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Regional and Local Development – Economic, Social and Environmental Factors

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Introduction

Regional development is usually perceived as something positive: it involves changes that take place not only in the economic, social or cultural sphere, but also in the environment of a given region. The occurrence of such changes depends on a number of exogenous and endogenous factors. Given the progressive degradation of the natural environment and the intensification of migration processes, factors that ensure permanent and sustainable development are particularly important. However, it should be remembered that positive quantitative, qualitative or structural changes can be effected not only by governing bodies but also be the result of cooperation with partners and communities of a given region. As a result, regional development is directly related to regional policy, which should focus on creating the region's competitiveness.

The articles presented in this issue address issues of permanent and sustainable development and its role in the region's development. The authors also draw attention to other problems of regional development and regional policy, such as the need to study migration activity, to analyse causes and effects of financial imbalances or to monitor the spending of public funds.

Danyila Oliinyk and Yurii Konizhai in the article entitled *Smart and green economic recovery: a prerequisite for sustainable development* argue that the global economy should reflect a transition from the exploitation of natural resource to a decarbonized and circular economy and be consistent with energy and climate objectives. This transition is predicated on a macroeconomic model that benefits from opportunities provided by globalization, digitization and digital sustainability in all spheres of life. The use of such a model has an obvious value for the development of monetary and fiscal policies and the implementation of structural reforms, since forecasts made under certain scenario conditions (e.g. a given oil price) are standard practice and can serve as a new tool for forecasting and simulating economic, environmental and social analysis.

In the article entitled *Antidepressant policy as a means of overcoming structural divergence*, Halyna Bublei and Anatoliy Mokiy review different definitions of "depression" in the regional context and with reference to the concept of divergence. They present results of a comparative analysis of Ukraine's depressed cities, highlighting their main problems. They also propose possible ways of counteracting the problem of socio-economic depression.

Rasa Balvočiūtė, Roberta Dubosaitė-Lepeškevičė and Ivanna Myshchyshyn, in their article entitled *Methodological aspects of evaluation of natural ecosystem services in urban areas*, address the fundamental question of how to determine the direct and indirect use and non-use values of ecosystem services in urban areas, their value for future generations. The main objective of their study is to substantiate and propose a methodology for determining the value of services provided by the natural ecosystem in urban areas.

The article by Olha Ryndzak entitled *A study of potential migration activity as an important component of its regulation mechanism* describes the author's methodological approach to the study of potential migration activity investigation. The methodology for calculating the migration desires index (MDI) is applied to the data of the sociological panel survey in Lviv. The index makes it possible to track changes in the population's migration desires over time and across different socio-demographic groups. According to the MDI, the highest desire for emigration can be observed among young men (under 30 years) with higher education. The author uses the concept of the "value-need gap" (the gap between the subjective importance of a certain good and the degree to which this need is actually satisfied) as a tool for studying the most acute problems that can drive international migration. Insights from the study of potential migration activity can be used to develop preventive migration policy measures.

In the following article – by Halyna Voznyak, Khrystyna Patytska, Taras Kloba (entitled *Assessment of the causes and effects of financial imbalances in Ukraine's regional economies*) – the authors present results of an assessment of financial imbalances in the regional economies of Ukraine and identify their causes and effects, particularly the main factors contributing to the emergence of territorial disparities between the regions. The imbalances in question are assessed by taking into account a number of economic indicators.

Nadia Syniura-Rostun in the article entitled *Analysis of the Ukrainian services sector and its development trends* analyses the service industry in Ukraine, including major parameters that characterize it and the main development trends. The analysis shows that the Ukrainian service industry is undergoing a dynamic yet unstable development, which is typical scenario for countries with a transitional economy. The author concludes that the service sectors with high added value require additional support to stimulate their efficient development,

in particular, to increase the share of capital investment and to attract foreign investment. To do that and ensure growth of the service industry, it is necessary to improve the institutional environment of entrepreneurship and solve a range of socio-political problems.

In the article entitled *Border regions as an element of Ukraine's regional policy* Iryna Tymechko the characteristics of a border region in the context of EU cohesion policy and its place in the nomenclature of territorial units with reference to Eurostat's methodological manual on territorial typologies. Taking into account the definitions of border areas and border regions in Ukrainian legislation, the author analyses the role of border regions in Ukraine's regional policy, with emphasis on functional border areas the context of increasing cross-border cooperation. The functional border areas as an object of public regional policy in Ukraine in conditions of boosted cross-border cooperation are determined. The author's attention focuses on the role of territorial communities, which are involved in cross-border cooperation, particularly with regard to the national cross-border cooperation programme, which serves as a tool of public support in this area.

Iryna Storonyanska, Andriana Belya in the article entitled *Public control over the use of budget revenues of local communities in Ukraine* present results of a survey of public activists and specialists in the field of local finance in Lviv and Kharkiv regions (Ukraine) to collect their opinions about public control in the process of decentralization. According to most respondents, NGOs have more opportunities to control the spending of local budgets. Most of them supported the expediency of public control over local budgets and believed that discussions about the use of budget funds were the most effective tool of public participation. The main problems, according to the survey, in the way budget funds are spent include the low level of transparency of budget planning and implementation and the low efficiency of collecting and spending budget revenues. The survey was also used to identify a number of obstacles that standing in the way of implementing public control over the effective use of budget funds.

In the last study, entitled *How efficiently is the potential of the ICT services used to ensure the socio-economic development of Ukraine's regions*, Mariana Melnyk and Roman Yaremchuk present a retrospective comparative assessment of the exploitation of the potential of the ICT services sector in Ukraine, which is based on a composite index of efficiency. The study is an attempt to determine to what extent the ICT service sector has been contributing to the socio-economic growth at the regional level. The composite index is used to classify the regions of Ukraine in terms of how effectively they use the potential of their ICT services sector and identify the main characteristics of how specific aspects of the sector's development affected Ukraine's socio-economic growth in 2013 and 2018.

Although the articles included in this issue do not address all problems related to regional and local development, they provide an interesting overview, which should be of interest not only to scientists and students but also to those practically involved in dealing with these challenges.

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Smart and green economic recovery: a prerequisite for sustainable development

Abstract. *The article investigates the methodological basis for creating economic opportunities for the formation of modern economic, ecological and competitive economy, and identifies ways to improve them in order to respond more effectively to modern challenges and threats. The need for rapid response and decision-making to integrate a system of complex and dynamic relationships between ecology, economy and social development has been proved. It has been proved that the key principles of building a climate-resilient socio-economic model should be reflected in new state strategic documents, first of all, in Ukraine's environmental security strategy.*

Keywords: *ecological restoration, network systems, sustainability, taxonomy, digital infrastructure*

1. Introduction

Rethinking sustainability, especially at a time of economic slowdown, is interpreted in terms of integration, interconnection and geopolitics. A significant role in this context is assigned to the transition to a cleaner, more accessible and more interconnected system of information and energy networks (digital infrastructure). This is a subject of great interest and need to understand the common challenges facing society. There is a latent requirement to highlight these challenges and to develop joint approaches with other countries, as they are very similar and resonant throughout the world. Such challenges are, above all, the introduction and integration of innovative technologies; the digital transformation of systems and the sustainability and reliability of such systems in the transition from fossil fuel

sources to renewable energy sources. However, in the face of uncertainty, there is no one-size-fits-all solution, so the need for a sustainable, smart, reliable digital infrastructure is a common approach to smart and green economic recovery. Obviously, geopolitical concerns in the wake of the COVID-19 pandemic will be about rebooting the economy under the European Green Compact and shaping a digital future. The transition to such a modern sustainable economic and environmental model and the creation of economic opportunities is being realized by stimulating investment resources that are derived from global greenhouse gas emissions, natural resource recycling and risk management.

2. Formulation of the problem

The political, economic and social shifts brought about by the crisis of the COVID-19 pandemic are fundamentally changing the context of traditional decision-making and require a new economic model in harmony with the environment and priority steps to combat the spread of antimicrobial resistance and the growing emergence of infectious diseases.

To understand the risks and impacts caused by interconnected global systems and to overcome the impact of the COVID-19 pandemic, the World Economic Forum, in collaboration with Marsh and McLennan and the Zurich Insurance Group, launched the COVID-19 action platform and provided free access to the mapping of strategic trends, research, analysis and data in all post-Pandemic societal activities for future economic recovery, namely: innovative production; digital economy and value creation; health; technology management (artificial intelligence and machine learning, Blockchain, IoT, robotics and smart cities); urban infrastructure; cybersecurity and digital trust; financial and monetary systems; global public goods; trade and global economic interdependence; energy and materials; etc.).[1] Introduction of managerial, organizational and technological solutions in the global dimension based on pre-mapping to predict risks and their consequences for building a sustainable future and requires an inclusive approach, a new social deal aimed at creating a climate-neutral society and emphasizes the urgent need to implement measures aimed at:

– overcoming climate change and environmental challenges;
– limiting global warming to 1.50°C;
– achieving net zero greenhouse gas emissions.

This is also facilitated by the introduction of the latest technologies in the digital, biological and physical world, which accelerate the transition to a neutral

[1] COVID Action Platform, https://www.weforum.org/communities/transformation-map-co-curator-community [accessed: 10.10.2020].

carbon economy based on high social equity criteria.[2] Digital services such as Internet commerce, telemedicine, cashless payment, contactless delivery, screening services, collaboration tools, communication tools are now becoming more ubiquitous.

3. Presentation of the main material

Such a reboot of the economic, social and environmental system of the future is being shaped by the narratives of the fourth technological revolution – the digitization of the economy and decision-making based on digital data and interstate interaction of all stakeholders. At the same time, the effectiveness of positioning the global presence of states is assessed by *Elcano Global Presence Index* in three dimensions [Olivie, Gracia 2018]:

– economic (export of energy, raw materials, production, services and investments abroad),

– military (number of troops in international missions and bases abroad) presence and

– "soft presence" (migration, science, technology, database, Internet bandwidth, technology targeting foreign patents, education, information, tourism, sports, culture and humanitarian aid).[3]

On a planetary scale, these trends are being implemented by a number of policy decisions, including the UN's Sustainable Development Goals, the Framework Convention on Climate Change[4] and the European Commission's proclamation of a "green" course, "A Clean Planet for All" [European Parliament resolution of 15 January 2020 on the European Green Deal]. The key goals of this social transition are to achieve climate neutrality, environmental protection, sustainable resource use, health and quality of life for citizens. In 2019, as a result of consistent policies of individual countries, global CO_2 emissions fell by about 33 gigatons (Gt), primarily due to a sharp decline in emissions in the energy sector due to the increasing role of renewable sources, the transition from coal to natural gas and increased nuclear power generation.

Ukraine has ratified the United Nations Framework Convention on Climate Change [Ramkova konventsiya Orhanizatsiyi Obyednanykh Natsiy pro zminu klimatu 1996] and joined the global sustainable development process "Transform-

[2] The terms "carbon-free" (CO_2-free) and „carbon-neutral" hydrogen are different. The first type includes "green" hydrogen produced from water by electrolysis based on RES. The second is "blue" and "turquoise" hydrogen, produced from natural gas by two different methods, but with the use of CCS (carbon capture and storage) technologies.

[3] Ukraine in the global presence in 2017 was on the 52nd position.

[4] Sustainable Development Goals – Agenda 2030, https://www.undp.org/content/undp/en/home/sustainable-development-goals.html [accessed: 10.10.2020].

ing our World: the 2030 Agenda for Sustainable Development" and has started an inclusive process of adaptation of the sustainable development goals [*Tsili Staloho Rozvytku: Ukrayina. Natsionalna dopovid* 2017]. In accordance with its international obligations, Ukraine is exercising its authority in accordance with the requirements of the Convention on Biological Diversity [Pro ratyfikatsiyu Konventsiyi pro okhoronu biolohichnoho riznomanittya 1994], the Convention to Combat Desertification [Pro pryyednannya Ukrayiny do Konventsiyi Orhanizatsiyi Obyednanykh Natsiy... 2002] and the United Nations Framework Convention on Climate Change [Pro ratyfikatsiyu Ramkovoyi konventsiyi OON pro zminu klimatu 1996], and is also involved in addressing global environmental issues affecting the social and economic well-being of the country. However, now in order to respond quickly to changes in politics or technology, Ukraine requires faster decisions to integrate the system of complex and dynamic relationships between ecology, economy and social development and integrate the results into major sectors through the implementation of the Sustainable Development Strategy "Ukraine – 2020" [Pro Stratehiyu staloho rozvytku "Ukrayina – 2020" 2015] in such areas as: social protection, agriculture, ecology and natural resources, regional and local development, economy, education and science, transport and transport policy, and energy policy. The holistic vision of sectoral development for Ukraine, based on an integrated and science-based approach, is based on:

- to achieve competitive opportunities;
- the transition to a low-carbon economy;
- sustainability management;
- generation and use of sustainable energy sources;
- recognition of the values of the circular economy.

Based on science-based approaches and holistic impact assessment, a new model of human development is being formed that describes the economic system with minimized vulnerability to external shocks and prospects for sustainable growth that combines social rights, environmental integrity, regional cohesion and competitiveness of industries. The relevance of this issue is confirmed by the interest of the Club of Rome members, who emphasize the need for rapid and fundamental transformation of society in order to achieve the objectives of the Paris Agreement [von Weizsaecker, Wijkman 2018]. The precondition for achieving such positive social, industrial and economic trends is to provide certainty for investors in the long run, predictable regulatory norms, as well as adequate financial structure, resources and market and fiscal incentives.

The creation of economic opportunities for the formation of a modern economic, environmental and competitive economy and economic growth in the wake of the COVID-19 pandemic is realized by stimulating investment resources that are derived from global greenhouse gas emissions, natural resource use and waste generation.

Achieving these goals requires each country to take its own carbon footprint reduction measures[5] and requires mobilization of significant public and private investments, as global climate change and biodiversity loss are not confined within national borders. However, at present, business entities in the conditions of unstable external environment, uncertainty and the scale of information flows in decision-making are motivated to achieve short- and medium-term goals, although it is in the long term that development goals and objectives should be designed, produced and adjusted.

The European legal field of increasing climate ambition is governed by commitments to achieve net zero greenhouse gas emissions progressively by 2050, as set out in the Green Deal [Communication from the Commission to the European Parliament... 2019], the renewal of planned public contributions (Intended Nationally Determined Contributions, INDC) in accordance with COP21 and the implementation of an Emissions Trading System (ETS) depending on the resource endowment of each country and the determination of an effective carbon price.[6]

This approach requires a review of environmental and energy legislation and regulations to ensure that all sectors of the economy have the economic and social opportunity for a green transition, and to address issues related to industrial and domestic waste, greenhouse gas emissions, environmental design and transboundary cooperation.

There is currently some paradigm shift in the choice of "green" pathways, the search for new, more efficient forms and methods, based on drivers such as decarbonization, decentralization, deregulation, democratization and digitization, where energy plays a key role in the transition to reducing greenhouse gas emissions and focuses on accelerating the development of renewable energy sources and investing in innovative clean energy technologies, using the principle of "first energy efficiency" in the supply of electricity, as well as the principle of "first energy efficiency" [Simon 2020]. For example, in the electricity sector, each country defines its own regulatory systems (or combinations of these) to stimulate the energy transition by means of a "first energy efficiency" principle:

– income restrictions (Estonia, Finland, Germany, United Kingdom, Hungary, Ireland, Lithuania, Luxembourg, Netherlands, Romania, Spain, Slovenia, Sweden);
– price restriction (Slovakia);
– regulatory environment (Austria, Croatia, Cyprus, Denmark and Malta);

[5] Carbon footprint is a set of emissions of all greenhouse gases formed as a result of the activities of an individual, organization, city, country, etc.

[6] The Global Compact to Combat Climate Change (COP21) outlines the post-2020 climate actions known as "Planned National Contributions" (INDCs) in achieving long-term goals of keeping global average temperatures well below 2°C and working to limit temperatures to 1.5°C and achieve a net-zero emission by 2050.

– profit rate regulation (Bulgaria, Greece, Latvia and Spain);
– hybrid solutions, including cost or profit adjustments.

In fact, the priority is declared to be digitalization based on the global process of digital transformation of society, introduction of new generation mobile network technologies and changing the nature of the mode of production.[7]

According to research by the Carbon Tracker analytical center, the world's fossil fuel reserves of energy and mining companies amount to 2,795 gigatons of CO_2, which is incompatible with the goals to keep the global average temperature rise below 2°C by 2050 [Wills 2014]. In such circumstances, the priority is to prepare the real economy and financial markets for the risks associated with climate and energy transitions and to shape new thinking [Intellectual Property Rights (IPR) Policy 2014]. The energy sector in Europe is now moving from a model dominated by fossil fuels to a clean, digitalized and electrified consumer system with distributed resources.

Such an approach requires the introduction of new norms and a series of standards [ISO 9000 Family Quality Management] corresponding to environmental and climatic ambitions regarding the Internet of Things (IoT), robotics, nanotechnology, microelectronics, 5G, high-performance and quantum computers, as well as critical infrastructure, digital and cloud data. Parameters and rules of electricity connection, intelligence (necessary IT management functions), efficiency and measurement of "smart grids," balancing demand and production of electricity, harmonics, voltage, etc. also require standardized approaches from all market participants.

A crucial role in the integration of countries into the global network infrastructure affects planetary survival, has been assigned to a timely and manageable energy transition and synergy between energy security, access, affordability and environmental sustainability.

Ukraine is among the most energy consuming countries in the world with the highest energy intensity of GDP in the EU. In the structure of the fuel balance of the electric power industry of Ukraine, the first place is occupied by coal (28.7%), the second is gas (27.4%), the third is nuclear power (25.1%), the fourth is oil (14.3%) and fifth – renewable energy sources (4.4%) (Table 1) [Enerhetychnyy balans Ukrayiny za 2017 rik]. The existing domestic energy infrastructure has been built over the past decades using coal, oil, natural gas and nuclear energy.

The annual losses of the national economy from inefficient use of energy resources are estimated at USD 15-17 billion. This is mainly due to the poor state of energy infrastructure, high losses during energy transformation, transmission and distribution, low efficiency of fuel and energy resources use in technologi-

[7] At the global level, the decarbonisation of energy systems is expected to be implemented on the basis of different scenarios for the use of Power-to-X technologies in digital infrastructure.

cal processes (mainly in energy-intensive sectors), as well as low efficiency in end-use sectors. According to information posted on the website of the National Commission, which performs state regulation in the energy and utilities sectors, daily energy losses in Ukraine reach UAH 100 000 000 (in prices of 2012), and in annual terms – UAH 36 500 000 000 [Zakhody z enerhozberezhennya u sferi elektropostachannya 2016]. This situation requires measuring the energy efficiency of the national energy system and managing risks that arise in the system to ensure dynamic sustainability.

Table 1. Energy balance of European countries for 2017 (thousand tons of oil equivalent)

Country	Total	Coal	Natural gas	Nuclear energy	Hydro energy	Wind, sun, etc.	Biofuels and waste	Petroleum
Europe	1 998 105	321 869	504 120	244 092	49 751	67 442	174 284	635 011
Germany	311 245	71 414	75 341	19 887	1 733	13 407	31 012	102 965
France	247 086	9 891	38 492	103 796	4 297	3 579	17 912	72 568
United Kingdom	175 883	9 564	67 839	18 327	510	5 344	12 414	60 616
Turkey	146 797	40 089	44 232		5 006	10 170	3 032	44 318
Poland	103 845	49 421	15 445		220	1 373	8 145	29 028
Ukraine	89 462	25 757	24 554	22 449	769	149	2 989	12 696

Source: own work based on World Energy Outlook 2019.

There is now a move away from the basic values of safety, reliability on which existing energy systems have been built, and a new paradigm of values of sustainability, flexibility and affordability is being shaped, with a completely new way of producing, supplying and consuming energy. The instruments of such energy transition on a global, regional, national, sectoral and/or intersectoral basis are[8]:

– monitoring the world's energy problems;
– measuring the efficiency of the national energy system (index of the energy policy trilemma);
– global energy scenarios;
– risk management (dynamic sustainability);
– introduction of innovative data.

Electricity from renewable energy sources is cheaper than electricity from coal and other sources. The challenge is to capitalize on this difference and interest institutional investors, including private investors, in investing in clean energy and moving towards low-carbon activities.

The United Nations Environment Programme (UNEP) has determined that by 2030 the transition to a new economy will require replacing a large part of the

[8] Creating insight for successful energy transition, https://www.worldenergy.org/transition-toolkit [accessed: 7.10.2020].

world's infrastructure. The Global Commission on Economic and Climate Affairs, under the international initiative "New Climate Economy," has determined that balancing economic growth with climate change risks will require funding of approximately USD 90 trillion. To prevent dangerous climate change, the International Energy Agency has estimated that the world will need to invest at least USD 53 trillion in the energy sector by 2035.

The Common Policy Initiative of the Eastern Partnership (EaP), as a platform for cooperation between the EU and Ukraine, aims to deepen and strengthen relations between the European Union and post-Soviet countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova). Within the framework of the Greening Economies in the European Union's Eastern Neighbourhood (EaP GREEN), the Ukrainian government is creating an integrated policy framework for the transition to a green economy by: reforming policy instruments, adopting new analytical tools, improving access to finance, supporting capacity development and launching pilot projects in infrastructure.[9] However, in terms of per capita ecological footprint, Ukraine now ranks 91st among other countries (Belarus – 41st) [Global trends. Challenges and Opportunities... 2017].

The top priorities under "20 Deliverables for 2020" aim to support development that balances and integrates the economic, social and environmental dimensions of sustainability [The Eastern Partnership and the Agenda... 2019] for more complementary, coherent and catalytic action:

a) economic development and market opportunities;

b) institutional strengthening;

c) networking, energy efficiency, environmental conservation and climate change;

d) mobility.

In the context of adaptation and climate resilience, there is a need to provide key criteria for green finance, discontinue direct and indirect subsidies for fossil fuels and review the base of electricity and energy products used for heating and transport according to the "Polluter pays" principle. Cessation of fossil fuel use and increase in renewable energy requires reconsideration of the impact on the national energy network of the deployment of the intelligent *Trans-European Networks for Energy* (TEN-E) and *Projects of Common Interest* (PCI) using the most efficient renewable energy investments [Evaluation of the TEN-E regulation 2017].

To overcome these challenges Ukraine needs to form a new vision of economic growth, review legislative and regulatory acts on climate, biodiversity, industrial strategy and adopt an action plan on circular economy.

[9] EaP GREEN (Greening Economies in the Eastern Neighbourhood (EaP GREEN) programme), http://www.unece.org/env/eia/about/eap_green.html [accessed: 9.11.2020].

Such investment plans are now submitted by Argentina, Australia, Canada, the European Union, France, Germany, Indonesia, Italy, Japan, the Republic of Korea, the Netherlands, the Kingdom of Saudi Arabia, Singapore, Spain, Turkey, and the United Kingdom [A Collaborative Endeavor Templates 2019]. In addition, energy system operators from Spain, France, Denmark, Finland, Poland, Lithuania, the Netherlands and Estonia have signed an alliance agreement that combines energy data of all Europeans and access to this data in any European country without barriers.

The innovative global development action plans of the G20 [G20 Karuizawa Innovation Action Plan 2019] are primarily aimed at creating innovative ecosystems to promote energy transitions and contain measures to mobilize finance for various options for energy transitions and to build quality, low-emission infrastructure, including the following:

– stimulating innovation in the electricity sector, including digitization, renewable energy, demand management, energy efficiency, biofuels, etc. Hydrogen is seen as a clean, reliable and safe energy source in the energy future. The potential to develop and deploy carbon capture, utilization and storage technologies (*Carbon Capture, Utilization and Storage, CCUS*) is also recognized.

– ensuring energy security as one of the leading principles of sustainability, protection and development of reliable energy infrastructure;

– achieving energy efficiency as an affordable, safe and sustainable means of providing energy services under the *Energy Efficiency Leading Programme (EELP*). *International Electrotechnical Commission (IEC*) Environmental Impact Assessment of Energy Efficiency, including Well-to-Wheel Life Cycle assessment of a product or service in the areas of construction, heating and cooling[10];

– strengthening the role of renewable energy sources (solar, hydro and geothermal, wind, bioenergy, etc.) in the transport, housing and industrial sectors to promote innovative solutions with the support of international organizations such as IRENA, IEA, ISA and the initiative launched to facilitate international coordination on a relatively sustainable low carbon bio-economy – Biofuture Platform[11];

– implementation of energy supply systems of the future with low greenhouse gas emissions for the system integration of variable renewable energy sources, including energy storage, smart grid technologies, minimizing the risks of using ICT technologies, electric vehicles, hydropower, biomass energy generation and demand management;

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[10] The G20 Task Force on Energy Efficiency in October 2019 published a report on the outcome of the G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technologies (G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology)

[11] In December 2018, during COP24 in Katowice, Poland, the IEA was invited to act as a secretariat on the initiative (facilitator).

– introduction of new developments on small modular reactors in nuclear power engineering in terms of access to basic power and reduction and/or prevention of greenhouse gas emissions through international cooperation;

– introduction of competitive energy markets and application of cleaner fossil fuel technologies, including Carbon capture, utilization and storage technologies (*CCUS*) and measures to phase out inefficient fossil fuel subsidies [G20 Leaders Statement: The Pittsburgh Summit 2009];

– improving access to energy and ensuring reliable, sustainable and modern energy services as a precondition for social and economic development;

– improving resource efficiency through reduced, reused and recycled resources (*Reduce, Reuse, Recycle, 3Rs*) and recognizing innovative ways to achieve sustainable consumption and production goals in line with the *United Nations Environment Assembly's* (*UNEA*) [Assambleya Organizatsii Oyedinennykh Natsiy… 2019] and promoting multilateral partnerships at regional and global levels, including public-private partnerships for sustainable and efficient resource use, including environmentally sound waste management.

A sensible and green recovery is based on a gradual transition to a modern, climate-neutral, highly efficient and competitive industrial base and on the stimulation of value chains for economically profitable and sustainable products, processes and business models using the potential of digital technologies. *The Reference Architectural Model Industrie 4.0* (*RAMI 4.0*) provides a framework for various programs, specifications, standards, and promotes an understanding of what standards for *Industry 4.0* provide the basis for discussing applications, specifications, standards, their interrelationships, and details. The focus is on counteracting air, water and soil pollution from industrial emissions. Interregional cooperation with relevant assets of "smart specialization" of industrial clusters will promote value chains of innovative ecosystems and industrial transformation.

Ukraine needs to form a more fundamental strategic concept of the circular economy of industrial production, which would identify priority areas aimed at reducing the overall environmental and resource footprint of production and consumption, while ensuring the benefits of the circular economy at both the domestic and global levels to stimulate innovation and the formation of markets for climate-neutral and non-toxic products.

In doing so, regenerative materials will play an important role in the transition to a climate-neutral economy and encourage investment in sustainable bioeconomy and energy production, which must take into account the need to protect unique biodiversity and ecosystems. This will facilitate the reuse of recovered materials in priority sectors, increasing the replacement of substances of particular concern (IT equipment, batteries, obsolete products, plastic bioplastics, etc.). Although the circular economy model has been successful in meeting the eco-

nomic imperatives of introducing resource efficient and low-carbon production processes, energy is a key area for protecting natural capital.

Maintaining and restoring the ecosystem and reducing biodiversity loss under the auspices of the Convention on Biological Diversity [On the Road to the 2020 UN Biodiversity Conference 2019] requires a global agreement on biodiversity beyond 2020 with clear targets for ecosystem restoration, improving the efficiency of urban infrastructure, protected areas, enhancing environmental accountability and promoting rapid substitution of hazardous chemicals, including endocrine disruptors, persistent chemicals, and neuro– and immuno-toxicants. An important role in these processes is assigned to the decarbonization of the multi-modular transport sector (road, rail, air and water) aimed at achieving a climate-neutral economy and the transition to sustainable and intelligent mobility based on innovative infrastructure and new technological solutions. However, this requires a revision of the emission standards for vehicles.

The G20 Summit, held in Osaka, Japan, on 29 June 2019, approved an updated G20 Sustainability Vision and Action Plan 2030, which identifies investment in basic infrastructure (digital infrastructure, ICT networks, research and development infrastructure, etc.) as a key driver of economic growth and sustainable development, and productivity as a key driver of economic, political and social progress. In addition, G20 leaders have adopted principles for infrastructure investment to bridge infrastructure gaps (sustainable development, economic efficiency, environmental aspects, sustainability of buildings, social considerations and infrastructure management). G20, OECD and World Bank infrastructure investments are defined as a global resource for the *Perfomance Grading Index* (*PGI*) set of core global indicators on investment in quality infrastructure (*QII Database*).[12]

However, most digital infrastructures (electricity, gas, telecommunications, transport) are now developing independently of each other and constitute separate social and technical systems. The growth of the Internet of Things (*IoT*) based on 5th generation wireless technologies (*5G*) is increasingly driving sector-to-sector convergence, leading to cross-sector and integrated infrastructure services (*Mobility-as-a-Service, MaaS*). Actual climate and other environmental problems are also compared between different sectors, e.g. caused by energy production (renewable energy sources or fossil fuels) and can only be overcome by synergies from energy efficiency to increased share of renewable energy sources. Achieving such ambitious goals depends on technological innovation, on improving the productivity of digitization units, and on the following ability to store and convert energy in all its forms, from electrical to thermal / cooling, chemical and others. Digital technologies are being integrated into energy systems to provide a smarter,

[12] Quality Infrastructure Investment Database, https://www.gihub.org/quality-infrastructure--database/ [accessed: 21.10.2020].

more efficient, reliable and interconnected way of operating them, while digitalization in transport, construction and industry is increasing energy demand and requires the introduction of digital technologies into energy infrastructure. Thus, innovation, digitalization, storage and conversion will enable the integration of new market models to ensure an integrated energy system. Digitalization of the energy sector is becoming a key driver of future changes. Thus, energy systems tend to evolve into more sustainable systems based on renewable energy sources other than fossil fuels and require the introduction of digital energy infrastructures where digital devices, communications and interconnections can be safely used by end users. Compatibility of energy infrastructures and data exchange at this stage of development are the main challenges of digitalization.

