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The first issue contains articles by scientists from different countries, prepared on the basis of their scientific work. It is designed for university teachers, graduate students, undergraduates, practitioners in economics, finance, accounting and auditing, as well as other branches of economics.

CONTENTS

CHAPTER 1
CURRENT TRENDS IN ECONOMIC DEVELOPMENT

UKRAINE'S INVESTMENT COOPERATION WITH THE EU: PROBLEMS AND PROSPECTS IN MODERN CONDITIONS OF ECONOMIC DEVELOPMENT

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Abstract*. The article considers theoretical basis of investment cooperation, defines the category of international investment cooperation, defines the principles of attracting foreign direct investment from EU countries, and peculiarities for host countries. The necessity of attracting foreign investments into the national economy is substantiated. The study identified factors that affect investment cooperation and the volume of investment. The analyzed movement of investments between Ukraine and the EU in the sectoral breakdown of country in the last twenty years. The movement of investments between Ukraine and EU countries in the sectoral and country context for the last twenty years is analyzed. It is noted that the benefits of direct investment are inherent in both the recipient country and the investor country. The article outlines the benefits of investment cooperation for Ukraine and the EU. The main problems on the way to promoting effective investment cooperation are generalized. Analysis of investment flows and observations prove positive changes in investment cooperation and it became especially noticeable with the election of the European vector of development of Ukraine's foreign economic relations and the signing of the Association Agreement between Ukraine and the EU. The projected data are calculated on the basis of statistical data on investment flows between Ukraine and the EU without taking into account external factors influencing economic development. The article states that the constructed trend coincides with the global trend of the world economy. Based on the analysis of investment cooperation between Ukraine and the EU, and to improve it the author proposes the creation of a register of economically and technically viable investment projects in accordance with the priority of development of economic sectors, with taking into account the national interests of all regions of the country, promoting the direction of foreign capital to those regions, sectors and projects that are most in need. Priority sectors for foreign investment have been identified, steps to improve investment cooperation between Ukraine and EU countries have been proposed, and ways to overcome obstacles to the movement of foreign direct investment have been identified in the article.*

Keywords*: international investment cooperation, foreign direct investment, economic growth, macroeconomic factors, economic sectors.*

JEL Classification E27, F21, F62

Formulas: 0; fig.: 1; tabl.: 2; bibl.: 12

Introduction. Investment and investment cooperation play a leading role in the development of national economies. In the context of economic growth, foreign direct investment is of particular importance for developing countries and countries with economies in transition, because own investments are usually not enough. Such investments have an impact on structural changes in the economies of countries, on the sectoral development of national economies and on the volume of social production. World experience has shown that the optimal and efficient use of

investment is the shortest way to develop productive forces, and the economy as a whole. In the current conditions of continuing to reform the domestic economy, in terms of Ukraine's integration as an independent state into the world community, and in terms of the European integration vector of development, particularly important is the issue of cooperation with partner countries, including investment cooperation with the European Union. Ukraine, as a recipient country, desperately needs to attract foreign direct investment to rebuild its economy, as it lacks its own investment.

Literature review. International investment agreements are a key tool in economic development strategies for most developing countries and countries with economies in transition. UNCTAD experts conducted a study on the dependence of the impact of international investment agreements on investment inflows [1]. It is revealed that the recipient countries are reviewing the role of international investment agreements not only as a tool to stimulate FDI inflows from developed countries, but also as a tool to encourage and protect national investments, going to developed and other countries.

Manuel F. Montes and Adriano José Timossi in their scientific work considered the basic principles of reforming the regime of protect investment, including agreements and the system of settlement of disputes between investor and recipient in the context of South-South dialogue on future investment cooperation [2].

Loukas Mistelis and others consider international investment cooperation and investment agreements as a topical issue for the reform of recipient countries [3]. At the same time, they place emphasis on the reforms that should go beyond investment agreements and focus on promising projects of sustainable development, environmental protection, support for small and medium-sized businesses.

Falkner R. in his work focused on the peculiarities of investment cooperation, which requires an adjusting the behavior of entities to achieve mutually beneficial goals, and is a widespread in the world economy. It is noted that such management is based on the context of interaction, which is institutionalized and has a more permanent nature [4, pp. 72-74]. It is necessary to bring together the interests of actors in international investment cooperation through the coordination function of markets. It is also noted that the impact of globalization on the change in the structure of economic activity, the emergence of global production networks, form a demand in particular for investment resources. The growing demand for investment services has led to the development of institutional forms of investment cooperation between company’s resident in different countries [5].

Many Ukrainian scholars consider the principles of international investment cooperation through the analysis of foreign investment between countries [6-9]. The raised issues in the scientific literature are relevant today.

Aims. Investigate the features of Ukraine's investment cooperation with EU member states in order to improve investment cooperation and probable prospects for development.

Methods. The main research methods were scientific abstraction, logical generalization, graphical method for determination projected data on investment

flows between Ukraine and the EU as a basis for improving international investment cooperation and national economic growth.

Results. International investment cooperation has been in active development since the last century. There is no unified and commonly accepted understanding of the category 'international investment cooperation'. One understands this notion as various opportunities and forms of investment cooperation for all interested stakeholders-residents from different countries whose purpose is diversifying resources and distributing them efficiently, achieving set goals, obtaining income (profit), and useful effect. In the framework of investment cooperation various other forms of cooperation arise including production and technical cooperation (by this one means coordination and mutual long-standing production and technical activity of partners from different world countries based on allocation of production programs) and international scientific and technical cooperation manifesting itself through mutual solving of scientific and technical problems by partners from different countries, mutual exchange of production experience, mutual exchange of scientific achievements and mutual training of highly qualified personnel.

Investment cooperation of Ukraine with the EU countries is carried out by sighing bilateral agreements. Thus, there are 23 agreements signed with the European countries. Such cooperation facilitates:

- establishing favourable conditions for investment at the level of both countries;
- expanding economic cooperation for the mutual benefit of both countries;
- intensifying cooperation between private enterprises at the level of both countries;
- the need to encouragement and security of foreign investments;
- as well as economic development of Ukraine and a EU member country.

There are macro economical factors influencing investment cooperation and the volume of investment movement between Ukraine and the EU countries: (I) factors of the sphere level and those of the micro level; (ii) objective and subjective factors. The objective factors include resources and economical, political and economical factors, global and economical, location of an object (territorial conditions), etc. The subjective factors include the state of the economy measured with macro economical indices (including the level of inflation, preconditions and the growth level of GDP, stability of the legislative system, interest rate level, etc.), taxation rates - availability of a clear and understandable taxation system, and market environment considered through the available infrastructure, openness of the economy, capacity of the internal market, etc.

So, all the factors mentioned above are an integral part in the flow of foreign investments between Ukraine and the EU countries. The major part of the European business activity in the last decade namely the European FDI has been directed into the following sectors [10]: financial and insurance activity – 27 %; production (mainly through privatization) – 25 % (from these 20 % are process manufacturing); wholesale and retail trade – 15 %; real estate operations – 10 %; food stuffs manufacturing, beverages, and nicotine products – 7 %; other– 16 %. Among the EU countries investors into the economy of Ukraine are Cyprus, the Netherlands, the

United Kingdom, the Virginian Islands (Great Britain), Germany, France, Austria, and Poland [11].

The following sector have always been attractive targets for foreign and European investors since Ukraine has become independent: wholesale and retail activity, financial, banking, and insurance activity, foodstuff production. The reason behind that is that it is these sectors which give the quickest return on investment and have relatively little risk for investors. The EU is interested in investing into the Ukrainian process manufacturing (the fifth part of all FDI). One can explain that with the inherent problem of lack of raw materials and energy resources typical for the EU economy [12].

In general, the advantages of direct investment are intrinsic both for Ukraine and the EU member countries. In particular, for European investors investment will facilitate the following:

- reduction and avoidance of quotas, tariffs for goods produced at the national market;
- diversification for the European capital flows, diversification of the European investors' activity;
- reduction of risks by signing bilateral agreements;
- developing the Ukrainian market thereby reducing transport costs;
- using highly trained work force which is relatively cheap reducing the final cost of goods produced at the national market for goods and services;
- obtaining additional income, profit, and dividends.

The advantages of European investment for Ukraine are as follows:

- mastering cutting edge and innovative technologies;
- additional workplaces and as a result lesser levels of workforce outflows, especially in the EU member countries;
- stimulation of the national economy with the help of European investment which in turn increase the GDP and economical growth. In turn European investment will not only improve cooperation but increase the efficacy of the national economy. The Investment cooperation between Ukraine and the EU member counties is constantly increasing as confirmed by the statistical data (Fig. 1).

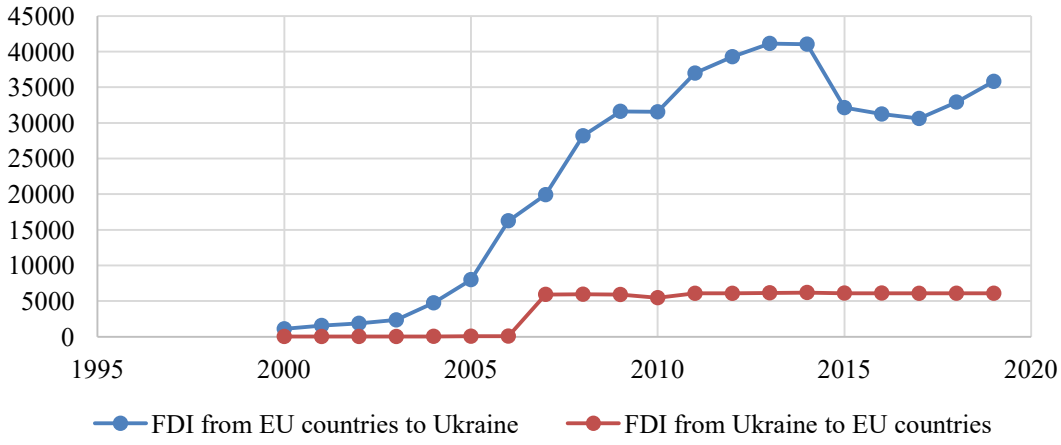

Figure 1. Investment flows between Ukraine and the EU, 2000-2019, mil. USD

Source: author's development based on [10]

The investment cooperation between Ukraine and the EU should reflect not only modern trends of global economy and global processes of its development but their discrepancies in the world economy as well as positive facets.

There are following principal problems in the way of development and facilitation of effective investment cooperation: The level of corruption in the country, anti-corruption reforms, resolving the crisis of the Constitutional Court; difficult political climate, political strife directly influencing the implementation of the reform; the economic growth and macro economical indices; the current situation with the COVID 19 pandemic causing not only a reduction in the volume of foreign trade and loss of investors but leaves Ukraine vulnerable to outside shock and inventory cycle on the whole.

At the same time, taking into account the European vector of foreign economic connection of Ukraine, the signed Ukraine–European Union Association Agreement, there has been present a trend of improvement in investment cooperation. The author has plotted a dynamic of changes in the amount of European investment in Ukraine for the period of 2000-2019 and determined a further trend line using the graphic method (Fig. 1). Selection of the empirical function has been done by using linear, logarithmic, polynomial, and power functions.

Table 1. Functions that determine investment trends between Ukraine and the EU, 2000-2019

Function	FDI from EU countries to Ukraine	FDI from Ukraine to EU countries
Linear	$y = 2176,5x - 4E+06$ $R^2 = 0,7534$	$y = 416,11x – 832246$ $R^2 = 0,7062$
Power	$y = 0x^{363,14}$ $R^2 = 0,7279$	$y = 0x^{736,43}$ $R^2 = 0,7159$
Polynomial	$y = -179,85x^2 + 725012x - 7E+08$ $R^2 = 0,8892$	$y = -29,665x^2 + 119640x - 1E+08$ $R^2 = 0,801$
Logarithmic	$y = 4E+06\ln(x) - 3E+07$ $R^2 = 0,7542$	$y = 836555\ln(x) - 6E+06$ $R^2 = 0,7069$

Source: author's development

The trend of changes in FDI from the EU has been analysed using linear, logarithmic, polynomial, and power functions. At the figure the function maximally converge: linear (R^2=0,61), logarithmic (R^2=0,61), polynomial (R^2=0,67), power (R^2=0,81). The validity coefficient is the biggest for the power function; although, if we increase the determination coefficient, the calculations will have a higher validity coefficient. The bigger the polynomial, the higher the value of the validity coefficient.

