the management of innovation ecosystem of Ukraine in crisis and post-crisis conditions.

Materials and methods. Theoretical and methodological basis of scientific research were scientific concepts and theoretical developments on the functioning of the innovation ecosystem; information and analytical materials of the State Program of Economic Stimulation to Overcome the Negative Consequences Caused by Restrictive Measures to Prevent the Occurrence and Spread of Coronavirus Disease (COVID-19) for 2020–2022. The research used methods of theoretical generalization, comparative analysis and synthesis, which allowed to identify the key determinants of innovation ecosystem development in the future.

Results. The formation of terminological support for the research of the innovative vector of economic development at the present stage has become controversial. Thus, according to G. Lanovska, the innovation ecosystem is seen as a synergy of the state, business and explorative environment with the use of organizational, regulatory, educational and methodological and financial resources and the introduction of a mechanism for knowledge transfer to transform into innovative products [4]; I. Fedulova argues that the innovation ecosystem is a set of organizational, structural and functional institutions and their relationships involved in the creation and application of scientific knowledge and technologies that determine the legal, economic, organizational and social conditions of the innovation process and ensure the development of innovation at the level of enterprises, and at the level of the region and the country in general according to the principles of self-organization [7].

According to managers, the innovation ecosystem plays an important role in the development of the innovation economy. After all, given the dynamic combination of economic and political programs on the innovation platform, in the context of creating a space for social product production, the innovation ecosystem is able to ensure cooperation of knowledge and technology between universities and business on progressive standards of innovation, creativity and quality; to promote the creation of a new innovative business through incubation mechanisms and accelerate the growth of its share in the formats of small and medium-sized companies, including in the global network, promoting the internationalization of business, etc.

The innovation ecosystem usually materializes in five key components that are quite sensitive to the state of the economy: science, engineering and technical communities, higher education institutions, which play the role of the main suppliers of innovative ideas for commercialization; the venture capital industry, which provides the attraction into the ecosystem of financial resources and business competence that is necessary for the formation of innovative companies and their transformation into full-fledged business structures; infrastructure that ensures the functioning of innovative companies, which can be formalized into technology parks, business incubators, development institutions, etc., as well as represent an intangible substance – a variety of services specifically tailored to the needs and specifics of innovative companies (intellectual property protection services, breeding and promotion innovative products for foreign markets); steady demand for high-tech products, technologies and start-ups – primarily from big business and other real sector companies, as well as for innovative companies along with all their developments and intellectual property (as promising objects for acquisition); legal field that provides comfortable conditions for participants in innovation processes [4].

In the context of the pandemic, some areas of innovation are virtually suspended, but at the same time, it is worth noting the surge in new inventions in the field of health care.

Thus, in Spain, the functioning of the innovation ecosystem is ranked as highly efficient. It includes the Universities of Castile and Leon, the Foundation for Universities and Higher Education (FUESCYL), the Ministry of Education of the Regional Government of Castile and Leon and the Red de Transferencia de Conocimiento Universidad-Empresa (TCUE) network, which is responsible for promoting knowledge transfer from universities to companies under the Regional Intelligence Specialization Strategy (RIS3). When the spread of the coronavirus epidemic led to a health crisis, the laboratories of four public universities in Castile and Leon were able to respond quickly by creating an effective network of cooperation, intensifying the production and delivery of protective equipment to hospitals and nursing homes. The University of Burgos joined the local network of protective masks supplied to the hospital in collaboration with the City Council, the Cluster of Innovative Solutions for Independent Living (SIVI) and local companies. As part of its innovative laboratories, the University of Valladolid joined the Renault to the rescue network to manufacture protective elements for medical staff in hospitals and nursing homes (using 3D printers). The solidarity project, launched by more than 120 employees of the Renault engine plant in Valladolid, was funded by Amazon crowdfunding in collaboration with CIDAUT Technology Center, Renault, the parent organization AENIUM and other organizations. On the basis of the laboratory of the University of Leon, the production of sanitary protection materials was introduced for the first time in coordination with the laboratory of the University of Valladolid and thanks to the efforts of local

companies. These achievements would be impossible without the coordination of the efforts of regional universities, local companies, other spontaneous networks of public associations, etc. Civic initiatives in a stable innovation ecosystem helped to support the health care system and did not break the value chain [9].

Combining the experience of the innovation ecosystem and its features in a pandemic, the National Smart Specialization Strategy for 2021-2027 for Castile and Leon, for example, will create and consolidate collaboration of environments for all stakeholders, deepening on its geographical expansion and linkages with other innovations. ecosystems of various scales. After all, general approaches do not cause exclusive trajectories of rational specialization by the criterion of achieving optimal conditions for the functioning of innovative ecosystems, their subjective content and technological originality [9].

In the United States, to support the innovation ecosystem and the effective collaboration of government, research, and business, the government has announced the launch of the high-performance computing consortium COVID-19, which will provide virus researchers around the world with access to the most powerful pandemic control [10].

World experience shows the needs to strengthen collaboration in the innovation ecosystem in a pandemic to maintain its current state and further development. In order to increase the innovation potential of the country and unite the efforts of participants in the innovation process in the innovation ecosystem, it is necessary to complement resources, opportunities and competencies in various combinations, and thus implement a system of expert monitoring of efficiency and potential of institutional and organizational innovation structures. This is possible under the condition of an effective service of management, audit and monitoring of the innovation environment. That is why it is necessary to conduct an audit of previously created innovation structures for the existing potential and feasibility of their existence. In a pandemic, based on foreign experience, it is advisable to reorganize the institutional and organizational innovation structures that are designed to develop innovation infrastructure for modern needs. Such a reorganization should be carried out in order to reduce unpromising institutions and organizations and create on their basis a small number of effective structures capable of establishing interaction between science, invention, innovation, on the one hand, and business – on the other. This will allow to obtain a positive economic effect in the crisis due to the intensification of the processes of formation of the national innovation ecosystem, ensuring investment and innovation development of small business, cooperation of government agencies, higher education institutions, small, medium and large enterprises in innovation, creation of scientific and technical clusters. This can lead to an increase in sectoral domestic product by 5–7% annually, which is crucial in a crisis.

Ukraine is open to the penetration of progressive experience, but it needs to create a strong system of state support for all actors in the innovation ecosystem. Global measurements of the current state of innovative development of Ukraine's economy are classified as crisis and inconsistent with the level of European countries (rating "Global Innovation Index 2020"). Despite the fact that in 2020 Ukraine improved its result by 2 steps, taking 45th place, it is almost twice lower than the value of the index of European leaders. In the same metrics for Ukraine, compared to 2018, there is a decrease of 2 positions. (*figure 1*).

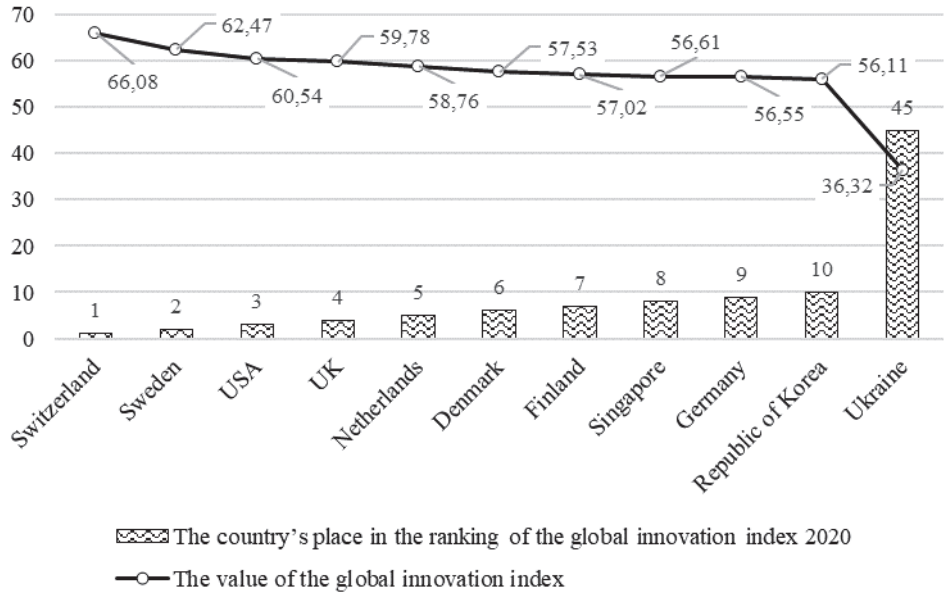

Figure 1. Global Innovative Development Rating 2020

Source: compiled by the author according to [11].

Ukraine ranks 93rd out of 129 countries in terms of institutional development (which is 3 positions higher than 2019) with signs of lagging behind due to intense turbulence and weak regulatory support and 94th place in terms of infrastructure development, which is identified as underdeveloped and inefficiently used even in its current state. Important in the context of determining the state of the innovation ecosystem of Ukraine is the indicator of the level of market development as a whole. Ukraine is ranked 99th in the ranking, which is 9 positions lower than the previous year. Analysts believe that this is due to difficult access to microfinance and investment of economic entities – the main economic agents.

Shown in *figure 2* structural characteristics of the Global Innovation Index prove the fact that there are no changes in the innovation ecosystem of Ukraine and the processes of increasing the intensity of innovation renewal of the economic potential for the development of a competitive economy in the short term.

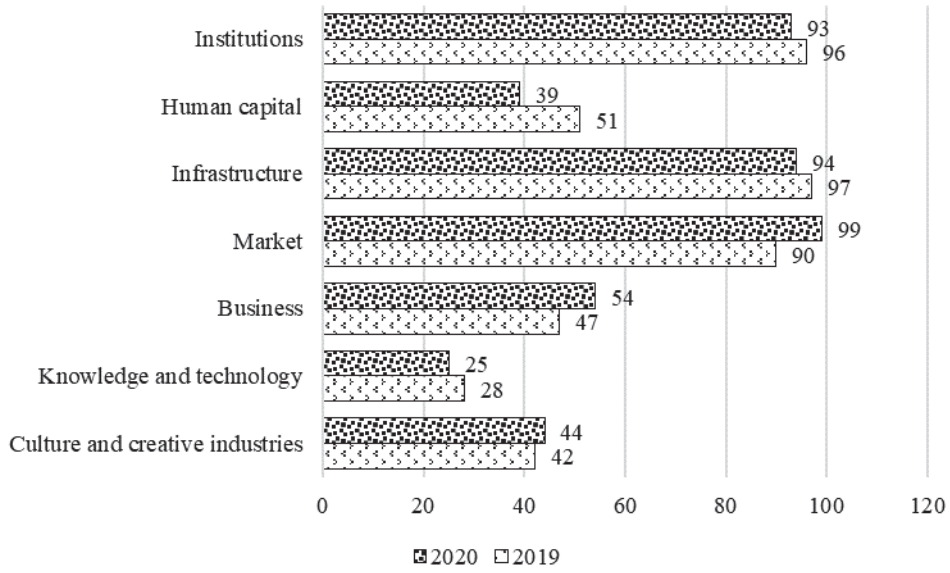

Figure 2. The value of the multipliers of the Global Innovation Index of Ukraine 2019–2020

Source: compiled by the author according to [11].

The introduction of high-tech robotics can reduce labor costs per year in the field of production on the globe by 6.3 trillion dollars. US (19% of global labor costs), automation of information and knowledge – to reduce labor costs over the same period by $ 9 trillion. USA (27% of world labor costs) [12].

It is proved that the growth of labor productivity and improving the quality of life of the population directly depends on the level of innovation, which in the long-term perspective becomes a determining factor in the ability to create and use new technologies.

According to the June 2020 forecast of the International Monetary Fund (IMF), world GDP will shrink by 4.9% by the end of the year, and is projected to slow down ten years, with high unemployment and long-term damage to globalized trade and value chains [11].

The sphere of functioning of the innovation ecosystem is a multi-factorial environment *(figure 3)*, where the greatest threat is posed by factors of negative impact, especially in a pandemic.

During the pandemic, investment in innovation has "depressive" signs, with a significant decline in economic growth, spending on innovation is rather solely due to falling business profitability due to declining consumer market activity, solvency, growth of investment and credit markets. As a result, innovation ecosystems face the problem of funding, and in a pandemic, this problem is exacerbated by the reduction of sources of investment capital.

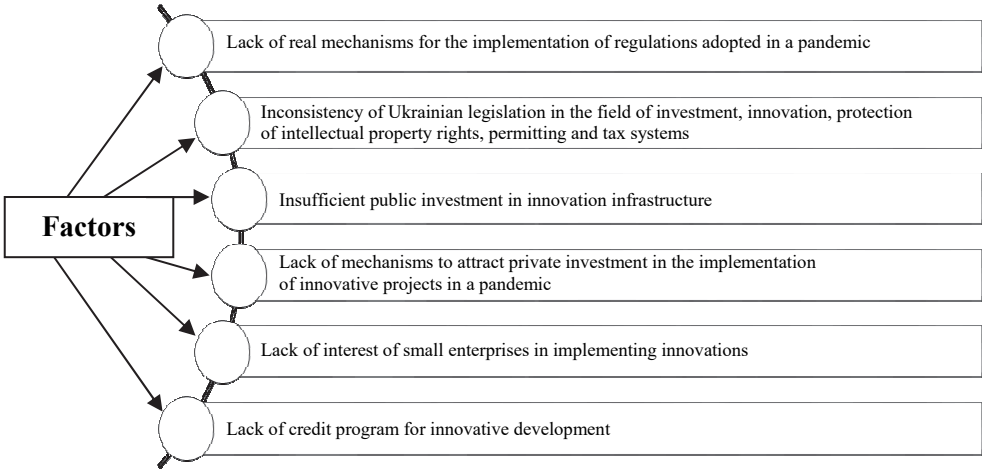

Figure 3. The main factors of negative impact on the functioning of the innovation ecosystem of Ukraine in a pandemic

Source: compiled by the author according to [1–6].

However, the financial crisis of 2008-2009 did not cause a sharp drop in R&D for the economies of a number of countries (Argentina, China, Costa Rica, Egypt, France, India, the Republic of Korea, Mexico, Poland and Turkey). The crises of previous years had different effects on different countries: in some of them there has even been an increase in innovation, in others – a decrease [9]. The current economic scenario of the country's development raises a number of questions regarding the effectiveness of investment policy in terms of innovation vector, including on a short- or long-term basis. That is, the policy of stimulating investment in innovation is a leading tool for strategic management of business, national economy, and world economic trajectories.

It is strategically important for Ukraine to create favorable conditions for the existence and development of innovation clusters as a platform for the successful functioning of the entire innovation ecosystem. After all, Ukraine is still not represented in the world's TOP-100 scientific and technological clusters, and this is due to the existence of public administration tools. Investment and innovation policy in Ukraine is declared as the organization of cooperation between small, medium and large enterprises in the field of innovation in the near future. However, so far no agglomeration of small and medium enterprises has been created around large enterprises – technological leaders in certain sectors of the economy. In the experience of leading countries, leaders create powerful innovative production and service networks that are filled with small businesses. That is why in order to create highly efficient innovation clusters it is necessary to introduce a system of digital transformation in the field of innovation in order to eliminate artificial procedural obstacles to the creation of innovation structures (clusters). Also in the context of digital transformation, it is necessary

to provide for simplification of the procedure for obtaining copyright documents and optimize all processes of interaction in the innovation ecosystem in general, which will significantly affect the strengthening of the innovation ecosystem in a pandemic.

Thus, the implementation of proposals to strengthen the innovation ecosystem in a pandemic will maintain the current position and will accelerate the pace of economic development in a lockdown.

Conclusion. Successful innovation ecosystems should be based on a collaborative format, i.e. relationships between subjects that continuously share knowledge, form common rules and structures, agree on common decisions and coordinate actions to achieve common goals, including in the fight against a pandemic. After all, the ecosystem approach involves evolution over time, taking into account the influence of environmental factors, i.e. innovative ecosystems are characterized by an open dynamic nature.

In the conditions of crisis the state regulation of activity of innovative ecosystems through the mechanism of direct influence on subjects of the organization and definition of conditions and rules of their activity acquires special value. The analysis of highly efficient innovation ecosystems indicates the existence of a mechanism of self-development. That is, under the right conditions of regulation and support, the innovation process can be continuous even in a pandemic. Effective collaboration on the platform of the innovation ecosystem will promote the development of an innovative economy, as evidenced by the foreign experience of Spain and the United States. Coordination of efforts of state, regional, local authorities and companies can facilitate the search for cooperation of knowledge and technology between research institutions and business and, as a consequence, the creation of a new innovative product.

In Ukraine, the innovation ecosystem is underdeveloped, and during the pandemic there is a threat of growing lag behind the leading countries. The main reason for slowing down the development of the ecosystem is the lack of proper government regulation, control and evaluation of the innovation environment. In the conditions of the crisis there are practically absent: the state support of the subjects of the innovation ecosystem and effective investment and innovation policy to ensure collaboration between large, medium and small enterprises; effective tools for organizing such cooperation (pilot projects for the creation of innovation and production agglomerations in the form of scientific and technical clusters of large, medium and small innovative enterprises based on large enterprises – technological leaders to eliminate the crisis in health care); government orders in science-intensive and high-tech sectors of the economy in accordance with the requests of health care institutions; public investment in the development of new organizational forms of such cooperation. The introduction of an effective mechanism of state regulation will lead to overcoming the destructive impact of the pandemic on the innovation ecosystem, as the benefits of uniting the participants of the innovation ecosystem are obvious. Combining

different unique competencies to overcome the pandemic will help create innovative products. Competitive advantages in overcoming the pandemic will be on the side of those innovative ecosystems that combine their unique resources and knowledge to develop new products that will further define the market.

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The article submitted to editor's office on 19.11.2020.

Пурденко О. Інноваційна екосистема в умовах пандемії COVID-19.