4. Directions for further research

Introduction of a model of sustainability of low greenhouse gas emissions digital infrastructure based on best international practices for Ukraine. The key area of ensuring reliable operation of Ukraine's digital infrastructure is bringing the legislative and regulatory framework for the rules of technological functioning of global information and network systems into compliance. Such a model of dynamic stability of the energy system, as the ability of the energy system to return to the established mode of operation without asynchronous mode after significant disturbances, excludes the concept of electricity tariff [Pro zatverdzhennya Kodeksu systemy peredachi... 2018].

To address the issue of infrastructure as an asset class, the G20 countries have established the Infrastructure Data Initiative, which excludes certain sub-sectors that are remotely related to infrastructure in the three priority areas:

– financial performance benchmarks: Inclusion of new indicators for both infrastructure capital and debt, including risk over the project life cycle;

– economic analysis: project evaluation for the social and economic impact caused by infrastructure projects;

– ESG performance: stability and inclusive impact on growth, environmental and climate risks.

As part of this initiative, the *EDHEC Infrastructure Institute* (*EDHECinfra*) has created an infrastructure investment database, which over the past 20 years has covered more than 500 infrastructure assets in 10 different countries, including tracking private capital (*EDHECinfra Private Equity*) and infrastructure debt (*EDHECinfra Private*).[13] The Index represents the market capitalization results of industrial infrastructure companies included in the *Global Industry Classification System's*

[13] EDHEC Infrastructure Database, https://www.gihub.org/resources/data/edhec-infra-database/ [accessed: 26.10.2020].

(*GICS*). The EU Action Plan for Sustainable Financing through the integration of *environmental, social, and governance* (*ESG*) criteria and greening national budgets also includes private and public investment. The key infrastructure indicators are designed to represent companies' activities in both environmental, social and governance indicators and ESG-focused assets in the *Morgan Stanley Capital International* (*MSCI*) stock market capitalization index, which aims to measure productivity in the securities market of developed countries. Setting new standards for sustainable growth consistent with environmental and climate ambitions is the basis for ensuring a fair and orderly transition in all economic sectors, especially those dependent on fossil fuels [GRI 207: Tax 2019].

In macroeconomics, the methods of modeling Dynamic Stochastic General Equilibrium modeling (*DSGE*) are used for mathematical modeling and forecasting of these phenomena and analysis of the impact of political and non-political shocks, which find their application primarily in the economic, environmental and social spheres.[14] DSGE models, which were used to study transmission shocks in different countries, provide a sample of quarterly data for countries and emerging markets (*Emerging Market and Economies*, *EMDE*). The traditional macroeconometric model consisting of a large number of given equations is the *Bayesian vector autoregression model* (*BVAR*), whose data are identified on the basis of assumptions about the exogenous nature of variables after economic recessions [Global Economic Prospects 2020].

The decline in economic growth and revenues for *EMDE* in 2020 as a result of the Coronavirus crisis, according to the World Bank's Global Economic Outlook report, is estimated using the *BVAR* model based on the identification of indicators such as: weighted average GDP growth, oil price, interest rates and government borrowing. However, for a more flexible approach based on vectorial autoregressions, international practice also uses small models (usually containing no more than five indicators), which are considered the most important determinants of the modeled process. Such econometric methodology can be applied for Ukrainian economy using recently developed Bayesian VAR-models [Giannone, Lenza, Primiceri 2015; Bańbura, Giannone, Lenza 2014] in order to obtain adequate results with simultaneous simulation of a large number of endogenous variables.

5. Conclusion

The European Strategy for Financing Climate Action and Environmental Sustainability, adopted by the European Investment Bank in November 2019 and other financing institutions and programmes (*InvestEU*), aims to provide financing

[14] Monetary and Fiscal Policy Analysis with DSGE Models (DSGE), https://www.imf.org/en/Capacity-Development/Training/ICDTC/Courses/DSGE [accessed: 21.10.2020].

for investments in sustainable energy projects and aims to combat global warming and finance innovation in clean energy, energy efficiency, digital infrastructure and renewable energy [Financing climate change and sustainability 2020]. On this basis, the littoralworld economy should reflect the transition from natural resource exploitation to a decarbonized and circular economy and be consistent with energy and climate objectives. This transition defines a macroeconomic model using the chances of globalization, digitization and digital sustainability in all spheres of life. The use of such a model has obvious value for the development of monetary and fiscal policies and the implementation of structural reforms, since the calculation of forecasts under certain scenario conditions (e.g. a given oil price) is standard practice and can serve as a new tool for forecasting and simulating economic, environmental and social analysis.

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Inteligentne i ekologiczne ożywienie gospodarcze: warunek wstępny zrównoważonego rozwoju

Streszczenie. *W artykule poddano analizie metodologiczne podstawy tworzenia ekonomicznych szans rozwoju nowoczesnej, ekologicznej i konkurencyjnej gospodarki na Ukrainie oraz wskazano, co należy robić, aby lepiej odpowiadać na współczesne wyzwania i zagrożenia. Autorzy podkreślają potrzebę szybkiej reakcji i podejmowania decyzji, aby zintegrować system złożonych, dynamicznych relacji między ekologią, ekonomią i rozwojem społecznym. Twierdzą, że nowe dokumenty strategiczne, zwłaszcza strategia bezpieczeństwa ekologicznego Ukrainy, powinny odzwierciedlać główne zasady budowania odpornego na zmiany klimatu modelu społeczno-gospodarczego.*

Słowa kluczowe: *odbudowa ekologiczna, systemy sieciowe, zrównoważony rozwój, taksonomia, infrastruktura cyfrowa*

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Antidepressant policy as a means of overcoming structural divergence

Abstract*. The article summarizes different definitions of socio-economic depression at the regional context and with reference to the concept of divergence. The authors present a comparative analysis of depressed cities of Ukraine and identify the main problems faced by those cities. They also propose possible ways of counteracting the problem of socio-economic depression.*

Keywords: *depression, depressed region, antidepressant policy, divergence*

1. Introduction

Studies of the origin, course and counteraction of depression of socio-economic systems are important and relevant for the current stage of development of Ukraine's economy, especially in the spatial dimension. Important tasks of state regional policy include harmonization of regional development, achieving maximum convergence of regional economies, as a prerequisite for the integrity, competitiveness and economic security of the state. It is difficult to achieve this in all regions, but this does not negate the expediency of implementing a state equalization policy based on solving such key tasks. First of all, backward regions must reach the level of development of the most developed regions. Second, compensatory mechanisms for interregional differences or compensation for the negative effects of depression are needed. Third, we need to refer to the goal-oriented strategy of socio-economic development of the regions to improve the quality of life of residents.

It must be acknowledged that the antidepressant component of public policy, including in the regional dimension, has not yet been sufficiently reflected in science and practice. Antidepressant policies are: convergence of regional economies as a prerequisite for the integrity, competitiveness and economic security of the state; reaching the level of development of the most developed regions of backward regions; compensatory mechanisms of interregional differences; goal-oriented strategy of socio-economic development of regions to improve the quality of life of residents.

2. Literature review

Significant scientific achievements in the study of the problem of depression were made by such scientists as: M. Baranovskyy [2007], I.M. Vakhovych, M.I. Kupyra [2014] and others. Structural divergence is highlighted in the scientific works of such scientists as: D. Acemoglu, J. Robinson [2012], E.S. Reinert [2010] and others.

3. Main results of the study

Now there are processes of divergence of economies, which is especially important for our country. Semantic analysis allows to attribute to the essential characteristics of the concept of "divergence" such as: separation; movement in different directions; differences in features and properties of system elements; adaptation to different living conditions; disagreement, destruction of existing inclusive relationships.

If convergence (divergence) implies convergence (divergence) of macrosystemic indicators of development, then for structural divergence the subjective-objective characteristics of the process change. That is, the object of divergence is not only spatial units (regions, cities, rural settlements, territorial communities, but also industries, sectors, economic and social spheres (scientific and technological, educational and health and environmental protection)). The process of divergence covers the development of the primary element of the macrosystem – man, family, household, human capital due to the diversity of their movement, population stratification by income, sources of origin, degree of legitimacy of property, quality of life and safety. Moreover, divergent tendencies are observed in the structure of the macrosystem in the relationship between its elements. Thus, structural divergence becomes the basis for the destruction of the integrity of the state's macrosystem in the face of the negative impact of geopolitical challenges and a threat to national security. It is structural divergence as a "disagreement", the destruction of existing relatively inclusive relationships, which are transformed into

	Geographical level	Basic territorial typologies	Urban typologies	Coastal typology	Border typology	Island typology	Mountain typology
Regional typologies	NUTS 1 regions						
	NUTS 2 regions						
	NUTS 3 regions	Urban-rural typology: predominantly urban regions intermediate regions predominantly rural regions	Metropolitan regions	Coastal regions	Border regions	Island regions	Mountain regions
Local typologies	Local administrative units (LAU)	Degree of urbanisation ([1]): cities, towns and suburbs, rural areas	City definitions: cities, functional urban areas (FUA) = cities and their commuting zones	Coastal areas			
Grid typologies	Grid cells (1 km^2)	Cluster types: urban centre, urban clusters, rural grid cells	Urban clusters and urban centres				

Individual codes and labels (based on geographicalentity)

Three categories per country (aggregated)

Combination of individual codes and aggregation

Two categories per country (aggregated)

Technical level

As defined in Regulation (EC) No. 1059/2003 on the establishment of a common classification of territorial units for statistics (NUTS)

Fig. 1. Methodology for assessing depression according to NUTS

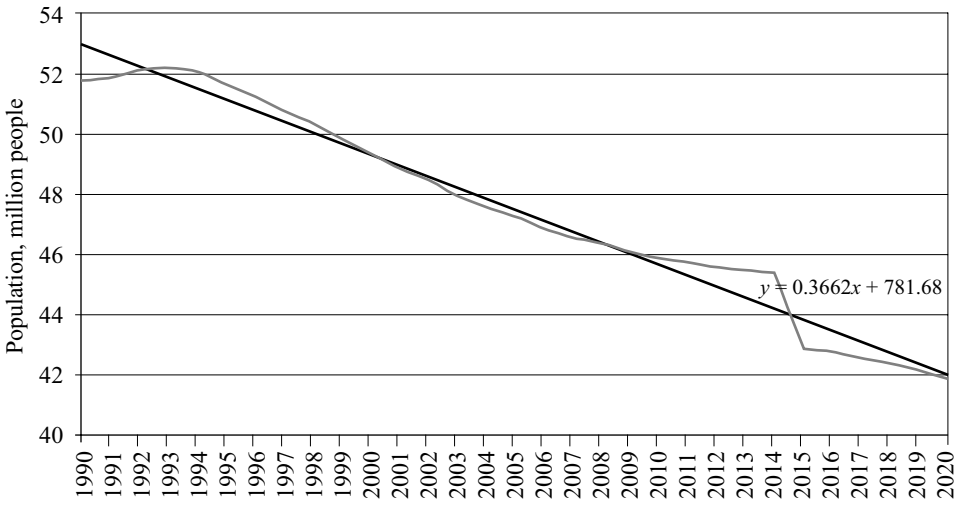
Source: Methodological manual on territorial typologies 2018.

exclusive extractive institutions – regulators of socio-economic development of the national macrosystem, focused on maximum "extraction" of income from the exploitation of one part of society parts ", by D. Acemoglu, J.A. Robinson [2012]. Structural divergence of the socio-economic macrosystem of Ukraine includes the following: it manifests itself in the divergence of elements at different levels of the system hierarchy; objects of divergence – spatial units (regions, cities, rural settlements, territorial communities; industries, sectors, spheres of economy and society (scientific and technological, educational and health and environmental protection)); divergence covers the development of the primary element of the macrosystem – individual, family, household, human capital due to the diversity of their movement, stratification by income, sources of origin, the degree of legitimacy of property rights, the level of quality of life and safety of life, as well as the structure of the macrosystem in the relationship between its elements.

We present the method of assessing depression according to NUTS (Fig. 1) and the method used in Ukraine. In Western scientific thought, depressed areas are mostly studied in the context of the problem of the genesis of socio-economic growth and decline.

The methodology for assessing depression is used in Ukraine: dynamics of the average GRP per capita for five years; for industrial regions – the excess over the last three years of the registered unemployment rate and the share of employed in industry and significantly lower volumes of sold industrial products (works, services) per person and lower average monthly wages than the corresponding

Chart 1. Dynamics of population decline, 1990-2020

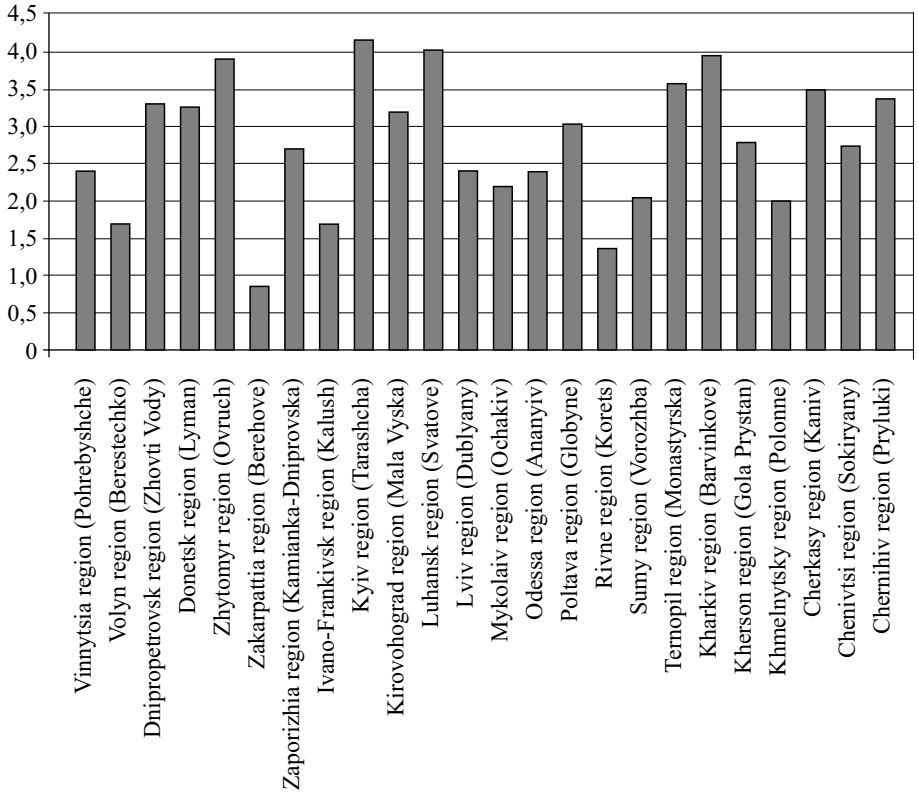


Source: State Statistics Service of Ukraine.

indicators of development in this group; for rural areas – lower density, natural population growth rate, the level of average monthly salary, the volume of sales per capita over the past three years than the average indicators of development in this area; for cities of regional significance – the highest level of registered unemployment during the last three years, and the lower level of the average monthly salary for the corresponding averages in this group. Over a thirty-year period, the population of Ukraine decreased by 20% (Chart 1).

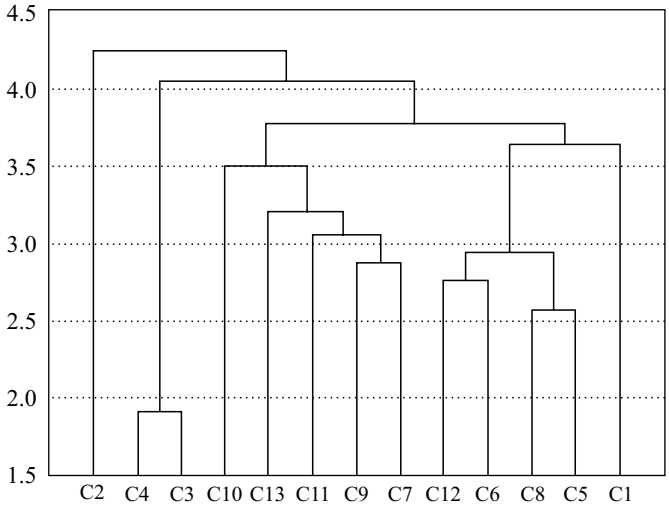
Dynamics of the population of small and medium-sized cities in 2020 in the regions of Ukraine is characterized by significant unevenness (Chart 2). Almost all cities with the largest population decline in the past have played a significant role in the social and economic life of the regions. However, the insufficient level of development, liquidation of city-forming enterprises caused the processes of intra-regional, inter-regional and international migration, which led to the loss of resource potential of these cities and, accordingly, to potential depression.

Chart 2. Cities with the highest rates of population decline, % of total population



Source: State Statistics Service of Ukraine, January 2020.

One of the main forms of targeted strategy for overcoming regional depression is the formation and implementation of a cluster model. It should be noted that the creation of clusters in depressed regions is quite difficult, if at all possible, so a more realistic way to overcome depression may be to strengthen interregional integration. To conduct an institutional analysis of antidepressant policy, we took four regions, namely: Zaporizhia, Odessa, Kherson and Chernivtsi to identify the relationship of legislation, strategies and regional policy documents in the context of overcoming depression (Fig. 2). None of the regional development strategies traces the isolation of a depressed region.



C1 – State. strategy reg. development in 2020
C2 – State. strategy reg. development in 2027
C3 – Law "On Principles of State Regional Policy"
C4 – Law "On stimulating the Development of Regions"
C5 – Resolution of the Cabinet of Ministers of Ukraine "On the directions of ensuring the integrated development of monofunctional cities"
C6 – Regional Development Strategy of Zaporizhia Region 2020
C7 – Regional Development Strategy of Zaporizhia Region 2027
C8 – Regional Development Strategy of Odessa Region 2020
C9 – Regional Development Strategy of Odessa Region 2027
C10 – Regional Development Strategy of Kherson Region 2020
C11 – Regional Development Strategy of Kherson Region 2027
C12 – Regional Development Strategy of Chernivtsi Region 2020
C13 – Regional Development Strategy of Chernivtsi Region 2027

Fig. 2. Dendrogram of priority of laws and program documents concerning regional development

Source: official sites of regional state administrations of Ukraine.

Carrying out a cluster analysis of documents, we came to the conclusion that the most influential, comprehensive document on regional policy is the State Strategy for Regional Development 2027 [Postanova Kabineta Ministriv Ukrayiny "Pro zatverdzhennya Derzhavnoyi stratehiyi rehionalnoho rozvytku na 2021-2027 roky" 2020] and the Law "On Stimulating the Development of Regions" [Zakon Ukrayiny, Pro stymulyuvannya rozvytku rehioniv 2005].

Back in 2014, scientists A.O. Dvihun, A.I. Mokiy, A.M. Humenyuk and O.I. Datsko [2014] proposed the following ways to solve the problem of depression: decentralization of the budget following the example of EU countries; creation of free economic zones and territories of priority development in problem regions, cities; development of small and medium business; increasing the social responsibility of big business.

4. Conclusion

We offer the following methods to support depressed areas: expanding the rights of regions; introduction of common social standards; decentralization and delegation of executive functions to the regions; balancing powers between central and local executive bodies and local governments; providing depressed regions with real state support and stimulation of socio-economic development.

Summing up, we note that the implementation of regional antidepressant programs will overcome depression and increase the level of social, environmental and economic development of depressed areas on the basis of: increasing the business activity of economic entities in depressed areas; improving the level and quality of life of the population in such regions; creation of additional jobs, increasing the level of employment.

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Polityka antydepresyjna jako sposób przezwyciężenia strukturalnej dywergencji

Streszczenie*. W artykule zaprezentowano różne definicje depresji społeczno-ekonomicznej w kontekście regionalnym oraz w odniesieniu do pojęcia dywergencji. Autorzy przedstawili wyniki analizy porównawczej pogrążonych w depresji miast Ukrainy i określają główne problemy tych miast. Proponują także możliwe sposoby przeciwdziałania problemowi depresji społeczno-gospodarczej.*

Słowa kluczowe*: depresja, region depresyjny, polityka antydepresyjna, dywergencja*

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Methodological aspects of evaluation of natural ecosystem services in urban areas

Abstract. *According to the principle of sustainable development, a country's economic and social development must be oriented in such a way that meeting the needs of today does not reduce the possibilities of meeting the needs of future generations, taking into account the limited natural resources. But without knowing how many natural ecosystem resources there are, what their value is, society cannot estimate the extent of their loss. This problem is particularly acute in urban areas, where rapid population and economic growth is continually affecting the natural ecosystem. In 2000, the United Nations launched a global initiative called the Millennium Ecosystem Assessment. The European Environment Agency (EEA) emphasizes the importance of ecosystem accounting methods for examining the relationship between economic sectors and their dependence on natural ecosystem resources and functions, and their impact on resources and functions. In determining the value of ecosystem services, the authors pose the fundamental question: how to determine the value of direct and indirect use and non-use of ecosystem services in urban areas, their value for future generations. The main objective of the study is to substantiate and propose a methodology for determining the value of services provided by the natural ecosystem in urban areas.*

Keywords: *economic value, social value, ecosystem*

1. Introduction

Categorisation of ecosystem service is a precondition for any attempt to measure, map or value them and to communicate the findings in a transparent way [Burkhard, Maes (eds.) 2017]. Ecosystem services are the benefits of nature for human well-being and the economy. It can be: street trees; lawns/parks; urban forests; cultivated land; wetlands; lakes/sea; and streams. These services are considered free and inexhaustible by the public, are not sufficiently known and properly valued [Costanza et al. 1997]. Ecosystem functions (Table 1) are the internal characteristics of an ecosystem, including the biogeochemical processes that take place in them. They determine ecosystem services – the benefits that people derive from ecosystems [MEA 2005]. Ecosystem functions demonstrate the links between ecosystem services and human well-being.

Studies evaluating ecosystem services do not include the supporting function – the structure, processes and functions of ecosystem services that benefit society

Table 1. Natural ecosystem functions

Type of ecosystem service	Description
Provisional	Services whose benefits can be directly felt. Ecosystem products: food, fuel, drinking water, food, medicinal substances, wood, material resources, genetic resources.
Regulating	Improving water, air, soil quality, flood regulation, soil erosion prevention, disease and pest control, CO2 absorption, crop pollination. Biological regulation of pollutants or toxins of anthropogenic origin. Filtration, absorption, containment and / or accumulation of pollutants by terrestrial / soil, freshwater, marine organisms; adsorption, binding of heavy metals and organic matter in organisms.
Cultural	1. Physical and experiential interaction with wildlife. (Bird watching, other animals, swimming in water bodies. Walking, hiking, climbing). 2. Intellectual and perceptual interaction with wildlife. (Aesthetic induction caused by the place). 3. Spiritual, cultural and other experience. (Spiritual, ritual identity with place, holy places). 4. Other non-utilized living features. (Moral / ethical approach, Pleasure knowing that wild species, wildlife, ecosystems, landscape exist). Meets various cultural, emotional, social needs of people. Recreation, aesthetic, spiritual satisfaction, traditions, connection with place.
Supporting	Supporting nutrient cycling, soil formation, primary production. Supporting services – ecosystem processes and functions that underpin other three types of services. Without supporting services, provisional, regulating and cultural services wouldn't exist.

Source: MEA 2005; Norgaard 2010.

not directly but through other functions. This does not mean that support services are less important, but such a narrowing of the scope of assessment is necessary to avoid double counting in the assessment of ecosystem services. Assessing the importance of the natural component more than once because it is included unduly reinforces the outcomes of other services.

The capacity of ecosystems to provide services depends on the state of their structure, processes and functions, which are determined by the interaction with socio-economic systems [Maes et al. 2013]. Due to economic and population growth, the consumption of ecosystem services is increasing. The harmful effects of the environment on consumption depend on the efficiency of the production technologies used to extract ecosystem services. The interaction of these factors is complex and takes place in different areas. Influencing factors are almost always multifaceted and interactive, a one-way relationship between certain influencing factors and changes in ecosystems rarely exists. The usual link between determinants and changes in ecosystems is usually mediated by many other factors. The values created by the services provided by the ecosystem are divided into the value created for people and the environment (Table 2).

The value is defined as the relative value, benefit, or importance of something. There are many different concepts of value. In terms of natural capital, we can

Table 2 . Ecosystem-created values

Values for the environment	**Ecological values:** connections between objects and organisms.
	Intrinsic value: independent of any processes, functions or services performed, organisms and natural objects are valuable in existence.
Values for people	**Non-economic values:** intangible, often community benefits come from nature (health, education, inspiration, etc.) (Cultural ecosystem services).
	Economic values: **Usage** **Direct:** Consumption: food, drinking water, fuel, building materials, etc. (Provisioning ecosystem services). Non-use: recreation (Cultural ecosystem services). **Indirect:** water treatment, flood control, crop pollination, reduced pollution, etc. (Regulating ecosystem services)**.** **Non-use** **Saving for the future –** satisfaction of knowing that future generations will have access to ecosystem services. **Existence** is the satisfaction of knowing that ecosystem services and the ecosystems that provide them exist. **Choice of when to use:** the possibility of direct or indirect use of ecosystem services in the future; today, an ecosystem may not provide value for use, but that does not mean that its future value is insignificant.

Source: based on NRC 2005.

measure the biophysical, socio-cultural, health, justice value. People have different beliefs or moral values that lead them to describe value differently. How they measure value varies greatly. Economic theory provides a basis for reconciling all these different types of values. When analysing the value of ecosystem services, two differences need to be described. Firstly, when it comes to the economy and the markets, it is important that they are efficient, but the economy is not the same as the market. Therefore, when examining various entities or phenomena (including ecosystem services) from an economic point of view, they cannot be considered only as objects traded on the markets. Valuation is not the same as their monetary valuation or change in the benefits of goods. Second, value can be determined for a variety of things that are not traded in the markets. Many things are not and should not be traded in markets, as markets do not always work properly, and sometimes even contrary to the beliefs of many people (e.g. the market value of various chemicals can increase regardless of their negative effects on the soil). Valuing something does not necessarily mean wanting it to be traded in the markets, so expressing values in monetary terms is not the same as assigning a price when you want to sell something on the market or exchange it for something else. The monetary expression can be used as a measure, just like meters or yards, to compare the relative value or benefits of an item. In addition, prices do not reflect the importance of the product to society.

Society cares not only about people, but also about the ecosystem itself and the services it provides, so we value them not only in economic terms. Even if people only take care of themselves, the services provided by an ecosystem will be valuable in terms of their use, the functions they perform and their enduring value. Unfortunately, but most often the value of items is understood only as an instrumental value, that is, they are valuable only when we use them. Of course, things also have their (intrinsic) value, regardless of society‘s attitude towards them. Therefore, it all depends on what value definition we use. The problem of valuation is still relevant today; this issue is discussed by many scholars in various fields.

2. Economic value

Economic value is one way to define and measure value [Caputa 2015]. This is useful in making decisions about trade-offs in resource allocation. The neoclassical value described by economic theory reflects the preferences of individuals. Benefits and costs are defined in terms of how much a person wants to give up or receive compensation for something else that he or she values in order to receive it [Caputa, Krawczyk-Sokolowska, Pierscieniak 2020]. There is no absolute measure of value in this system; there are only value equivalents between one thing and another. This substitutability of goods means that any change in the

quantity or quality of goods can directly offset another type of good, when the consumer does so, he is indifferent to that change. This assessment is appropriate for the assessment of ecosystem services in the calculation of the relationship between non-market goods. Neoclassical economic theory assumes that all consumers are rational and independent. This means they know what they want and make the best decisions for their well-being [Costanza et al. 1997; Huppert, Kantor 1998]. They are thought to be consistent and make the most of their preferences for goods and services. Utility is often presented as a curve of indifference. Economic theory provides a basis for comparing different subjects. We may classify items as costs or benefits according to their effect on our utility. Utility is a concept that refers to all of our provisions. Utility is a preference for the purchase of a particular set of goods or services. To know whether something meets our needs better or worse depends on whether this gives us greater or lesser utility. The concept of utility does not limit people's desires, beliefs, or goals. The content and form of a person's utility function is entirely dependent on that person's preferences. The usefulness of people is revealed through their willingness to pay for something.

