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The relationship between the economy, enterprises and culture in the conditions of strategic discontinuity

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Introduction

Changes in the broad environment affect not only economies, enterprises and institutions but also communities and whole societies. The current changes are so dynamic and profound that they are more and more commonly described as a situation of strategic discontinuity. For one thing, this means a radical departure from or interruption of strategies employed to date, which is due to a fundamental change in the way new knowledge and technological innovations are used; it is also manifested by the continuous search for new solutions in all areas of human activity.

As a result, there is a strong emphasis on innovation; efforts are being made to identify causes and develop ways of minimising differences in the development of regions, to reclaim and develop post-industrial areas, to find news methods of identifying strategic domains of activity and determinants of socio-economic changes. There is also a growing interest in anomalies that occur in capital markets, in the shadow economy, or economic measures designed to secure the survival of enterprises and institutions during the pandemic.

The problems mentioned above are addressed in the articles included in the current issue.

In the article by Myroslava Soldak, Wiesława Caputa, Lyubomyr Sozanskyy, entitled *An assessment of innovation in economic sectors of the Pridneprovsky Economic Region in Ukraine,* the authors analyse the manufacturing sector in Poland and Ukraine, highlighting the need for an ecosystem of innovation, which fosters R&D activity, creates conditions for the development of networks of research centers, provides training of professional staff and facilitates access to global sources of technology, knowledge and highly qualified engineering and technical personnel. They also point out that the development of such an ecosystem depends on the institutional support, which determines, among other things, what kind innovation is pursued.

Iryna Leshchukh and Olha Mulska, in their article entitled *The impact of the regional capital on center-periphery interactions – the case of Lviv and its surrounding region*, present results of a study in which they analysed the impact of Lviv on centre-periphery interactions in the region. Their analysis is based on the Socio-Economic Development Index, which was calculated for different districts, and on the distance of each district from the regional capital. The authors demonstrate that the impact of the regional capital on the socio-economic development of administrative districts decreases with their increasing distance from the regional centre. The level of socio-economic development in districts depends, on the one hand, on the strength of impulses generated by the regional centre, and on the other hand, is determined by the local economic capacity and ability to absorb the impacts of the regional centre and other local growth poles.

The problem of space in the context of spatial management, is the topic of the article entitled *Reclamation and development of post-industrial sites for recreation as exemplified by projects carried out in Poland in the 1920s and 1950s*, written by Elżbieta Zagórska and Łukasz Makowski. The article is based on a review of the literature presenting examples of successful reclamation and development of post-industrial sites. Though the projects were carried out during the last century, they have become a model and point of reference for other park planning projects in Poland.

In his article entitled *The development of industrial enterprises in Ukraine in 2016-2020: assessment and analysis,* Yaroslav Kudria discusses theoretical and practical aspects of the development of enterprises, which makes it particularly interesting from the perspective of management. The author describes a methodical approach to assessing the development of industrial enterprises, which can be used to identify areas of strategic importance.

Ivan P. Buleev, Irina Bryl and Yaroslav Bryukhovetskiy, in their article entitled *The relationship between spirituality and technocentrism in the inclusive development of business entities*, focus on social and economic changes which are the result of changes in the relationship between factors associated with technology on the one hand and spirituality and morality on the other. They consider possible changes in the development of economic entities under inclusive capitalism and a new world economic order, together with associated risks and discuss possible ways of avoiding their negative consequences.

In the article entitled *An extended list of calendar anomalies in the context of the efficient market hypothesis,* Marcin Fuksiewicz uses the context of the efficient market hypothesis to highlight the phenomenon of cyclic anomalies, especially calendar anomalies, which can be used to develop investment methods and procedures. The article contains a list of calendar anomalies that are largely unknown in Poland, e.g. those related to phases of the moon.

Iryna Babets and Wiesława Caputa investigate the problem of illegal operations in the Ukrainian market of transport services in the article entitled *The impact of the shadow sector of transport services on the economic development of Ukraine's regions*. Their study is based on the analysis of regression, which was used to determine the correlation between the coefficient of unreported activity in the sector of transport services and the main indicators of economic development in Ukraine's regions. Although the estimated coefficients of unreported activity in the transport sector were high, they were not found to be significantly correlated with the economic development of particular regions. However, an inverse relationship was observed between the coefficient and per capita income.

In her article entitled *Social entrepreneurship as a tool for supporting the socio-economic development of Ukrainian cities,* Nadia Syniura-Rostun identifies a range of obstacles to social entrepreneurship in Ukraine and argues that the problems caused by the military conflict and the socio-economic instability have in fact stimulated the development of social entrepreneurship. She indicates economic sectors that are the most attractive for social entrepreneurs and formulates a number of recommendations which, if implemented, would stimulate the economic development for Ukrainian cities.

The purpose of Martyna Musiał's article entitled *The impact of the Anti-Crisis Shield package on the activity of cultural institutions in Poland* is to present activities of cultural institutions during the pandemic. In the theoretical part she describes the impact of the anti-crisis shield package on the operation of cultural institutions during the lockdown. The empirical part contains an analysis of specific support tools offered by cultural institutions and organisations, units of local government, the EU, banks, foundations and art academies.

Although the articles included in this issue do not exhaust the range of possible problems, 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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An assessment of innovation in economic sectors of the Pridneprovsky Economic Region in Ukraine

Abstract. *The article provides a comparative assessment of the innovativeness of Ukrainian and Polish manufacturing. The main types and kinds of innovation in different sectors of the Pridneprovsky Economic Region are identified and each kind of economic activity in the region is rated in terms of intensity and efficiency of development. It was found out that the most promising sector of the Pridneprovsky Economic Region was the engineering industry, where innovation is based on engineering developments and research. The authors provide economic justification for measures to increase intensity and efficiency, and hence the level of innovation of key economic activities of the region. What is required is an innovation-oriented ecosystem that provides conditions for research and development, the formation and development of networks that consolidate activities of research centers and science-intensive industrial production, training of professional staff; reliable protection of intellectual property, the development of industrial clusters; that facilitate access to global sources of technology, knowledge and highly qualified engineering and technical personnel.*

Keywords: *innovative activity, industry, innovations, types of economic activit*

1. Formulation of the problem

An innovative ecosystem creation is a complex activity that provides the prerequisites for sustainable development and competitiveness of the territory. On the one hand, innovative ecosystems are formed under the influence and taking into account global social, technological, economic and environmental changes. On the other hand, they are created and developed in a limited (localized) space, where material, production, information and labor resources are already concentrated, which makes it possible to develop and use innovative solutions.

The concept of an innovative ecosystem offers a tool for creating conditions that increase the competitiveness of individual enterprises in various economic sectors. At the center of the concept is the idea that innovation is the process of transforming an idea into the final innovative product or service, the implementation of which requires many participants: entrepreneurs, universities, research institutions, venture funds and others. The combination of all participants allows the innovative ecosystem to implement the full cycle of innovation development.

Each economic sector has the peculiarities of conducting economic activity and types of innovative activity. Some focus on innovative processes based on research centers or companies, others believe that the speed of the implementation and dissemination of innovations is the most important thing. Each activity creates a demand for the relevant institutions of the innovative ecosystem and is a source of demand for the results of innovation. For example, the high-tech business allows universities to form a wide network of partnerships to solve problems: the focus of applied research on the interests of specific customers, obtaining additional sources of funding from customers – high-tech companies of the region, employment of university graduates in high-tech industries. Therefore, the formation of an innovative ecosystem is impossible regardless of the needs and capabilities of participants in the innovative process (Pidorycheva, 2020).

The purpose of the article is to determine which economic sectors have been more successfully developed in recent years in the Pridneprovsky Economic Region (PER), what kinds of innovative activity and types of innovation are peculiar to them, as well as to draw conclusions about the conditions to be provided by the innovative ecosystem of PER to enhance the development of such activities.

In the process of research, the methods of analysis and synthesis, logical generalization, system approach, special methods in economics – economic and statistical analysis, grouping, comparisons and observations were used. To obtain the results, we used the primary data of the State Statistics Service of Ukraine, main departments of statistics of the Dnipropetrovsk, Zaporizhia and Kirovohrad regions from 2012 to 2018, which characterize the innovative activity of industrial enterprises, enterprises by types of innovation and economic activity, intensity

and industry efficiency of development of economic sectors and industry of PER, as well as own data which were received in the course of the economic and statistical analysis, grouping and comparisons.

2. Literature review

The modern general definition of innovations extends innovative activity to all economic sectors, and the very definition of "innovation" is one that can be applied to each sector. Innovations are new or improved products or processes (or their combinations) that are significantly different from the products previously produced by the unit or business processes used by it, offered to potential users (products) or used by the unit (processes) (OECD. Eurostat. 2018).

According to this definition, there are technological (product and process) and non-technological (marketing and organizational) types of innovation.

Technological innovation is the introduction of technologically new and significantly technologically improved products (product innovations) and processes (process innovations). *Product innovation* is the introduction of a product or service that is new or significantly improved in terms of its properties or utilization. Product innovation includes significant improvements in specifications, components and materials, embedded software, user compatibility, or other functionalities; *process innovation* is the introduction of a new or significantly improved method of production or delivery of the product. It includes significant changes in technology, production equipment and/or software.

Marketing innovation is the introduction of a new method of marketing, which includes significant changes in the design or packaging of the product, its warehousing, market promotion or sales pricing.

Organizational innovation is the introduction of a new method and form of organization of all activities of enterprises, improvement of the organizational structure of the management and controllable subsystem of enterprises, improvement of the organization of labor and organization of use of all types of resources in enterprises (Science and innovation in Ukraine, 2018, p. 11).

Traditionally, the analysis and modeling in the economics of innovation focus on identifying technological changes, usually measured by indicators of research and development or patenting (Archibugi & Planta, 1996). However, recently, no less significant are management and organizational innovations, emphasizing the importance of organizational and marketing changes, along with product and process innovations (Franz & Lambert, 2008, p. 18).

Many studies are devoted to the practice of using different types of innovations. Thus, British scientists, using cluster and factor analysis, have identified

two types of innovation, namely "expanding innovation", which combines marketing, organizational, managerial and strategic innovations, and "traditional innovation" which includes product, process and technological innovations. The authors associate these regimes with manufacturing companies and conclude that "expanding" and "direct" innovations do not replace, but rather complement each other. Enterprises that practice both types of activities show higher productivity (Battisti & Stoneman, 2007).

The importance of technological innovation for the economy is determined by the fact that technology ultimately generates wealth, which is a key point for political and economic power; technology is a major factor in increasing productivity and competitiveness; technology is a means of uniting the interests of science, business and government; technology requires a new philosophy of management and practice.

Technological innovations are the basis for the implementation of vital strategies for future technological growth, they increase the productivity of the economy. Economic achievements depend on how quickly technology potentials are recognized and exploited. Therefore, scientific and technical results must be promptly developed and transmitted for use, business must be managed, and government regulation must be aimed at the timely and effective use of technological innovations (Peshkun 2010, pp. 140-141).

3. Main results of the study

The innovativeness of the Ukrainian economy is quite low. In particular, the share of innovative products in the volume of sold industrial products (a key indicator of innovation efficiency) in Ukraine in 2019 was 1.3% against 0.8% in 2018 and 3.3% in 2013. At the same time, the same indicator was over 9% in Poland and over 19% in Germany. In the context of process manufacturing in Ukraine and Poland, the highest share of innovative products is manufactured by mechanical engineering (Table 1). The least innovative products in the Ukrainian industry are products of low-tech industries, including food, consumer goods, woodworking, furniture, other products, repair and installation of machines and equipment. In Poland, the products of the same industries are also less innovative, but their level significantly exceeds the same indicators of Ukraine. It should be noted that the raw material, resource potential in the production of low-tech industries in Ukraine is approximately the same in Poland (Sozanskyy & Ryvak, 2020).

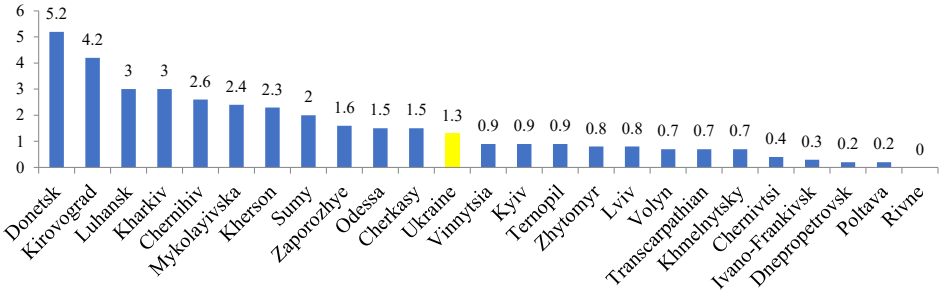
Thus, the low innovation of industrial products, which has the highest potential for innovation, development and implementation of technological innovations

Table 1. The share of innovative products in the volume of sold products (goods, services) by industrial enterprises, Ukraine and Poland (%)

Production	Code NACE Rev. 2	Ukraine	Poland
Industry	B+C+D+E	1.3	9.3
Mining and quarrying	B	**0.2**	0.4
Manufacturing	C	**1.9**	10.9
Manufacture of food products	10	0.9	3.7
Manufacture of beverages	11	2.3	7.3
Manufacture of tobacco products	12	…	7.9
Manufacture of textiles	13	0.4	13.1
Manufacture of wearing apparel	14	0.2	3.2
Manufacture of leather and related products	15	…	3.2
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	16	0.1	6.7
Manufacture of paper and paper products	17	0.1	14.7
Printing and reproduction of recorded media	18	6.3	6.3
Manufacture of coke and refined petroleum products	19	…	16.1
Manufacture of chemicals and chemical products	20	0.6	8.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	21	1.7	9.6
Manufacture of rubber and plastic products	22	1.8	6.5
Manufacture of other non-metallic mineral products	23	0.7	4.4
Manufacture of basic metals	24	3.2	5.1
Manufacture of fabricated metal products, except machinery and equipment	25	0.7	7.0
Manufacture of computer, electronic and optical products	26	6.3	23.2
Manufacture of electrical equipment	27	4.1	27.2
Manufacture of machinery and equipment n.e.c.	28	8.1	15.2
Manufacture of motor vehicles, trailers and semi-trailers	29	5.6	21.8
Manufacture of other transport equipment	30	1.6	21.7
Manufacture of furniture	31	1	5.9
Other manufacturing	32	0.3	4.1
Repair and installation of machinery and equipment	33	0.4	6.9
Electricity, gas, steam and air conditioning supply	D	…	0.5
Water supply; sewerage, waste management and remediation activities	E	…	1.5

Source: calculated according to SSSU (2021), Eurostat (2021).

Chart 1. The share of innovative products in the volume of sold products (goods, services) by industrial enterprises of the regions of Ukraine in 2019 (%)



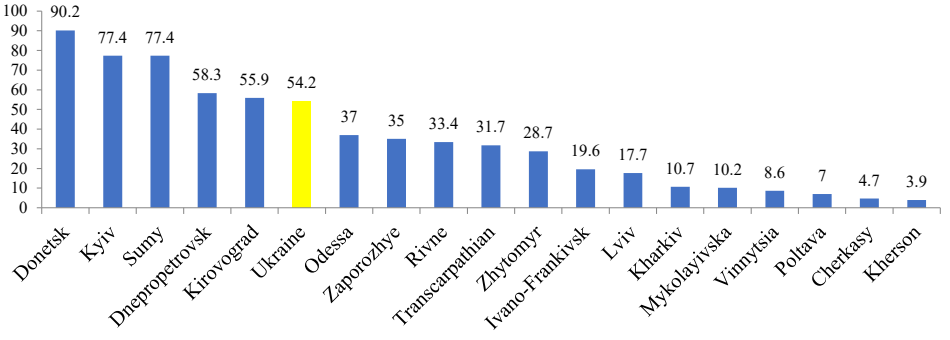
Source: calculated according to SSSU (2021), Eurostat (2021).

is a confirmation of the low level of innovation of the Ukrainian economy as a whole.

Among the regions of Ukraine, the highest level of product innovation is in the Donetsk, Kirovohrad, Luhansk and Kharkiv regions (Chart 1). Here the share of innovative products in the volume of sold products (goods, services) is more than twice as high as in Ukraine. The lowest value of this indicator in the range of 0.0-0.4% in 2019 was recorded in the Chernivtsi, Ivano-Frankivsk, Dnipropetrovsk, Poltava and Rivne regions.

In addition to the low level of innovation of Ukrainian industry products, the problem is the excessively high export orientation of innovative products. Thus, the share of sold innovative products outside the country in the volume of sold innovative products exceeds 54% (Chart 2). This situation in conditions of

Chart 2. The share of sold innovative industrial products (goods, services) outside Ukraine in the volume of sold innovative products of certain* regions of Ukraine (%)



* For some regions of Ukraine such information is not available.

Source: calculated according to SSSU (2021), Eurostat (2021).

economic instability will create potential risks for stable innovative development of the country. Moreover, the fact that most innovative products are not sold in the domestic market is a sign of systemic problems related to the macroeconomic factors, system of stimulating and regulating innovation in Ukraine, as well as the imbalance of intersectoral ties in the economy. It is noteworthy that the Donetsk region is the leader in Ukraine in terms of the share of innovative products (4%), as well as the leader in terms of export-oriented innovative products, more than 90% of which are sold outside the country. High export orientation is also peculiar to the Kirovohrad region – the second product innovation in the country.

Relatively small volumes of production of innovative products and their high export orientation are one of the main and most important barriers to achieve a higher level of social and economic level of functioning and development of the country and its regions. First of all, this is due to the fact that a low-innovation economy provides lower economic, financial and social efficiency, expressed in such indicators as average monthly wages, gross value added per employee, gross domestic product growth, labor productivity and others. In particular, product innovation affects the level of wages, productivity, dynamics of gross value added, profit growth and decrease in production cost. As a result, low innovation of economic products indirectly generates labor migration from the country, dependence on international financial funds, and thus the gradual loss of the country's own innovative potential. Under these circumstances, as well as under the economic influence of challenges caused by global economic instability, the country's economy may be threatened by a loss of competitiveness and productive potential. In sum, all this may lead to such negative trends as even greater growth in the structure of output and exports of low-tech products and goods produced by tolling operations, reducing the role of the economy in international value chains, increasing dependence on imports of intermediate and final goods and fixed capital. Consequently, economic threats can cause serious social and financial challenges.

One of the important reasons for the low level of innovation of Ukrainian products is the low innovative activity and the share of technological innovations that can create the highest multiplier effect in the economic and social spheres.

In Ukraine, most industries, even if they are aimed at technological innovations, prefer their process component (Table 2). This refers, for example, to the construction industry, although global construction companies create the very product innovations (investments).

Each economic sector has the peculiarities of conducting the economic activity and its own types of innovative activity. The work (*Innovatsii v Rossii – neischerpayemyy istochnik rosta*. 2018) proposed a methodology according to which sectors were divided into four types by dominant sources of innovation: scientific, engineering, consumer and type of efficiency. Sectors of one type

Table 2. The ratio of the share of innovatively active enterprises of Ukraine in the total number of enterprises by type of innovations and economic activity (%)

Type of economic activity	Innovatively active enterprises	Of them				
		enterprises with technological (product and / or process) innovations	of them:			enterprises only with non-technological (marketing and/or organizational) innovations
			enterprises with technological (product and / or process) innovations	enterprises with process innovations	enterprises with product and process innovations	
Total	1.00	1.00	1.00	1.00	1.00	1.00
Industry	1.05	1.43	1.51	1.33	1.33	0.84
Mining and quarrying	0.78	0.75	0.31	1.09	1.09	0.80
Manufacturing	1.13	1.56	1.75	1.26	1.26	0.90
Electricity, gas, steam and air conditioning supply	0.71	0.89	0.37	2.00	2.00	0.61
Water supply; sewerage, waste management and remediation activities	0.56	0.81	0.42	1.71	1.71	0.42
Trade	1.07	0.46	0.42	0.57	0.57	1.42
Transportation and storage	0.55	0.39	0.21	0.67	0.67	0.65
Information and communication	1.12	0.99	1.01	0.90	0.90	1.20
Financial and insurance activities	1.36	1.15	0.53	1.79	1.79	1.49
Architectural and engineering activities; technical testing and analysis	0.78	0.75	0.89	0.49	0.49	0.80
Scientific research and development	1.33	2.83	2.62	1.75	1.75	0.49
Advertising and market research	1.21	0.79	0.84	0.81	0.81	1.45

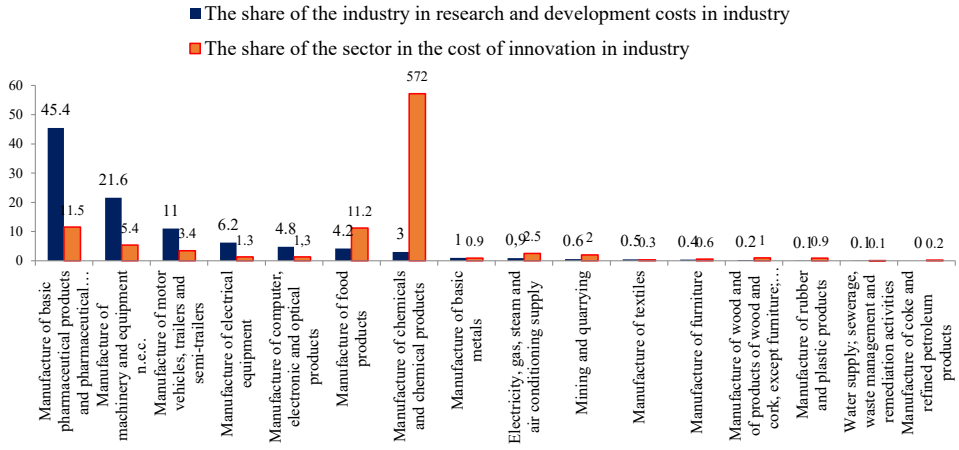
The activities in which the share of enterprises with technological and product innovations is the largest are highlighted in grey.

Source: calculated according to SSSU (2021).

have the general specificity, which makes it possible to determine the patterns of emergence and development of innovations.

Chart 3 demonstrates how metallurgical production (57%), production of pharmaceutical (12%) and food (11%) products are in the lead in terms of total

Chart. 3. Distribution of total volume of expenditures on innovative activities by types of economic activity of Ukrainian industry (%)



Source: calculated and compiled according to SSSU (2021).

expenditures on innovation among the types of economic activity of industry. However, pharmaceutical enterprise (45%) and mechanical engineering spend the most on research and development: machinery and equipment (22%), motor vehicles (11%), electrical equipment (6%) and computers (5%). These sectors will be considered as sectors where innovation is determined by research.

The classification of sectors in strict accordance with the types of innovations is not indisputable since each of the sectors has different types and kinds of innovations.

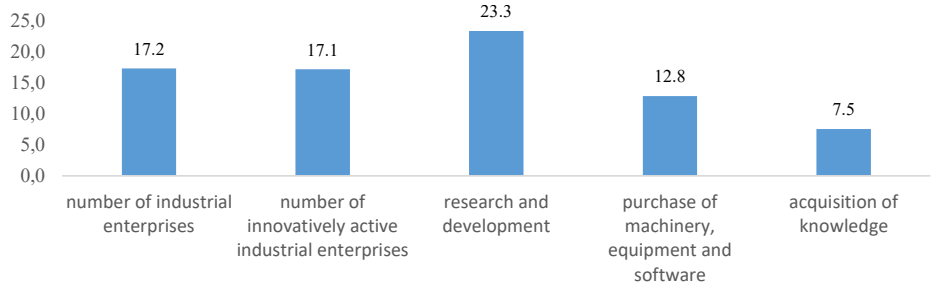
3.1. Innovative development of economic sectors of the Pridneprovsky economic region

The level of innovative development of the Pridneprovsky economic region is primarily determined by the level of development of the industrial potential of the Dnipropetrovsk, Zaporizhia and Kirovohrad regions, which are part of it. Dnipropetrovsk and Zaporizhia regions are industrially developed and together generate 26% of sold industrial products in Ukraine. The contribution of the Kirovohrad region is much smaller – 1.3%.

Almost every sixth industrial enterprise and every sixth innovative industrial enterprise of Ukraine is located in the Pridneprovsky economic region (Chart 4).

Analysis of the situation among industrial enterprises of the Prydniprovsky economic region makes it possible to draw the following conclusions: the share

Chart 4. The place of the Pridneprovsky economic region among the industrial enterprises of Ukraine by the areas of innovative activities



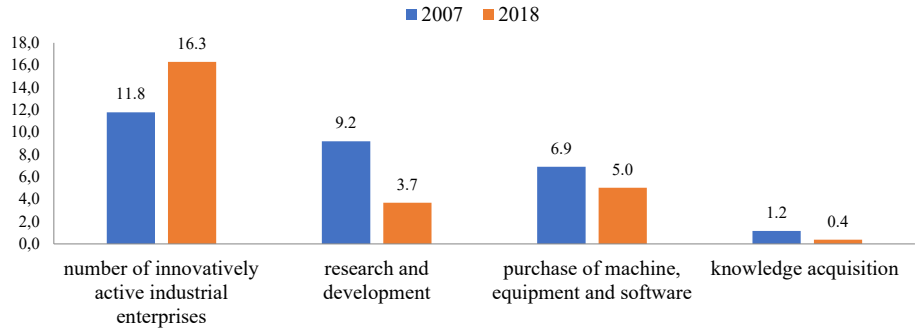
Source: compiled according to SSSU (2021).

of innovative enterprises has increased over the past 10 years, although the absolute number of those who carried out research and development has decreased significantly. The share of research potential of industrial enterprises of the Prydniprovsky economic region has significantly decreased. Most of them began to prefer the purchase of machines, equipment and software, rather than research and development (Chart 5).

The general characteristic of innovative development of PER related to industrial enterprises is given. Assessment of the level of innovative activity of economic sectors should take into account the specifics, namely, the kind and type of innovation that are peculiar to each of them.

According to Table 3, the enterprises with non-technological (marketing and/or organizational) innovations prevail in PER. Meanwhile, the percentage of

Chart 5. Distribution of industrial enterprises of the Prydniprovsky economic region by the areas of innovative activities (%)



Source: compiled by the author according to the SSSU (2021).

Table 3. Distribution of innovatively active PER enterprises by technological and non-technological innovations (%)

Region	Enterprises with technological (product and/or process) innovations	These include			Enterprises only with non-technological innovations
		enterprises with product innovations	enterprises with process innovations	enterprises with product and process innovations	
Ukraine	**35.9**	9.4	12.7	13.9	**64.1**
Dnipropetrovsk region	34.8	9.3	13.0	12.5	65.2
Zaporizhia region	35.5	13.9	4.3	17.3	64.5
Kirovohrad region	53.0	15.2	20.7	17.1	47.0
On average in PER	**41.1**	**12.8**	**12.7**	**15.6**	**58.9**

Source: calculated and compiled according to SSSU (2021).

enterprises with technological innovations is higher than the average in Ukraine (41.1% and 35.9%, respectively), in particular, it relates to enterprises with product innovations (12.8% and 9.4%, respectively).

To determine the type of innovations that are most peculiar to PER economic sectors, it is advisable to determine the rating of their development by intensity (growth rate of production) and efficiency (contribution to GRP). The methodology of integrated measurement of the development of PER economic activities is based on a score by the indicators of intensity and effectiveness and their total value. Each of the indicators is extremely important, so the weight effect of each is taken at the level of 50% ($0.5 \times 2 = 1$). The results of the score are shown in Table 4.

The rating of types of economic activity of PER by development intensity and efficiency based on score assessment presented in Chart 6.

Metallurgical production, mining industry, chemical industry, production of rubber and plastic products, as well as production of coke and oil refining products are developing more intensively and effectively in PER. It is not possible to provide a realistic assessment of the development of the pharmaceutical industry in PER since domestic statistics do not provide data on the production indexes of the pharmaceutical industry in the Dnipropetrovsk and Zaporizhia regions. Therefore, the score was based only on the data of the production index in the Kirovohrad region, as well as the volume of sold pharmaceutical products of all regions that are part of PER.