Correspondingly, let us analyse a trend of FDI flow to the EU by using linear, logarithmic, polynomial, and power functions. The figure shows that the investment outflows from Ukraine to the EU functions maximally converge: linear (R^2=0,71), logarithmic (R^2=0,71), polynomial (R^2=0,72), power (R^2=0,85). The power function has the highest validity coefficient.

The value of the functions in both trends are close to unity which signifies the highest probability of the forecast values. Therefore, in the next four years the trend

will show a gradual growth. Figure 2 provides statistical date as to the investment flows for the last five years and contains a forecast for the next four years (save for unforeseeable factors, world crises, etc.) using the data available from the last twenty years. The said trend matches the world trend for the world economy development.

Table 2. FDI trends between Ukraine and the EU for 2015-2019 and predictive values by 2024, million dollars USA

Year	Direct investment in Ukraine			Direct investment from Ukraine		
	Total	*from EU*	*% of EU countries*	Total	*to EU*	*% of EU countries*
2015	32122,5	24982,8	77,8	6315,2	6111,0	96,8
2016	31230,3	23425,7	75,0	6346,3	6115,1	96,4
2017	31606,4	24145,2	76,4	6322,0	6075,5	96,1
2018	32905,1	25972,3	78,9	6294,4	6084,4	96,7
2019	35809,6	28289,3	79,0	6272,7	6086,0	97,0
Predictive values						
Year	*from EU countries*			*to EU countries*		
2021	46262,07			8293,147		
2022	48438,58			8709,255		
2023	50615,09			9125,363		
2024	52791,6			9541,472		

Source: author's development

In order to improve investment cooperation between Ukraine and the EU and to achieve the forecast values of investment flows and promote national economic growth, some efforts are needed. Such proposals may be, as noted by leading scientists and experts, the creation of a register of economically and technically viable investment projects in accordance with the priority of development of economic sectors. Of course, it is necessary to take into account the national interests of all regions of the country and to promote the direction of foreign capital to those regions, sectors and projects that are most in need. Therefore, we can support the selection of such groups to attract foreign capital in the first place:

1. The most vital industries, which are not only a priority, but also important for the economy of Ukraine include transport, engineering and electricity.

2. The second group consists of sectors of the economy that are also important for the economies of Ukraine. Enterprises in these industries can survive and become competitive in today's conditions of trade liberalization and liberalization of foreign economic relations and it can help update technology and increase the efficiency of production. These include ferrous and nonferrous metallurgy, enterprises of the military-industrial complex, and chemical industry.

3. The third group includes enterprises that are not competitive today, and may even be unprofitable. This group includes coal companies, agriculture, civil engineering, production of chemical fibers and plastics and others. They are the ones most in need of investment, new approaches in the organization of production and technology upgrades.

Also, in order to improve investment cooperation and relations between Ukraine and the EU, the main priority steps should be the following: establishing investment cooperation in the context of Ukraine's European strategy and strategic programs; introduction of forms of international joint financing of strategic investment projects; formation of a system of mutual protection of investments; promoting investment in priority sectors of the economy; supporting through economic diplomacy for the creation of consortia, alliances of Ukrainian enterprises with powerful European companies; dissemination of information on investment demand and opportunities in domestic production and economic sectors; introduction of monitoring of pricing within TNCs, in order to prevent tax evasion in Ukraine.

Conclusion. The foreign direct investment market is characterized by the intensive development of globalization, strengthening the interdependence of the world's economies, including strengthening investment cooperation between Ukraine and the EU. Increasing the level of confidence of foreign investors, improving and strengthening of investment cooperation with European countries, and cooperation with international creditors is important for national needs for strengthening international reserves, investing in critical sectors and national projects, and economic growth in general.

Having identified priority sectors and priority steps for attracting foreign investment, and analyzing approaches to investing in the EU we can note that effective cooperation between Ukraine and the countries of the European Union is possible even under the conditions of first of all adaptation of the domestic legislation on the European one. Ukraine must comply with certain EU directives in the field of investment, in particular, for example, on the transparency of securities and on compensation for losses to foreign investors. Therefore, the legal framework must be improved, and must be transparent, clear and one-sided for European investors, and protect the rights of foreign investors.

What does Ukraine need to do to overcome obstacles in order to attract European investors? In the context of the European integration vector chosen by the government, in addition to the above steps, it is also necessary to modernize the sphere of investment activity, namely to develop adequate and effective incentive policy measures. Stimulation attracting of European investments, infrastructure of investment activity, formation of an attractive investment environment should become a priority in investment activity. To achieve this goal, it is necessary to use world experience and to use those stimulating and possible factors that will contribute to the implementation of the country's investment policy. Such measures will confirm the positive forecast trends that we have calculated.

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CLUSTER ANALYSIS OF REGIONAL MARKETS OF AUTOCLAVE AERATED CONCRETE IN UKRAINE BY PRICE LEVEL AND SUPPLY LEVEL INDICATORS

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Abstract. *One of the key priorities of the construction industry is well-balanced provision of the country's regions with modern building and construction materials. That is why the research of the balance between supply and demand in the regional markets of Ukraine is extremely important. The object of this study is the aerated concrete market of Ukraine. The purpose of the work is to carry out a cluster analysis of regional aerated concrete markets of Ukraine in terms of price level and supply level. The article examines the situation in regional markets for aerated concrete as one of the leading wall materials, resulting in specifying regional trends in prices for this wall material, as well as proves the need for state regulation of its prices in a particular region in order to increase construction and reduce disparities in prices. The paper identifies the degree of monopoly of the aerated concrete market of Ukraine in the conditions of oligopoly. The author considers the location of aerated concrete enterprises in Ukraine and identifies the directions and scopes of distribution of their products based on such data as sales volume and regional sales structure of each manufacturer. The study analyzes the supply of aerated concrete in each region and evaluates the proportion of its distribution on the territory of Ukraine in accordance with such factors as the area of the region, its population and the size of regional GDP. As a result, it is found out that in some regions there are disparities between supply and demand. However, in most regions of Ukraine the aerated concrete market is balanced.*

Keywords: *price, aerated concrete, market, region, oligopoly, import, demand, supply, market balance, cluster, cluster analysis*.

JEL classification: E30, L19, L22.

Formulas: 3; fig.:0; tabl.:4; bibl.: 20.

Introduction. At present, autoclaved aerated concrete (hereinafter-aerated concrete) is one of the most effective wall building materials in Ukraine. Thus, according to the All-Ukrainian Association of Autoclaved Aerated Concrete Producers, over the past 10 years aerated concrete has taken the largest share among structural wall materials in Ukraine, it increased from 8% in 2010 to 53% in 2020 (VAAG,2020). However, the development of the aerated concrete market in Ukraine, in our opinion, is constrained by the lack of state regulation of prices for this material, as a result of which aerated concrete is rapidly becoming more expensive, which, in turn, leads to a constant increase in construction costs. In this case, in order to regulate the pricing of aerated concrete one should first investigate the pricing process for this building material in Ukraine (Skrypnyk, O. 2018), including the supply and demand for it.

The market of wall building materials in Ukraine has a clear regional segmentation (Skrypnyk, O. 2018), which is primarily due to the high cost of transportation of aerated concrete from the production sites to other regions. Thus, according to our research the cost of delivery of aerated concrete in Ukraine from the production sites to other regions is on average 0.6-1.5 UAH / (m^3 * km) taking into

account the cost of returning the car to the factory (Corporation «HSM» 2020). Therefore, the study of regional aerated concrete markets will not only identify the regional trends in prices for this material, but also the need for state regulation of its prices in a particular region, as well as possible ways and forms of such regulation. As for the goods structure of autoclaved aerated concrete in Ukraine, the predominant market share is occupied by aerated concrete blocks in the form of parallelepiped with a density of D400 and D500, meanwhile, several manufacturers (TOV "Dnepropetrovsk Plant of Construction Materials", PJSC "Zhytomyr CSR", TOV "Ternopilbud") produce a density of only D500 (Zakharchenko, P 2020). It should be noted that the D400 and D500 density products can easily replace each other (i.e. they are interchangeable with a slight adjustment of the construction project) and therefore belong to one and not to different markets.

The first stage of the analysis of the aerated concrete market in Ukraine was conducted in our previous publication (Skrypnyk, O. 2018) and included an analysis of the market monopoly and geographical location of aerated concrete producers in Ukraine. The next steps are to identify aerated concrete supply in the regions of Ukraine, to evaluate the proportion of its distribution throughout the country, and to determine the dependence between the relative level of aerated concrete prices in the region and the relative supply in regional aerated concrete markets. This article is an attempt to solve the above-mentioned tasks.

Literature Review. Research of the aerated concrete market of Ukraine is conducted on regular basis by the All-Ukrainian Association of Autoclaved Aerated Concrete Producers (VAAG) (including the executive director O.V. Sirotin (Sirotin, O. 2017), as well as the Department of Commodity Research and Commercial Activity in the Construction of KNUBA under the leadership of prof. Zakharchenko (Zakharchenko, P 2020). However, these studies focus on the production, export and import of aerated concrete, while the issues of national and regional supply and demand, as well as formation of regional prices for aerated concrete have not been studied yet.

The issues of cluster analysis in construction are revealed in the works of A.F. Goyko and L.V. Sorokin (Goiko, A. 2013), O.Yu. Belenkova (Bielienkova, O. 2019) , I.S. Golovko-Marchenko (Golovko-Marchenko, I. 2015), etc., however, the condition of regional construction materials markets in Ukraine has not been considered in these works.

Aims. The purpose of the article is to conduct a cluster analysis of regional markets of autoclaved aerated concrete in Ukraine in terms of price level and supply level in order to determine the features of pricing in this market.

Methods. In the research, the following methods were used: the balance method and the method of proportion (distribution of aerated concrete between the regions of Ukraine), the rating method (distribution of regions of Ukraine in clusters by level of aerated concrete), and the matrix method (cluster analysis of regional markets of autoclaved aerated concrete of Ukraine by price and supply levels).

Results. As already mentioned, the first stage of the analysis of regional aerated concrete markets was our 2018 evaluation of aerated concrete supply of regional

markets in Ukraine based on the data concerning production capacity and location of domestic producers (Skrypnyk, O. 2018). Considering the dynamics of aerated concrete production in Ukraine, it should be noted that in 2019 there were significant changes in the structure of aerated concrete supply, as a number of manufacturers stopped production and sold only previously produced stocks (PE "Budtechnologiya-N", TOV "TBK", TOV "Silicatobeton" , TOV "Teplobud-Sivershchina") (Zakharchenko, P 2020). Accordingly, the degree of monopoly of this market increased, and the Herfindahl-Hirschman indicator increased to 1952.55 points (which is typical for highly concentrated oligopolistic markets). Based on the data on the sales volume of aerated concrete in Ukraine by domestic manufacturers, we divided the aerated concrete supply by regions. At the same time, we proceeded from the fact that the aerated concrete supply of a certain manufacturer in the region is directly proportional to its sales volume in Ukraine and inversely proportional to the distance from the place of production to a particular region. It should be noted that in real practice, the aerated concrete supply cannot be identified with its sales volume; but it is the sales volume that reflects it most accurately. In contrast to production capacity (which may not be fully used) or production volume (which may be greater or less than the supply volume, since the manufacturer may display for sale products from the warehouse, produced earlier or vice versa – send part of the products manufactured this year to the warehouse, not to the market). As a source of information, we used data from aerated concrete domestic producers and distributors concerning the availability of aerated concrete of a particular brand in a particular region and the distance from the production site to the administrative center of a particular region.

The distribution of aerated concrete supply by regions of Ukraine was made on the grounds of two assumptions based on the results of a survey of commercial department workers of some enterprises of this industry:

- The sales volume of a particular manufacturer in a particular region is inversely proportional to the distance from the production site to the administrative center of the region;

- The sales volume of a particular manufacturer in the region, the administrative center of which is closest to the place of production is twice less than the sales volume in the region of production.

Based on this assumption we have compiled and solved systems of equations for each manufacturer:

$$\begin{cases} X_1+X_2+\ldots+X_n = D & (1); \\ X_1=X_2*2 & (2); \\ X_i = X_2 * S_2 / S_n & (3); \end{cases}$$

where: X_1 - is sales volume in the region of production; X_2 - is sales in the nearest region; n - is the number of regions in which the products of this manufacturer are delivered; X_i - is sales in any region, except for the first and second; S_2 - is distance from the place of production to the second region; S_i - is distance from the place of production to the i-th region; D - is the total volume of aerated concrete production of a certain manufacturer in 2019.