3. Social value

People adhere to moral, spiritual, educational, aesthetic, and other values related to the urban environment that determine their attitudes and actions when evaluating ecosystem services [MEA 2005]. These values reflect emotional, effective, and symbolic views of urban structure that, in many cases, cannot be adequately captured using commodity-specific valuations or monetary units of measurement [Martinez-Alier, Munda, O'Neill 1998; Norton, Hannon 1997]. Social and cultural value is directly related to the cultural function of the services provided by the ecosystem and includes local values such as a sense of community and identity, physical and mental health, social cohesion, education [Chiesura 2004; Chan, Satterfield, Goldstein 2012]. A sense of place identity arises from the emotional connections between people and ecological places [Altman, Low 1992; Feldman 1990; Williams et al. 1992; Norton, Hannon 1997]. Attachment to place is a set of social close ties, common interests, and common neighbourhood activities [Gotham, Brumley 2002]. In many places, ecosystem services are associated with spiritual values [Stokols 1990]. Social and cultural values are difficult to capture and assess, often using qualitative assessments and assessment scales [Chan, Satterfield, Goldstein 2012]. Assessing the cultural functions of ecosystem services, we can say that it is a social value that can be determined using optional assessment methods that allow us to assess through the willingness to pay for the free values created. Integrating and incorporating social and cultural values into

decision-making processes is more difficult in urban areas and larger cities due to population diversity, cultural and social differences. Therefore, perceptions of the value of services provided by an area's ecosystem are expected to be more diverse in an urban environment compared to a rural area or a smaller city.

The willingness of the population to pay or the willingness to give up are the means of finding total economic value over time [Pascual at al. 2010]. Motivation based on willingness to pay / willingness to give up influences the process of value aggregation. **Total economic value** is the net corresponding amount of willingness to pay and willingness to give up, measured through the prism of individual utility. The value of greenery for urban and suburban residents will have different socio-economic value, although ecosystem functions will perform similarly. Just the utility of greenery for urban and rural residents will be different.

4. Ecosystem service assessment methods

In order to identify value expressions that may be related to social values rather than markets, new valuation methods had to be developed (e.g., travel costs, hedonic prices, deliberative monetary valuation, avoidance, replacement costs, choice experiments). Research in this area over the last 50 years has led to a broadening of the categories of sites to be assessed, from recreation and tourism to air and water quality, health and safety, tranquillity, aesthetics, culture and history, etc., and ecosystem services and biodiversity [Lo, Spash 2012; Freeman III, Herriges, Kling, 2014]. Economists redefine ecosystem functions as the ability to supply goods and services as tangible and quantifiable output. These results are only valuable if people want to pay for them to avoid losses rather than doing something else with their money. This trip included the estimation of direct recreational use values using actual costs, using travel cost methods, and the assignment of biodiversity loss existence values using choice experiments.

Studies on the evaluation of ecosystem services provided in urban areas and summaries of these studies [Dunford et al. 2018; Dubosaitė-Lepeškevičė, Balvočiūtė 2018] are described in the scientific literature. Table 3 presents the methods by which ecosystem service functions were assessed in these studies.

Multicriteria and cost-benefit methods are probably the most commonly used methods for evaluating ecosystem services, but they have significant shortcomings. The multicriteria method assesses all ecosystem service functions, but it is practically impossible to express the results of the assessment in one dimension. The cost-benefit approach has been particularly common in such studies over the last decade, but emphasizes the problem of the social discount rate and the future value of these services. Many researchers argue and confirm in their research that it is necessary to combine different assessment methods when assessing ecosystem services studies [Costanza et al., 1997; Dunford et al. 2018]. Also unique is

Table 3. Methods of assessment of ecosystem services in urban areas

Assessment methods	Estimated ecosystem function
Deliberative Monetary Valuation Method Market price Method Cost-benefit Method Multicriteria method	Provisioning function
Hedonic Pricing Method Avoidance, Replacement Cost Method Defensive Expenditure Method Cost-benefit Method Multicriteria method	Regulating function
Travel Cost Method Contingent valuation, Expressed preferences Method Conjoint analysis Method Choice experiment Method Multicriteria method	Cultural function

Source: based on Dunford et al. 2018; Dubosaitė-Lepeškevičė, Balvočiūtė 2018.

the cultural function of ecosystem services – only an indirect economic assessment of this function is possible.

The phenomenon of the value of services provided by the urban ecosystem is examined at the crossroads of economics, the environment, health, biology and other sciences. The diversity of ecosystem service functions and their differences in different urban areas lead to the use of different assessment methods to determine their value. People intuitively evaluate the services provided by an ecosystem, according to their understanding, income level, education, satisfaction or dissatisfaction with the current situation, and so on. Assessments of the current situation are socially meaningful – the meanings of a person‘s needs characterize his or her willingness to pay for the benefits, although there may be statistical discrepancies. Thus, subjective assessments exist in the consciousness of each person and are identified only when he or she expresses an opinion on certain topics. The evaluation of all three functions and services aims to find out to whom the population gives the greatest relative weight in the overall assessment of the ecosystems themselves. Individually set priorities allow each respondent to include and assess the importance of ecosystem services. The public opinion survey does not reflect the actual object, but the perception of the respondents, which is related to its belonging to a social group (for example, younger people are usually more active and spend more time playing sports or relaxing in the park). Also, the assessment of ecosystem services is closely related to the country’s economy, so it is not surprising that in cities with lower economic and social development, the subjective assessment of ecosystem services is slightly lower.

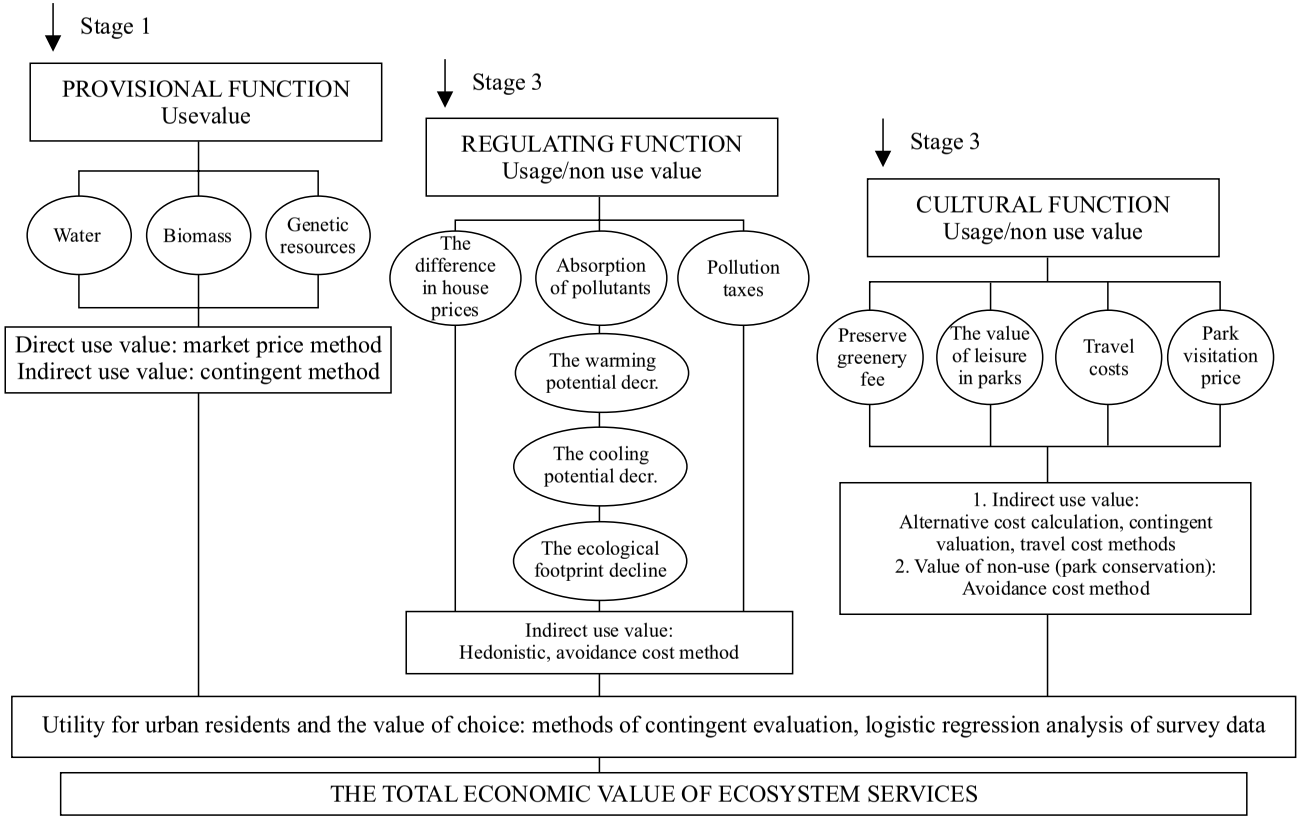

Fig. 1. Assessment methodology of ecosystem services in urban area

Source: own elaboration.

Supportive methodological assumptions for economic assessments of ecosystem services in urban areas are:

– nature is worth as much as it is – now and in the future – what people need, and the usefulness of the elements of nature is comparable both to each other and to the values of another nature;

– the usefulness of various goods – their expected contribution to human well-being, perceiving the latter as the satisfaction of needs and desires – is reflected in people's preferences in the set of goods and their consumption methods;

– monetary evaluations express the said preferences in monetary units, reflecting the comparative (relative) usefulness of goods.

The model for evaluating ecosystem services in urban areas consists of 5 stages (Fig. 1):

Stage 1. Determining the economic value of the functions of supplying ecosystem services in cities using the value methods of use (market price method) and non-use (contingent method).

Stage 2. Determining the economic and social value of the regulatory function of urban ecosystem services using use (market prices) and non-use (hedonistic) methods.

Stage 3. Adjustment of the determined economic value of the functions of ecosystem services provided in cities – supply, regulation and culture – by coefficients of utility value and choice value (social value). The method of logistic regression analysis of population survey data is applied to determine these coefficients.

Stage 5. Determining the total economic value of ecosystem services in cities.

5. Conclusions

Urban ecosystem services are public and non-market-oriented, so their economic valuation methods have limitations. Solutions related to sustainability are more social choices question, they are not backed by traditional costs and benefits analysis. The measurement of non-market services (non-market flows or facilities) is essentially a set of aggregates provided to the environment and not a specific expression of the market price of a financial transaction or financial transaction. To determine this universe and to define the value subjective, hypothetical values and prices apply determination and justification methodology, subjective based on indirect use or valuation using the disclosed preferences method. In most cases, ecosystem services are not sold on markets and do not have market prices, but it cannot be said that their economic value or market value is equal to zero. In cases where ecosystems do not have a market price (because there is no market) but the individual agrees (would agree) to pay for access to it or to obtain com-

pensation for not using it, the economic value of the good would be related to the amount of the price to be paid by consumers. In order to identify the different ecosystem services provided in cities, it is proposed to use different assessment methods that are appropriate for different types of ecosystems. Selection methods based on human behavior and choice, used in cases where respondents may experience different impacts of the ecosystem service provided. These are market, travel cost, hedonistic, reading monetary valuation methods. Revealed preference methods – contingent assessment, selected options – are applied to the value of non – use, which provides all three types of ecosystem services identified. The value of non-use ecosystem services lies in the future of biodiversity conservation and heritage value for generations. A set value helps prevent loss of change. Cost-based avoidance prices cost methods, in which case ecosystem services shall be valued at the costs of damage resulting from the loss of the ecosystem service or the costs of relocating or replacing the service. The latest method of valuing ecosystem services – the monetary valuation method of consideration – is better suited as a complementary valuation method rather than a primary one.

In determining the value of urban ecosystem services, it is important to choose the right method or system. The diversity of ecosystem services and the functions they perform demonstrates the need to integrate assessment methods so that they reflect as accurately as possible the benefits of these services to society, not only now, but also for the preservation of the ecosystem itself for future generations. All methods have disadvantages and advantages, only by combining them is a rational assessment of natural ecosystem services possible.

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Metodologiczne aspekty oceny usług naturalnych ekosystemów na obszarach miejskich

Streszczenie. *Zgodnie z zasadą zrównoważonego rozwoju rozwój gospodarczy i społeczny kraju musi być tak ukierunkowany, aby zaspokojenie potrzeb współczesnych nie ograniczało możliwości zaspokojenia potrzeb przyszłych pokoleń przy uwzględnieniu ograniczonych zasobów naturalnych. Jednak nie wiedząc, ile jest naturalnych zasobów ekosystemu i jaka jest ich wartość, społeczeństwo nie może oszacować stopnia ich utraty. Problem ten jest szczególnie ważny na obszarach miejskich, gdzie szybki wzrost liczby ludności i wzrost gospodarczy nieustannie wpływa na naturalny ekosystem. W 2000 r. Organizacja Narodów Zjednoczonych uruchomiła globalną inicjatywę pod nazwą Milenijna Ocena Ekosystemów. Europejska Agencja Środowiska (EEA) podkreśla znaczenie metod rachunkowości ekosystemów dla badania relacji między sektorami gospodarki i ich zależności od zasobów i funkcji naturalnych ekosystemów, a także ich wpływu na zasoby i funkcje. Dokonując*

wyceny usług ekosystemowych, autorzy stawiają fundamentalne pytanie: jak określić wartość bezpośredniego i pośredniego użytkowania oraz niewykorzystywania usług ekosystemowych na obszarach miejskich, tzn. ich wartość dla przyszłych pokoleń? Głównym celem badania jest uzasadnienie i zaproponowanie metodologii wyceny usług, jakie zapewnia naturalny ekosystem na obszarach miejskich.

***Słowa kluczowe**: wartość ekonomiczna, wartość społeczna, ekosystem*

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A study of potential migration activity as an important component of its regulation mechanism

Abstract. *This article describes the author's methodological approach to the study of potential migration activity. The methodology for calculating the migration desires index (MDI) is applied to the data from the sociological panel survey in Lviv (2013-2016, 2018-2019). The index makes it possible to track changes in the population's migration desires over time and across different socio-demographic groups. According to the MDI, the highest desire for emigration can be observed among young men (under 30 years) with higher education. The author uses the concept of the "value-need gap" (the gap between the subjective importance of a certain good and the degree to which this need is actually satisfied) as a tool for studying the most acute problems that can drive international migration. Insights from the study of potential migration activity can be used to develop preventive migration policy measures.*

Keywords: *migration activity, potential migration, the migration desires index, value-need gap, Ukraine*

1. Introduction

In recent decades large-scale external migration of the active working population has become a serious challenge for human capital donor countries, including Ukraine. Naturally that poorly regulated significant emigration flows lead to the washing away of the most productive part of the population outside the country, which causes demographic losses and a number of social and economic problems.

The coronavirus pandemic significantly affected the intensity, course and direction of migration processes in the world, but has not stopped them. Problems of

migration regulation in order to preserve the human potential of the origin countries do not lose their relevance today. The development of effective regulating mechanisms requires investigation of not only real but also potential population's migration activity.

Migration issues cause a great interest of scientists. A lot of the studies are dedicated to the analysis of existing migration processes and their factors in different countries [for example: Gheasi, Nijkamp 2017; Grenčíková, Španková 2016; Snel, Bilgili, Staring 2020]. But potential migration is not researched enough.

Migration activity is a complex and multidimensional problem which can't be fully covered in one article. Therefore, this study focuses on important and insufficiently developed aspects of this problem. The aim of the article is to present the author's methodological approach to potential migration activity investigation on the basis of the results of the sociological panel survey in Lviv (2013-2016, 2018-2019).

2. Methodology

Migration activity in the broad sense of the word characterizes the degree of a person's ability to participate in migration processes. It means not only the spatial movement of the population between settlements, but also decision-making, preparation for such a movement, as well as the processes of adaptation in the host society, return and reintegration. We distinguish between realized (actual migration movement) and potential (unrealized) migration activity.

The most common and well-developed aspects of the study of the realized migration activity are population migration and its integration. There are absolute (number of arrivals/departures for a certain period, migration balance, migration turnover) and relative (migration intensity on arrival/departure, migration turnover intensity and migration balance) indicators [Puryhina, Sardak 2007: 102]. Regarding the integration of the migrant in the host society, a number of indicators have been developed, which are monitored in most countries of the world. In particular, in 2004 the Migration Policy Group developed the Migrant Integration Policy Index (MIPEX), which has been calculated for years in all EU member states, as well as in Canada, USA, Switzerland, Norway, Australia, etc. It includes 167 integration indicators, each of which is an issue in one of eight policy areas (labor market mobility, family reunification for migrants from third countries, education, health, participation in political life, long-term residence, citizenship, anti-discrimination measures) [Migration Policy Group 2015].

One of the most popular indicators of potential migration is the share of the population with a positive migration attitude (migration desires) or plans to migrate [Laczko, Tjaden, Auer 2017]. In this study we use more complex indicator

– the migration desires index (MDI). Based on the formula of the weighted average and point scale we calculate the index in the following way [Ryndzak 2019]:

$$MDI = \frac{5f_5 + 4f_4 + 3f_3 + 2f_2 + f_1 + 0f_0}{N}, \quad (1)$$

where N is the overall number of responses for this question and f_i is the number of respondents willing to migrate at the i-level. Thus, there are six single indicators for a complex estimation of migration desires. When conducting the sociological survey the following question was asked "If you had an opportunity to be employed abroad, what would you prefer?". Each of the proposed answer options received points from 0 to 5 that measure the degree of migration desires, where 5 is the highest (typical for people who want to move abroad for permanent residence) and 0 reflects its absence (observed in individuals who do not wish to move abroad under any circumstances). So, the answer "Would move abroad for permanent residence" received 5 points; "Would move abroad for a few years to improve financial situation" – 4 points; "Would move abroad for temporary work" – 3 points; "Would move abroad only for learning or entertaining experience" – 2 points; "Not sure" – 1 point; "Would not move abroad" – 0 points.

3. Research results

The value of the migration desires index in the context of various socio-demographic groups is given in table 1. In general, the calculations confirmed the hypotheses put forward in the research program regarding higher level of men's migration potential compared with women's one. This gap was most noticeable in 2015, when the active phase of the armed conflict broke out in the east of Ukraine. This suggests that some men consider external migration as an option to avoid military mobilization. However, this issue requires a special, more detailed study. In 2018 the difference in the values of the migration potential index of men and women became even larger compared to 2015. It is important to note that the overall value of the index in 2018 increased, as compared to 2016, particularly due to males.

The age distribution of the index shows that the highest value is among young people under 30, quite high among people aged 31-40, after which it significantly decreases further in age. The level of migration desires of persons under 40 was above average over the entire period of study, while it was average among people over 50 years. The highest value of the index among young people under 30 was in 2013 and amounted to 3.38 points. An interesting fact is that the value of the index of migration desires of young people under 30 is high mainly due to the

Table 1. Migration desires index

Respondents	2013	2014	2015	2016	2018	2019
All	2.8	2.6	2.9	2.5	2.7	2.7
Distribution by gender:						
– male	2.83	2.62	3.10	2.57	3.13	2.73
– female	2.75	2.55	2.76	2.40	2.48	2.70
Age groups:						
– under 30 years	3.38	2.74	3.10	2.69	2.91	2.91
– 31-40 years	2.90	2.71	3.00	2.52	3.10	2.93
– 41-50 years	2.06	2.23	2.83	2.28	2.62	2.49
– 51-60 years	1.50	2.20	2.10	1.92	2.20	2.06
Educational groups:						
– full secondary	1.67	2.30	1.15	1.30	3.46	2.42
– vocational and technical	2.38	2.28	2.34	2.00	2.10	2.57
– basic or incomplete higher	2.56	2.23	2.42	2.60	2.87	2.71
– completed higher education	2.98	2.68	3.14	2.58	2.85	2.77
Marital status:						
– married	2.53	2.41	2.86	2.50	2.97	2.69
– single	3.31	2.84	3.12	2.67	2.54	3.04
– divorced (including widowed)	2.38	2.92	2.05	1.78	1.98	2.20
Level of the material status:						
– low and very low	2.69	2.63	3.10	2.69	3.21	2.65
– lower than medium	2.80	2.45	2.80	2.80	2.89	2.53
– medium	2.76	2.59	3.20	2.20	2.52	2.58
– higher than medium*	3.30	2.87	3.20	1.95	2.00	3.04

* A very small number of respondents rated their material status as "high", that's why they were included in the group "higher than medium."

Source: own calculations based on the results of 2013–2016, 2018–2019 panel survey.

significant number of people who want to go for temporary work abroad, and desires of the people 31-40 years old – due to the shown desire to go abroad for permanent residence.

The results of the panel survey revealed a direct dependence of the index of migration desires on the level of education. So, for almost all years of study, the value of the index grows with the level of education: for people with complete secondary education this value is the lowest, and for people with complete higher education it is the highest. Only 2018 was an exception, when the MDI value for the people with complete secondary education was as high as possible and amounted to 3.46. Such a rapid increase of the index took place due to a significant increase in the number of respondents who would like to go abroad for a long time in order to improve their financial situation. At the same time the high index value for people with complete higher education is mainly provided by those who want to go abroad for permanent residence.

In our opinion, the influence of marital status on the level of migration desires of the population is ambivalent. In fact, on the one hand, the necessity to support a family encourages many people to seek work abroad, while for others, on the contrary, the presence of a family and devotion to it serves as a brake factor for such travels. During 2013-2016 and in 2019 the results of the study revealed higher MDI of single respondents in comparison to married and divorced. This difference is most noticeable in 2013. The exception to this pattern was 2018, when respondents with a family showed higher level of migration potential. It should be mentioned that married respondents more often wanted to go abroad for permanent residence than unmarried or divorced. Obviously, this meant mostly moving of the whole family. In general, the value of the MDI of divorced respondents is lower than that of other groups of respondents, and in 2016 and 2018 it even decreased. But in 2019 it increased again and amounted to 2.2 points.

In the course of the study we also tried to trace a connection between the level of the financial situation of respondents and their migratory preferences. Persons, who assessed the financial situation of their family as above average, had the highest level of migration potential in 2013-2015. However, in 2016 and 2018, on the contrary, it was the lowest. Perhaps it happened because of the depletion of the migration potential of a more wealthy part of the population. In 2019 the value of the index for this group of respondents increased again and amounted to 3.04 points.

Since migration often occurs as a result of deprivation of certain needs of the individual, we propose to use the concept of "value-need gap" for a comprehensive assessment of the population's potential migration activity. It is a gap between the level of the importance (value) of one or another significant good and its actual satisfaction. At the last stage (2019) of the monitoring study of migration attitudes of the unemployed, they were asked to assess the level of significance (where 5 points – the most important, 1 – does not matter) and the degree of satisfaction (5 points – completely satisfied, 1 – completely dissatisfied) of 15 components and factors of their own life. The calculation of the average score B ($1 \le B \le 5$) was performed according to the formula:

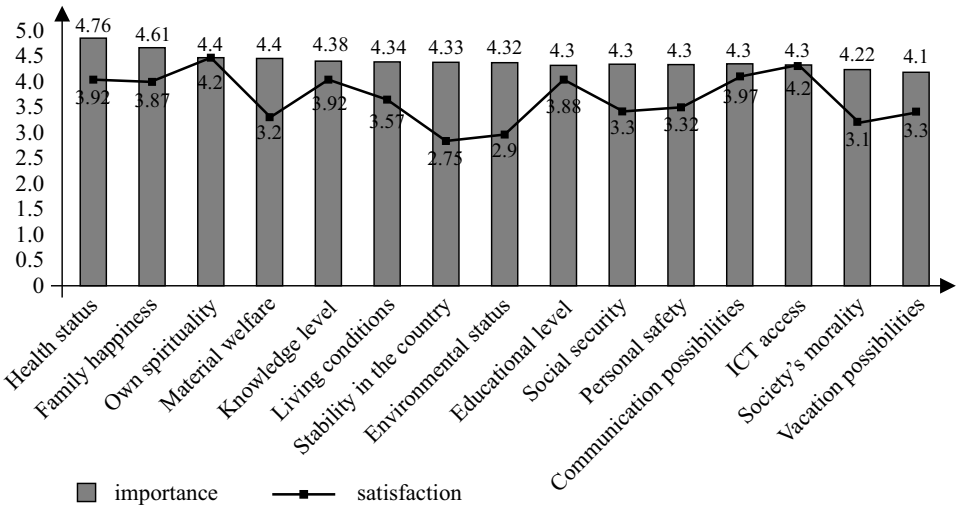
$$B = (5 \times n_5 + 4 \times n_4 + 3 \times n_3 + 2 \times n_2 + n_1) / N, \quad (2)$$

where n_i – the number of persons who determined the significance / satisfaction of the listed factors at the i-level and, N – the total number of persons who answered the question.

This allowed us to rank these factors from the most to the least significant. The results of the survey confirmed our hypothesis in the research program about the dominance of vital values in the structure of value orientations of the unemployed. Thus, the first two ranks of significance belong to the values of health (4.76 points) and family well-being (4.61 points) (Chart 1).

The hypothesis of the significance of material values was only partially confirmed. Although the level of material security, as expected, occupies a leading position in the hierarchy of values of respondents, but suddenly shares a position with the values inherent in developed societies of innovative type, it is – spirituality and knowledge. Thus, "the level of one's own spirituality, morality" and "level of material welfare" occupy the third rank (4.4 points), and "the level of acquired knowledge" – the fourth rank (4.38 points) of importance in the answers of the unemployed population of the region. The significance of other factors was almost the same level (from 4.34 to 4.3 points). Slightly less important are the morality of society (4.22 points) and opportunities for recreation, cultural development, organization of culture and sports (4.1 points).

Chart 1. The level of significance and degree of satisfaction of the main components and factors of life of the unemployed population of Lviv region, 2019



Source: calculated and compiled by the author.

It is worthwhile to mention the high level of significance for the respondents of all the values proposed in the questionnaire (none of them scored less than four points). The situation with the degree of satisfaction differs. Two components rank first: the level of one's own spirituality (4.2 points) and access to and use of information and computer technologies (4.2 points). Somewhat less satisfied, but still close to 4 points are: the ability to communicate, social contacts (3.97 points), health (3.92 points), level of education (3.88 points) and family happiness (3.87 points). The least satisfied (that is occupy the lowest rank positions) are: the stability of the socio-economic and political situation in the country (2.75 points) and

the state of the environment (2.9 points). These factors are the most inconsistent, namely a high level of significance is revealed versus a low level of satisfaction. A certain value-need gap is also formed by: living and housing conditions (3.57 points), personal safety in society (3.32 points), social security (3.3 points) and the level of material welfare (3.2 points). These results indicate the most acute problems that may cause emigration, and therefore require appropriate measures and actions from state and regional authorities.

The low level of satisfaction of certain components of life is not unequivocal evidence of a critical situation. After all, components with a low level of significance, as well as satisfaction have almost no effect on the overall level of life satisfaction and, consequently, on the migration desires spreading.

The most harmonized, balanced positions of significance and satisfaction of the main components of a person's life are: the level of their own spirituality, access and use of information and computer technology, the ability to communicate and the level of knowledge gained. Such results show that the value-cultural dimensions of mobility have a special stabilizing and mobilizing significance in the development of Ukrainian society.

4. Conclusions

The migration desires index (MDI) is one of the most important indicators of the potential migration of the population of some territory. We have used it to study the changes of population's migration desires over time and in different socio-demographic groups. Thus, the highest value of the index was observed in 2015. It can be partly explained by the active phase of the war on the East of Ukraine. But this issue requires a deeper study. However, if in 2015 the index grew due to a large number of men who wanted to go for permanent residence abroad, then in 2018 it grew due to a sharp increase in those who wanted to go for temporary work out of Ukraine. Increasing of the index value in 2018 can be explained by the introduction of a visa-free regime of Ukraine and EU countries, which, although not giving the right to work abroad, but somewhat simplifies this procedure. Moreover, the main country of destination for Ukrainian migrant workers, Poland, grants such a right to non-EU citizens who have crossed the border in visa-free regime. In addition, the highest indicators of the MDI were recorded among young men (under 30 years) with higher education.

Due to "value-need gap" investigation the most actual problems, that can cause international migration, were identified. In particular, high level of significance and low degree of satisfaction were observed on such factors: stability of the socio-economic and political situation in the country, environmental status and material welfare. Investigations of the potential migration activity serve as

an information basis for the preventive migration policy. The recommendations for such measures development is a prospect for further researches on this issue.

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Badanie potencjalnej aktywności migracyjnej jako ważny element mechanizmu jej regulacji

Streszczenie. *W artykule przedstawiono autorską metodykę badania potencjalnej aktywności migracyjnej, opartą na wskaźniku pragnień migracyjnych (MDI), który został obliczony na podstawie wyników panelu socjologicznego we Lwowie (2013-2016, 2018-2019). Wskaźnik umożliwia śledzenie zmian w pragnieniach migracyjnych populacji w czasie oraz w różnych grupach społeczno-demograficznych. Grupą o najwyższym pragnieniu emigracji, według wskaźnika MDI, są młodzi mężczyźni (poniżej 30 lat) z wyższym wykształceniem. Przedstawiona w artykule luka między wartościami a potrzebami (tzn. pomiędzy poziomem subiektywnej istotności danego dobra a stopniem faktycznego zaspokojenie tej potrzeby) jest narzędziem do badania najbardziej istotnych problemów, które mogą być przyczyną migracji zagranicznych. Wyniki badania aktywności migracyjnej mogą służyć jako podstawa informacyjna do opracowywania środków zapobiegawczych w zakresie polityki migracyjnej.*

Słowa kluczowe: *aktywność migracyjna, potencjalna migracja, indeks pragnień migracyjnych, luka wartości-potrzeb, Ukraina*

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Assessment of the causes and effects of financial imbalances in Ukraine's regional economies

Abstract. *The article presents the results of an assessment of financial imbalances in the regional economies of Ukraine and their causes and effects, particularly the main factors contributing to the emergence of territorial disparities between the regions. At the present stage, technical progress, investment attractiveness and structural transformations play a key role in equalizing territorial disparities in the economic development of the country's regions. Thus, the task of combating financial imbalances consists of reducing existing regional imbalances and preventing further imbalances in the level of regional development. The imbalances in questions are assessed by taking into account the following economic indicators: gross regional product, industrial output in the region, sold industrial output per capita, agricultural output, sold agricultural output per capita, number of residential buildings completed, the amount of capital investment, the amount of local budget revenues, the amount of wages, the amount of wage arrears.*

Keywords: *financial imbalances, regional economy, gross regional product*

1. Introduction

Today, the assessment of the causes and consequences of financial imbalances in the regional economy is a complex and dynamic process that contributes to the formation of a balanced structure of the regional economy. Financial imbalances in the economy of the regions of Ukraine contribute to economic stability and provide for integrity and autonomy, which are important for regional development. Thus, sustainable, balanced development of regions involves the modernization of regional policy as a whole, which leads to the formation of strategic programs for regional development.