Consideration of the methodology according to which sectors are divided into four types by dominant sources of innovation: scientific, engineering, consumer and type of efficiency, as well as compiling and analyzing the rank-

Table 4. Score assessment of the development of PER sectors by development intensity and efficiency in 2012-2018

Type of economic activity	Development intensity			Development efficiency			Total score
	index of physical production volume	score		specific weight in total production volume	score		
		total	balanced		total	balanced	
Overall in PER	**102.2**	**1**	×	**17.3**	**1**	×	×
Agriculture, forestry and fishing	129.7	1.269	0.635	13.5	0.780	0.390	1.025
Mining and quarrying	99.3	0.972	0.486	36.5	2.110	1.055	1.541
Manufacturing	94.1	0.921	0.460	27.1	1.566	0.783	1.244
Manufacture of food products; beverages and tobacco products	98.7	0.966	0.483	12.0	0.695	0.347	0.830
Manufacture of textiles, wearing apparel, leather and related products	97.0	0.949	0.474	10.6	0.612	0.306	0.780
Manufacture of wood, paper, printing and reproduction	99.0	0.969	0.484	7.2	0.414	0.207	0.691
Manufacture of coke and refined petroleum products	97.1	0.950	0.475	19.1	1.106	0.553	1.028
Manufacture of chemicals and chemical products	96.2	0.942	0.471	26.1	1.509	0.755	1.225
Manufacture of basic pharmaceutical products and pharmaceutical preparations*	50.5	0.494	0.247	1.1	0.065	0.033	0.280
Manufacture of rubber and plastic products	106.9	1.046	0.523	20.2	1.168	0.584	1.107
Manufacture of basic metals	100.0	0.978	0.489	53.0	3.062	1.531	2.020
Mechanical engineering	80.3	0.785	…	21.7	1.255	0.627	0.627
Electricity, gas, steam and air conditioning supply	86.7	0.848	0.424	19.0	1.098	0.549	0.973
Construction	110.3	1.079	0.540	9.6	0.555	0.277	0.817
Trade	86.2	0.843	0.422	10.0	0.578	0.289	0.711
Transportation and storage	102.9	1.007	0.503	10.2	0.590	0.295	0.798
Hotel and restaurant business	108.2	1.059	0.529	11.1	0.642	0.321	0.850
Information and communication	140.2	1.372	0.686	6.8	0.393	0.197	0.882

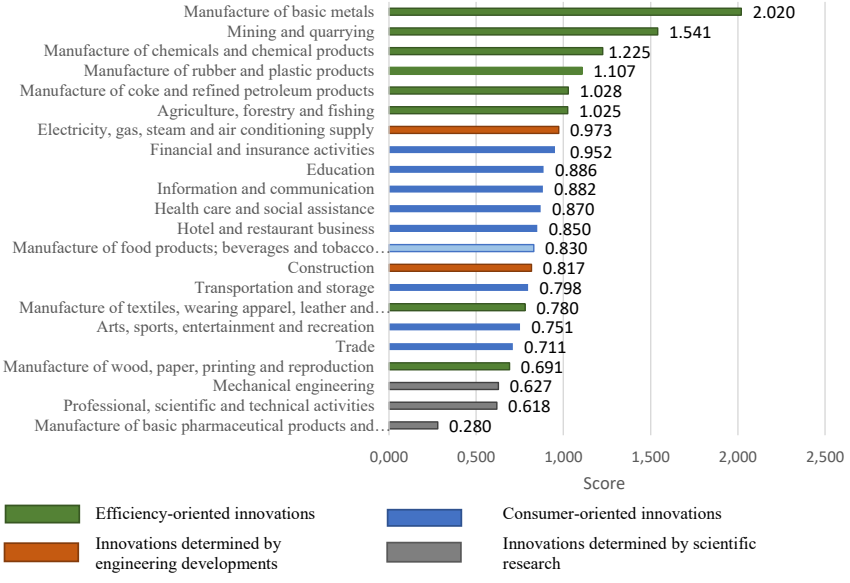
Table 4 – cont.

Type of economic activity	Development intensity			Development efficiency			Total score
	index of physical production volume	score		specific weight in total production volume	score		
		total	balanced		total	balanced	
Financial and insurance activities	118.9	1.163	0.582	12.8	0.740	0.370	0.952
Real estate activities	142.0	1.389	0.695	13.4	0.775	0.387	1.082
Professional, scientific and technical activities	88.6	0.867	0.433	6.4	0.370	0.185	0.618
Administrative and support service activities	111.4	1.090	0.545	10.3	0.595	0.298	0.843
Education	96.7	0.946	0.473	14.3	0.827	0.413	0.886
Health care and social assistance	96.8	0.947	0.474	13.7	0.792	0.396	0.870
Arts, sports, entertainment and recreation	99.1	0.970	0.485	9.2	0.532	0.266	0.751

* There are no data on production indexes of the pharmaceutical industry in the Dnipropetrovsk and Zaporizhia regions.

Source: calculated according to SSSU (2021).

Chart 6. Rating of types of PER economic activities by development intensity and efficiency in 2012-2018



Source: compiled by the author based on research results.

Table 5. Economic sectors of the Prydniprovsky economic region by types and kinds of innovations*

Types of economic and industrial activities	Rating	Types of innovations	The predominant type of innovation	Technological level of industries
Manufacture of basic metals	1	Innovation focused on efficiency	Product and process	Medium low
Mining and quarrying	2	Innovation focused on efficiency	Process	Medium low
Manufacture of chemicals and chemical products	3	Innovation focused on efficiency	Product and process	Medium low
Manufacture of rubber and plastic products	4	Innovation focused on efficiency	Product and process	Medium low
Manufacture of coke and refined petroleum products	5	Innovation focused on efficiency	Product and process	Medium low
Agriculture, forestry and fishing	6	Innovation focused on efficiency	Product and process	_
Electricity, gas, steam and air conditioning supply	7	Innovations determined by engineering developments	Product and process	_
Financial and insurance activities	8	Consumer-oriented innovations	Non-technological	_
Education	9	Consumer-oriented innovations	Non-technological	_
Information and communication	10	Consumer-oriented innovations	Non-technological	_
Health care and social assistance	11	Consumer-oriented innovations	Non-technological	_
Hotel and restaurant business	12	Consumer-oriented innovations	Non-technological	_
Manufacture of food products; beverages and tobacco products	13	Consumer-oriented innovations	Product and process	Low
Construction	14	Innovations determined by engineering developments	Process	_
Transportation and storage	15	Consumer-oriented innovations	Non-technological	_
Manufacture of textiles, wearing apparel, leather and related products	16	Innovation focused on efficiency	Product and process	Low
Arts, sports, entertainment and recreation	17	Innovation, oriented for consumers	Non-technological	_
Trade	18	Innovation, oriented for consumers	Non-technological	_
Manufacture of wood, paper, printing and reproduction	19	Innovation focused on efficiency	Product and process	Low

Table 5 – cont.

Types of economic and industrial activities	Rating	Types of innovations	The predominant type of innovation	Technological level of industries
Mechanical engineering	20	Innovations that are determined by scientific research	Product and process	High
				Medium high
Professional, scientific and technical activities	21	Innovations that are determined by scientific research	Product innovations	–
Manufacture of basic pharmaceutical products and pharmaceutical preparations	22		Product and process	High

* The colors in the Table 5 correspond to the colors in Figure 6.

Source: compiled by the author based on research results.

ing of economic activities by development intensity and efficiency makes it possible to make such observations. According to the types of innovations in PER, efficiency-oriented sectors are developing more intensively and effectively. Enterprises of these activities implement technological innovations (process and product), the technological level of sectors is medium-low. Types of activities that focus on scientific innovations with their product type – mechanical engineering, professional research and technical activities, pharmaceuticals – are at the end of the ranking of PER sectors by development intensity and effectiveness Table 5.

4. Conclusion

Institutional support for the formation of the innovative ecosystem depends on what kind and type of innovations the leading types of economic activity developed in a limited geographical area and implement local innovative processes aim at.

If PER continues to develop economic activities in which innovation is focused on efficiency (primarily the metallurgical industry), for which the most important is the presence of a developed system of partnerships that promotes effective interaction of suppliers, producers and customers, and the costs of innovation are spent on the purchase of new technologies, machines and equipment, the implementation of new innovative solutions should be carried out in the following directions:

– modernization of equipment with the mandatory introduction of new ecological systems and improvement of production processes aimed at increasing the range of products (Yakubovskiy, & Soldak, 2017a, b, p. 46);

– implementation of digital technologies at all stages of production: IoT-platforms, cloud technologies, intelligent sensors, mobile devices, "smart" machines and mechanisms, additive technologies (3D-printing), which provide advanced interfaces for human-machine interaction, multilevel interaction with customers and collection of customer information, verification and fraud detection (Amosha, & Nikiforova, 2019).

For the development of such industries, the local innovative ecosystem should provide training for STEM staff who have and regularly update modern digital skills through various programs aimed at promoting lifelong learning in a region, establishing partnerships with business in the formation of STEM staff development, reforming the education system and methods of staff training, as well as regulating investment in lifelong learning through the introduction of tax benefits and preferences (Chekina & Vorhach, 2019, p. 52).

Among the activities whose innovative activity is determined by engineering developments and research in PER, the most promising is the engineering industry. To increase production volume through the creation and implementation of new and improved technologies, it is necessary to conduct research and development where manufacturers work closely with scientific institutions, university faculties, research centers. There is a need for professional staff and a business environment that provides reliable protection of intellectual property; the presence of developed industrial clusters, as well as policies that promote greater access to global sources of technology, knowledge and highly qualified engineering and technical personnel.

The long-term efforts required by scientific innovation necessarily involve a favorable environment at the national level. One of the first steps in this direction may be making appropriate adjustments to the Strategy of Innovative Development of Ukraine to create high-level groups for key technologies; identification and periodic updating of the national list of key technologies; level increase in R&D funding to at least 2% of GDP; stimulation of long-term investment in R&D; adjusting the share of private funding in total funding to 50% (Vyshnevskyi et al., 2018, p. 121), strict measures to protect intellectual property, ensuring that companies make a profit from the sale of new products based on their inventions.

Successful formation of an institutional structure that is good to the establishment of a developed network of business partnerships with the vector of innovation is possible only in combination with limiting the scope of institutional traps in the form of corruption, administrative barriers, insecurity of property rights.

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Ocena innowacyjności sektorów gospodarczych Naddnieprowskiego Regionu Gospodarczego na Ukrainie

Streszczenie. *Artykuł zawiera porównawczą ocenę innowacyjności ukraińskiego i polskiego przemysłu. Zidentyfikowano główne typy i rodzaje działalności innowacyjnej w różnych sektorach Naddnieprowskiego Regionu Gospodarczego, a każdy rodzaj działalności gospodarczej w regionie został oceniany pod względem intensywności i efektywności rozwoju. Stwierdzono, że najbardziej obiecującym sektorem Naddnieprowskiego Regionu Gospodarczego jest przetwórstwo przemysłowe, w którym innowacje opierają się na rozwoju technologii produkcji i badaniach. Autorzy uzasadniają ekonomicznie działania mające na celu zwiększenie intensywności i efektywności, a co za tym idzie – poziomu innowacyjności kluczowych form działalności gospodarczej w regionie. W tym celu potrzebny jest ekosystem nastawiony na innowacje, który zapewni warunki do prowadzenia badań i rozwoju, tworzenia i rozwoju sieci konsolidujących działalność ośrodków badawczych i produkcji przemysłowej wykorzystującej najnowsze osiągnięcia naukowe; który zapewnia szkolenia profesjonalnej kadry, rzetelną ochronę własności intelektualnej, rozwój klastrów przemysłowych; który ułatwia dostęp do światowych źródeł technologii, wiedzy oraz wysoko wykwalifikowanej kadry inżynieryjno-technicznej.*

Słowa kluczowe: *działalność innowacyjna, przemysł, innowacje, rodzaje działalności gospodarczej*

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The impact of the regional capital on center-periphery interactions – the case of Lviv and its surrounding region

Abstract. *To analyse the impact of Lviv on centre-periphery interactions the authors calculated the Socio-Economic Development Index for different districts of the region and considered the distance of each district from the regional capital. The Socio-Economic Development Index (I_r) of each district was calculated as the arithmetic mean of indices of its economic (I_e) and social (I_s) development. A strong inverse relationship was found between districts' indices and their distances from the regional capital ($R = –0.69$). The indices were used to classify districts into three categories: central, semi-peripheral, and peripheral. The central category includes districts located within a 50-km radius of Lviv and their indices range from 0.5 to 0.7. Semi-peripheral districts are located within the radius of 50-75 km and their I_r values range from 0.3 to 0.5. Peripheral districts are located at the furthest distance from the regional centre, and their I_r values are below 0.3. Because the correlation between the distance from the regional center and index value for some districts was not consistent with the general pattern, two subtypes of districts were also added – core and ancillary. The authors demonstrate that the impact of the regional capital on the socio-economic development of administrative districts decreases with their increasing distance from the regional center. The level of socio-economic development in districts depends, on the one hand, on the strength of impulses generated by the regional center, and on the other hand, is determined by the local economic capacity and ability to absorb the impacts of the regional center and other local growth poles.*

Keywords: *center-periphery, center-periphery interactions, regional economy, socio-economic development, decentralization, region*

1. Introduction

The cities-oblast centers are the powerful cores for surrounding territory (oblast) that simultaneously concentrate and generate the large-scale financial-economic, socio-cultural, material, human, and informational, etc. flows. Being, in fact, the largest cities of Ukraine both in the territorial context and by the density of the population, they constitute the place of income redistribution and accumulation, the residence of the wealthiest population in the regions, the pole of power, wealth, and therefore – overconsumption.

Serving as the frame elements of the society's territorial organization, the cities-oblast centers, on the one hand, "exhaust" the resources of adjoining areas (districts of the oblast), aggravating the socio-territorial segregation. On the other hand, they attract these areas to the processes of modernization and market exchanges, stimulating the renovation of the periphery and integrating the local economic sectors and settlement systems.

Meanwhile, the level of penetration of positive development impulses generated by the city-oblast center through the territory of a region is different. It is manifested in the respective structural changes of the socio-economic nature in the region. Achievement of respective "positive effects" spatially depends on the capacity of the economies of adjoining and remote areas to absorb technological, managerial, and social innovations, availability of respective development conditions and resources, transport and communication corridors and networks, and intellectual capital.

2. Analysis of recent research and publications

A range of domestic researchers addresses various aspects of socio-economic development of Ukrainian regions, namely M. Deich (2020), N. Ivanova (2017), M. Melnyk, I. Leshchukh and R. Yaremchuk (2019), I. Tsymbalyuk (2019) etc.

The researchers of the SI "The Institute of Regional Research Named after M.I. Dolishniy of the NAS of Ukraine" cover various aspects of conducting regional economic policy (Melnyk, 2014, 2020; Melnyk & Leshchukh, 2019). Yet, the impact of the city-oblast center on the socio-economic development of the districts in the region in the context of the center-periphery interactions remains to be underresearched.

The paper aims to determine the impact of the city-oblast center on the space structuring in the region in the context of the center-periphery interactions.

3. Main research results

The nature of development impulses generated by a city-oblast center is complicated and underresearched both in the domestic and world science despite the fact that the capacity of the center-periphery concept allows using its dominants when setting numerous tasks of not only political-geographical but also socio-economic nature on all levels of the territorial system hierarchy.

The impact of a city-oblast center on the socio-economic development of districts in the region will be examined on the example of Lviv and Lvivska oblast.

The impact of Lviv on the socio-economic development of Lvivska oblast districts will be evaluated by calculating the Districts' Socio-Economic Development Index in the region. It will be analyzed taking into account the distance of the district from the city-oblast center.

Table 1. Parameters to calculate the districts' indices of economic and social development

No.	Parameters	Parameter's impact
Economic Development Index (I_e)		
1	Capital investment per capita, thous. UAH	Stimulator
2	Foreign direct investment, (equity) per capita, $	Stimulator
3	Foreign trade in goods balance per capita, $	Stimulator
4	Foreign trade in services balance per capita, $	Stimulator
5	Provided services per capita, thous. UAH	Stimulator
6	Commissioning of the housing space per 1,000 of the population, sq.m	Stimulator
7	Average number of full-time employees per 1,000 persons, persons	Stimulator
8	Number of companies-economic entities, units per 10,000 persons	Stimulator
9	Companies' retail turnover per capita, thous. UAH	Stimulator
10	Average monthly nominal wages, on average per employee, UAH	Stimulator
Social Development Index (I_s)		
1	Housing space available to the population (as of the end of the year, sq. m of the total space per capita)	Stimulator
2	Children coverage with pre-school educational facilities, %	Stimulator
3	Number of pupils per 1 teacher, persons	Stimulator
4	Number of medical staff per 10,000 of the population (doctors and paramedics), persons	Stimulator
5	Demographic burden on the population aged 15-64 (at the beginning of the year, persons aged 0-14 and 65 and older per 1,000 persons aged 15-64)	Destimulator
6	Natural growth, persons per 1,000 of the de-facto population	Stimulator
7	Migration growth, persons per 1,000 of the de-facto population	Stimulator

Source: developed by the authors.

The integral Districts' Socio-Economic Development Index in Lvivska oblast (I_r) is suggested to be calculated as an arithmetic mean of indices of their economic (I_e) and social (I_s) development (Table 1).

Taking into account the fact that the parameters provided in Table 1 are heterogeneous, i.e. they cannot be compared and have substantial intraregional fluctuations, the process of their standardization is necessary as it will secure the compatibility and comparability of the created information basis.

The standardization procedure should be carried out taking into account the fact that the provided parameters are the stimulators (the growth of their rates positively impacts the level of economic/social development of the district) or destimulators (the growth of their rates, respectively, affects the level of economic/social development of the district):

$$N_i = \frac{Z_i - Z_{\min}}{Z_{\max} - Z_{\min}};\ N_{ij} = \frac{Z_{\max} - Z_i}{Z_{\max} - Z_{\min}}, \tag{1}$$

where:

N_i – the normalized value of the i parameter in the district;
Z_i – the value of the i parameter in the district;
$Z_{\max}$ – maximum value of the i parameter in the district;
$Z_{\min}$ – minimum value of the i parameter in the district.

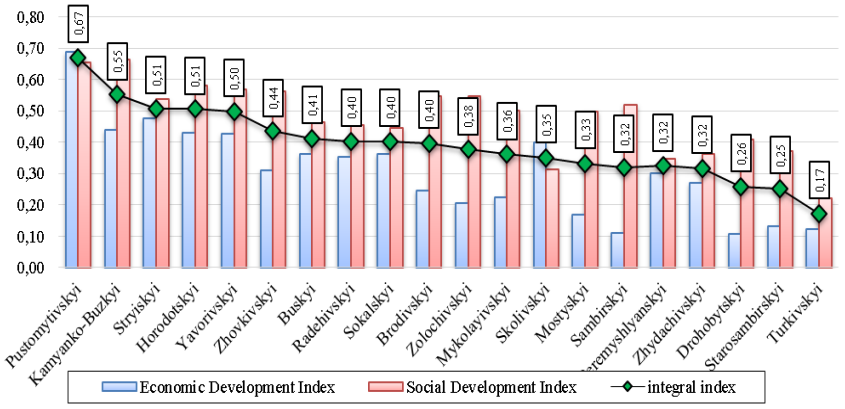
The normalization of primary parameters by the formulas (1) will bring their values within the range [0:1]. Meanwhile, the higher is the index, the higher is the development level of the district by the respective index, and vice versa.

The results of the calculations made according to the methodology explained above confirm the centrifugal-zonal nature of Lviv's impact on the socio-economic development of the adjoining area (Fig. 1).

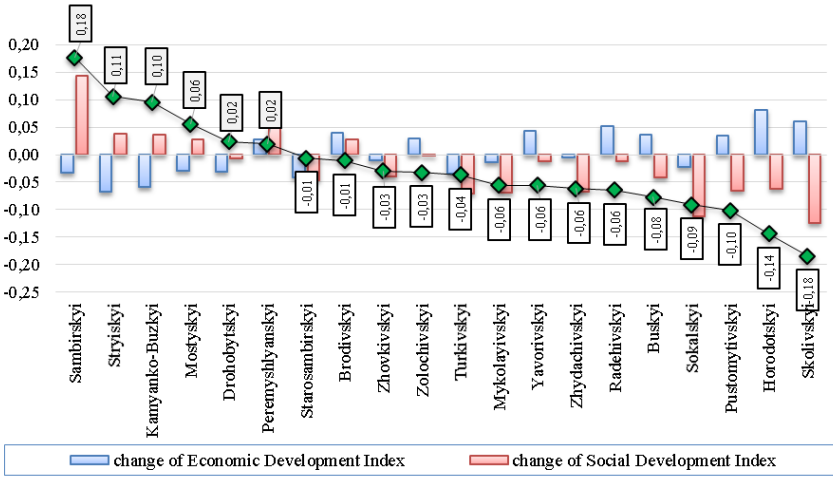
Social Development Index rate in 2019 was higher than the Economic Development Index rate in all districts of Lvivska oblast, except for Pystomytivskyi and Skolivskyi. Yet, the dynamics of the parameter in the reporting year compared to 2014 was characterized by a growing trend only in 30% of the districts in the region. Meanwhile, the Economic Development Index increased in the period under research in 45% of districts in the region.

Taking into account the fact that one of the most large-scale reforms has been undergoing in Ukraine since 2014 – the decentralization reform, the represented calculation results (Fig. 1) testify to its insufficient impact on the socio-economic situation of districts in Lvivska oblast. Therefore, local growth poles and internal prospective and competitive advantages of the region remain to be the drivers of development in the region. In particular, the coefficient of correlation between the distance from Lviv (as the center with the highest functional-hierarchical status and, consequently, impact level) and socio-economic development of districts in Lvivska oblast is –0.69 (Fig. 2).

Fig. 1. The Districts' Socio-Economic Development Index in Lvivska oblast



(a) 2019



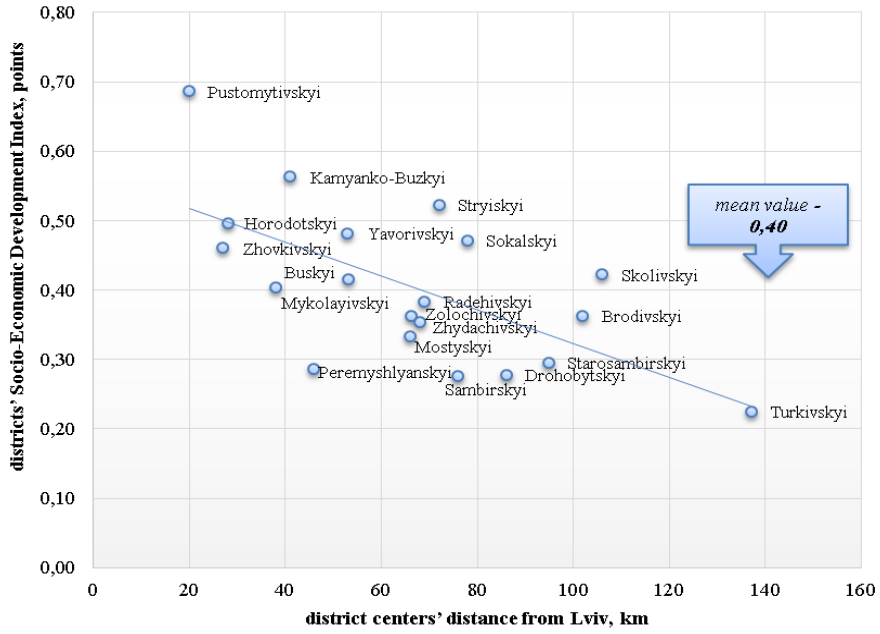
(b) change of parameters in 2019 against 2014

Source: calculated by the authors based on the data of The Main Statistical Office in Lvivska Oblast (2014 and 2019).

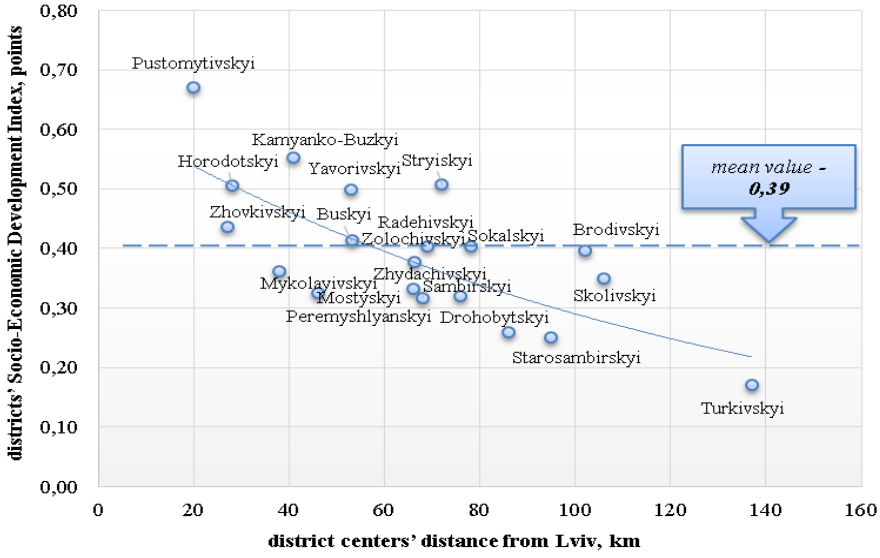
The level of socio-economic development of districts in Lvivska oblast (Fig. 2) is characterized by high variability, acquiring the highest value in Pustomytivskyi district (I_r = 0.67), and the lowest – in the mountain Turkivskyi district (I_r = 0.17).

Economic-geographical (adjacency to Lviv; location close to the border with the EU countries) and transport-geographical location (2 pan-European transport corridors cross the territory; there is a well-developed transport network (highways, railways); location close to Lviv Danylo Halytskyi International Airport)

Fig. 2. Dependence of the Districts' Socio-Economic Development Index in Lvivska oblast on their distance from Lviv, 2014 (a) and 2019 (b)



(a) 2014



(b) 2019

Source: calculated by the authors.

is the essential advantage of Pustomytivskyi district. Having a well-developed transport-logistics infrastructure and ICT sector, the district is characterized by the biggest among the districts in the oblast population growth and the biggest amount of capital investment[1] per capita (in 2019 – 30.02 thous. UAH) in the region, and the highest density of the de-facto population (in 2019 – 127 persons per 1 sq. km; +6 persons per 1 sq. km compared to 2014), commissioning of housing space per 1,000 of residents, employment, number of enterprises per 10,000 residents, and services provided per 1 resident, etc.

Naturally, TOP 5 districts in Lvivska oblast by the level of socio-economic development consists of the districts included in Lviv agglomeration (Kamyanka-Buzkyi, Horodotskyi, Yavorivskyi, and Zhovkivskyi districts in addition to the abovementioned Pustomytivskyi district). Having a well-developed transport-logistics infrastructure in the agglomeration, these districts are characterized by the closest relations with the "core" – Lviv.

Moreover, the semi-peripheral Stryiskyi district is among the leaders in Lvivska oblast by the level of socio-economic development (I_r = 0.51). Thus, in the background of a slight fading of Lviv's impact, existing internal prospective and competitive advantages play an essential role in the district's development. In the first place, Stryisko-Rozdolskyi industrial hub is located at the territory of the district – the industrial structure of mixed type with the development of mining and processing industries. In the second place, this district is the leader in the oblast by average monthly wages (in 2019 – 11,078 UAH, which exceeds the average oblast rate by 1,807 UAH); the leader among the districts in the oblast (behind Buskyi district) by attracted foreign direct investment per 1 resident (in 2018 – $ 1219.6, the respective rate for the oblast in general – $ 658.3); and is ranked third by sold industrial products per 1 resident, about 88% of which is sold by TzOV "Leoni Wiring Systems UA GmbH" – one of the largest foreign-invested companies at the territory of Lvivska oblast by volume of investment and production level (investment project on the production of electrical equipment for motors and vehicles, investment volume – over € 65 million. The cables produced by the factory go to the plants manufacturing cars of global brands Opel, Porsche, Audi, and Lamborghini).

Furthermore, the level of socio-economic development of Stryiskyi district is much boosted by the local growth pole – the city of oblast significance Stryi, which is the leader in the oblast (behind Lviv) by retail turnover, is ranked second (behind Pustomytivskyi district) by migration growth and is characterized by foreign trade in services surplus.

[1] The biggest volumes of capital investment are secured by such economic activity types as construction, manufacturing, wholesale and retail trade, repair of vehicles, transport, and warehousing. Enterprises' funds were the main sources of capital investment in 2014-2019 (The Main Statistical Office in Lvivska oblast, 2014 and 2019).

The lowest level of socio-economic development is recorded in the mountain Turkivskyi district (I_r = 0.17), which is related to:

– *in the first place,* difficult geography (according to the Law of Ukraine "On the Status of Mountain Settlements in Ukraine", settlements in districts are granted the status of mountain ones. Moreover, among all districts of Lvivska oblast, Turkivskyi district is located the farther from the "core" (oblast center) – over 130 km);

– *in the second place,* low level of socio-economic development of neighboring districts (namely, in Starosambirskyi district I_r = 0.25);

– *in the third place,* lack of influential local growth pole that would secure absorption of development impulses generated by Lviv or other oblast centers (distance from Uzhorod is 118 km, Ivano-Frankivsk – 216 km) and the closest border checkpoints (distance from border checkpoint Vyšné Nemecké on the border with Slovakia is 118 km, border checkpoint Medyka on the border with Poland – 123 km) (The Main Statistical Office in Lvivska oblast, 2021).

Other mountain districts of Lvivska oblast – Skolivskyi (I_r = 0.35), Drohobytskyi (I_r = 0.26), and Starosambirskyi (I_r = 0.25) – are characterized by low development level. Insufficient business development, low investment activity[2], poor transport and road infrastructure[3], structural problems in the labor market, and environmental problems are the problems common for mountain areas.

Geographic features of mountain areas impact the parameters of social infrastructure development. Thus, the level of children's coverage with preschool education in mountain areas is the lowest among administrative units of Lvivska oblast (in 2019, in Starosambirskyi district – 34.6%, Sambirskyi – 34%, Turkivskyi – only 21%; the average rate in the oblast – 55%). As far as there are many ungraded schools on these territories, the average class size in schools remains below standard rate (15 pupils in the class) and much lower than the average rate in the oblast (21 pupils in the class). The number of hospital beds also needs optimization. At the standard rate of 37.5 beds per 10,000 of the population, the rate is the highest in Turkivskyi district and amounts to 58.1 (Melnyk, Leshchukh, & Syniutka, 2013).

Even though Lviv is the biggest transport hub of the Western region of Ukraine, there is a problem of poor transport accessibility of some areas in Lvivska oblast. The problem is the most severe for mountain villages in the

[2] For example, in 2014-2018, Turkivskyi district was characterized by the lowest volumes of attracted foreign direct investment among administrative units of Lvivska oblast (per capita in 2014 – $ 1.05, and in 2018 – $ 0.99).