Further, similar equations were solved for foreign producers represented on the domestic market.

According to the SFS (State Fiscal Service of Ukraine 2020). in 2019, Ukraine imported 343.390 tons of aerated concrete (which at an average density of D500 (500 kg / m^3) gives us 686.776 thousand m^3), and exported almost 10 times less (37.122 tons, or 72.244 thousand m^3). At the same time, since the volumes of aerated concrete exports are insignificant, and the volumes of exports of specific domestic producers are unknown, the export of aerated concrete from Ukraine will not be taken into account in our further calculations.

Aerated concrete is imported mainly from two countries: Belarus and Poland.

As for the import of aerated concrete from Belarus, it has decreased significantly in recent years because of the anti-dumping investigation initiated by VAAG. In fact, the only Belarusian manufacturer whose products are actually on sale in Ukraine in 2019-2020 was the group of companies "SLS Group" (TM "SLS"). Deliveries to Ukraine are made from Berezivsky KBI and SZAT "QuartzMelProm" (Khotyslav, Brest region). The price of the Belarusian aerated concrete enables it to compete successfully with domestic product.

As for Polish aerated concrete producers, only Xella aerated concrete (TM Ytong), manufactured at the company's plant in Ostrolissy, is supplied to Ukraine on regular basis (Maximus Center 2020). This plant is located at a distance from the centers of the border regions of Ukraine, quite similar to the distance from Kiev to them (for example, 488 km to Lviv, 498 km to Lutsk), but the price of Polish aerated concrete significantly exceeds the price of domestic equivalents.

Imported aerated concrete is sold mainly in Western Ukraine (Volyn, Zakarpattia, Rivne, Khmelnytsky, Ivano-Frankivsk, Chernivtsi, Ternopil, Lviv regions) and Northern Ukraine (Kyiv, Chernihiv, Zhytomyr regions), where both Belarusian and Polish aerated concrete can also be found. We calculated that the import volume of Belarusian aerated concrete is 288.337 thousand m^3 (which generally corresponds to the results of other experts (Zakharchenko, P 2020), and the import volume of Polish aerated concrete is 398.442 thousand m^3. The specified import volume was distributed between the above-mentioned regions inversely proportional to the distance from these foreign producers.

As a result of the distribution of sales of aerated concrete by domestic producers and the import volume between the regions of Ukraine, we determined the total sales of aerated concrete of Ukraine in each region. Then all regions were put in descending order of the total supply of aerated concrete and divided by this indicator into 3 groups: regions with high supply of aerated concrete, regions with medium supply and regions with low supply of aerated concrete. We did this by dividing into 3 parts the interval between the aerated concrete supply volume in Chernihiv region (which is second in the rating) and the aerated concrete supply volume in the last ranked Luhansk region (we did not take into account the supply volume in Kyiv region, as it is extremely high). Thus, regions with a total supply of aerated concrete up to 112 thousand m^3 were included into the group with low supply of aerated concrete; regions with a total supply of aerated concrete from 112 thousand m^3 to 205

thousand m^3 were included into the group with a medium supply of aerated concrete, and regions with a total supply of aerated concrete over 205 thousand m^3 were included into the group with high supply of aerated concrete.

The results of these studies are shown in Table 1.

Analysis of the data in Table 1 showed that the distribution of aerated concrete supply on the territory of Ukraine is extremely uneven. For example, the supply of aerated concrete in Kyiv region (where it is the highest) is more than 10 times higher than the supply in Luhansk region (where it is the lowest). However, the obtained results cannot give the accurate data of the level of aerated concrete supply in the regions in itself, as all regions differ in demographic, economic and geographical features. Therefore, to clarify the results, we analyzed the proportion of the regional distribution of aerated concrete supply in Ukraine in accordance with the area of the region, its population and the size of regional GDP (according to the State Statistics Committee of Ukraine). The initial data and the results of these calculations are given in Table 2.

Based on the data in Table 2 the regions were divided for each indicator into 3 clusters. To do this, we determined the difference between the maximum and minimum values for each indicator and divided it into three ranges. As a result, according to Table 4 we have identified extremely large disparities in the distribution of aerated concrete supply by regions of Ukraine.

As a result per 1 million UAH regional GDP distribution of aerated concrete by region of Ukraine showed that the maximum value of this indicator (4.29 thousand m^3 / million UAH in Chernihiv region) is 18.3 times higher than the minimum (0.23 thousand m^3 / million UAH) in Donetsk region). According to this indicator, the regions of Ukraine were divided as follows: up to 1.58 thousand m^3 / million. UAH – low supply; from 1.58 thousand m^3 / million UAH up to 2.94 thousand m^3 / million UAH – medium supply; over 2.94 thousand m^3 / million UAH - high supply.

As for the indicators of aerated concrete supply in the region per one thousand people and aerated concrete supply in the region per one km^2 area, the disparities in the regional distribution of aerated concrete were even greater. Thus, for the indicator of aerated concrete supply in the region per one thousand people, the maximum value (301.6 thousand m^3 / thousand people recorded in the Chernihiv region) is 34.3 times higher than the minimum (8.76 thousand m^3 / thousand people) in the Luhansk region). According to this indicator, the regions of Ukraine were divided as follows: up to 106 thousand m^3 / thousand people – low supply; from 106 thousand m^3 / thousand people to 204 thousand m^3 / thousand people – medium supply; more than 204 thousand m^3 / thousand people – high supply.

Considering the supply of aerated concrete in the region per one km^2, we determined that the highest value of this indicator (19.3 thousand m^3 / per one km^2, was recorded in Kyiv region), 27.5 times higher than the minimum (0.7 thousand. m^3 / per one km^2 in Luhansk region).

Table 1. Distribution of aerated concrete supply by regions of Ukraine (thousand m^3) *

Region / Trademark (or manufacturer)	TOV "AEROK" thousand m^3	TOV "Orientyr-Budelement" thousand m^3	TOV "YUDK" thousand m^3	TOV "Energy Product" thousand m^3	TOV "Yupiter" thousand m^3	TOV "Plant Kharkiv Building Materials" thousand m^3	TOV "Zhytomyr CSR" thousand m^3	TOV "Dnipropetrovsk Plant BM" thousand m^3	TOV "Ternopilbud" thousand m^3	Import, thousand m^3	Total volume of supply, thousand m3 (supply level)
Kyiv	205,088	268,218	'13,333	15,893	-	8,943	3,626	-	-	44,673	559,774(high)
Chernihiv	101,108	134,109	11,134	-	-	8,493	-	-	-	44,059	298,903(high)
Zhytomyr	102,544	96,558	9,929	-	-	-	7,934	-	-	51,958	268,923(high)
Dnipropetrovsk.	29,943	-	141,836	35,81	-	19,777	-	13,788	-	-	241,154(high)
Mykolaiv	29,943	-	18,793	69,4	120,236	-	-	1,827	-	-	240,199(high)
Cherkasy	73,216	86,5	21,559	22,763	-	-	-	-	-	-	204,038(medium)
Vinnytsia	53,323	56,326	10,567	-	25,37	-	3,967	-	-	42,655	192,208(medium)
Kherson		28,297	18,297	138,8	-	-	-	1,779	-	-	187,173(medium)
Ternopil	34,147	35,673	-	12,145	14,849	-	-	-	21,706	62,139	180,659(medium)
Rivne	43,889	45,061	-	-	-	-	2,702	-	7,868	75,304	174,824(medium)
Odesa	30,25	32,052	13,262	35,741	60,118	-	-	-	-	-	171,423(medium)
Volyn	35,89	37,282	-	-	-	-	-	-	-	87,767	160,939(medium)
Zaporizhzhya	26,046		70,918	41,293		14,435		6,894			159,586(medium)
Khmelnytsky	44,402	45,597	-	-	-	-	2,773	-	10,853	52,924	156,549(medium)
Kharkiv	29,84	33,661	27,658	-	-	60,022	-	2,689	-	-	153,87(medium)
Lviv	26,559	28,029	-	-	-	-	-	-	9,41	73,373	137,371(medium)
Sumy	43,068	51,364	17,446	-	-	23,319	-	-	-	-	135,197(medium)
Poltava	41,735	-	33,331	22,069	-	30,011	-	3,24	-	-	130,386(medium)
Chernivtsi	28,2	29,638	-	-	14,428	-	-	-	7,174	46,692	126,132(medium)
Kirovograd	47,375	51,096	24,396	-	-	-	-	2,372	-	-	125,239(medium)
Ivano-Frankivsk	23,688	27,358	-	-	-	-	-	-	8,986	55,205	115,237(medium)
Zakarpattia	17,74	19,178	-	-	-	-	-	-	-	50,027	86,945(low)
Donetsk **	-	-	24,821	19,085				2,413			46,319 (low)
Luhansk **			18,722								18,722 (low)
Total	1068	1106	476	413	235	165	21	35	66	686,776	4271,776

** - compiled by the author based on VAAG and websites of aerated concrete manufacturers in Ukraine.*

*** - data from the temporarily occupied territories of Donetsk and Luhansk regions are missing*

Table 2. Distribution of aerated concrete supply by regions of Ukraine

Region/ Indicator	The population of the region as of 01.01.2020 (in thousands)	Area of the region, km²	Regional GDP for 2019, UAH million	Supply of aerated concrete in the region per one thousand people, thousand m^3 / one thousand people	Supply of aerated concrete in the region per 1 km^2, thousand m^3 / 1 km^2	Supply of aerated concrete in the region per 1 million UAH regional GDP, thousand m^3 / 1 million UAH
Vinnytsia	1 545	26 513	111498	124,40647	7,2495757	1,606589
Volyn	1 031	20 144	60448	156,0999	7,9894261	2,838419
Dnepropetrovsk	3 176	31 914	369468	75,930101	7,5563702	0,631244
Donetsk **	4 131	26 517	192256	11,212539	1,7467662	0,234361
Zhytomyr	1 208	29 832	77110	222,61838	9,0145817	3,463281
Zakarpattia	1 253	12 777	52445	69,389465	6,8048055	1,684789
Zaporizhia	1 687	27 180	147076	94,59751	5,8714496	1,070077
Ivano-Frankivsk	1 368	13 900	78443	84,237573	8,2904317	1,384594
Kyiv	4748	28 970	198160	117,8968	19,322541	0,514952
Kirovograd	933	24 588	64436	134,23258	5,0935009	1,859922
Luhansk **	2 135	26 684	35206	8,7690867	0,7016189	0,514796
Lviv	2 512	21 833	177243	54,685908	6,2918976	0,761339
Mykolayiv	1 119	24 598	79916	214,65505	9,7649809	2,881729
Odesa	2 377	33 310	173241	72,117375	5,1462924	0,97201
Poltava	1 386	28 748	174147	94,073593	4,5354807	0,742034
Rivne	1 152	20 047	56842	151,75694	8,7207063	2,839901
Sumy	1 068	23 834	68489	126,58895	5,6724427	1,912787
Ternopil	1 038	13 823	49133	174,04528	13,069449	3,611923
Kharkiv	2 658	31 415	233321	57,889391	4,8979787	0,650373
Kherson	1 027	28 461	55161	182,25219	6,5764731	3,329944
Khmelnitsky	1 254	20 645	75646	124,83971	7,5829014	2,073642
Cherkasy	1 192	20 900	93315	171,17282	9,7625837	2,118751
Chernivtsi	901	8 097	33903	139,99112	15,577621	3,563581
Chernihiv	991	31 865	70624	301,61756	9,3802919	4,296766

*** - data from the temporarily occupied territories of Donetsk and Luhansk oblasts are missing.*

According to this indicator, the regions of Ukraine were divided as follows: 6.9 thousand m^3 / 1 km^2 - low supply; from 6.9 thousand m^3 / 1 km^2 to 13.11 thousand m^3 / 1 km^2 - medium; more than 13.11 thousand m^3 / 1 km^2 - high supply.

Summarizing the qualitative results of all four indicators of the level of aerated concrete supply in the regions of Ukraine (one absolute and three relative), we determined an integrated evaluation of supply in the regional aerated concrete markets of Ukraine (Table 3). At the same time, in controversial cases, the criterion for including the region into a particular group was the indicator of the total supply of aerated concrete in the region.

This table also provides data on the price level for aerated concrete in the region in order to determine the relationship between the aerated concrete supply level and the price level for aerated concrete in the region.