2. Research results

Analytical assessment of information on financial imbalances in the system of endogenous-oriented development of regions, according to the author's method of identification of financial imbalances in the regions (stage IV of the proposed sequence), should begin with the first direction of analysis: arithmetic means in Ukraine.

First of all, we note that the need for a comprehensive analysis of financial imbalances in the regions is due to:

– first, the need to identify possible threats to the functioning of the financial system of the region;

– secondly, the formation of financial imbalances at the regional level is significantly influenced by various factors (both external and internal), which should not be underestimated;

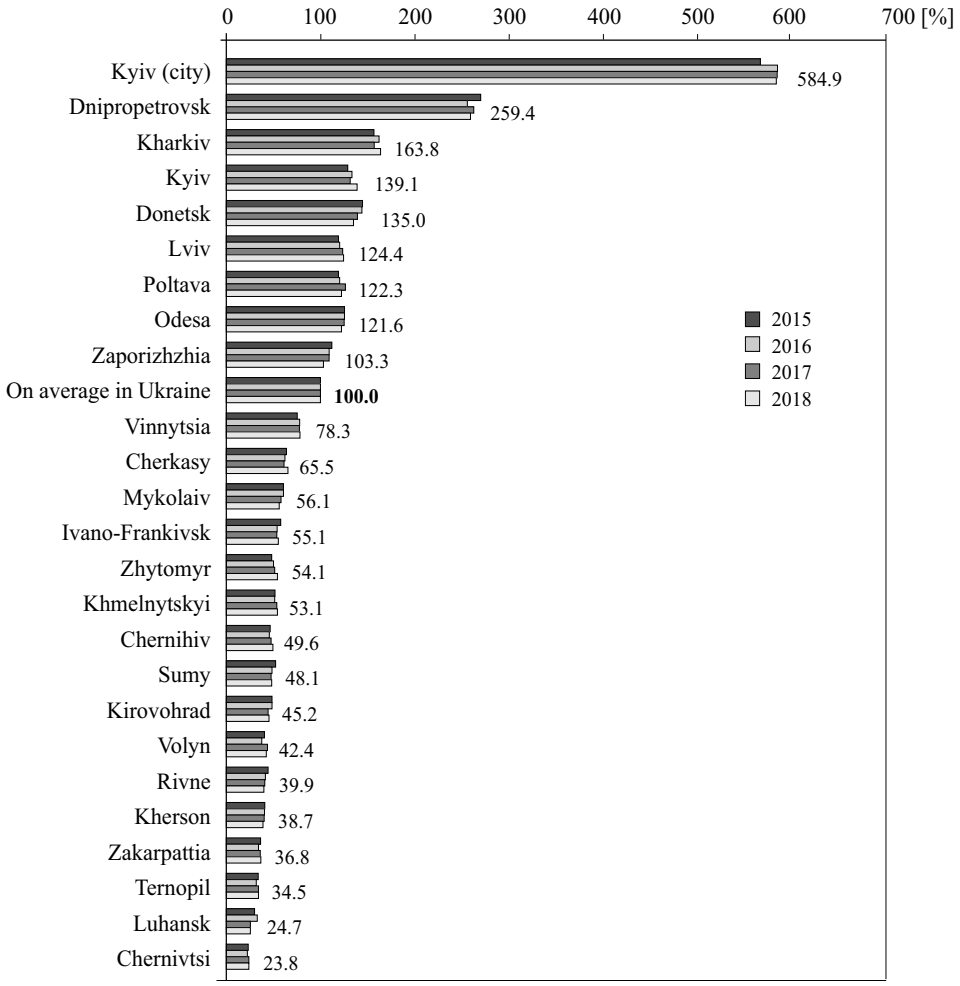
– thirdly, the territorial/geographical features of the region may cause the formation of various imbalances. In this case, it is worth noting that imbalances often arise between imbalances, especially financial imbalances.

One of the main indicators of effective activity of the region is the volume of gross regional product (GRP), as the gross regional product characterizes the level of economic development and results of economic activity of all economic entities of the region (Chart 1). According to the data in the above figure, there is a significant deviation of the gross regional product (GRP) of the capital by 5.8 times higher than the average in Ukraine. Arithmetic means data allowed to assert the presence of imbalances between GRP areas. Thus, Dnipropetrovsk region exceeds the average GRP in Ukraine by 2.6 times or 159.4%.

At the same time, there were significant imbalances between oblasts,[1] whose GRP indicator is insufficient, in particular, the GRP of Chernivtsi oblast is 10.9

[1] An oblast (region) is one of Ukraine's 24 primary administrative units.

Chart 1. The ratio of GRP regions to the average value of GRP in Ukraine during 2015-2018



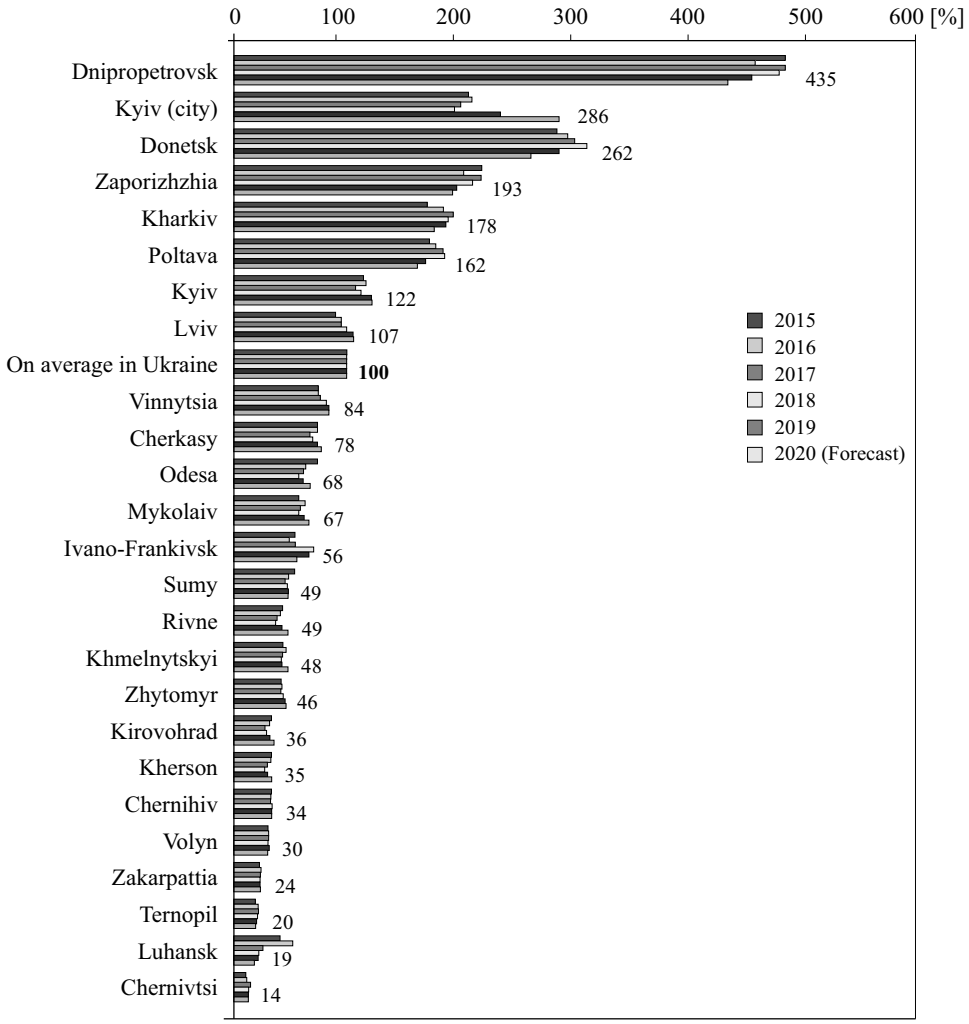
Source: calculated and compiled by the authors based on data SSSU 2019a.

times less than the GRP of Dnipropetrovsk oblast, and four times less than the arithmetic average in Ukraine. This imbalance, first of all, indicates the insufficient level of economic activity of these oblasts, as a result of which the ablest receives insufficient revenues and, accordingly, becomes dependent on the state budget. In general, GRP is defined as the sum of the gross value added of all economic activities, including net taxes on products. Thus, we can talk about the existence of significant economic imbalances between the regions of Ukraine.

3. Estimation of volumes of the made and realized production of regions of Ukraine

Given the fact that the main component of GRP is, including the volume of selling industrial products, we will consider these volumes in more detail on Chart 2 to specify the sources of financial imbalances. According to Chart 2, we

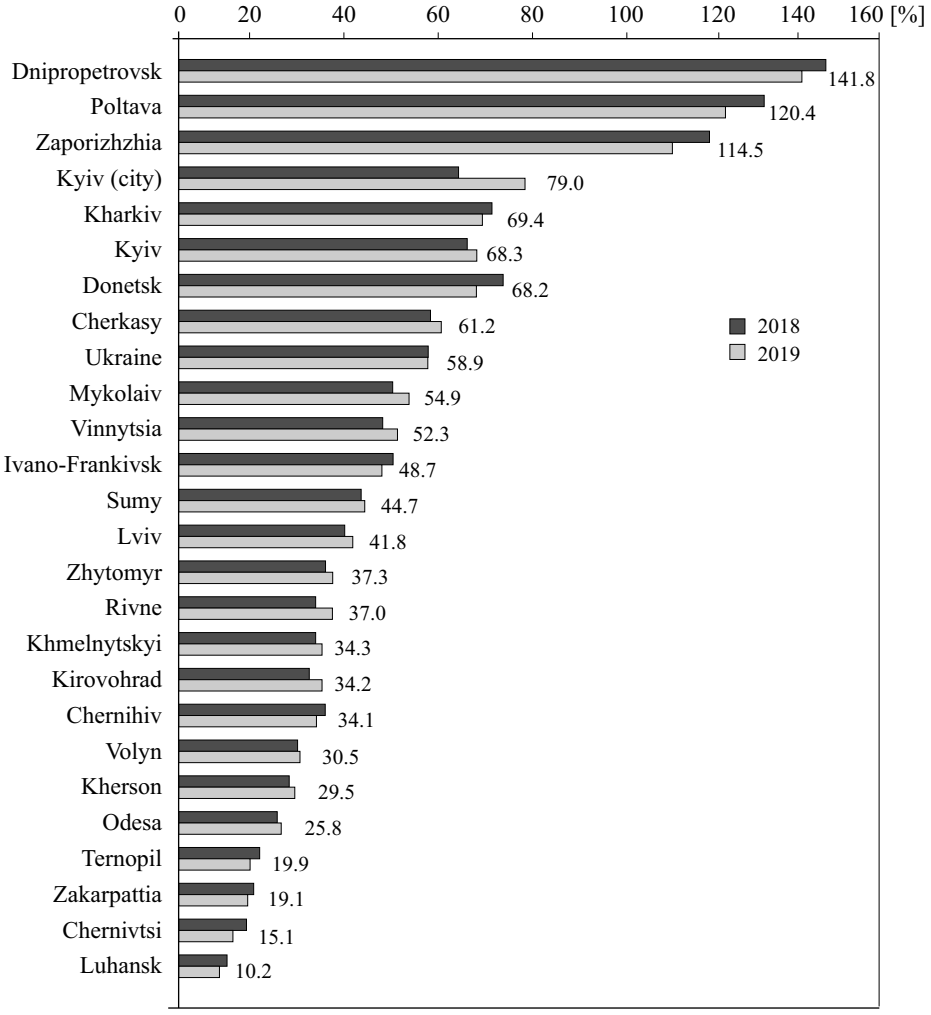
Chart 2. The ratio of industrial output, of the regions in comparison with the average value in Ukraine during 2015-2020 (forecast)



Source: calculated and compiled by the authors based on data SSSU 2020e.

observe a significant financial imbalance, which arises due to a significant gap between the volumes of industrial production in the regions of Ukraine. Thus, the Dnipropetrovsk region continues to lead, producing industrial products 4.35 times higher than the average level in Ukraine. The indicators of Ternopil, Luhansk and Chernivtsi oblasts are of concern, the production of industrial products in these oblasts is insufficient, five times, 5.26 times and 7.14 times lower than the average in Ukraine, respectively. We attribute the existence of such imbalances

Chart 3. The volume of selling industrial products per person in terms of regions of Ukraine during 2018-2019, thousand UAH



Source: calculated and compiled by the authors based on data SSSU 2020e, 2020a.

to the concentration of industrial production in Dnipropetrovsk, Donetsk, Zaporizhia, Kharkiv, Poltava regions and Kyiv, along with a small number of industrial productions in Zakarpattia, Ternopil, Luhansk, Chernivtsi regions. For example, in the Zakarpattia region, the volume of output is UAH 21.97 billion, which is only 23% of the average in Ukraine. This imbalance is due to the concentration of a significant industrial base in some regions of the country.

To more objectively assess the state of production of a gross regional product, consider the indicator in relation to the population of the region (Chart 3). As you can see, the average volume of selling industrial products per capita in Ukraine is 58.9 thousand UAH. In 2019 and 59.2 thousand UAH in 2018. The leaders in these indicators are Dnipropetrovsk, Poltava and Zaporizhia regions, as the obtained indicators in these regions are more than twice the average in Ukraine.

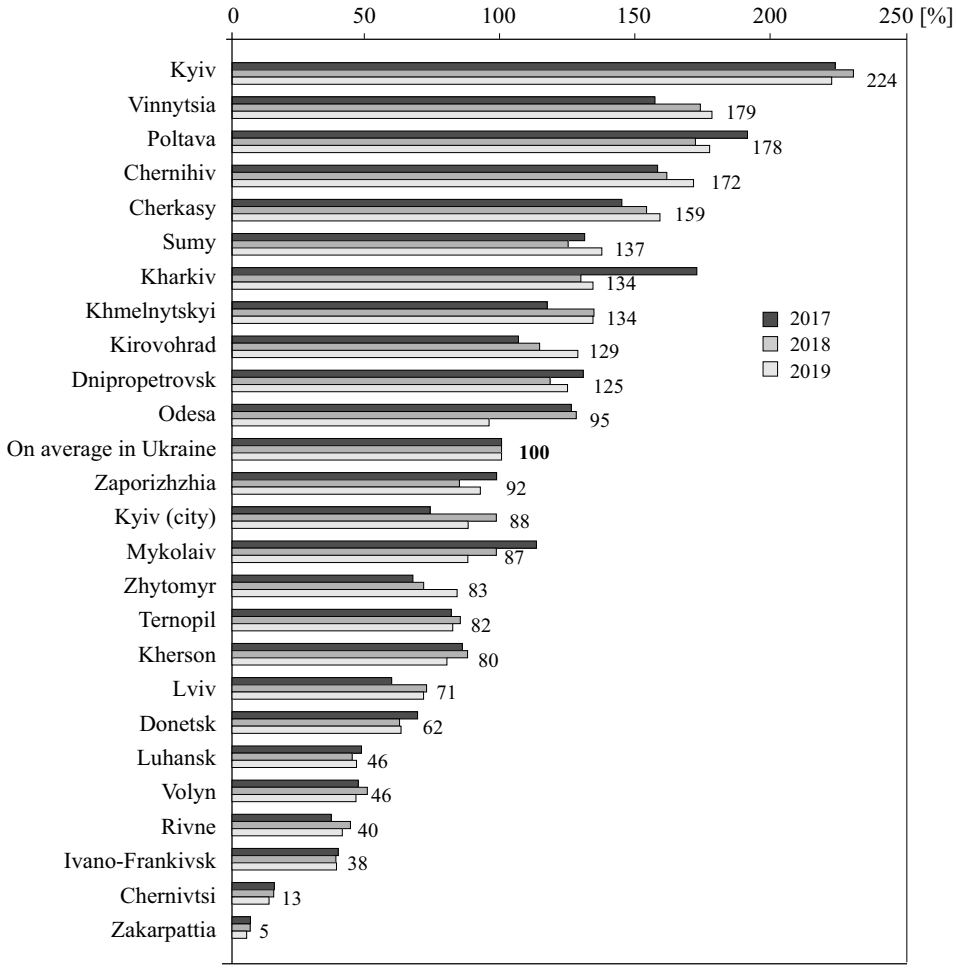
At the same time, we note a decrease in industrial output per capita in 2019 compared to the previous period. If on the average across Ukraine, this indicator during 2019 decreased by 0.3 thousand UAH, across the Dnepropetrovsk area reduction makes 7.3 thousand UAH per 1 person. Thus, we observe numerous imbalances in the development of regions. The level of gross regional product per capita makes it possible to identify the most productive regions of Ukraine and indicates low productivity in Luhansk, Chernivtsi and Zakarpattia regions. At the same time, the low level of productivity of the Luhansk region (which until 2014 showed high productivity and GRP) is associated with the difficult situation in the region, including the anti-terrorist operation.

Consider also the volume of agricultural production by regions of Ukraine (Chart 4). According to Chart 4, leaders in terms of agricultural output are Kyiv, Vinnytsia, Poltava, Chernihiv and Cherkasy regions, which, in our opinion, is due to geographical and climatic features. These areas during 2017-2019 show high volumes of agricultural output.

At the same time, the lack of sufficient areas of fertile soil in the Transcarpathian region, as well as significant emigration of the working population led to a significant imbalance in agricultural production (20 times less than the average in Ukraine and 44.8 times less than produced in the Kyiv region). In total, 11 oblasts out of 24 show higher volumes of agricultural production than the average volumes in Ukraine. In addition, we note a reduction in the volume of agricultural products produced in 2019 by the Zakarpattia region to the level of UAH 798 million, or 17%. A similar situation is observed in the Chernivtsi region, which is less than the average in Ukraine by 87%.

Consider also the indicators of the volume of selling agricultural products per 1 person in terms of regions of Ukraine (Chart 5). Given the population, we observe the leading positions of Chernihiv Kirovohrad, Cherkasy, Poltava and Sumy regions, which allows us to say about the effectiveness of agricultural activities in these regions.

Chart 4. The ratio of the volume of agricultural production of the regions in comparison with the average value of Ukraine during 2017-2019

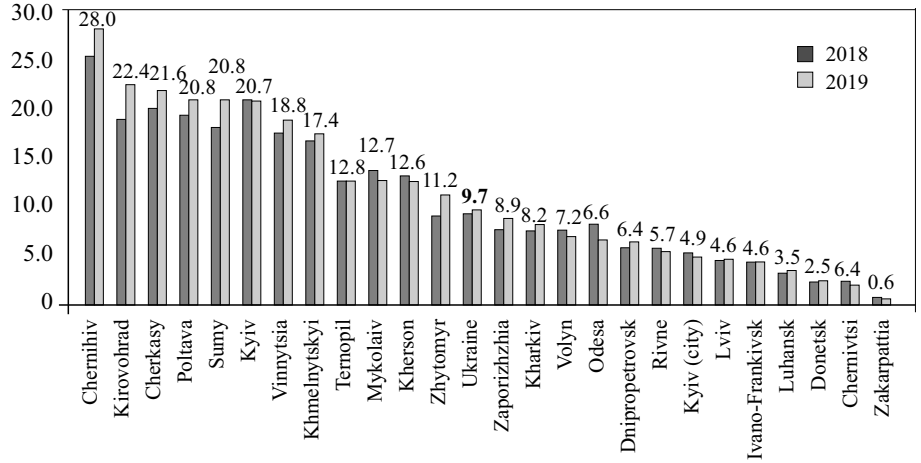


Source: calculated and compiled by the authors based on data SSSU 2020d.

At the same time, Zakarpattia, Chernivtsi, Donetsk and Luhansk oblasts produce and sell in significant volumes of agricultural products per capita, which is due to, among other things, the difficult economic and political situation in eastern Ukraine. In addition, data on the number of population in the region are used for the calculation, which is not adjusted for the number of the population located in the temporarily occupied territory of Donetsk and Luhansk regions.

In general, the main reasons for the negative trends in the reporting period were:

Chart 5. The volume of selling agricultural products per person in terms of regions of Ukraine during 2018-2019, thousand UAH



Source: calculated and compiled by the authors based on data SSSU 2020a, 2020d.

– Restriction of access of producers to credit resources;
– Increase in price of material and technical resources;
– Low level of purchasing power of the population;
– African swine fever (there is a tendency to reduce the incidence of ASF compared to the corresponding period of 2018) [Analiz stanu sotsialno-ekonomichnoho rozvytku… 2019].

Let's analyze in more detail the volume of construction products in the regions of Ukraine (Chart 6).

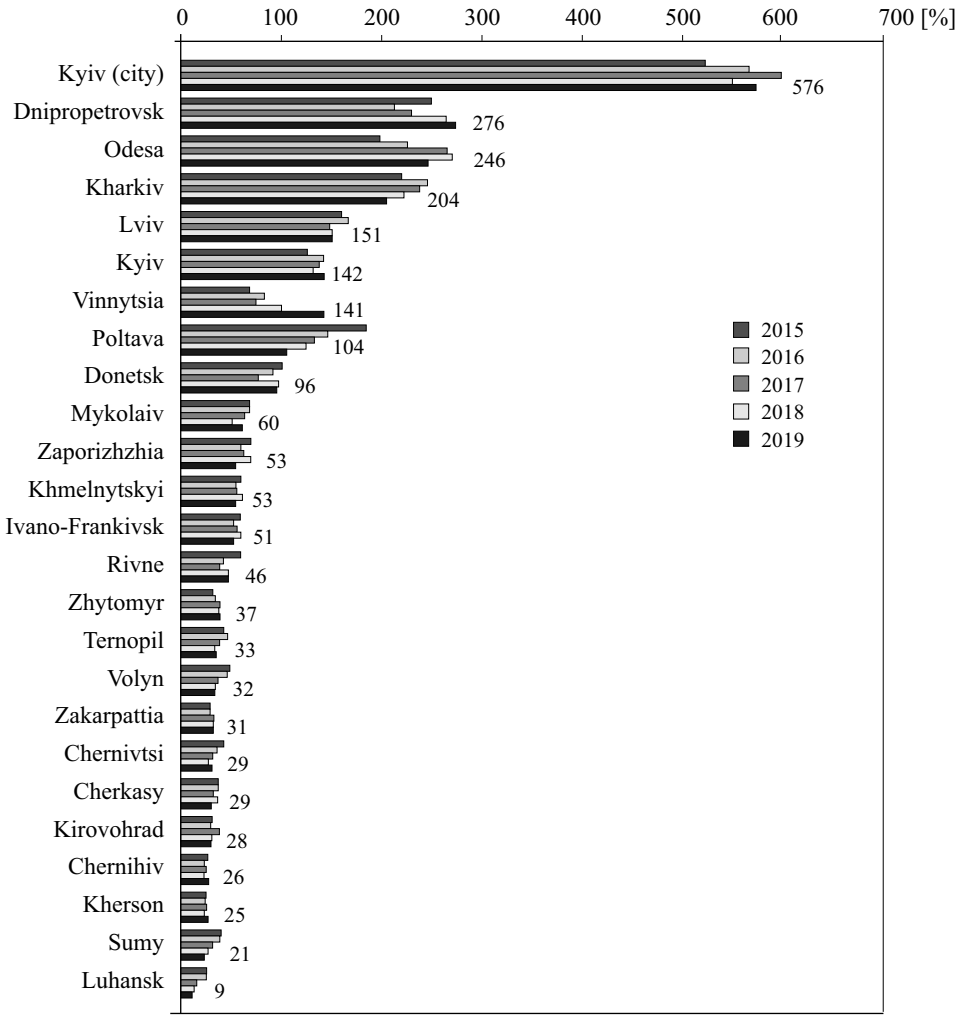
According to the results of 2019 in 22 regions, there was an increase in production of construction products: from 4.4% in Luhansk region to 83.7% in Vinnytsia, in general, in Ukraine the growth was 28.7% (for the corresponding period of 2018 – by 7%).

In terms of regions, the largest growth in construction output, except for Vinnytsia region, was recorded in Chernihiv (1.6 times), Mykolaiv (55.5%), Kherson (50.1%) and Chernivtsi (45.9%) areas.

Negative dynamics in the production of construction products in 2019 were recorded in the Zaporizhzhia region – by 0.04%.

At the same time, we observe the presence of numerous imbalances, especially in the Luhansk region, the volume of construction output is less than the same indicator on average in Ukraine 11 times and less than the indicators of Dnipropetrovsk region 31 times.

Chart 6. The ratio of the volume of construction products produced by region compared to the average value in Ukraine during 2015-2019

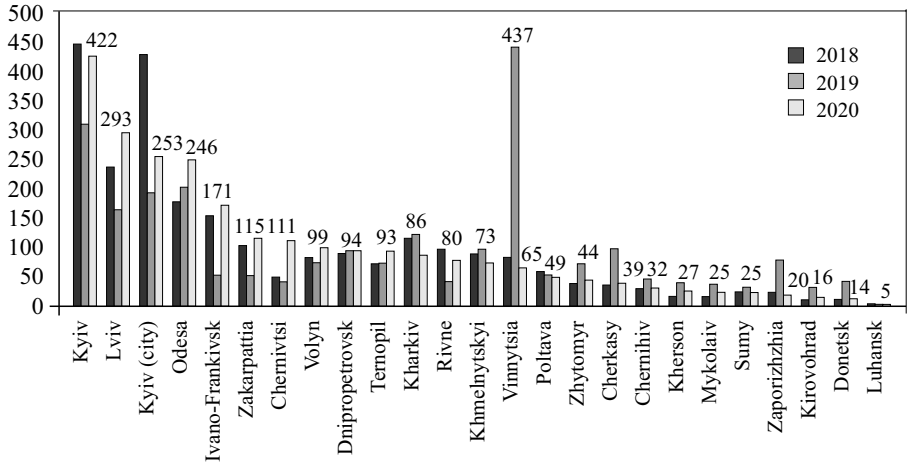


Source: calculated and compiled by the authors based on data SSSU 2020f.

4. Analysis of the area of residential buildings put into operation and capital investments in the regions of Ukraine

The reason for the recorded imbalances, in our opinion, is the numerous differences between the regions of Ukraine, including resources, geographical, eco-

Chart 7. The ratio of the area of residential buildings is put into operation during the average in Ukraine during 2017-2019, %



Source: calculated and compiled by the authors based on data SSSU 2020h.

nomic. These differences cause significant differences in the volume of construction products produced and are objective in relation to the regions.

Since construction products are used, including for housing construction, consider in more detail the amount of housing commissioned (Chart 7).

According to the results of 2019 in Ukraine, compared to the corresponding period of 2018, there was an increase of 50% in the volume of housing commissioned. We note that in Vinnytsia region in 2018 there was a sharp increase in this indicator to 508,470 m^2, which is 50.48% more than in 2017. At the same time, already in 2019, the indicator has decreased to 287,392 m^2, which is 35% less than the arithmetic average in Ukraine.