Постановка проблеми. *Інноваційна екосистема України сьогодні перебуває в процесі подолання рецесії, спричиненої пандемією COVID-19. Саме тому особливого значення набуває екосистемний підхід до вирішення проблем та пошуку нових механізмів кооперації зусиль усіх учасників інноваційного процесу.*

Аналіз останніх досліджень і публікацій. *Визначено, що попри наявність окремих наукових досліджень з питань інноваційних екосистем існує необхідність встановлення механізму подолання кризи в умовах пандемії COVID-19.*

Метою *статті є ідентифікація основних загроз від запровадження карантинних заходів у зв'язку з пандемією COVID-19, визначення ініціатив для ефективного функціонування інноваційної екосистем України.*

Матеріали та методи. *Теоретико-методологічною основою наукового дослідження стали наукові концепції та теоретичні розробки з питань стану інноваційної екосистеми, а також інформаційно-аналітичні матеріали державних органів влади.*

Результати дослідження. *Наведено досвід існування високоефективної інноваційної екосистеми під час вибуху кризи та їх успішної реорганізації, що сприяло досягненню оптимальних умов для функціонування й розвитку інноваційних екосистем. Проаналізовано основні показники Глобального Індексу Інновацій 2020 та основні виклики інноваційної екосистеми України.*

Висновки. *Встановлено, що в Україні інноваційна екосистема є недостатньо розвиненою, а в період пандемії існує загроза посилення відставання від провідних країн. Головною причиною гальмування розвитку екосистеми є відсутність належного державного регулювання, контролю та оцінки інноваційного середовища. Запропоновано заходи щодо зміцнення інноваційної екосистеми.*

Ключові слова: інноваційна екосистема, інновації, інноваційна діяльність, інвестиції.

UDC 004.738.5:339.93.:334.012.61- 022.5
JEL Classification: M21, M15
DOI: http://doi.org/10.31617/visnik.knute.2020(134)03

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DIGITALIZATION OF BUSINESS UNDER GLOBAL CHALLENGES

The article focuses attention on prospects for the development of Ukraine's economy taking into account the potential of social processes and business digitalization. We accentuated the global tendencies of economic relations digitalization, which create progressive forms and methods of business processes for small and medium enterprises. The article determined priorities of development for small and medium businesses of Ukraine under the conditions of the pandemic, world economic crisis, and digital transformation of economic relations.

Keywords: digitalization, digital technologies, digital economy, digital platforms, business processes, small and medium business.

Background. Modern conditions of work for small and medium-sized businesses are characterized by a very high level of dynamism, so running a business with old business models means exposing yourself to the risk of being behind competitors. Accelerating the pace of informatization and digitalization, on the one hand, increases the risks for existing business models, but on the other hand, it opens up new opportunities for business development.

According to a study conducted by Huawei and Arthur D. Little [1], in 2016, 60 % of companies began to use digital technologies and change their business; 20 % of companies have just started to get acquainted with digital; 18 % attracted and served customers with the help of information technologies; 2 % are completely digitalized. In 2016 the digital economy accounted for 15.5 % of world GDP, in 2022, according to experts from Huawei and Oxford Economics calculations, this figure could reach 60 % [2].

Nowadays, digitalization is becoming a necessary condition for doing business, which affects not only work with customers but also internal processes related to production, management, internal communication. Particular attention is paid to the applied aspect of digitalization, ie the possibility of its application in the practice of enterprises, which encourages the latter to constantly increase the set of digital tools and expand their scope.

According to a McKinsey company study, businesses, and organizations that have switched to digital competition have 2.5 times more active revenue growth, better EBIT and ROI indicators. Conversely, in the case of a slowdown in digital transformation, companies estimate the probability of revenue loss in the next 3 years at 25-40% depending on the industry [3].

Analysis of recent research and publications. Theoretical and applied aspects of digital economy formation and development are highlighted in the works of such foreign researchers as A. Toffler and H. Toffler [4], they point out that information can replace a large number of material resources and will become the main material for employees. B. Larralde and P. Hagen [5] emphasize that the use of digital tools leads to radical changes in our lives, makes us think in new ways, plan and make decisions.

Among national scientists who study the problems of the digital economy and its impact, in particular, on the activities and development of domestic enterprises, it is worth noting the works of O. Abakumenko, Y. Bazhal, V. Varga, O. Gudz, A. Derkach, I. Dulska, K. Kononova, M. Korneeva, S. Korol, N. Kraus, V. Makoviy, E. Polovyk, O. Halapsis, and others.

Thus, Yu. Bazhal [6] focuses on the ability of small businesses to implement digital tools in business, which provides advantages over large corporations when it is necessary to dynamically commercialize the latest technologies or meet innovative consumer demand. The advantage of small innovative entrepreneurship is its ability to quickly introduce new products, modernize and disseminate them through cooperation with both large businesses and consumers, adapting new product properties to possible innovative needs, as well as being a link between industry science and public research sector, universities and other participants of innovation processes.

In turn, K. Kononova pays attention to the information economy, the use of artificial intelligence, and their impact on the activities of enterprises [7]. N. Kraus considers the digital economy as one that is based on digital computer technology. The researcher focuses on the description of this type of economy basic components and innovative services/products [8].

Taking into consideration the urgency of this problem and the growing need for digital tools for small and medium business entities, the questions of new ways to manage the economic and social changes associated with the digital transformation demand more in-depth research.

The **aim** of this work is to substantiate the modern vision of society digitalization manifestation and determine a set of tools for enterprises' digitalization, including small and medium-sized businesses under the conditions of global challenges.

Materials and methods. The informational bases of the research were publications of national and foreign scientists on the research topic, statistical materials, and Internet sources. To fulfill the set tasks and achieve the main goal of the research we used methods of generalization, analysis and synthesis, comparison, scientific abstraction and systematization.

Results. The term"digitalization" is an English word, which means "digitization". However, scientists are increasingly using this definition based on its practical aspect, and therefore the terms "digitalization" have become widespread.

O. Abakumenko, A. Derkach and M. Korneeva interpret the concept of "digitalization" as a process of converting a certain information field from analog to digital format for easier further use on modern electronic devices [9]. O. Halapsis defined this definition as "digitization of being", that is not only the mass use of digital technologies but the process of bringing into an electronic form the various types of information used by people, covering all spheres of life [10]. In the scientific works of national researchers we can also find the interpretation of digitalization as a system of data collection, storage, analysis and use of artificial intelligence [11] or "… the process of using the modern information and communication technologies based on the capabilities of the modern IT industry, for the transformation of existing business processes by their digitalization "[12].

V. Varga emphasizes on the applied aspect and importance for using it in the practical activities of enterprises, taking into account the existing definitions in national publications, characterizing digitalization as "the process of systematization, use, processing of information in digital format to improve customer service in the business environment" [13]. According to the scientist, its effective application in daily activities will ensure the formation of stable competitive advantages of enterprises both in the current and in future periods.

Thus, digitalization under the conditions of the modern economy and global challenges is one of the main tools for enterprise development aimed at the successful management of all business processes. Digitalization gives a possibility to simplify and carry out work at a faster pace, using large databases, providing automation of all activities – both basic and investment and financial; improve communication between customers, suppliers and partners; increase mobility in interaction within the enterprise – between departments, employees, management; make the transition to such new organizational forms of management as a network or virtual economy.

According to a study by the International Telecommunication Union at the United Nations, the number of Internet users increased from 25.8 % of the world's population in 2009 to 53.6 % in 2019, when 4.1 billion people in the world were connected to the Internet [14]. Therefore, it should be expected that the development of the Internet will expand the network of penetration of digitalization into all spheres of life of both individuals and enterprises. The spread of technology leads to a significant reduction in the share of the traditional economy in the global economic system and an active transition to the digitalization of all spheres of public life.

For the economy of Ukraine, which is in crisis, it is important to form and implement new highly effective ideas of economic growth, one of which, according to I. Dulska, is the introduction of information and communication technologies (ICT) into all sectors of the national economy [15].

Thus, the emergence of 3G connection, according to the scientist, has become one of the catalysts for the domestic economy. according to research by Deloitte, in all markets where 3G appeared, GDP grew by at least 1 % (*figure 1*).

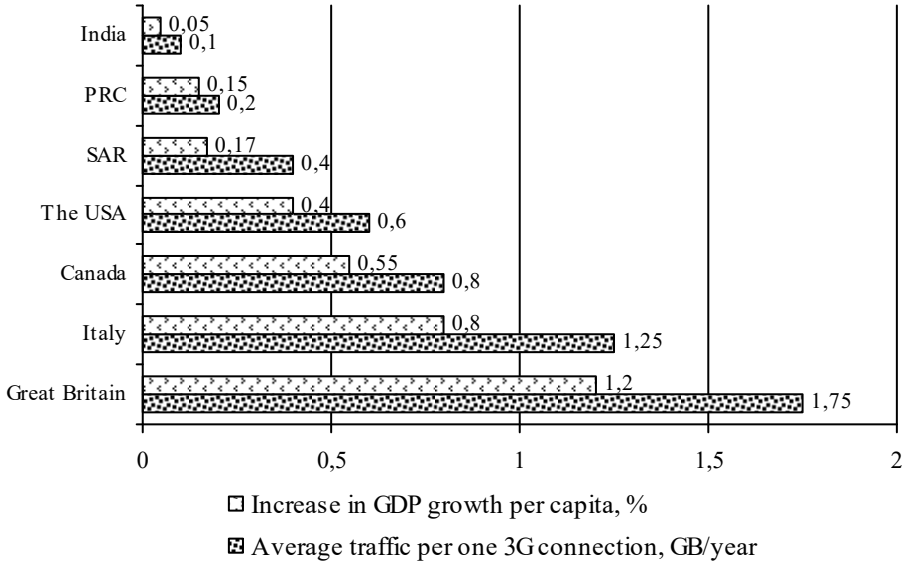

Figure 1. The effect of doubling the mobile use of data over 3G-connection on the increasing of GDP growth

Source: generated by the authors according to [15].

The explanation for such positive changes is that the possibilities of using this coverage contribute to the development not only of telecom operators but also of other branches of business, as management decisions are made faster and the space for small and medium-sized businesses expands.

In Ukraine, the introduction of 3G connection was characterized by a rather long time lag, as in 2007-2014 Ukrtelecom was licensed to implement it. However, its management did not pay enough attention to the development of this technology, and only in February 2015, a tender was held in which real competitors purchased three licenses. Currently, most of Ukraine has adequate coverage, but the share of rural population covered by the mobile network in our country, compared to other countries where the share of coverage in 2011-2012 was more than 90% (in the UAE and Bahrain – 100 %, Greece and Canada – 95 %, Sweden and Armenia – 93 %, Bulgaria – 92 % [15]), is still low.

Since 2018, 4G has been actively used in Ukraine. The coverage already takes the territory inhabited by 77 % of the population of Ukraine (mostly large and medium-sized cities, where 82 % of the population lives) [16]. The need for high-quality mobile connection has become especially acute in the context of the COVID-19 pandemic, in particular for those settlements where there is no wired Internet. Currently, about 70 % of business customers who use 4G download data to cloud storage, 80 % use messengers and online applications that allow them to communicate with customers and promote their products.

Today in the world, companies and organizations successfully use 5G, in particular, in manufacturing, logistics, agriculture, transport. Looking to the future, there are prospects for using the capabilities of this coverage in telemedicine, robotics, remote control, and transport control [17].

Business players must actively generate new business ideas in order not to lose market position. The slowdown in the economic growth in early 2020 with the global pandemic COVID-19 will have significant negative consequences for the economy in Ukraine (the official forecast of GDP decline, up to 7 %), on the one hand, and new living and economic conditions accelerate the introduction of digital technologies for the small and medium businesses on the other hand.

According to the Draft "Industry Development Strategy" 4.0 [18], the positive preconditions for the digitalization of Ukrainian businesses are a developed IT industry and a strong free economic system, while the introduction of negative factors include weak domestic demand for digital innovations, which is probably due to the awareness lack of representatives in small and medium business with digital economy opportunities.

The main advantages of business digitalization are presented in the *table*.

Table

Advantages of digitalization for enterprises

Advantages	Content
Optimization of business-process	All process chains are revised due to the possibility of flexible adaptation to different conditions in modern business. Removing outdated templates makes it possible to use existing human resources more efficiently
Opportunities to increase profits	With new digital technologies, the potential for profit is increasing, in particular, due to the increase in the number of potential buyers
Focus on customer needs	Customer is the main subject for income, so the digitization of processes will provide an opportunity to master the information about the customer's needs at each stage of interaction and create all the conditions to meet customer's needs
Optimal growth of innovations	The rapid growth in the number of innovation processes will provide an opportunity to respond to problems quickly with increasing the business efficiency and reducing potential costs
Increasing the volume of data and opportunities for the use	Prompt, reliable information, including about potential buyers, partners or competitors, will help expand relationships and improve communications
The use of artificial intelligence in the production process	The use of robotics and biotechnology in production processes will help improve technological processes

Source: generated by the authors according to [19].

Business digitalization processes, according to L. Labeznyk [20] promote electronic communication, which increases the effectiveness of interaction between buyers and sellers and creates new markets and opportunities for economic processes, expands the network of potential buyers, and reduces the cost of electronic communications due to low transmission costs data and significantly increases the speed of the exchange. All these actions lead to an increase in the turnover of financial resources of enterprises, and hence the successful conduct of business.

The development of small entities is necessary to support the economy of the country as a whole, as they provide jobs and increase the number of skilled workers at relatively low capital costs, create a healthy competetive environment and can protect society from market monopolization. In the periods of structural changes in the economic and political life of the country, small and medium-sized businesses are the main units of structural economic and political transformations and facilitates and remotes the rapid transition and adaptation of the country to the new technological system. An economy with a high amount of small and medium enterprises and entrepreneurs has a lot of important advantages, including inclusive stable economic growth based on knowledge and innovation; flexibility and adaptability to new economic realities.

The easiest way to improve the business processes of the enterprise, making maximum use of the electronic component, is possible in the field of product sales. Thus, according to the State Statistics Service, 89 % of all Ukrainian enterprises work in the services sector, and they account for almost 45 % of employment. They generate 56% of value-added [21]. Almost half of the value-added of business services is formed in the wholesale and retail sectors.

More than a third of the 100 largest US retailers believe it is possible to increase their income by providing e-commerce services. From the participation in the global electronic market in 2012-2015, US network trading companies had received revenues of $ 375 billion, and by 2020 they plan to increase it to $ 535 billion [20]. Therefore, at the beginning of the XXI century, the increase of participants number in the Ukrainian e-commerce market segment and their high interest in e-commerce systems became regular.

In July 2020, the results of the rating compiled by the online publiccation Retailers, the most popular online stores among Ukrainians were published on the *E&Lnews* website – E-Commerce and Logistics (*figure 2*).

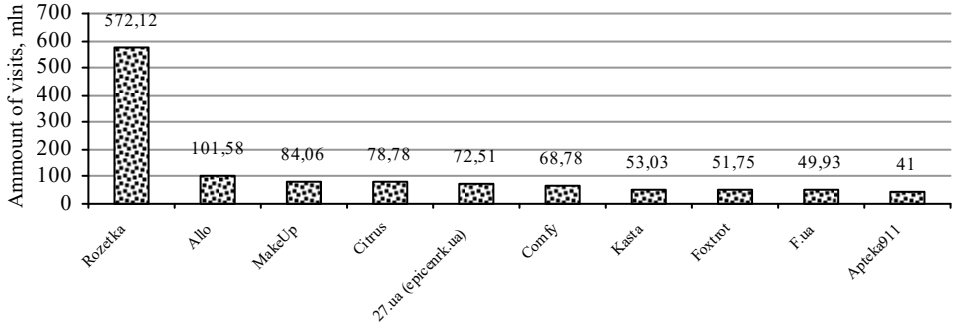

Figure 2. Rating of the most visited online stores in Ukraine, 2019

Source: developed by the authors according to [22].

The marketplace *Rozetka* became the leader in the number of visits by a large margin from other online stores – 572.12 million visits. The second position was taken by the online store Allo (almost 102 million visits). MakeUp, Citrus, and *epicenrk.ua* online stores are also among the top five.

So, modern electronic communications based on Internet technologies provide small and medium-sized businesses: expansion and development of new markets; expanding the network to attract new customers, which are no longer limited to the territory; term reduction for carrying out cases; possession of the operational information which is necessary to respond to market changes.

The experience has shown that e-commerce systems can save up to 15 % on purchases and 22 % on sales by optimizing logistics channels, consoledating purchases, reducing intermediary surcharges and achieving optimal prices.

In January 2018, the Concept of Development of the Digital Economy and Society in Ukraine for 2018–2020 was approved [23]. Due to this Concept, there have been created conditions for the beginning of more rapid development in digital technologies and their further implementation in the economy of Ukraine. In particular, the provision of administrative services, according to the preliminary digitalization of processes, has provided an opportunity to continue the financial activities of enterprises and individuals with the use of Internet resources through ordering services online, even in strict quarantine.

Although the digital economy in Ukraine has not reached a large scale compared to developed foreign countries, these countries also have problems with the implementation of the digital transformation. According to the results of the study *Riverbed Digital Performance*, conducted by the American company *Riverbed Technology* in nine countries – USA, UK, Brazil, Germany, Australia, France, China, Singapore, India (objects of the study – 1000 companies in the field of retail, transport, industry, health care, finance with an annual income of more than $ 500 million) – 95 % of survey participants said they are not ready to implement a digital strategy in their companies nowadays. Only 10 % of companies in the world have completely switched to digital technology in their activities, and only 26 % are ready to change [24].

Today, domestic enterprises not only automate business processes but also create their control and analysis tools for effective management. According to O. Hudz and V. Makova [25], enterprises, that do not develop and implement digital transformation strategies, will be inefficient tomorrow and will simply disappear under the pressure of new market realities and more pragmatic and successful competitors.

Conclusion. The traditional economy is affected by the digitalization of business relations, which modernizes and transforms business processes, under the influence of which changes not only the structure of the market participants but also the technology of management. The development of digitalization at enterprises in Ukraine should be facilitated by the spread of 5G-network, training of qualified personnel specializing in electronic communications, development of new services for convenient delivery of online orders, development and improvement of electronic payment systems.