Based on the data in Table 3, it can be concluded that in most regions of Ukraine the aerated concrete market seems to be balanced (13 regions where aerated concrete supply is medium), in 8 regions it seems to be in short supply (areas with low aerated concrete supply) and only in 3 areas with a high supply of aerated concrete it is probably redundant. It should be noted that for a reliable analysis of the balance of regional markets for aerated concrete in Ukraine one should also evaluate, directly or

indirectly, the demand for aerated concrete in the regions and compare them with supply indicators (which will be the aim of our further research).

Next, we determined the relationship between the price level for aerated concrete in the region and its supply level in this region. In order to do this, we first divided the regions of Ukraine into 3 groups according to the price level for aerated concrete, rejecting the abnormally high price in Luhansk region and dividing the remaining interval into 3 segments (low price is up to 1523 UAH / m^3, medium is from 1523 UAH / m^3 to 1786 UAH / m^3, high price is more than 1786 UAH / m^3).

Table 3. Integral supply evaluation in the regional markets of aerated concrete in Ukraine

Region/ Indicator	Relative level of aerated concrete supply in the region (according to Table 1)	Supply of aerated concrete in the region by UAH 1 million. regional GDP	Supply of aerated concrete in the region per one thousand people (according to Table 2)	Supply of aerated concrete in the region per 1 km^2 (according to Table 2)	Integral evaluation of the aerated concrete supply in the region	Regional price of aerated concrete as of 01.12. 2019, UAH / m^3 (Inproekt LLC 2020)
Vinnytsia	Medium	Medium	Medium	Medium	Medium	1680
Volyn	Medium	Medium	Medium	Medium	Medium	1740
Dnipropetrovsk	High	Low	Low	Medium	Medium	1670
Donetsk**	Low	Low	Low	Low	Low	1775
Zhytomyr	High	High	High	Medium	High	1500
Zakarpattia	Low	Medium	Low	Low	Low	1795
Zaporizhia	Medium	Low	Low	Low	Low	1500
Ivano-Frankivsk	Medium	Low	Low	Medium	Medium	1260,25
Kyiv	High	Low	Medium	High	Medium	1460
Kirovohrad	Medium	Medium	Medium	Low	Medium	2030
Luhansk **	Low	Low	Low	Low	Low	2980
Lviv	Medium	Low	Low	Low	Low	1317
Mykolaiv	High	Medium	High	Medium	High	1740
Odesa	Medium	Low	Low	Low	Low	1610
Poltava	Medium	Low	Low	Low	Low	2020
Rivne	Medium	Medium	Medium	Medium	Medium	2050
Sumy	Medium	Medium	Medium	Low	Medium	1500
Ternopil	Medium	High	Medium	Medium	Medium	1680
Kharkiv	Medium	Low	Low	Low	Low	1550
Kherson	Medium	High	Medium	Low	Medium	1540
Khmelnitsky	Medium	Medium	Medium	Medium	Medium	1480
Cherkasy	Medium	Medium	Medium	Medium	Medium	1586
Chernivtsi	Medium	High	Medium	High	Medium	1560
Chernihiv	High	High	High	Medium	High	1600

*** - data from the temporarily occupied territories of Donetsk and Luhansk oblasts are missing.*

Then based on this distribution and the data of Table 3 we comprised a matrix showing the distribution of regions of Ukraine in clusters according to two criteria: the relative price level for aerated concrete and the relative level of its supply in the region (Table 4):

Table 4. Cluster analysis matrix of aerated concrete regional markets of Ukraine by indicators of the price level for aerated concrete and its supply in the region

Relative price level for aerated concrete / Relative supply level for aerated concrete in the region	Low supply	Medium supply	High supply
High price	Luhansk, Zakarpattia, Poltava,	Rivne, Kirovohrad	
Medium price	Donetsk, Kharkiv, Odessa	Volyn, Ternopil, Cherkasy, Kherson, Vinnytsia, Dnipropetrovsk Chernivtsi	Mykolaiv, Chernihiv
Low price	Zaporizhia, Lviv	Ivano-Frankivsk, Khmelnytsky, Sumy, Kyiv	Zhytomyr

Sourse: develop by author

Based on the matrix, we can draw several conclusions:

1. The price of aerated concrete in most regions is low or medium, which indicates rather efficient logistics of aerated concrete transportation from production sites to most regions of Ukraine.

2. There is a clear relationship between the relative supply level of aerated concrete and its relative price level in the majority of regional markets of aerated concrete. This is an example of Walras's model of market equilibrium, as domestic producers do not set prices for each region, therefore price determines supply in the regional aerated concrete markets, not the other way around (unlike Marshall model).

Thus, in three clusters the ratio between supply and price clearly corresponds to Walras's model of market equilibrium: at a low price for aerated concrete there is a high level of its supply (particularly in the Zhytomyr region); at the same time, the high price of aerated concrete has a low level of supply (in Luhansk, Zakarpattia and Poltava regions), and at an medium price there is a medium level of supply (in Volyn, Ternopil, Cherkasy, Kherson, Vinnytsia, Dnipropetrovsk and Chernivtsi regions). The situation in the clusters "medium price - high supply" (Mykolaiv and Chernihiv regions), "high price - medium supply" (Rivne and Kirovohrad regions), "medium price - low supply" (Donetsk, Kharkiv and Odesa regions), "low price - medium supply" (Ivano-Frankivsk, Khmelnytsky, Sumy, Kyiv regions) does not contradict Walras's concept. Only a single cluster "low price - low supply" (which includes Zaporizhia and Lviv regions) does not correspond to this concept, which requires additional study (the reason might be a low demand for aerated concrete in these regions).

Discussion. It should be noted that in order to complete the analysis of the condition of regional aerated concrete markets of Ukraine, it is necessary to evaluate, directly or indirectly, the indicators of demand for aerated concrete in the regions and compare them with supply indicators (which will be the purpose of our further research).

Conclusion. As a result of the research of the supply and price levels in the regional markets of aerated concrete in Ukraine, we have made the following conclusions:

1. There is an oligopoly in the aerated concrete market of Ukraine, and the degree of monopoly of this market has increased significantly in recent years. In fact, there is no single aerated concrete market in Ukraine, but there is a separate local

market in each region (however, most of them are represented by the same domestic and foreign manufacturers).

2. The sales volume of a particular manufacturer in the region is inversely proportional to the distance from the plant to the region, and the sales volume of a particular manufacturer in the nearest region is twice less than the sales volume in the region of production.

3. The aerated concrete supply in Ukraine is distributed very unevenly, both in absolute terms and in terms of the area of the region, its population, the area of regional GDP. This can lead to disparities in supply and demand in regional aerated concrete markets, which will require government regulation. However, the price for aerated concrete in most regions is low or medium, which indicates rather efficient logistics of the transportation of aerated concrete from production sites to most regions of Ukraine.

4. The relationship between the price level for aerated concrete and its supply level in the regions of Ukraine is generally consistent with the Walras's model with some exceptions that require additional research.

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A COMPARATIVE STUDY OF THE COST OF LIVING AND QUALITY OF LIFE BETWEEN NORTH AFRICAN COUNTRIES

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Abstract. *Through research and delving into the issue of the cost of living, as it is considered one of the important matters that concern the citizen and business owners and companies, as there are many studies, research, abstracts, reports and articles about the cost of living in different cities around the world. Although these studies are rich and powerful, only final results, such as city rankings, or summaries of most important and least-ranked cities, are published without price indexes displayed and compared. But through this paper, we aim to study a comparison between the most livable city countries in North Africa and the quality of life in them, using a presentation and comparison of cost-of-living data for the year 2020/2021.*

We will compare the outputs for the price indexes between the countries and cities under study, as these countries under study have a contiguous geographical location in North Africa and also have many common factors that were the reason behind the study and comparison of the cost of living in them, where this type of analysis and comparison to help people or business owners determine which city will be moved to reduce the cost of living.

Keywords*: cost of living, city, price indexes, Lifestyle, Cost of Living Index, Rent Index, Groceries Index, wages.*

JEL Classification: C10, C01, C15 ,C19 , C40, C44, C69, C80, E30, E49.

Formulas: 0; fig.:6; tabl.: 4; bibl.: 6.

Introduction. In many research and studies, it is possible to collect a lot of data from various fields, but this data is useless without proper analysis to obtain useful information. In this paper, we focus on collecting data on the cost of living and the quality of life by presenting, analyzing and comparing the results of the countries and cities under study, as the costs will be studied based on groups that include some of the elements that have been divided for their importance daily, as well as finding differences between the results for cities and countries To give a clear picture, to the people or the owners of the company to know the largest amount of data and its results to reach the best decision in the case of searching for the best and lowest cost of living.

Where the items are assigned to predefined categories (price indices) that depend on collecting data in terms of costs, prices and cost difference, and based on comparing differences to reach results that show that there is low variance within and between price indexes.

Literature review. Many researchers and specialists have made many contributions to studying the cost of living. But from my point of view, I will present the topic of studying the cost of living, the proportion of spending and the quality of life in it, and I will review the cost data and display the service packages and prices for each of the countries under study, and compare which countries are less in the cost of living than their counterparts in general, and through A comparison between the capitals of these countries and the cost of living in them in particular, and a comparison between the lifestyle and its quality in each of them.

Aims. The main objectives through presenting this research paper are to study and compare between prices of costs of living and quality of life in the North African countries under study and compare them with each other to reach which country can be better for living through lower cost of living and high quality of lifestyle.

Methods. In the beginning, we will provide an overview of the cost of living, display and describe its data, its sources and where we found it, and we will present its costs through a set of elements that we have divided to enumerate and compare them, and also display the quality of life data in the countries of the study and compare them to reach the best The results indicate which country has the lowest cost of living and the highest quality of life. These results may help some people and companies to determine the city they will move to reduce the cost of living.

Results. Through the research, the prices and costs of living were presented and also the quality of life in the countries of the study was presented and the results were compared to reach the best decision to choose the least expensive after giving a brief overview of the groups of important elements, whether on the personal or family level or in terms of the work of companies and institutions.

What is "cost of living". One of the most important determinations you need to make before moving to a new city or town is how much it will cost to live there. "Cost of living" is the amount of money you need to sustain a certain lifestyle in a given place.

Because the price of goods and services varies from one city to the next, calculating the cost of living will determine how affordable it is to live in a certain area. The expenses that factor into the cost of living can include housing affordability, transportation expenses, food prices and entertainment costs. Cost of living is also tied to income, as salary levels in a geographic area are measured against these expenses.

The definition of Cambridge Advanced Learner's Dictionary the Cost of Living is "the amount of money that a person needs to live [Cambridge, D.2013].

Changes in the cost of living over time are often operationalized in a cost-of-living index. Cost of living calculations is also used to compare the cost of maintaining a certain standard of living in different geographic areas. Differences in cost of living between locations can also be measured in terms of purchasing power parity rates.

Cost of living adjustment (COLA). Employment contracts and pension benefits can be tied to a cost-of-living index, typically to the consumer price index (CPI). A COLA adjusts salaries based on changes in a cost-of-living index. Salaries are typically adjusted annually. They may also be tied to a cost-of-living index that varies by geographic location if the employee moves. In this latter case, the expatriate employee will likely see only the discretionary income part of their salary indexed by a differential CPI between the new and old employment locations, leaving the non-discretionary part of the salary (e.g., mortgage payments, insurance, car payments) unmodified.

Annual escalation clauses in employment contracts can specify retroactive or future percentage increases in worker pay which are not tied to any index. These

negotiated increases in pay are colloquially referred to as cost-of-living adjustments or cost of living increases because of their similarity to increases tied to externally determined indexes. Cost-of-living allowance is equal to the nominal interest minus the real interest rate.

The Cost of Living Index. The cost of living is an index which is a measure of differences in the price of goods and services. Such a measure represents the cost of living at a given location as one number of aggregating prices on different goods and services. It is easy then to compare and rank different locations by this measure. On the other hand, the amount of money that a person needs to live also depends on the living standards of the person. Different persons need different amounts of goods to be satisfied. So it is difficult to construct one measure which will be useful for any person.