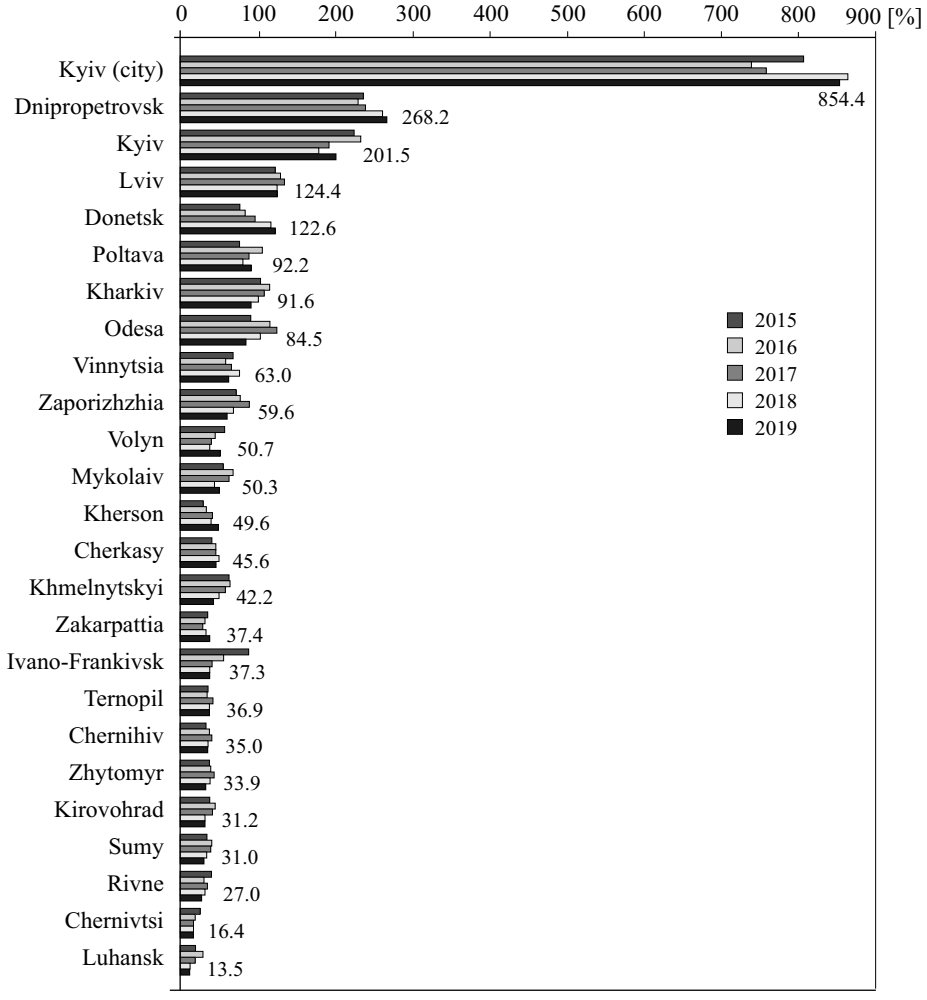
Kyiv, Lviv, Odesa regions and the city of Kyiv show high volumes of housing commissioned during 2017-2019. In the city of Kyiv and Kyiv region, significant volumes of the analyzed indicator are observed in 2017, 4.25 times and 4.22 times higher than the average in Ukraine in this period.

In total, an increase in housing construction was observed in 24 regions during the analyzed period. The increase in the area of residential buildings puts into operation indicates the existence of demand for housing primarily, in the population invests its own savings in living space. At the same time, we can talk about the financial imbalance between the amount of money spent by the population to buy housing between the regions of Ukraine. Thus, in 18 oblasts, the volume of residential buildings commissioned does not reach the average in Ukraine. In Luhansk, Donetsk, Kirovohrad and Zaporizhzhia regions, the area of residential buildings commissioned in 2019 is more than four times smaller than the average in Ukraine.

Consider also the dynamics of capital investment attracted to regional economies (compared to the average in Ukraine) during 2015-2019 (Chart 8).

Graphically displayed indicators of capital investment in the regions as a percentage of the average value of this indicator in Ukraine indicate the existence of a financial imbalance in the distribution of these investments between regions. The main share of investments is concentrated in Kyiv (city), Dnipropetrovsk and Kyiv regions. 34% of all capital investments in regional economies are concentrated in Kyiv (city), which amounts to UAH 213,247.8 million, respectively.

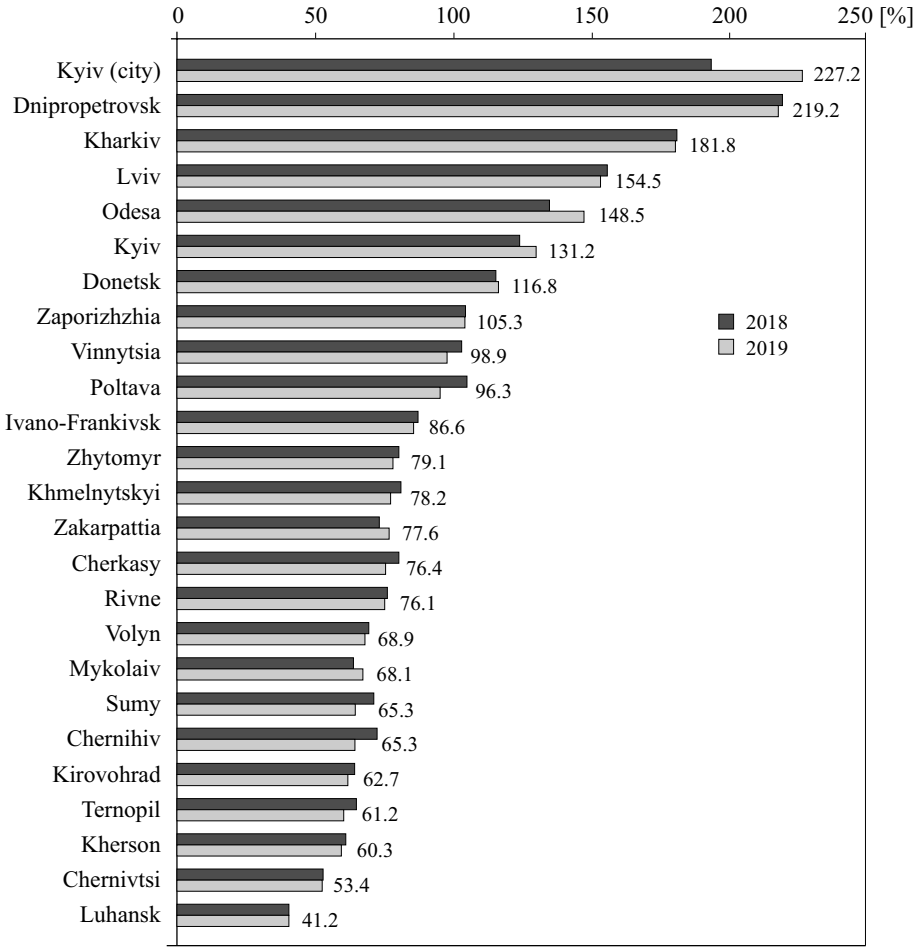
Chart 8. The ratio of capital investments attracted to regional economies in comparison with the average value in Ukraine during 2015-2019



Source: calculated and compiled by the authors based on data SSSU 2020c.

The level of investment in the Dnipropetrovsk region is 2.68 times higher than the average investment in Ukraine. Significant volumes of investments are also concentrated in the Kyiv region, namely UAH 50,295.7 million, which is twice as much as the average in Ukraine. Also, Lviv and Donetsk regions receive significant volumes of investments, which are 24.4% and 22.6% higher than the average volumes of investments in the region in Ukraine. In our opinion, this situation indicates the existence of significant financial imbalances of an investment nature in the regions. 13 regions do not receive even 50% of the average volume of invest-

Chart 9. The ratio of local budget revenues in comparison with the average local budget revenues in Ukraine during 2018-2019

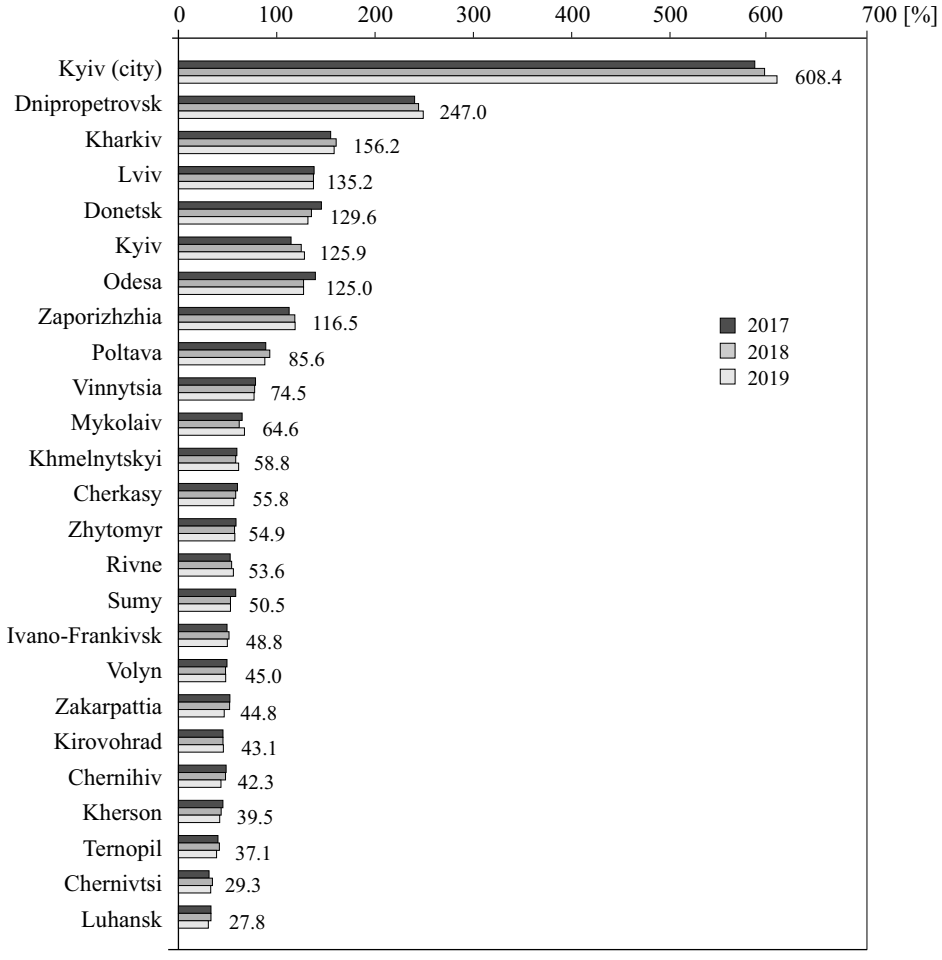


Source: calculated and compiled by the authors based on data BOOST-analiz. Dokhody [BOOST analysis. Income], https://openbudget.gov.ua/analytics/incomes [accessed: 21.09.2020].

ment in Ukraine, and insufficient investment in the region leads to a slowdown in its development and reduced efficiency of economic activity.

Continuing our study, we consider the ratio of local budget revenues in comparison with the average local budget revenues in Ukraine (Chart 9). Dnipropetrovsk, Kharkiv, Lviv, Odesa and Kyiv regions, as well as the city of Kyiv, are characterized by the most profitable budgets. During 2019, the budget revenues of Kyiv (city) increased by 9% compared to the previous period. At the same time, we note the insufficient level of local budget revenues in such oblasts as Luhansk, Chernivtsi, Kherson, Ternopil, Kirovohrad, whose budget revenues do not reach even 65% of the average level of local budget revenues in Ukraine (Chart 10).

Chart 10. The ratio of the wage bill compared to the average in Ukraine during 2017-2019



Source: calculated and compiled by the authors based on data SSSU 2020b.

5. Analysis of the volume of the wage fund by regions of Ukraine

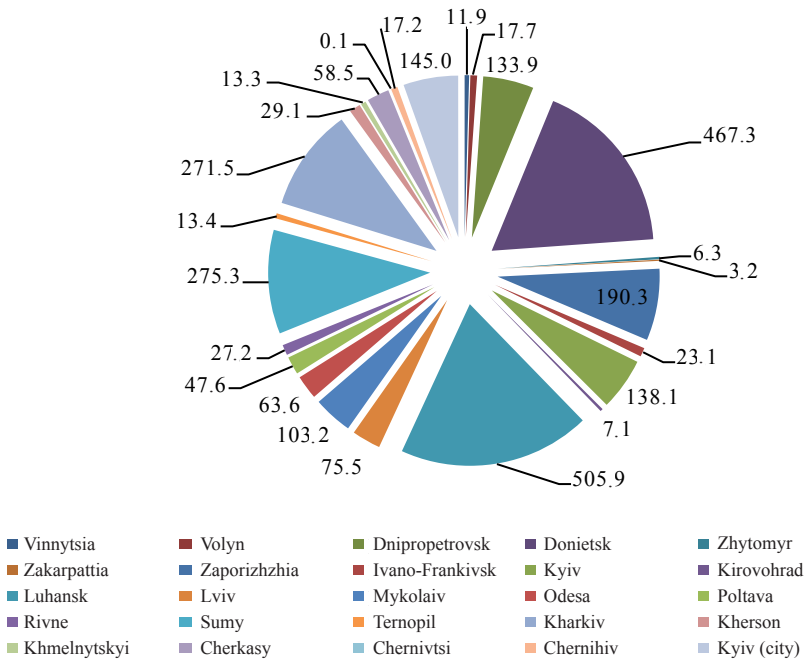
Imbalances of budget revenues cause underfunding of the main directions of the region's development, so they pose a threat. Continuing our study, we consider the ratio of the wage bill in comparison with the average in Ukraine in Chart 10.

We observe that the largest volumes of the salary fund are in Kyiv, Dnipropetrovsk, Kharkiv, Lviv, Donetsk, Kyiv, Odesa oblasts, we note that in the same oblasts we observed the highest volumes of local budget revenues.

In general, during 2019, wages grew faster than prices. During 2019, real wages in Ukraine as a whole increased by 8.6%. Such dynamics were typical for all regions, and in the regional context, the increase in the level of real wages ranged from 6.4% in Odesa to 12.6% in the Dnipropetrovsk region.

At the same time, the wage funds of Luhansk, Chernivtsi, Ternopil and Kherson regions are much lower than the average in Ukraine, by 72.8%, 70.7%, 62.9%, 60.5% below the average in Ukraine, respectively. Consider also the amount of arrears of wages by region (Chart 11).

Chart 11. Volumes of arrears of wages by region during 2015-2019, UAH mln



Source: calculated and compiled by the authors based on data SSSU 2020g.

Considering the amount of arrears of wages in terms of regions of Ukraine, we allocate significant amounts of arrears in Luhansk, Donetsk and Kharkiv regions.

The decrease in the amount of arrears of wages in relation to the wage fund took place in 13 regions, and the lowest values of this indicator were recorded in Chernivtsi and Zakarpattia (0.2%), Zhytomyr (0.3%), Khmelnytskyi (0.4%)), Rivne and Chernihiv (0.8%) regions.

As for unemployment, in 2019 the unemployment rate of the population aged 15-70 years (according to the ILO methodology) in Ukraine amounted to 1487.7 thousand people. A positive trend in reducing unemployment (compared to the corresponding indicators in 2018) took place in all regions, 11 of which are the largest in Luhansk, Rivne, Ternopil, Sumy and Vinnytsia regions. The lowest unemployment rate was recorded in Kharkiv (5.9%), Kyiv (6.3%), Odesa (7.0%), Lviv (7.4%) regions and the city of Kyiv (6.7%), and the highest – in Luhansk (15.3%), Donetsk (14.1%), Volyn (12.3%), Kirovohrad (12.1%), Ternopil and Poltava (11.8%) regions.

6. Conclusions

Thus, based on the above, we can justify that the regions of Ukraine are developing differently and in economic activities face a significant number of financial imbalances. The analysis allows us to state that some areas of the regions are economically weak, as evidenced by disparities within the region's economies, disproportions in the volume of industrial output, disproportions in the volume of agricultural output. Such areas are often referred to as economically backward areas, "disaster areas", depressed areas, subsidized areas, and so on. Depressed areas include parts of Donetsk and Luhansk oblasts, which are temporarily occupied, respectively, face problems with attracting investment, expanded reproduction.

In addition, interregional differences in the level of economic development are complicated by differing depths of social problems. Thus, the level of employment and unemployment of the region's population is an important problem in Ukraine, which is deepening in the current conditions of the pandemic and the spread of coronavirus infection.

The causes of financial imbalances in the regions, in our opinion, lie in the territorial disparities of development. There are several main factors that cause territorial disparities in the regions: Natural and climatic conditions, resource potential, composition and quality of labour, the level of infrastructure in the region, financial market development, the level of investment attractiveness of the region, technical development and structural changes, political factors, etc.

Industrial development and acceleration of economic growth in certain regions and territories, such as Dnipropetrovsk, Kharkiv, Donetsk and Zaporizhzhia

regions. The location of industrial enterprises in areas with favourable conditions, strengthened their economic position in these areas, because due to cumulative development, in parallel with the development of related sectors of the economy, such as industrial and social infrastructure.

At the present stage, technical progress, investment attractiveness and structural transformations play a key role in equalizing territorial disparities in economic development. Thus, the regulation of financial imbalances, in our opinion, aims primarily to reduce existing regional disparities and prevent further imbalances in the levels of regional development by transferring existing, primarily financial, community resources to problem regions in order to expand reproduction and economic efficiency of these regions.

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Ocena przyczyn i skutków nierównowagi finansowej w gospodarkach regionalnych Ukrainy

Streszczenie*. W artykule przedstawiono wyniki oceny nierównowagi finansowej w gospodarkach regionalnych Ukrainy oraz ich przyczyny i skutki, ze szczególnym uwzględnieniem czynników wpływających na powstawanie dysproporcji terytorialnych między regionami. Obecnie w wyrównywaniu dysproporcji terytorialnych w rozwoju gospodarczym regionów kluczową rolę odgrywają: postęp techniczny, atrakcyjność inwestycyjna i przemiany strukturalne. Zadanie zwalczania nierównowagi finansowej polega na zmniejszaniu istniejących dysproporcji regionalnych i zapobieganiu dalszym zaburzeniom w poziomie rozwoju regionalnego. Ocena nierównowagi finansowej została dokonana na podstawie następujących wskaźników ekonomicznych: produktu regionalnego brutto, wielkości produkcji przemysłowej regionu, wielkości produkcji sprzedanej przemysłu w przeliczeniu na 1 mieszkańca, wielkości produkcji rolnej, wielkości sprzedanej produkcji rolnej na 1 mieszkańca, liczby ukończonych budynków mieszkalnych, wielkości kapitału inwestycyjnego, wysokości dochodów budżetów lokalnych, wysokości wynagrodzeń, wielkości zaległości płacowych.*

Słowa kluczowe*: nierównowaga finansowa, gospodarka regionalna, produkt regionalny brutto*

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Analysis of the Ukrainian services sector and its development trends

Abstract. *The article provides an analysis of the service industry in Ukraine, including major parameters that characterize it and the main development trends. The analysis shows that the Ukrainian service industry is undergoing a dynamic yet unstable development, which is typical scenario for countries with a transitional economy. Trade continues to be the main form of activity in the service industry. There are some positive trends, such as the growing market of educational services and rising sales volumes in the sector of computer and information technologies, which remains the only export-capable sector with added value in the Ukrainian services market. The analysis indicates that the service sectors with high added value require additional support to stimulate their efficient development, in particular, to increase the share of capital investment and to attract foreign investment. To attract foreign investment and ensure growth of the service industry, it is necessary to improve the entrepreneurship institutional environment and solve a range of socio-political problems. The author emphasizes that Ukraine has all conditions for the development of the service sectors capable of creating high added value and exerting a positive influence on the country's economic development.*

Keywords**:** *service industry, sectors of the service industry, growth rate, gross value added, investment*

1. Introduction

In conditions of post-industrial society, the service industry gains dynamic development and becomes one of the factors influencing economic growth, raising a country's competitiveness on global markets, and improving the welfare of the population. Expansion of the service industry in global and national scales is explained by the processes of economic liberalization, integration, and globaliza-

tion, dematerialization of production, intellectualization of labor, informatization of social and productive relations, and growing solvency of the population, which increase the consumption of educational, touristic, medical, social, and other types of services.

The practice shows that the service industry is one of the most important and quickly growing components of the economy of the countries and regions. Thus, the share of the service industry in the structure of the GDP in the developed countries exceeds 70%. Over 60% of the workforce is employed there (in the USA – up to 75%). The share of commercial services in global trade has increased twice in the last thirty-five years (from 16.2% in 1980 to 30% in 2017).

The service market has some features that stipulate the specifics of its forming and functioning, namely, the services cannot be accumulated (except for several types) or transported, they do not exist separately from the producer, and are consumed at the moment and place of their provision [Poyta 2013]; the volumes of provided services grow due to growing demand for them. Therefore, the service industry is extremely sensitive to the environment it functions in and is the first to react to new challenges and opportunities. New technologies, changing socio-economic development of society, growing wellbeing and quality of life of the population, the desire to have more time for spiritual and creative development, etc. are the grounds for the swift development of the service industry.

The research of structural and dynamic features of the functioning of the service industry in Ukraine will contribute to outlining the new trends, detecting the problems, and suggesting the ways to solve them with the view to improve the competitive advantages of the country and increase the volumes of the services export on the global market. The research aims to carry out a structural-dynamic analysis of the service industry in Ukraine to detect the main trends and problems of its development.

The sectors of the service industry in Ukraine are determined according to the classifier of the economic activity types (CEAT-2010),[1] which provides that 14 sectors belong to the service industry: wholesale and retail trade; repair of vehicles and motorcycles, transport, warehousing, postal and courier activities; temporary accommodation and catering organization; information and telecommunication; finance and insurance; operations with the immovable property; professional, scientific, and technical activity; administrative support and assistance; public governance and defense; mandatory social insurance; education; healthcare and social assistance; art, sport, entertainment, and leisure; other types of services; the activity of households, activity of exterritorial organizations and bodies.

[1] Klasyfikatsiia vydiv ekonomichnoi diialnosti (KVED-2010) [Classifier of economic activity types (CEAT-2010)], http://kved.ukrstat.gov.ua/KVED2010/kv10_i.html [accessed: 16.09.2020].

2. Features of functioning of the service market in Ukraine: analytical aspect

The service market is developing quite dynamically in Ukraine, although unequally. The misbalances by the types of services and volumes of their provision, the number of employed, the share of services in the GDP structure, etc. are peculiar to the market.

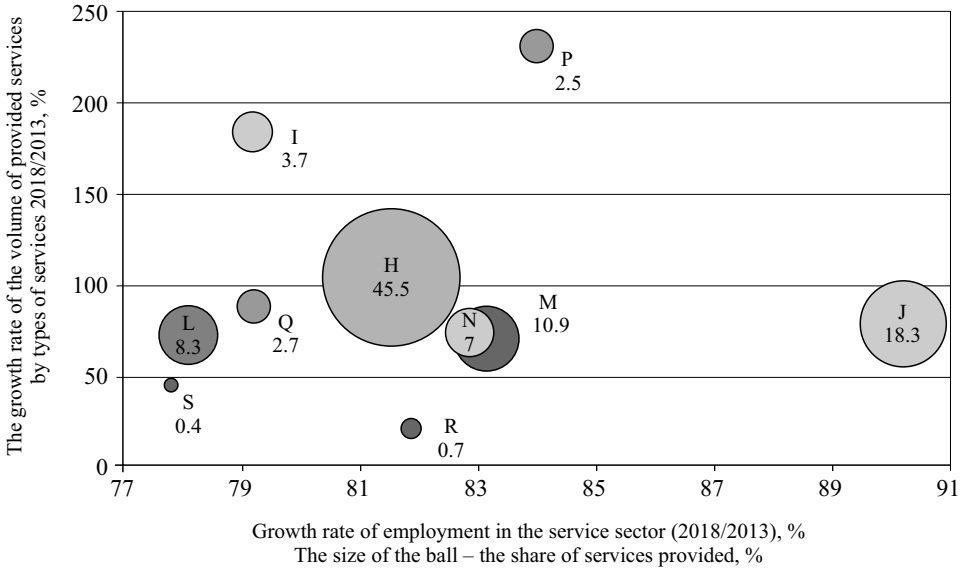
Ukraine, in general, has an ambiguous trend in the service industry development, which is caused by the socio-economic and political instability in the country. In absolute terms, the volume of provided services increased more than twice in 2013-2018 (from UAH 357.1 billion in 2013 to 773.1 billion in 2018), while the growth pace of the services provided in the respective period was 199.1%, which corresponds to the global trends. Yet, taking into account the inflation index in the respective period (252.1%[2]), the growth pace of the volume of provided services was slowing down to 85.9%. The following sectors had the positive growth pace of the volume of provided services with the calculation of the inflation index: education (230.9%), temporary accommodation and catering (102.7%), and transport (102.7%). The growth pace of the volume of provided services in all other sectors was negative (Chart 1). Chart 1 shows that the market of education services is being formed in Ukraine (growth pace of the volume of provided services in education was the highest (230%). It is boosted also by the reforming of the sector, changing volumes and directions of funding, etc. However, the transport sector remains to be the leader by the share of provided services, accounting for 45.5%.

Information and telecommunication services remained the second by their significance in the total volume of services in the last years – 18.3%. Yet, compared to 2013, their share had fallen by 2.1 p.p. The share of professional, scientific, and technical services in the total volume of provided services in 2018 was at the level of 10.9% and had decreased by 2.9 p.p. compared to 2013. The falling share in the total volume of provided services was observed in other types of services, excluding the education and temporary accommodation and catering organization. Ukraine faces the negative trend of falling volumes of provided services among the types of activity with high value, which is partially caused by the unstable political and socio-economic environment in the country in the same period.

Gross value added is an important parameter for the analysis of services functioning. It shows the ability of the service industry to create new value in the amount that can be purchased by the service consumers. The level of intermediate

[2] Kalkuliator infliatsii [Inflation calculator], http://database.ukrcensus.gov.ua/dw_infl_uk/calc_p1d.asp?ter=00000000000&month=12&year=2018&year_b=2013&month_b=&tov=1&kat=4&Submit.x=48&Submit.y=17 [accessed: 6.09.2020].

Chart 1. The changing role of certain types of services in the economy of Ukraine in 2013-2018



H – transport and warehousing; I – accommodation and catering; J – information and communication; L – operations with the immovable property; M – professional, scientific and technical activities; N – administrative support and assistance; P – Education; Q – Healthcare and social assistance; R – Arts, entertainment and leisure; S – Other types of services.

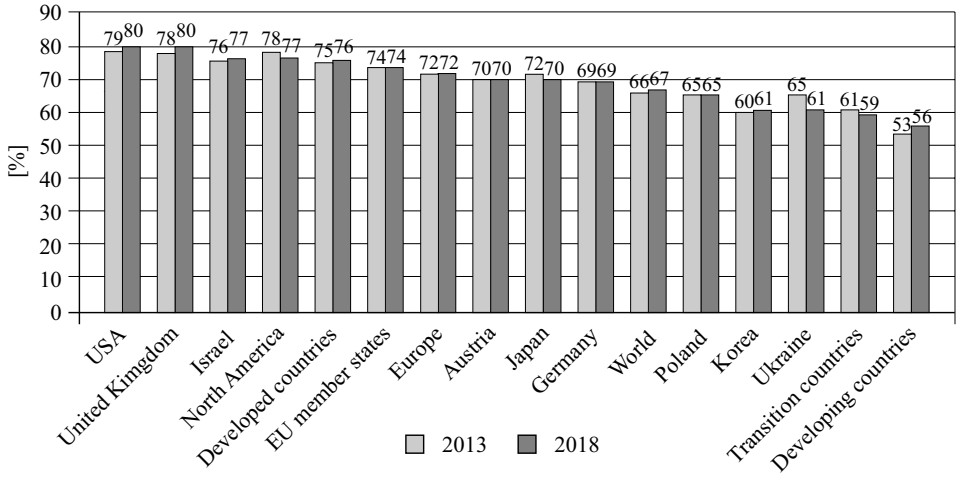
Source: developed based on the data: Derzhavna sluzhba statystyky Ukrainy [State Statistics Service of Ukraine], http://www.ukrstat.gov.ua/ [accessed: 6.09.2020]; Obsiah realizovanykh posluh za rehionamy za vydamy ekonomichnoi diialnosti [Volume of realized services, by regions, by types of economic activity], http://www.ukrstat.gov.ua/ [accessed: 16.09.2020].

consumption in the service industry is quite low, therefore, the GVA shows the efficiency of its activity [Pizhuk 2015].

The growing share of services in the structure of GVA of Ukraine up to 64.54% in 2013 and the fall down to 60.5% in 2018 show the dynamic yet unstable development of the service industry. The trend is peculiar to the countries with transitional economies, which is partially caused by the fact that the most profitable final stages in the value chains are located abroad. At the same time, Ukraine still needs to boost its capacity to increase the share of services in the GVA by 7 p.p. to achieve the average global rate, by 11.8 p.p. – the average European rate, and by 15.5 p.p. – the rate of developed countries (Chart 2).

The structure of services GVA has some specifics by its types, in particular the wholesale and retail trade (15.6%), transport (7.5%), and operations with the immovable property (6.8%) traditionally have the largest shares among the economic activity types. Technological types of services aren't sufficiently developed in Ukraine. Namely, they accounted for 3.6% in the ICT in 2018 and 3.8% in the

Chart 2. Share of gross value added of services in the total volume of GVA of countries and regions



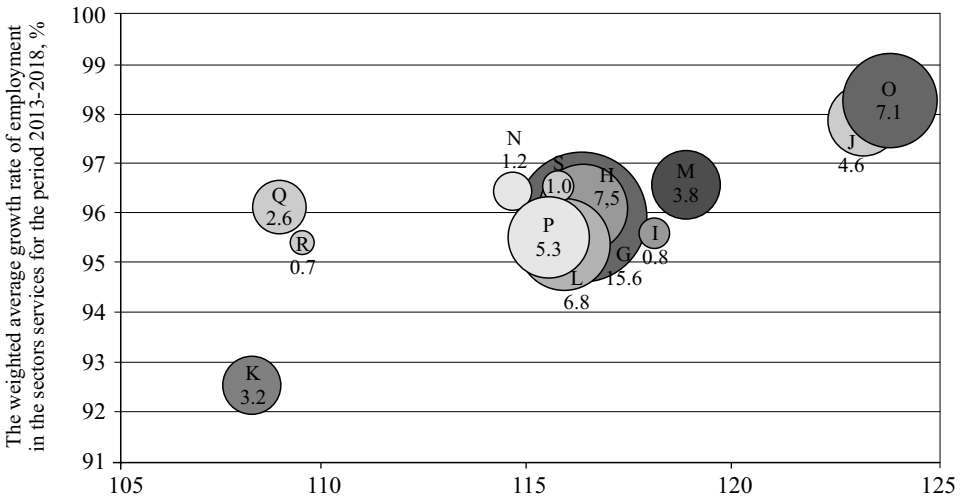
Source: developed based on the data: OECD 2020; UNCTAD 2020.

professional, scientific, and technical activity. The low GVA share of the hi-tech and creative services sectors also indicates the faster development of the sectors that require less investment and secure fast return. The gradual increase of the share of ICT (by 0.9 p.p.), public governance and defense (by 1.6 p.p.), and other types of services (by 4.1 p.p.) in the GVA is observed. It is stipulated by the gradual economic transformation. Meanwhile, the share of services in the GVA reduces the most in the sectors with the highest share of public funding, which is caused by their reforming. They are the education (by 3.5 p.p.) and healthcare (by 3.2 p.p.). Progressive trends in the service industry of the hi-tech countries show the quick increase in the share of information and telecommunication, education, healthcare, licensing, art, sport, entertainment, and leisure services in the GVA structure.