The issues of digitalization became especially acute in the quarantine conditions when the trend is to sell goods online and carry out activities at a distance. The global economic crisis caused by the COVID-19 pandemic requires small and medium-sized businesses to adapt to multi-vector priorities, which will be dominated by such development trends in the short term.

Internationalization, which gives such enterprises new growth opportunities, contributing to the economic stability of the country. This can be product exports, licensing, franchising, joint ventures, relocation of production, and so on.

Localization. Local production is valuable for the consumer because it provides additional quality guarantees and a higher level of availability. Opportunity for small and medium-sized businesses to work with large retail chains (it applies to farms and producers of industrial consumer goods). Large commercial enterprises can promote small and medium-sized businesses by taking joint and several responsibilities for the quality and safety of goods. In addition to retail chains, the pharmaceutical industry is interested in the local manufacturer. For this industry, local producers are more transparent and open, and quality standards, licensing conditions, equipment, and business processes have met European requirements. Besides, the product quality is strictly regulated by local government services and regulations, which are already synchronized with European ones.

The use of digital platforms is important in nowadays environment. They transform not only trading platforms, but also the market of services, agriculture, educational services and provide the opportunity to develop small and medium-sized businesses in various areas of the modern economy.

Through the use of digital tools, businesses gain several benefits that increase competitiveness, save costs, simplify working with large data sets, improve the company image and increase customer loyalty.

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The article submitted to editor's office on 29.09.2020.

Кондратюк О., Стояненко І. Диджиталізація бізнесу в умовах глобальних викликів.

***Постановка проблеми**. Умови, в яких сьогодні доводиться працювати малому та середньому бізнесу, характеризуються надвисоким рівнем динамізму, тому здійснювати діяльність, використовуючи старі бізнес-моделі, означає наражати себе на ризик залишитися позаду конкурентів. Нині диджиталізація стає необхідною умовою ведення бізнесу, яка зачіпає не тільки роботу з клієнтами, але і внутрішні процеси, пов'язані з виробництвом, управлінням, комунікаціями.*

***Метою** цієї роботи є обґрунтування сучасного бачення прояву диджиталізації суспільства та визначення набору інструментів диджиталізації діяльності підприємств, у тому числі малого та середнього бізнесу в умовах глобальних викликів.*

***Матеріали та методи.** Інформаційною базою дослідження слугували публікації вітчизняних та зарубіжних науковців за темою дослідження, статистичні матеріали та інтернет-джерела. Для виконання поставлених завдань і досягнення основної мети дослідження застосовано методи узагальнення, аналізу та синтезу, порівняння, наукового абстрагування та систематизації.*

Результати дослідження. *Диджиталізація в умовах сучасної економіки є одним із головних інструментів розвитку підприємств, спрямованих на успішне ведення усіх бізнес-процесів. Завдяки диджиталізації з'являється можливість спростити та здійснювати роботу в більш швидкому темпі, використовуючи великі бази даних, забезпечуючи автоматизацію всіх видів діяльності, як основної, так інвестиційної та фінансової, покращити комунікацію між клієнтами, постачальниками та партнерами, збільшити мобільність у взаємодії у межах підприємства – між підрозділами, працівниками, менеджментом, здійснити перехід до таких нових організаційних форм господарювання, як мережева чи віртуальна економіка.*

Висновки*. Світова економічна криза, спричинена пандемією COVID-19, вимагає від суб'єктів малого та середнього бізнесу адаптації до різновекторних пріоритетів, серед яких у короткостроковій перспективі домінуватимуть такі тенденції розвитку: інтернаціоналізація, локалізація та використання диджитал-платформ.*

Ключові слова: диджиталізація, диджитал-технології, диджитал-економіка, диджитал-платформи, бізнес-процеси, малий та середній бізнес.

UDC 453.87.35
JEL Classification: F23, O15 DOI: http://doi.org/10.31617/visnik.knute.2020(134)04

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THE UNIVERSAL MODEL OF KNOWLEDGE MANAGEMENT OF CORPORATIONS

The components of the universal model of knowledge management of TNCs are considered and human, structural, innovative capital and capital of relations are characterized. Measurements of intellectual capital and sources of its quantitative assessment in the context of knowledge management are analyzed. It is proved that in the conditions of the formation of the knowledge economy and limited resources, the possibility of introducing a knowledge management system in an organization is its main competitive advantage. The role of the knowledge management model in ensuring the effectiveness of TNCs is established.

Keywords: knowledge economy, TNC, knowledge management, resource management, R&D, knowledge management model.

Результати дослідження. *Диджиталізація в умовах сучасної економіки є одним із головних інструментів розвитку підприємств, спрямованих на успішне ведення усіх бізнес-процесів. Завдяки диджиталізації з'являється можливість спростити та здійснювати роботу в більш швидкому темпі, використовуючи великі бази даних, забезпечуючи автоматизацію всіх видів діяльності, як основної, так інвестиційної та фінансової, покращити комунікацію між клієнтами, постачальниками та партнерами, збільшити мобільність у взаємодії у межах підприємства – між підрозділами, працівниками, менеджментом, здійснити перехід до таких нових організаційних форм господарювання, як мережева чи віртуальна економіка.*

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Keywords: knowledge economy, TNC, knowledge management, resource management, R&D, knowledge management model.

Background. In a knowledge-based economy, knowledge-based assets are becoming a key factor in the development of transnational corporations (TNCs). Accordingly, the company's ability to manage its intellectual capital is one of the defining competencies, which allows it to increase value for business owners. Thus, the prospects for the development of TNCs in the knowledge economy largely depend on its ability to manage intellectual capital. Due to the fact that the share of tangible assets in the market capitalization of companies in developed markets by early 2010 decreased to 16 % (in the late 2000s it was 52 %), the relevance of the study of intellectual capital as a key factor in the success of TNCs will only grow. It is obvious that in different industries the degree of influence of certain elements of intellectual capital on the performance of TNCs will be different, because even in developed markets, intellectual capital can play a different role in the activities of corporations. That is why in the development of the knowledge economy a necessary condition for the development of TNCs is the justification of the components of the universal model of knowledge management.

An analysis of recent researches and publications has shown that in multinational companies, the knowledge management system is an important asset that combines databases, documents, policies, procedures, previously unexplored knowledge and experience of individual employees. This approach ensures sustainable socio-economic development and forms the competitiveness of TNCs.

Given the limited resources, the ability to implement a knowledge management system in any multinational company is its main competitive advantage. Among scientific researches in the field of knowledge management by Ukrainian and foreign scientists a number of theoretical, methodological and methodical approaches to realization of process of knowledge management, various principles and methods of management, models of knowledge management are developed. I. Nonaka and X. Takeuchi [1], B. Milner, P. Senge, V. Bukovich, K. Viig, D.Ye. O'Leary, D. Snowden, Y. Vovk, M. Martynenko, A. Degtyar and M. Bubliy, A. Nalyvayko, N. Butenko, N. Smolinska and I. Hrybyk, S. Leonova and other scientists.

Thus, interesting research is made by B. Milner concerning the influence of knowledge management system on the functioning and development of the organizations [2]; scientific works of T. Gavrilove about the set of methodological approaches, procedures, technologies and mechanisms that allow the management of the organization tocreate additional value through the use of knowledge [3]; E. Popov as for formation of knowledge management institutions [4]; A. Tiwana offers knowledge management toolkit: practical techniques for building a knowledge management system [5]. At the same time, it is important to note that at the beginning of the XXI century in the conditions of knowledge economy development it is actual to provide management efficiency of TNCs intellectual resources. There are significant contributions in existing developments of the chosen field of re-

search, although it should be noted another aspect that must be taken into account in the formation of the knowledge management system for TNCs. This identifies the components of a universal model for transnational corporations that can be effective regardless the region.

The **aim** of the article is to substantiate and describe the components of the universal model of knowledge management of TNCs, including the analysis of indicators and measurements of intellectual capital, definition and description of the components of the universal model of knowledge management of TNCs.

Materials and methods. The set of complementary methods of scientific research of economic processes and phenomena such as system-structural, comparative and statistical analysis have been used in the article. The information base of the research is statistical and analytical materials and information-analytical collections and reviews of international organizations; information materials of national and foreign research centers, scientific publications and statistical materials of leading TNCs.

Results. In the formation of the knowledge economy, TNCs can be considered as a dynamic institution that can influence the development of economic systems, both nationally and internationally, and which is in constant interaction with them through their own organizational, economic, technical, social levers. Actively influencing the international economic system, TNCs are forming new economic relations at both the national and global levels. It is important that the meaning of "world economy" concept is changing, it has been transformed from "international" to "transnational", and it is characterized by the establishment of more stable and long-term economic ties than before.

At the beginning of the XXI century it is expedient to take away the dominant role of transnationalization in the process of creating a new "geo-economic map of the world" and growing economic interdependence of states where division by country is of secondary importance, giving way to division of economic forces and interests. Transnationalization, as an objectively determined process with multilevel and contradictory manifestations, significantly adjusts national and international development strategies and is therefore the most attractive object of a scientific research.

Knowledge management system is one of the important assets that unites databases, documents, policies, procedures, previously unexplored knowledge and experience of individual employees in TNC. This approach ensures sustainable socio-economic development and forms the competitiveness of TNC. In conditions of limited resources, the possibility of implementing the system knowledge management in an organization is its main competitive advantage. Therefore, technologies based on the knowledge system have become widespread and applied. The knowledge management system is a new stage in the development of management technology, replacing stage on the use of corporate databases [6].

The measurement of intellectual capital focuses on intangible assets in the context of strategic planning to determine their impact on value creation and benefits for organizations. It covers non-financial assets such as innovation opportunities, employee creativity or customer satisfaction and is future-oriented, namely the creation of value and core skills that provide a competitive advantage. From this point of view, the measurement of intellectual capital is necessary to test the capabilities of the organization in achieving strategic goals.

It is important to note that most existing ultrasound systems do not determine the indicators of intellectual capital, creating a gap between their measurements. According to Smith, this gap is one of the biggest shortcomings in the modern practice of measuring and managing the intellectual capital of TNCs.

The unified model of the dynamic organizational process of knowledge creation (SECI model), proposed by I. Nonaka and H. Takeuchi in 1991, was adopted as a basic theoretical model for understanding the dynamic essence of knowledge creation and effective management of this process. The SECI model characterizes the sequential movement of knowledge of individuals in an organization. This knowledge is transformed and amplified by the spiral of knowledge through processes such as socialization, externalization, combination and internalization. As part of the study, in order to systematize foreign experience and assess the possibilities of its use to identify the knowledge management system in MNC, three models of knowledge management – structural, matrix and process – were analyzed and the main tools that are used in these models were identified. The structural model The Knowledge Management Process Framework, Bukowitz and Williams (1999) focuses on knowledge discovery, knowledge use, learning and knowledge dissemination. The matrix model of the knowledge management Matrix, Gamble and Blackwell (2001) is based on determining the source of knowledge, organizing knowledge, assessing the strengths and weaknesses of the company's knowledge management system, determining the relevance of knowledge and the possibility of reuse, assimilation of knowledge in the process of use. Process model The Knowledge Management Process, Botha (2008) aims to develop and understand knowledge, organize and capture knowledge, share and disseminate knowledge [7].

In the formation of the knowledge economy, it is strategically necessary to create a model of knowledge management of TNCs, in which there would be a link between the UZ system and the measurement of intellectual capital, which would focus on supporting the measurement of TNC intellectual capital through knowledge management, demonstrating the contribution of these systems.

Models of measuring intellectual capital Intellectual capital (IC) refer to intangible assets that can bring future economic benefits, i.e. the value of creation. These assets are a key competitive advantage, they are characterized by invisibility, difficulties in quantification and acquisition without monetary nature and without physical substance. Its measurement

reflects the added value of knowledge for organizations, allows you to monitor the performance of knowledge assets and related activities, provides an understanding of how organizations develop, manage and use their knowledge assets.

Table 1 summarizes the models for measuring intellectual capital, identifying the components specified in each of them.

Table 1

Measurements of intellectual capital

Type of the capital	Index
Human capital	
Induvidual human capital	
Indicators of absenteeism average level of IT literacy years of work in companies	Motivation index digital literacy index employee satisfaction index
Human capital of the company	
% full-time employees % of part-time employees % specialized employees	Initiative index innovation index leadership index
National human capital	
% men, women the average age of the employee average level of literacy of employees distribution by age groups	Gender inequality index loyalty index employee engagement index employee satisfaction index
Structural capital	
Consumer capital	
Information technology capabilities administrative costs / employee administrative costs / total receipts quality of execution (ISO 9000)	Profitability index labor quality development index process efficiency index business reputation index
Organizational capital	
The cost of developing new products or services experienced staff / total staff hours in development hours of training	Index of intellectual potential human development index labor quality index freedom of education index
Innovational capital	
Innovative-technological	
Availability of information innovative opportunities innovative staff investment in IT investment in IT development	ICT development index innovation capacity index global index of effective innovation index of information opportunities process efficiency index
Creative	
Digitalization talent breakthrough technologies investment in new competencies	Digitalization index talent competitiveness index index of technological readiness labor productivity index
Capital of relationships	
Capital of professionalism	
The average duration of the relationship experienced staff / total staff	Productivity index education index
Capital of brand	
Customer visits to the company number of customers	Customer satisfaction index company image

Source: compiled by the author, based on [8].

Models are characterized by various components: human, structural and relative capital, as well as social capital, R&D, corporate identity, environmental capital or others, depending on the characteristics. At the same time, human, structural, innovative and capital relations are the components that are most often used in models.

Human capital (includes individual human capital, individual company capital and national human capital) is related to individual abilities, knowledge, skills, experience and problem-solving skills. It is manifested in the competence, attitude and intellectual dexterity of the employee. Competencies include skills and education, while attitudes cover employee behavior. Intellectual dexterity helps to find innovative solutions and change methods to solve the problem.

Structural capital (consumer capital, organizational capital) is related to systems, organizational processes, technologies, concepts and business models with databases, documents, patents, copyrights and other codified knowledge. According to Roos, structural capital is what stays with a company when employees go home overnight.

Innovative (innovative technological, creative) related to investment financing of innovation activities and the securities market of companies in high-tech industries; includes R&D funding within the innovative technological process, venture capital, capital acquired through the placement of securities of enterprises in high-tech industries and long-term bank loans to expand the innovative activities of companies.

Relationship capital (professional capital, brand capital) is related to alliances and relationships with customers, partners, suppliers, investors and communities. This also includes brand awareness, organization image and market position. Relationship capital is built-in knowledge and added value from relationships with others.

The systematization of indicators proposed by each of the models of measuring intellectual capital was also done in order to determine a set of valuable indicators for measuring intangible assets.

The researchers have written about the use of different types of ultrasound system. The classifications mentioned by these authors are based on various assumptions: some of them are based on technological problems, some on related functionality; others still combine these two criteria in one classification. But, on the other hand, some of these classifications do not draw a clear line between the knowledge management system and tradetional information systems. The variety of classifications of the ultrasound system on the basis of different approaches leads us to systematize the categories of the ultrasound system according to their problems, capabilities and functional features. This systematization includes the following categories of knowledge management system:

- business intelligence systems;
- collaboration systems (group software);
- competency management systems;
- corporate portals;

- document management systems;
- e-learning systems;
- expert systems;
- knowledge identification systems;
- knowledge maps;
- document management systems [9].

Table 2 summarizes the IR measurement models and identifies the components specified in each model. The systematization of the indicators proposed by each of the models of measuring intellectual capital was also done in order to review a certain set of values for measuring intangible assets. The models describe different components, such as human capital, structural capital, innovation capital and relationship capital, as well as social capital, corporate identity, environmental capital, etc., depending on their own characteristics.

Table 2

Sources of quantitative assessment of intellectual capital in the context of knowledge management

Source	Quantitative assessment
System management document	Access to the knowledge base of the organization Contribution to the knowledge base of the organization Time (average) for the request Knowledge level access / reuse
Maps of the knowledge	Access to the knowledge base of the organization Contribution to the knowledge base of the organization Time (average) for the request Knowledge level access / reuse
System cooperation	Projects in cooperation with external organizations Projects in collaboration with other working groups Speed of dissemination of best practices Questions reported on forums
Workflow Systems	Processes completed without errors Processes according to manuals Processes updated % of processes completed on time % of automated business processes
Business intelligence system	New business opportunities Speed of investment in new markets Market share in the segment Geographical distribution of customers % of new customers / lost customers Sales speed in new markets Speed of sales to new customers Customer satisfaction index Employee satisfaction index
Expert systems	Specialists with a degree of specialization Managers with a degree of specialization Access to current issues Expert contribution: best practices, tips, suggestions Level of expertise access / reuse % of new experts

End of the table 2

Source	Quantitative assessment
Competence management systems	Average training time per employee (days per year) Cost per capita in educational programs Average year of service in the organization The average age of employees % Of employees by group age % Female and male employees Absenteeism rate Employee rotation speed Employee satisfaction index % of employees with academic degrees
E-learning Systems	E-learning programs Hours spent in e-learning programs % of employees who have successfully completed e-learning training programs Employees with specialization based on e-learning programs
Knowledge of system discovery	New patents Patents in registration Average number of registered patents The level of knowledge that is reused in new contexts New ideas for updating products, services or processes New products, services or processes created by innovative processes Certified processes
Corporate Portals	Speed of knowledge dissemination / application

Source: compiled by the author, based on [10].

Knowledge management system belongs to a class of information systems used to manage organizational knowledge, which are based on information technology and focused on supporting organizational processes of creation, storage and retrieval of knowledge, dissemination and application. The main purpose of the system is to create an environment that facilitates the creation and use of knowledge and communication, cooperation between organizations.

At the beginning of the XXI century, it should be noted that there are no significant differences in the industry or service orientation of a multinational corporation. The materials of this study will be used in a model developed to clarify the potential contribution of the knowledge management system to the measurement of intellectual capital.