Cost of Living and Lifestyle. The cost of living can be a significant factor in personal wealth accumulation because a salary can provide a higher standard of living in a city where daily expenses such as rent, food and entertainment are less. In contrast, a high salary can seem insufficient in an expensive city such as New York. In a 2018 survey, Mercer, a global human resources firm, finds the cities with the highest cost of living include Hong Kong; Luanda, the capital of Angola; Tokyo; Zurich and Singapore, in that order. New York City was ranked the costliest city in the United States followed by San Francisco and Los Angeles, Chicago, Washington and Boston.[1]

Cost of living and wages. The rising cost of living has sparked controversy over the bottom line and the disparity between the lowest salary permitted by law and the earnings needed to maintain an adequate cost of living. Proponents of higher wages point to the increase in worker productivity levels since 1968 as unfairly linked to the minimum hourly wage rate. Since wage levels once followed the increase in productivity, the difference between profits and the efficiency of workers has reached historically disproportionate levels. By contrast, opponents of minimum wages argue that an increase could spur higher consumer prices as employers compensate for higher labour costs.

To do this we will use the following data on the cost of living from the Numbeo website are used.

Data Description. Five countries were selected, as these countries are in North Africa, and they are distinguished by their proximity to each other. We obtained data on consumer goods and services prices from the Numbeo website [www.numbeo.com], where forty-seven variables were selected on the cost of living prices according to the US dollar (USD), which were collected in - 2021/2020 by country as shown in Tables 1.

Table 1. Represents five variables of consumer services for the cost of living

	Detailed living costs variables (USD)
Represents five variables of consumer Restaurants services for the cost of living	
Meal in exp	Meal, Inexpensive Restaurant
Meal 2	Meal for 2 People, Mid-range Restaurant, Three-course
Cappuccino	Cappuccino (regular)
Coke/Pepsi	12 or small bottle
Water	12 or small bottle
Represents fifteen variables of consumer Markets services for the cost of living	
Milk	Milk (regular), (1 gallon)
Bread	A loaf of Fresh White Bread (500g)
Rice	Rice (white), (1kg)
Eggs	Eggs (regular) (12)
Cheese	Local Cheese (1kg)
Chicken Fillets	Chicken Fillets (1kg)
Beef	Beef Round (1kg) (or Equivalent Back Leg Red Meat)
Apples	(regular) (1kg)
Banana	(regular) (1kg)
Oranges	(regular) (1kg)
Tomato	(regular) (1kg)
Potato	(regular) (1kg)
Onion	(regular) (1kg)
Lettuce	(regular) (1 head)
Water	Water (1.5-litre bottle)
Represents six variables of Transportation services for the cost of living	
One-way Ticket	One-way Ticket (Local Transport)
Monthly Pass	Monthly Pass (Regular Price)
Taxi	Taxi 1km (Normal Tariff)
Gasoline	Gasoline (1 litre)
Volkswagen Golf 1.4 90 KW	Volkswagen Golf 1.4 90 KW Trend line (Or Equivalent New Car)
Toyota Corolla Sedan 1.6l 97kW	Toyota Corolla Sedan 1.6l 97kW Comfort (Or Equivalent New Car)
Represents three variables of consumer Utilities (Monthly) for the cost of living	
Utilities	Basic (Electricity, Heating, Cooling, Water, Garbage) for 85m2 Apartment
Mobile	1 min of Prepaid Mobile Tariff Local (No Discounts or Plans)
Internet	Internet (60 Mbps or More, Unlimited Data, Cable/ADSL)
Represents four variables of consumer Sports and Leisure for the cost of living	
Fitness	Fitness Club, Monthly Fee for 1 Adult
Tennis	Court Rent (1 Hour on Weekend)
Cinema,	Cinema, International Release, 1 Seat
Nike	1 Pair of Nike Running Shoes (Mid-Range)
Represents two variables of consumer Childcare services for the cost of living	
Preschool	Preschool (or Kindergarten), Full Day, Private, Monthly for 1 Child
International Primary School	International Primary School, Yearly for 1 Child
Represents four variables of Clothing And Shoes for the cost of living	
Pair of Jeans	1 Pair of Jeans (Levis 501 Or Similar)
Summer Dress	1 Summer Dress in a Chain Store (Zara, H&M, ...)
Pair of Nike	1 Pair of Nike Running Shoes (Mid-Range)
Pair of Men Leather Shoes	1 Pair of Men Leather Business Shoes
Represents four variables of consumer Rent Per Month for the cost of living	
Apartment	Apartment (1 bedroom) in City Centre
Apartment	Apartment (1 bedroom) Outside of Centre
Apartment	Apartment (3 bedrooms) in City Centre
Apartment	Apartment (3 bedrooms) Outside of Centre
Represents two variables of Buy Apartment Price for the cost of living	
Apartment in City Centre	Price per Square Feet to Buy Apartment in City Centre
Apartment Outside of Centre	Price per Square Feet to Buy Apartment Outside of Centre
Represents twenty variables of Salaries and Financing for the cost of living	
Average Monthly Salary	Average Monthly Net Salary (After Tax)
Mortgage Interest Rate	Mortgage Interest Rate in Percentages (%), Yearly, for 20 Years Fixed-Rate

The countries that were selected for the study are: Libya, Tunisia, Egypt, Algeria, and Morocco. The cities for which the price costs of living and lifestyle were compared are: Tripoli, Tunis, Cairo, Algeria, and Rabat. The considered goods and services may also be divided into groups concerning their meaning in the life of a typical consumer to Table 2.

Table 2. Represents variables of consumer goods and services for the cost of living

Type of variables	Consumer goods and services for the cost of living
Restaurants	A meal in exp, Meal 2, Cappuccino, Coke/Pepsi, Water
Markets	Milk, Bread, Rice, Eggs, Cheese, Chicken Fillets, Beef, Apples, Banana, Oranges, Tomato, Potato, Onion, Lettuce ,Water
Transportation	One-way Ticket , Monthly Pass , Taxi , Gasoline , Volkswagen Golf 1.4 90 KW , Toyota Corolla Sedan 1.6l 97kW .
Utilities	Utilities , Mobile , Internet .
Sports and Leisure	Fitness , Tennis , Cinema , Nike .
Childcare	Preschool , International Primary School .
Clothing And Shoes	Pair of Jeans , Summer Dress , Pair of Nike , Pair of Men Leather Shoes .
Rent Per Month	Apartment (1 bedroom) in City Centre Apartment (1 bedroom) Outside of Centre Apartment (3 bedrooms) in City Centre Apartment (3 bedrooms) Outside of Centre
Apartment Price	Apartment in City Centre Apartment Outside of Centre
Salaries and Financing	Average Monthly Net Salary (After Tax). Mortgage Interest Rate in Percentages (%), Yearly, for 20 Years Fixed-Rate.

Sourse: develop by author

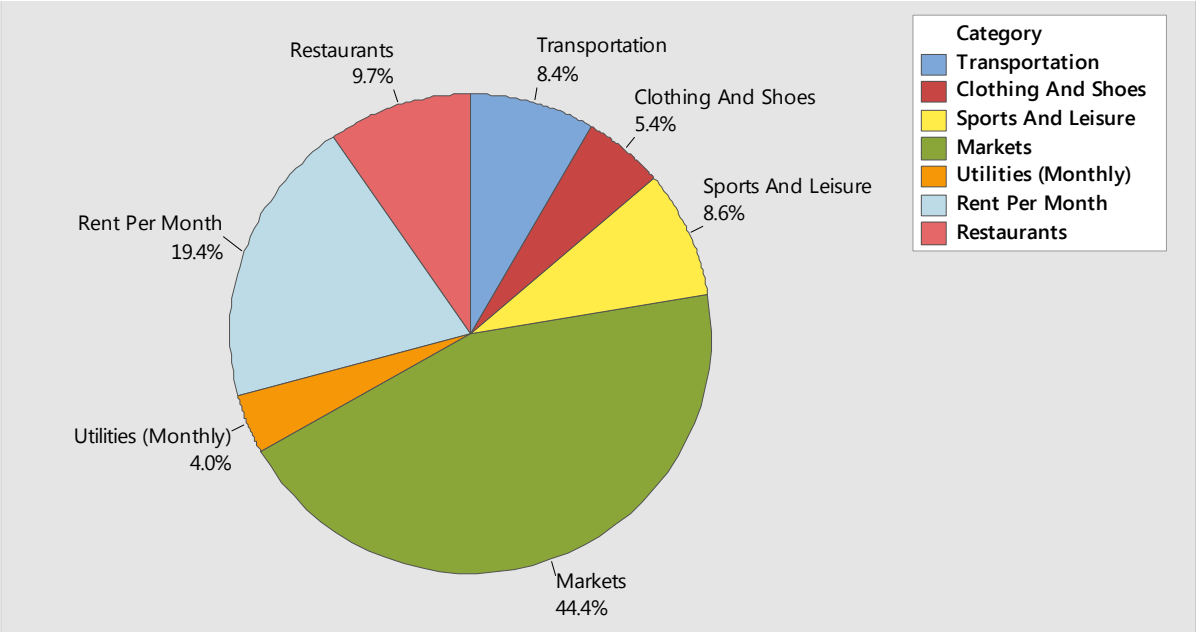

Figure 1. Represents variables Cost of Living in Libya

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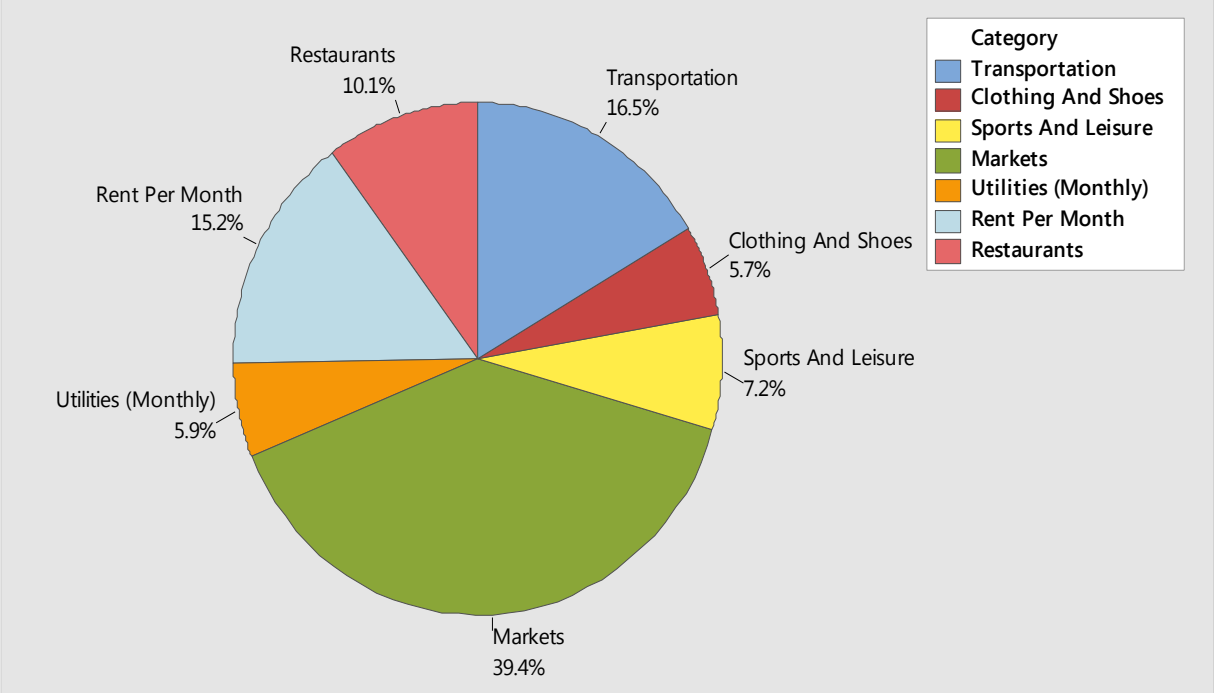