Analysis of the average weighted pace of the services GVA growth (in 2013-2018) demonstrates the positive dynamics, while the highest paces of the services GVA growth were in the following sectors: public governance and defense; mandatory social insurance – 124.1%, and ICT – 123.4%. Growing GVA pace in the ICT is quite natural due to constant and deep ICT penetration into all areas of socio-economic relations. The sector also has a considerable capacity to increase GVA (Chart 3).

The volume and the level of paid taxes are among the indicators of the services' contribution to the economic development because the taxes are the main source of budget revenues to secure the financial framework, which is necessary for the country to perform its functions. The importance of the service industry by

Chart 3. Changing role of the service industry in the economy of Ukraine in 2013-2018



Average weighted growth rate of GVA of service by types of services in 2013-2018, %
The size of the ball – the share of gross value added of a certain type of services in the overall structure of gross value added in 2018

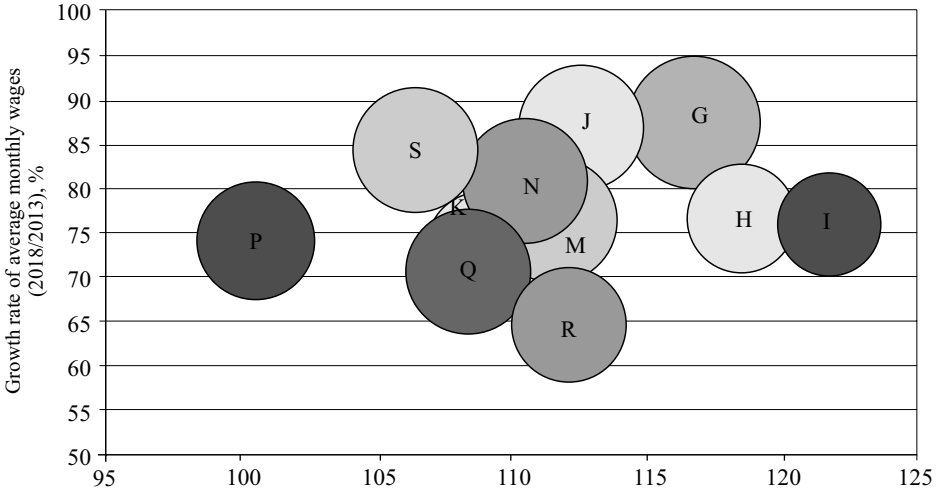
G – wholesale and retail trade, repair of motor vehicles and motorcycles; H – transport and warehousing; I – accommodation and catering; J – information and communication; K – finance and insurance; L – operations with the immovable property; M – professional, scientific and technical activities; N – administrative support and assistance; O – public governance and defence, mandatory social insurance; P – education; Q – healthcare and social assistance; R – arts, entertainment and leisure; S – other types of services

Source: developed based on the data: Derzhavna sluzhba statystyky Ukrainy.

the volume of paid taxes continues to grow. The companies in the service industry paid the total amount of taxes of over UAH 455 billion in 2019, which accounted for 51% of the amount of taxes paid by all companies in the economy of Ukraine. The highest volumes of taxes were paid in trade – 13.72%, transport – 7.56%, and professional and scientific activity – 14% (Chart 5). Trade became the leader by the share of corporate tax (19.3%), single tax (19.7%), VAT reimbursement (28.2%), VAT on goods produced in Ukraine (18.9%), etc. It is obvious that companies in the trade sector remain to be the major taxpayers in the service industry of Ukraine.

The growing share of profitable companies is a positive trend. Whereas there were 62% of them in 2013, in 2018 – already 69%. The share of profitable companies was the highest in trade (76.9%), transport (73.6%), temporary accommodation and catering organization (71.1%), other types of services (71.1%), etc. The share of profitable companies is gradually increasing in all sectors (Chart 4). It can indicate the well-arranged business processes, the gradual coming of the companies out of shadow activity, and reduced external destructive impacts.

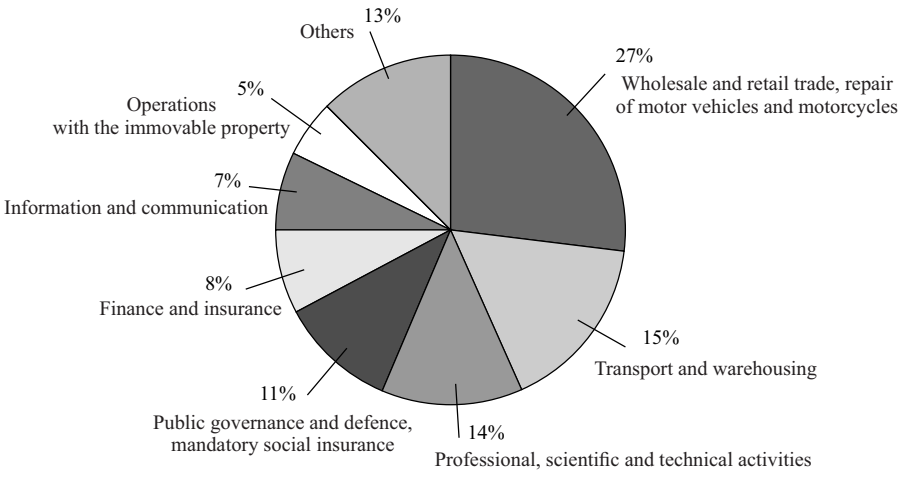
Chart 4. Functioning efficiency of the companies in the service industry of Ukraine



G – wholesale and retail trade, repair of motor vehicles and motorcycles; H – transport and warehousing; I – accommodation and catering; J – information and communication; K – finance and insurance; M – professional, scientific and technical activities; N – administrative support and assistance; P – education; Q – healthcare and social assistance; R – arts, entertainment and leisure; S – other types of services

Source: developed based on the data: Derzhavna sluzhba statystyky Ukrainy.

Chart 5. Structure of tax revenues by the sectors of the service industry in Ukraine in 2019



Source: developed based on the data Struktura podatkovykh nadkhodzhen za haluziamy ekonomiky 2019.

The trade sector evidently continues to keep leading positions in the economy of Ukraine, holding the highest share in the service industry. It is caused by low entrance barrier in many types of activities in the business, which helps entrepreneurs with different size of capital to organize private businesses, and variety of institutional forms for the implementation of the business model (from a small shop to large trade center, easy entrance to regional and global markets using the e-commerce, etc.).

3. Innovative activity of the companies in the service industry as a precondition of its export capacity development

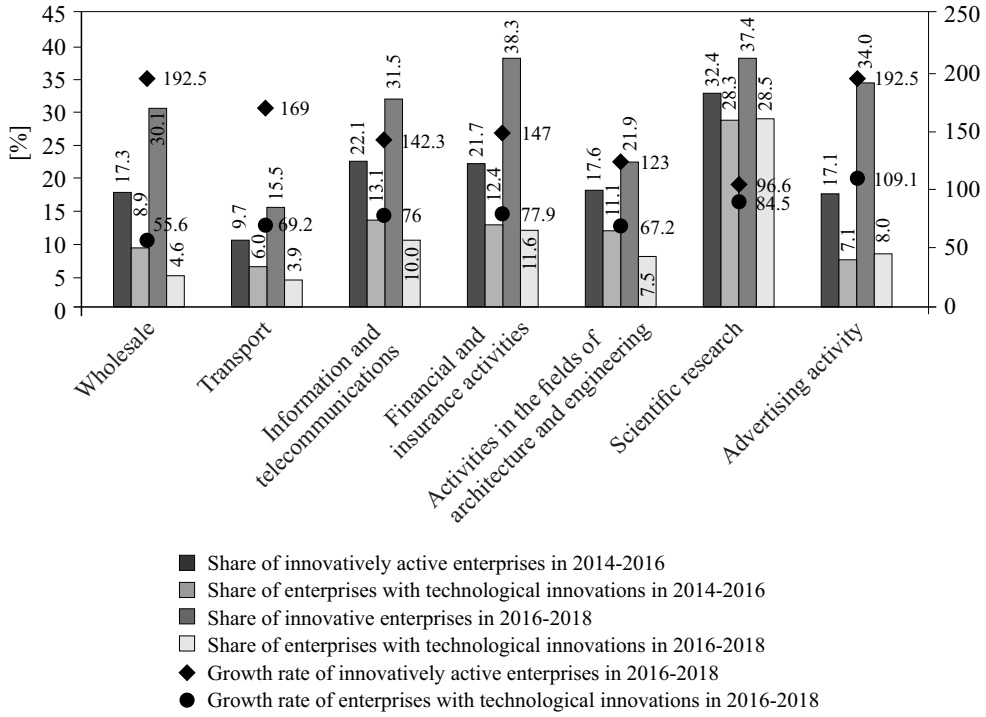
The use of innovations in the activity of companies is one of the indicators of their innovativeness. It also shows their eagerness to improve the management and production processes by creating a more competitive product or a service, which in the future creates an opportunity to enter the regional and international markets. The share of innovatively active companies in the service industry was 26.8% in 2016-2018, showing the growth of 10% compared to 2014-2016 (Chart 6).

Across sectors of the service industry, the highest share of innovative companies in 2016-2018 was in finance and insurance (38.3%), scientific research (37.4%), advertising (34%), ICT (31.5%). The share of innovative companies was lower in transport (15.5%) and in architecture and engineering (21.9%). A modest share of innovative companies is stipulated by the fact that innovative development at companies is funded mostly at their own expense (self-funding) and from bank loans (to a lesser extent due to high interests); at the expense of domestic and foreign investors (their share in total funding is extremely low) [Major, Sveleba 2018]. In 2016, the cost of innovations was mostly covered at the expense of companies (89.5% of the total funding), from funds of foreign investors (3.1%), and from other sources (2.9%) [Obstezhennia innovatsiinoi diialnosti... 2018].

Positive dynamics of the number of innovative companies was observed in all sectors in 2018-2016 compared to 2014-2016, excluding scientific research. Meanwhile, the positive pace of the growth of the number of companies using technological innovations was only in the advertising sector; the fall was observed in all other sectors. Decreasing pace of the growth of innovative companies in the sector of scientific research was caused by reduced public funding of science in general. Yet, the trend is destructive for the further development of both scientific research and the economy of the country as a whole, and it imposes a threat to national security.

The innovative activity of the companies is partially displayed in the export capacity of the companies. Moreover, the volume of services export displays the ability of national sectors of the service industry to compete in international mar-

Chart 6. Innovative activity of the companies in the service industry of Ukraine



Source: based on the data Naukova ta innovatsiina diialnist Ukrainy 2018.

kets. Analyzing simultaneously the trade balance of services, one can determine whether they bring additional foreign currency to the country [Pizhuk 2015].

The highest share in the structure of services export in 2013 accounted for transport services – 50.3%, while the services on the processing of material resources held the second place – 12%. Meanwhile, in 2018, the ICT services export gained second place – 18.2% and had the highest growth pace of 175% (Table 1). The share of transport services in the structure of export had decreased by 7%. The changing structure of export in 2013-2018 indicates the gradual structural reconstruction of the economy directed at a growing share of services with high value and their growing competitiveness on the global market. The ICT services remain to be the only export-capable among the services with a high value on the Ukrainian market, while the volumes of export of financial, insurance, royalty, and other services related to the use of intellectual property, cultural and recreational services remain to be insignificant (less than 1% in the structure of services export in 2018) and have the negative dynamics towards the further decrease.

Table 1. Structure of services export of Ukraine

Types of services	The structure of export of services, %		The growth rate of export of services
	2013	2018	2013-2018
Transport services	56.1	50.3	89.66
Information and communication	10.4	18.2	175.10
Processing of material resources	12.1	14.6	120.68
Business services	10.8	9.1	84.03
Travel	2.5	2.6	102.06
Repair and maintenance	2.5	2.1	84.87
Construction	1.6	1.3	81.79
Financial activity	2.4	0.9	38.93
Insurance	0.6	0.4	63.05
Royalty	0.7	0.4	53.76
Cultural and recreational services	0.3	0.2	65.00
Government services	0.1	0.0	37.05

Source: developed based on the data: Dynamika zovnishnoi torhivli posluhamy za vydamy (utochneni dani) [Dynamics of foreign trade in services by types], http://www.ukrstat.gov.ua/operativ/operativ2008/zd/dseip/dseip2007_u.htm [accessed: 16.09.2020].

The active development of the service industry requires an attraction of additional financial resources both domestic and external. The course of modern political processes mostly negatively impacts the investment climate and international investment attractiveness of Ukraine. The following problems are the reasons for it: the negative international image of the country; substantial misbalances in regional and sectoral development; outdated infrastructure; tax burden; low level of investor protection and corporate management legislation efficiency [Mordan, Bilets, Serdyuk 2017].

Analyzing the capital investment (CI) across the services sectors, the positive dynamics of their share in the total CI volume in Ukraine from 36.1% in 2013 to 44.4% in 2018 can be observed. Therefore, the service industry remains to be attractive for investment.

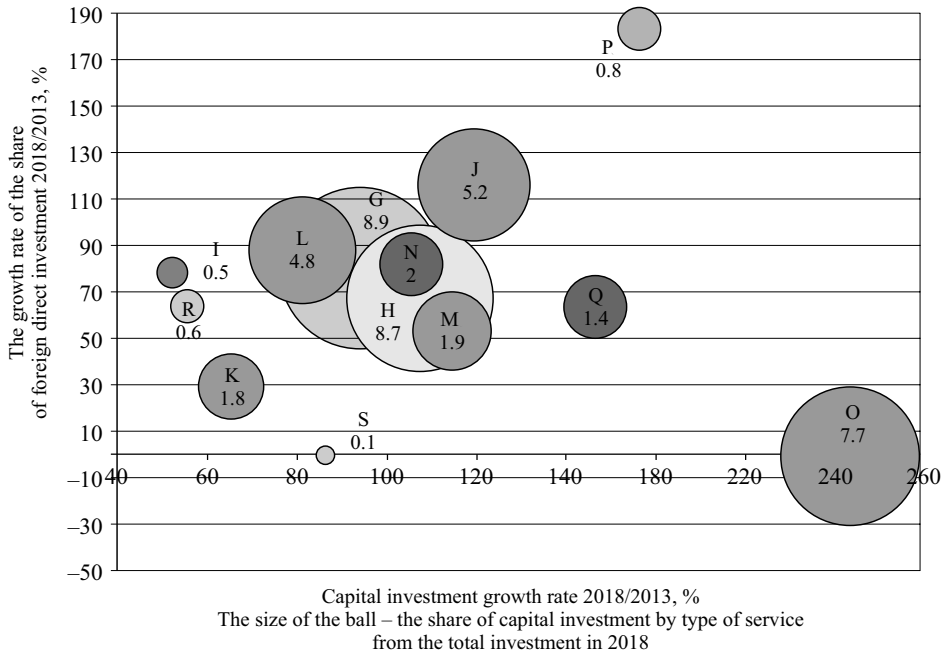
The largest share of CI is directed to the retail and wholesale trade and transport (8.9% and 8.3%, respectively), which is rather understandable considering their largest share in the structure of services sectors by the quantitative parameters of the volume of sold products, employment, etc. Growing CI in public governance and defense up to 7.7% is also entirely natural for a country in the state of war. Meanwhile, the growing CI share in the ICT up to 5.2% shows an interest in their development, which corresponds to the global economic trends. Chart 7 shows substantial growth paces of the CI share in education, healthcare, and scientific activity, yet, the CI volumes remain insignificant, and they can't cope

with the growing needs of development and functioning of these services sectors, which are strategically important for economy.

Traditionally, trade and transport remain the priority sectors for capital investment; the ICT share is gradually growing, yet, investment in scientific activity, education, healthcare, and art, etc., i.e. the sectors capable to produce high value, is insufficient.

However, the well-developed services sectors and those with potentially high value that have the perspectives for further innovative-technological development are more attractive for foreign investors. In 2018, foreign investors were most interested in trade (16.6% of the total investment in the economy of Ukraine – the sector with quick emerging new goods, range, cost-efficiency, and low commercial risks), operations with the immovable property (12.9%), and finance and insurance (11.0%), the sectors that do not require the long-term investment and adoption of new technologies. The share of ICT and professional, scientific, and

Chart 7. Dynamics and attractiveness of domestic and foreign investment by types of services in Ukraine



G – wholesale and retail trade, repair of motor vehicles and motorcycles; H – transport and warehousing; I – accommodation and catering; J – information and communication; K – finance and insurance; L – operations with the immovable property; M – professional, scientific and technical activities; N – administrative support and assistance; O – public governance and defence, mandatory social insurance; Q – healthcare and social assistance; R – arts, entertainment and leisure; S – other types of services

Source: developed based on the data: Derzhavna sluzhba statystyky Ukrainy.

technical activity and became almost equal (6.8% and 6.3%, respectively). Meanwhile, analysis of the growth paces of foreign investment shows a substantial fall in the investment in all sectors, excluding ICT (185%) and education (117%) (Chart 7).

The trend towards the falling investment is caused by the low trust of investors because of a range of unsolved problems, including strong corruption in the country, distrust in the judicial system, unstable national currency, market monopolization, and military conflict, etc [Osnovni pereshkody dlia inozemnykh investytsii v Ukrainu 2019], as well as overcoming technical barriers in trade and undergoing customs procedures; an indistinct and non-transparent legal framework that can be interpreted ambiguously, the practice of frequent legislation changes; high bureaucracy (need to obtain numerous approvals from various institutions); exceeding of the authority by the control institutions, etc. [Markevych 2019]. The quality of the institutional environment to do business, which requires improvement despite a range of positive changes [Syniyra-Rostun 2019] at regional and state levels is one of the most important factors to attract foreign investment to the country.

4. Conclusions

The latest ambiguous trend in the service industry in Ukraine is accompanied by challenges caused by unstable socio-political development in the country and unfavorable global impacts, including those caused by the COVID-2019 crisis. In a global aspect, some services sectors have faced the falling volumes and development paces (tourism (caused by restricted movement among the countries and closed borders), transport, commercial immovable property), while the other had the growing ones (computer and telecommunication services, online trade, electronic logistics, electronic commerce, online entertainment, fast food and delivery, etc.). The largest fall in the volume of sold products in Ukraine (first half of 2020 against the first half of 2019) was recorded in the art (43.9%), other types of services (42.6%), and temporary accommodation and catering organization (49.3%). In transport, the fall was only 7.3% (92.7%), in professional and scientific activity – 2.2% (97.8%), in operations with immovable property – 1% (99%). Meanwhile, the highest growth occurred in education (182.5%) and ICT (104.9%).[3] Ukraine has the perspectives for the development of services sectors that can produce high value. They have manifested the strongest stability in turbulent conditions, and the state has all the preconditions for their development (including the educated human resources). These are the ICT services, the demand

[3] Obsiah realizovanykh posluh za rehionamy za vydamy ekonomichnoi diialnosti [Volume of realized services, by regions, by types of economic activity], http://www.ukrstat.gov.ua/operativ/operativ2018/posl/arh_dpsp_18_17.html [accessed: 2.12.2020].

for which is growing continuously, education, scientific activity, etc. The development of medical services and creative industries is bound to become increasingly relevant, yet currently, they obviously lack attention. The further development of sectors with high value will positively impact the economic development of the country and improve its competitiveness on international markets.

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Analiza ukraińskiego sektora usług i jego trendów rozwojowych

Streszczenie. *Artykuł przedstawia analizę branży usługowej na Ukrainie, w tym charakteryzujące ją wskaźniki oraz główne kierunki rozwoju. Przeprowadzona analiza wykazała, że ukraiński sektor usługowy rozwija się dynamicznie, ale niestabilnie, co jest scenariuszem typowym dla krajów o gospodarce w okresie przejściowym. Główną formą działalności w branży usługowej pozostaje handel. Widoczne są pozytywne trendy, takie jak rosnący rynek usług edukacyjnych oraz wzrost sprzedaży w sektorze technologii komputerowych i informatycznych, który pozostaje jedynym sektorem generującym wartość dodaną z potencjałem eksportowym na ukraińskim rynku usług. Analiza wskazuje, że sektory usług o wysokiej wartości dodanej wymagają dodatkowego wsparcia w celu stymulowania ich efektywnego rozwoju, w szczególności w zakresie zwiększenia udziału inwestycji kapitałowych oraz przyciągnięcia inwestycji zagranicznych. Aby przyciągnąć inwestycje zagraniczne i zapewnić rozwój branży usługowej, konieczna jest poprawa otoczenia instytucjonalnego przedsiębiorczości oraz rozwiązanie szeregu problemów społeczno-politycznych. Autorka podkreśla, że Ukraina posiada wszelkie warunki do rozwoju sektorów usługowych, które mogą tworzyć wysoką wartość dodaną i pozytywnie wpływać na rozwój gospodarczy kraju.*

Słowa kluczowe*: usługi, sektory usług, tempo wzrostu, wartość dodana brutto, inwestycje*

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Border regions as an element of Ukraine's regional policy

Abstract. *The article outlines the characteristics of a border region in the context of EU cohesion policy and its place in the nomenclature of territorial units with reference to Eurostat's methodological manual on territorial typologies. Taking into account the definitions of border areas and border regions in Ukrainian legislation, the author analyses the role of border regions in Ukraine's regional policy, with emphasis on functional border areas the context of increasing cross-border cooperation. Cross-border cooperation is seen as a priority in the implementation of regional development strategies in Ukraine. For this reasons the author's attention focuses on the role of territorial communities, which are involved in cross-border cooperation, particularly with regard to the national cross-border cooperation programme, which serves as a tool of public support in this area.*

Keywords: *border area, border region, public regional policy, cross-border cooperation, territorial community*

1. Introduction

Deepening the cooperation between Ukraine and the EU stipulates mutual understanding and cooperation in regional policies and coordination of the methods of development and implementation of regional policy with special emphasis on the development of disadvantaged districts and territorial cooperation, including the establishment of links and expansion of information exchange between the national, regional, and local authorities and self-governing bodies, socio-economic entities, and civil society [Verhovna Rada 2015b].

In the EU, the border regions are delineated according to the Nomenclature of territorial units for statistics – NUTS. The NUTS nomenclature is applied only by the EU Member States. The NUTS classification is a hierarchical system of division of the EU economic territory for the purpose of collection, development, and harmonization of regional statistics; socio-economic analysis of regions; determining the EU regional policy. The NUTS principles are population thresholds, NUTS favours administrative divisions, regular and extraordinary amendments.

Eurostat has developed and is using the methodological manual on territorial typologies to secure the conformity and comparability of statistical information, in particular for internal border regions [Eurostat 2011]. It helps the consumers to understand and interpret a wide range of official statistics. According to the Eurostat typologies, a border area is classified as NUTS3. Internal border regions in the EU are:

– regions along the border that are adjoining the border;
– regions with over half the population residing within 25 km from the border.

2. Legislative definition of the border area in Ukraine

In Ukraine, a border area is not defined in legislation, yet, the Law of Ukraine "On State Border" provides the interpretation of "borderland" and "controlled border area" [Verhovna Rada 1992].

Borderland is established directly along the state border of Ukraine at its land sections or along the banks of border rivers, lakes, and other water basins, taking into account the features of geographic area and conditions defined by the Cabinet of Ministers of Ukraine. The borderland does not include the settlements and places of recreation of the population.

Controlled border areas are usually established within the territory of a district, city, village council, which adjoins the state border of Ukraine or the sea coast and is protected by the State Border Service of Ukraine. The controlled border area also includes the territorial sea of Ukraine, internal waters of Ukraine, and some part of waters of border rivers, lakes, and other water basins of Ukraine, and islands located in these waters. The Resolution of the Cabinet of Ministers "On the Controlled Border Areas" provides the list of cities and districts at the territory of which the controlled border areas are set [Verhovna Rada 1999].

3. Border region as an object of state regional policy of Ukraine

The border regimen that regulates the entrance, stay, residing, and movement of Ukrainian residents and other persons, holding the works, recording and hold-

ing of self-propelled and non-self-propelled vessels at wharves, berths, and stations, their navigation and movement in the internal waters of Ukraine is established in the borderland and the controlled border area according to the procedure defined by the Cabinet of Ministers of Ukraine.

Intergovernmental agreements on local border movement in the EU-Ukraine cross-border space define the *border zone* as the territory of administrative units of the states of Concluding Parties that is within the 30 kilometers from the joint border; if some part of the administrative unit is located between the 30th and 50th kilometer from the borderline, it is still recognized as a part of the border zone [Verhovna Rada 1998].

The object of public regional policy of Ukraine constitutes a territory of:

– regions – a region is the territory of the Autonomous Republic of Crimea, oblasts, Kyiv and Sevastopol;

– macroregions – a macroregion is a part of Ukrainian territory that includes several regions or their parts consolidated by joint features, having similar development problems, and covered by specific regional development programs;

– microregions – a microregion is a part of the territory of a region that is characterized by territorial integrity and development features and covered by specific regional development programs;

– groups of regions (or their parts), cities, villages, settlements consolidated by the criteria and according to the procedure established by the Cabinet of Ministers of Ukraine.

The documents that envisage the public regional policy include [Verhovna Rada 2015a]:

– State Regional Development Strategy of Ukraine and Action Plan on the Implementation of the State Regional Development Strategy of Ukraine;

– regional development strategies and action plans on the implementation of regional development strategies;

– investment programs (projects) directed at the development of regions.

The 2021-2027 State Regional Development Strategy provides new approaches to public regional policy for a new planning period, namely the transition to territory-oriented development policy based on stimulation of the use of territories' capacity, granting support to the territories characterized by specific socio-economic problems, high historical and cultural capacity, environmental conditions and needs for environmental protection. The Strategy defines the functional types of territories to be in the focus of public regional policy till 2027 [Cabinet of Ministers of Ukraine 2020b].

The 2021-2027 State Regional Development Strategy delineates a border region as a type of territory that requires special attention from the state and the application of specific mechanisms and tools for their development.

Border regions are the regions located directly close to the border. According to the Law of Ukraine "On the Foundations of Public Regional Policy", a region is the territory of the Autonomous Republic of Crimea, oblasts, Kyiv and Sevastopol [Verhovna Rada 2015a]. Yet, if we delineate the border region in Ukraine following the EU methodological manual on territorial typologies [Eurostat 2011], the new administrative-territorial structure provides that NUTS3 corresponds to the sub-regional (district) level in Ukraine. It is clear that in the process of implementation of the EU methodological manual on territorial typologies with regard to current Ukrainian legislation in the framework of the 2021-2027 State Regional Development Strategy, a border region is defined as a territory of the respective border oblast and border area (borderland of close contacts) as a territory of regions located directly at the state border.

The border region is also mentioned in the State Cross-Border Cooperation Development Program, which defines the public regional policy of Ukraine [Cabinet of Ministers of Ukraine 2020a]. Public support of the development of cross-border cooperation stipulates the following: determining the priority directions of the public support to the cross-border cooperation development; securing the funding of cross-border initiatives, activities, projects, programs, and strategies that receive funding under the international technical assistance programs; forming and implementation of preferential customs, monetary, fiscal, and other economic activity conditions for the cross-border cooperation participants; concluding the intergovernmental agreements on border crossing simplification, cross-border cooperation forms; selection of projects (programs) of cross-border cooperation that require state support; elaboration and execution of public cross-border cooperation development programs; providing the legal, organizational, methodological, informational support and assistance to cross-border cooperation entities and participants in Ukraine.

Yet, it is worth mentioning that, according to the Law of Ukraine "On Cross-Border Cooperation" , the territorial communities are the cross-border cooperation entities [Verhovna Rada 2004]. In the course of implementation of public regional policy in Ukraine with regard to the public support to the development of cross-border cooperation, the following territorial communities should be delineated:

– border territorial communities – territorial communities directly adjoining the state border;

– territorial communities in the territorial boundaries of a border region according to the documents that define the public regional policy in Ukraine (State Regional Development Strategy, State Cross-Border Cooperation Development Program);

– territorial communities in the area of close contacts and in territorial boundaries of border areas in the framework of implementation of the 2021-2027 State Regional Development Strategy;

– territorial communities covered by the European Neighborhood Instrument (ENI), Neighbourhood, Development and International Cooperation Instrument (NDICI), etc. For example, the ENI 2014-2020 Cross-Border Cooperation Program Poland-Belarus-Ukraine is directed at border regions of Poland, Belarus, and Ukraine. On the Polish side, the Program covers NUTS3 units, in Ukraine and Belarus – the territorial units of the oblast level (corresponding to NUTS2) [European Commission 2017].