A model for linking the measurement of knowledge management system and intellectual capital. The main purpose of the model proposed in our study is to combine the system of knowledge management and measurement of intellectual capital, which indicates the contribution of these systems to value creation in TNCs. The model can also facilitate the choice of knowledge management system depending on the needs of the organization, bringing the choice of knowledge management system in line with strategic goals and intangible assets that provide competitive advantages. This provides a comprehensive view of intangible assets, covering the strategic and operational perspectives of knowledge management.

Components of the model of measuring intellectual capital. The purpose of this component is to identify intangible assets that provide a competitive advantage and ensure the development of the core competency organization. It also contains a specification of the relevant metrics in order to measure these intangible assets.

The components of the intellectual capital measurement model begin with defining a mission and corporate strategic goals that identify business drivers, critical success factors, and intangible assets that can create wealth for an organization. The purpose of linking intellectual capital to strategic goals is to ensure that the organization receives a competitive advantage from the use of intellectual capital and knowledge management system.

This component can be implemented using one of the considered measurements of the intellectual capital model, such as Skandia Navigator, Balanced Scorecard, Intangible, Assets Monitor, Intelect Model, etc. It is important to note that the model presented in this study does not depend on the model of measuring intellectual capital, in order to avoid diminishing its application.

Component of the knowledge management system. The purpose of this component is to provide a set of measures useful for quantifying intellectual capital (metrics are specified in the first component of the model). A knowledge management system can help improve intellectual capital by supporting and improving organizational knowledge processes that are critical to an organization. However, this can only be achieved if the knowledge management system focuses on intangible assets that bring value, additional and competitive benefits to organizations, in line with their strategic goals. From this point of view, a knowledge management system can contribute to a quantitative set of useful indicators for measuring IM using the knowledge recorded in these systems by measuring the components of knowledge management and management system. This component should also help determine the optimal categories of knowledge management system, according to the corporation, needs and strategies, as well as match the choice of knowledge management system with intangible assets that bring competitive advantage.

The structure is implemented through different categories of knowledge management system, according to their own characteristics and functionality in support of knowledge management processes, namely the creation of knowledge, storage, dissemination and application. This relationship is based on the assumption that the knowledge management system as a technological system focused on the management of organizational knowledge does not support the application of knowledge; and only people can apply for knowledge. However, a knowledge management system can contribute to the development of an environment that allows the use of knowledge and applications from the people of the organization.

Component of the system of measuring intellectual capital. The purpose of this component is to support IC measurement according to the model and metric selected in the first component. The system of measuring intellectual capital uses a set of measures provided by different categories of the knowledge management system to quantify these indicators of intellectual capital. It can also use some of the measures provided by other sources that complement the measurement of intellectual capital, such as financial programs, quality systems, enterprise resource planning systems. This component establishes a link between the model of measuring intellectual capital and the knowledge management system, demonstrating the contribution

of different categories of the knowledge management system to the intangible development of assets. The outcome of the intellectual capital measurement system consists of a report that facilitates the valuation of intangible assets and is the starting point for identifying strengths and weaknesses in terms of organizational knowledge development [1].

Valuation of intangible assets can facilitate the redefinition and reorganization of business drivers, success factors and intangible assets that create competitiveness in the organization.

Measures provided by the knowledge management system for the quantitative assessment of intellectual capital indicators. Each organization seeks to select the most appropriate indicators to measure the value of intangible assets and knowledge management initiatives according to their needs and strategic goals. A large number of indicators of intellectual capital can be quantified through the knowledge management system, i.e. through the knowledge recorded in the KMS. A significant number of knowledge management indicators from different categories and suppliers have been analyzed to clarify the potential contribution of these systems to the measurement of ICs.

Conclusion. One of the consequences of the growing importance of knowledge and organizational learning in economics has become knowledge management and at the same time it is a new management function and a special type of joint activity. At the beginning of the XXI century there is a dynamic change of epochs of world socio-cultural development to a new epoch of knowledge and creativity. Nevertheless, it can be argued that this kind of conflict situation in the world occurs due to the existence of several epochs simultaneously, i.e. currently the process of formation of post-industrial (information-innovation) society, although the era of the new economy at the present stage is presented in a new content, where the knowledge resource reaches a qualitatively new level. Based on the results of the study, it is shown that the existing models of knowledge management do not fully analyze the components of knowledge management models. That is why this article analyzes the dimensions of intellectual capital, on the basis of which the components of the universal model are developed.

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The article submitted to editor's office on 24.10.2020.

Бусарєва Т. Універсальна модель управління знаннями у корпорації.

Постановка проблеми. *У різних галузях економіки ступінь впливу певних елементів інтелектуального капіталу на результати діяльності ТНК буде різним, оскільки навіть на розвинених ринках інтелектуальний капітал може відігравати різну роль у діяльності корпорацій. Саме тому при розвитку економіки знань необхідною умовою розвитку ТНК є обґрунтування складових універсальної моделі управління знаннями.*

Аналіз останніх досліджень та публікацій *показав, що, незважаючи на певний науковий прогрес, питання щодо компонентів універсальної моделі ТНК залишається невирішеним.*

Метою *дослідження є обґрунтування та опис компонентів універсальної моделі управління знаннями ТНК, включаючи аналіз показників та вимірювань інтелектуального капіталу, визначення та опис компонентів універсальної моделі управління знаннями ТНК.*

Матеріали та методи. *Для досягнення мети використано набір додаткових методів наукового дослідження економічних процесів та явищ: системно-структурний, порівняльний та статистичний аналіз.*

Результати дослідження. *Система управління знаннями є одним із важливих активів ТНК, що об'єднує бази даних, документи, політику, процедури, раніше не вивчені знання та досвід окремих працівників. Такий підхід забезпечує стійкий соціально-економічний розвиток та формує конкурентоспроможність ТНК. В умовах обмеженості ресурсів можливість впровадження системного управління знаннями в корпорації є її основною конкурентною перевагою. Тому технології, засновані на системі знань, набули широкого поширення та застосування. Система управління знаннями – це новий етап у розвитку технології управління, що замінює етап використання корпоративних баз даних.*

Висновки. *На початку XXI ст. відбувається динамічна зміна епох світового соціокультурного розвитку на нову епоху знань та творчості. У той же час такий тип конфліктної ситуації у світі виникає внаслідок існування декількох епох одночасно, тобто нині відбувається формування постіндустріального (інформаційно-інноваційного) суспільства, де ресурс знань виходить на якісно новий рівень.*

Ключові слова: економіка знань, ТНК, управління знаннями, управління ресурсами, НДДКР, модель управління знаннями.

UDC 336.201:339.17
JEL Classification M21
DOI: http://doi.org/10.31617/visnik.knute.2020(134)05

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TAXATION OF TRADE ENTERPRISES

The article substantiates the need to assess the level of tax burden. The place and role of the tax analysis of a trade enterprise activity in the system of management are investigated. The subject, information support, types, functions and stages of tax analysis are presented. The algorithm for calculating the absolute and relative tax burden is presented. The importance of the analysis of the state of settlements for tax liabilities in the system of tax analysis is determined.

Keywords: trade enterprise, economic activity, tax analysis, tax burden, tax liability, tax payments.

Background. As of October 1, 2020, the revenues of the state budget of Ukraine for September amount to UAH 765 108.6 mln, which is 69.8 % of the planned revenues for 2020. The monthly dynamics for the current year differs in its unevenness (*figure 1*), this is due to the terms of payment of certain taxes types provided by the Tax Code of Ukraine, the lack of penalties for late payment of taxes due to quarantine, as well as economic and social and political instability.

Among the revenues of the state budget of Ukraine there are tax revenues (taxes on income, profits and market value increases, rent and fees for the use of other natural resources, domestic taxes on goods and services, taxes on international trade and foreign transactions, fees for fuel and energy resources etc.), non-tax revenues (income from property and business activities, administrative fees and payments, revenues from non-profit activities, other non-tax revenues, own revenues of budgetary institutions), revenues from capital transactions (revenues from fixed assets, revenues from sales of state stocks, funds from the sale of land and intangible assets), funds from foreign countries and international organizations, trust funds and official transfers. The most important component is tax revenues.

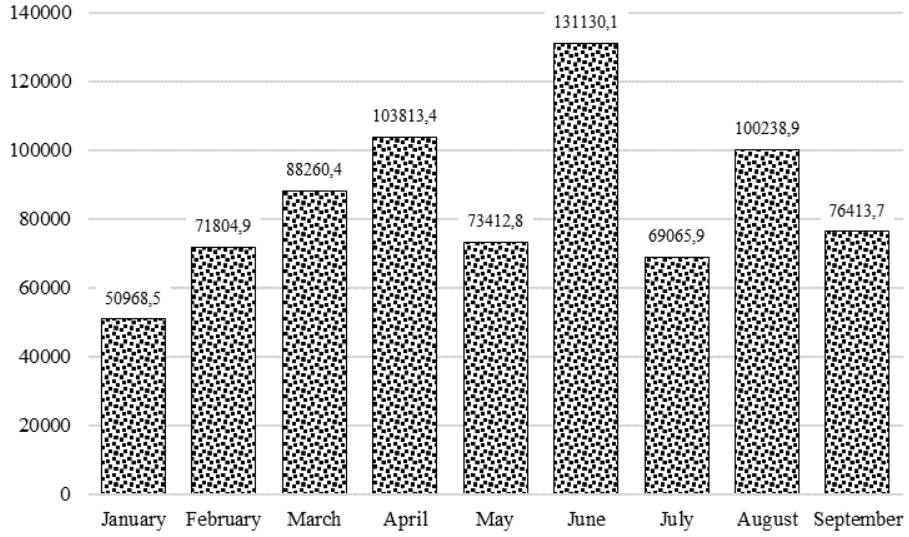

Figure 1. Revenues of the state budget of Ukraine in 2020, mln UAH

Their volume for the three quarters of 2020 amounted to UAH 5 74980.3 mln, which in percentage terms is 75.15 % of the total state budget revenues of Ukraine (*figure 2*).

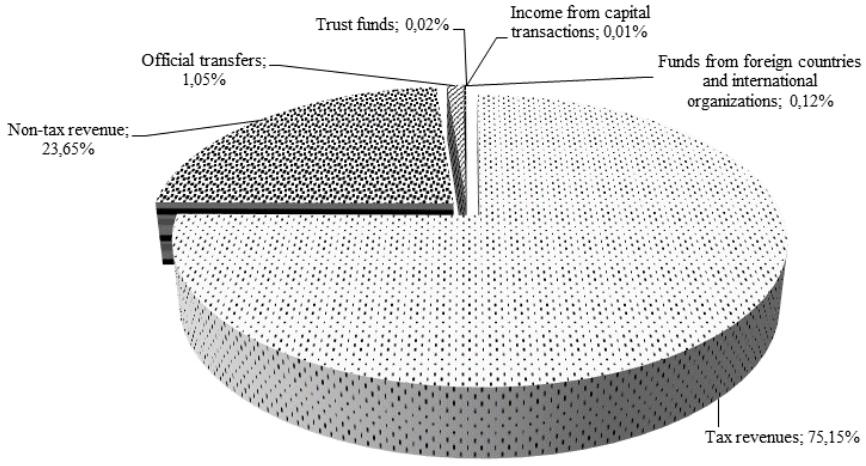

Figure 2. Revenues structure of the state budget of Ukraine by items of revenue in 2020

Taxes are the main source of state revenues, the most important element of its economic policy, an instrument of economic regulation and invading the sphere of strategic, tactical and operational decisions, they put business leaders in front of the need to have knowledge and organize tax management system. Taxes are a mandatory, unconditional, individually gratuitous payment levied on legal entities and individuals in the form of alienation of funds due to them in order to financially support the activities of the state [1, p. 52].

Among other sources, 9.65 % of state budget revenues are corporate income tax, which for the period from January to September 2020 amounts to UAH 73 810.8 mln. These data show that taxation of business entities is important and significant at the macro level. However, quite often investors, owners and / or business leaders are faced with the question of choosing a particular tax system. The solution of this problem requires a scientific justification, which is possible through tax analysis.

Analysis of recent researches and publications. A large number of scientific works of researches such as O. Butska, O. Legostaeva, N. Lysenkova, M. Nikonovich, G. Devlikamova, V. Aranchiy, T. Mysnyk, E. Mnykh, T. Melikhova, M. Kondratenko, L. Novoselska, Yu. Panura, M. Novikov, A. Guzatulin, O. Malyshkin, V. Babenko, O. Pokolodna, A. Mishchenko, E. Duliba, T. Kaneva, A. Drepin, K. Kanonishena-Kovalenko, N. Kovshun, N. Pyatka, A. Nikitishin, V. Onisiforova, I. Parasiy-Vergunenko, Y. Shvets, A. Zavalnyuk [1–14] as well as many others, are devoted to research of separate questions of methodology and the analysis organization. Despite their thoroughness, comprehensive studies of the analysis of taxation of trade enterprises, which would contain a detailed study of organizational and methodological support, are missing. This necessitates the study of a number of issues.

The **aim** of the study is to develop methodological approaches to the analysis of taxation of trade enterprises.

Materials and methods. The information base of the article is presented by scientific works of domestic and foreign scientists [1–14].

The research is based on such scientific methods as analysis and synthesis, comparison, idealization and abstraction, systematization and generalization have been used for conclusions formulation of the study results.

Results. It was recorded an increase in budget revenues compared to previous years, value added tax, excise tax, personal income tax and profits tax according to the State Tax Service of Ukraine for 9 months of 2020.

Among the 100 largest taxpayers a special place is occupied by trade enterprises (13 enterprises), among which there is LLC "ATB-Market", LLC "Epicenter K", LLC ESC "Esco-Pivnich", LLC "Silpo-Food", LLC "Tedis Ukraine", LLC "Metro Cash and Carry Ukraine", LLC "Auchan Ukraine Hypermarket", LLC "Sistemoiling Engineering", LLC "Monsanto Ukraine", LLC "Philip Morris Sales and Distribution" and others.

At the same time, in the first half of 2019, the country's largest network of construction hypermarkets LLC "Epicenter K" became the leader in the ranking of TOP-10 transport tax payers, paying 137.5 thousand UAH of tax, while the next 4 positions were occupied by the state companies. LLC "Epicenter K" also took the 9th place in the list of the largest payers of personal income tax, ML and SSS tax, paying UAH 391.0 thousand in taxes.

The data of the State Statistics Service confirm the importance of trade enterprises at the state level. Despite the fact that the volume of retail trade turnover of retail trade enterprises in April-June 2020 amounted to UAH 188.1 bln, which is 5 % less than in January-March 2020 (UAH 198.0 bln), the number of businesses in this industry has grown in recent years (*figure* 3).

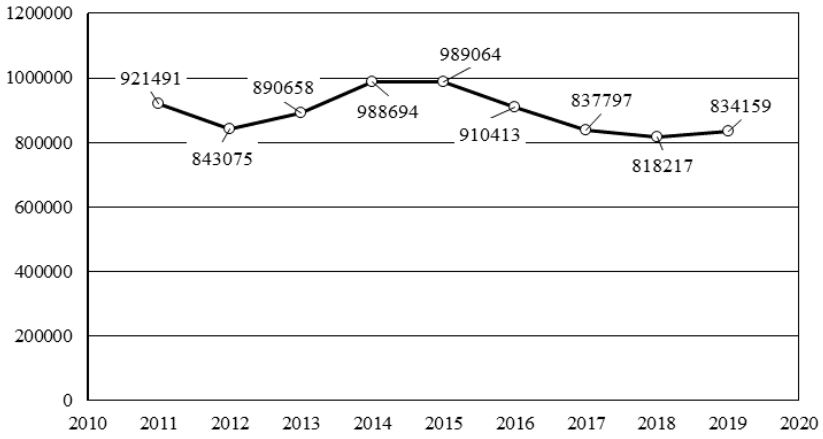

Figure 3. Dynamics of the number of business entities involved in trade during 2011–2019, bln UAH

In the context of the economic crisis against the background of the global pandemic, there is a growing need to assess the impact of the chosen system of taxation on the financial results of economic entities. This leads to the analysis of enterprises taxation. The main task of tax analysis is to substantiate economic decisions aimed at optimizing tax costs of enterprise profits by choosing a taxation system in accordance with current legislation.

The basis of tax analysis is to prove and argue the fairness and effectiveness of tax systems in the interests of the state, businesses and individuals. Equality of these interests is a stimulus for economic development of the country, social and political stability, the establishment of the principles of civilized progress [2, p. 100].

Tax analysis is the tax system study, assessment of its fairness and efficiency, calculation of the impact of various factors on the state of tax calculations and achieving their optimization. At the microeconomic level, the content of tax analysis is the justification of the volume and structure of tax payments, assessment of trends in the tax burden, diagnosis of tax payments and the possibility of their change, regulation of tax calculations over time and changing the conditions of their implementation.

Depending on the field of economic activity, there are the following types of tax analysis:

• Financial and economic (is carried out by financial and tax services of an enterprise).

• Audit or accounting analysis (is expert diagnosis of tax payments, which is carried out by independent audit services to assess the correctness of their calculation and the overall payment of all taxes).

• Socio-economic analysis (it studies the impact of the tax system on the social status of employees, in particular, the impact on changes in employee income rates and determine the possibility of increasing them by changing these tax payments).

• Economic and statistical analysis (is performed by statistical bodies at different levels of government: at the state level it assesses the general

state and trends of taxes paid by businesses and individuals; at the enterprise level it assesses the completeness of taxes payment as well as enterprise's payment of separate types of taxes).

• Marketing analysis (it studies the relationship between increased sales of certain goods and changes in corporate taxes).

• Economic and environmental analysis (is carried out at different levels of government: at the state level it provides a comparison of environmental damage with the amount of environmental tax paid by the company, i.e. determines the coverage of nature; at the enterprise level it is carried out by paying the tax by comparing its change with increasing damage to the environment caused by the enterprise).