[3] In 2017, 27% of the total program expenditures of the local budget in Turkivskyi district were directed at the development of roads, which is the main factor of investment development in mountainous terrain.

oblast that do not have railway connections. Railway routes create the main network from which other less developed transport routes branch off. The situation is most explicit in Starosambirskyi district, where over 20 villages beyond the railway lines are almost inaccessible. The worst is the transport accessibility in Turkivskyi and Skolivskyi districts. There is no railway connection in the mountain part of Drohobytskyi district, so access of the rural population to job places and to social and administrative services is complicated (Strategy for the development of mountain areas of Lviv region for 2018-2022).

Therefore, local and regional authorities should prioritize the improvement of economic competitiveness in mountain areas and transition to their intensive development model. In particular, socio-economic development of peripheral areas, in the first place mountain districts, can be boosted by creating new industrial centers around Turka and Skole, which is stipulated by 2021-2027 Lvivska Oblast Development Strategy.

The calculations made above allow singling out certain territorial patterns for socio-economic development of districts in the oblast and their distance from the oblast center, i.e. typing (grouping) the districts dividing them into central, semi-peripheral, and peripheral types (Fig. 3).

The central type includes the districts located close to the "core" (district centers no more than 50 km from the oblast center), and their Socio-Economic Development Index ranges within $0.5 < I_r < 0.7$. The semi-peripheral districts are somewhat farther from the "core" compared to the central ones (50-75 km). The results of the research show that their I_r is within 0.3-0.5. The peripheral districts are furthest away from the oblast center and have $I_r < 0.3$.

Meanwhile, there are some inconsistencies between the distance of the oblast districts from the oblast center and the level of their socio-economic development, which has generated the need to single out subtypes in addition to main types. Namely, among the central districts, there is a group of administrative units with socio-economic development slightly lower despite close location to the oblast center. These are Zhovkivskyi, Peremyshlyanskyi, and Mykolayivskyi districts. They constitute the central districts of the lacunar type.

Despite the peripheral location against Lviv, Stryiskyi district is characterized by a higher socio-economic development level than other semi-peripheral districts. Therefore, the administrative unit acquires the central features beyond the impact of the oblast center and is, in fact, the core of socio-economic activity in semi-periphery.

Peripheral districts of Lvivska oblast are not homogeneous. Thus, Skolivskyi, Sambirskyi, Sokalskyi, and Brodivskyi districts actually acquire the semi-peripheral features because they are characterized by slightly higher development levels compared to other peripheral administrative units. Therefore, we classify them as semi-peripheral districts of the core type.

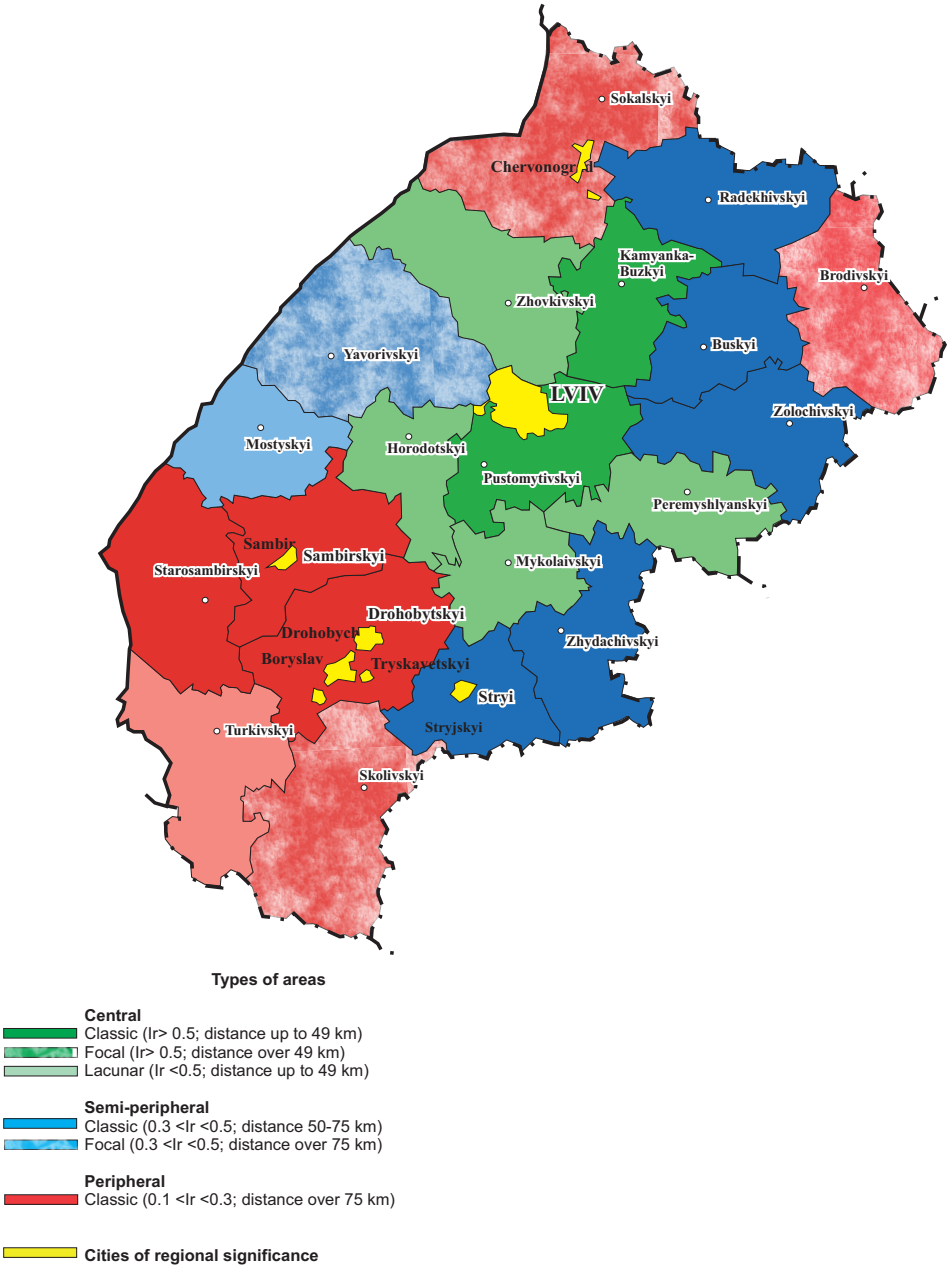


Fig. 3. Classification of the districts in Lvivska oblast by the level of socio-economic development and distance from Lviv

Source: developed by the authors.

4. Conclusions

The impact of Lviv on the socio-economic development of administrative units in Lvivska oblast is of centrifugal-zonal nature because the intensity of the impact falls with the growth of distance between the district centers and the "core". Meanwhile, the level of socio-economic development of districts stems from the strength of impulses generated by the city-oblast center, and on the other hand, is determined by the existing local economic capacity and ability to absorb the impacts of the "core" and other local growth poles (e.g. the cities of oblast significance). The research allows to make a range of other conclusions:

1. The socio-economic development level of districts in Lvivska oblast is characterized by high variability, acquiring the highest rates in the districts included in Lviv agglomeration (Pustomytivskyi, Kamyanka-Buzkyi, Horodotskyi, Yavorivskyi, and Zhovkivskyi districts). Moreover, the semi-peripheral Stryiskyi district is among the leaders in the region by the socio-economic development level (I_r = 0.51), where the existing internal prospective and competitive advantages are the development drivers in the background of a slight fading of Lviv's impact (Stryisko-Rozdolskyi industrial hub, city of oblast significance Stryi). The lowest level of socio-economic development is recorded in the peripheral districts of the oblast – especially the mountain ones – Skolivskyi, Drohobytskyi, Starosambirskyi, and Turkivskyi districts. It is caused by complex structural problems (in particular, in economic development (difficult economic conditions in mountain terrain, narrow sectoral economic structure), labor market, social protection of the population, nature management) and poor development of transport and engineering infrastructure caused, in the first place, by geographic features of these territories.

2. High variability of the Districts' Socio-Economic Development Index in the region (from 0.67 points in Pustomytivskyi district to 0.17 points in Turkivskyi district) is caused by specifics of the region's economic development, where new industrial, agglomerative, mountain, and border territories function along with traditional industrial, agricultural, and industrial-agricultural administrative units.

3. Inconsistencies between the distance from Lviv and the Districts' Socio-Economic Development Index in Lvivska oblast (like central Peremyshlyanskyi or semi-peripheral Stryiskyi districts) are objectively explined, on the one hand, by availability/absence of internal competitive advantages of certain districts, and on the other hand, their dependence on stimulating role and impact of other local growth poles.

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Wpływ stolicy obwodu na interakcje centrum-peryferia – przypadek Lwowa i okolic

Streszczenie. *Aby przeanalizować wpływ Lwowa na interakcje między centrum a peryferiami obwodu lwowskiego, autorzy obliczyli wskaźnik rozwoju społeczno-gospodarczego dla różnych rejonów obwodu i wzięli pod uwagę odległość każdego rejonu od centrum regionu. Wskaźnik rozwoju społeczno-gospodarczego (I_r) dla każdego rejonu obliczono jako średnią arytmetyczną wskaźników jego rozwoju gospodarczego (I_e) i społecznego (I_s). Stwierdzono silną zależność odwrotną między*

wskaźnikami rejonów a ich odległościami od centrum regionu (R = –0,69). Indywidualne wskaźniki posłużyły do sklasyfikowania rejonów na trzy kategorie: centralne, półperyferyjne i peryferyjne. Kategoria centralna obejmuje rejony położone w promieniu 50 km od Lwowa, a ich wskaźniki rozwoju wahają się od 0,5 do 0,7. Okręgi półperyferyjne znajdują się w promieniu 50-75 km, a wartości wskaźnika I_r wahają się od 0,3 do 0,5. Dzielnice peryferyjne znajdują się w największej odległości od stolicy obwodu, a ich wskaźniki I_r są poniżej 0,3. Ponieważ korelacja między odległością od centrum obwodu a wartością wskaźnika dla niektórych rejonów nie była zgodna z ogólną zależnością, dodano również dwa podtypy rejonów – podstawowy i pomocniczy. Autorzy wykazują, że wpływ stolicy obwodu na rozwój społeczno-gospodarczy rejonów maleje wraz z ich coraz większą odległością od centrum. Poziom rozwoju społeczno-gospodarczego w rejonach zależy, z jednej strony, od siły impulsów generowanych przez stolicę obwodu, z drugiej zaś jest determinowany przez lokalne możliwości gospodarcze i zdolność do wykorzystywania wpływu stolicy obwodu oraz innych lokalnych biegunów wzrostu.

Słowa kluczowe: *centrum-peryferia, interakcje centrum-peryferie, gospodarka regionalna, rozwój społeczno-gospodarczy, decentralizacja, obwód, rejon*

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Reclamation and development of post-industrial sites for recreation as exemplified by projects carried out in Poland in the 1920s and 1950s

Abstract. *The aim of this article is to present spectacular examples of reclamation and development of post-industrial sites, carried out in Poland in the 1920s and 1950s, with emphasis on their recreational function. Examples include a park built between 1889 and 1920 by Wojciech Bednarski in the valley of the former quarry in Podgórze, now the right-bank district of Krakow, and "General Jerzy Ziętek Provincial Park of Culture and Recreation", now called "the Silesia Park", created in the 1950s on degraded post-industrial land located within the borders of three cities: Chorzów, Katowice and Siemianowice Śląskie. Both parks are examples of reclaiming brownfield sites for recreational use in order to create attractive leisure spaces. They have become a model and point of reference for other park planning projects in Poland. Their spatial and functional design is exceptionally timeless. The study is mainly based on a review of the literature of the subject.*

Keywords: *brownfield sites, post-industrial, reclamation, urban park*

1. Introduction

Human activity has led to a profound transformation of the used land (Kubicka, 2015, p. 40).

Reuse of brownfield sites reduces the demand for new land necessary for the development of industry, services and housing, improves the aesthetics of the part of the city subject to change, prevents the growth of chaos in spatial development and improves the quality of existing public spaces (Markuszewska,

2009, p. 23). Due to renewal of architectural substance and infrastructure the investment attractiveness of these areas increases (Markuszewska, 2009, p. 23).

A systemic approach to the problem of degraded post-industrial sites is important due to the need for their reclamation and revitalisation. The optimal choice of reclamation technology generates the need to identify the existing contamination and pollution and to determine their impact on the population and the future use of the sites (Maciejewska, & Turek, 2014, p. 82; Gorgoń, 2009, p. 19).

The essence of the process of transforming post-industrial properties is the introduction of new functions there, with the simultaneous transformation of the present spatial form as a result of the emergence of new buildings, modernising and adapting some of the facilities used previously for industry and make them serve a new function. The industrial architecture is unlimited in its adaptability.

The decline of manufacturing functions in Western European cities contributes to the use of former factories, railway stations, market halls, docks or mines for the development of new activities, including the cultural sector (Namyślak, 2013, p. 238). Old buildings left over from decommissioned plants can be used for laboratories, lecture halls, cinemas, multimedia centres, theatres, film studios, cafes, restaurants, galleries, offices or used as tourist attractions related to visiting old, renovated forms of post-industrial buildings. The existing technical monuments in the city can be adapted to the needs of technology parks and business promotion centres.

In Poland, the predominant trend is to convert brownfield sites into shopping or leisure centres, warehouses, business incubators and offices (Syposz-Łuczak, 2008, pp. 431-432; Wyrzykowska, 2008, pp. 54-55). Of the various potential uses of developed brownfield sites, adaptation for health purposes[1] and re-use for production purposes are the least likely (Gasidło, 2010, p. 116). The industrial function often requires the construction of new infrastructure. Post-industrial buildings can also be used for residential purposes.

2. Examples of adaptation of brownfield sites for recreational purposes

The conversion of industrial sites often leads to a complete change in their spatial and functional structure. In the case of mining waste dumps and waste sites, once their environmental hazard has been eliminated, their development

[1] The underground chambers of the salt mines in Wieliczka and Bochnia are a fine example of the post-industrial facility use for healthcare purposes.

into leisure, sports and recreational, tourist, service or production functions is permitted.

Degraded urban space can be reclaimed by transforming post-industrial areas into parks, which are an important element of the spatial structure of cities and serve their inhabitants.

The term park comes from the Latin word "parricus", literally translated as a fenced-in enclosure (Rysiewicz, 1959, p. 496). The park is the oldest conscious form of urban greenery, designed and created by man, having the characteristics of a public space due to the way it is arranged and its location (Chojecka, 2013, p. 10). It is a place for various forms of physical activity for all people, regardless of age and social status.

The early examples of what is now known as modern urban parks are the royal hunting parks in Mesopotamia from the 15th century BC and the sacred groves in Egypt and Greece from the 4th century BC.

In the mid-17th century, German and French cities began to create promenades accessible to the public, an example of which is Berlin's Großer Tiergarten.

In the following century, urban parks became an integral part of every major urban establishment.

In the 16-18th and centuries, parks and gardens adjacent to residences or monasteries, which had previously been closed to the public, became increasingly accessible, but it was not until the 19th century that public parks began to be designed and perceived as an important part of the urban environment, serving both residents and tourists.

According to some authors, the first city park was Boston Common in Boston, USA, opened to the public in 1634. In 1728 a road was built there to serve as a promenade, but it did not become a city park in the full sense of the word until 1830, when it ceased to be used as a pasture. It was then renamed Washington Park.

John Claudius Loudon is considered to be the author of the concept of an urban park, understood as a public park, and Princes Park, opened in 1843 in the suburb of Liverpool, is considered to be the first publicly accessible urban park that followed his concept. Due to the fact that the land on which the park was built was privately owned[2], some believe that the first public parks in the full sense of the word, created on municipal land, were English parks: Peel Park in Salford opened in 1846 and Birkenhead Park in Birkenhead opened in 1847[3].

The idea of so-called people's parks (Volksgärten), as a meeting place for different social classes, emerged in the 19th century in Germany.

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[2] In 1841 the site was acquired by Richard Vaughan Yates.

[3] Birkenhead Park in Birkenhead is widely recognised as the world's first publicly funded urban park.

Urban parks became popular in the United States in the late 19th century. Central Park in New York City was opened in 1857. It was designed by Frederick Law Olmsted and Calvert Vaux.

Due to their functions or the way they are developed, parks can be classified as follows:

– culture and leisure parks,
– forest parks,
– historical parks.

In terms of the area they serve, a distinction is made between (Łukasiewicz & Łukasiewicz, 2006, p. 35):

– urban/community parks,
– district parks,
– central parks,
– housing estate parks.

Urban parks usually cover an area of more than 2 ha. They are often divided into district parks, central parks and public parks (Łukasiewicz & Łukasiewicz, 2006, p. 35).The average area of district parks is 5-10 ha. They can be regular or landscaped – blending in with the lines of a natural landscape, or a combination of both types.

The central parks are 15-20 hectares in size and are intended for residents of the whole city.

Culture and leisure parks, called public parks are a variety of urban parks. They are usually established on large areas (20 to several hundred hectares) and mainly intended for active leisure, mass entertainment and cultural events. They are recreational green areas, open to the public, intended for active leisure related to culture, education, entertainment and sport. They began to be established in the early 20th century in Germany and the United States. After 1922, culture and recreation parks began to be established in all large cities of the Soviet Union. Gorky Central Park of Culture and Recreation in Moscow with an area of 576 ha is one of the first that were established.

In Poland, the first public park with an area of 237 hectares was created in Łódź according to a design by Stefan Rogowicz, an architect, in 1930, but due to the outbreak of World War II the park was not completed.

In 1952, the Central Park of Culture was established in Warsaw's Powiśle district.

Between 1978 and 1983, the Forest Park of Culture and Leisure was established in Bydgoszcz, covering an area of 800 ha.

According to the Act of 16 April 2004 on nature protection, parks belong to green areas. Article 5, item 21 of this Act defines green areas as "arranged areas with technical infrastructure and buildings functionally related to them, covered with vegetation, fulfilling public functions, and in particular parks, green areas,

promenades, boulevards, botanical and zoological gardens, green playgrounds and historical gardens, cemeteries, greenery along roads in developed areas, squares, historical fortifications, buildings, storage sites, airports, railway stations and industrial facilities" (Ustawa z dnia 16 kwietnia 2004 r. o ochronie przyrody).

Parks in the city have ecological and social functions. They support the implementation of sustainable urban development[4] by fulfilling ecological functions such as climate, soil ecology, hydrology and pollution absorption.

The social functions of park complexes are also important for city residents, namely: recreational, leisure, aesthetic or educational. The need to use the recreational space of a park is strongly rooted in city residents. This is the reason why more and more parks are created around the world, including those established by regeneration of post-industrial areas.

Analysing newly designed park layouts on brownfield sites, the following areas have been included:

– post-exploitation sites,
– post-industrial facility sites,
– post-railway facility sites,
– post-harboursides.

Some examples of parks created on brownfield sites in France:

– Parc De La Villette – built on the site of a former slaughterhouse and national meat exchange,
– Parc André Citroën – built on the site of the former Citroën factory,
– Parc De Bercy – created on the site of former wine warehouses on the banks of the Seine.

In Barcelona, Spain, Parc de la Ciutadella (Sykta, 2012, p. 107) was built on the site of a former citadel.

In Germany, a large part of the Ruhr area is covered by parks created along the Emscher River as part of the IBA Emscherpark regional regeneration programme:

– Landschaftspark Duisburg Nord – built on the site of the former Thyssen steelworks,
– The Zollverein museum and park complex in Essen – built on the site of a mine and coking plant,

[4] Sustainable urban development "is such social and economic development in which there is a process of integrating political, economic and social activities, maintaining natural balance and sustainability of basic natural processes in order to guarantee the satisfaction of basic needs of particular communities or citizens of both contemporary generation and future generations" (Ustawa z dnia 27 kwietnia 2001 r. Prawo ochrony środowiska, Dz. U. 2001, Nr 62, poz. 627, tekst jedn. Dz. U. 2020, poz. 1219, 1378, 1565, 2127, 2338, art. 3, pkt 50 [Act of 27 April 2001. Environmental Protection Law, Journal of Laws of 2001, No. 62, item 627, consolidated text: Journal of Laws of 2020, item 1219, 1378, 1565, 2127, 2338, Art. 3, point 50]).

– Westpark in Bochum – built on the site of a former steelworks.

In Switzerland, 4 parks have been created on brownfield sites as part of a regeneration programme for the Centre North Zürich district:

– in 2001, Oerliker Park on the site of the former engineering industry plant,

– in 2002, MFO Park on the site of the former Machinefabric Oerlikon[5] foundry waste dump,

– in 2003 Louis-Häfliger-Park on the site of the former munitions factory Wahlenpark in 2005.

In the United States, the following are examples of urban parks that have been created on land degraded by industry:

– High Line Park in New York on the site of a former railway overpass,

– Brooklyn Bridge Park in Brooklyn on the site of former docks,

– Millenium Park in Chicago was built on land that was historically controlled by the Illinois Central Railroad, the land was occupied by railway tracks and car parks,

– Gas Works Park on the site of the former Seattle Gas Works.

In Poland post-industrial sites have been used in recent years to create:

– Amelung Park in the Chorzów II district on the site of water reservoirs created in the 1920s as a result of mining subsidence, which were a water reservoir for the mining area of the Barbara coalmine until the 1980s,

– park in Ursus after the former Ursus tractor factory,

– a municipal park in Chęciny with an area of about 2 hectares, created on the site of a former slaughterhouse,

– English-style park with a large number of plantings on the site of the reclaimed Piłsudski waste dump in Jaworzno.

These examples prove that in many European cities, leftover areas such as decommissioned factories, disused railway lines and sidings or degraded riverbanks are also being transformed into parks.

3. Examples of urban space reclamation by transforming post-industrial areas into parks

Reclamation and development of post-industrial sites in Poland have a long tradition.

The first example of the reclamation and development of post-industrial areas described in the literature on the subject is the Art Nouveau-Modern park (Huculak, 2009, p. 139, 156; Ostręga, 2013, p. 13) built in Podgórze by Wo-

[5] Its name is derived from the former machine factory (Maschinen Fabrik Oerlikon).

jciech Bednarski[6] between 1889 and 1920 in the surroundings of a former quarry, used since the Middle Ages, which is one of a few examples of such a quarry site development in the world[7]. Similar solutions can be found in Canada and New Zealand. In 1904 in Vancouver, Canada, Jennie Butchart transformed into a garden a limestone quarry that supplied material to Robert Butchart's cement factory. Te Puna Quarry Park, on the other hand, is a park set in a disused quarry on a northern island in New Zealand.

The park in the Krzemionki quarry created by W. Bednarski is therefore a pioneering undertaking, for which W. Bednarski spent 734 Austro-Hungarian guldens of his own money.

The established park and the mining company undergoing decommissioning process worked together for more than 20 years. The work done mainly concerned spreading soil on the rocky bottom of the quarry and planting sizable trees, even several dozen years old.

A park with a sports field, a summer cinema, a playground and a gardener's house were created on the reclaimed area. The official opening of the park took place on 19 July 1896.

The trailblazer and founder of this park became a precursor of the idea of reclamation of post-industrial areas (Park im. Wojciecha Bednarskiego, n.d.). The idea and implementation of the garden won recognition throughout Europe, and even the newspapers of St. Petersburg wrote about its opening.

The inhabitants of the Podgórze region granted W. Bednarski the title of honorary citizen in 1897, and they named the park after him in 1907. The bust of the park's founder was unveiled in 1937 and a plant composition was built around it.

Another example of investment use of a large degraded post-industrial area is the Silesia Park formerly know as "General Jerzy Ziętek Voivodeship Park of Culture and Recreation" (WPKiW) (Tabacki, 1982, p. 10), located in the Śląskie Voivodeship. The project was carried out on degraded areas covered with waste dumps, mining and metallurgical waste dumps, sinkholes filled with water left mainly after the former "President" mine (Tabacki, 1982, p. 10). "General Jerzy Ziętek Voivodeship Park of Culture and Recreation" was created within the borders of three cities: Chorzów, Katowice and Siemianowice Śląskie. Originally WPKiW was called "People's Culture and Recreation Park".

The archetype of the Chorzów park is the municipal park (Stadtpark) in Bytom, built at the turn of the 19th and 20th centuries, which was the first public park in Upper Silesia.

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[6] Wojciech Bednarski was a social activist, teacher and headmaster of a school in Podgórze, a councillor of Podgórze and founder of the Society for the Beautification of the City of Podgórze.

[7] Today's Wojciech Bednarski Park is located in the right-bank district of Krakow – Podgórze, which was incorporated into Krakow as a district in 1917.

"General Jerzy Ziętek Regional Culture and Recreation Park" was one of the first projects in Europe intended to transform a degraded area of around 600 ha into a variety of functions (Biernacka, 2011, p. 55; Gasidło, 2008, p. 78; 2010, p. 123; Herczek et al., 1990, p. 3; Opania, 2012, p. 156; Ostręga, 2013, p. 14; 2016, p. 53; Uberman & Ostręga, 2012, p. 119; Wagner, 2016, p. 178).

Król (King's) Mine, founded in 1791, carried out mining operations in the area of today's park and later mines separated from this mine continued the process. As a result of the division of Upper Silesia into Polish and German parts in 1922 Król mine was transferred to the Polish State Treasury and leased to the Polish-French company Skarboferm.

It was divided into the President and Barbara – Wyzwolenie mines in the interwar period.

There were four mining shafts operating in the park, namely:

– Forest Shaft I,
– Forest Shaft II,
– Ligonia shaft,
– Paweł Shaft.

As a result of mining works, sinkholes were formed in the area of today's Park.

"General Jerzy Ziętek Regional Culture and Recreation Park" was set up by the Resolution of the Regional National Council in Katowice on 20th December 1950. A decision to develop the area was made in 1950 (Wolny, 2011, p. 91), and the basic structure of the park (Gasidło, 2004, p. 70) was built by 1962. The mastermind behind its creation was gen. Jerzy Ziętek (Pancewicz, 2007, p. 136). The team of architects was led by Władysław Niemirski Dr. Eng. (Walczak, 2002, p. 292). Prof. Kazimierz Wejchert PhD. Dr. Eng. arch., Tadeusz Braun Eng. arch. and Krystyn Olszewski Eng. arch. worked out the assumptions and general concept of the WPKiW.

The WPKiW is an example of a park created as a public culture park. It was supposed to refer to Moscow's Gorky Park, but unofficially the creators sought inspiration for the park's concept in Western Europe, and the only manifestations of socialist realism in the WPKiW are some sculptures.

A festival area with dance circles (one large dance circle and smaller dance circles) was opened in 1952. The Alpinarium was opened in 1953. The Swan House, built at the turn of the 1950s and 1960s, was the entrance to the Alpinarium, a now defunct themed garden where alpine plants were grown. The Zoo, the "Bambino" playground area for children and the water sports centre were opened in 1954. The Planetarium and the Silesian Stadium were completed in 1956. A narrow-gauge railway track over 5 km long was opened in 1957. Wesołe Miasteczko (The Amusement Park) was opened in 1959. The PTTK (Polish Tourist and Sightseeing Society) centre was opened in 1962, and in 1963 – the

Scouts' Centre with a camping site and a sports shooting range. The "Fala" (The Wave) Swimming Pool was put into operation in 1966. In 1967 the "Elka" cable railway was opened, being the first attraction of this type in Europe (Respondek, 2017, p. 1), and in 1968 "Kapelusz" (the Hat) Exhibition Hall, the Rosarium and the highest tower greenhouse in the world at that time (which was functional until 1983) were opened. The Perennial Garden was the successor of the park's Alpinarium. The Upper Silesian Ethnographic Park was established in 1975.

The construction of some of the WPKiW facilities was financed by the School Reconstruction Fund (Walczak, 1996, p. 295).

The post-industrial landform used to create a water system on the site of old sinkholes, ponds and depressions (Gasidło, 1998, p. 88). The materials from the waste dumps were used to form the stadium basin and to build roads. Approximately 3.5 million cubic metres of earth were moved to compensate for the effects of the mining operations, 100,000 cubic metres of topsoil and 50,000 cubic metres of peat were brought in. Moreover, trees were planted, ponds were regulated and lawns and green areas (Pancewicz, 2007, p. 136) were laid and developed.

There were 4 funnel-shape sinkholes that formed in the park after its creation:

– three of them in the area of the main entrance in 1968,

– one sinkhole on the grounds of the Zoological Garden in 1987.

Further sinkhole formation risk level remains low, considering the fact that it has been a long time since the last sinkhole opened up.

On 16 April 2012, by a decision of the park authorities, the previously used name "Wojewódzki Park Kultury i Wypoczynku im. gen. Jerzego Ziętka" was changed to "Park Śląski" (Silesia Park). Currently, the entire Silesia Park lies within the administrative boundaries of Chorzów. However, it is not a part of any of its districts, which emphasises its regional dimension.

"Wojewódzki Park Kultury i Wypoczynku im gen. Jerzego Ziętka", today's "Park Śląski" in Chorzów has become a model and point of reference for similar type of projects in Poland, including Park Ludowy "Zielona" in Dąbrowa Górnicza, parks in Powiśle and Bielany in Warsaw, Wojewódzki Park Kultury i Wypoczynku Gliwice-Zabrze, recreational areas of Pogoria Lake (Borowik, 2020, p. 182).

4. Conclusions

Brownfield sites represent a huge potential and background for the development of a green space systems and the creation of urban parks. The emerging new public space is becoming an important element in the townscape, influencing

its identity. The relatively high implementation costs of parks on post-industrial sites may be recouped indirectly by raising the standard of the space and thus increasing the attractiveness of the location for other urban functions. The two examples of brownfield remediation and development presented in this article stand out among similar ones.

The first of these is the park founded by Wojciech Bednarski, which is an example of the oldest deliberate reclamation of a post-industrial area in Podgórze and one of the few examples of such a quarry development in the world. The park founded by him, located inside the quarry, was described as one of the most beautiful parks in Europe.