Figure 2. Represents variables Cost of Living in Tunisia

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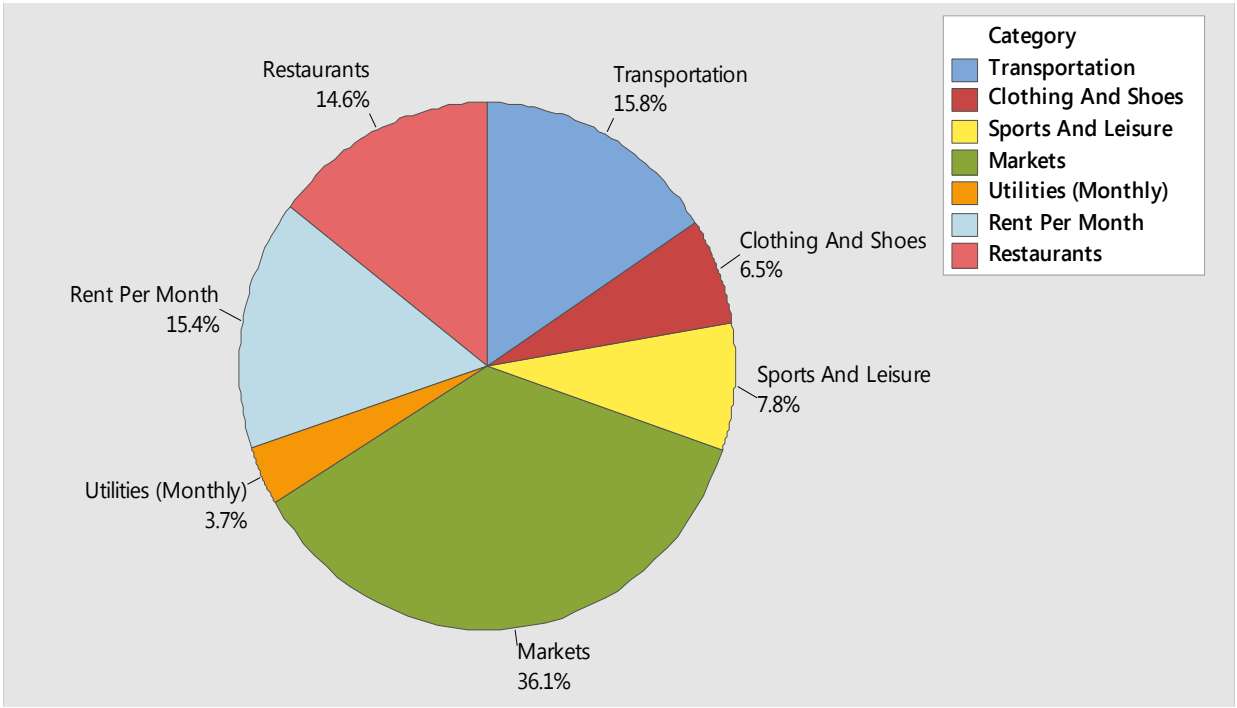

Figure 3. Represents variables Cost of Living in Egypt

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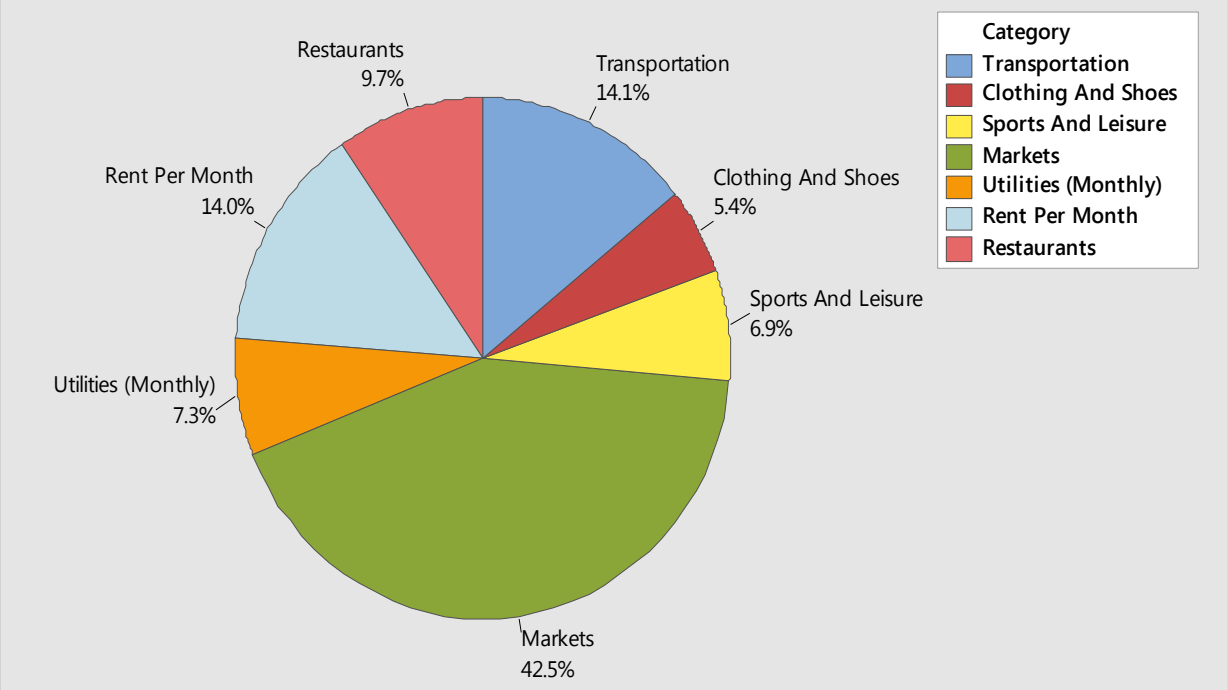

Figure 4. Represents variables Cost of Living in Algeria

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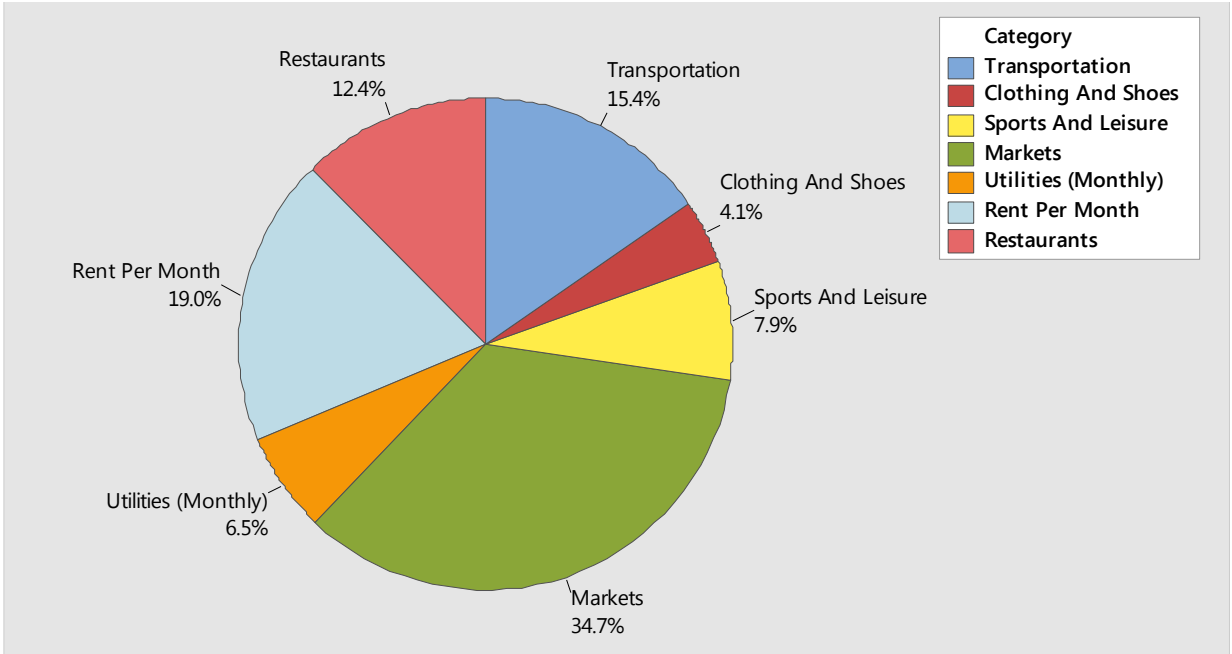

Figure 5. Represents variables Cost of Living in Morocco

Sourse: develop by author

Table 3. Represents variables Cost of Living Comparison Between Tripoli and Tunis, Tripoli and Cairo, Tripoli and Algiers, Tripoli and Rabat

	Cost in Tripoli	Cost in Tunis	Difference	Cost in Cairo	Difference	Cost in Algiers	Difference	Cost in Rabat	Difference
Restaurants									
Meal, Inexpensive Restaurant	3.70 $	2.95 $	-20.37 %	5.12 $	+38.29 %	3.01 $	-18.78 %	3.91 $	+5.59 %
Meal for 2 People, Mid-range Restaurant, Three-course	13.47 $	18.43 $	+36.87 %	25.61 $	+90.15 %	18.80 $	+39.59 %	22.35 $	+65.92 %
Cappuccino (regular)	0.52 $	0.84 $	+61.20 %	2.11 $	+302.7%	0.68 $	+30.01 %	1.67 $	+217.8 %
Coke/Pepsi (12 or small bottle)	0.42 $	0.67 $	+58.68 %	0.36 $	-14.05 %	0.52 $	+24.26 %	0.63 $	+50.75 %
Water (12 or small bottle)	0.18 $	0.28 $	+55.60 %	0.22 $	+24.25 %	0.19 $	+7.63 %	0.36 $	+104.3 %
Markets									
Milk (regular), (1 gallon)	3.59 $	1.70 $	-52.65 %	3.67 $	+2.19 %	2.60 $	-27.49 %	2.89 $	-19.36 %
Loaf of Fresh White Bread (1 lb)	0.20 $	0.13 $	-35.19 %	0.61 $	+200.19 %	0.13 $	-34.21 %	0.59 $	+189.90 %
Rice (white), (1 lb)	0.43 $	0.34 $	-19.97 %	0.33 $	-23.97 %	0.39 $	-9.03 %	0.70 $	+62.82 %
Eggs (regular) (12)	1.18 $	1.12 $	-5.26 %	1.14 $	-2.98 %	1.13 $	-3.70 %	1.33 $	+13.27 %
Local Cheese (1 lb)	3.20 $	4.19 $	+31.00 %	1.55 $	-51.72 %	2.95 $	-7.94 %	4.60 $	+43.62 %
Chicken Fillets (1 lb)	1.79 $	2.01 $	+11.87 %	2.08 $	+16.09 %	1.71 $	-4.70 %	2.54 $	+41.52 %
Beef Round (1 lb)	3.35 $	4.66 $	+39.17 %	3.97 $	+18.64 %	5.30 $	+58.42 %	4.25 $	+26.98 %
Apples (1 lb)	0.68 $	0.75 $	+10.65 %	0.71 $	+5.05 %	0.90 $	+33.17 %	0.62 $	-8.67 %
Banana (1 lb)	0.43 $	0.85 $	+96.99 %	0.38 $	-10.68 %	0.81 $	+88.13 %	0.56 $	+30.66 %
Oranges (1 lb)	0.40 $	0.37 $	-6.87 %	0.26 $	-34.39 %	0.56 $	+40.37 %	0.29 $	-27.76 %
Tomato (1 lb)	0.29 $	0.26 $	-9.69 %	0.19 $	-33.94 %	0.29 $	+0.41 %	0.26 $	-11.05 %
Potato (1 lb)	0.28 $	0.26 $	-5.45 %	0.18 $	-35.64 %	0.17 $	-36.51 %	0.23 $	-16.26 %
Onion (1 lb)	0.27 $	0.26 $	-5.43 %	0.17 $	-36.41 %	0.17 $	-35.24 %	0.23 $	-16.38 %
Lettuce (1 head)	0.58 $	0.36 $	-37.10 %	0.33 $	-42.80 %	0.49 $	-15.27 %	0.40 $	-30.83 %
Water (1.5 liter bottle)	0.34 $	0.27 $	-19.66 %	0.32 $	-4.05 %	0.23 $	-31.75 %	0.63 $	+85.97 %