The subject of tax analysis for business entities is to assess the amount and structure of taxes paid, their impact on the efficiency of financial and economic activities, as well as the search for ways and reserves to reduce them.

Information support of tax analysis includes the main element – an information database formed according to the rules of accounting and taxation. The use of two independent sources of information in the analysis is due to the fact that the calculation of a number of taxes is based on accounting. At the same time, in some cases, using accounting methods, it is not possible to meet a large enough number of requirements that exist in the regulations on taxation. Accounting is not applicable here. In this case, we are talking about information collected in the registers of taxation. Accounting and taxation prepares information for internal and external users on the basis of certain rules of conduct. But due to their specifics, these types of accounting can not provide a significant amount of operational information needed to make optimal management decisions. Existing accounting systems in the organization contain the information necessary for tax management, you just need to use it properly. The task of tax analysis is to combine the available information into a system of knowledge about its use. Tax analysis, acting as a consumer of information data, should identify the advantages and disadvantages of the existing information system, promote its use to achieve the goals of the organization, while achieving the goals of each of the existing accounting systems in the organization [3, p. 138].

Tax analysis is closely related to other functional phenomena in the system of tax management at the micro level. It is a link between accounting and management decisions, it plays an important role in preparing information for tax planning [1, p. 54].

The most important functions of tax analysis include the study, evaluation and determination of reserves. Implementing the function of the study, economic laws are analyzed, patterns of economic processes at the enterprise in certain conditions are determined, the causes of deviations from the planned indicators are established, etc. The principles of tax analysis are statehood, scientificity, complexity, system, objectivity, effectiveness, planning, operational efficiency, democracy and efficiency [2, p. 98-99].

The main stages of tax analysis at the enterprise are presented in *figure 4*.

Analysis of the absolute tax burden involves assessing the composition of taxes and fees for the period under review, identifying payments that account for the largest share in the total tax, assessing the causes of the dynamics of the tax structure, and identifying and assessing the most significant factors influencing the dynamics and structure of taxes and fees.

The relative tax burden is not only a quantitative but also a qualitative characteristic of the impact of the tax system on the business entity. The system of analytical ratios of the relative tax burden includes three groups of indicators.

The *first group* of analytical ratios of the tax burden on income from the enterprise includes:

Tax burden ratio (1):

$$K_1 = \frac{A_{ITR}}{S_r}, \quad (1)$$

where K_1 – is the tax burden ratio;

A_{ITR} – is the the amount of indirect taxes and fees;

S_r – is sales revenue.

The ratio of the total tax burden (2):

$$K_2 = \frac{DTF+ITF}{I_t}, \quad (2)$$

where K_2 – is the ratio of the total tax burden;

DTF – direct taxes and fees;

ITF – indirect taxes and fees;

I_t – is total income from the enterprise.

The ratio of the amount of income tax and total income from the enterprise (3):

$$K_3 = \frac{A_{IT}}{I_t}, \quad (3)$$

where K_3 – is the ratio of the amount of income tax and total income from the enterprise,

A_{IT} – is the amount of income tax;

I_t – is total income from the enterprise.

The *second group* of analytical ratios includes indicators that characterize the level of tax burden on net profit and expenses of the enterprise. These ratios characterize the ratio of the amount of taxes and fees and the amount of net profit (4):

$$K_4 = \frac{DTF+ITF}{P}, \quad (4),$$

where K_4 – is the ratio of the amount of taxes and fees and the amount of net profit;

P – is net profit.

The *third group* of analytical indicators characterizes the tax burden on the cost of the enterprise. These ratios are calculated as the ratio of the amounts of taxes and fees included in the prime cost and the total prime cost (5):

$$K_5 = \frac{A}{C}, \quad (5)$$

where K_5 – is the ratio of the amounts of taxes and fees included in the prime cost and the total prime cost;

A – is the amount of taxes and fees included in the prime cost;

C – is the prime cost.

The proposed system of analytical ratios is a stable quantitative characteristics, the dynamics of which allows to draw conclusions, assess trends in the taxation of the enterprise and its impact on the enterprise in the study period.

Minimization of tax payments is primarily related to the use of tax benefits provided by law, or the use of shortcomings in the legal field. It is professional assessments and knowledge of the effectiveness of the main forms of income tax benefits (reduced tax rates for individual units, accelerated depreciation, investment tax credit and investment tax rebate, the formation of targeted tax-free reserve funds, tax holidays) that make it possible in the legal field to form additional financial opportunities to ensure sustainable economic growth.

Analysis of the status of settlements for tax liabilities is aimed at improving the regulation of cash flows; identification of opportunities for profit growth due to savings in tax payments; anticipating of the payment of fines and tax penalties.

Depending on the set tasks, the analysis of the state of tax calculations can be carried out in the operational mode (daily, every ten days), as well as for the selected reporting period as a whole on tax payments or selectively on their individual types (retrospective analysis).

Analysis of business taxation can be supplemented by factor analysis of indicators using multiplicative, additive and multiple factor models to identify the negative impact on tax flows of the enterprise.

Conclusion. Tax analysis provides a scientific basis for management decisions and meet the information needs of users of financial statements, and is an analytical support for management functions, including planning, forecasting, monitoring the implementation of plans, determining deviations from actual indicators, regulation. With the help of tax analysis of enterprise activity it is possible to make timely adjustments to planned tasks and to correct a situation and indicators.

The use of tax analysis techniques helps to increase tax discipline and strengthen financial well-being. The study of the taxation systems provided by the current legislation of Ukraine and the scientifically substantiated choice (general or simplified taxation system) among them, in order to optimize the tax burden, is an extremely important management task.

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The article submitted to editor's office on 02.11.2020.

Барабаш Н., Ріпа Т. Оподаткування підприємств торгівлі.

Постановка проблеми. *З-поміж інших джерел 9.65 % надходжень до державного бюджету – це податок на прибуток підприємств. Оподаткування суб'єктів господарювання є важливим і значущим на макрорівні. Проте досить часто перед інвесторами, власниками та/або керівниками підприємств постає питання вибору певної системи оподаткування. Це потребує наукового обґрунтування, що можливо за допомогою податкового аналізу.*

Метою *дослідження є розробка методологічних підходів до аналізу оподаткування діяльності підприємств торгівлі.*

Матеріали та методи. *Інформаційна база статті представлена науковими працями вітчизняних та зарубіжних вчених. Основою дослідження є наукові методи, серед яких доцільно виділити: аналіз і синтез, порівняння, ідеалізацію та абстрагування, а також систематизацію та узагальнення – для формулювання висновків.*

Результати дослідження. *В умовах економічної кризи зростає необхідність оцінки впливу обраної системи оподаткування на фінансові результати суб'єктів господарювання. Це обумовлює важливість здійснення аналізу оподаткування діяльності підприємств.*

Висновки. *Податковий аналіз, що створює наукове підґрунтя для прийняття управлінських рішень та задоволення інформаційних потреб користувачів фінансової звітності, являє собою аналітичне забезпечення для виконання функцій управління, серед яких планування, прогнозування, контроль над виконанням планів, визначення відхилень фактичних показників від планових, регулювання.*

Ключові слова: підприємство торгівлі, господарська діяльність, податковий аналіз, податкове навантаження, податкове зобов'язання, податкові платежі.

FINANCE AND BANKING

UDC 336.143:614.4
JEL Classification: E62, H3, H6
DOI: http://doi.org/10.31617/visnik.knute.2020(134)06

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BUDGET POLICY UNDER THE COVID-19 PANDEMIC

The role of budget policy in ensuring financial and economic regulation of the country is determined. The institutional principles are revealed and the directions of budget policy in the conditions of the COVID-19 pandemic are substantiated. Revenues and expenditures of the State Budget of Ukraine for 2020 are compared in accordance with the Law of Ukraine "On the State Budget of Ukraine for 2020" of 15.09.2019 № 294-IX and the Law of Ukraine "On Amendments to the Law of Ukraine "On the State Budget of Ukraine for 2020" of 13.04.2020№ 553-IX.

Keywords: budget, budget system, budget policy, budget revenues, budget expenditures, budget regulation.

Background. In the context of the COVID-19 pandemic, the effecttiveness of budget policy is an important prerequisite for stabilizing socio-economic processes. Decisions on the viability of the use of appropriate budgetary tools should be determined basing on the assessment of changes in the level of economic development of the country due to the deepening of the crisis processes caused by the pandemic. Timely consideration of the influence of exogenous and endogenous factors on the formation of budget revenues on the one hand, and on its expenditure part on the other, will contribute to the development of sound budget architectonics. Accordingly, in the conditions of the COVID-19 pandemic it is advisable to strengthen the regulatory function of budget policy. The tasks of finding alternative sources of budget revenues, choosing budget instruments and levers and optimizing the structure of budget expenditures became important. The level of impact of crisis processes exacerbated by the pandemic is much stronger in export-dependent countries. Negative factors in foreign markets significantly affect the imbalance of macroeconomic balance in these countries, respectively, violating budgetary constancy, stability and balance.

Analysis of recent research and publications. Among the important studies of foreign scholars on the formation of budget policy as a tool for social development of labor are works by J. Keynes, P. Samuelson, W. Nordhaus, J. Stiglitz, V. Tanzi [1-5]. The works of domestic scientists T. Boholib, L. Lysyak, V. Oparin, V. Fedosov [6-8] and others are devoted to the formation and implementation of budget policy in the conditions of transformations. At the same time, in the conditions of the COVID-19 pandemic, it is important to justify institutional changes in budget policy in order to stabilize socio-economic processes.

The **aim** of the article is to reveal the institutional principles and substantiate the directions of budget policy in the context of the COVID-19 pandemic.

Materials and methods. The following methods were used in this study: systematic – in revealing the role of budget policy in the context of the COVID-19 pandemic; comparative – in the generalization and systematization of institutional support for the formation and implementation of budget policy; the factor method and scientific abstraction – in the disclosure of budget architectonics and justification of budget policy directions in the conditions of the COVID-19 pandemic.

Results. Ensuring a purposeful impact on the pace and quality of economic growth requires the formation and implementation of effecttive budget policy based on improving the system of institutional support for financial and budgetary transformations [9]. The effective use of budget policy instruments helps to reduce the variability of macroeconomic variables and the appropriate level of their formation. The difficulty of finding ways to qualitatively change the budget architectonics, the components of which are interrelated, necessitates a complex approach to the formation and implementation of budget policy which will be based on predicting trajectories of budget revenues and areas of public financial resources [10].

The application of moderate budget adjustments in the implementation of budget management for the formation of both budget revenues and expenditures in response to crisis processes in the context of the COVID-19 pandemic is an important condition for macroeconomic stability. An important task aiming at ensuring the stability of the budget system and increasing interregional factor mobility is to justify the optimal level of tax burden. In the process of determining the directions of budget policy, it is important that additional government spending does not replace private consumption and investment. The high level of tax burden hinders investment. At the same time, a significant level of tax burden partially offsets the expansionary effect of increasing government spending. In order to stimulate aggregate demand and reduce the negative impact of crisis processes in the COVID-19 pandemic it is appropriate to use budgetary policy instruments which are aimed at both increasing government spending and reducing taxes.

When substantiating the directions of budget policy regarding the formation of budget revenues, it is reasonable to take into account the Laffer Curve, which shows the relationship between tax rates and the level of

government revenues [11]. However, scientific views on the optimal level of taxation in different countries are not the same. In particular, scientists estimate that the peak of the Laffer curve in China is about 40%. Accordingly, public authorities should take into account changes that occur throughout the tax system, not just changes in direct taxes, while increasing their rates. It is determined that an important task of budget regulation in China is to reduce the level of taxation to 35% [12].

An important task in the context of the COVID-19 pandemic is to develop a risk management strategy, particularly in terms of the risks of not receiving the planned level of income, which will facilitate the increase in the country's budgetary stability and diversify the relevant risks. The use of risk diversification mechanisms is an important condition for making informed decisions on financing innovation and investment projects at the expense of public financial resources.

Among the risks of not reaching the planned level of budget revenues, particularly in the area of taxes, it is worth noting the risks caused by the slowdown in economic growth due to the intensification of financial crisis processes in the context of the COVID-19 pandemic. Adverse conditions in world markets have a directly proportional effect on the reduction of budget revenues. According to the normative legal documents of the European Financial Stability Facility, the criteria and indicators for assessing the level of impact of potential imbalances on budget revenues are substantiated. If they indicate the likelihood of imbalances, an in-depth assessment of macroeconomic indicators is carried out and suggestions are made to address the identified problems. In addition, the risks of losses in the planned budget revenues are evaluated on the basis of budget projections: the dynamics of budget revenues is studied and their impact on the country's budget sustainability is assessed; the specifics of budget revenue formation are considered and the forecast of their share in GDP is developed.

According to the forecast of the Ministry of Finance of Ukraine for 2020, the following is envisaged: a decrease in gross domestic product by 3.9%; the inflation rate will be 8.7%, the average year hryvnia-dollar exchange rate – 29.5. While the previous forecast expected the economy to grow at 3.7%, inflation – 6%, hryvnia to dollar exchange rate on average for the year – 27 [13].

The intensification of crisis processes has reduced the level of budget revenues. According to the Law of Ukraine "On Amendments to the Law of Ukraine "On the State Budget of Ukraine for 2020" of 13.04.2020 № 553-IX, the tax revenues of the State Budget will be reduced by UAH 144.62 billion. Given the above, public administration have identified measures to increase non-tax revenues of the budget, respectively, they are expected to increase by UAH 42.26 billion (*table 1*).

Table 1

Revenues of the State Budget of Ukraine for 2020, UAH billion

Revenues	Revenues in accordance with the Law of Ukraine:	
	"On the State Budget of Ukraine for 2020"	"On Amendments to the Law of Ukraine "On the State Budget of Ukraine for 2020"
Tax revenues	925.75	781.13
Income taxes, taxes on profits, capital gains taxes	239.27	209.04
Rent and payment for the use of other natural resources	58.15	32.53
Internal taxes on goods and services	591.95	507.71
Taxes on international trade and foreign transactions	32.86	28.62
Other taxes and fees	3.52	3.22
Non-tax revenues	141.08	183.33
Income from property and business activities	77.45	113.93
Administrative fees and charges, income from non-commercial economic activities	9.89	17.68
Other non-tax revenues	17.34	14.35
Own revenues of budgetary institutions	36.40	37.37
Income from capital transactions	0.65	0.66
Proceeds from the sale of fixed capital	0.03	0.05
Proceeds from the sale of land and intangible assets	0.01	0.004
Official transfers	3.06	1.76
Trust funds	0.19	–
Total income (excluding intergovernmental transfers)	1070.73	967.07
Total income	1079.49	975.83

Source: calculated by the authors on the basis of the Law of Ukraine "On the State Budget of Ukraine for 2020" of 15.09.2019 № 294-IX and the Law of Ukraine "On Amendments to the Law of Ukraine "On the State Budget of Ukraine for 2020 " of 13.04.2020 № 553-IX.

In order to optimize the expenditure side of the budget and free up funds for the costs associated with overcoming the pandemic, the level of funding for many ministries has been reduced. In particular, the Ministry of Education and Science of Ukraine – by UAH 1.75 billion, the Ministry of Economic Development, Trade and Agriculture of Ukraine – by UAH 0.88 billion, the Ministry of Infrastructure of Ukraine – by UAH 0.97 billion, the Ministry of Justice of Ukraine – by UAH 0.46 billion, the Ministry of Foreign Affairs of Ukraine – by UAH 0.14 billion. Subventions for the development of communities and territories, financing of Energy Efficiency Funds and partial loan guarantee have been abolished. Expenditures on local elections have been reduced. At the time of the quarantine, the level of salaries of heads of state-owned enterprises is limited to no more than 10 minimum wages (UAH 47,230). The level of funding was increased: the Ministry of Health of Ukraine – by UAH 16.37 billion, the Ministry of Social Policy of Ukraine – by UAH 19.50 billion, the Ministry of Finance of Ukraine – by UAH 0.99 billion, the Ministry of Internal Affairs of Ukraine – by UAH 0.20 billion, the Pension Fund. The reserve fund of the Cabinet of Ministers of Ukraine has been

increased to UAH 4 billion. In general, expenditures of the State Budget of Ukraine for 2020 in accordance with the amendments increased by 7.31% and amounted to UAH 1266.22 billion. The share of the budget deficit in the gross domestic product increased to 7% (*table 2*).

Table 2

Expenditures of the State Budget of Ukraine for 2020, UAH billion

Spending unit	Expenditures in accordance with the Law of Ukraine:	
	"On the State Budget of Ukraine for 2020"	"On Amendments to the Law of Ukraine "On the State Budget of Ukraine for 2020 "
Ministry of Internal Affairs of Ukraine	92.97	93.16
Ministry of Economic Development, Trade and Agriculture of Ukraine	17.95	17.07
Ministry of Foreign Affairs of Ukraine	4.68	4.54
Ministry of Education and Science of Ukraine	44.51	42.76
Ministry of Health of Ukraine	98.18	114.55
Ministry of Social Policy of Ukraine	293.40	312.91
Ministry of Infrastructure of Ukraine	4.95	3.98
Ministry of Finance of Ukraine	18.89	19.88
Ministry of Justice of Ukraine	14.34	13.88
Total	1180.10	1266.42

Source: calculated by the authors on the basis of the Law of Ukraine "On the State Budget of Ukraine for 2020" of 15.09.2019 № 294-IX and the Law of Ukraine "On Amendments to the Law of Ukraine "On the State Budget of Ukraine for 2020" of 13.04.2020 № 553-IX.

The budget includes the Fund for Combating COVID-19. According to the Law of Ukraine "On the State Budget of Ukraine for 2020", the envisaged level of financing of the Fund is UAH 64.7 billion. The fund will be used to provide: "one-time financial assistance to family members of medical and other health care workers who died from COVID-19; financial assistance to citizens in connection with the negative consequences of the spread of COVID-19 in Ukraine. Besides the Fund resources will be directed to measures related to the prevention and spread, localization and elimination of outbreaks, epidemics and pandemics of COVID-19" [14].