General Jerzy Ziętek Voivodeship Park of Culture and Recreation (Park Śląski) is one of the largest park complexes in Poland, and probably one of the largest projects in Europe involving the reclamation of land degraded by mining activities. The implementation of the General Jerzy Ziętek Voivodeship Park of Culture and Recreation, now called Silesia Park has become a role model for many cities and areas. Its projects were exhibited in 1956 at the IFLA Congress in Zürich, as well as in Lisbon, Cologne and Boston. In 1974 UNESCO commissioned a short film about it.

Both parks are examples of the reclamation of brownfield sites with recreational function as the main focus point to create attractive leisure spaces. Both parks in their composition, spatially as well as functionally, are exceptionally timeless.

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Rekultywacja i zagospodarowanie terenów poprzemysłowych dla celów rekreacji na przykładzie spektakularnych projektów zrealizowanych w Polsce w latach 20. i 50. XX wieku

Streszczenie. *Celem artykułu jest przedstawienie spektakularnych przykładów rekultywacji i zagospodarowania terenów poprzemysłowych w kierunku rekreacyjnym, zrealizowanych w Polsce w latach 20. i 50. XX w. Jako przykłady wybrano założony w latach 1889-1920 przez Wojciecha Bednarskiego park w dolinie dawnego kamieniołomu w Podgórzu, obecnie prawobrzeżnej dzielnicy Krakowa, oraz powstały w latach 50. XX w. na zdegradowanych terenach poprzemysłowych w granicach trzech miast: Chorzowa, Katowic i Siemianowic Śląskich Wojewódzki Park Kultury i Wypoczynku im. gen. Jerzego Ziętka, obecnie noszący nazwę Park Śląski. Oba parki są przykładem rekultywacji terenów poprzemysłowych w kierunku rekreacyjnym w celu wykreowania atrakcyjnych dla wypoczynku przestrzeni. Stały się one wzorem i punktem odniesienia dla innych założeń parkowych w Polsce. Kompozycja obu parków charakteryzuje się wyjątkową ponadczasowością, zarówno pod względem przestrzennym, jak i funkcjonalnym. Badania oparto na przeglądzie literatury przedmiotu.*

Słowa kluczowe: *tereny poprzemysłowe, rekultywacja, park miejski*

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The development of industrial enterprises in Ukraine in 2016-2020: assessment and analysis

Abstract. *The article describes a methodical approach to assessing the level of and prospects for the development of industrial enterprises based on results of a study investigating the dynamics of economic indicators of production and economic activity. The author presents determinants of productivity, efficiency and effectiveness which affect corporate development of enterprises and explains how they stimulate innovative organizational and economic changes in production and economic activity.*

Keywords: *analysis, development, enterprise, evaluation, industry, level, prospects*

1. Introduction

Development is an irreversible, directed and the natural process. It brings the system to new states. It is the main condition for the adaptation of enterprise to the modern conditions. Economic evaluation of the development of industrial enterprises is an analysis of the dynamics of production and economic activities, taking into account the peculiarities of external environment, the synthesis of evaluation of the development of enterprises. At the same time, the assessment of the economic development of enterprises implies a comparison of the results of analysis of the dynamics of values of performance indicators in areas with changes into the operating environment.

2. Analysis of publications

As the development of industrial enterprises is the extremely important for countries, the efficiency of activity in the future depends on validity and timeliness of economic assessment of the development level. But, despite the research progress, the adequacy of the development of scientific and methodological problems related to the practice and the theory of enterprise development; there is still no common understanding of phenomenon and process, problems are not solved, in particular, related to the economic assessment of development by types of industrial activity. The complexity of the problem of assessing the development of enterprises lies in diversity and ambiguity of these concepts those make up the development process and assessment methods. As noted in Gregor and Tailor (2019, pp. 158-161); Gurochkina (2020, pp. 178-184), the methods have distinctive advantages. However, there are a number of common shortcomings: firstly, the most methods do not fully take into account the dynamics of changes in indicators, that is, the estimates given are static; secondly, the methods are focused on the expert choice of sets of indicators, there is almost no evidence of the need and adequacy of proposed indicators.

3. The purpose

It is the economic evaluation of the development of Ukrainian industrial enterprises with taking into account theoretical and methodological bases of estimation of the development of such enterprises in practice.

4. Research methodology

In world economy science and practice, such features are called non-adative, those that arise as a result of the joint interaction of elements and inherent only in systems. Depending on the specific nature of the interaction between the components, there are different types of systems. In turn, within all types it is possible to consider separate types of the systems. Each individual object, phenomenon, process is approached from a systemic point of view, they are certain integral formations that are able to exist the independently. The connections of the system combine its components in the system process (Gurochkina, 2020, p. 174-175; Telnov, 2005, p. 83).

In order to determine the optimal capital structure, the ratio between borrowed funds and equity, it is advisable to calculate the value effect of enterprise financial leverage (Buyak, Kulina, & Pauchok, 2011, pp. 329-330):

$$\alpha = (1-\beta)(\chi-\delta)\times\left(\frac{\varepsilon}{\phi}\right), \quad (1)$$

where:

α – the effect of industrial enterprise financial leverage, consists in increasing the rate of return on equity, %;

β – the income tax rate, %;

χ – the gross return on assets ratio (the gross profit to average asset value), %;

δ – the average amount of interest on loan of borrowed capital, %;

ε and ϕ – the average amounts of borrowed capital and equity, monetary units, m.u.

The very important indicator of industrial enterprise profit is free from the influence of accounting features and manipulations of parameter *A* by financial management, characterizes company profit, ignoring the taxes, investment costs and debt. It is use to assess the industrial enterprise ability to service the loans and investment resources. Parameter *A* began to count on peak of popularity of the acquisition of company through debt financing – the leverage and company buyout by management, which also carried out at the expense of borrowed funds.

Levels of loans raised to repurchase the asset were transferred to the company and it was necessary to understand whether it could bear the additional burden. At the same time, it was interesting for investor, lender and management to attract long-term monetary resources for short-term actions, which means investments (accrued depreciation does not affect the money in account of balance sheet). For the same reasons, the impact of depreciation on the amount of profit, the use of indicator is carried out by single, but large-scale investments with a long depreciation period of time, for example, – the steel and the drilling.

Thus under parameter *A* mean the concentrations of profitability; it is characterize the ability of industrial enterprise to accumulate financial resources over a period of time and are determined by changes in: net financial result (the net profit), equity, economic value added, net operating profit less adjusted taxes and operating income net of taxes and interest, gross income before interest, dividends, before taxes and depreciation on fixed assets and the intangible assets earnings before interest, the taxes, depreciation and amortization.

Later, the calculations of *A* became much more widely used and the connection with the original logic was lost. Financiers began to use it as a measure free

from manipulation and as a key performance indicator, which can be influenced by management. The author believe that the basis for calculating parameter *A* is the difference between total income (including the taxes, interest on liabilities, depreciation). This calculation is usually made on the basis reporting. In order to verify the reliability of the valuation performed by the method of discounting cash flows, the method of capitalization of income is used, which involves the transformation of income into value. The peculiarity of the method is that the object of assessment must have a stable income or stable rate of change. Depending on the purposes of valuation, the following indicators may be taken into account for income: pre-tax profit, net profit or free cash flow (a total amount of net cash flows of the enterprise as result of operating and investing activities, excluding financial performance, return of investor contributions, etc.). So, the free cash-flow is indicator that characterizes the amount of cash flow that investor can claim). The method of income capitalization provides for use of the gross and net approaches, respectively entity (the gross cost based on the total capital) and equity (the net cost – equity).

According to the net approach, the value of enterprise is defined as the ratio of net profit to capitalization rate. Under the gross approach, the value of enterprise is set as the difference between the share of profits to the payment of interest on weighted average cost of capital and the amount of borrowed capital. In order to determine the value of the industrial enterprise, using the method of capitalization, the economic meaning of which is expressed by the formulas (2-3):

$$\varphi = \frac{\gamma}{(\eta - \iota)}, \qquad (2) \qquad\qquad \varphi = \frac{\gamma}{(\eta)} - \delta_1, \qquad (3)$$

where:

φ – the cost of enterprise, m.u.;

γ – the expected income (the subject to capitalization), m.u.;

η – the capitalization rate (is equal to the rate of equity);

ι – the income growth rate, %;

η – the equity rate, %;

δ_1 – the amount of borrowed capital, m.u.

A capitalization rate – the divisor (the percentage) used to translate income into value. The weighted average cost of the industrial enterprise capital is determined on the basis of the structure of investment financing and the value of individual components, using the following formula:

$$\kappa = \eta \times \frac{\varphi}{\lambda} + (1 - \mu)\nu \times \frac{\delta_1}{\lambda}, \qquad (4)$$

where:

φ – the expected rate of return on equity of enterprise, m.u.;

λ and μ – the amount of equity (%) and capital (m.u.);

ν – the income tax rate, %;

δ_1 – the expected rate of cost of the borrowed capital, m.u.

In order to determine the value of the industrial enterprise of the method of capitalization (the net approach), the essence of which is expressed by the next formula:

$$o = \sum_{e=1}^{m} \frac{\pi}{(1+\varpi)^e} + \frac{\theta}{(1+\varpi)^e} + \vartheta - \delta_1, \tag{5}$$

where:

o – the net value of enterprise and total value of operating, the investment cash flow at valuation date (the interval time series or the period of time), m.u.;

π – the at valuation date *e*, m.u.;

ϖ – the coefficient, characterizes the discount rate and calculate by the following formula (6):

$$\varpi = \frac{\kappa}{100}, \tag{6}$$

θ – the residual value at valuation date *e*, m.u.;

ϑ – the surplus assets (m.u.), calculate by the next formula:

$$\theta = \frac{\pi_{e+1}}{\kappa(1+\kappa)^e}. \tag{7}$$

The value of the object of measurement is defined as the total present value of future net cash flows or dividends, less the amount of the enterprise's liabilities and increased by the value of surplus assets. When capital structure of enterprise is satisfactory and not overloaded with debts, the gross approach is used; when the balance sheet was overloaded with debts, the assessment based on the net approach is used. In order to estimate the value of the enterprise (the gross), the discount rate is applied to the estimated amount of the net cash flow for individual periods of time. The net value of enterprise is equal to difference between the gross value and the amount of borrowed capital.

5. Main results of the research

Among powerful industrial enterprises to determine the general factors influencing at the development of a positive non-adative properties, the study

selected companies, the most of which were included in the TOP-100 of Ukraine taxpayers. The statistical sample consists of enterprises, among which there are strategically oriented and leading of respective industrial activities. The manifestations of non-adative properties will be studied among such industrial enterprises, as non-adative are inherent in the system after mergers, acquisitions and other connections in the activities, where new opportunities, qualities and markets are created.

The level of integration of the links and interaction is characteristics of the balance sheet of industrial enterprise structure and stability, capacity building, responsible behavior, strengthening innovation and financial innovation. The analysis of the dynamics of values profitability indicators of the industrial enterprises was carried out. Rapid positive changes in these indicators of economic systems are characteristic and the main result of the non-adative of new qualities of systems, that were not previously inherent in the individual components.

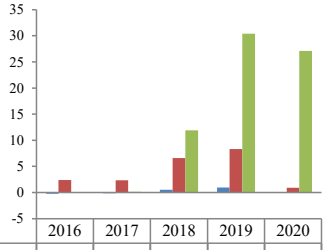
As a result of the cluster analysis, industrial enterprises were grouped in the extractive and processing industries; in turn, as a result, these enterprises determine the composition and structure of above industries.

In the Figures 1-2 and the Tables 1-2 were presented the values of the net financial result of industrial enterprises during 2016-2020.

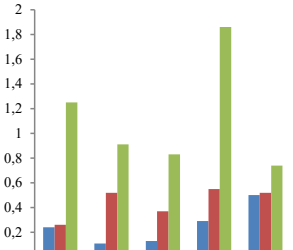
In general, list of integration links should be compared with performance of the industrial enterprises, because the first of all indicators of development is the net financial result, which is indicated in growth rates after interaction, joint organizational and associations activities, mergers, other links in the activities, where new opportunities, qualities and limits are limited.

As we can see in the Table 1, the largest increase on the net financial result is observed in UkrGazVydobuvannya JSC – 27 mill. EUR, among represented

Fig. 1-2. The net financial result of extractive industry enterprises in 2016-2020, mill. EUR



	2016	2017	2018	2019	2020
DTEK Shakhta Komsomolets Donbass PJSC	-0,25	-0,12	0,52	0,98	0,1
NaftoGazVydobuvannya PJSC	2,39	2,34	6,6	8,3	0,93
UkrGazVydobuvannya JSC	0,05	0,15	11,9	30,4	27,1



	2016	2017	2018	2019	2020
UkrGazVydobutok PJSC	0,24	0,11	0,13	0,29	0,5
Vesko PJSC	0,26	0,52	0,37	0,55	0,52
Kryvyi Rih Iron Ore Plant PJSC	1,25	0,91	0,83	1,86	0,74

Source: author's own research on the basis of Smida (n.d.)

Table 1. The net financial result of operating activities of processing industry enterprises, mill. EUR

Enterprise	2016	2017	2018	2019	2020
Roshen Corp.	1.10	2.00	1.90	2.40	2.60
National Vodka Comp. LLC	0.01	0.06	0.05	0.00	0.03
Oliyar PE	0.06	0.11	0.09	0.05	0.04
Carlsberg PJSC	0.84	0.92	1.01	1.08	0.16
Volodarka PJSC	0.04	0.08	0.05	×*	0.01
Swiss Krono LLC	–0.80	–0.61	0.11	0.64	0.75
Pharmaceutical Comp. (PC) "Darnytsia" PJSC	0.30	0.39	0.32	0.35	0.45
Rosava PJSC	–0.34	0.08	–0.41	–0.72	–1.84
Bila Tserkva Plant "Tribo" LLC	0.06	0.04	0.06	0.02	0.06
Arcelor Mittal Kryvyi Rih JSC	1.18	1.38	2.70	0.50	9.50

* × – similar to the previous year.

Source: author's own research on the basis of of Smida (n.d.).

Table 2. The net financial result of operating activities of machine-building enterprises, mill. EUR

Enterprise	2016	2017	2018	2019	2020
Kalinov Machine-Building Plant PJSC	0.04	0.01	–0.06	0.01	0.01
Mogilev-Podilskuy Machine-Building Plant PJSC	–0.06	–0.09	–0.51	0.03	0.03
Zolotonosha Machine-Building Plant named after I. Lepse PJSC	–0.01	0.01	0.67	0.03	0.38
Nizhinsilmash Plant PJSC	–0.04	0.01	0.02	0.01	0.01
Novokramatorsk Machine-Building Plant PJSC	0.35	0.95	0.46	0.39	0.63
EuroCar PJSC	–0.36	–0.5	–0.07	0.06	1.82
AvtoKrAZ PJSC	–0.15	–0.31	–0.18	–0.08	–4.73
Plant of Municipal Mechanical Engineering "Kommash" PJSC	-0.67	–0.46	–0.04	–0.06	–0.01
SKF Ukraine PJSC	0.16	0.32	0.26	0.21	0.10
Turboatom JSC	0.63	1.63	1.06	0.71	0.76

Source: author's own research on the basis of of Smida (n.d.).

enterprises during 2016-2020. This phenomenon is explained, mainly, by the changes in foreign economic policy and gradual increase in the gas prices.

The indicators of the net financial result into amount of 0.01 mill. EUR in 2016-2020 at subsidiary of Roshen Corp., which has the best indicators in terms of tax payments for the last years of activity, significantly increased.

On the second place among the sample of powerful industrial enterprises of country is Arcelor Mittal Kryvyi Rih JSC with an increase in the net financial

result in amount of 10.6 mill. EUR during 2016-2020. Significantly improved the dynamics of the net financial result in Swiss Krono LLC, which is part of Swiss Krono Group. From a negative value in 2016 into amount of loss 0.87 mill., but the dynamics of net financial result increased to 0.75 mill. EUR in 2020. The optimal spatial placement (or geographical location) of separate divisions allows Swiss Krono LLC to respond flexibly the needs of the domestic market and produce products in close proximity to the consumer. The short distance from warehouses to the border and availability of its own access tracks opens wide prospects for the export of finished products.

The worst state of operation is Rosava PJSC with a decrease in the net financial result of (18.1 mill. EUR) among represented industrial enterprises of country during 2016-2020 bankruptcy the Commercial court in order to obtain a new owner. Today the beneficiary of Rosava PJSC is owner with assets to 1.1 mill. EUR, ranked the 7th in the TOP-100 of the richest Ukrainian's at the end of 2018. It should be noted, bankruptcy of commercial enterprise in country from inability to pay off a significant amount in the debt not always mean its complete collapse. The liquidation commission accrued to 18 mill. EUR in debt of Rosava PJSC with the total value to 762 mill. and 3.4 bill. EUR by property complex.

The author will analyze in more details the dynamics of values indicators of the optimal capital structure, efficiency, capitalization of industrial enterprises during 2016-2020 into extractive industry lover (Table 3).

So, as we can see from the dates in the Table 3, the effect of financial leverage reflects the level of return on equity in form of growth rate, while characterizing the optimization of financial resources structure. With a positive leverage value maximizes return on equity. And with a negative leverage value, the portion of the enterprise's net profit that was accumulated through equity will serve too high interest rates to raise borrowed capital. Among them DTEK Shakhta Komsomolets Donbass PJSC stands out with the largest indicators of capitalization or value of enterprise on the basis of total capital, but the indicators of equity are negative.

Considering the dynamics of industrial enterprise indicators in the Table 4, the author would highlight the general trend of payment for attracting financial resources in extractive industry during 2016-2020 are in the loss zone. At the same time, the increase in profit before interest and taxes on parameter A – 6.93 mill. EUR, which is the positive indicator of investment attractiveness.

Return to base of the date in the Table 3, we also analyze the dynamics of optimality the capital structure, efficiency and capitalization of mining of metal ores, other minerals and quarrying, provision of ancillary services in the national mining industry and quarrying during 2016-2020. It is very necessary to highlight the leading position of Kryvyi Rih Iron Ore Plant PJSC with capitalization ratio of 0.93 mill. and the parameter A into amount 1.19 mill. EUR.

Table 3. The dynamics of values indicators of the optimality capital structure, efficiency and capitalization of extractive industry enterprises

Index*	2016	2017	2018	2019	2020
DTEK Komsomolets Mine Donbass					
A	–30.30	–3.28	10.30	37.70	5.72
B	–21.70	–82.90	17.10	148.00	0.00
C	150.00	39.90	44.50	69.80	52.80
D	402.00	243.00	221.00	228.00	186.00
E	31.90	28.60	64.40	36.70	28.70
F	–0.05	0.01	0.09	–0.13	–0.21
G	–0.15	–0.23	1.64	–0.21	–0.13
H	0.11	1.03	2.64	0.83	0.13
I	–0.27	–8.52	3.65	–1.36	–1.76
J	–1.25	–1.54	–2.21	–1.81	–0.93
NaftoGazVydobuvannya					
A	82.10	23.60	43.40	34.60	26.20
B	57.70	38.10	58.80	64.10	56.30
C	33.20	23.20	6.60	0.00	4.97
D	445.00	288.00	135.00	132.00	199.00
E	69.70	90.40	177.00	264.00	288.00
F	0.04	0.04	0.06	0.02	0.01
G	1.79	1.51	5.27	6.62	7.91
H	4.65	8.15	12.1	9.20	11.58
I	2.71	3.33	3.95	7.44	9.15
J	–0.76	–1.84	–0.75	–1.19	–1.28
UkrGazVydobuvannya					
A	1.37	0.20	12.9	20.70	19.20
B	0.59	0.70	21.6	40.50	34.30
C	262.00	21.40	21.3	15.90	21.20
D	91.30	83.40	207.0	429.00	132.00
E	–0.78	–1.27	16.1	28.30	4.62
F	0.00	–0.03	0.01	0.04	0.02
G	–1.26	–1.61	9.94	29.30	23.70
H	4.87	11.10	30.1	54.10	55.10
I	432.00	136.00	51.8	40.80	21.20
J	10.50	–16.10	–19.1	–2.27	–29.10
UkrGazVydobutok					
A	44.30	10.20	5.69	12.70	20.00
B	34.70	13.30	13.50	29.80	31.60
C	41.50	20.90	47.80	41.10	53.10
D	321.00	431.00	654.00	565.00	152.00
E	81.50	127.00	325.00	227.00	97.9
F	0.03	0.00	0.07	0.09	0.19
G	0.17	0.07	0.16	0.25	0.39
H	0.34	0.25	0.55	0.61	0.96
I	0.56	0.51	2.52	0.61	0.37
J	–0.17	–0.18	–0.73	–0.73	–0.99

* A – the return of assets, B – the net marginal revenue, C – the debt, D – the coverage ratio, E – the working capital, F – the effect of financial leverage of the economic value added (%); G – the economic added value of the economic value added, H – the profit before interest, taxes and depreciation parameter *A*, I and J – the enterprise cost by the net and the gross approaches (mill. EUR).

Source: author's own research.

Table 4. The dynamics of values indicators of the optimality capital structure, efficiency and capitalization of food, beverages enterprises

Index	2016	2017	2018	2019	2020
Roshen					
A	22.00	21.70	16.80	18.70	17.40
B	15.10	18.80	16.50	19.20	17.50
C	28.00	21.70	21.20	11.70	20.10
D	357.00	335.00	258.00	506.00	296.00
E	211.00	188.00	74.50	117.00	98.30
F	0.03	0.04	0.02	0.02	0.02
G	1.05	1.71	1.47	2.17	2.19
H	7.02	9.65	10.10	11.20	12.80
I	6.33	2.91	1.32	3.12	3.63
J	–1.36	–1.94	–2.33	–1.42	–2.91
National Vodka Comp.					
A	0.23	1.36	1.150	3.92	2.33
1	2.00	3.00	4.000	5.00	6.00
B	1.08	3.56	3.240	3.19	1.75
C	19.30	23.40	22.200	81.50	80.60
D	518.00	409.00	613.000	139.00	150.00
E	242.00	178.00	213.000	188.00	276.00
F	–0.03	–0.03	–0.020	0.00	0.95
G	–0.13	–0.08	–0.002	0.01	–0.04
H	1.42	2.05	1.900	1.67	2.09
I	29.50	4.96	8.750	–1.86	3.05
J	–1.06	–1.07	–1.040	–1.05	–1.20
Oliyar					
A	0.63	0.58	0.52	0.20	1.42
B	4.85	0.41	0.34	0.35	1.21
C	131.00	91.50	95.70	96.10	97.50
D	312.00	107.00	125.00	300.00	307.00
E	170.00	348.00	363.00	150.00	60.00
F	–1.21	–0.36	–0.47	–0.65	–0.19
G	–0.11	–0.41	–0.14	–0.16	–0.22
H	0.33	3.10	3.15	1.89	4.34
I	11.20	3.19	23.10	61.10	11.50
J	–1.30	–1.72	–1.80	–2.48	–3.20
Carlsberg					
A	41.30	18.60	17.50	22.80	36.60
B	24.40	20.20	19.70	18.20	21.70
C	47.70	25.60	47.70	35.20	35.50
D	209.00	238.00	142.00	149.00	148.00
E	52.90	91.30	63.10	36.40	36.50
F	0.04	0.04	0.11	0.20	0.25
G	0.30	0.25	0.30	0.73	1.32
H	3.66	4.85	5.65	6.21	7.81
I	2.68	1.71	–0.63	1.23	0.25
J	–0.95	–1.24	–2.70	–1.65	–1.56

Source: author's own research.

Next time, in the Table 4 we shall analyze the dynamics of indicators of the optimality capital structure, efficiency and capitalization of industrial enterprises during 2016-2020 into food, beverages industry.

From the Table 4 it follows that some leaders of food industry suffer losses, namely: in 2016-2020, National Vodka Comp. LLC recorded the negative value of leverage, the interest rates on attracting the financial resources were higher than the growth of net profit. Earnings before the interest, taxes, depreciation and amortization in the parameter *A* is growing, which is positive; so, the same has been observed into Oliyar PE for the last 5 years, but the trend is improving as indicator approaching to 0. In Roshen Corp., the capitalization of total capital is declining; its own capital is rapidly accumulating with the positive accumulation of economic value added and other indicators are weakening the last years.

The subsidiary should pay attention to an amount of working capital. It is significantly reduced and negatively affects the coverage ratios. In Carlsberg PJSC, the coverage ratio and the negative capitalization rates of equity and the total capital are weakening. This enterprise would review the policy on quality and quantity of technical innovations, improve efficiency of the investment process, to promote development of human capital (resource).

The last dynamics of values indicators of the optimal capital structure, efficiency and capitalization of processing industry enterprises during 2016-2020 on the example of the next productions: chemical, light, metallurgical, paper and plastic, etc. were shown in the Table 5.

The indicators of return assets and capitalization for total capital of textile enterprise, which are negative, deteriorating, gradually decreasing, relative to the capitalization of equity, the value of the indicators increases. In Volodarka PJSC in 2019 and 2020 there was a slight weakening of the economic value added, which is characterized by a slight deterioration in the provision of enterprise financial resources.

The marginal income of the last industrial enterprise is growing, at the same time, all of the volumes of the capitalization indicators are negative, which indirectly indicates certain manipulations with provision of the debt obligations. The values of the economic value added only in 2020 showed the structuring of financial resources – the industrial enterprises operates into full, but on borrowed capital.

In the Table 6-7 the author analyze the dynamics of values indicators of the optimality capital structure, efficiency and capitalization of machine-building enterprises during 2016-2020, not include other groups of processing industry products, and into the vehicles, trailers.

As we can see from the Table 7, Zolotonosha Machine-Building Plant named after I. Lepse PJSC effectively increases at the economic value added, improves return on the assets, parameter *A* and reduces the debt, which has positive im-

Table 5. The dynamics of values indicators of the optimality capital structure, efficiency and capitalization of processing industry enterprises

Index	2016	2017	2018	2019	2020
Volodarka					
A	24.100	21.900	13.300	11.300	3.600
B	6.080	7.600	4.170	3.220	1.000
C	46.800	38.200	29.600	23.700	25.700
D	278.000	188.000	192.000	311.000	239.000
E	146.000	71.200	63.600	88.100	71.500
F	0.170	0.360	0.260	–0.040	–0.040
G	0.004	0.006	0.004	0.020	0.020
H	0.030	0.050	0.060	0.030	0.030
I	0.020	0.001	0.002	0.030	0.130
J	–0.007	–0.010	–0.001	–0.001	–0.001
Swiss Krono					
A	–91.90	–17.90	3.14	16.00	18.20
B	–42.10	–21.00	3.44	16.80	17.80
C	251.00	94.70	92.80	79.00	60.00
D	966.00	269.00	428.00	583.00	478.00
E	39.00	44.00	57.50	87.00	87.00
F	–0.08	0.23	1.51	0.86	0.27
G	–0.07	–0.33	–0.06	0.25	0.32
H	2.33	3.41	3.52	3.91	4.53
I	–2.31	–4.71	8.17	0.32	0.16
J	–2.17	–3.20	–3.23	–3.13	–2.43
PC “Darnytsia”					
A	27.20	16.90	11.80	11.20	10.90
B	23.10	21.60	14.50	13.40	14.50
C	39.10	24.20	23.60	21.20	28.10
D	255.00	272.00	301.00	647.00	777.00
E	100.00	113.00	153.00	195.00	91.50
F	0.07	0.09	0.08	0.08	0.08
G	0.21	0.24	0.16	0.18	0.27
H	1.41	1.91	2.37	2.68	3.17
I	1.48	0.86	1.13	1.07	1.01
J	–0.41	–0.54	–0.62	–0.64	–1.12
Rosava					
A	–36.90	2.53	–10.90	21.80	575.00
B	–22.60	4.90	–27.50	81.80	245.00
C	213.00	54.70	69.50	87.80	659.00
D	57.50	82.80	78.80	70.50	5.50
E	–37.70	–9.85	–18.5	–22.70	–900.00
F	–0.29	–0.18	–0.23	–0.52	0.16
G	–0.25	–0.24	–0.43	–0.38	–4.66
H	1.63	1.94	1.65	0.96	3.08
I	–1.61	4.76	–2.90	–3.57	–21.10
J	–1.94	–1.86	–2.60	–2.88	–21.10

Table 5 – cont.

Index	2016	2017	2018	2019	2020
Bila Tserkva Plant "Tribo"					
A	8.33	5.11	1.35	0.60	1.34
B	2.34	1.53	3.12	0.85	1.88
C	78.30	60.60	6.78	10.50	12.30
D	127.00	99.90	475.00	992.00	930.00
E	48.70	–0.02	37.50	168.00	212.00
F	0.34	0.35	0.00	0.00	0.00
G	0.01	×	0.07	–0.04	–0.01
H	0.19	×	0.13	0.33	0.31
I	0.33	0.31	0.83	0.56	0.32
J	–0.06	–0.04	–0.02	–0.04	–0.05
Arcelor Mittal Kryvyi Rih					
A	–6.51	1.79	3.34	5.680	9.74
B	–3.21	2.99	5.11	7.650	13.90
C	100.00	25.90	25.6	26.700	23.70
D	176.00	175.00	194.00	198.000	259.00
E	13.80	17.10	24.20	30.500	41.30
F	–0.04	–0.05	–0.03	–0.007	0.00
G	–1.74	–2.91	–0.51	2.210	6.33
H	35.00	43.00	50.00	63.600	66.50
I	–19.1	194.00	114.00	77.100	50.40
J	–17.8	–19.60	–20.30	–23.300	–22.60

Source: author's own research.

pact at the company's development. The debt of Nizhinsilmash plant PJSC has decreased to (72.2%) in recent years; the coverage ratio has increased to 132% and the economic value added, in turn – 73.3%. At the same time, the value of parameter *A* is 23 850 EUR and has increased over the last 5 years to 215%, but the capitalization rates increased to 13.6% by the net approach and to 11.4% (according to the gross approach).