	Cost in Tripoli	Cost in Tunis	Difference	Cost in Cairo	Difference	Cost in Algiers	Difference	Cost in Rabat	Difference
Transportation									
One-way Ticket (Local Transport)	0.25 $	0.22 $	-11.52 %	0.32 $	+28.05 %	0.30 $	+20.32 %	0.67 $	+168.2%
Monthly Pass (Regular Price)	8.98 $	14.75 $	+64.24 %	12.80 $	+42.61 %	11.28 $	+25.63 %	27.93 $	+211.1 %
Gasoline (1 gallon)	0.14 $	2.87 $	+1883.9%	1.86 $	+1190.6%	1.17 $	+711.1%	4.16 $	+2782.8%
Volkswagen Golf 1.4 90 KW Trend line (Or Equivalent New Car)	7,856.34 $	28,748.39 $	+265.93 %	26,890.34 $	+242.28 %	22,936.64 $	+191.95 %	27,932.96 $	+255.5 %
Toyota Corolla Sedan 1.6l 97kW Comfort (Or Equivalent New Car)	10,518.36 $	27,188.94 $	+158.49 %	24,170.79 $	+129.80 %	23,713.73 $	+125.45 %	23,479.65 $	+123.23 %
Utilities (Monthly)									
Basic (Electricity, Heating, Cooling, Water, Garbage) for 915 sq ft Apartment	16.83 $	46.78 $	+177.95 %	40.40 $	+140.02 %	36.80 $	+118.63 %	35.38 $	+110.23 %
1 min. of Prepaid Mobile Tariff Local (No Discounts or Plans)	0.03 $	0.08 $	+172.14 %	0.01 $	-56.46 %	0.07 $	+120.26 %	0.12 $	+317.61 %
Internet (60 Mbps or More, Unlimited Data, Cable/ADSL)	23.05 $	19.54 $	-15.22 %	17.43 $	-24.35 %	39.30 $	+70.53 %	33.52 $	+45.44 %
Sports And Leisure									
Fitness Club, Monthly Fee for 1 Adult	25.99 $	29.20 $	+12.37 %	29.42 $	+13.20 %	21.97 $	-15.45 %	24.39 $	-6.14 %
Tennis Court Rent (1 Hour on Weekend)	22.31 $	10.04 $	-55.02 %	10.58 $	-52.60 %	12.12 $	-45.70 %	23.04 $	+3.28 %
Cinema, International Release, 1 Seat	3.93 $	4.42 $	+12.62 %	5.44 $	+38.54 %	5.26 $	+34.01 %	5.59 $	+42.22 %
Childcare									
Preschool (or Kindergarten), Full Day, Private, Monthly for 1 Child	55.58 $	102.53 $	+84.48 %	150.84 $	+171.40 %	88.09 $	+58.50 %	137.57 $	+147.52 %
International Primary School, Yearly for 1 Child	1,794.37 $	2,229.00 $	+24.22 %	3,521.35 $	+96.24 %	3,371.56 $	+87.90 %	3,351.96 $	+86.80 %

	Cost in Tripoli	Cost in Tunis	Difference	Cost in Cairo	Difference	Cost in Algiers	Difference	Cost in Rabat	Difference
Clothing And Shoes									
1 Pair of Jeans (Levis 501 Or Similar)	40.03 $	56.62 $	+41.44 %	47.23 $	+18.00 %	42.14 $	+5.28 %	41.63 $	+4.02 %
1 Summer Dress in a Chain Store (Zara, H&M, ...)	28.33 $	52.70 $	+86.00 %	52.00 $	+83.55 %	44.14 $	+55.80 %	44.69 $	+57.75 %
1 Pair of Nike Running Shoes (Mid-Range)	54.60 $	91.65 $	+67.85 %	131.06 $	+140.04 %	73.13 $	+33.93 %	87.99 $	+61.15 %
1 Pair of Men Leather Business Shoes	80.46 $	71.58 $	-11.04 %	73.80 $	-8.28 %	101.86 $	+26.60 %	97.12 $	+20.70 %
Rent Per Month									
Apartment (1 bedroom) in City Centre	211.21 $	228.74 $	+8.30 %	260.37 $	+23.28 %	256.94 $	+21.65 %	460.51 $	+118.04 %
Apartment (1 bedroom) Outside of Centre	122.44 $	152.04 $	+24.17 %	150.60 $	+23.00 %	164.76 $	+34.57 %	241.08 $	+96.90 %
Apartment (3 bedrooms) in City Centre	491.35 $	422.06 $	-14.10 %	493.56 $	+0.45 %	451.21 $	-8.17 %	858.30 $	+74.68 %
Apartment (3 bedrooms) Outside of Centre	267.76 $	293.76 $	+9.71 %	318.03 $	+18.77 %	277.99 $	+3.82 %	446.11 $	+66.61 %
Buy Apartment Price									
Price per Square Feet to Buy Apartment in City Centre	88.65 $	85.50 $	-3.55 %	85.30 $	-3.78 %	178.73 $	+101.60 %	172.57 $	+94.66 %
Price per Square Feet to Buy Apartment Outside of Centre	33.77 $	67.72 $	+100.54 %	46.06 $	+36.41 %	103.18 $	+205.55 %	96.02 $	+184.32 %
Salaries And Financing									
Average Monthly Net Salary (After Tax)	242.28 $	332.38 $	+37.19 %	274.15 $	+13.15 %	277.44 $	+14.51 %	534.22 $	+120.49 %
Mortgage Interest Rate in Percentages (%), Yearly, for 20 Years Fixed-Rate	15	9.94	-33.75 %	12.68	-15.47 %	6.68	-55.44 %	4.77	-68.17 %

Sourse: develop by author

As we can see through the table 3 that there are a difference and variation in the cost of living between Tripoli, Libya, Tunisia in Tunis and Cairo in Egypt, Algeria in Algeria, and Rabat in Morocco, where the cost in these countries and their capitals are high compared to the cost of living in Tripoli Libya.

Table 4. Represents variable of Cost of Living Index by Country Northern Africa

Rank	Country	Cost of Living Index	Rent Index	Cost of Living Plus Rent Index	Groceries Index	Restaurant Price Index	Local Purchasing Power Index
1	Morocco	36.85	9.72	23.89	32.78	26.33	32.17
2	Egypt	30.1	5.97	18.57	26.53	24.91	19.99
3	Tunisia	29.5	5.77	18.16	28.48	15.75	27.81
4	Algeria	28.31	5.01	17.18	29.09	14.98	24.77
5	Libya	22.32	5.68	14.37	25.3	13.31	31.81

Sourse: develop by author

Also, we can also see from the table 4 that there are a difference and variation in the cost of living index according to the countries in North Africa: Libya, Tunisia, Egypt, Algeria and Morocco, where it can be noted that the country of Libya is one of the lowest indicators of the cost of living compared to the rest of the countries.

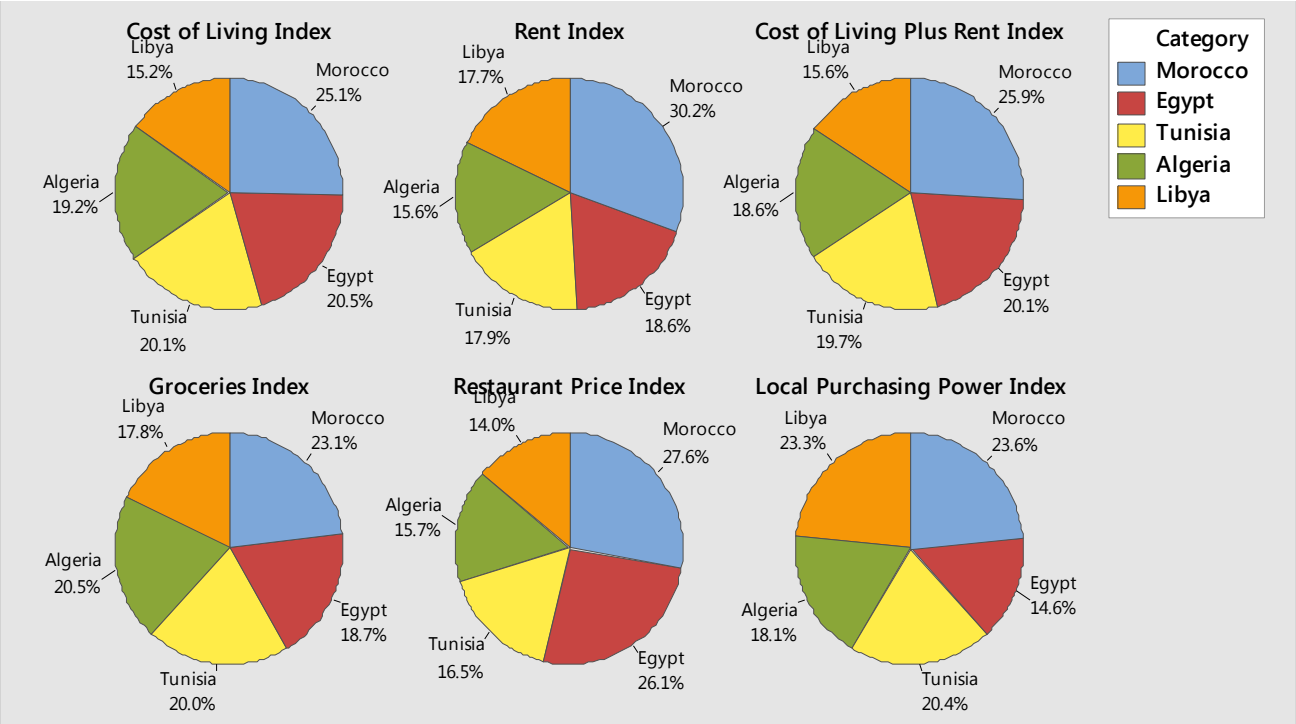

Figure 6. Represents variables Cost of Living Index by Country Northern Africa
Sourse: develop by author

Discussion. From the results of viewing and analyzing the cost of living data in the study countries, as they have a contiguous geographical location in North Africa, especially when compared with each other, we noticed that there are differences in prices, whether in costs or lifestyle.

Whereas, surprisingly, there is a variation in the cost of living and lifestyle costs despite the close geographical location, and as these countries have other similar

factors such as language, religion, customs and traditions similar, and we can notice this discrepancy in prices by looking at the charts presented earlier.

Since the countries under study have a local currency for each, for this purpose in this paper, the US dollar is used as a general standard.

Conclusions. In this research, we take into account the methods of collecting and presenting data on the cost of living and the quality of lifestyle within the countries and cities understudy and comparison, as we noticed through the results the difference and discrepancy in prices and costs during the presentation of the illustrations for the analysis.

Through these results, we were able to compile an opinion based on facts that differ from what is common in other research that reflects different views on the method of outputs and results analysis. These results allow us to describe the similarities and differences in the price structure of products and services in different cities and countries under study.

The results showed that the state of Libya is considered one of the cheapest countries in terms of cost of living compared to neighbouring countries such as Tunisia, Egypt, Algeria and Morocco, taking into account the neighbourhood in its geographical location.

Where these results can be used by individuals or institutions to choose the best countries in North Africa to live in by comparing the cost of living in them compared to the available budget.

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ECOLOGICAL AND ECONOMIC PROBLEMS OF ROOF GREENING

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Abstract. *One of the rational ways to solve the problem of environmental pollution and energy savings is landscaping roofs. Their creation is becoming an increasingly popular element of ecological construction. The purpose of this article is to study the state of landscaping of roofs of buildings in the city of Lviv to identify environmental and economic problems and develop incentives to combat themTo achieve the goal of the study, a comprehensive approach was used, which includes the generalization and analysis of information, current regulations and experience in installing "green" roofs. While disclosing the content of the "green roof", a logical method was used. Methods of system analysis were used to identify structural links between landscaping roofs and solving environmental and economic problems; comparative analysis allowed to compare phenomena in order to establish similarities or differences between them. The article highlights the essence of the concept of "green" roof. Features of extensive type of roof landscaping and its ecological and economic problems are given. The calculation of the reduction of surface wastewater volume during the installation of green roofs at PJSC "Lvivsilmash Plant" was made and recommendations for their proper functioning were formed. Incentive measures to overcome environmental and economic problems of living roofs have been developed. Urban farming is proposed as a new element of ecological and economic policy of Lviv. Conclusions. The use of landscaping of roofs in both industrial zones and residential areas makes it possible to create a comfortable environment close to natural conditions, increases the recreational and aesthetic attractiveness of the urban environment and improves its economic performance.*

Keywords: *environment, ecospace, landscape design, roof constructions, energy saving, water saving, real estate, urban farming, ecological safety, economic responsibility.*

JEL Classification: P18, Q41, Q57.

Formulas: 3; fig.: 3; tabl.: 2; bibl.: 31.

Introduction. In connection with the industrialization of society, namely, the growth of cities and population, the increase of residential and public buildings that are put into operation, the development of all modes of transport, etc., especially exacerbated the problem of energy conservation and pollution. The increase in residential buildings in the city of Lviv affects the comfort of living. One of the rational ways to solve the problem of environmental pollution and energy savings is landscaping. Only modern technologies for creating and restoring a green environment that can change the ecological situation.