Thus, the need to develop a multi-pronged strategy aimed at resolving the problematic issues caused by the COVID-19 pandemic – both directly in the field of health care and in relation to public financial support of economic activity – has become urgent. This strategy should combine short-, medium- and long-term goals, taking into account the impact of exogenous and endogenous factors on the economy and the interrelationships of the components of the financial system, including the public finance system. In particular, a number of financial and budget regulation measures are being implemented in the EU in connection with the COVID-19 pandemic.

With the onset of the COVID-19 pandemic crisis, EU Member States have stepped up their efforts to support the economy through coordinated and targeted budget stimulus. Significant state resources are aimed at streng-

thening the health care sector and civil protection mechanisms, supporting the development of leading sectors of the economy. At present, the share of discretionary budget measures of member states in GDP is about 3%. In addition, EU Member States have committed themselves to maintaining the liquidity of sectors of the economy by providing government guarantees and deferred tax payments, which are currently estimated at 16% of EU GDP. The need to implement a flexible budget policy to support the economy and respond to the impact of the COVID-19 pandemic in a coordinated manner is identified. General budget recommendations are provided in the framework of the European Semester.

Much attention is paid to the following issues: the provision of state aid to accelerate public support for businesses, while ensuring the necessary equal conditions in the Single Market, support for research to combat the COVID-19 pandemic. Starting from 1 April 2020, the EU budget has provided financial assistance to the most affected Member States in the amount of up to € 800 million to support liquidity and financing conditions for households, businesses and banks in order to provide uninterrupted lending to the economy.

Important tasks of the budget policy of the EU countries today include: improvement of budget tools; increasing the effectiveness of mechanisms for attracting tax revenues; improving the model of budget revenue generation, which provides for the optimization of their structure, reducing the share of capital taxes, increasing the effectiveness of risk management tools in this area; optimization of the expenditure part of the budget; ensuring coordination of public administration bodies in the process of revenue generation and budget expenditure planning; improving the system of information exchange between public administration bodies and business entities in the process of revenue forecasting; implementation of systematic monitoring of the uniformmity and proportionality of the tax burden by region and assessment of vectors of changes in its level.

The ground of the use of budget instruments, the optimal structure of budget revenues and expenditures contributes to ensuring the effective impact of budget policy on macroeconomic stability. The choice of budget strategy in the context of the COVID-19 pandemic should be based on the assessment of development trends of national economies, which will contribute to their sustainable development; budget policy should be mutually consistent with the priorities of socio-economic development of countries and budget instruments should be aimed at solving them; budget projections of budget revenues should be used to anticipate the financial consequences of public finance reforms or decisions of public administration bodies on the implementation of budget policy; the development of budget policy in the context of the COVID-19 pandemic should be based on taking into account the risks of loss in the planned level of government revenue.

Considering the significant level of volatility in the economic situation, an important task is to adapt budget policy priorities to new global challenges, strengthening the role of endogenous factors in the process

of ensuring macroeconomic stability [15]. Despite the different trajectories of budget policy, countries mostly use a unified range of budget tools. To achieve the target values of primary balances, budget policy measures reflected in budget strategies are developed. However, as foreign experience shows, there are different conceptual approaches to optimal budget architectonics.

Conclusion. The results of the study show that in the financial and economic crisis intensified by the COVID-19 pandemic, an important task is to implement an adaptive budget policy to internal and external changes in the economic environment, aimed at ensuring optimal budget architecttonics that will favor stabilization of socio-economic development. Disclosure of institutional principles and features of budget policy implementation in the context of the COVID-19 pandemic indicates the establishment of guidelines for its direction to change the structure of revenue and expenditure parts of the budget. There is a forced reduction in the level of funding for some budget items and redistribution of funds to others. An important task, given the significant level of Ukraine's export dependence, is to strengthen the role and conduct of discretionary budget policy in the context of the COVID-19 pandemic. Limited budgetary financial resources determine the need to update changes in the vectors of budget policy and budget management in terms of the possibility of implementing alternative ways of forming and ensuring the appropriate level of budget revenues, taking into account the peculiarities of public relations development.

At the same time, the model of ensuring the effective implementation of budget policy in the context of the COVID-19 pandemic is weak, due to the nature of the risks of loss in the planned level of income, particularly in terms of taxes. These risks, the main of which are caused by the slowdown in economic growth due to the intensification of financial and crisis processes, pose a threat of violating the fiscal stability of the budget system. The development of fiscal projections of budget revenues as a basis for continuous analysis and assessment of financial and budgetary security of the country will contribute to the goal of budget regulation. At the same time, fiscal design of budget revenues should be used to anticipate the financial consequences of decisions of public administration bodies on the implementation of budget policy.

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The article submitted to editor's office on 15.10. 2020.

Чугунов І., Макогон В. Бюджетна політика в умовах пандемії COVID-19.

Постановка проблеми. *В умовах пандемії COVID-19 результативність бюджетної політики є вагомою передумовою стабілізації соціально-економічних процесів. Прийняття рішень про доцільність застосування відповідного бюджетного інструментарію повинно визначатися, виходячи з оцінки зміни рівня економічного розвитку країни внаслідок поглиблення кризових процесів, зумовлених пандемією.*

Мета *статті – розкриття інституційних засад та обґрунтування напрямів бюджетної політики в умовах пандемії COVID-19.*

Матеріали та методи. *У дослідженні використано системний метод: при розкритті ролі бюджетної політики в умовах пандемії COVID-19. Порівняльний метод застосовано з метою узагальнення та систематизації інституційного забезпечення формування та реалізації бюджетної політики. Факторний та метод наукового абстрагування використано при розкритті бюджетної архітектоніки та обґрунтуванні напрямів бюджетної політики в умовах пандемії COVID-19.*

Результати дослідження. *Визначено роль бюджетної політики у забезпеченні фінансово-економічного регулювання країни. Розкрито інституційні засади та обґрунтовано напрями бюджетної політики в умовах пандемії COVID-19. Здійснено порівняння доходів та видатків Державного бюджету України на 2020 рік згідно із Законом України "Про державний бюджет України на 2020 рік" від 15.09.2019 № 294-IX та Законом України "Про внесення змін до Закону України "Про Державний бюджет України на 2020 рік" від 13.04.2020 № 553-IX.*

Висновки. *Проведене дослідження надає можливість визначити, що в умовах фінансово-економічних кризових процесів, посилених пандемією COVID-19, вагомим завданням є реалізація адаптивної бюджетної політики до внутрішніх і зовнішніх змін економічного середовища, спрямованої на забезпечення оптимальної бюджетної архітектоніки, що сприятиме стабілізації соціально-економічного розвитку. Розкриття інституційних засад та особливостей реалізації бюджетної політики в умовах пандемії COVID-19 свідчить про установлення орієнтирів її спрямування на зміну структури дохідної та видаткової частин бюджету. Здійснюється вимушене скорочення рівня фінансування одних статей бюджету та перерозподіл коштів на інші. Вагомим завданням, враховуючи значний рівень експортозалежності України, є посилення ролі та проведення в умовах пандемії COVID-19 дискреційної бюджетної політики.*

Ключові слова: бюджет, бюджетна система, бюджетна політика, доходи бюджету, видатки бюджету, бюджетне регулювання.

UDC 336.14:061.1
JEL Classification: E60, H60, H61, H83 DOI: http://doi.org/10.31617/visnik.knute.2020(134)07

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GENESIS OF BUDGETING AT THE MACRO-LEVEL

The intermediate results of the study about the essence and development of budgeting technology were shown. Budgeting technology changes at the macro level in the public policy tasks implementation are systematized and concretized. It is proposed to unify the use of the concept with the context of the use of "budgeting" in domestic publications on financial issues

Keywords: public budgeting, spending unit, performance budgeting, budgeting methods, public finance, budget management.

Background. The development of financial resources allocation technology at the macro level requires further specification of the modern budgeting evolution study to determine its proper spot among the financial science concepts. In the research process of budgeting, the conclusion about this technology as an integral objective property of financial relations was obtained, although it received the modern name "budgeting" only a few centuries ago. "Budgetary policy", "budgetary mechanism", "budgetary management" and "budgetary architecture" terms connected with the essence of "budgeting" in the discourses about public finance management.

Modern budgeting as a technology of combining management and politics methods and tools with the financial relations and financial resources [1] uses development of management techniques to ensure additional accuracy in achieving the public administration expected results. In other words, organization of budgeting that meets the available resources and goals, ensures the ideas of budget architectonics implementation through a dynamic combination of budget mechanism and budget policy. Macro-level budgeting provides an opportunity to focus the budgetary relations system analisys either on the powers of the entities, or on the attraction and allocation of resources ways, or on the policy implementation format by involving the combination of political science and management sciences generation into the public finance management.

Much attention is paid to the use of the concept of "budgeting" for the microeconomic entities activities in domestic publications. At the same time, in foreign publications, modern "budgeting" is used both for the financial relations of all levels and for the interdisciplinary aspect to emphasize

the streamlining of resources to achieve a certain goal. It is necessary to specify the significance of this concept for domestic science through the essential meaning, systematization of historical development in public finance and the current context.

Analysis of recent researches and publications. In modern domestic publications, budgeting as a borrowed term (budgeting in English) is used in two main contexts: to describe work directly with budgets (of any level); to describe the technology of combining separated in time and characteristics of the components of financial relations and management tools of economic entities. S. Polishchuk [2] defines budgeting as a separate technology of financial planning and begins the historical countdown of budgeting as an activity of economic entities from the middle of the last century. N. Yuvzhenko [3] (as well as other authors) supports this opinion and emphasizes the spread of budgeting technology in the direction from the micro level to the macro level.

The facts of public budgeting development through the adoption of specific laws since the 1960s were given by L. Vasiutynska and M. Slatvinska [4]. V. Demianyshyn and Z. Lobodina considered the budgetary mechanism [5], the aspects of budget policy implementation are studied in the works of I. Chugunov and co-authors in different years [6]. S. Kondratiuk through the genesis of the budget in Great Britain brought the formation of modern budgeting meaning with the development of parliamentarism and showed the evolution of "budgets" essence concept at the state level [7]. The migration of the concept of "budgeting" between the branches of science will be demonstrated by the example of the article on mental budgeting in inflationary expectations of the consumer for rationalization in human thinking by S. Hirschman and others [8]. Now the concept of "budgeting" is applied to many economic-related practical mechanisms for financial resources consolidation and relations to achieve a certain goal.

The leading role of financial resources of cities in the formation of US budgeting (1910-1950) is emphasized in the articles of American researches [9]. P. Foreman emphasizes government budgeting until the 1940s in Australia through the development of state order and the public sector of industry [10].

The statements in this article are supported by selected publications, but it should point out a significant number of publications, textbooks for universities and civil servants, collective volumes under the auspices of the OECD and the World Bank on public budgeting and its evolution. They were published more than 10 years ago, they are not mentioned to avoid overloading the bibliography.

The **aim** of this article is a coverage of some results of a comprehensive study about budgeting as a technology for managing financial resources, its development towards universalization; as well as a demonstration of the evolution of budgeting, which in different periods of time exhibit the approbation of certain techniques to achieve goals and results.

Materials and methods. The results of the article are based on the study of foreign and domestic publications on budgeting, systems management and cybernetic approach over the last two centuries, the author's empirical observation of budgeting practices in the world through official sources of information. Theoretical generalization methods based on the results of the analysis of the budgeting practices components have been used in the article for obtaining the results.

Results. Human communities organized common resources through financial and management technologies to adapt for their environment in ancient India, China and Egypt. The concept "fisc", which meant the place of the treasury of the head of state in the Roman Empire, was later transformed into the name of the policy of redistribution of funds from payers and sources for the interests and will of the authorities. It is necessary to emphasize the important role in the history of the common centralization of value by removing it from individuals in favor of the power subjects subsequent redistribution (including religion) without equating finance and money. The right to redistribute value through the parts of production division between producers developed, and with the development of trade unions and similar associations – between employees [11]. The need for redistribution and pooling of financial resources for further redirection in the process of achieving the goal is objectively inherent in society, and its subjective implementation determines the constant development of financial relations forms and methods [12].

Although the name "budget" became fixed for the financial and legal object of fiscal policy several centuries ago [7], prototypes of embodiments of government search for revenues and their subsequent distribution in the management process exist throughout government history, implemented in fiscal policy (e.g, history of revenue sources is shown in the publication O. Baik [13]). Along with taxes, the state included in the budget the public sector of the economy, its ownership of production and infrastructure using [10]. Raising funds from securities also took place to support certain government projects. The term "budgeting" spread with the strengthening of the political component in fiscal policy, when budgets became the subject of compromise discussion.

The concept of budgeting was actively used at the beginning of the last century. In the 1920s, the main task of budgeting was to streamline the formation and implementation of budgets at all levels (followed by the formation of budget systems), accounting and accountability of participants in the budget process, "budget awareness" of the public and democratic control [14]. At the same time, the concept of "architecture" of budgeting was mentioned and two budget classifications were used, which fit the format of budgets by lines to streamline analysis and management: prototypes of modern departmental classification of budget expenditures (by budget entities) and economic appointment.

The economic thought of the Russian Empire, and then of the Soviet Union, to which Ukraine belonged, tended to limit the scope of financial science to state budgeting. The concept "budgeting" itself was not used, it was about "finance" as a service for the formation and use of resources to authorities needs and government policy activities, starting with the works of M. Speransky, and "state (*not public*) finance" as primary tool of regulation and stimulation economy for the prospect.

It is interesting to draw parallels between English-language and Russian-language discourses on budgeting. In English-speaking countries, including the United States, budgeting was seen as a set of applied ways to centrally organize a decentralized system of financial relations with authorized entities that performed functions at public expense. Russian-language science considered "finance" as a theory of servicing a single centralized state financial economy, where financial relations needed to be streamlined through the correct definition of income and expenditure components of a holistic (as a single object) financial cost estimate – the budget. However, more than a hundred years ago, scientists took a systematic approach to the organization of public finances and budgeting.

In the first half of the last century, the development of budgeting continued as a technology with a set of methods and tools to combine financial resources in government activities, their accounting, planning and reporting. This technology was not used in the private sector at that time on the example of Australia: "Private industry did not generally adopt budgeting and standard cost techniques before the 1940s, partly due to the size of industry units…" (small – *auth.*) [10, p. 50]. First of all, budgeting in the private sector at the beginning of the last century did not develop due to the lack of the williness to report about internal financial flows and due to the low complexity of economic and financial operating of the privat enterprises.

Budgeting at that time was correlated with the managing public financial resources based on scientific approaches to management and accounting of revenues and expenditures. The use of shares and debt securities also took place at the state level and state-owned companies or with the direct participation of government officials after speculative fever and the "Bubble Law", which during its action gave rise to new ways to fulfill state budgets and the government officials needs [15]. Programs and bonds were used in particular for the construction of road networks or railways (for example in India, tsarist Russia in the nineteenth century).

Budget relations with the development of democracy and the government institutions system (instead of personal power) have acquired a comparable between the countries of the whole world's "budget format" [16] and features of public budgeting technology: consistency, accountability, streamlining the organization management of subjects [17] and legal nature. Although these features are common to modern budgeting, their compositions involve a combination the financial relationships with management techniques such as plans, programs, performance and efficiency, accounting tools, and data analysis techniques.

The systematization of knowledge about management and the combination of its scientifically described methods with systematic and analytical approaches gained considerable popularity among scientific circles in the middle of the last century. Tectology, cybernetics, the theory of behaviorism are devoted to the organization and management of systems. Planning is one of the universal tools for organizing the activities of entities, which is used in management. Programs, goal setting, evaluation are tools of information management provided through the accounting of universal management, which can be applied both in combination with planning, and at budgeting. The above is concretized through the development of budget formats in the budget system, basic budgeting techniques and decision-making management for budgeting by fund managers (spending units).

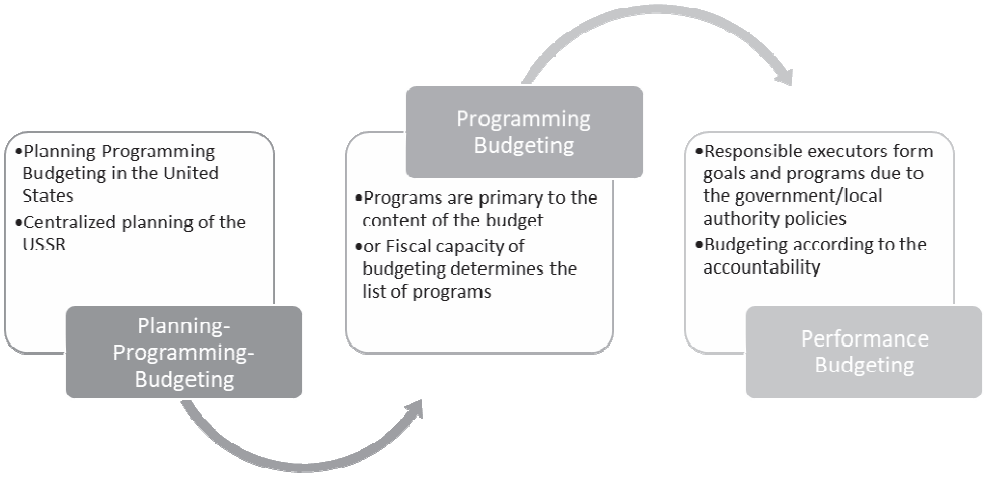
In Ukrainian budget science, four bases of the budget system have been identified, which distinguish the types of budgets, their interrelations, revenues and expenditures characteristics and components. At the same time, foreign budgeting is often described in relation to the "policy" of the government to which budgets are subordinated. The rapid development of management sciences and the study of systemic interactions brought to the fore in the 1950s the idea of systemic comprehensive planning through the budgeting [4]. At the same time, the relationship of financial, non-financial resources, goals and objectives began to formalize in programs designed for several years of use, and in the early 60’s proposed a format of public finance "planning-programming-budgeting" (PPB is name from the USA) [18]. But the impact on budget systems through external (centralized) plans and programs has not justified itself due to the difficulty of taking into account the implementation of the needs, powers and behavior of performers in complex systems. Therefore, on the example of the United States, the system was reformatted until the 1970s. During this period, such budgeting techniques (methods) as "zero-based" budgeting and "incremental" budgeting were singled out and tested. The incremental budgeting method developed further and have been allowed to allocate the project components in in budgets which were revised on other conditions and could have various duration of performance in comparison with traditional operating parts of budgets.