Among machine-building enterprises with the analysis of the dynamics of indicators in 2016-2020, it is necessary to allocate EuroCar PJSC and existence at enterprise of displays of the non-adative potential. Under the conditions of creating a car cluster in Transcarpathia, this company significantly strengthened market position and financial situation began to improve *A*, so the equity capitalization are increasing.

Finally, below in the Table 8 we shall analyze the dynamics of values indicators of the optimality capital structure, efficiency and capitalization of enterprises during 2016-2020 into other vehicles.

Table 6. The dynamics of values indicators of the optimality capital structure, efficiency and capitalization of machine-building enterprises

Index	2016	2017	2018	2019	2020
Kalinov Machine-Building Plant					
A	18.900	18.300	–6.400	8.370	4.40
B	9.960	15.100	–8.960	6.320	5.46
C	50.900	34.700	59.200	71.900	81.10
D	234.000	176.00	115.00	127.000	111.00
E	47.900	68.300	28.200	227.000	92.10
F	–0.009	0.060	–0.090	0.190	0.14
G	0.002	0.007	–0.010	–0.001	–0.01
H	0.040	0.080	0.060	0.130	0.21
I	0.040	0.030	0.007	0.030	0.08
J	–0.010	–0.020	–0.060	–0.080	–0.18
Mogilev-Podilskuy Machine-Building Plant					
A	–62.400	–16.40	–0.890	10.500	10.50
B	–24.300	–37.90	–0.920	5.800	4.36
C	133.000	35.60	35.100	64.900	53.70
D	87.600	54.60	74.900	101.000	116.00
E	–3.060	–17.30	–10.200	2.950	18.10
F	–0.020	–0.04	0.040	1.170	27.30
G	–0.007	–0.01	–0.002	0.002	0.16
H	0.020	×	0.050	0.040	0.05
I	0.020	0.01	–0.230	0.040	×
J	–0.010	–0.02	×	×	–0.01
Zolotonosha Machine-Building Plant named after I. Lepse					
A	–39.300	6.580	3.15	0.090	0.760
B	–7.240	5.050	2.34	0.130	0.850
C	196.000	75.800	73.10	83.700	87.200
D	55.200	89.300	85.30	96.100	97.700
E	–36.700	–23.900	–27.50	–16.600	–13.300
F	0.110	0.170	0.29	0.300	0.470
G	–0.001	–0.002	×	–0.003	–0.005
H	0.010	×	0.02	×	0.040
I	0.001	0.008	0.01	0.520	0.120
J	–0.005	–0.010	×	–0.030	–0.040
Nizhinsilmash Plant					
A	–23.700	6.760	6.480	3.250	3.250
B	–25.900	7.770	6.910	2.940	2.910
C	107.000	47.300	36.100	35.200	35.200
D	107.000	167.000	230.000	239.000	239.000
E	13.400	83.500	166.000	244.000	244.000
F	–0.490	–0.040	0.020	0.030	0.020
G	–0.005	–0.001	–0.270	–0.001	×
H	0.010	×	0.020	0.030	×
I	0.001	0.007	0.001	0.002	0.001
J	–0.01	×	×	×	–0.020
Novokramatorsk Machine-Building Plant					
A	12.2 0	17.30	7.81	6.53	9.84
B	13.70	32.10	14.90	9.08	11.20
C	33.70	10.40	14.40	17.3	19.30

Table 6 – cont.

Index	2016	2017	2018	2019	2020
D	305.00	579.00	441.00	366.00	324.00
E	88.39	126.00	136.00	119.00	124.00
F	–0.01	×	0.00	0.02	0.03
G	–0.22	0.61	0.28	0.24	0.53
H	2.31	2.47	2.91	4.01	5.23
I	2.97	1.24	2.43	2.47	2.55
J	–0.96	–0.54	–0.81	–1.01	–1.21

Source: author's own research.

Table 7. The dynamics of values indicators of the optimality capital structure, efficiency and capitalization of vehicles, trailers enterprises

Index	2016	2017	2018	2019	2020
EuroCar					
A	–69.9 0	–44.50	–5.49	7.13	7.92
B	–37.80	–67.20	–4.61	2.76	7.08
C	199.00	137.00	137.00	201.00	87.40
D	127.00	88.40	126.00	273.00	305.00
E	18.40	–12.10	26.20	24.60	65.10
F	–0.04	–0.35	0.11	0.39	0.20
G	–0.02	–0.29	–0.16	–0.06	–0.09
H	1.04	1.07	1.85	2.86	3.04
I	–0.9	–1.79	–4.57	3.38	–0.22
J	–1.02	–1.55	–1.79	–1.94	–1.99
AvtoKrAZ					
A	–4.05	–5.12	–3.01	–1.30	–159.00
B	–9.00	–16.20	–15.30	–8.57	–484.00
C	121.00	95.30	98.50	99.9	259.00
D	114.00	112.00	84.90	123.00	30.70
E	35.10	35.30	–25.30	205.00	–908.00
F	–0.82	–1.02	–2.83	–13.8	0.36
G	–0.20	–1.10	–0.81	–0.91	–3.51
H	2.55	3.16	2.26	1.85	1.84
I	–9.72	–8.83	–12.8	–4.47	–16.50
J	–4.72	–5.81	–6.15	–6.88	–7.67
Plant of Municipal Mechanical Engineering "Kommash"					
A	–225.000	–0.44	–4.760	–3.500	–7.82
B	–38.98	–21.8	–212.000	–211.000	–369.00
C	166.000	4.83	3.230	3.070	6.66
D	52.100	49.8	28.90	18.50	14.30
E	–0.25 0	–0.32	–2.310	–2.510	–5.76
F	–0.007	×	–0.005	–0.004	–0.01
G	–0.007	×	–0.009	–0.006	–0.01
H	0.009	×	×	0.006	0.01
I	0.090	–0.21	–0.020	–0.240	–0.11
J	–0.004	×	–0.002	–0.005	–0.01

Source: author's own research.

Table 8. The dynamics of values indicators of the optimality capital structure, efficiency and capitalization of other vehicles enterprises

Index	2016	2017	2018	2019	2020
SKF Ukraine					
A	31.50	30.70	22.10	16.30	7.85
B	15.70	21.90	15.80	10.80	4.77
C	47.50	12.90	15.80	17.90	16.30
D	238.00	670.00	608.00	576.00	616.00
E	102.00	203.00	226.00	210.00	167.00
F	0.07	0.08	0.03	0.04	0.02
G	0.18	0.29	0.20	0.17	0.77
H	1.01	1.41	1.54	1.78	1.85
I	0.74	0.31	0.31	0.34	0.52
J	–2.48	–0.13	–0.18	–0.22	–0.20
Turboatom					
A	19.10	33.80	22.40	9.83	10.10
B	34.60	60.60	49.10	29.80	29.20
C	43.10	21.60	28.70	25.60	26.10
D	261.00	421.00	234.00	190.00	206.00
E	300.00	526.00	110.00	32.50	45.50
F	–0.02	0.04	0.01	0.03	0.01
G	0.26	1.31	0.73	0.47	×
H	2.24	2.67	1.81	2.39	2.62
I	3.62	1.21	–0.65	1.88	2.97
J	–1.41	–1.01	–1.33	–1.81	–1.92

Source: author's own research.

According to results of the analysis of dynamics the financial and economic activity, the optimality of the capital structure, efficiency and capitalization of industrial enterprises in 2016-2020, the main characteristic tendencies of manifestation and activation of non-adative properties are revealed. In order to determine causal links and study the integration processes, the formation of value chains we need, firstly, identify the key trends into financial indicators, and, secondly, – integration links of processing industries.

In turn, NaftoGazVydobuvannya PJSC, according to the indicators of capitalization of the equity, is dominated into the extractive industry (the increase of A is –0.69 mill. EUR). It is a positive trend increases the investment attractiveness of this enterprise. The leader among industrial activity in extraction of metal ores, other minerals and development of quarries is Kryvyi Rih Iron Ore Plant PJSC (the increase of parameter A is –1.19 mill. EUR).

Among to the food industry, Roshen Corp. should be singled out, which significantly increased the net financial result of this industrial enterprise into amount

of 1500 during 2016-2020, and in the subsidiary parameter *A* increased to 5863 EUR. It was recorded the highest rates of the tax payment for the last 5 years.

The national enterprises in chemical and pharmaceutical industry are developing quite intensively. Among the leaders are dominated PC "Darnytsia" PJSC, parameter *A* increased to 1.75 mill. EUR. But the profitability of the assets and net margin income decreases, as well as debt increases, reduces the value of company. Therefore, it is advisable to review the terms of financing and the non-adative of debt. In addition, the investment policy should be aimed at intensifying the innovative development processes with increasing the shares of intangible assets in the balance sheet of enterprise.

Arcelor Mittal Kryvyi Rih JSC remains the leader in the metallurgical industry with *A* growth rates to 31.5 mill. EUR and the increase of working capital to 27.4%. However, there is a tendency to increase the debt, which in the future may lead to negative consequences.

Regarding the study of machine-building enterprises activities, we note that there are trends of increasing the working capital, and in some cases – decreasing profitability: EuroCar (the increase of parameter *A* is near 1.99 mill.) and Novokramatorsk Machine-Building Plant PJSC – 2.92 mill., Kalinov Machine-Building Plant (0.16 mill.) and Nizhinsilmash Plant (0.02 mill.), SKF Ukraine PJSC (0.83 mill. EUR).

By the way, it is worth noting that the dynamics of indicators of the optimality capital structure, efficiency and capitalization of industrial enterprises during 2016-2020 in vehicles, trailers and other vehicles indicate that among enterprises, there are the chaotic dynamics of indicators of the reduction of working capital with the existing increments for: Turboatom JSC (the increase of the parameter *A* is –0.38 mill.) and Kyiv Plant of Municipal Mechanical Engineering "Kommash" PJSC (–0.05 mill. EUR).

These enterprises have a significant rate of the financial indicators. This indicates that the last 5 years industrial enterprises have been marked by intensive integration activity. So, we should describe in more detail this interaction and the value chains, because integration is a prerequisite for non-adative properties and serves as an asset innovative development.

The analytical assessment of financial effects in development of industrial enterprises helps to identify the latent manifestations of activation of non-adative properties. Monitoring of development can be carried out, according to the indicators of abrupt dynamics. Regarding the study of integration effects, we should pay attention to the processes of strengthening the effectiveness of integration interaction, occurs after creation of new structures and institutions that affect the strategic strength of integrated structure of enterprises.

The positive economy effects of integration ties and consolidation of development machine-building during 2016-2020 should be reflected in increased

Table 9. The dynamics of shares of the fixed and intangible assets in balance sheets of machine-building enterprises

Enterprise	A*	B	C	D	E
EuroCar					
2016	1.11	0.03	2.99	0.001	0.09
2017	1.13	0.02	2.33	0.790	0.07
2018	1.31	×	1.58	0.001	0.08
2019	0.97	×	2.41	0.960	0.10
2020	2.29	0.1	4.42	0.770	0.03
AvtoKrAZ					
2016	5.34	0.29	5.45	0.006	0.11
2017	6.13	0.27	4.51	0.005	0.10
2018	6.28	0.26	4.22	×	0.09
2019	6.92	0.25	3.66	×	0.08
2020	2.95	0.24	8.36	×	0.20
Kalinov Machine-Building Plant					
2016	0.05	0.008	15.20	0.040	0.08
2017	0.07	×	10.30	0.020	0.04
2018	0.10	0.010	10.20	0.010	0.01
2019	0.12	0.009	8.10	0.007	×
2020	0.23	0.010	8.20	0.001	0.79
Mogilev-Podoilskuy Machine-Building Plant					
2016	0.06	0.04	77.9	0.35	0.57
2017	0.05	×	78.3	0.28	0.48
2018	×	×	74.8	0.22	0.39
2019	0.03	0.01	37.1	0	×
2020	×	×	37.5	0	×
Kyiv Plant of Municipal Mechanical Engineering “Kommash”					
2016	0.11	0.11	99.7	0	0
2017	×	×	99.6	×	×
2018	0.09	0.09	99.1	×	×
2019	0.18	×	49.7	×	×
2020	0.17	0.08	49.5	×	×
Kyiv Machine-Building Plant named after I. Lepse					
2016	0.009	0.006	68.7	0	0
2017	0.020	0.007	33.2	×	×
2018	×	0.008	38.3	×	×
2019	0.030	0.006	16.6	×	×
2020	0.050	×	12.8	×	×
Nizhinsilmash Plant					
2016	0.02	0.005	21.2	0.001	6.29
2017	×	0.004	18.1	×	6.26
2018	0.03	×	13.6	×	5.00
2019	0.04	×	10.7	×	3.88
2020	×	0.005	10.7	×	×
Novokramatorsk Machine-Building Plant					
2016	5.18	1.74	33.7	0.001	0.03
2017	5.48	1.92	35.9	×	0.02

Table 9 – cont.

Enterprise	A*	B	C	D	E
2018	5.89	×	32.7	×	×
2019	6.05	2.05	33.8	0.870	0.01
2020	6.45	×	31.7	0.003	0.06

* A – the assets of the balance sheet, B – the main funds, C – the part of main funds in the result of the asset, D – the intangible assets (mill. EUR), E – the fraction intangible assets as a result of the asset of the balance (%).

Source: author's own research.

share of fixed assets, intangible in balance sheets, as presented in the Table 9. According to the analysis of shares of the fixed and intangible assets in balance sheets of machine-building enterprises, it was found that among the sample of surveyed companies the largest share of assets belongs to Nizhinsilmash Plant PJSC with 6.29% enterprise development.

It is necessary to highlight the negative trend of reducing of the share of intangible assets during 2016-2020 to (2.41%), which may lead to deterioration of situation, and for Nizhinsilmash Plant PJSC – it is advisable to responding in timely manner to eliminate a negative challenges, strengthen the innovation in structure of sheet until 2016.

So, the worst situation is observed in Kyiv Plant of Municipal Mechanical Engineering "Kommash" and Zolotonosha Machine-Building Plant named after I. Lepse PJSC; it has no the intangible assets into balance sheets. At the same time, the economic value added of Kyiv Plant of Municipal Mechanical Engineering "Kommash" PJSC is (0.05 mill. EUR) and by the period under review decreased to (80.1%). The rate of *A* is 0.05 mill. EUR and increased the last 5 years to 62.1%, significantly reduced capitalization, which is extremely negative. The share of fixed assets in total asset of balance sheet is 99.7%. It is may be the cause of negative challenges in the dynamics of development machine-building enterprise.

Slightly better economy trend is in Zolotonosha Machine-Building Plant named after I. Lepse PJSC – the negative of the economic value added is –0.03 mill. and for the period under review decreased to (0.18 mill. EUR). At the same time, the rate of parameter *A* is 0.03 mill. EUR, but the last 5 years increased to 326%. Capitalization indicators increased significantly to 729% and the gross approach decreased to (635%).

Thus, it should be noted that the presence of the intangible assets in balance sheet of machine-building enterprises has a positive effects on the activation of non-adative properties. It is contributes to high-quality structuring, improved economic value added and profitability, business capitalization.

6. Conclusions

The theoretical and methodological approach of identification, selection of the development factors by deterministic component of efficiency that reflects consequences of activation of the non-additive characteristics of industrial enterprises, which include a set of indicators of the effective functioning, creating conditions for timely adaptation in management decisions.

Improved scientific and applied principles of comparative assessment of abrupt dynamics of the economic system, which provide identification of manifestations of the non-additive properties, an opportunity to outline the recurrence of non-additive phenomena in a dynamic environment and serve as a tool to prove the relevance of internal monitoring of the industrial properties.

According to approaches, the latent manifestations of positive non-additive properties were monitored in terms of the optimality, efficiency and capitalization for industrial enterprises. As the monitoring results showed, it was determined that Nizhinsilmash Plant PJSC has the highest level of non-additivity among the studied machine-building enterprises, as well as Eurocar, which has positive and differs from others by organizational stability. The use of the proposed approach allows to determine the priority areas of enterprises strategic development.

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Rozwój przedsiębiorstw przemysłowych na Ukrainie w latach 2016-2020 – ocena i analiza

Streszczenie. *W artykule opisano metodyczne podejście do oceny poziomu i perspektyw rozwoju przedsiębiorstw przemysłowych na podstawie wyników badania dynamiki wskaźników ekonomicznych produkcji i działalności gospodarczej. Autor przedstawia determinanty produktywności, wydajności i efektywności, które wpływają na rozwój korporacyjny przedsiębiorstw oraz wyjaśnia, w jaki sposób stymulują one innowacyjne zmiany organizacyjne i ekonomiczne w działalności produkcyjnej i gospodarczej.*

Słowa kluczowe: *analiza, rozwój, przedsiębiorstwo, ocena, branża, poziom, perspektywy*

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The relationship between spirituality and technocentrism in the inclusive development of business entities

Abstract. *The purpose of the article is to analyse the evolution of society and the economy as a result of changes in the relationship between factors associated with technology on the one hand and spirituality and morality on the other. The technocentric orientation of civilization increases cyclically, while moral aspects are on the decline. The spiritual foundation of society ensures its stable development. The authors consider the structure of the capitalist society, which has entered a systemic crisis aggravated by the COVID-19 pandemic, and focus on possible changes in the development of economic entities under inclusive capitalism and a new world economic order. Risks associated with these changes and possible ways of avoiding destructive consequences are also addressed. The above considerations are analysed with regard to the problems of reforming the Ukrainian economy at this stage of its development.*

Keywords: *capitalism, economic and social development, inclusive capitalism, inclusive society, spirituality of man and society, structure of society, new world economic order*

1. Introduction

At the end of the 16th century, a social system called capitalism (mammonism) was born in European countries. To date, it occupies a dominant position in the world economy. Passing through the stages of pre-industrial, industrial and post-industrial (in the developed countries of the G-7 and G-20) development, modern oligarchic financial capitalism faced difficulties in development, complicated by the COVID-19 pandemic. During 2020, the economy reduced the production of gross domestic product (GDP) by 4.3%. In 2021, the crisis is in most of the G-7 countries, practically in all post-socialist countries and in most developing countries of the peripheral capitalist system.

Well-known economists, authoritative international organizations, leaders of major countries and organizations declare that the modern model of financial-industrial oligarchic capitalism has outlived its usefulness. There is a search for new forms of development of society, the state, corporations, and institutions. The theories of a new world economic order and an inclusive society (world, states, regions, corporations, people) have been added to the well-known forms of development in recent decades. However, at the same time, a technocentric approach to development problems remains, the role of personal and social spirituality is underestimated, development is understood as a struggle of opposites, the structure of society is classed, etc. Taken together, such approaches, focused on solving issues directly divorced from the system, do not provide a real assessment of the situation, substantiation of strategic and tactical vectors of development. Critical consideration of these and some other development problems remains relevant in the social science and in industrial practice.

Purpose of the study – analysis of a technocentric approach to considering the development of economic entities in modern conditions and the development of proposals for their use in combination with spirituality in the Ukrainian economy.

2. A brief overview of research and publications on the problem

In numerous publications, capitalism is defined as a mode of production, the development of society, which aims to maximize profits obtained mainly through the exploitation of employees, the distribution of added value and profits by capital, which are its owners; competition that grows into monopoly. These are market relations (not covering all spheres of society, for example, family ones), income inequality, economic and external economic incentives

(compulsion) to work, modern technologies (including information-computer and digital), a tendency to external and internal expansion and others. Production (economic) relations are recognized as the basis of capitalist society (Bregel, 1967), although some scholars criticize this direction (Katasonov, 2015). Despite the fact that Adam Smith (1997) noted the importance of ethics and spirituality in the economic development of society, this problem has not been sufficiently studied in our time. The main attention is paid to technocentric development, which is confirmed by the materials and speeches of the World Economic Forum (WEF) anniversary meeting participants in Davos in January 2021, in the work of its permanent leader Klaus Schwab (Schwab & Malleret T. 2020). The end of capitalism is predicted by both the participants of the WEF in Davos and the participants of the Rome and Bilderberg Clubs, as well as its most recent defender J. Soros (1999). The principles of the new world economic order are actually being implemented in China, India, and a number of countries in Southeast Asia (Buzgalin & Kolganov, 2009; Khazin, 2019). The ideas of inclusive capitalism are outlined in the works of K. Schwab (Schwab & Malleret T, 2020), A. Fursov (2020) and others. The problems of spirituality and industrial development are reflected in the works of I. Sikorsky (2004), I. Buleev (Buleev, 2020; Buleev & Bryukhovetskaya, 2018; Amosha, Bryukhovetska, & Buleev, 2020) and others. this, in a systematic manner, the above and other issues require further research.

3. Presentation of the main material

The analysis of the problem is based on the two main factors presented in the development of social process. They are the technical and technological factor, and the spiritual and moral one. At the same time, the spiritual and moral aspects of development are accepted as dominant.

Of all the socio-economic formations (SEFs) that are recognized in political economy, capitalism or the capitalist formation is the least long-lasting and the most dynamic in development. Capitalism has provided a dynamic growth of productive forces, labor productivity, concentration of population in cities with industrial enterprises, growth of workers' incomes and the population, development of education, science, health care, etc. These aspects amount a positive development. The negative ones include the cyclical nature of crises, the formation of antagonistic classes, the recognition of main goal development, profit maximization and its distribution in favor of the ruling class, etc. The system evolves, but first of all, we methodologically study, all its separate parts, losing the vision of the system as a whole, attributing to development aspects that are positive in the researcher's opinion, and to negative – others that are not.

It is known that the research process consists of the accumulation of facts (empirics), systematic analysis of factual material, obtaining and interpreting the results. In the social sciences, according to some scholars, an adequate explanation is delayed by 15-25 years. Therefore, periodically there is a need to review scientists concepts (categories) that are common in the use and bringing them to the real state of the system with all its components.

For example: development is traditionally associated with quantitative and qualitative growth, but in reality there are recessions and crises. Is it development or not? Yes, it is a development. In reality, development can be characterized by improvement and reduction of indicators. "Positive" and "undesirable" components in the composition of increasing or declining development can both increase and decrease, that is shown in Fig. 1.

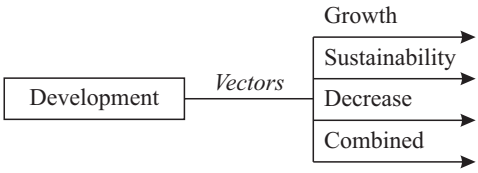

Fig. 1. Directions of the vector development

Source: compiled by the authors.

Development is considered as a combined system of growth, sustainability and decline (Fig. 1). The components of development are a system of technical-technological and spiritual direction (Fig. 2).

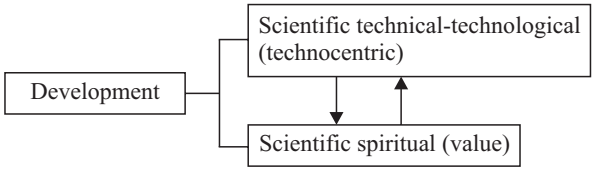

Fig. 2. The basis of development

Source: compiled by the authors.

The main factors of development – the triad (Fig. 3): Creator (World Mind, God, etc.), Human (society) – spiritual, bio-social in nature and Nature (Fig. 3).

Research methods are dialectical and trialectic or the concept of three forces of development; the category "socio-spiritual formation" (SDF) is added to the category "socio-economic formation" (SEF); society has a basis and a superstructure, but the spirituality (values) of the people (society) is taken as a basis, and all other relations and institutions are taken as a superstructure.

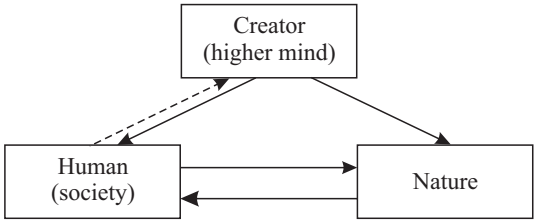

Fig. 3. Triad of development factors

Source: compiled by the authors.

Class theory applies only to capitalist SDF. In other formations, the differentiation of society is not class in nature, but clan, caste, mafia, class, etc. character, based on the fact that the class needs a scientifically sound ideology, demographic and industrial concentration of the population, the presence of political associations, parties, etc.

Most researchers associate the emergence of capitalism (mamonism) in the social science and political economy with technical (scientific-technical, scientific-technological) progress. It is believed that capitalism passed three technical (production) revolutions (VR) and joined the IV BP (recall that some experts believe that the IV BP did not occur, and that this is a full stage of the III BP, because the stage referred to the IV BP did not take place revolutionary scientific discoveries, and indicators of production and services decline). This position remains debatable, as the problem of the future of the capitalist SEF (SDF) does.

The fact that capitalism has historical terms of its development was noted by the founders of classical political economy. Thus, Adam Smith (1962) believed that the time of capitalism would end with the completion (on a global scale) of extensive market development and deepening the division of labor. K. Marks (1959) – in the liquidation of private property, in the conflict between the social nature of production and the private-capitalist appropriation of added and profit value and in the class victory of the proletariat over the bourgeoisie. The rebirth of capitalism into a more just system (people's capitalism, consumer society, democratic capitalism, post-industrial or hyperindustrial society, a new world economy, social capitalism, and finally socialism, etc.) still worries society and researchers, but there is no solution.

At one time, Pitirim Sorokin developed the theory of convergence. It is supported by prominent scholars, including Albert Einstein (article in 1949 "Why Socialism"), J. Schumpeter, J. Samuelson, J. Stiglitz and others. The general provisions of these theories are widely known, we do not dwell on them. We talk either about a new world economic system, or about improving the existing one.

The general crisis of industrial capitalism in the twentieth century deepened in the twenty-first century. In the 90s of XX century. oligarchic technical and

technological system in developed countries is inferior to the oligarchic financial system. The sphere of services in the world economy exceeds 60% of GDP, in the USA – exceeds 80% of GDP, unemployment is growing, income growth is slowing down, the middle class is eroding, income differentiation is growing. But there was a short-term exception: from the 90s of XX century till the tenth years of the XXI century leading countries have improved the state of their economies by developing the markets of post-socialist countries. If in the 90s of XX century US GDP was 24-25% of world GDP, then in 2008 – 31%. But in the late tens and twenties of the XXI century, the situation deteriorated sharply again, and COVID-19 led to a fall in world GDP in 2020 by 4.3%, the United States – 3.5%, the EU – 6.3%, Ukraine – 4.4% (according to the World Bank, n.d.; the Ministry of Finance of Ukraine, n.d.; Dinamika VVP Ukrainy s 1990 po 2023 gody, n.d.).

The preliminary conclusion comes down to the fact that the deterioration of the economic situation in leading countries is not the result of technocentric development of society. Capitalist and socialist systems in the second half of the twentieth century had almost the same material and technical base and different results. In the 80s of the twentieth century Vasily V. Leontiev was invited to the Soviet Union and made a conclusion, based on the analysis of the economy state. He concluded that the economy of the USSR had no systemic problems, but needed structural regulation. At the same time, on the instructions of President Reagan, three independent groups in the United States analyzed its economy and concluded that the country had systemic problems so the United States could lose competition with the Soviet Union (Fursov, 2020; Porokhovsky, 2008). The results are well known: the Soviet-style system of socialism has lost. The reason, in our opinion, is that the spiritual component of development at that time was more stable in the United States than in the USSR.

The spiritual component of the society development is leading in the general development, and its changes lead to changes in socio-spiritual formations. As a result of the shaking of spirituality, values, the stability of existing systems weakens, the internal struggle in society intensifies. Revolutions and civil wars are possible, other spiritual values are formed, another formation comes. Capitalism replaced feudalism, destroyed the canonical provisions of Christianity (as written by Max Weber in his works) (Weber, 1990). Socialism continued the destruction of Orthodoxy and other world religions, and had short-lived successes. Capitalism is currently destroying the universal and national values of the population. It deepens the crisis, actively seeks new systems of the economy and society organization.

One of the search directions is the theory formation of stakeholder corporations' inclusive capitalism. Once again, emphasis is placed on the technocentric component of the development of the system, spirituality is significantly under-

estimated in the development of society, corporations, management of business entities, civic institutions.

In scientific publications, the media in recent decades, the concept of inclusive capitalism is widely used. The term "inclusion", "inclusion" (from inclusion – inclusion) – the process of increasing the degree of participation of all citizens in society and especially those with disabilities. In the seventeenth and twentieth centuries, this was the inclusion of the visually impaired, hearing, etc. in civic activity, education, culture and art. An inclusive society provides a sense of acceptance and a full-fledged subject for a person, regardless of gender, ethnicity, status, as well as physical or mental status. This is a society where everyone always wins. Some of its provisions are recorded in the UN Universal Declaration of Human Rights, 1948.

In combination with the concept of capitalism, the concept of inclusive was used as inclusive capitalism (IC) by a meeting (London, 2014), which was attended by Christine Lagarde, Prince Charles, Fiona Wolf (Lord Mayor of the City of London) and others. It has been formulated that "comprehensive capitalism (inclusive capitalism – IC)" is capitalism without the poor, in which everyone is involved in economic activity. There is a responsibility to future generations. In her speech, Lady Lynn de Rothschild acknowledged Karl Marx's right to exclusive capitalism (EC), exclusive enterprises and corporations (EC), but these provisions are now obsolete, and exclusive capitalism has become inclusive capitalism, all-encompassing capitalism. Researchers should take aspects critically.