The 2021-2027 State Regional Development Strategy defines the tasks for cross-border cooperation according to the following directions:

● Creation of the conditions for further development of mountain areas in Ukrainian Carpathians. The tasks are:

1) To create an efficient system of cooperation between countries, regions, and communities located at the territory of the Carpathian macroregion and to interact in the framework of interregional and cross-border cooperation.

2) To secure active participation and consideration of Ukrainian interests in the course of forming the EU policies and instruments in the area of the Carpathian region's development, including in terms of preparation and implementation of the EU macroregional strategy for the Carpathian region.

● Development of the territories of the Ukrainian part of the Danube region and cross-border cooperation. The tasks are:

1) To secure the proper level of participation of Ukrainian representatives in activities and events held under the EU Strategy for the Danube Region, to strengthen coordination with the countries participating in the Strategy to develop and implement joint projects.

2) To take into account the priorities of the EU Strategy for the Danube Region in transport, agrarian production, environmental protection, tourism, promotion and preservation of cultural heritage, etc. in sectoral strategies.

3) To secure active participation in the Conference of Danube Parliamentarians.

4) To promote the attraction of the funds of international technical assistance and international financial organizations to promote regional development, in particular in the Danube River basin.

5) To develop the 2027 Draft State Cross-Border Cooperation Development Program and to secure its implementation.

6) To promote the forming and development of cross-border clusters in Ukraine.

7) To introduce the mechanisms of support of cross-border industrial and technological parks as well as economic and industrial zones at the territory of Ukraine to boost regional economic development.

8) To secure the participation of Ukraine in the border cooperation programs in 2021-2027 at the expense of EU funding.

9) To secure cooperation with the EU in preparation of new programs of territorial cooperation under the Eastern Partnership.

10) To create conditions for socio-economic and environmental development of the territories at the Ukrainian part of the Danube region that include the development of infrastructure for transport connection with the Danube countries and border crossing infrastructure and to solve the issues of maintaining the quality water supply and flood protection at the respective territories.

● Support of the interregional cooperation programs and exchanges between Ukrainian regions. The tasks are:

1) To secure the development of cross-border, inter-municipal, and macroregional cooperation in the development and implementation of joint projects on sustainable development.

2) The State Cross-Border Cooperation Development Program is a tool to implement the State Regional Development Strategy. The 2021-2027 Draft State Cross-Border Cooperation Development Program provides the following directions [Cabinet of Ministers of Ukraine 2020a]:

– promotion of implementation of the EU Strategy for the Danube Region and the Danube Transnational Programme in Ukraine;

– implementation of projects (programs) funded by international technical assistance and under the Neighbourhood, Development and International Cooperation Instrument (NDICI);

– development of mountain border areas in the Carpathians;

– promotion of the development of non-public institutions (NGOs) in the cross-border cooperation domain.

4. Border area as an object of regional development strategies of Ukraine

Regional development strategies should correspond to the provisions of the State Regional Development Strategy of Ukraine. Regional development strategies are elaborated for the operating period of the State Regional Development Strategy of Ukraine. It is worth mentioning that regional development strategies had been elaborated and approved by the oblast councils of Ukraine before the 2012-2027 State Regional Development Strategy of Ukraine was approved. The fourth part of regions delineated as the border ones by the 2021-2027 State Regional Development Strategy does not mention the cross-border cooperation in strategic and operating goals and tasks for their implementation in the regional development strategies. Only one regional development strategy indicates the development of cross-border cooperation as a strategic development goal of Volynska oblast.

5. Conclusion

Based on the abovementioned, the following issues should be addressed in the process of implementation of the territorially-oriented development policy grounded on stimulation of the use of border areas' capacity in conditions of cross-border cooperation activation:

1) Strengthening the institutional capacity of the entities and participants of cross-border cooperation in the context of public support of the development of cross-border cooperation through:

– legal, financial, informational, and consulting support of forming and development of EGCs and EGTCs;

– support in training, retraining, and career development of managers in cross-border cooperation;

– extended cooperation of local authorities, businesses, and civil organizations in cross-border cooperation.

2) Strengthening the public support to the development of border regions, including:

– development of border infrastructure: development of border crossing points and border road infrastructure; improvement of transparency and efficiency of border and customs control;

– securing the implementation of the cross-border cooperation policy based on regional smart specialization (joining the European S3 Platform, development of joint strategies based on regional smart specialization, detection of cluster initiatives)

– creation of proper legal and economic conditions necessary for the development of cross-border groupings (cross-border clusters, cross-border parks, cross-border partnership, etc.).

3) Introducing the changes in regional development strategies in accordance with the 2021-2027 State Regional Development Strategy to improve the competitive ability of border regions in conditions of boosted cross-border cooperation (competencies of local authorities and local self-governing bodies).

4) Developing and approving the regional cross-border cooperation programs in correspondence with the 2021-2027 State Regional Development Strategy and State Cross-Border Cooperation Development Program.

5) Taking into account new approaches to the public regional policy according to the 2021-2027 State Regional Development Strategy, State Cross-Border Cooperation Development Program, and regional cross-border cooperation programs in the process of development strategizing by the newly created territorial communities that would allow attracting additional resources in 2021-2027 to solve the development tasks and improve the capacity of territorial communities.

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Regiony przygraniczne jako element polityki regionalnej Ukrainy

Streszczenie. *Artykuł przedstawia cechy regionu przygranicznego w kontekście polityki spójności UE oraz jego miejsce w nomenklaturze jednostek terytorialnych w odniesieniu do podręcznika metodologicznego Eurostatu dotyczącego typologii terytorialnych. Uwzględniając definicje obszarów przygranicznych i regionów przygranicznych w prawie ukraińskim, autorka analizuje rolę*

regionów przygranicznych w polityce regionalnej Ukrainy, ze szczególnym uwzględnieniem funkcjonalnych obszarów przygranicznych w ramach zacieśniania współpracy transgranicznej. Współpraca transgraniczna jest postrzegana jako priorytet w realizacji regionalnych strategii rozwoju na Ukrainie. Z tego względu uwaga autorki skupia się na roli wspólnot terytorialnych, które są zaangażowane w tego typu współpracę, w szczególności w ramach krajowego programu współpracy transgranicznej, który jest narzędziem wsparcia publicznego w tym obszarze.

***Słowa kluczowe**: obszar przygraniczny, region przygraniczny, publiczna polityka regionalna, współpraca transgraniczna, wspólnota terytorialna*

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Public control over the use of budget revenues of local communities in Ukraine

Abstract. *The decentralization reform, started in 2014, aims to change not only the administrative structure of Ukraine but also the budget system. The purpose of the article is to identify key aspects required for implementing public control in Ukraine. The study provides an overview of tools of public control and reports results of surveys conducted to collect views of civil society activists and experts on public control in the process of decentralization. Emphasis is placed on the main instruments of public control, which include public hearings, elements of e-democracy etc. According to most respondents asked in the survey of public activists and specialists in the field of local finance in Lviv and Kharkiv regions, NGOs have more opportunities to control the spending of local budgets. The main problems in the way budget funds are spent include the low level of transparency of budget planning and implementation and the low efficiency of collecting and spending budget revenues.*

Keywords: *public control, local budget, local community*

1. Introduction

Reforms of local administrative and financial decentralization, which have been implemented in Ukraine since 2015, are aimed, on the one hand, at creating affluent local communities (named in Ukraine – amalgamated hromadas) – and increasing the welfare of their inhabitants, on the other – at increasing citizens' responsibility for their local communities. In these conditions, the issue of public control over the activities of local governments in the local communities, in particular regarding the use of local budget resources, is extremely relevant. Public control over the

movement of community financial resources allows community residents not only to ensure their effective use in accordance with its basic needs, but also requires citizens to have the appropriate level of knowledge of the budget process and budget legislation, which helps increase financial literacy of public control.

The issue of public control is widely covered in the publications of Polish scholars. For example, in the works of D. Budzeń [2015] highlights the features of 25th years' experience of local government and the ability of society to influence the decisions of communes, in some research [e.g. Wyporska-Frankiewicz 2020] discovered control dividing and supervision (including public) of local governments and identifies the role of openness of information to the public, and in case research [Barczak 2019; Rakoczy 2007] especially highlights the environmental direction, and the community's ability to influence the environmental situation in the region. There are global studies on public participation in local government, such as the work of the European Tribunal of Auditors in 2019, which cover public control in the context of the European Union.

2. Levels of public participation and tools of public control over the local budget's resources of local communities

Based on the analysis of the levels of society possible influence over government decision-making, four levels of public participation can be distinguished, differing in the depth of stakeholder involvement in the decision-making process, including budget allocation: informing, consultation, dialogue, partnership.

Informing – unilateral relations, during which the governing body of the local communities provides the public with information on the formation, approval, filling and use of the local communities budget. This relationship involves both the provision of information at the initiative of the authority and its provision at the request of the public [Kupriy 2019: 1-2].

According to a program research "Decentralization brings better results and efficiency (DOBRE)" [DOBRE 2019], informing is the main level of communication in modern Ukrainian local communities. The main problems at the stage of disclosure of informing are:

– incomplete placement of information on budgets on the websites of local communities, which complicates the process of analytical evaluation;

– in most, but not all, local communities (80%) websites contain information of current year budget;

– there is almost no information of the current local budget`s using, only annual reports are published;

– only 53% of the surveyed communities published budget program passports on their websites, which violates legal norms;

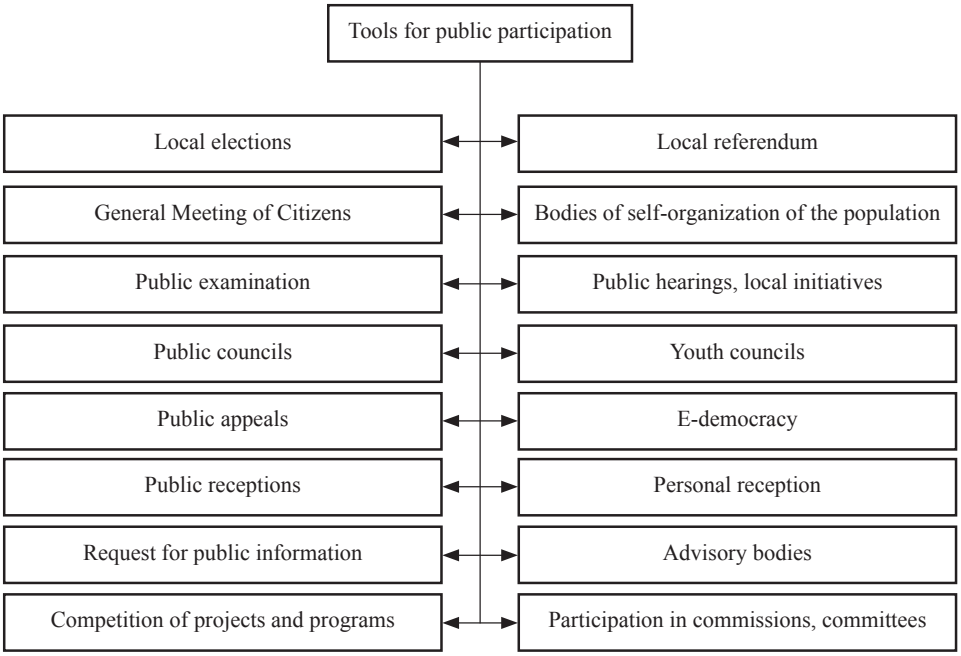


Fig. 1. Tools for public participation in the management of local communities

Source: developed on the basis of the analysis of Zakon Ukrayiny, Pro sotsial′nyy dialoh v Ukrayini 2010 (Law of Ukraine "On social dialogue in Ukraine") and literature sources [Savchuk, Kolomyychuk 2018].

– there is almost no analytical information of the planning and implementation of local budgets [DOBRE 2019].

Consultations take place when publishing draft decisions of local self-government bodies of the community in order to obtain comments, remarks, suggestions from the public or when discussing problems or prospects for the development of the local communities. As a rule, consultations are initiated by the governing body.

The dialogue can be implemented in the form of involving public representatives in working groups, expert councils, etc., for drafting specific regulations, decisions, and policies. Representatives groups are full participants in the decision-making process. The result of such interaction is a joint decision. The dialogue can be initiated both by the community governing body and public organizations, which is defined at the level of the relevant law[1].

[1] Zakon Ukrayiny, Pro sotsial′nyy dialoh v Ukrayini (Pryynyattya vid 23.12.2010) [Law of Ukraine "On social dialogue in Ukraine", of 23.12.2010 no. 2862-VI], Vidomosti Verkhovnoyi Rady Ukrayiny (VVR), 2011, no. 28, st. 255, https://zakon.rada.gov.ua/laws/show/2862-17#Text [accessed: 20.10.2020].

Partnership – is level of interaction, when public authorities and civil society organizations carry out mutual exchange of various resources (for example, delegation to civil society organizations, provision of certain services, joint activities, etc.) [Kupriy 2019: 1-2].

Implementation of public control over the formation and implementation of local budgets local communities is through the use of a number of tools (Fig. 1).

Consider the most effective tools for public control over the effective use of budget funds. Thus, one of the tools of public control is the General Meeting of Citizens at the place of residence, which is a form of their direct participation in addressing issues of local importance. Decisions of the General Meeting of Citizens are taken into account by local governments in their activities. In order for the general meeting to be legitimate, it is necessary that 50% + 1 of the community members in the respective territory come to the meeting. This tool is prescribed in Article 8 of the Law of Ukraine "On local self-government in Ukraine"[2], and obliges the leadership of the local communities to take into account the decisions of the community, including the requests and recommendations to the local budget [Vrublevskyy 2018].

Another important tool is public hearings – the most common mechanism of local democracy in most democracies countries. The need for public hearings often arises if:

– the decision prepared by the local authorities is unpopular and can cause social tension. an example is the redistribution of budget expenditures in favor of a particular recipient while ignoring the interests of other local communities participants;

– the issue/project has several alternative solutions;

– the issue is quite complex and there are no obvious solutions;

– there is a certain confrontation between the authorities and some group of the local communities.

Ukrainian practice shows that the settlement procedure can be regulated both by the community charter and by a separate provision. The Law of Ukraine "On Local Self-Government in Ukraine" (Article 13) stipulates that public hearings must be held at least once a year.

However, the K. Litvinova and O. Maevska researchs [Litvinova, Maevska 2018a] show that only 67.7% of local communities used the instrument of public hearings before unification, while after unification – 92.9% of the surveyed local communities in Lviv and Kharkiv regions. The procedure for holding public hearings is determined by the Charter of the local community. However, there is

[2] Zakon Ukrayiny, Pro mistseve samovryaduvannya v Ukrayini (Pryynyattya vid 21.05.1997) [Law of Ukraine "On local self-government in Ukraine", of 21.05.1997, no. 280/97-BP], Vidomosti Verkhovnoyi Rady Ukrayiny (VVR), 1997, no. 24, st. 170, https://zakon3.rada.gov.ua/laws/show/280/97-%D0%B2%D1%80 [accessed: 20.10.2020].

a problem with the availability of statutes in open access, so as of November 2018, out of 35 communities in Lviv region, only 4 published statutes on their websites, and out of 16 communities in Kharkiv region – only 2. According this, we can identify a low level of websites using to publish important information about legal aspects of community activities.

Local initiatives are opportunities for residents to be heard, to bring the problem to the attention of local council deputies, and to reflect the community's position on the issue. The importance of this mechanism of public participation is that it gives the local communities the right to initiate consideration in the local council of any issue related to its competence, which is important for the community, but which is not submitted to the council for unwillingness to do so by the mayor or deputies for the sake of. The procedure for submitting local initiatives is established by the representative body of local self-government or the Charter of the local communities.

In the absence of a response from the community governing bodies to these public activities, in particular on financial issues, it is possible to hold either a local referendum or early elections. Note that the local referendum, as a way for Ukrainian citizens to make decisions on important issues of local importance, has no legal support, as the Law of Ukraine on Local Referendums has ceased to be *Unconstitutional* (according to the Constitutional Court of Ukraine № 4-r /2018). In this context, in our opinion, it should be noted that the European experience is extremely relevant in Ukraine, because, for example, in Switzerland [European Information and Research Center 2017], the main decisions are made through financial referendums and community meetings, the list of which may include:

- areas of community spending;
- community tax rates;
- introduction of new taxes;
- acquisition, exchange or sale of community land;
- granting a building permit, etc.

Note that according to current legislation, any citizen of Ukraine has the right to apply to local governments, associations of citizens, institutions, organizations, regardless of ownership, officials in accordance with their functional responsibilities with comments, complaints and suggestions that relate to their statutory activities, a statement or petition for the implementation of their socio-economic, political and personal rights and legitimate interests and a complaint about their violation.[3]

[3] Zakon Ukrayiny, Pro zvernennya hromadyan (Pryynyattya vid 2.10.1996) [Law of Ukraine "On citizens' appeals," of 2.10.1996, no. 393/96-VR], Vidomosti Verkhovnoyi Rady Ukrayiny (VVR), 1996, no. 47, st. 256, https://zakon2.rada.gov.ua/laws/show/393/96-%D0%B2%D1%80 [accessed: 20.10.2020].

In practice, electronic appeals to local governments and feedback are available only on 23 websites of Lviv region local communities (which is 65.7% of the analyzed websites) [Litvinova, Maevska 2018a]. At the same time, only half of the websites of local communities in Kharkiv region have such functionality.

For local governments, the increase in the number of inquiries concerning the efficient spending of budget funds should be a signal for additional inspections and strengthening of self-control. An example for consideration at a meeting of the governing body of the local communities [Storonyanska et al. 2019].

However, despite the possibility of such tools is a petition, which, after obtaining the required minimum, is mandatory

to submit a petition on the sites of communities in Lviv region, only 19 websites allow to record the petition (out of 40 available – 47.5%) [Litvinova, Maevska 2018b], in addition, the statutes of many local communities do not specify the required minimum votes to consider this petition. For example, the Statute of Lviv provides for such a minimum of 500 votes.

Public consultations are an open dialogue between the authorities and the residents, aimed at making optimal decisions by the authorities on socially important issues[4]. Public consultations are also conducted by public councils in the form of public discussion, electronic public consultations (direct forms) and public opinion polls (indirect form).

Note that consultations should be based on the following principles: – taking into account the interests of stakeholders; the presence of a coordinator who unites and directs the participants towards consensus; mandatory recording of results and stages of counseling; accessibility – all stakeholders should have access to the results of consultations; transparency, etc.

In general, the results of inspections of the public or public financial control bodies on the effectiveness of the use of budget funds for previous periods can be the basis for public consultation and determination of the need and feasibility of directing limited financial resources to specific community needs.

In 2016, "The Concept for the Development of the Electronic Services System in Ukraine and at the Local Level" was approved, which launched the use of such e-democracy tools as the public budget, various forms of e-consultations, e-voting and other services. For example, by mid-2018, Ukrainians had initiated more than 12,000 petitions to local authorities through the Unified System of Local Petitions. More than 170 local communities joined the system.

Public expertise is widely used by public organizations in European countries. It provides for civil society institutions, public councils to conduct an ongoing as-

[4] Zakon Ukrayiny, Pro hromads′ki ob'yednannya (Pryynyattya vid 22.03.2012) [Law of Ukraine "On public associations", of 22.03.2012, no. 4572-VI], Vidomosti Verkhovnoyi Rady Ukrayiny (VVR), 2013, no. 1, st. 1, http://zakon2.rada.gov.ua/laws/show/4572-17 [accessed: 20.10.2020].

sessment of the activities of local governments, the effectiveness of decision-making and implementation of such bodies, the preparation of proposals to address significant issues for consideration in their work [Litvinova, Maevska 2018b]. According to the results of the Litvinova, Maevska research, only in 4 communities of the Carpathian region out of 70 respondents the tool "public expertise" is used, while 14 local communities have public councils, 16 local communities have youth councils and 52 local communities have public organizations.

Since 2016, youth councils in Ukraine have changed their status and are considered in communities as an advisory body to the relevant authorities, in addition, youth councils are actively involved in attracting grant funding for community development.

An important factor in the formation of civil society is public associations that operate in local communities. Public associations include both specialized and a broader profile. In terms of local communities, there is a concentration of public associations in urban local communities (both in Lviv and Kharkiv regions). In general, the number of registered public associations in the communities of Lviv region is smaller than in the communities of Kharkiv region.

3. Sociological survey results about public control implementation in local communities

In order to identify the role of public control over the functioning of local budgets in 2020, a sociological survey was conducted by anonymous questionnaires of public representatives and experts in the field of public administration and control (public authorities, employees of local communities and local governments with the budget process). During the survey, 91 public activists and 54 experts from Lviv and Kharkiv regions were interviewed. The representativeness of the sample is 95% with a mean deviation of 5%.

The survey covered all age groups of civic activists and experts, as well as different types of communities in which they live (urban, rural, settlement territorial communities).

The survey revealed a much higher level of awareness of the possibilities and tools of public control among community representatives than among public activists – only 83.3% of them had information about various tools of public control. This may indicate an insufficient level of public awareness of the opportunities for residents to participate in the management of the local communities.

To the question: "Who should be involved in exercising public control over the use of budget funds in the community?" residents and representatives of the response authorities differ slightly (Chart 1). While civic activists emphasize the

role of local government representatives, government officials place more responsibility on civic organizations.

According to the vast majority of representatives of community governing bodies, the participation of public organizations in public control activities is more effective than the participation of residents.

Chart 1. Distribution of answers to the question "Who should be involved in the implementation of public control over the use of budget funds in the local communities?"

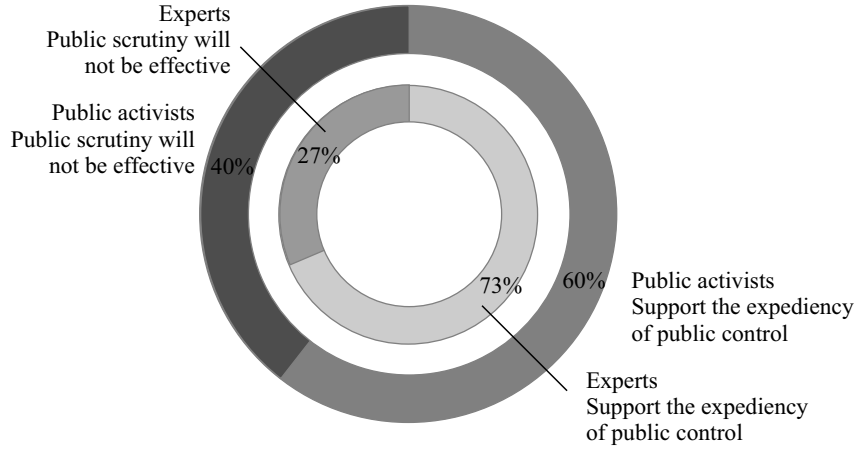
Source: own elaboration.

According to the results of the questionnaire (Chart 2), we can say that the majority of respondents, both experts and public activists, consider it necessary to exercise public control over budget processes at the local level. Thus, 72.8% of experts are inclined to believe that public control over the budget process will increase the efficiency of local budgets, and 66.7% of experts believe that public control over the budget process will not prevent local governments to effectively implement the budget process.

Civic activists also claim that community governments listen to the public in most cases – 60% of surveyed public activists said they were aware of cases of public proposals to amend local community budgets. At the same time, they record an increase in public activity in public control over the budget process in communities after the start of modern reforms.

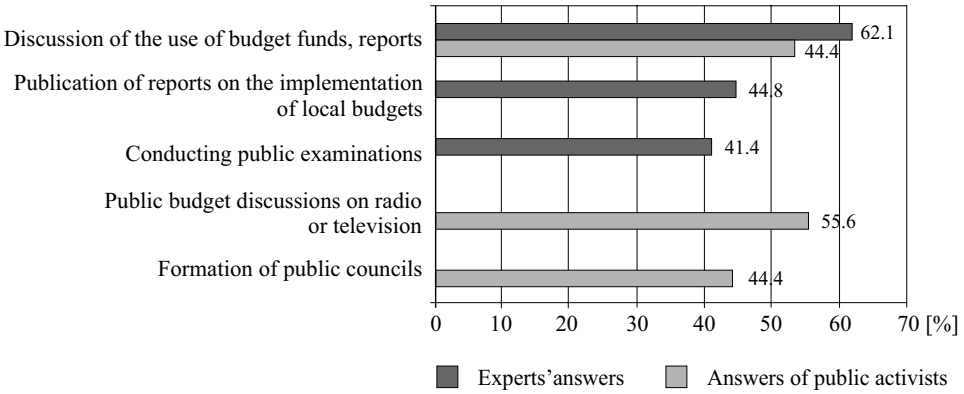
One of the most difficult issues for public control is the issue of tender procedures. Thus, only 31% of surveyed public activists have evidence of public and civic activist involvement in tender processes in local communities. As the results of tenders determine contractors for implementation, including infrastructure projects, abuse in tender funding is a significant threat of inefficient use of local budgets.

Chart 2. Distribution of answers on the expediency of public control over local budgets of the local communities



Source: own elaboration.

Chart 3. Distribution of answers to the question "What, in your opinion, are the tools of public participation in the budget process the most effective?"



Source: own elaboration.

The survey allowed building a list of key tools for public participation in the budget process (Chart 3).

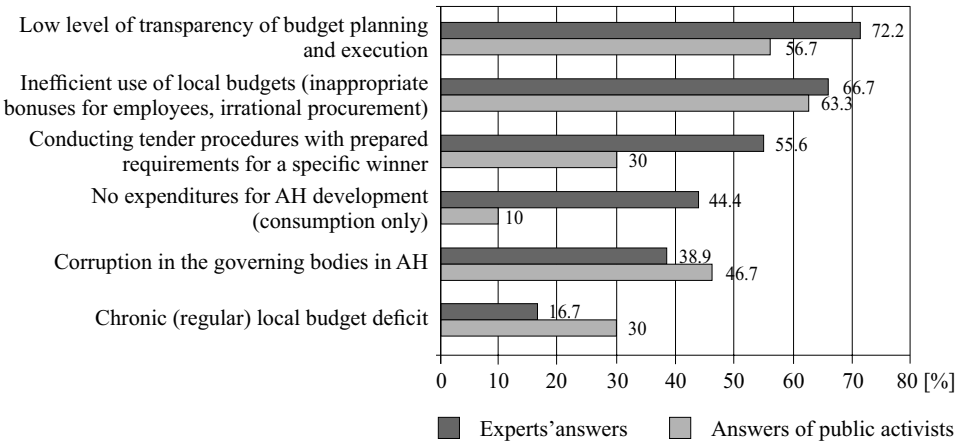
It should be noted that there are different approaches to the understanding of such tools by the public and by representatives of government in the community.

If the second is more effective tools of public participation in the budget process are tools of informative nature (discussion, reporting and expertise), then, according to public activists, higher (first place) efficiency provides community involvement in direct participation in budget control, including through the formation of public councils.

As management measures require control over the effectiveness of their implementation, respondents were asked to identify a list of tools for public monitoring of local budgets. In the first place, according to the survey of activists, there are public hearings as a tool for managing budget resources in local communities – 41.4%; according 27.8% of respondents experts, this tool for monitoring budget processes placed only 2nd place.

According to experts in the field of local government, the most important reasons for inefficient use of budget funds are: low level of transparency of budget planning and implementation (72.2% of respondents chose this reason), inefficient use of local budgets (inappropriate bonuses, irrational procurement and etc.) (66.7% of respondents) and conducting tender procedures with prepared requirements for a specific winner – 55.6% of respondents (Chart 4).

Chart 4. Distribution of answers to the question "Which, in your opinion, of the listed problems are the most acute in the use of budget funds of the local communities?"



Source: own elaboration.

As for the opinion of public activists, 63.3% of respondents among the proposed problems in the budget process of local communities noted inefficient use of local budgets (inappropriate bonuses for employees, irrational procurement, etc.); 56.7% – low level of transparency of budget planning and execution, 46.7% – corruption in the governing bodies of the local communities.

The chronic deficit of the local budget was singled out by 16.7% of experts and 30% of public activists as the reason for the low efficiency of the use of budget funds of local communities. However, in essence, the deficit is a consequence of the inefficiency of budget funds.

Both experts and civil society activists see problems in the procedures for allocating budget funds at the local level, including among the problems that need to be addressed, highlight the low transparency of the allocation procedure and the corruption component.

4. Conclusions

It should be noted that the main institutional and organizational obstacles to ensuring the effectiveness of public control in the budget process of the territorial community are:

– imperfection of the institutional framework for the use of a number of instruments of public participation, in particular such as the local referendum, which potentially leads to non-transparency of the decision-making process of local governments and leveling the possibility of public influence on the decision-making process;

– low level of information transparency in the use of budget resources in local communities, which complicates the procedure of public control of current budget expenditures of communities;

– low level of use of public expertise as an effective tool of public control over budget flows in the community;

– usually, local authorities use elements of e-democracy only to inform citizens about their own decisions;

– low level of awareness of community residents in the possibility of their own participation in the processes of public control over the use of budgetary resources of the territorial community.