During the 1970s, goals and policy makers became key elements in public budgeting. Since the 1980s, along with administrative management in the civil service, which provided for a clear vertical of orders and many units of subordinate officials, developed competitive management between departments and even individual positions. The word "administrative" has even become synonymous with describing the public sector before this. Budget holders have been empowered to freely allocate budget resources within a certain approved framework (limits, "ceilings"), to set intermediate goals for the best achievement of their public policy goals. Instead, "spending units" have become more responsible, accountable and dependent on their performance for further funding from the budget [22]. Such techniques

as *program budgeting*, where the executors followed the programs of activity, and *performance budgeting have* been developed, where the result of the activity within the program or budget unit became decisive for obtaining further financing. These techniques, as well as any manifestation of modern budgeting, in a complex system of implementation have many nuances of application, but they are topics for future publications.

At the beginning of the 21st century, public budgeting, along with the public sector as a whole, start has been influenced by a personalized approach to performers not only as heads of departments. Attention is paid to the civil servants personalization, the calculation of KPI for a particular position. Informatization and practice of "good governance" involve such a component of performance budgeting as assessment of civil servants not only by the government system standarts indeed but also by consumers of "public services", which built the comprehensive feedback and its impact on the activities of individual employees inside and outside the budget unit in the overall scheme tasks of a comprehensive, systemic government policy. At the same time, such management tools as a plan, program, or accounting tool – cost sheet – can be used in the future. But monitoring and evaluation of the activity of performers for budget funds is necessary, so in European countries it is about performance budgeting as the most modern and advanced technology [20]. Performance budgeting involves different algorithms for linking public funds and performance. Budgeting techniques generally differ in the criteria of grounds for obtaining budget (or public) funds in managing their distribution. At the same time, the concept of "budgeting" in the general context still refers to the formation and implementation of "budgets".

The stage of budget systems format and government policies development in combination with budgeting after complicating its implementation with plans and programs is shown in the *figure*.



Development of budgeting in the system of public management

Source: developed by the author.

The evolution of budgeting methods has developed according to the following objects of financial resources allocation: "budget bodies (institutions) – allocation of funds (by functions) – plans and programs – goals and performance indicators of their achievement – tasks of managers / recipients of the budget funds – public services, diversified according to specific individuals needs". Various names for the combination of methods in the framework of budgeting techniques commit an additional complication to the modern interpretation of the technology itself, so this publication shows the essence of budgeting through resource allocation.

Subjects of modern public budgeting in the public finance system are engaged in revenue planning, streamlining and direction of expenditures, monitoring and evaluation of the spending funds results for their activities. Each specific design (or architectonics) of these combinations allows researchers to identify and describe both concrete manifestations of budgeting technology, and to identify methods in the technology, some of which are described in previous ukrainian publications [21]. Complications of economic tasks and acceleration of the exchange of information on budgets took place along with the systematization and fixation in science of management techniques in the budgeting system. The objects of management were public budgets as plans and regulations, public finances with the inclusion of the budget system, the subjects-institution's powers impact on the organization system. The latter includes building in Ukraine a relationship between the Ministry as the main administrator of funds (key spending unit) and subordinate executors of budget programs to obtain the best "impact" on the results of budgeting in Ukraine.

Additionally, a superstructure for the management of public financial resources in the form of budgeting for personalized needs is being developed: gender, participatory, environmentally responsible, etc. These built-in basic budgeting tools for identifying needs under the sustainable development goals provide additional opportunities to achieve results in primary (traditional) budgeting.

A whole stratum of domestic economics considers "budgeting" as a technology that appeared at the level of economic entities only in the 1960s. It can be assumed that this is due to insufficient familiarity with foreign language professional literature (for example, as an analytical paper [22]), after all, in the last century, only some textbooks on systems management and public finance were translated. Well-known Western systemologists were interested in the influence of the subjects of the system on its management, self-organization of the systems, including economic activity in particular. R. Akoff published his book in 1970 [23] and it was translated in the USSR, it did not mention budgeting, it was devoted to planning in the economic system by combining a management approach and economic (including financial) methods. His book which was published in 1981 [24] dealt with planning in corporations with the consideration of their employees interest

(R. Akoff is a recognized behaviorist, in addition to studying applied approaches to systems), and mentioned program budgeting as a tool for quantitative analysis.

The term "budgeting" in connection with the organization of corporate finance on the basis of criteria for distribution between units of the system and "active" control (translated as controlling) could be used by I. Blank, whose work became the basis for domestic scientific development of corporate financial management. Domestic publications were interpreted the work of system-managers in the middle of the last century on the use of planning and behaviorism in economic systems as a basis for the concept of "budgeting". The origins of this interest in the combination of plans and programs since the 1960s, and its connection with the budget sphere, are shown in the previous article.

Conclusion. With the development of the essence of budgeting, this term has acquired a very wide range of applications, so it makes no sense to limit the use of this name to a particular area of financial science. However, the use of the concept of budgeting in the study of public finance provides significant advantages due to the experience of its technologies, techniques, applied methods and tools, which detaization is rarely used in domestic publications on public financial relations, in particular adaptation the budget architecture in the useful working techniques and budgeting methods. Management developments in the use of budgeting in the world allow to detail "budget politics" from a whole object and combine it with specific government decisions in terms of specific responcible subjects policies due to the emergence of this term in its modern form.

Modern budgeting has developed in the context of using first external influence on budget units in the form of plans and programs, then creating competitive conditions for budget units to perform their tasks, and today the responsibility of both employees of budget units and the citizens has become direct involvement in the budgeting process with the permanent purpose of efficiency financial resources management performing. The concepts detailing and concretization in financial management is a necessary prerequisite for the formation its results predictability through the avoidance of the content substitution and the absence of "blind spots" among the selected technology.

The direction of further research and additions on the subject of this publication is to systematize the essence of effective techniques and budgeting tools through its empirical use, analysis of the such tools as "program", "goals" and "indicators" apply in budgeting without static fixation in the content of technology as enhancement of the flexible management tools combinations using by the subjects of financial relations is the purpose of modern budgeting.

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The article submitted to editor's office on 01.10.2020.

Жибер Т. Генезис бюджетування на макрорівні.

Передмова. *Визначено, що технологія бюджетування є невід'ємною об'єктивною властивістю фінансових відносин. Бюджетування на макрорівні надає можливість фокусування аналізу системи бюджетних відносин або на повноваженнях суб'єктів, або на точках тяжіння та алокації ресурсів, або у форматі системи імплементації політики.*

Метою *публікації є еволюція бюджетування, яка у різні періоди показувала апробацію окремих технік досягнення цілей і результатів.*

Матеріали та методи. *Під час дослідження використано методи теоретичного узагальнення за результатами аналізу складників практик бюджетування.*

Результати дослідження. *Поняття бюджетування активно використовувалося вже на початку минулого століття. У 1920-х роках основним завданням бюджетування вважалося впорядкування формування та виконання бюджетів усіх рівнів.*

З 1950-х років спостерігався розвиток форматів бюджетів у бюджетній системі, основних відокремлених технік бюджетування та управління прийняттям рішень щодо бюджетування розпорядниками коштів. Еволюція методів бюджетування розвивалася за такими об'єктами алокації фінансових ресурсів: "бюджетні одиниці (установи) – призначення коштів (функції) – плани і програми – цілі і результативні показники їх досягнення – завдання розпорядників/одержувачів коштів – публічна послуга, диверсифікована за потребами конкретного індивіда". Різноманітні назви для поєднання методів у рамках технік бюджетування додатково ускладнюють сучасне трактування самої технології, тому у цій публікації показано сутність бюджетування через алокацію ресурсів.

Висновки. *З розвитком сутності бюджетування цей термін набув дуже широкого діапазону застосування, отже, немає сенсу обмежувати його використання окремою сферою фінансової науки. Разом з тим, використання поняття бюджетування при вивченні публічних фінансів надає значні переваги через напрацьований досвід його технологій, технік, методів та інструментів, деталізація яких мало використовується у вітчизняних публікаціях щодо публічних фінансових відносин, зокрема адаптації бюджетної архітектоніки у прикладні техніки і методи бюджетування.*

Ключові слова: публічне бюджетування, розпорядник коштів, результативне бюджетування, методи бюджетування, публічні фінанси, бюджетний менеджмент.

UDC 336.711(477)
JEL Classification E44 DOI: http://doi.org/10.31617/visnik.knute.2020(134)08

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SPECIALIZED DEVELOPMENT BANKS: ECONOMIC VIABILITY FOR UKRAINE

The economic usefulness of specialized development banks in the context of economic heterogeneity has been substantiated. The principle of refinancing at a differentiated rate for development banks has been pioneered in the article. Based on that interest rate policy implementation will take into account the specific needs of the economy.

For the first time, the principle of refinancing at a differentiated rate for development banks was formed, which will make it possible to implement an interest rate policy, taking into account the specific needs of the economy.

Keywords: specialized development banks, refinancing rate, uneven economic growth.

Background. In March 2020, the National Bank of Ukraine (NBU) introduced long-term refinancing of banks for up to 5 years. Previously, the NBU operated by standard short-term refinancing tools and now it got the opportunity to stimulate economic growth. Such a mechanism should support bank lending in hryvnia. A floating interest rate is set for such loans. It's determined as the NBU refinance rate plus constant premium (in percentage points) in effect on the date of the loan approval.

Nevertheless, universal banking system means universal conditions of the banking market. The NBU has almost no mechanisms for targeted support of the economy. Moreover, support mechanisms for large government projects are weak.

The NBU has limited capacity to make counter-cyclical effects on the economy during crisis periods. Ukrainian cyclical downturns are always accompanied by accelerating inflation. Therefore, central bank, being constrained by inflation targeting, tightens monetary policy by raising refinancing rates and absorbing excess hryvnia liquidity. Thus, quite often the monetary policy of the NBU is pro-cyclical. So, there should be additional tools for targeted intervention in the economy, including targeted credit support.

Today, banks build their interest rate policy within the framework set by unified refinance rate and the profitability (or creditworthiness) of a particular sector. Banks have single interest rate floor for all sectors of the

economy. Some sectors are willing to take over higher debt servicing than those determined by refinance rate. At the same time, some other sectors cannot alow credit at a price determined on the basis of the universal refinance rate. However, the borrowers can potentially be highly profitable sectors of the economy (companies in such sectors), moving up credit cost for the entire corporate sector and households. This leads to a number of consequences:

deepening inequality in the economy. Low-profit sectors receive inflated credit rates and cannot efficiently operate with borrowed funds;

increasing risks and their asymmetric distribution. Some sectors of the economy get loans at the optimal (or understated) interest rates in terms of their profitability. Other ones borrow at an overstated rate. As a result, the function of risk distribution has low kurtosis, i.e. there is significant part of general banking system portfolio with very low risk, and large part of general banking system portfolio with very high risk;

uneven access to credit – under-lending to sectors with lower profitability. Under the monetary policy with a universal refinancing mechanism, the refinance rate is set with regards to average needs of the economy. In addition, the tightness of the NBU's monetary policy within the framework of inflation targeting may undermine the efficiency of the credit channel.

Analysis of recent research and publication. At present, foreign economists are rethinking the role of development banks (DBs) and improving their work. María José Romero [1] proposes DB reforms that would improve their effectiveness and make them more accountable. Gutierrez Eva et al. [2] highlighted the lessons learned after the global financial crisis and presented some of the best DB's practical examples – they should become the basis for politicians. Douglass Sims [3] discussed the role of DB in financing green energy projects in Latin America and the Caribbean. Instead, very little work is devoted to the potential launching of state-owned development banks in Ukraine. The study made by Y. Kindzersky [4] and collective monograph of V. Vyshnevsky, L. Zbarazska, M. Zanizdra, and V. Chekina [5] are the most valuable. The latter proposes the creation of a universal development bank. Thus, there is a need for comprehensive study of DBs feasibility in Ukraine.

The **aim** of this study is to argue the need for specialized development banks in Ukraine. In addition, the principles of refinancing for DBs must be proposed.

Materials and methods. This research is based on the knowledge and experience previously published by economists and international organizations as a whole. Comparative analysis, system and chronological approaches were used to conduct the study about DBs.

Results. It is proposed to *create DBs in Ukraine on the basis of current state banks* to increase the effectiveness of monetary policy in stimulating investment demand and to form an effective redistribution mechanism in the economy.

The Development Bank, as defined by the World Bank, is a bank or financial institution with at least 30% state ownership and legitimate mandate to achieve socio-economic goals in a particular region, sector or specific market segment. Historically, DBs have been important tools used by governments to promote economic development. Such banks were created in many countries of the world, regardless of the stage of their development: in the former socialist economies, capitalist developed economies and developing economies. They financed the construction of roads, energy facilities, dams and telecommunications. DBs promoted certain industries, supported small and medium-sized enterprises (SMEs), and provided financial services to low-income households.

In developing economies, DB is usually the main source of long-term lending, loan guarantees and other financial services for infrastructure, housing and agriculture. However, DBs continue to play an important role even in developed economies, where private financial institutions and capital markets successfully meet the financial needs of businesses and individuals. DBs operate successfully in Germany, Japan, Canada, etc.

A significant number of DBs were built due to the post-war (post-World War II) needs of economic recovery. However, despite the active promotion of privatization of state property in the world, countries continued to establish DBs. According to the World Bank survey, 25% of DBs were established after 2000. These are Bulgarian Development Bank, Thailand SME Development Bank, Export Credit Guarantee Agency of Oman, Small Industries Development Bank of India, Development Bank of Nigeria and others. Development banks were also established in Serbia, Bosnia and Herzegovina, Angola and the Republic of Mozambique. A number of countries have established so-called "Green Banks" which finance projects in the field of green energy.

To finance economic projects, there are various options *for attracting resources for DBs*: deposits from the population; borrowing from other financial institutions; domestic or international capital markets; own funds; state budget allocations. Most DBs combine all of these funding options.

In 2012 and 2017, the World Bank conducted a survey among DBs. The results formed the understanding of the principles and rules by which such financial institutions operate [7].

In particular, *table 1* presents answers to questions about the sources of DB funding (according to the results of the survey in 2017).

The results of the survey show that most banks receive loans from other financial institutions (including abroad), place debt securities on financial markets, and the debts of many DBs are guaranteed by the governments of such bank's origin countries. Many banks accept government deposits and a small proportion of banks accept deposits from individuals. Almost 30% of banks receive financing (transfers) from the budget.

Table 1

A survey of countries about the sources of their DBs funding

Questions that characterize the DBs	Distribution of answers, %	
	Yes	No
Does your DB accept deposits from the public?	21	67
Does your DB accept deposits from government organizations?	46	54
Can your DB receive loans from other financial institutions or place debt securities on financial markets?	84	16
Is your DB a participant in the local interbank market?	56	44
Can your DB issue debt securities in the local market?	75	25
Can your DB borrow on international capital markets?	85	15
Does your DB receive direct budget transfers from the government?	29	71
Is the government a guarantor of your DB's debts? *	64	36

* This question and corresponding distribution of answers are given from the report for 2012.

Source: [6; 7].

DBs are created with a wide range of mandates (tasks). DBs can be divided into two groups according to the mandate given to them: institutions with *a narrow and specific mandate*, which extends to a certain sector, activity type or client type supported by DBs; institutions with *broad powers* – without ties to sector or activity type.

About 53% of DBs in the world have a specific mandate, while the other 47% have general tasks (*table 2*). Among banks with a clear mandate, the majority support SMEs, infrastructure projects and the agricultural sector. Compared to the survey conducted 5-6 years earlier, it was found that the share of banks with mandates to finance SMEs, infrastructure projects and local government projects has increased significantly.

Table 2

Comparison of surveys (2012 vs 2017) on development banks mandates

Mandate	Distribution of answers, %	
	2012	2017
Agricultural sector	13	10
SMEs	12	15
International trade	9	8
Housing	6	2
Infrastructure projects	4	13
Local government projects	3	5
Industrial and other projects	6	*
Extensive mandate	47	47

** In the study for 2017, "industrial and other projects" were not separated out in a separate group.*

Source: [6; 7].

For the last 30 years in Ukraine and the last 40 years in the world there has been an active privatization of state financial institutions. However, a significant number of such institutions have retained state ownership (*figure 1*) and continue to play an important role in the financial system.

According to some estimates, public financial institutions average about 25% of total assets in the global banking systems. For example, in the European Union, public financial institutions account for 30% of the total financial system. In developing economies (particularly the BRIC countries), the share of public financial institutions is even higher. Such institutions include commercial banks, development banks, postal banks, insurance companies, deposit guarantee funds, leasing companies and others.

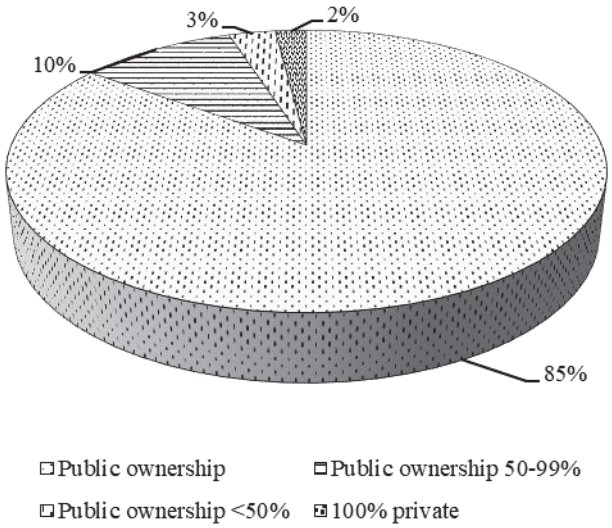

Figure 1. Development banks in the world by type of ownership

Source: [7].