The shortcomings of capitalism remain. Thus, the report of the organization Oxfam (January 2020, Davos) provides data that 2153 billionaires in the world have property that exceeds all the property of 60% of the world's population. In the United States, the decile ratio (income ratio of 10% of the poor and 10% of the rich) from 1: 5 (50s of the twentieth century) has changed to 1:15 in our time.

According to Bloomberg, the total wealth of the 100 richest citizens of the United States during the 100 days of D. Biden's presidency (from January 20, 2001 to April 30, 2021) increased by $ 195 billion and amounted to 2.9 trillion $. During the same period, the total property of 50% of US citizens with the lowest incomes was 2.5 trillion $.

However, the transformation of the global world elite's views on capitalism should not be underestimated. Last year, at a business round table (BKT) in the United States with the participation of Jeff Bezos (Amazon), Tim Cook (Apple), Mary Bar (General Motors), it was noted that the principle of shareholder supremacy prevails in large corporations and enterprises, but it was obsolete. Responsibility must be extended to all stakeholders (all company employees, suppliers, contractors, consumers, local governments, the state), and the economy must serve all, not just shareholders. The shortcomings of modern capitalism were discussed at the anniversary (50th anniversary) WEF in Davos (January 2021),

and on the eve of the WEF in 2020, they were detailed in the monograph by K. Schwab and T. Malleret (2020) where the main provisions of IR and ways of its transformation were named. Inclusive capitalism should:

– become open to all, eliminate all barriers and restrictions;

– involve all stakeholders in a compatible, sustainable process of creating added value;

– not consider profit maximization as the main goal of an inclusive business entity;

– gradually eradicate poverty and begging;

– increase innovative investments;

– gradually remove business entities from the power of shareholders;

– increase the responsibility of all parties (stakeholders) for their activities for the company, and the company for stakeholders;

– gradually gain social functions, build a socially responsible company, gradually taking them over to the state.

Both joint-stock (EC) and state capitalism must evolve in the IC, K. Schwab notes. The essence of inclusive capitalism (IC) (from inclusion – expansion, inclusion) – a global movement that combines the aspirations of business, government and open civil society to create a fairer and more equitable system of values distribution in the economy, solving the problem of income inequality and status in society. The transition from profit maximization as a goal to increase value added, its distribution to all stakeholders, the gradual transition from private to collective ownership of tangible and virtual means, services, etc.

The authors and providers of IC are: closed supranational structures; Bilderberg Club; Club of Rome; WEF in Davos and the Council for Inclusive Capitalism (UN Secretary General, Pope, Prince Charles, a number of billionaires, top managers of TNCs, economically developed countries, etc.).

The main shortcoming of the IR theory, which is promoted by K. Schwab and supported by the leaders of the G7, is the lack of real mechanisms for its implementation. These are just intentions, but even good intentions do not always lead to good. It is important for them to create a leading ideology with specific roadmaps for their implementation, responsibility and motivation instead of intentions. All these are categories of the spiritual component of development. It is laid down for individuals, inclusive subjects from the first days of their emergence and through the system of education, responsibility becomes a character trait, a guide to it. The positive thing about IR theory is that it emphasizes the role of spirituality in development, which is very important itself.

Technocentric policy development of society, economy and business entities leads to a reduction of the time required to meet the material needs of society and the required amount of services. The positive directions of IR, in accordance with the theoretical provisions that objectively cover the progressive part of the modern

global elite, must be based on both the technocentric and the spiritual directions of society development. Technocentric development has greater prospects. Today even an agricultural worker, according to some Western researchers, has the ability to meet up to 35 people, and one worker in the manufacturing sector – up to 10 people. The service sector will soon receive a high degree of automation and robotics. The problem of unemployment and overpopulation becomes real. Therefore, scientists and politicians must deal in detail and objectively with the problem of effective use of free time from production at the level of society, corporations, specific professions and people. The results can be positive if free time is used to form a creative person, a creative person. This compensates for the shortage of resources, which is becoming more acute. Partial solutions to some of the problems associated with the formation of IR, the use of free time, remote work have been found in the process of overcoming the pandemic COVID-19. This is "definitely the main income" – in the United States. "Fair Basic Income", "Universal People's Dividend" – in the Scandinavian countries. "Social credit" – in China, etc. It is also a continuous supervision of every citizen.

Forecasts of the coming future from 70 to 90% of the population will live worse: the differentiation of the population by income will increase; the world will move from GDP growth to realities; the slogan "Live better, be content with less" is spread, this slogan is introduced in the "Manifesto of the People" developed in May 2020, most of the achievements of the last 100 years in the field of welfare of the majority of the population are nullified; delegitimize property through information, social and environmental platforms; assets of small and medium-sized businesses will be transferred to large business; blurred middle class; free time a person spends more and more in cyberspace.

4. Conclusion

Mankind faces great problems, the solution of which is possible through spiritual and technical progress with the dominance of spirituality.

The above theoretical provisions apply to the society, economy and corporations of Ukraine. The situation was complicated by the fact that pre-industrial capitalism was formed in Ukraine during the years of reforms and independence. Its formation was not through the development of material, labor and spiritual resources, but through the destruction of created earlier things. Production and labor potential has almost halved, traditional spirituality and values are being destroyed.

Researchers have repeatedly asked government officials to perform work on the audit of inventory and analysis of the existing production and labor poten-

tial of the service sector. This can become a basis for revising the strategies of economic development, industry, high-tech industries. It is necessary:

– to stop insufficiently substantiated plans for privatization of state-owned enterprises and enterprises with state-owned shares;

– critically consider and adjust the laws and regulations that determine the conditions of the enterprise operation related to all forms of ownership, size, forms of management;

– to restore the system of retraining and advanced training of managerial staff. Conduct research on the application of the main IC provisions in Ukraine, taking into account the peculiarities of the country's development, major sectors of the economy, large companies and corporations;

– using spiritual and scientific and technical approaches.

The integrated use of the above and other approaches can be the basis for overcoming the systemic socio-economic crisis of society, mitigating and addressing current and future challenges.

And the last. The theory, or rather the IC hypothesis, has both positive and insufficiently elaborated questions. It increases the role of the spiritual component in the development of society, but still the main remains the technocentric component.

Already achieved level of equipment and technology is able to provide results when:

– 1% of rural workers will meet the needs of the state and society in agricultural products;

– 10% of industrial workers are able to provide society with industrial products;

– automation, robotics, artificial intelligence significantly reduce human employment in services, management, finance, etc.

Humanity faces the global question of how to use the potential of people who become redundant as the free time of workers increases sharply? Are our societies, elites ready to organize and usefully realize the growing free time for intellectual, creative, spiritual growth? These issues are facing states, their elites and societies.

Further research: deepening research on the influence of spirituality on the development of society and the subjects of economic activity. Determining the boundaries of acceptable deviations from the optimal ratio of human interests, regions, TNCs, the state and top regions. Development of a model for the development of economic entities at the micro, meso and macro levels. Forecast of the potential of the labor force, the use of human free time for his self-education, the growth of spirituality and professionalism in the conditions of inclusive capitalism and the new economic system. Study of robots production consequences and services for the population of the country, regions, on family relations and spirituality.

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Związek duchowości i technocentryzmu w inkluzywnym rozwoju podmiotów gospodarczych

Streszczenie. *Celem artykułu jest analiza ewolucji społeczeństwa i gospodarki w wyniku zmian relacji między czynnikami związanymi z technologią z jednej strony a duchowością i moralnością z drugiej. Technocentryczna orientacja cywilizacji wzrasta cyklicznie, podczas gdy aspekty moralne zanikają. Duchowy fundament społeczeństwa zapewnia jego stabilny rozwój. Przedstawiona została struktura społeczeństwa kapitalistycznego, które weszło w systemowy kryzys pogłębiony przez pandemię COVID-19, jak również możliwe zmiany w rozwoju podmiotów gospodarczych w warunkach kapitalizmu inkluzywnego i nowego ładu gospodarczego na świecie. Uwzględniono również zagrożenia, jakie niosą opisane zmiany, i możliwe sposoby uniknięcia ich negatywnych konsekwencji. Powyższe rozważania są analizowane w odniesieniu do problemów reformowania gospodarki ukraińskiej na tym etapie jej rozwoju.*

Słowa kluczowe: *kapitalizm, rozwój gospodarczy i społeczny, inkluzywny kapitalizm, inkluzywne społeczeństwo, duchowość człowieka i społeczeństwa, struktura społeczeństwa, nowy światowy porządek gospodarczy*

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An extended list of calendar anomalies in the context of the efficient market hypothesis

Abstract. *The efficient market hypothesis is commonly tested mainly with regard to capital markets, but it has also been applied to currency and commodity markets. Although the theory has been used to confirm that different markets vary in their effectiveness, certain cyclical anomalies can be observed in these markets. Particularly noteworthy are calendar anomalies, which can be used to develop investment methods and procedures. In addition to commonly known anomalies, such as the January or the December Effect, or short-term ones, like the Friday or Monday Effect, there are many others that are largely unknown in Poland, such as those related to the Presidential Election Cycle in the USA or very short-lived ones, associated with individual hours of investing in a trading session. The aim of the article is to present a possibly complete list of calendar anomalies recognized in foreign capital markets, but largely unknown in Poland, such as short-lived anomalies and exotic ones (e.g. related to phases of the moon).*

Keywords: *calendar anomalies, efficient markets hypothesis, market anomalies, behavioral finance*

1. Introduction

The effective market hypothesis (EMH) created by E.Fama is over 50 years old. This theory was a summary and development of a number of theories functioning in literature up to that time. It should be noted, that its individual elements had already been relatively extensively analyzed and discussed by researchers in the 19th century.

Regardless of its range of features, one of EMH's main tenets is, that all publicly disclosed information is reflected immediately in quoted stock prices. The first, that pointed this relationship was J. Regnault in 1863 in his book: "Calcul des Chances et Philosophie de la Bourse" (Buła, 2014, p. 12). At the same time, he was the first, that presented the hypothesis of the random walk of share prices on stock exchanges (Poitras G. & Jovanovic, 2010, p. 12), which is a key element of this theory, investigated whether the model of random price wandering really takes place in capital markets. An author who also contributed to the basics of EMH was Louis Bachelier. As early as 1900 in his doctoral dissertation "Théorie de la speculation" stated that: "past, present and even discounted future events are reflected in market price, but often show no apparent relation to price changes" (Dimson & Mussavian, 2000, p. 1). This statement indicated, that it was already at that time, that attention was drawn to the fact, that stock prices in the capital markets are subject to random wandering, despite the fact that, intuitively considering stock prices, they should reflect emerging information. Bachelier's works and concepts were not really disseminated until the 1960s (Zielonka, 2017, p. 30). The date of the publication of the effective market theory is assumed to be 1970, when the article by E. Fama "Efficient Capital Markets: A Review of Theory and Empirical Work" was published. Although he has been working on this theory since 1965, in fact EMH aggregates and specify elements of the existing knowledge on this subject (Czerwonka & Gorlewski, 2012, p. 125). Currently, EMH is one of the most popular theories describing capital markets today, and Fama was honored in 2013 with the Bank of Sweden award of Alfred Nobel, for his contribution to the development of economic sciences, primarily for the theory of efficient markets.

In summary, the foundation of EMH was the discovery, that future price movements of financial instruments were unpredictable and that efficient markets are those markets, where all information is immediately and fully reflected in prices of its financial instruments. Such market is defined as being in equilibrium. If the markets proved to be perfectly efficient, as research attempts have often been carried out, then the use of technical or fundamental analysis methods, or even insider trading, should not yield any over-normative profits.

Behavior of the markets under the influence of emerging information is perceived differently by the supporters of behavioral finance. They believe, that the new information is actually reflected in the share prices, but not immediately. Market equilibrium does not follow immediately after released information. According to them, there is always an over-reaction or a delayed market reaction to its appearance. The importance of EMH is significant because the inability to predict prices in the future results in the assumption, that active investing is pointless, and all investment methods, regardless of their type, are ineffective (Ang, Goetzmann, & Schaefer, 2010, p. 1).

Both supporters and opponents of the efficient market theory argue with each other about the true nature of capital markets. Market efficiency research is practically constantly carried out. They provide arguments for both supporters and opponents of EMH. Paradoxically, often the same data is the basis for inferring efficiency or lack thereof (Janicka, 2008, p. 169).

Research has confirmed and denied the veracity of EMH on various markets, not only capital markets. M. Jensen in 1978 in his article "Some Anomalous Evidence Regarding Market Efficiency" claimed, that this is a theory, that has the most reliable confirmation in empirical research from stock, bond and commodity markets from around the world. At the same time, it underlines the fact, that the abundant evidence emerging, that the EMH is not completely consistent and unambiguous cannot be ignored. The basic assumptions of the EMH, which determine its shape and nature, are criticized by supporters of behavioral finance as non-existent (Simon, 1955).

Newly emerging observations, as a result of the development of econometrics itself, showed facts that could not be ignored (Jensen, 1978). The process of obtaining improved data quality and accuracy is significant. The processes of digitization and digitization continue to leave their mark on capital investments as well. The use of digital and computer techniques in collecting and processing data is significant in a number of areas of economy, business and, of course, the investments themselves (Caputa, 2017).

The research carried out all over the world, since the inception of EMH, has highlighted a number of, most importantly, repetitive situations in the markets that undermine the truth of its principles. The phenomena of these deviations from the EMH rules are commonly referred to as anomalies (Buczek, 2005, p. 39). They can be defined as such changes in the prices of a given instrument, that deviate upwards or downwards from the EMH model. At the same time, it should be emphasized, that these changes can be predicted and that they occur cyclically. They can often constitute the substantive basis for the investment strategies used by various investing entities (Keller, 2015, p. 70). EMH deviation anomalies are well known. There are several groups of types of anomalies and anomalies themselves, such as:

1. Positive correlations between future and past rates of return,
2. Negative correlations between future and past rates of return,
3. Calendar effects group,
4. Excessive trading level on the stock exchanges,
5. The mystery of closed investment funds,
6. Anomalies related to the IPO of shares,
7. The risk premium puzzle,
8. Results of actively managed investing funds,
9. Anomalies related to fundamental figures,

10. The effect of low share prices,
11. Anomalies related to the popularity of companies (blue chips),
12. Anomalies related to information about share buyback,
13. Anomalies related to the change in dividend policy,
14. Anomalies related to the issuance of debt by the company,
15. Anomalies related to mergers and acquisitions,
16. Whole prices of shares effect,
17. Other

One of the most famous anomalies are calendar effects. They constitute a broadly identifiable category encompassing anomalies resulting from investor behavior, occurring cyclically at certain characteristic periods or moments of time, possibly generated by certain characteristic events. One can indicate wide range of calendar effects, such as:

1. January effect,
2. December effect (Santa Claus Rally),
3. Weekend or Friday and Monday effect,
4. Tuesday effect,
5. May effect,
6. September effect,
7. Turn-of-the-month effect,
8. Anomalies caused by upcoming holidays and days off,
9. Presidental Election Cycle,
10. The effect of unlucky dates,
11. Moon phases effect,
12. Hour effect.

The occurrence of the above anomalies proves the ineffectiveness of the given markets. Their characteristic feature is the cyclical deviation from the assumptions of the EMH, as mentioned at certain times or under certain recurring events.

2. Calendar effects

2.1. January and December effect

Authors describing calendar anomalies, that violate the EMH usually indicate first the January and December effect. These are one of the most popular effects of the month, i.e. situations, in which monthly rates of return deviate from the theoretical model of their equality in each period. The December effect is often referred to, in particular in the media, as ‘Santa Claus Rally’. Both of these phenomena are related to one another, hence their common description. The

December effect implies the appearance of the January effect. What are both effects? It boils down to the fact, that the average rates of return in December and January are statistically higher, than the average rates of return in the remaining months of the year (Borowski, 2018). The first effect, the December effect, is more irregular, than the other calendar effects. As a result, it is sometimes not observed for several years. The time range when this anomaly is noticed often refers to two separate periods. The first is the period from December 6 to December 31. The mainly American media also indicates, that these are the days from December 26 to December 31. What is the cause of the December effect? The reason for its formation is the proximity of Christmas and the optimism related to it, possible prospect of the end of winter. It should be noted, that between the December effect and the January effect, both of which are characterized by emerging bull markets, there should be a period, when investors sell stocks or financial instruments. There are several reasons for this often short sale:

1. End-of-year tax optimization, which causes a large number of investors to cause at least a temporary selling pressure results in drop in share prices.
2. Another reason may be, when investors may wish to pay themselves a portion of their end-of-year profit by selling shares.
3. Remodeling of owned portfolios before the end of the year.

The consequence of the sale in December is the fact, that investors in January are trying to buy back the same shares. This applies in particular to small capitalization companies, which often result in more spectacular increases. The reality shows that some investors, expecting increases in January, may start buying as early as December, counting on the possibility of selling them in the following months of the next year (Efekt grudnia, 2021). This effect was first described by M. Rozeff and W. Kinney. Although the creator of the very name of the concept was S. Wachtel, who was the first to observe significant increases in the value of the Dow-Jones Industrial Average (DJIA) in the first months of the years from 1927 to 1942. The phenomenon of the January effect is, that usually during the first two weeks of January, there are on average higher rates of return on equity investments, than in other periods, although the bull market may also develop in the following months (Malkiel, 2003). There are various reasons why the January effect is occurring. One of them is the aforementioned assumption, that investors are buying shares due to the future possible sale at a more favorable price of the shares, which, however, would not fully explain the increase this month. Tax issues may be different. It consists in the fact, that at the end of the year, for tax reasons, investors get rid of the shares on which they suffered a loss. By revealing the loss, they are able to reduce or eliminate the payment of taxes. In January, they buy back these stocks, triggering increases in share prices. This way of behaving applies primarily to institutional investors, although it is now widely noticed also among individuals. Paradoxically,

the January effect occurred on the Polish capital market at a time, when market operations were not taxed yet. This state of affairs can probably be explained by the actions of foreign investors. Another cause of the January effect may be the windows-dressing effect. It consists in the fact, that managers of investment funds at the end of the year try to sell shares of unpopular companies, with low reputation from industries, that do not meet the principles of corporate social responsibility or simply those, that they do not want to show in their portfolio. The reason is to present investors or potential investors with shares held by the fund at the end of the year. The content of these portfolios may influence the future demand for units of these funds. Of course, in January they will probably try to buy back these stocks at similar prices, triggering a demand impulse to which small stocks are particularly susceptible (Buczek, 2005, p. 52-53).

With regard to the January effect, there is also often talk of a method for predicting future returns in a given year, known as the January Barometer. This phenomenon consists in the fact, that depending on the rate of return, that can be achieved in January, investors predict profits in the remaining months of the year. If the rate of return is positive, then in the remaining months the returns should also be positive and, similarly, if it was negative then the rate of return should be close to zero or negative. This phenomenon is particularly widely described in the English-language literature (Żelazowska, 2018).

2.2. May and September effect

Apart from monthly calendar effects in the form of December and January effects, there are some anomalies related to fluctuations in rates of return in other months. For example the combined effects of the May effect and the September effect are often described. They are characterized by the rates of return on equity investments showing lower returns in May and higher returns in September of a specific year. These frequently occurring trends are related to the holiday cycle and therefore the summer holiday period. These phenomena are directly related to the period when most investors rest, what results an oversupply of shares in May, just before the holiday season. Investors, trying to avoid the risk of losing the value of their shares, due to lack of control, sell their shares during this period and wait, for safer reasons. Usually after the holiday period in September, they buy them back. Demand, that arises, generating an increase in share prices. It is a specific phenomenon of getting rid of shares during a vacation, in order to avoid the stress of having them, or the inability to react quickly to unfavorable events. Probably also investors do not want to focus on their investments at this time. The May and September effect applies to statistically different rates of return in these months, as compared to other periods of the year (Grotowski, 2008).

2.3. Turn-of-the-month effect

In the context of the calendar effects of the month, the turn-of-the-month effect can also be shown. This anomaly is based on the fact, that a significant increase of share prices is noticeable directly in the period preceding the end of the month and immediately after it. The reasons for the occurrence of this phenomenon are seen in the fact, that investors receive wages from professional activity. Especially among individual investors the turn-of-the-month effect causes an increase in the demand side (Zawadzki, Troska, & Domańska, 2017). This anomaly was first identified by Ariel in 1987. The research conducted by him, concerned the stock market in the years 1963-1981. He concerned the rates of return on the last day of a given month and the first three days of the following month. They clearly showed the existence of this dependence. Calculations show, that they are on average eight times higher during this period, than the average daily rates on other days of the month (Grotowski, 2008).

2.4. Friday effect, weekend effect, Monday effect

Apart of calendar effects relating to long periods of time, annual or monthly cycles, there are also effects relating to a short, weekly time perspective. These types of effects can be described by several terms. They are referred to as: "weekday effects", but also associated with the term of the Friday effect and the Monday effect, as those most often identified in the literature. These are effects, that are often observed, mainly in the capital markets. They consist in the fact, that the daily changes in stock prices in Monday and Friday are differ from the rates of return in the other days of the week. Friday's price increases are statistically excessively high, and Monday's are falling stronger than on other days. These are referred to as the "Friday effect" and the "Monday effect". The reality shows, that these price changes cannot be explained by accidental price wandering (Zielonka, 2017, p. 39). Generally, Friday's price changes are believed to be significantly positive and Monday's significantly negative (Grotowski, 2008). Explanation of this phenomenon can be found in hypothesis made by A. Damodaran. He explains these phenomenon by the fact, that companies tend to announce negative information on Fridays after the end of the session. He also draws attention to the issues of emotions, often negative, accumulating in the periods of Saturday and Sunday. This obviously reinforce this effect and falling prices on Mondays ((Buczek, 2005, p. 53). Sometimes it is also mentioned, that it actually does not have the effect of higher rates of return on Fridays and lower rates on Mondays. It is found that there are only lower rates of return on Mondays which contrasts with the Fridays' changes (GPWInfoStrefa, 2020). Apart from the stock market,

the effect of the days of the week was also found on the currency, derivatives and some other markets (Grotowski, 2008).

2.5. The effect of the days of the week

Some researchers also note the effects of different days of the week, phenomenons with reference to different rates of return. However, they are not as stable or important as the previously described Friday and Monday effects, but they create a calendar effect known as "weekday effects". Despite the disputable size of changes in rates of return on individual days, it can be agreed, that Thursdays and Fridays are characterized by higher rates of return, and lower rates in Mondays and Tuesdays. The reasons for appearance of day of the week effects can be broadly associated with the activities of the companies themselves, the moment of publication of financial results, but also the information asymmetry between large and small investors. The macroeconomic pieces of information presented are also provided at certain specific points in time. It may also result in different interpretations of information by investors at different points in time (Marrett, 2008).

2.6. Holiday effect

Another anomaly is the phenomenon known as the "holiday effect". It is manifested by high positive rates of return recorded in the period preceding the days during which trading sessions do not take place due to e.g. holidays or days commonly used by investors as holidays (e.g. the last day of the year). This effect is similar to the described Friday and Monday effects. At the same time, during the sessions following such days, after the holiday season, the prices of financial instruments fall. Research on the American market has clearly shown this tendency. In the days preceding the holidays, the rates of return are twenty-three times higher, than the average rates of return that the shares recorded on other days in the years 1897 to 1985.

2.7. Presidential cycle

Some anomalies relate to certain cyclical events, that occur every few years. An example is the situation relating to the term of office of the US president, which causes a characteristic cyclicality of changes in rates of return, referred to as the presidential cycle. It creates the following anomaly affecting the amount of rates of return in consecutive annual periods. Observing the changes in share prices on the American stock exchanges, it was noticed, that in different years

of the president's tenure, different changes in the rates of return of share prices can be distinguished. The first period characterized by excessively positive rates is the period immediately preceding the presidential election, the period of the presidential campaign (Przasnyski, 2000). After the elections, the first year is by far the weakest for investors. However, when it comes to rates of return, the best is the third year of the presidency, which is commonly associated with activities aimed at possible re-election for another term (or possibly of a candidate from his own party). Following this year is an election year. This year is usually characterized by an improvement of the economy during this period (Hońdo, 2018). There is no need to convince anyone, that the office of the president of the United States is important for the global economy (Paluch, 2019). Considering the markets from the macroeconomic point of view, the very phenomenon of the existence of economic cycles causing calendar effects on capital markets should not be surprising.

2.8. Difficult dates effect

Different cultures have different views on certain specific dates or days on the calendar find them as unlucky. In Europe, Friday, the 13th of the month, is commonly accepted as a date when adverse situations may occur. Can this date be significant for the level of return on stock market investments? The literature talks about a calendar anomaly for the stock market regarding the date of the 13th of the month on Friday. In the former Spanish colonial countries, an unlucky day is considered every Tuesday on the 13th of the month. For Far East countries, the 4th day of the month is unlucky, as is the number 4 itself unlucky. So to sum up, the days: the 13th of each month, the 13th Friday of each month, the 13th Tuesday of each month, and the 4th day of each month. depending on the region in the world, there may be times when the calendar effect known as "unlucky days effect" is in power. The first research on this subject conducted by R. Kolb and R. Rodriguez showed, that the rates of return on Friday 13 are definitely lower, than the average for the other Fridays (in which, by the way, there should exist a Friday-Monday effect). Subsequent studies, made for example E. Dyl and D. Maberly, showed a completely opposite tendency, where the rates of return on that day were much higher, than in the other Fridays. This could possibly be related to the Friday effect. For the Far East markets, D. Hirschleifer, M. Jian and H. Zhang showed that primary-listed companies, that had lucky numbers such as 8 in their tickers had higher rates of return, than those that had numbers associated with disaster (Borowski, 2017). The effect of unlucky numbers is therefore an anomaly, that has significant implications for changes in returns on stock exchanges around the world.

2.9. Mark Twain effect

This calendar effect is named after Mark Twain's novel Pudd'nhead Wilson. From it comes the quote "October is a particularly dangerous month to speculate on the stock market. Other such months are July, January, September, April, November, May, March, June, December, August and February." This ironic sentence suggests a strategy of either not owning stocks in October or investing short (Efekt października, 2021; Lerski, 2009). Although statistically October is not the month when the lowest rates of returns are recorded. September is such a month (it has the most downturn sessions), but common opinion focuses its attention on October. October is perceived as the weakest month for investments also because of the reputation caused by the biggest crashes in the history of stock exchanges, mainly in the US capital markets. It concerns in particular such events as:

– October of 19th, 1987 (black Monday) – the DJIA dropped by 22%, the share prices of the Hong Kong stock exchange by 48.5%, in Australia by 41.8%, in the United Kingdom by 26.4%.

– October of 24, 1929 – This and the following days resulting in a fall in share prices on the NYSE begin the Great Depression in the global economy.

October also influences the mental condition of investors. End of summer – the approaching autumn, less and less light may cause pessimistic inclinations. Negative changes in share prices may be strengthened by worse economic conditions this month. The very existence of an effect can be debatable. In fact, the numbers do not support the October effect (Mark Twain effect). Great economic crises, such as the collapse of the Lehman Brothers bank, took place in September. The calendar perspective is also different. While the largest American stock exchange in the world focuses primarily on events in its history, other exchanges, including those from the Far East countries, have a different perspective, seeing primarily events in their own region (Hayes, 2021).

2.10. Moon phases effect

In the context of the considerations on the calendar effect, one cannot fail to mention the effectiveness of investing in shares depending on the exotic phenomenon of the phases of the moon. Although the topic seems quite irrational, research is being done in this area. The basis of the considerations is the work "Lunar cycle effects in stock returns" by I. Dichev and T. Janes from the University of Michigan. The article presents the results of research on the influence of the moon phases on investments in capital markets. They showed, that the full moon affects the level of returns in the capital markets. The difference

in the rates of return is noticeable in both cases. It turned out, that the rates of return were definitely, as much as 2 times higher during the new moon, than during the full moon (Dichev & Janes, 2003). The example of the dependence of investments on the phases of the moon shows, that the dependence of prices on abstract, unrelated to the financial market can have significant dependence.

2.11. Hour in day effect

The kind of calendar effect can be seen in an even shorter period of time. An example of this is the hour in day effect. Research on the American market confirms, that during the session itself, moments can be distinguished, that are characterized by higher and lower rates of return. This effect also helps to achieve above-average profits. Research shows that the first 45 minutes of the session is statistically characterized by a downward trend. Interestingly, this phenomenon is characteristic only for Monday sessions. On the other days of the week, the beginning of the session statistically brings price increases. Calendar effect trends can also be referred to the end of the session. There is a tendency, that the last 15 minutes of the session is characterized by higher rates of return (GPWInfoStrefa, 2020).

3. Conclusion

The nature of these calendar effects indicates, that they do not function independently and overlap with each other. It seems that both temporal and geographical contexts can be found in this matter. Calendar effects in leading markets may affect smaller markets, shifting the direction of price movements over time. In certain periods of opening of stock exchanges in large asian markets, it directly influences european and later american markets. Friday's increases in Tokyo may translate into increases in London, and then in New York. The calendar effects seem to combine also on a smaller scale, the Monday effect co-exists with the hour effect on a given day, resulting in drops at the beginning of the Monday session. In addition to the coexisting effects, it is also impossible not to notice that some calendar effects seem to contradict their indications, such as increases in share prices shown by the September effect, although statistically this is the month with the largest annual declines in share prices. It seems, that the reality of the stock market requires further research in order to search for new or confirm existing calendar effects.