At the same time, it should be noted that the processes of decentralization of financial resources and transfer of a number of functions to the basic level of management have significantly intensified the public in matters of public control. As a result, there is an increase in financial literacy of the population (including residents of rural communities) in terms of formation and use of budget resources at the local level, as well as the gradual inclusion of residents in the management of socio-economic development of communities. This demonstrates the understanding of the residents of communities of shared responsibility for their own well-being.

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Publiczna kontrola wykorzystania dochodów budżetowych społeczności lokalnych na Ukrainie

Streszczenie. *Rozpoczęta w 2014 r. reforma decentralizacyjna ma na celu zmianę nie tylko struktury administracyjnej Ukrainy, ale także systemu budżetowego, co otwiera możliwość nieefektywnego wykorzystania dochodów budżetowych. Celem artykułu jest identyfikacja kluczowych aspektów niezbędnych do wprowadzenia tego rodzaju kontroli publicznej na Ukrainie. W opracowaniu przedstawiono przegląd narzędzi kontroli publicznej oraz wyniki ankiet przeprowadzonych w celu zebrania opinii działaczy społeczeństwa obywatelskiego i ekspertów w dziedzinie kontroli publicznej w ramach procesu decentralizacji. Nacisk położono na główne instrumenty kontroli publicznej, wśród których wymienić można: przesłuchania publiczne, elementy e-demokracji, organy doradcze, rady publiczne i wybory lokalne. Zdaniem większości respondentów obejmujących aktywistów społecznych i specjalistów z zakresu finansów lokalnych w obwodzie lwowskim i charkowskim, organizacje pozarządowe mają większe możliwości kontrolowania wydatków budżetów lokalnych. Z badania wynika, że do głównych problemów w sposobie wydatkowania środków budżetowych należą niski poziom przejrzystości planowania i wykonywania budżetu oraz niska efektywność pozyskiwania i wydatkowania dochodów budżetowych.*

Słowa kluczowe: *kontrola publiczna, budżet lokalny, społeczność lokalna*

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How efficiently is the potential of the ICT services used to ensure the socio-economic development of Ukraine's regions

Abstract*. The article presents a retrospective comparative assessment of the exploitation of the potential of the ICT services sector in Ukraine, which is based on a composite index of efficiency. The study is an attempt to determine to what extent the ICT service sector has been contributing to socio-economic growth at the regional level. For a more thorough statistical analysis, a matrix method was used to classify the regions of Ukraine in terms of the composite index and identify the main characteristics of how specific aspects of the development of the ICT services sector affected Ukraine's socio-economic growth in 2013 and 2018. These characteristic features can be used by relevant government authorities to develop a set of measures aimed at eliminating existing obstacles to a more positive impact and create guidelines for improving the regulatory mechanisms that could stimulate a more efficient use of the potential of the ICT services sector to drive the socio-economic development.*

Keywords: *ICT services sector, ICT company, efficient use of the potential, ICT market, socio--economic growth, matrix of the distribution of regions*

1. Introduction

In modern conditions, the ICT services sector in Ukraine owns not only one of the highest development potentials and has a positive impact on the process of functioning of related economic activities and the growth of highly-paid jobs, but acts as a powerful catalyst for increasing the efficiency and competitiveness of many important sectors of the national economy and social life through the active introduction of information technologies in the processes of their functioning. As evidenced by numerous positive examples of the technological development of

various countries, the implementation of an effective policy for ICT services allows providing favorable conditions for the formation of a competitive economic system at national and regional levels soon, strengthening the export potential, enhancing human development, increasing the efficiency of the public administration system functioning and stimulating the growth of the quality of citizens' life. However, the availability of numerous regulatory and financial and economic barriers together with the high level of the shadow economy in the ICT services sector not only significantly limit the positive effects and structural changes, but also do not allow the fullest and most effective potential for its development in Ukraine. Under such conditions, the study of special features of the use of the ICT services potential is becoming especially relevant, which in the future may become the basis for the formation of a reasonable set of measures to eliminate existing obstacles to its development, as well as a systematic mechanism for improving the efficiency of the use of its potential in the socio-economic development of Ukraine's regions.

2. Analysis of recent research and publications

Numerous scientific works both of Ukrainian scientists (V. Heiets [2009: 276-290], V. Semynozhenko [Halchynsky et al. 2002: 86-105], V. Bykov [2011: 120-124], I. Aristova [Aristova Kurylo, Kalugin 2014: 45-51], K. Bezugla [2014: 54-63]) and foreign ones (R. Baldwin [1998: 127-136], D. Bell [1999: 186-193], M. Castells [1996: 69-75], M. Porter [1999: 208-217], R. Mansell [Mansell, Wehn 1998: 79-84], D. Tapscott [1998: 117-123]) are devoted to the study of the special features of the ICT services development. The special features of modern trends and basic patterns of the influence of the technological development on the national economy are revealed in the scientific works of such Ukrainian scientists as Yu. Bazhal [Bazhal, Bakumenko, Bondarchuk 2004: 36-41], T. Vasyltsiv [Vasyltsiv, Hunchak, Sukhai 2010: 42-48], O. Kuzmin [Kuzmin, Georgiadi 2006: 140-148], A. Filipenko [Shnyrkov, Filipenko 2013: 162-170], L. Fedulova [Fedulova, Bazhal, Osetsky 2011: 318-322], and many others. However, the analysis of the publications of domestic and foreign scientists shows that currently, many issues remain unresolved in assessing the efficiency of the ICT services potential in ensuring the socio-economic development of Ukraine's regions in particular their features at the regional level. Insufficient elaborations of this issue, its relevance and practical application have determined the purpose of this study.

3. Main results of the study

The growing role of the ICT sector in Ukraine's economy over the past decade is primarily caused by the accelerated pace of its development and increasing

the share in the structure of the national export of services, as well as its close relationships and active cooperation with the international technical and economic environment. However, despite the positive dynamics of the ICT services development, as well as the significant research and technical potential, Ukraine is not among the leading countries concerning both the knowledge economy and information society and the level of the development of information and communications technologies. In particular, according to the data of the European Bank for Reconstruction and Development (EBRD), in 2018 Ukraine ranked 35th in the Knowledge Economy (KE) Index among 46 countries (in 2011 – 34th), being inferior to all the neighboring countries (Poland (14th), Slovakia (16th), Hungary (17th), Belarus (19th), Romania (23rd), the Russian Federation (25th), and Moldova (34th)) according to the level of this indicator [Introducing the EBRD Knowledge Economy Index 2019]. According to another significant rating ICT Development Index, which is calculated by the International Telecommunication Union (ITU) and reflects the level of the development of information and communications technologies (ICT), Ukraine ranked 79th among 176 countries in 2017 (in 2010 62nd among 152 countries), yielding not only to all economically and technologically developed countries but also to a significant number of countries with an average level of development [Measuring the Information Society Report 2017].

The ICT services sector, as one of the leading factors and elements of the material and technological basis of the transition of Ukraine's socio-economic system to the information economy, is one of the most innovative and dynamic sectors of the Ukrainian economy, which determines the dynamics and nature of this process in Ukraine. To assess the efficiency of the use of the ICT services potential in ensuring the socio-economic growth of Ukraine's regions, the authors calculated the composite indicator for 2013-2018 (Fig. 1).

In particular, the analysis for 2013 and 2018 was conducted based on the statistics data from 24 regions of Ukraine and Kyiv, which allowed carrying out a retrospective comparative assessment of the level and change in the efficiency of ICT services in ensuring socio-economic growth on a regional scale. For a more thorough statistical analysis, the authors used a matrix method to classify Ukraine's regions according to the level of their composite index. All the regions of Ukraine were divided into 4 groups: 1) leading regions; 2) pursuing regions; 3) regions with a low level of efficiency; 4) outsider regions with the lowest level of efficiency.

Among the regions of Ukraine, according to the typology methodology, the undisputed leader was the city of Kyiv, which having demonstrated the highest level of the composite index of efficiency of using the ICT services potential in ensuring the regions' socio-economic growth both in 2013 and 2018, outweighed the average value of this indicator for all the Ukrainian regions by almost 2.8 times in 2018 and by 3.3 times in 2013. Its undeniable dominance not only by

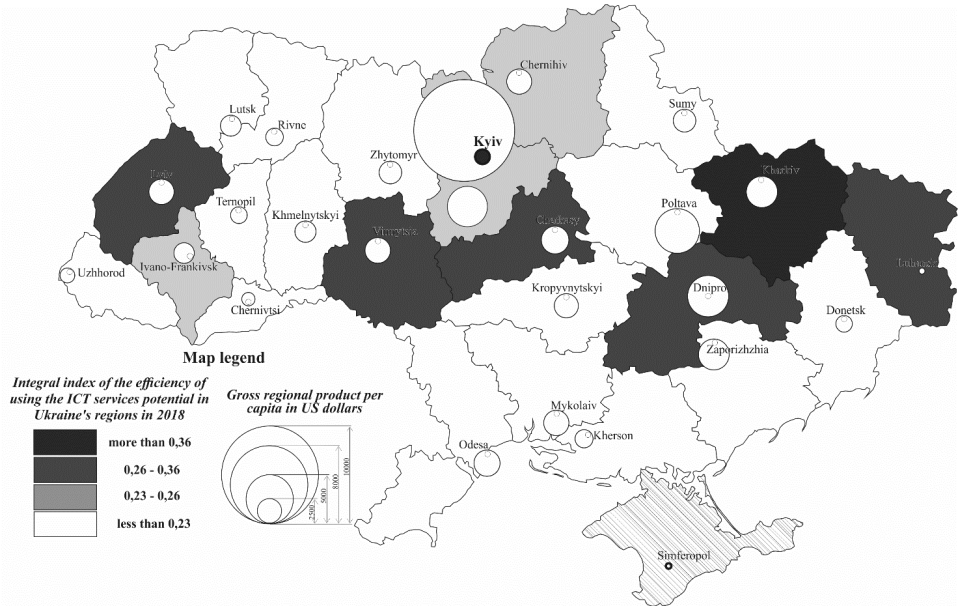

Fig. 1. Composite index of efficiency of using the ICT services potential in Ukraine's regions in 2018

Source: calculated and compiled according to the data: Ekonomichna aktyvnist′ naselennya Ukrayiny 2018, Statystychnyy zbirnyk 2019; Valovyy rehional′nyy produkt u 2018 rotsi, Statystychnyy zbirnyk 2020.

the level of the composite index of efficiency of using the ICT services potential among Ukraine's regions but also by 6 of 10 of its key indicators, shows the availability of a balanced and developed set of competitive advantages in Kyiv that allow it to use the human, financial, economic and innovation potential in Ukraine the most effectively, actively attracting and concentrating the most capable and qualified specialists in the capital's ICT companies.

Despite the high level of a shadow economy and informal employment in the sphere of ICT services in Kyiv among other regions of Ukraine in the analyzed period, the capital mostly had the highest level of both the main parameters of ICT services development (the share of this sector in terms of employment, capital and direct foreign investment, export of ICT services in the region, labor productivity in the sector of ICT services) and the parameters of the region's socio-economic development as a whole (average wages and available income per capita in the region, the innovative activity of enterprises). On the other hand, structural changes in the process of redistribution of the ICT services potential in favor of the pursuing regions led to a decrease in the level of the efficiency of its use in Kyiv in the analyzed period (by 0.062 s.p.).

The outbreak of systemic crisis phenomena in the socio-economic system of Ukraine in 2014 (annexation of Crimea and the beginning of military aggression of the Russian Federation on the territory of Ukraine, socio-political and financial and economic instability) negatively affected the functioning of ICT services, having significantly slowed down the pace of its growth and development. The post-crisis recovery of ICT services in Ukraine since 2016 has led to reformatting in the structure of the distribution matrix of Ukraine's regions according to the level of the composite index of efficiency of using the ICT services potential in 2018 compared to the pre-crisis 2013.

One of the characteristic features of the matrices of distribution of Ukraine's regions according to the level of the composite index of efficiency of the use of the ICT services potential in 2013-2018 is a high uneven representation of regions in the quadrants of matrices, which is connected with rather high average values of the composite index, which are caused by the significant advantage of the composite index level of Kyiv over the levels of all the regions in the analyzed period. In particular, the group of leading regions with the highest level of the composite index in 2018 included only 2 regions: the city of Kyiv and Kharkiv region, and in 2013 only one – the city of Kyiv. Despite the significant dominance of Kyiv, both in this group of regions and within the national distribution, as the most developed and powerful center of ICT services in Ukraine by the main quantitative and qualitative indicators, against the background of a significant increase of the composite index level of most of the regions of Ukraine in the post-crisis period, the lag of the other regions from the leader has begun to gradually decrease. Thus, the advantage of the city of Kyiv by the value of the composite index of efficiency of the use of the ICT services potential over the nearest region by the composite index value (Vinnytsia region) in 2013 was almost 2.4 times, while in 2018 its advantage over the nearest pursuer (Kharkiv region) was only 1.7 times.

In the pre-crisis 2013, more than half of the total number of regions (14) found themselves in the last quadrant of the distribution matrix – outsider regions with the lowest level of the composite index of efficiency of the use of the ICT services potential, which is connected not only with low values of most of the components in the calculation of this composite index for these regions but also with a low root-mean-square deviation from its average level. According to the results of the post-crisis 2018, already 15 regions found themselves in the last quadrant of the distribution matrix, Luhansk and Ivano-Frankivsk regions left the group of outsider regions, while 3 regions (Khmelnytsk, Zhytomyr, and Volyn regions) moved from the higher quadrants. Moreover, in 2018 the average value of the composite index of the outsider regions was higher by 0.0246 s.p. (0.2033 s.p. vs. 0.1787 s.p.), which indicates the fact that despite the significant negative impact of crisis factors, there were positive upward trends of the level of efficiency of the use of the ICT services potential even in the least developed regions. The effective co-

operation between local authorities, ICT business and educational institutions of many regional centers allows creating favorable conditions (gradual improvement of telecommunications and social infrastructure, development of new educational areas focused on acquiring current knowledge and skills in the modern ICT market, as well as active promotion of ICT services, both among potential employees and among customers) for the development of ICT services, which directly affects the level of the efficiency of the ICT services potential use.

The lowest values of the composite index of efficiency of using the ICT services potential in 2018, recorded in Rivne and Odesa regions, were lower than the maximum level of this composite index (Kyiv) by 6.9 and 4.1 times, respectively, than the average level of the index of Ukraine's regions by almost 2.5 and 1.5 times, and than the average level of the index of leading regions (excluding Kyiv) by almost 5.5 and 3.2 times, respectively. These results indicate significant disparities in the efficiency of using the ICT sector potential in the development of Ukraine's regions.

According to the results of 2013, the group of pursuing regions with a high level of the composite index of efficiency of using the ICT sector potential included 6 regions, including 2 powerful centers of the ICT sector of Ukraine – Kharkiv and Lviv regions, with the most nationally developed areas of ICT after the capital, as well as the promising regions in this area – Vinnytsia, Chernihiv, Zhytomyr and Volyn regions. According to the results of the post-crisis 2018, among the representatives of this group of regions, there were the most dynamic changes in their values of the composite index among all the groups and regions.

In particular, in 2018 Kharkiv region made the greatest progress, both among the representatives of this group and among all four groups of the regions, in improving the efficiency of using the ICT services potential, whose composite index value increased by 0.126 s.p. and allowed it to move to the group of leading regions with the highest level of this indicator. The success of Kharkiv region is mainly caused by the high growth rate of labor productivity in the sphere of ICT services in the region and its share in the export of services, as well as the lowest levels of a shadow economy and informal employment among the leading centers of ICT services in Ukraine in the analyzed period. Among the other regions with a significant increase in the level of this composite index in 2018, it is worth noting Cherkasy and Luhansk regions (+0.104 s.p. and +0.076 s.p., respectively), which allowed them to move from the lower quadrants of the distribution matrix to a higher level – to a group of pursuing regions with a high level of efficiency of the use of the ICT sector potential. On the other hand, according to the results of 2018, the level of this composite index in Zhytomyr and Volyn regions decreased by –0.074 s.p. and –0.054 s.p. respectively, which was the largest decline among all the regions of Ukraine in the analyzed period and led to their transition from the group of pursuing regions to the group of outsider regions.

Table 1. Impact of the change in the efficiency of the use of the ICT sector potential on ensuring the socio-economic growth of Ukraine's regions in 2013-2018

Indicator	Regression equation	R^2
Change in the level of shadowing the ICT services sector, p.p.	$Y_1 = 7.127 \times x^2 - 18.109 \times x - 6.615$	0.0797
Change in the level of informal employment in the ICT services sector, p.p.	$Y_2 = 5.584 \times x^2 - 0.968 \times x - 0{,}014$	0.1263
Change in the level of labor productivity in the ICT services sector, %	$Y_3 = 909.420 \times x^2 - 608.450 \times x + 416.390$	0.1058
Change in the share of ICT services in the export of services in the region, p.p.	$Y_4 = 1443.200 \times x^2 + 87.690 \times x + 1.450$	0.5027
Growth rate of GVA in the ICT services sector, %	$Y_5 = 295.270 \times x^2 + 156.860 \times x + 270.780$	0.0056
Growth rate of tax payments to the consolidated budget, %	$Y_6 = -6{,}638 \times x^2 - 2{,}246 \times x + 1{,}837$	0.0476
Growth rate of the Human Development Index, s.p.	$Y_7 = -15{,}625 \times x^2 - 0{,}512 \times x + 0{,}068$	0.1749

Source: calculated according to the data: Ekonomichna aktyvnist′ naselennya Ukrayiny 2018, Statystychnyy zbirnyk 2019; Valovyy rehional′nyy produkt u 2018 rotsi, Statystychnyy zbirnyk 2020; Struktura podatkovykh nadkhodzhen′ za haluzyamy ekonomiky za 2019 rik.

The analysis of the efficiency of the ICT services potential use of Ukraine's regions allowed highlighting the following characteristics of the impact of the components of the ICT services development on the socio-economic growth of Ukraine's regions in 2013 and 2018 (Table 1):

1) Increasing the efficiency of the ICT services potential use in most regions of Ukraine in the analyzed period was accompanied by a decrease in the level of shadowing and informal employment (Fig. 2) in this area (correlation coefficients $R_1 = -0.282$ and $R_2 = -0.317$, respectively). The growth of the average level of the composite index of efficiency of the ICT services potential use, as well as the reduction of the average level of shadowing and informal employment in the ICT services sector of Ukraine's regions in 2018 compared to 2013, is connected with favorable conditions of the global ICT market, the relative stability of the current tax regime for ICT companies and gradual regulation improvement in the field of currency control, export and import transactions and fiscal regulation, which contributed to the active growth and efficiency of the ICT services potential use in Ukraine, which creates incentives for legal activities of ICT companies.

2) Increasing the efficiency of using the ICT services potential in most regions of Ukraine in 2013-2018 is explained by the positive dynamics of the main structural parameters of its development, which had a positive impact on the process of socio-economic growth of the regions. In particular, this is confirmed both by the increase in productivity of ICT employees on average by more than 3 times in

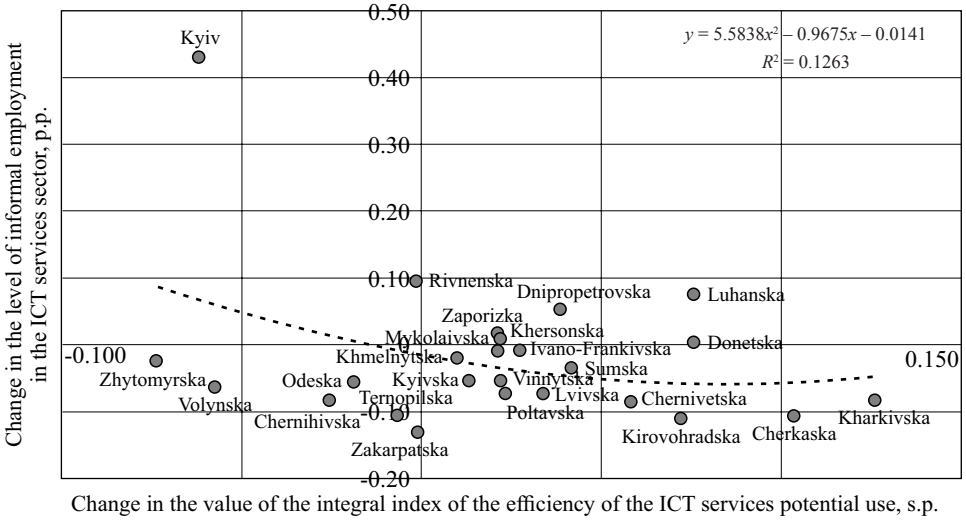

Fig. 2. Relationship between the change in the value of the composite index of efficiency of the ICT services potential use and the change in the level of informal employment in the ICT services sector in 2013-2018

Source: compiled according to the data: Ekonomichna aktyvnist′ naselennya Ukrayiny 2018, Statystychnyy zbirnyk 2019; Valovyy rehional′nyy produkt u 2018 rotsi, Statystychnyy zbirnyk 2020.

hryvnia equivalent and by 27% in dollar equivalent, by the increase in the share of the ICT sector in the total volume of services export in 23 of 25 regions – on average by 7.27 percentage points, by increasing the share of ICT services in the structure of gross value added of the 21st of the 25 regions – on average by 0.07 percentage points, and a fairly close direct relationship between the change in the values of the composite index of the potential use efficiency and the growth rate of labor productivity of employees in this sector, as well as the change in its share in the total volume of services export (Fig. 3) and in the structure of the gross value added of Ukraine's regions (correlation coefficients $R_3 = 0.324$, $R_4 = 0.602$ and $R_5 = 0.442$).

3) Despite many positive effects on the regions' economies, which are formed as a result of the active growth and effective functioning of ICT services sector, its direct impact and role in the regions' socio-economic development are currently quite limited. This is evidenced primarily by the low share of this area in the structure of tax revenues to the consolidated budget of Ukraine compared to the other types of economic activity, which in 2018 amounted to only 4.35% of the total tax revenues, which is significantly lower than the level of three leading areas by this sector indicator (power engineering (22.43%), production of consumer goods and services (19.64%) and industry (14.49%) [Zlety i padinnya 2019]) and does

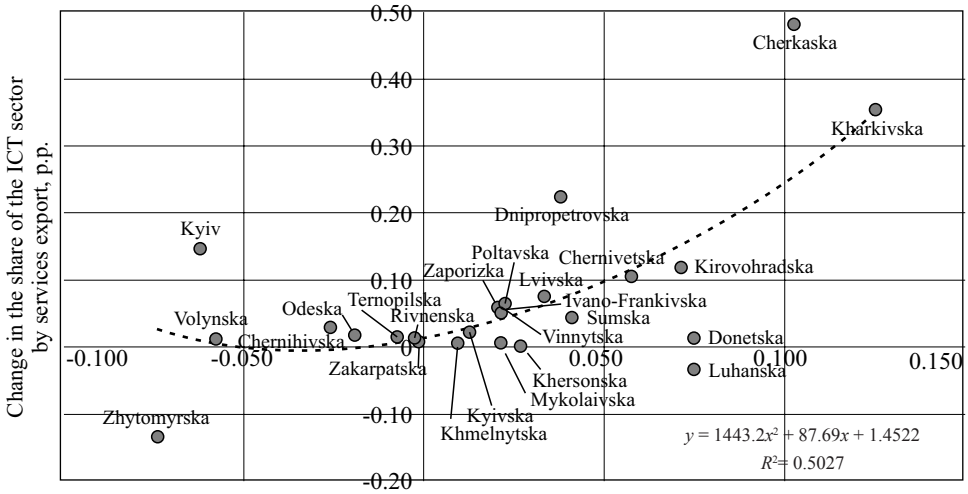

Fig. 3. Relationship between the change in the value of the composite index of efficiency of the ICT services potential use and the change in the share of the ICT sector by services export in 2013-2018

Source: compiled according to the data: Ekonomichna aktyvnist′ naselennya Ukrayiny 2018, Statystychnyy zbirnyk 2019; Valovyy rehional′nyy produkt u 2018 rotsi, Statystychnyy zbirnyk 2020.

not allow currently being considered as a significant budget-forming taxpayer. This fact is also confirmed by the lack of a clear positive relationship between the change in the values of the composite index of efficiency of the ICT services potential use and the growth rate of tax payments to the consolidated budget, as well as the growth rate of GVA in this area in the analyzed period (correlation coefficients $R_6 = -0.215$, $R_7 = -0.074$).

4) Inelasticity of both the growth rate of the export volume of the ICT services sector and the number of people employed in this field, as one of the main indicators of the efficiency of its potential use, concerning the growth rate of tax payments to the consolidated and local budgets may indicate the presence of shadow revenues of ICT companies, which due to the understatement of the tax base leads to a decrease in their tax and budget-generating results. The use of several optimization mechanisms in the field of taxation (misuse of the simplified taxation system) and labor relations by ICT companies (fictitious fragmentation of large business into small, hidden employment, use of freelance services) in Ukraine leads to significant shortfalls in budget revenues, which is directly reflected in their growth rates and the state's ability to fully ensure the implementation of its social function and stimulate the socio-economic development of Ukraine.

5) Numerous examples of the positive impact of ICT companies on the system of human development in the regions of Ukraine, especially in cities with the highest concentration of ICT services in socio-economic systems, certainly contribute to the improvement of its main components (education and training, social and information infrastructure, real incomes and demand/supply of highly skilled jobs in regional labor markets, health care systems, etc.). However, the limited scale of this impact in modern conditions, due to the relatively small size of this area in the economy and its concentration exclusively in the largest urban centers of Ukraine, does not allow it to systematically promote the process of improving human development at the national level. This is confirmed by the low elasticity of labor productivity growth in the ICT services sector and the level of efficiency of the ICT services potential use to the growth rate of the human development index in Ukraine's regions [Rehional′nyy lyuds′kyy rozvytok, Statystychnyy zbirnyk 2018], as well as a very weak relationship between these indicators ($R_8 = 0.0560$ and $R_9 = –0.1098$ respectively).

The characteristic features of the impact of the components of the ICT services development identified as a result of the assessment may become the basis for the development by relevant government authorities of a set of measures to eliminate existing obstacles to their development and a positive impact on the socio-economic growth of Ukraine's regions, as well as target guidelines for improving the mechanism of stimulating the process of increasing the efficiency of using the ICT services potential in ensuring their socio-economic development.

The negative impact of the COVID-19 pandemic, which affects the functioning and development of all the spheres of public life in Ukraine, has not caused significant devastating consequences for the ICT services sector yet, but its further spread soon may slow down the growth of this area. The success of the adaptation of the Ukrainian ICT services sector to new socio-economic conditions and maintaining positive growth dynamics, in the authors' opinion, will largely depend on the effectiveness of cooperation between public authorities and representatives in this area in overcoming the negative consequences of the COVID-19 pandemic, the timeliness and validity of state support measures, as well as the quality of transformation of business processes of ICT companies.

4. Conclusions

The development of the ICT services sector since its emergence in Ukraine has taken place in the absence of attention and support from the Ukrainian state. In the authors' opinion, removing obstacles for the effective use of its potential in ensuring the socio-economic growth of Ukraine lies in the plane of improving the efficiency of functioning of all the components of systems of public authorities and

optimization of their regulatory impact on economic entities. The effective functioning of public authorities, judicial and law enforcement systems, fiscal stability and balanced regulatory policy, stability of the financial and economic system are the basic conditions for maintaining the current dynamics of the growth of the ICT services sector and the gradual removal of barriers for its positive impact on the socio-economic systems of Ukraine's regions soon. Systematic state support for the development of the ICT services sector in the presence of these basic conditions is able to significantly intensify these processes, which will stimulate the growth of economic and social returns, as well as the strategic competitiveness of this sector.

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Efektywność wykorzystania potencjału sektora usług teleinformatycznych w zapewnieniu rozwoju społeczno-gospodarczego regionów Ukrainy

Streszczenie. *W artykule przedstawiono retrospektywną ocenę porównawczą wykorzystania potencjału sektora usług teleinformatycznych na Ukrainie na podstawie syntetycznego wskaźnika efektywności. Badanie jest próbą określenia, w jakim stopniu sektor usług ICT przyczynia się do wzrostu społeczno-gospodarczego na poziomie regionalnym. W celu dokładniejszej analizy statystycznej zastosowano metodę macierzową, za pomocą której regiony Ukrainy zostały sklasyfikowane pod względem syntetycznego wskaźnika efektywności. Na tej podstawie określono głównych cechy wpływu poszczególnych aspektów rozwoju sektora usług ICT na wzrost społeczno-gospodarczy Ukrainy w 2013 i 2018 r. Te charakterystyczne cechy mogą być wykorzystane przez właściwe organy rządowe do opracowania zestawu środków mających na celu wyeliminowanie istniejących przeszkód dla bardziej pozytywnego wpływu tego sektora oraz stworzenia wytycznych dla usprawnienia mechanizmów regulacyjnych, które mogłyby stymulować bardziej efektywne wykorzystanie potencjału usług ICT sektor do napędzania rozwoju społeczno-gospodarczego.*

Słowa kluczowe*: sektor usług ICT, firma ICT, efektywność wykorzystania potencjału, rynek ICT, wzrost społeczno-gospodarczy, macierz rozmieszczenia regionów*

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