During the global financial crisis of 2008–2010 and during the economic crisis in 2020, most DBs played a countercyclical role. They lended to private companies that temporarily did not have access to loans from private commercial banks or capital markets. This increases the interest of politicians in DBs during periods of economic downturns.

The 2020 Global Recession forced economists to reconsider their attitude to state property. *First*, a number of countries have faced large-scale humanitarian and economic challenges that have forced governments to impose a state of emergency with the power to intervene administratively in previously restricted areas of the economy. *Second*, world experience has shown the inability of deeply liberalized economies to meet serious challenges. It became disputable the neoclassical and monetarist's view that economy is capable for self-regulation. However, *Third*, in the process of liberalization, governments have long deprived themselves of significant powers, but have not absolved themselves of responsibility for socio-economic performance. This conflict has become an additional issue that forces economists and politicians to think about the role of the state, its rights to regulate certain areas of socio-economic relations.

Thus, the need for DBs not only persisted, but even increased. Since the early 2000s, the concentration of bank capital, as well as the combination of such capital with multi-industry groups has transformed commercial banks into multifunctional credit and financial complexes, combining deposit, credit, investment, consulting and other banking operations [8, p. 95]. At the same time, banks have moved away from their key role – long-term lending to the economy.

At the same time, some experts see the future of the European banking sector in the development of specialized institutions. In the long run they will be able to displace the current universal banks [9]. In support of this statement, it is argued that the benefits of universal banks are significantly exaggerated, and the threats posed by their development are underestimated [10]. To create an effective banking space, it is extremely important to choose the right priorities for the development of banks, taking into account the potential advantages and disadvantages of the dominance of *specialized* or *universal* banking.

Regarding the efficiency of universal banking [11], it is also limited by high requirements for the employees' skills if the bank operates simultaneously in different areas. Banking diversification requires professional management and deep market knowledge. The entry of banks into fundamentally new activities increases risks. The bright example of inefficient entry to the unknown sectors is the introduction of banks' services in the real estate market in the US, Japan and France in the late 1990s. Due to the lack of experience it exacerbated the crisis in these countries.

Monetary policy is inefficient in managing the overall credit indicators. Also there is weak impact on individual sectors of the economy [12]. In addition, there are empirically confirmed shortcomings of the universal banking system. So, there are reasons for rethinking of the classical understanding of the bank's role.

Banking system rebuilding should lead to the following results:

• an effective monetary policy transmission mechanism, in particular, effective interest and credit channels;

• the monetary transmission mechanism influences the cost of lending and the amount of lending for some individual sectors of the economy or some individual groups of sectors of the economy;

• increased efficiency of the transmission mechanism with lower losses ("sacrifice ratio") for economic growth;

• a fairer wealth redistribution between the financial and non-financial sectors of the economy.

Through empirical analysis and econometric studies, the potential of the NBU's monetary policy in terms of achieving these results was studied [12]. Current monetary policy framework and banking system model cannot fully achieve such results. Therefore, specialized DBs and new refinancing mechanism with discounts for DBs are proposed.

The specialization of DBs (giving them a mandate to finance specific sectors) and the simultaneous introduction of a refinancing mechanism with discounts are measures that mutually require each other. Simultaneous implementation of such measures is necessary for:

targeted support to certain sectors of the economy: the central bank together with the government will be able to increase funding for priority sectors at discounted (relative to market average) rates;

preferential financing (in the long run) of large economic projects. Since with differentiated refinancing rates can be adjusted to the profitability of the sector, preferential financing of economic projects in the sector will require a much smaller rate adjustment compared to the rate on general (non-preferential) terms. For example, if the economy has a universal refinancing rate, the cost of loans (on basic terms) may be overstated for certain sectors of the economy, as it will not take into account their low profitability. In this case, in order to provide effectively preferential financing for economic projects in the relevant sector, the government will have to initiate significant compensation of interest payments - relatively higher than in the case of a differentiated refinancing rate, which will provide special rates for sectors;

simplification and, at the same time, improvement of the control over the banking system. Relying on specialized DBs, the government can effectively finance and monitor large economic projects. The specialization of DBs will allow to have categorical controllers in the supervisory units of the central bank, who will be deeply aware of a particular sector, and therefore will be able effectively monitor the movement of financial assets and the appropriateness of individual operations;

reduction of potential for spreading risks in the economy. DB's specialization will localize risks within individual banking segments and will provide the central bank with the opportunity for selective measures to maintain liquidity, improve banking assets, etc.;

concentration of innovations of the financial sector in the areas of lending. DB's specialization will strengthen the banking system's focus on lending. First, a special approach to refinancing such banks will increase the feasibility of bank lending, i.e. strengthen the channel "refinancing – lending". Second, the specialization of DBs will reduce banks' profits from financial (non-credit) operations. As a result, banks will increase innovation around lending;

redistribution of the role of banks from the role of financial intermediaries to the role of partners in the real sector of the economy. DB's specialization will attract these banks specialists who have experience in implementing economic projects in a particular sector, and therefore are able to assess quickly credit requests; deepen bank's participation in a separate projects; effectively supervise existing projects.

Task "A" – determining the optimal specialization of DBs. It is proposed to be guided by the following [11, p. 8] when create specialization: "depending on the range of operations there are: universal banks that perform a wide range of operations and provide various services to their customers; banks with customer specialization (servicing a certain category

of customers); banks with industry specialization (servicing mainly legal entities and individuals within a certain industry); banks with functional specialization (providing a small range of services for most of its clients).

It is proposed to establish specialized DBs according to the structure in *figure 2*.

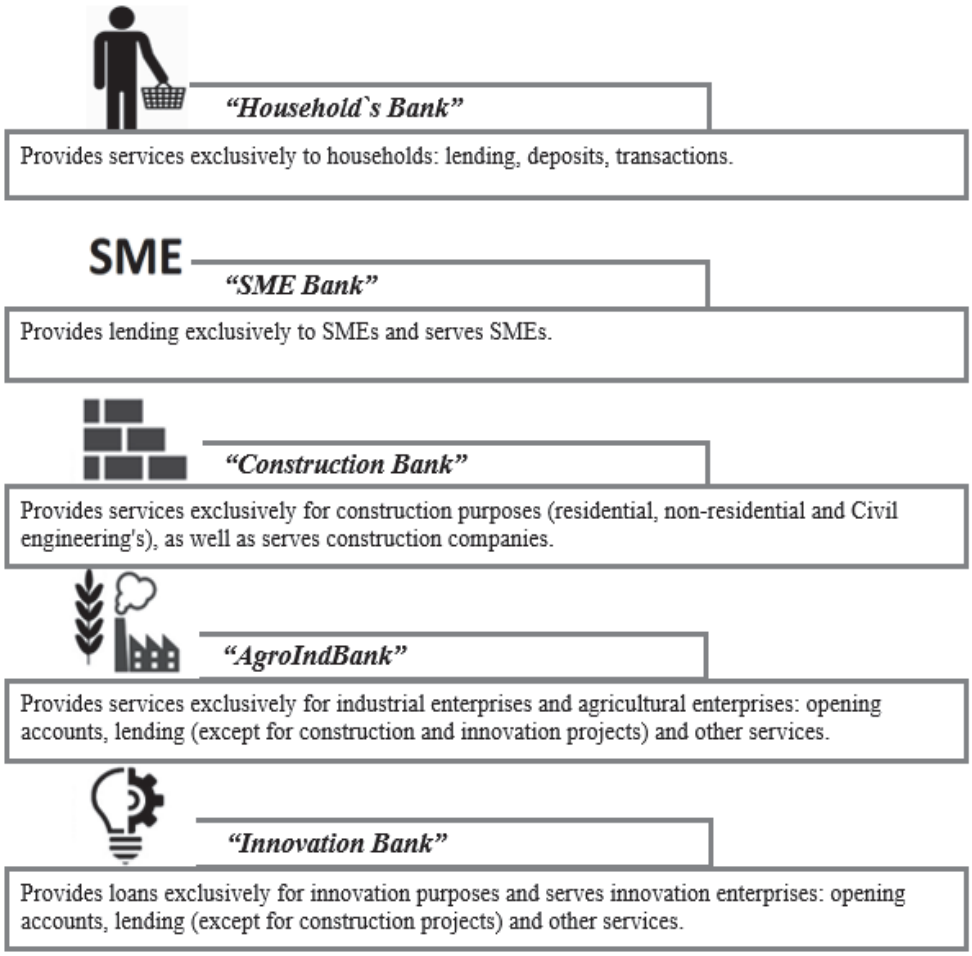

Figure 2. Specialized development banks

Source: author's development.

Task "B" – defining the principle of DB financing. As an innovative DB financing tool, a differentiated refinancing rate has been proposed, which should be based on the principle of discounted rates for specialized DBs. That is, the refinance rate works for the entire banking system, while the rates for specialized DBs are formed as the refinance rate minus the regulated discount in percentage points (*figure 3*).

The mechanism of discounted rates for specialized DBs will provide an opportunity to regulate effectively the activity of individual sector. It will give the impetus to individual sectors and manage the welfare redistribution between sectors.

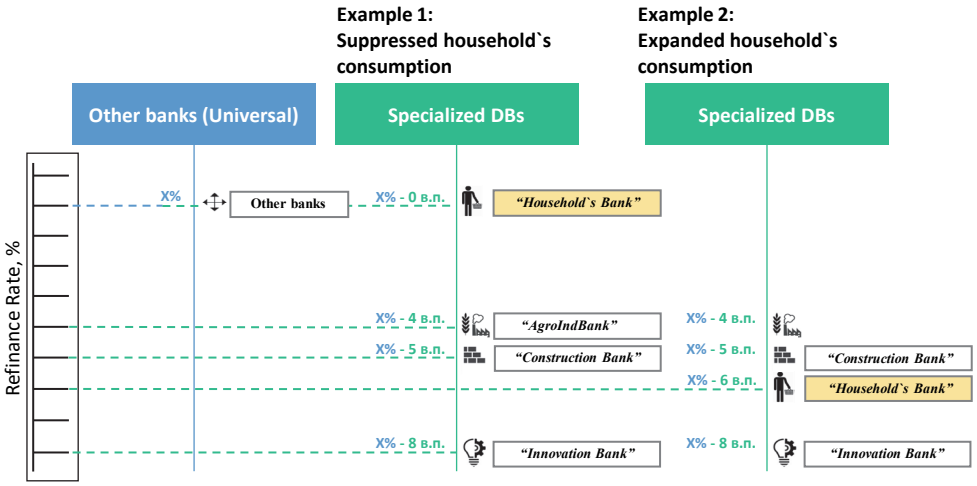

Figure 3. Mechanism of preferential refinancing of specialized DBs

Source: author's development.

Table 3 shows the features of the refinance rate [13]. Such characteristics are mandatory prerequisites for the rate effectiveness. The mechanism of discounted rates for specialized DBs will keep all these characteristics. In the meantime, it will give much more representativeness for refinance rate.

Table 3

Features the refinance rate should have

Feature	Characteristic	Effect
Reliability	Proper bid management to prevent manipulation and errors	Integration and functionality of markets
Stability	Transparent rules for rate management, including transparent rules for reducing it during a cyclical economic slowdown	Availability and usefulness during the market stress
Frequency	Rates calculated on a daily basis to support the functioning of the market	Evaluation of new contracts; conversion of debt positions in current prices (mark-to-market)
Accessibility	Publication on special sites	Contract verification
Representativeness	Rates are based on the needs of a representative sample of the market	Correct basis for pricing

Source: [13].

The specialization of DB and the differentiated refinance rate for such banks will provide an opportunity to form interest rate policy taking into account the specific needs of the economy. From the moment the system of "specialized development banks – differentiated rate" is built, the interest rate policy will become a joint prerogative of the central bank with the government. It will be able to solve a much wider range of issues. In particular, the problem of uneven economic growth will be partially solved with the help of interest rate policy.

A differentiated refinance rate for DBs can significantly increase the effectiveness of *inflation targeting*. Today, by raising the refinance rate, the central bank has an equal effect on all sectors of the economy. Under

differentiated refinance rate, the cost of lending provided by the development bank to the household sector can be increased or decreased. Thus, it is possible to regulate inflationary pressures on the demand side without losing the economic growth pace.

Restrictions of the banking system in order to avoid arbitrage are:

• operations of *specialized DBs* outside the banking system should be limited to the relevant sector of specialization, i.e. any operations should be conducted purely with counterparties of the relevant sector of specialization. Within the banking system: in the case of short-term interbank borrowing it is allowed for banks to interact with higher group of banks in terms of refinance rate level; in the case of short-term interbank lending it is allowed for banks to interact with lower group of banks in terms of refinance rate level;

• credit operations of *other banks* (in the context of their distribution) should be unlimited – lending can be provided for any period to all counterparties both within the banking system and outside it. Passive operations of universal banks should be limited to counterparties of a group of other banks (all except DB), as well as participants in the economy with the balance sheet free of funds raised in development banks.

Imperfect legal environment is the biggest problem for specialized development banks creation and introduction of a refinancing mechanism with discounts for such banks. Contrary to the economic feasibility of such banks and mechanism, there are possible side effects that may occur in the case of unearmarked activities of relevant banks and imperfections of regulatory and law enforcement agencies (inability to ensure transparent operation of development banks and new refinancing principles). However, the development banks performance in many emerging economies may indicate that the positive achievments more than offsets the potential losses from their creation.

Some recent changes should contribute to the legal environment formation for specialized development banks in Ukraine. Firstly, the judicial system of Ukraine is on the way of improvement (ongoing judicial reform [14], which started after the Law of Ukraine "On the Judiciary and the Status of Judges" adopted in June 2016). Secondly, supervisory activities of the National Bank of Ukraine are becoming stronger (supervisory mechanisms revised). In addition, from July 1, 2020 the NBU took over the functions of the regulator of the market of non-banking financial services [15]. The financial market of Ukraine is also developing, and the strategy of the Ukrainian financial sector development for the period until 2025 has been adopted [16].

Conclusion. Despite the heterogeneity of monetary policy impact on the economy, there is limited impact on the welfare redistribution. Based on the global experience, it is proposed to create specialized development banks. In addition to the generally accepted instruments of DB financing it is proposed to introduce a refinancing mechanism with discounts for DBs of each specialization. These measures will ensure targeted support of certain economic sectors, preferential financing of large economic projects, reduction of the potential economic risks spread, redistribution of the role of banks – from the role of financial intermediaries to the role of real economy participants.

Specialized banks and refinancing mechanism with discounts should add to monetary policy effectiveness in stimulating the economy and wealth redistribution. There is something to sacrifice for expected positive results. These are the risks associated with complication of prudential regulation. Thus, next scientific thought should develop primarily in the regulatory field. A new optimal legal framework for the arbitrage-free operation of the banking system should be developed after the proposed reforms. The risks of additional regulatory rules should be reduced by strengthening the banking supervision efficiency and judicial system further development. The supervisory function of the National Bank of Ukraine will be effective only after the courts have an effective law enforcement function. The feasibility of specialized development banks and the refinancing mechanism with discounts will grow as the legal culture in Ukraine approaches high-quality standards.

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The article submitted to editor's office on 10.09.2020.

Дейсан І. Спеціалізовані банки розвитку: економічна доцільність для України.

Постановка проблеми. *На сьогодні комерційні банки будують свою відсоткову політику в рамках, які визначаються уніфікованою ставкою рефінансування, з одного боку, та показниками рентабельності та кредитоспроможності певного сектора (суб'єкта господарювання) – з іншого. За таких умов відсутні можливості для контрольованого монетарного впливу на певні сектори економіки. Ціноутворювачами на ринку кредитних ресурсів потенційно можуть бути високорентабельні сектори економіки, завищуючи вартість кредитних ресурсів для усього корпоративного сектора та домогосподарств. Це є підґрунтям для поглиблення дисбалансу добробуту в економіці.*

Метою *статті є обґрунтування необхідності створення спеціалізованих банків розвитку в Україні, формування принципів диференційованого рефінансування та безарбітражної діяльності банківського ринку після створення спеціалізованих банків розвитку.*

Матеріали та методи. *Інформаційним базисом статті є наукові праці економістів-теоретиків, а також статистичний аналіз матеріалів аналітичних звітів, підготовлених міжнародними організаціями. Для аналізу діяльності банків розвитку у світі використано компаративний аналіз, системний і хронологічний підходи.*

Результати дослідження. *Спеціалізовані банки розвитку здатні підвищити ефективність монетарної політики у стимулюванні сукупного попиту, зокрема, інвестицій. Вони сприятимуть ефективному перерозподілу ресурсів серед секторів економіки. Рекомендовано створити банки розвитку на базі діючих державних банків. Новостворені банки розвитку отримають вузький мандат і діятимуть як спеціалізовані банки. Як інноваційний інструмент фінансування запропоновано диференційовану ставку рефінансування, яка має ґрунтуватися на принципі дисконтованих ставок для спеціалізованих банків розвитку. Одночасне впровадження таких заходів необхідне для: спрямованої підтримки окремих секторів економіки; пільгового фінансування (у довгостроковій перспективі) економічних проєктів; зниження потенціалу розповсюдження ризиків в економці; концентрації інновацій фінансового сектора на напрямках кредитування; переспрямування ролі банків від ролі фінансових посередників до ролі співучасників реальної сфери економіки.*

Висновки. *Спеціалізовані банки розвитку та диференційована ставка рефінансування для таких банків дають змогу формувати політику процентних ставок з урахуванням специфічних потреб економіки. Процентна політика стане спільною прерогативою центрального банку з урядом, оскільки вона зможе вирішити значно ширший спектр питань (зокрема, проблему нерівномірного економічного зростання).*

Ключові слова: спеціалізовані банки розвитку, ставка рефінансування, нерівномірне зростання економіки.