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Rozszerzony wachlarz anomalii kalendarzowych w ujęciu hipotezy rynku efektywnego

Streszczenie. *Teoria rynku efektywnego jest powszechnie testowana w ujęciu przede wszystkim rynków kapitałowych, ale może się odnosić również do rynków walutowych czy surowcowych. Mimo potwierdzania różnego poziomu ich efektywności, nie można nie zauważać cyklicznie pojawiających się na nich anomalii. Wśród całego ich wachlarza należy zwrócić uwagę na anomalie kalendarzowe z powodu możliwości ich zastosowania do tworzenia metod i procedur inwestycyjnych. Oprócz powszechnie znanych anomalii, takich jak: efekt stycznia, grudnia czy o krótszym zasięgu czasowym – efekt piątku i poniedziałku, wyróżnić można także wiele powszechnie nieznanych w Polsce. Mowa o zupełnie egzotycznych, związanych np. z cyklem urzędowania prezydenta USA, czy też zupełnie krótkich, dotyczących poszczególnych godzin inwestowania na sesji giełdowej. Celem artykułu jest zbiorcze przedstawienie możliwie kompletnego wachlarza anomalii kalendarzowych, w tym ujęcia pewnych, powszechnie nieznanych, związanych z bardzo krótkim okresem, jak i egzotycznych (np. powiązanych z fazami księżyca), dość powszechnie identyfikowanych na zagranicznych rynkach kapitałowych.*

Słowa kluczowe: *anomalie kalendarzowe, hipoteza rynków efektywnych, anomalie rynkowe, finanse behawioralne*

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The impact of the shadow sector of transport services on the economic development of Ukraine's regions

Abstract*. The article analyses aspects of illegal operations in the Ukrainian market of transport services associated with the main types of transport and their relationship with other areas of unreported economic activity. The extent of the shadow sector in the market of transport services in the regions of Ukraine in 2013-2019 was estimated by calculating the shadow economy coefficient for economic activities classified as "Transport, warehousing, postal and courier activities" using the so-called "method of unprofitable enterprises". The correlation between the coefficient of the shadow economy in the market of transport services and the main indicators of economic development is estimated using regression analysis involving panel data for different regions of Ukraine in the period of 2013-2019. In order to improve the method of assessing the extent of the shadow economy in the transport services sector, a method is proposed which takes into account differences between volume of services provided and consumed.*

Keywords*: region (oblast), transport services, unprofitable enterprises, shadow economy coefficient, regression analysis, economic development*

1. Introduction

The deepening economic crisis in Ukraine, due to prolonged hostilities in the east of the country and restrictive quarantine measures to counter the spread of the COVID-19 pandemic, is accompanied by an increase in the level of the shadow economy. According to the Ministry of Economy of Ukraine, the overall level of the shadow economy for 9 months of 2020 increased to 31% compared

to the same period in 2019 (28%), with the largest growth occurred in transport services, warehousing, postal and courier activities – from 32% to 54% respectively (Ministerstvo ekonomiky Ukrayiny, 2020).

One of the main reasons for the significant growth of the shadow sector of transport services is the imperfection of institutions and mechanisms for implementing legislation, the inconsistency of the real administrative and legal conditions of enterprises with the rules defined in the legislation under the ineffective system of justice. Therefore, entrepreneurs try to minimize their losses by using various illegal schemes, which in turn lead to an increase in the level of the shadow economy in various areas of economic activity. The destructive impact of the shadow economy on the country's economy, caused by the deformation of market mechanisms and reduced effectiveness of state regulatory instruments, is manifested by low competitiveness of enterprises, high level of corruption, and lack of funds for socio-economic programs.

The purpose of the article is to assess the level of shadowing of the market of transport services at the regional level and its impact on the economic development of the regions. According to the purpose the following tasks are defined: identification of factors of shadowing and the characteristics of illegal operations in the market of transport services; calculation of the coefficients of the shadow economy for foreign trade "Transport, warehousing, postal and courier activities" by regions of Ukraine and analysis of their dynamics in 2013-2019; determination of correlation between indicators of economic development of regions and indicators characterizing the market of transport services, in particular the level of its shadowing.

2. Research methods

The study of the impact of the shadow economy of the transport services market on the economic development of regions consists of two parts. The first part provides for determining the size of the shadow economy of the transport services market in Ukraine's regions, the second – includes an assessment of the impact of the shadow economy of the transport services market on the economic development of the regions.

Assessment of the level of the shadow economy of the transport services market is carried out according to the methodology developed by the Ministry of Economy of Ukraine. The specificity of transport services limits the application of most of the methods recommended by the Ministry of Economy of Ukraine for the macro level to assess the scale of the shadow economy in this area ("population expenditure – retail" method, "financial" method, "monetary"

method and "electric" method). Taking into account the available statistical data at the regional level, it is possible to apply in practice only the method of "unprofitable enterprises" to assess the scale of the shadow economy of the transport services market. This method, as recommended, is applied under the following assumptions: (1) according to official statistics, all unprofitable enterprises are in fact profitable; (2) the profitability of unprofitable enterprises is equal to that of profitable enterprises in the analyzed period (Nakaz Ministerstva ekonomiky Ukrayiny 2009).

The main statistical offices in the regions conduct statistical surveys for the type of economic activity "Transport, warehousing, postal and courier activities". Statistical data for transport services are not extracted by the State Statistics Service of Ukraine. Therefore, the calculation of the level of the shadow economy is possible according to official statistics only for the type of economic activity "Transport, warehousing, postal and courier activity" (hereinafter – transport services).

Using the method of unprofitable enterprises, we will calculate the shadow economy coefficient of the transport services market according to the formula (1):

$$K_{SE} = \frac{P_{PE} \times R_{U/P} + U_{UE}}{GVA} \times 100\%, \quad (1)$$

where:

P_{PE} – annual profit of profitable enterprises, million UAH;

$R_{U/P}$ – ratio of the number of unprofitable enterprises to the number of profitable enterprises;

U_{UE} – annual losses of unprofitable enterprises, million UAH;

GVA – gross value added of transport services, million UAH.

The study of the impact of the shadow economy of the transport services market on economic development indicators is carried out using the linear regression method for panel data by regions of Ukraine based on annual data for 2013-2019, because statistical data for 2020 is not available yet.

As a dependent variable we use indicators of economic development of regions: gross regional product per capita (GRP per capita); growth rate of gross regional product (GRP growth rates); per capita income (Income per capita); consumer price index (Consumer price index); share of unprofitable enterprises in the total number of enterprises in the region (Unprofitable enterprises); the share of small enterprises in the total number of enterprises in the region (Small business).

Independent variables described by the indicators of transport services activity: shadow economy coefficient (Shadow sector); share of profitable enterprises in the total number of enterprises (Profitable enterprises); share of transport ser-

vices in gross value added in the region (Share services GVA); share of transport services in the total output of the region (Share services in total output); ratio of investment costs to the gross value added of transport services (Capital invest / GVA trans serv).

3. Characteristics of illegal activities on the transport services market

Illegal operations in transport services have different specifics depending on the type of transport. Therefore, each type of transport services contributes to the overall amount of gray revenue and losses for the state budget at the same time. In this respect, an important factor of the shadow economy is the structure of transport services by type of transport and its dynamics. That's why, it's necessary to pay attention to the significant share of road transport in the total volume of freight and passenger transport.

According to the State Statistical Service of Ukraine, 1 232.4 million tonnes were transported by road in 2020, which accounted for 75.1% of the total cargo transport, and by rail – only 18.6% of the total cargo [*Obsiah perevezenykh vantazhiv…*, 2021]. The overall volume of passenger traffic is also dominated by road transport, whose share in 2020 amounted 42.2% (in 2013 – 51%), which significantly exceeds the share of trolleybuses (22.5%), trams (16.4%) and metro (16%). The share of rail transport in passenger traffic decreased from 6% in 2013 to 2.7% in 2020 (*Kilkist perevezenykh pasazhyriv…*, 2021).

The dominance of freight and passenger transport by road and the largest number of enterprises operating in this area result in the existence of the largest shadow economy in this segment of the transport services market. Analyzing the variety and specificity of offenses that are typical for transport companies, we come to the conclusion that in the field of road transport there are the most flexible illegal profit maximization schemes compared to rail or sea transport.

The main shadow operations in passenger and freight transport by road include: (1) the work of carriers without state registration, without license permits or without passing tender procedures; (2) the use of the labor of employees without their official employment; (3) payment of wages "in envelopes" without withholding and transfer to the budget of personal income tax; (4) the unaccounted number of passengers carried in city (suburban) buses as a source of "shadow" cash flow.

The shadow sector in road transport is created mainly by carriers that operate without state registration, without a permit to practice as a road transport operator, or who have obtained the right to operate a public transport route without

a tender procedure. According to experts, the number of buses used to transport people without appropriate permits may reach over 160,000 (Ruban & Ruban, 2016), which is one third of officially operating bus operators. In Kiev region, one officially operated bus on suburban lines was covered by two illegal ones, which reduces the income of legal carriers and makes the business unprofitable (Koliubakin, 2018).

The source of the hidden income from road transport is unsettled cash, which results from the demotivation of drivers and vehicle owners to account for the number of passengers and tickets sold. In addition, illegal transactions in transport services are carried out with the support of officials of relevant government institutions, which results in an increase in corruption and illegal income of officials.

Another characteristic feature of the freight transport market is the provision of services not settled for cash (in particular, in the cereal transport market their share is over one third (Tkachov, 2019)). Relationship of the freight market with the shadow fuel market allows carriers operating illegally to use cheap fuel and provide services at lower prices, making the activities of legal carriers uncompetitive.

Violations by cargo carriers of the size and weight restrictions on the roads during the transport of rubble make it possible to increase the profitability of transport. At the same time, some employees of "Ukrtransbezpeka" (Ukrainian Transport Security) receive bribes for not imposing a fine for violation. The activity of this controlling institution also creates the conditions for the emergence of a gray market in international permits for the carriage of goods by road, which, according to experts, amounts to around EUR 10 million (Shulmeister & Pylypchuk, 2018).

These offenses are committed with the assistance of individual employees of authorities or institutions that regulate and control the activities of carriers, and therefore they are closely linked to the illegal benefit of persons responsible for: conducting tenders and issuing permits for the right to serve certain passenger routes; implementation of dimensional and weight control on highways; issuance of permits for the carriage of goods by road abroad. Also, some carriers can be involved in smuggling, participate in the shadow fuel market, document transport operations without providing services (fictitious business).

The market of rail transport services is monopolized, that eliminates the activity of entrepreneurs without a license and registration, as well as illegal employment. However, monopolization creates favorable conditions for the corruption of officials and illegal income of employees of Ukrzaliznytsia (Ukrainian Railways). The scale of the fraud is evidenced by the results of inspections of JSC "Ukrzaliznytsia" and its branches (for the period from January 2018 to September 2019) by the State Audit Office of Ukraine. The company's operations revealed violations of 11.8 billion UAH, of which: revenue of 210.1 million UAH was not

obtained (lowered tariffs, rents, missed fines); revaluation of the cost of works, services received and goods purchased – 184.6 million UAH; violations of public procurement in the amount of 8.9 billion UAH (*Derzhaudytsluzhba*…, 2020).

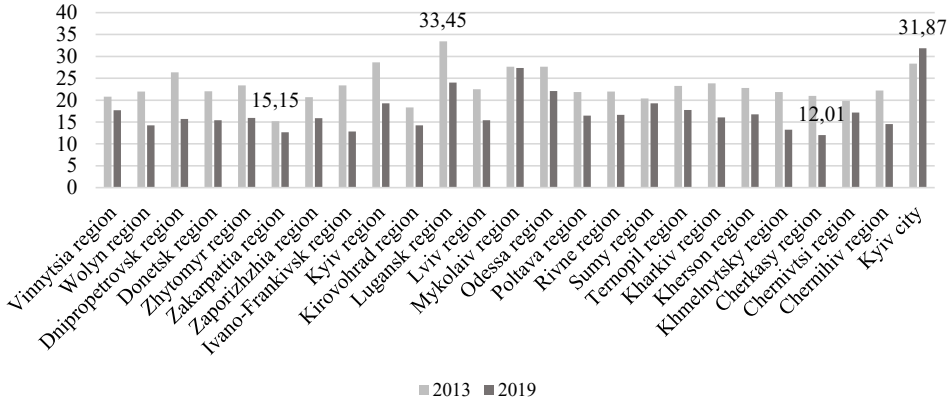
Ukrzaliznytsia's monopoly position in the rail freight market, along with the absolute inflexibility of management decisions to update rolling stock and optimize passenger routes, which leads to a decrease in passenger traffic (from 427.2 million people in 2010 to 68.3 million people in 2020 (*Kilkist perevezenykh pasazhyriv*, 2021)) became the main factors that determined the shadow operations in the segment of rail freight: (1) illegal benefit of management for the issuance of permits for the most profitable transit routes of freight at reduced rates, (2) non-transparent tender procedures, (3) illegal management staff for providing unscheduled cars, more containers, for hiding excessive downtime of cars and not collecting fines, (4) purchase of goods by structural units of "Ukrzaliznytsia" at inflated prices. In addition, rail transportation can ensure the implementation of smuggling schemes (roundwood, firewood, lumber) and the shadow circulation of timber, fuel, etc.

The consequence of the implementation of the above schemes is the formation of a significant part of the shadow economy on the transport services market, the size of which is difficult to estimate due to the hidden nature of most offenses and crimes. The negative impact of the shadow economy of the transport services market on the economic development of regions results from a number of threats arising from illegal activities of carriers: not paying taxes to state institutions, limited possibilities of budget financing of development programs, an increase in the level of corruption, deformation of competitive relations on the market due to the higher profitability of illegal enterprises. Therefore, it can be assumed that increasing the level of the shadow economy has a significant impact on the economic indicators of regional development.

4. Influence of the shadow economy of the transport services market on the economic development of regions

The results of calculating the shadow economy coefficient of the transport services market using the method of "unprofitable enterprises" according to the formula (1) showed a decrease in the level of the shadow economy in most regions of Ukraine in 2019 compared to 2013 (Fig. 1). The exception was the city of Kyiv, where the shadow economy index increased to 31.87 due to a significant increase in corporate losses: in 2013, profits exceeded losses by 1.1 times, and in 2019 losses exceeded profits by 1.3 times, and compared to 2013 – increased by 10.2 times.

Fig. 1. The dynamics of the shadow economy of the transport services market in the Ukraine's regions in 2013 and 2019



Source: calculated according to the data: Rehiony Ukrayiny (2016, 2019); Valovyi rehionalnyi produkt u 2017 r. (2019); Valovyi rehionalnyi produkt u 2019 r. (2020)

The lowest scale of the shadow economy of transport services is in the Cherkassy region (12.01%). In 2019, the ratio of unprofitable to profitable enterprises was 0.3 (0.5 in 2013), and the ratio of losses to profits of enterprises decreased almost seven times (from 2.7 in 2013 to 0.35 in 2019). Moreover, in the Cherkassy region, gross value added increased 2.6 times during the period under investigation.

Summing up, we note that according to the results obtained, the average shadow economy coefficient of the transport services market in 2019 in Ukraine amounted 17.4% of the gross value added generated in this sector (46.1 billion UAH), i.e. it was lower by 5.8 points percentage (pp) compared to 2013 (23.2%) and by 2.3 pp lower than in the previous year. In the analyzed period, most regions and the country's average had a decline in the shadow economy of the transport services market.

The quantitative assessment of the impact of the shadow economy on individual indicators of economic development was made on the basis of panel data regression analysis by regions of Ukraine in 2013-2019 using the computer software Statistica 7.0.

According to the results of the assessment, the value of the correlation coefficient ($R = 0.63$) confirms a sufficient relationship between income per capita and the shadow economy coefficient of income per capita to the change in shadow sector and the share of profitable enterprises in the total number of transport enterprises (Table 1). The ratio of capital expenditure to gross value added of transport services (capital invest / GVA trans serv) in the research period had

Table 1. The results of the assessment of the impact of transport services on the economic development of Ukraine's regions

Factor features	Dependent variable			
	Income per capita	Consumer price index	Small business	Unprofitable enterprises
Number of observations	175	175	175	175
Intercept	7.740*** (0.606)	0.904*** (0.191)	1.902*** (0.018)	4.584*** (0.147)
Shadow sector	–0.165** (0.076)	0.168*** (0.024)	0.005** (0.002)	–
Profitable enterprises	–2.413*** (0.298)	0.517*** (0.094)	0.032*** (0.009)	–1.698*** (0.078)
Share services GVA	–	–	–0.015** (0.007)	–0.163** (0.079)
Share services in total output	–	–	0.021*** (0.007)	0.159** (0.074)
Capital invest / GVA trans serv	0.233*** (0.036)	–0.028** (0.011)	0.003*** (0.001)	–
R	0.632	0.489	0.485	0.857
R^2	0.399	0.239	0.234	0.735

* – statistical error rate (p-level) ≤ 10%;
** – statistical error rate (p-level) ≤ 5%;
*** – statistical error rate (p-level) ≤ 1%.

Source: calculated according to the data: Rehiony Ukrayiny (2016, 2019); Valovyi rehionalnyi produkt u 2017 r. (2019); Valovyi rehionalnyi produkt u 2019 r. (2020).

a positive impact on the dependent variable. There is a weak direct relationship (R = 0.49) between the consumer price index and the shadow sector and the share of profitable enterprises in the total number of transport service enterprises.

The results obtained are characterized by such negative manifestations of the shadow market as an increase in unsettled cash flowing into the legal sector and an increase in transport costs due to the underestimation of the profitability of services. The direct impact of increasing the share of profitable enterprises on the consumer price index confirms the share of profitable enterprises in creating a gray market for transport services due to undeclared full income.

According to our calculations, a weak correlation was found (R = 0.48) between the share of small enterprises in the total number of enterprises in the region and the indicators characterizing the transport services market. As can be seen from Table 1, increasing the shadow economy ratio by 1% leads to an

increase in the share of small enterprises by 0.005% with the remaining conditions being equal, because the existing imperfect institutional mechanisms make this segment of the transport services market attractive for small enterprises (for example, minibuses that mainly operate as small enterprises). The 10% increase in the share of profitable enterprises in the total number of enterprises providing transport services contributes to the increase in the share of small enterprises in the region by 0.32%, which also confirms the attractiveness of this activity for entrepreneurs working legally.

The regression model showed a strong negative dependence ($R = 0.86$) of the share of unprofitable enterprises in the total number of enterprises in the region on the share of profitable enterprises in the total number of transport service enterprises and on the share of transport services in the total gross value added in the region. The estimation results confirmed the direct impact of the share of transport services in the region's total output on the share of unprofitable enterprises in the total number of enterprises in the region.

The increase in the share of profitable enterprises in the total number of transport service enterprises contributes to the reduction of the share of unprofitable enterprises in the total number of enterprises in the region. Increasing the share of transport services in the total gross value added in the region also reduces the share of unprofitable enterprises in the total number of enterprises in the region. These estimation results indirectly confirm the impact of the shadow economy of transport services on the economic development of regions by changing the profitability of economic entities. At the same time, it is worth noting that the increase in the share of transport services in the region's total output increases the share of unprofitable enterprises in the total number of enterprises in the region, which indicates that some of the income of enterprises providing transport services is hidden.

According to the obtained panel data regression results, the impact of the shadow economy coefficient of transport services on changes in gross regional product per capita ($R^2 = 0.19$), as well as on the growth rate of gross regional product ($R^2 = 0.17$), in 2013-2019 is not statistically significant.

The weak impact of the shadow economy of transport services on the basic indicators of the economic development of Ukrainian regions can be explained first by the small scale of the shadow economy of the transport services market in relation to the gross regional product (according to our calculations, 2.1% or 98 billion UAH in total in Ukraine), which is mainly generated by unsettled cash, and income from unlicensed activities of enterprises. For comparison, the annual amount of funds withdrawn from the Ukrainian economy to "tax havens" is approximately 320 billion UAH, and through "shadow imports" or smuggling – up to UAH 230 billion (Bukatiuk, 2017). Another reason for recovering such results is the hidden schemes of generating illegal income and the impossibility

of accurately scaling the scale of the strife to run the transport services with the help of the existing method.

5. Directions for further research

Based on the study results, we conclude that when applying the loss method, the results of assessing the level of the shadow economy of the market of transport services directly depend on the amount of declared losses of enterprises. In this case, the results obtained are to some extent distorted by the assumptions used in this method. In particular, it is quite possible that there is a real lack of profit in some unprofitable enterprises, which we considered to be conditionally unprofitable – those that receive a profit, but do not indicate it in the financial statements.

Under the conditions of quarantine restrictions on the operation of transport service enterprises, introduced to prevent the spread of the COVID-19 pandemic, there was an increase in losses and the number of unprofitable enterprises. Accordingly, under quarantine conditions, the losses of transport companies can no longer be considered as a direct sign of the existence of the shadow sector, as the losses are mainly due to objective factors resulting from changes in the global environment. Therefore, it is necessary to apply a different approach, which will assess the level of shadowing of transport services, based on the real situation in this field.

In terms of a systems approach, the transport industry is an entry-exit system. At the entrance resources are consumed (working time, fuel), and at the exit we receive the volume of services provided (cost of services, gross value added). Based on this approach, it is advisable to compare the intensity of fuel consumption by transport companies with the growth rate of services provided by them. Higher rates of increase in fuel use compared to the rate of growth of services provided indicate the presence of a shadow component in the activities of transport enterprises.

According to the method of "differences", the total cost of providing services consists of the cost of official and covert activities (Fleychuk, 2008, p. 225). If the value of illegal services is Q_{il}, and the amount of illegal profits is P_{il}, the total amount of services provided, taking into account the hidden activities is defined as:

$$O_{sum} = Q + Q_{il} = (C + P) + P_{il}, \tag{2}$$

where:

Q and P – indicate the volume of legal services and profits,

C – the total amount of costs in the process of providing services.

Accordingly, the volume of illegal services is calculated as:

$$O_{il} = (C + P) + P_{il} - Q. \quad (3)$$

To determine the consumed services based on the assessment of the cost of services provided for the reporting period, taking into account the shadow component, we can use the equation:

$$Q_{sum1} = Q_0 \times I_q \times I_p \times I_f, \quad (4)$$

where:

Q_0 – the cost of services provided for the base period,
I_q – the index of the physical volume of services provided,
I_p – the index of prices for services,
I_f – the index of fuel consumption by enterprises providing services.

A comparison of the volume of services provided and consumed allows us to determine the volume of illegal services as the difference between Q_{sum} and Q_{sum1}, and the share of this difference from the total volume of services provided – accordingly determines the level of shadowing of the transport services market.

Thus, in a crisis situation due to the introduction of quarantine restrictions in the field of transport services, the assessment of the level of shadowing of this type of economic activity based on the method of "unprofitable enterprises" does not allow to obtain correct results, as most enterprises have real losses. and not through concealment of profits. Therefore, it is advisable to apply the method of "differences" taking into account not only the indices of the volume of services provided and prices for services, but also the index of fuel consumed, which will more accurately assess the difference between the volume of services provided and consumed.

6. Conclusions

According to the results of the assessment of the level of shadowing of the transport services market in Ukraine's regions in 2019, the average value of the shadow economy ratio was 17.4%, and in some regions exceeded 20% of gross value added created in this type of economic activity. Despite the high values of the shadow economy, the impact of the illegal sector of the transport services market on the economic development of the regions was not significant. The results of regression analysis of panel data by regions of Ukraine in 2013-2019 revealed a sufficient inverse relationship between the coefficient of the shadow economy of the transport services market and income per capita: with an increase in the shadow economy by 10% income per capita decreases by 1.65%. At the same time, there is a weak direct relationship between the consumer price index

and the shadow economy of the transport services market, as well as a slight direct dependence of the share of small enterprises in the total number of enterprises in the region on the level of shadow services.

On the one hand, we can consider the relatively low influence of the shadow economy coefficient on the dependent variables as a positive result of regression modeling. This indicates a low level of threats to the shadow economy in the market of transport services for the economic development of the regions of Ukraine. On the other hand, the results of the study are negative, as the hypothesis of a significant impact of the shadow economy on the economic development of the regions has not been confirmed due to imperfect methodology and inaccuracy in estimating the shadow economy ratio, as well as significant latency of shadow operations. We see a partial elimination of this shortcoming in the application of the method of "differences" to assess the level of the shadow component of the transport services market, which will allow a more accurate assessment of the difference between the volume of services provided and consumed.

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Wpływ szarej strefy usług transportowych na rozwój gospodarczy obwodów Ukrainy

***Streszczenie**. Artykuł przedstawia analizę specyfiki nielegalnej działalności na rynku usług transportowych Ukrainy według głównych rodzajów transportu, a także ich relacje z innymi obszarami szarej strefy gospodarki. Dokonano oceny poziomu szarej strefy w sektorze usług transportowych w poszczególnych obwodach Ukrainy w latach 2013-2019 przez obliczanie współczynnika szarej strefy dla rodzaju działalności gospodarczej „Transport, magazynowanie, działalność pocztowo-kurierska" według metody „nierentownych przedsiębiorstw". W wyniku przeprowadzonej analizy regresji dla danych panelowych oszacowano korelację między współczynnikiem szarej strefy rynku usług transportowych a głównymi wskaźnikami rozwoju gospodarczego obwodów Ukrainy w latach 2013-2019. W celu doskonalenia metodyki oceny poziomu szarej strefy rynku usług transportowych zaproponowano metodę uwzględniającą różnice pomiędzy wielkością świadczonych i konsumowanych usług.*

***Słowa kluczowe**: obwód, usługi transportowe, przedsiębiorstwa nierentowne, współczynnik szarej strefy, analiza regresji, rozwój gospodarczy*

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Social entrepreneurship as a tool for supporting the socio-economic development of Ukrainian cities[1]

Abstract. *The article describes the development of social entrepreneurship in Ukraine. The author identifies a range of obstacles to social entrepreneurship in Ukraine, which correlate with European trends. She argues that the problems caused by the military conflict and the socio-economic instability have in fact stimulated the development of social entrepreneurship which has been able to react to the situation faster than public institutions. Economic sectors are identified that are the most attractive for social entrepreneurs. It is argued that the development policy for social entrepreneurship is at its still initial stage, which is evidenced by the lack of legal and strategic documents at the national and regional levels which would define conceptual foundations, priorities, and strategic directions for the development of social entrepreneurship. At the local level, only several municipalities have adopted development programs for this type of activity because they understand its importance for local economic development. The study shows that social entrepreneurship is becoming an efficient tool for implementing local policies of economic development for Ukrainian cities, but it requires a range of initiatives, including mentor guidance, institutional and financial support, and better access to sales markets, etc.*

Keywords: *social entrepreneurship, tool, development, policy*

1. Introduction

Social entrepreneurship is a common type of entrepreneurial activity that allows the efficient combination of economic activity and solution of urgent

[1] The study is carried out in the framework of the research "Globalization factors and risks of endogenous development of Ukrainian regions". Public registration number 0119U002011/.

social problems in a community. Social business has become a global trend, for example, there were 471,000 social enterprises in Great Britain in 2019 with about 1.44 million employed, and their share in the GDP amounted to 3% (*Keis stadi…*, 2020). In France, social entrepreneurship covers over 96,000 companies and over 1.1 million employees (ESELA, 2015). In the USA, there are about 100,000 social enterprises, which employ 2.5 million people, the government boosts the development of social entrepreneurship, and the universities develop educational and research programs in this domain (Defourny & Nyssens, 2010). Canada, Australia, France, Belgium, and Singapore were TOP-5 countries with the most comfortable social business environment in 2019 (Tran, 2019). Overall, about 13.6 million Europeans are engaged in social businesses (European Commission, 2020). The development of social entrepreneurship in Ukraine started in the 2000s supported by international donor organizations, in particular, the United States Agency for International Development (USAID) implemented the project "Ukraine Citizen Action Network" in 2004 and granted financial assistance to 28 social enterprises, some of which are still in operation (Kornetskyi, 2019).

Nowadays, the development of social entrepreneurship in Ukraine does not get enough support and hasn't gained widespread acceptance due to a lack of understanding of the nature of this activity type both among authorities and entrepreneurs and the absence of a legal framework for its functioning. Social entrepreneurship can become an efficient tool to boost business activity and solve social problems with the attraction of active community citizens in turbulences of economic development, global epidemic, general instability, and a range of chronic problems in cities.

2. Development of social entrepreneurship in Ukraine: barriers and activity directions

Social entrepreneurship constitutes the business model that stipulates in the basis of its activity the meeting of social needs by solving certain problems rather than profit maximization. Social enterprise mostly chooses its activity direction based on the needs and problems of the community it functions in, which require a solution. In European countries, social entrepreneurship operates in the following main types of economic activity:

– social and economic integration of the disadvantaged and excluded;

– social services of general interest (long term care for the elderly and for people with disabilities; education and child care; employment and training services; social housing; health care and medical services);

– other public services (community transport, maintenance of public spaces, refuse collection, etc.);

– other social and community services (counselling, micro finance, youth outreach, temporary housing for homeless, etc.);

– strengthening democracy, civil rights, and digital participation;

– cultural, tourism, sport, and recreational activities;

– environmental activities (reducing emissions, recycling, renewable energy);

– promoting fair international trade (European Commission, 2015).

Marginalized population groups, people with disabilities, migrants, minority ethnic groups, ex-soldiers, and women from vulnerable groups as well as long-term unemployed population groups are the main groups the social entrepreneurship is intended to attract.

The Social Business Initiative launched by the European Commission in 2011 has boosted the activity of social entrepreneurship in Europe. Moreover, the European Commission provided a unified definition of social enterprises through the combination of three activity dimensions:

– entrepreneurial – engagement in continuous economic activity;

– social – primary and explicit social purpose;

– governance – the existence of mechanisms to 'lock in' the social goals of the organization and consider the needs of various interested parties (*Keis stadi*…, 2020).

The following criteria of belonging to social entrepreneurship were established: income-generating activity; an explicit social aim that benefits society and is the priority of distribution of profits or assets; independence of state or for-profit organizations; inclusive governance – participatory and/ or democratic decision-making processes (ESELA, 2015).

All obstacles faced by European countries, which are outlined in the complex research of the European Commission conducted in 2015 (Huang & Donner, 2018), can be attributed to the barriers and limits that prevent the development of social entrepreneurship in Ukraine. They include:

– poor understanding of the concept of social enterprise – society associates the term 'social enterprise' with the activities of charities or social services and not entrepreneurship;

– lack of specialist business development services like incubators and mentoring schemes;

– lack of supportive legislative frameworks;

– access to markets and finance from typical and additional sources due to complexity of public procurement and lack of investors' and creditors' understanding of the dual missions and hybrid business models of social enterprises;

– absence of common mechanisms for measuring the impact of social entrepreneurship on community development. Methodologies and practices for

measuring or reporting the social impact of social enterprise are very limited in European countries and absent in Ukraine.

Social entrepreneurship is an efficient tool for solving social problems in economically developed countries. In Ukraine, the activity of social enterprises has intensified after 2014. Since the start of the military conflict, the number of vulnerable groups of the population has increased sharply, arising the issues of their social adaptation and employment. Social business responded to these challenges faster than government institutions.

Ukrainian social enterprises can be divided into three groups: income generators for funding of a social objective (support of social, cultural, environmental, sports projects, organizations or institutions for vulnerable population groups); employment of socially vulnerable populations; providing social services and production of socially important goods (Shcho slid znaty pro sotsialne pidpryiemnytstvo, 2017).

As far as the functioning of social entrepreneurship is not legally regulated in Ukraine, the statistical monitoring of quantitative parameters of its development is not carried out. The functioning peculiarities of social business are addressed by several researchers and organizations. According to the results obtained by them, only 150 social enterprises operated in Ukraine in 2017 (Pidsumkovyi zvit, 2017). Meanwhile, the types of activity social businesses are engaged in are quite varied and correspond to global trends (Fig. 1).

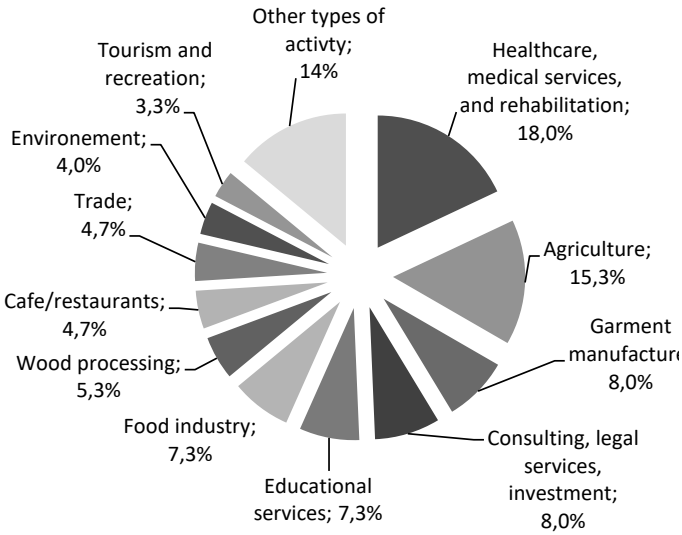

Fig. 1. Distribution of social enterprises by economic activity types in Ukraine (as of 2017)*

Source: developed based on the data (Pidsumkovyi zvit…, 2017).

According to the research (Khodhson, 2018), the activity of social enterprises is concentrated the following way:

– almost 67% of enterprises are operating in services (education, sport, tourism, etc.) because launching a business in these activity types does not require much financial investment;

– 26% of enterprises combine the production and services (psychological assistance in production, production of souvenirs, vocational and technical education, training of vehicle drivers, providing social assistance for the elderly and disabled);

– only 7% of enterprises are involved in production (catering, printing industry, agriculture);

– main focus is on the improvement of the quality of life for representatives of vulnerable population groups (disabled, internally displaces persons, women, youth, etc.), development of local community (almost 60%).

Social entrepreneurship has an essential development capacity because it solves local economic and social problems "upward", attracting the most active community residents and persons often remaining outside economic activity (disabled, displaced persons, migrants, marginalized persons). Moreover, social entrepreneurship has the capacity to develop economic sectors with prospectively high added value (creative sector, ICT, and other types of services) that will promote the transformation of municipal economies, especially nonfunctional, and boost economic activity.

3. Social entrepreneurship in national and local policies

Currently, there are no national policy documents in Ukraine that would comprehensively outline the conceptual foundations, priorities, and strategic directions of social entrepreneurship development as a tool to solve socio-economic problems because social entrepreneurship is only at its initial development stage. Social entrepreneurship policy is determined:

1. *On the national level* – the 2021-2023 State Policy Concept on Social Entrepreneurship Development in Ukraine is being elaborated.

2. *On the regional level* – social entrepreneurship is hardly planned, governing bodies do not use it as a tool for socio-economic development. For example, in 2011, every region in Poland had activities in social economy promotion and support of social enterprises and their ecosystem. In particular, 2007-2013 Lesser Poland Voivodeship Development Strategy defines social entrepreneurship as an important tool for competitiveness improvement in the region (Kokot, Rehelyuk, & Bocharnikova, 2020).

3. *On the local level* – local peculiarities and problems are taken into account along with national and regional priorities. The social entrepreneurship

development policy on the community level can be integrated into its development strategy, outlined in the Small and Medium Entrepreneurship Development Program or/and laid down in local target program for social entrepreneurship development. Nowadays, the territorial communities of Ukraine hardly have any experience of local policy development using social entrepreneurship tools to solve local economic problems. Only local social entrepreneurship development programs of Zaporizhzhya (Prohrama spryiannia rozvytku sotsialnoho pidpryiemnytstva v m. Zaporizhzhi, 2018), Vinnytsya (Vinnyts′ka Mis′ka Rada Rishennya, 2020), and Ivano-Frankivsk (Vykonavchyy komitet Ivano-Frankivs′koyi mis′koyi rady, 2021) can be singled out. Social entrepreneurship development programs of Vinnytsya and Ivano-Frankivsk are comprehensive and integral documents designated to create an ecosystem for SE development in the community. For this purpose, 6 strategic goals are set to be achieved: introduction of institutional support for social entrepreneurship and social innovation; popularization of the culture of social entrepreneurship; management, measurement, and reporting of social impact; development of business skills and support for the development of social business; promotion of free access to markets for social entrepreneurs; creation of financial instruments for the development of social entrepreneurship.

The following measures will contribute to the efficient use of social entrepreneurship tools:

– promotion of social entrepreneurship in society as a tool to solve social and environmental problems;

– SE activity institutionalization;

– development of the regulatory framework for the development of social entrepreneurship;

– ensuring access to consistent funding for social enterprises;

– ensuring access to markets for social enterprises;

– providing business services for the development of social business;

– support of research in the social entrepreneurship sector (Kokot, Rehelyuk, & Bocharnikova, 2020);

– creation and promotion of educational programs by social entrepreneurship specialty. Currently, only three educational institutions in Ukraine train students in this specialty (Ukrainian Catholic University, National University of Kyiv-Mohyla Academy, and Kharkiv National University of Civil Engineering and Architecture) (Kornetskyi, 2019).

Meanwhile, the lack of clear legal criteria to define social entrepreneurship creates uncertainty in approaches to their distinction among other types of business activity. The current Ukrainian legal environment promotes conducting social entrepreneurial activity in the following organizational-legal forms (Kornetskyi, 2019):

Table 1. Examples of social entrepreneurship functioning in the cities of the Western region of Ukraine

City	SE name	Economic activity	Organizational form	Founding date	SE type
Uzhorod	Zoloti sertsya Zakarpattya	Food production, bakery	NGO	2019	Employment for vulnerable groups
Lviv	Horihovyi dim	Food production	Individual entrepreneur	2012	Employment for vulnerable groups, reinvestment of profits
	Maysternya mriyi			2015	Employment for vulnerable groups
	Inclusive IT	Innovations, Internet, and IT		2018	
	Woodluck Social Workshop	Light industry, career guidance and employment	Individual entrepreneur	2016	
	SP Rukomysly		Other	2015	
Ivano-Frankivsk	Dobryk	Light industry, waste processing	Non-profit organization	2020	
	RE: laboratoriya resayklinhu	Ecology, innovations, light industry, education, waste processing	Individual entrepreneur	2018	Reinvestment of profits
	Zdraviya – masazh vid nezryachyh	Rest. Leisure. Other		2018	Employment for vulnerable groups
	Hromadskyi restoran Urban Space 100	Restaurant activity	–	2014	Creation of transparent target fund designated to finance social projects and startups directed at the city development
Ternopil	Kontakt-tsentr Simka	Internet and IT, career guidance and employment	Limited liability company	–	Employment for vulnerable groups
Chernivtsi	Kranchi z lyubovyu	Food production	Individual entrepreneur	2018	Employment for vulnerable groups, reinvestment of profits
	Solodka maysternya "Malenkymy krokamy"	Waste processing. food production		2016	Employment for vulnerable groups, reinvestment of profits
Rivne	Lohopedychnyi tsentr Klyain	Education. Healthcare. Services	Non-profit organization	2016	Provision of specific services, reinvestment of profits

Source: developed by the author based on: Social business IN UA (n.d.).

1. Civil society organizations (non-profit organizations):

– charitable organizations (according to Chapter 4 Article 16 of the Law of Ukraine "On Charity and Charitable Organizations in Ukraine", Chapter 5 Ar-

ticle 131 of Economic Code of Ukraine) (Pro blahodiinu diialnist ta blahodiini orhanizatsii v Ukraini, 2012);

– non-governmental organizations (according to Chapter 2 Point 2 of the Article 21 of the Law of Ukraine "On Non-Governmental Organizations") (Pro hromadski obiednannia, 2012);

– other types of non-profit organizations (religious organizations, etc.);

2. Business entities under private law:

– legal entities (on general taxation system; with 0% rate applied; on a simplified taxation system);

– enterprises and organizations founded by non-governmental organizations of people with disabilities (according to Article 14 of the Law of Ukraine "On Foundations of Social Protection of People with Disabilities in Ukraine") (Pro osnovy sotsialnoi zakhyshchenosti, 1991);

– individual entrepreneurs (on general taxation system; on a simplified taxation system) / individuals conducting independent professional activity;

3. Through concluding agreements on the joint activity of entities of various organizational-legal forms (civil society organizations, entrepreneurial entities, and individuals).

Social restaurant UrbanSpace 100 opened in Ivano-Frankivsk in 2014 is the most famous example of social entrepreneurship (80% of profits are directed at funding the projects related to the development of Ivano-Frankivsk, 111 projects were implemented in 2014-2020, 13 more are being implemented currently). 2021 became the first year when the restaurant didn't announce the opening of the grant season due to lockdown caused by the COVID-2019 pandemic – see Table 1 (Urban Space 100, n.d.).

4. Conclusions

Social entrepreneurship is an efficient tool for socio-economic policy implementation in many countries. Moreover, it is a resource for communities and the state for solving many issues. Current challenges faced by Ukrainian cities generate an additional need to boost the development of social entrepreneurship in Ukraine. Social entrepreneurship remains to be among the most efficient tools of local economic policy in the development of cities because it allows:

– stimulating the development and economic growth of the community by solving local economic and social problems with the involvement of its active residents;

– boosting innovative activity by attracting the unused community resources (human resources, social infrastructure, etc.);

– creating new jobs to involve marginalized groups in public life;

– attracting international technical assistance funds to develop a social economy. namely, the draft 2021-2026 EU Action Plan for the Social Economy provides the increasing role of social economy in EU external actions towards the third countries starting since 2021 (The Future of EU policies for the Social Economy, 2018), an opportunity to get grant assistance and funding for start-ups under the UN development program, International Organization for Migration, Eastern Europe Fund, Monsanto Fund, International Charitable Fund Community Wellbeing („HeiferInternational"), Western NIS EnterpriseFund social investment program, etc. (Kornetskyi, 2019);

– developing and strengthening democratic structures at the territory of the community.

The following remain to be the bottlenecks in social entrepreneurship as a tool to develop cities:

– poor institutional framework, lack of program and strategic vision of the development of social entrepreneurship not only at the level of communities but also at the level of regions and the state in general;

– lack of incentives and tools to support social entrepreneurship at the local level;

– lack of quantity and quality monitoring of social entrepreneurship activity that complicates the research of the subject.

Boosting the development of social entrepreneurship requires the public policy of social entrepreneurship support. The experience of the countries with developed social entrepreneurship shows that the following tools on national and local levels can be efficient:

– specialized support in the form of business consulting and guidance that includes various aspects of social enterprises' activity;

– activities directed at facilitating access to goods and services sales markets, namely public sector markets (by generating demand for services of social enterprises, for example, by adopting specific provisions in public procurement);

– activities directed at support of access to funding by creating specialized financial tools and social investment markets in general. Social enterprises founded based on civil society organizations attract mostly grant funding from international organizations, yet such opportunities are limited. The only lending program oriented on social business is the social investment program WNISEF (Prohrama sotsialnoho investuvannia, n.d.) implemented together with Oshchadbank and Credo Bank. But the requirements to receive it (functioning on the market for at least one year, providing all financial and non-financial documents confirming successful work) restrict the program accessibility for social start-up entrepreneurs;

– introduction of standardized systems for measuring and reporting on social impact;

– improvement of information framework by creating the information basis in the regions regarding the current legislation in Ukraine and information and analytical materials regarding the development of social entrepreneurship;

– support of social projects by local authorities and establishment of efficient cooperation between local authorities and social enterprises.

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Przedsiębiorczość społeczna jako narzędzie wspierania rozwoju społeczno-gospodarczego miast Ukrainy

Streszczenie. *Artykuł opisuje rozwój przedsiębiorczości społecznej na Ukrainie. Autorka wskazuje szereg przeszkód stojących na drodze rozwoju przedsiębiorczości społecznej na Ukrainie, które mają związek z trendami europejskimi. W artykule postawiono tezę, że problemy wywołane konfliktem zbrojnym i niestabilność społeczno-gospodarcza w rzeczywistości przyczyniły się do rozwoju przedsiębiorczości społecznej, która była w stanie reagować na sytuację szybciej niż instytucje publiczne. Zidentyfikowano sektory gospodarki, które są najatrakcyjniejsze dla przedsiębiorców społecznych. Zdaniem autorki, polityka wspierająca rozwój przedsiębiorczości społecznej znajduje się jeszcze na początkowym etapie, o czym świadczy brak dokumentów prawnych i strategicznych na poziomie krajowym i regionalnym, które określałyby podstawy koncepcyjne, priorytety i strategiczne kierunki rozwoju przedsiębiorczości społecznej. Na poziomie lokalnym tylko kilkanaście gmin, mając świadomość znaczenie tego typu działalności dla lokalnego rozwoju gospodarczego,*

przyjęło programy jej rozwoju. Z badania wynika, że przedsiębiorczość społeczna staje się skutecznym narzędziem wdrażania lokalnych polityk rozwoju gospodarczego dla miast Ukrainy, ale wymaga wielu inicjatyw, w tym doradztwa mentorskiego, wsparcia instytucjonalnego i finansowego, lepszego dostępu do rynków zbytu itp.

Słowa kluczowe: *przedsiębiorczość społeczna, narzędzie, rozwój, polityka*

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The impact of the Anti-Crisis Shield package on the activity of cultural institutions in Poland

Abstract. *The main aim of the article is to present activities of cultural institutions during the pandemic. The theoretical part describes the impact of the anti-crisis shield package on the operation of cultural institutions during the lockdown. The description is based on information from the website of the Ministry of Culture and National Heritage. The empirical part contains an analysis of specific support tools offered by cultural institutions and organisations, units of local government, the EU, banks, foundations and art academies.*

Keywords: *activities of cultural institutions, pandemic, cultural sector, financial support*

1. Introduction

The closure of cultural institutions for several months has deprived many artists of their jobs and livelihoods. The negative effects of ceasing all activity were felt by the animators and recipients of culture as well as entire institutions. Recently, many of them were able to start functioning again while taking into account the sanitary regime. The reopening of museums, libraries, art galleries, archives, theatres, philharmonics was carried out gradually. However, it will take a considerable amount of time before the cultural institutions recover the funds lost through their closure.

As a result of epidemic threats and restrictions in the activities of cultural institutions, the Ministry of Culture and National Heritage constantly strives to compensate for losses resulting from the suspension of the cultural sector.

Therefore, the Ministry of Culture and National Heritage has developed special forms of support for Polish artists. Nevertheless, the assistance provided with these measures is often insufficient. The entities supporting the activities of cultural institutions include:

– Cultural institutions and organisations,
– Local governments,
– EU,
– Banks, foundations,
– Art universities,
– Support programme for NGOs.

The support presented was prepared by cultural institutions, industry and local governments. They concern support for individuals and cultural institutions (more on this topic in: Musiał 2020, pp. 382-388).

2. Cultural institutions

2.1. Polish Film Institute

The Director of the Polish Film Institute, in cooperation with the Polish Filmmakers Association, Directors Guild of Poland, Polish Film Academy and the Association of Artists for the Republic of Poland, has created a project to support film-related professions. As part of the programme, filmmakers who are in a difficult financial situation due to the pandemic can apply for a grant. Financial support can be obtained by representatives of all film-related professions. The basis for awarding the grant is the applicant's statement describing a difficult financial situation and showing the difficulties resulting from the introduction of restrictions in the film industry during the pandemic. The gross amount of the grant is PLN 2400. Support can be received once a quarter – a maximum of three times. The total amount of grants awarded is PLN 1,123,200 (Polski Instytut Sztuki Filmowej, 2020).

2.2. Unia Literacka (Literary Union)

Writers in a difficult situation due to the pandemic can also count on social support. Unia Literacka (Literary Union) created a project in which the beneficiaries may receive financial support in the amount of PLN 1000. The application submitted should contain proof of the loss suffered. It is a matter of confirming the agreed author's meetings and then cancelling them (evidence in the form of an exchange of correspondence with cultural institutions), dissolving a previously signed agreement on publishing a book, publishing texts on the Internet or in

a magazine. Interestingly, support can also be applied for when the illness of a loved one is documented (Unia Literacka, n.d.).

2.3. Zachęta – National Gallery of Art

The National Gallery of Art has introduced a programme entitled "Visual Arts". The objective of the programme is to support the most important phenomena of Polish contemporary art and to popularise the phenomena of Polish and global art in the country. During the epidemic, changes were made to allow for the implementation of projects. The new regulations enable transforming projects once held in galleries, museums into those carried out online. The deadline for submission of applications was 15 September 2020 (Ministerstwo Kultury i Dziedzictwa Narodowego (2020; n.d. c).

3. Local governments

3.1. Poznań

Since the outbreak of the pandemic, the City of Poznań has been promoting online activities of all cultural entities. As a result, the inhabitants have continuous contact with culture and its creators. The local government of Poznań started a project entitled "Poznań supports". Activities within the programme include the following areas:

– "Culture to Go" competition,
– "Small Grant" programme,
– Grant programme for artists,
– Sectoral solidarity programmes,
– Research regarding the cultural sector in Poznań.

The "Culture to Go" competition is a vehicle promoting the cultural environment in Poznan during the pandemic. All activities take place with the use of Internet tools and other channels. The objective of the competition is to honour the most interesting cultural initiatives presented between 11.03 and 15.06 of this year. The initiatives included the following categories:

– education (workshops, webinars, courses),
– events (performances, concerts, reading of stories, meetings, showing previously recorded cultural events),
– publishing (music recordings, audio books, book publications, teaching materials).

Only the author or co-author who receives the consent of the remaining co-authors of the given piece may take part in the competition (Poznan.pl, n.d. a).

The "Small Grant" programme provides the beneficiary with financial resources for the implementation of creative projects during and after the national quarantine. The project must concern local or regional tasks in the areas of culture, art, protection of cultural assets and national heritage. The amount of funding cannot exceed PLN 10,000. The project implementation time is a maximum of 90 days. An important issue is that on entity or NGO can only be paid up to PLN 20,000 in a given calendar year (Poznan.pl, n.d. b).

As part of the "Poznań supports" programme, the City of Poznań offered financial support in the amount of PLN 200,000. The funds will be used for grants for Poznań-based artists. It is assumed that the amount of a single support grant will amount to PLN 4000 (city authorities may grant 50 grants). The programme has no age limits. The call for proposals took place from 17 to 31 July (Poznan.pl, n.d. c).

An important form of support is the Solidarity sector programme, which is a collaboration between city authorities, cultural institutions and other entities. The assistance consists of financial support for the cultural sector during the closure of the institutions. The implementation period was at the turn of April and May. After concluding the issue of financial support, the ongoing analysis of the cultural sector by the relevant institutions should be mentioned. This is to develop appropriate support methods (Poznan.pl, 2020).

3.2. Sopot

Sopot City Council provides support for cultural institutions on multiple levels. The first form of support are cultural grants. Cultural grants are assessed on an individual basis. The organisers do not use universalisation or harmful schemes. Furthermore, the artist can count on some kind of concessions. If the project cannot be carried out within the prescribed time limit, there are options for postponement and extension. When an association or foundation is considering transferring the scope of its task to an Internet platform, then that possibility is allowed. The second form of support is a grant for individual artists. The grant amounts to PLN 5000. Another interesting initiative includes measures intended to help art studios. The city reduces the cost of maintaining art studios. In May and April, payment for the use of the premises was postponed with the possibility of repayment in convenient instalments. In May, the amount of rent for the studios was reduced to PLN 1 per square metre. Financial support is not the only form of assistance. Creators can count on legal support. The city offers free legal aid. The legal aid at Goyki 3 Art Inkubator provides legal advice on copyrights. All inquiries can be submitted to an e-mail address. The content of the message will be viewed by an attorney who specialises in the issue. They will then conduct a legal analysis of the problem and provide free legal advice (online meeting) (Sopot.pl, 2020).

3.3. Pomorskie Voivodeship

The Pomorskie Voivodeship provides grants for the creators of culture. The grant can be awarded to persons working in the field of artistic creation, promotion of culture and monuments conservation. The funds come from the budget of the Pomorskie Voivodeship. They will be transferred following a competition for the implementation of creative plans in 2020. Each grant is individual and awarded to an artist whose place of residence or place of creative activity is the Pomorskie Voivodeship. The maximum gross amount is PLN 5000. The funds are paid out in a one-off manner. The total budget allocated to the project is PLN 200,000. The deadline for applications was 15 July 2020 (Pomorskie.eu, 2020).

4. European Union

On 8 April 2020, a virtual meeting of the European Union Ministers of Culture regarding the COVID-19 pandemic took place. The deliberations initiated the creation of an Internet platform for the cultural sector. The platform assumed the possibility of exchanging information and good practices among the creators. The Creatives Unite platform is the support measure proposed by the European Union as part of the anti-crisis shield for cultural institutions. The platform is intended to support artists, performers and other persons working for the cultural and creative sectors. All for easier sharing of cultural information during the ongoing crisis. Creatives Unite provides access to a variety of resources. It also offers an opportunity to co-create projects (Creatives Unite, n.d.).

5. Banks and foundations

5.1. Orlen Foundation

The Orlen Foundation held call for proposals for the third edition of the grant project entitled "We keep watch! We remember!". NGOs and local government institutions from all over Poland could apply for funding for the revitalisation or creation of a Memorial Site. The budget initially envisaged was PLN 190,000. 302 applications were received as part of the programme. Of these, 33 institutions and organisations have been selected to carry out the planned activities to commemorate sites located in their immediate vicinity. The high merit of the projects caused the Board of the Foundation to increase the program's budget to PLN 205,000 (Fundacja Orlen, n.d.).

5.2. PZU Foundation

The PZU Foundation has created a project entitled "PZU Foundation with Culture". Within the framework of the project, non-governmental organisations in the form of associations, foundations and student sports clubs can receive financial support. The main goal of the Foundation is to enable children and youth from rural areas and small towns (up to 30,000 inhabitants) to access high culture and to deepen their knowledge in the area of local and national cultural heritage. The Foundation provides financial support for the organisation of trips to visit to cultural institutions such as: philharmonic, theatre, opera, museum. Furthermore, it supports accompanying educational workshops. The maximum grant amount is PLN 15,000. The applicant has to incur an own contribution of 10% of the grant amount (Fundacja PZU, n.d.).

6. Liquidity loans for entrepreneurs

Liquidity loans are part of the Fund's Anti-Virus Package to support the Anti-Crisis Shield for business. Financial support comes from the European Funds dedicated to micro, small and medium-sized enterprises. The advantage of the liquidity loan is its compatibility with a grant fully covering the costs of interest. As a result, the entrepreneur is only forced to repay the capital in instalments. The grant is awarded in parallel with the loan – there is no need to submit additional applications. The funds received can be used for activities in the form of payment of salaries, current needs of the company or overdue receivables. The amount of the loan is determined individually. Repayment can be made within 6 years (loan repayment holiday or 6-month grace period are available) (Bank Gospodarstwa Krajowego, n.d.).

7. Art universities

7.1. Grażyna and Kiejstut Bacewicz University of Music in Łódź

Students of the Grażyna and Kiejstut Bacewicz University of Music in Łódź can count on assistance and postponement of payments for education and room rent at the Student House. The basis for applying for financial support may be the loss of the source of income (for the student or family member) as a result of restrictions related to epidemic risk and not using the Student House accommodation. The amount of support is 1000 PLN (Akademia Muzyczna im. Grażyny i Kiejstuta Bacewiczów w Łodzi, n.d. a).

Financial support is not the only form of assistance for students and Ph.D. students. The students can also count on psychological support. Psychological consultations offered by the University of Music in Łódź have been carried out since March 2019 (in the form of duties). At the present time, psychological assistance is provided either by means of IT or by telephone (prior appointment) (Akademia Muzyczna im. Grażyny i Kiejstuta Bacewiczów w Łodzi, n.d. b).

7.2. Karol Lipiński Academy of Music in Wrocław

Students and Ph.D. students of the Karol Lipiński Academy of Music in Wrocław can count on psychological support from the university, similar to the students of the Grażyna and Kiejstut Bacewicz University of Music in Łódź. The psychological consultations were previously carried out as weekly meetings. During the epidemic, they are carried out several times a week, by e-mail or telephone. Financial aid is also an important element of support. The application may be based on the loss of income by the student or a family member. The reason is that employers are restricted in their operations by the epidemic threat situation. The aid amount reaches PLN 400.

The aforementioned universities are not the only entities offering support to students during the epidemic. Other art universities operating in this area are Karol Szymanowski Academy of Music in Katowice, Stanisław Moniuszko Academy of Music in Gdańsk, Art Academy of Szczecin, Academy of Fine Arts in Gdańsk, Leon Schiller Polish National Film School in Łódź, etc.

8. Support programme for NGOs

On 27.04.2020 the Council of Ministers adopted a Resolution on the adoption of the "Programme of ad hoc support for NGOs in the area of counteracting the effects of COVID-19". The main objective of the concept is to provide funding to non-governmental institutions as well as to support undertakings concerning the fight against COVID-19.

Funding may be provided for the following activities:

1. Preparation and implementation of activities complementary to the tasks of public administration in relation to counteracting COVID-19 in the local community,
2. Preparation and implementation of replacement or complementary activities that were cancelled in whole or in part as a result of COVID-19,
3. Preparation and implementation of activities to sustain the functioning of organisations at risk as a result of COVID-19,

4. Financing of the purchase of equipment and materials required to implement the aforementioned projects,

5. Renting of premises required to carry out the activities (if funds for this purpose were lost due to COVID-19).

The budget for the support programme for non-governmental organizations is PLN 10,000,000. The managing entity is the National Freedom Institute – Centre for Civil Society Development. Beneficiaries may include non-governmental organisations, religious associations, churches, farmer's wives' association, social cooperatives and others. The programme is due for implementation during the time of the epidemic and 90 days after it is finished.

9. Summary

The Ministry of Culture and National Heritage, following the announcement of restrictions on the activities of cultural institutions in connection with COVID-19, began working on measures to compensate for losses resulting from the suspension of the cultural sector. The Minister of Culture and National Heritage participates in the Government Crisis Management Team. Representatives of the Ministry of Culture and National Heritage also participate in the works of the Ministry of Development as well as the Ministry of Family, Labour and Social Policy, aiming at eliminating losses to entrepreneurs and Polish economy. The Anti-Crisis Shield, created by the government and adopted by the Sejm, provides support for artists, creators, employees of the cultural sector, as well as companies and non-governmental organizations active in the field of culture, an increase in funds for social assistance for artists and additional support for the development of new forms of making culture available online and activation after the restoration of activity. The estimated value of financial support for the cultural sector may reach up to PLN 4 billion (Ministerstwo Kultury i Dziedzictwa Narodowego, n.d. b).

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Tarcza antykryzysowa wobec instytucji kultury w Polsce

Streszczenie: *Głównym celem artykułu jest przedstawienie działalności instytucji kultury w czasie pandemii. Część teoretyczna opisuje tarczę antykryzysową wobec instytucji kultury w czasie ich zamknięcia. Stworzony opis oparto na informacjach pochodzących ze strony internetowej Ministerstwa Kultury i Dziedzictwa Narodowego. Część praktyczna prezentuje analizę konkretnych narzędzi wsparcia oferowanych przez instytucje środowiskowe i branżowe, samorządy, UE, banki, fundacje, uczelnie artystyczne.*

Słowa kluczowe: *działalność instytucji kultury, pandemia, sektor kultury, wsparcie finansowe*

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