Landscaping is a measure aimed at improving the ecological condition of the environment of the city of Lviv and landscaping of its territory. Green roofs as an element of landscape architecture and design have recently become more and more of interest to society. As a rule, objects of social infrastructure are subject to such process: public centers, city streets and squares, parks, squares. But given the balance of the current environmental situation and landscaping of cities, as practice shows, such measures are either not always enough for a healthy and prosperous existence of the population, or they apply only to a certain part of the city (due to lack of "ecospace"). In this regard, there is interest and need for alternative methods of landscaping, the objects of which are the roofs of buildings. Currently, this type of landscaping is becoming an increasingly popular element of ecological construction.

Roof landscaping has gained recognition and spread around the world, even in countries with cold climates, where during the winter the plants may lose their aesthetic appeal. Therefore, in such an urbanized city as Lviv, the use of green roofs is especially important.

Literature review. Advantages and disadvantages, technical features of green roofs are revealed in the works L.M. Dadiverina, A.V. Reed (Dadiverina & Komishnya, 2018), M.A. Minyailo, O.I. Filonenko (Minyajlo & Filonenko, 2015), V.I. Solonenko, O.B. Watamanyuka (Solonenko & Vatamanyuk, 2017) and others. In studies of V.M. Shuvalov and M.M. Saadoma (Shuvalov & Saad, 2016) the relevance of the use of "green" roofs is based on the fact, that large cities face problems of air pollution and noise. Scientists A. Fedorov, F.G. Stolyarova, P.S. Kordyukov, M.C. Osintseva (Fedorova, Stolyarova, Kordyukov & Osintseva, 2013) consider the durability of "green" roofs, namely the range of plants that are most suitable for planting on the roof. Scientists V.M. Filipenko, R.G. Abakumov (Filipenko & Abakumov, 2017) determine the factors that increase the investment attractiveness of green buildings. In the works of T.V. Prilipko, T.E. Potapova, O.V. Siromakha (Prilipko, Potapova & Syromakha, 2015) and V.A. Gorokhov (Gorokhov, 2012) is shown the relationship between the decrease in the number and quality of greenery and the deterioration of the health of the city population (there is an increase in the number of diseases of the respiratory system, nervous system, etc.).

However, despite the significant amount of research on this issue, many issues of natural and economic nature in the field of management of green areas remain poorly understood. These studies did not focus on development stimulating measures to overcome environmental and economic problems of landscaping roofs.

Aims. The purpose of this article is to study the state of landscaping of roofs in Lviv to identify environmental and economic problems and develop incentives to overcome them. Achieving this goal determines the solution in the process of the study of the following tasks: to determine the features of the extensive version and the layered structure of the system of "green" roofs; identify the main environmental and economic problems of designing and creating landscaping roofs; calculate the reduction of surface wastewater during the installation of a green roof at PJSC "Lvivsilmash Plant"; to form recommendations for the proper functioning of green roofs; develop incentive measures to overcome environmental and economic problems of roof landscaping; to offer a new element of ecological and economic policy of the Lviv city.

Methods. To achieve the goal of the study, a comprehensive approach was used, which includes the generalization and analysis of information, current regulations and experience in installing "green" roofs. When disclosing the content of the "green roof", a logical method was used; methods of system analysis - to identify structural links between landscaping roofs and solving environmental and economic problems; comparative analysis - allowed to compare phenomena in order to establish similarities or differences between them.

Results. The practical implementation of ecological and economic development of a large city should include the following factors: cooperation of public authorities,

local governments, NGOs, science, business in solving problems and developing recommendations for integrated environmental protection, implementation of "clean", resource- and energy-efficient technologies, environmentally balanced systems of nature management and preservation of the city's eco-system, guaranteeing ecological safety for the health and life of the population, ensuring social welfare and economic stability. The object of management in this case is the city ecological and economic system. Leaders of ideas and practical actions for the dissemination of "green" approaches in the development of ecological and economic system in different countries are Green Building Councils (Green Building Councils), which are created according to the model and under the auspices of the World Council. In the United States, the USGBC Council unites more than 15,000 legal entities, the developer of the LEED standard, in Ukraine - the Ukrainian Council for Green Building (UaGBC), which is a public organization.

Environmental problems associated with landscaping of densely populated cities can be solved without using radical options for changing areas. Currently, special attention is paid to the development of modern methods of forming zones of ecological comfort. Within the framework of this direction, the following measures are carried out creation of living roofs of buildings; use of vertical plant facades; construction of eco-parks. Recently, the leader in the direction of "green" construction is the landscaping of roofs, which has long been used to increase the comfort and attractiveness of the appearance of houses.

From the point of view of L.M. Dadiverina and A.V. Komyshnaya, green roof is a combination of construction technologies and techniques of landscape design, i.e. it is the roof of the building, partially or completely covered with soil and vegetation (Dadiverina & Komishnya, 2018). Scientists O.V. Nilova and Z.S. Moskalenko argue that roof landscaping is a free area of space that can be used for rest and recovery (Nilova & Moskalenko, 2019).

In our opinion, a green roof (ecological roof, operated roof, living roof and vegetation roof) is a roof that partially or completely is covered with vegetation, located in the upper part of the roof structure on a waterproof membrane with a nutrient layer. It should be noted that in modern practice, the creation of "green roofs" is the most widespread extensive option.

At extensive gardening applies the plants, which maintain adverse conditions. They are usually low and fast growing, drought- and winter-hardy, do not require frequent watering and fertilizing, should not emit allergens. This is how perennial herbaceous plants, succulents, cereals and lawn grasses are used. The studied species, which belongs to the first group, is *Pseudofumaria lutea* L., of the *Papaveraceae* Juss-Borkh family. (The Plant List, 2020). The natural range covers the forest areas of the Southern Alps, despite the fact that it is a sciogeliophyte; it has proven itself well on green roofs. The undeniable advantages of this species include its life form - a geophyte-cryptophytic (Raunkiaer, 1934), which allows it to survive adverse periods - frosts in winter and drought in summer. This species is highly decorative, constantly blooms, is virtually undamaged by diseases and pests, is non-invasive, and in favorable conditions leaves the basal leaves evergreen, increasing the decorative

plant compositions (Missouri Botanical Garden, 2020). By USDA-zoning, *Pseudofumaria lutea* is suitable for planting in 4-8 zones of frost resistance, while the territory of the city of Lviv belongs to zone 6 and it is well suited for the roofs of the city (Heinze & Schreiber, 1984).

For landscaping roofs that are in the shade, you can use the species *Sedum* L., which belongs to the second group of plants. In an urban environment, one of the most suitable for use on flat roofs is the system "Sedum carpet", which is created on many roofs of buildings in Lviv. It includes such species and their cultivars as *Sedum aizoon* L., *Sedum acre* L., *Sedum album* L., *Sedum hybridum* L., *Sedum kamtschaticum*, *Sedum rupestre* L., *Sedum spurium*, *Sedum spectabile*, *Sedum alpestre*, *Sedum ewersii*.

The system of landscaping the roof using lawns is created from a mixture of plants - cereals: *Festuca rubra* L., *Lolium perenne* L., *Poa pratensis* L. Occasionally they are supplemented by solitary plantings of other cereals - *Calamagrostis epigejos* (L.), *Miscanthus sinensis*, *Festuca glauca*, F. *amethystina* L., creating a garden of cereals. This is the third group.

It will be great to see representatives of the genus *Sempervivum* L. (W.D.J. Koch) lay on the green roof. The leaves of these plants are covered with a special waxy coating, which prevents the evaporation of moisture. Therefore, they do not require additional watering. Bright green color can complement any architectural structure (Minyajlo & Filonenko, 2015).

Access of people to such roof for recreation is not provided and movement is possible only on special paths. This type of landscaping can be widely used in the arrangement of industrial enterprises, garages and shops (Skabelkina, 2017; Tsurkina, Laketich, Laketic & Korenkova, 2016; Solonenko & Vatamanyuk, 2017). Outside the city, the roofs of houses, gazebos, terraces, sheds and other outbuildings are planted in this way. Roofs with a slope of at least 4 degrees must be equipped with a drainage system, otherwise there will be stagnation of water in the soil and, consequently, increase the load on the roof.

An example of an extensive type of roof landscaping can be seen in Fig.1.

a) b)

Figure 1. Extensive type of roof landscaping (photo by O.E. Galevich)

As can be seen from Fig. 1, plants need soil and moisture for growth, respectively, the technology of extensive "green" roof involves the creation of a special structure in which each layer performs its specific functions (Fig. 2).

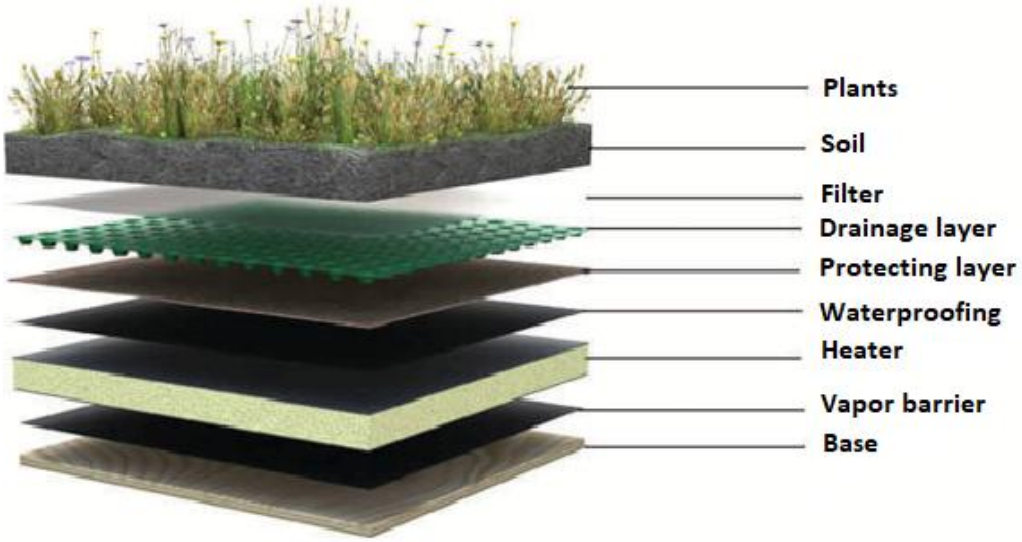

Figure 2. Layered structure of the "green" roof system

According to scientists V.P. Ocheretny, T.E. Potapova, D.M. Kuzmina and V.M. Sologor, the main problem why there are no green industrial roofs in Lviv is the misunderstanding that by installing a green roof with the right technology, you can completely forget about waterproofing repairs. Such roofs can hold up to 80% of rainwater, which is a reduction in the load on urban sewage, which often does not cope with rainwater volumes, fails, leading to flooding (Prilipko, Potapova & Syromakha, 2015; Ocheretny, Potapova, Kuzmina & Sologor, 2017).

Therefore, for landscaping large roofs (industrial and warehouses) it is advisable to use the extensive type, because it is cheaper, and the roof does not require special care and additional strengthening of structures enclosing buildings.

From our point of view, in order to stimulate the owners of industrial zones in water retention in the areas of their roofs, we will fulfill the forecast of reducing the volume of surface wastewater during the installation of green roofs. The calculations will be applied to two industrial sites of one of the agricultural machine-building enterprises in Lviv (PJSC Lvivsilmash Plant).

Annual volume of surface wastewater, W, m^3:

$$W = W_d + W_t, \quad (1)$$

where W_d is the volume of surface wastewater discharged during the warm period (volume of rainwater), m^3; W_t - volume of surface wastewater discharged during the cold period (volume of melt water), m^3.

The volumes of surface runoff discharged during the warm and cold periods of the year are determined according to the formulas (SOU ZhKG, 2009: 18):

$$W_d = 10 \cdot h_d \cdot k_d \cdot F, \quad (2)$$

$$W_t = 10 \cdot h_t \cdot k_t \cdot F, \quad (3)$$

where 10 is the coefficient of alignment of the dimensions h_d and F to obtain the values of W_d, W_t in m^3; h_d - average annual precipitation layer for the warm period of the year, mm, for Lviv is 475 mm (DSTU - NBV. 1.1 - 27: 2010, 2011); h_t - annual layer of precipitation for the cold period of the year, mm, is 225 mm (DSTU - NBV. 1.1 - 27: 2010, 2011); k_d - rainwater runoff coefficient, taken equal to the weighted average value for the entire catchment area, taking into account the average

values of runoff coefficients of surfaces of different types; k_t - melt water runoff coefficient; F - catchment area, hectare.

According to the current normative document in Ukraine (Order of the Ministry of Housing and Communal Services, 2010), the value of the total runoff coefficient for rainwater must be taken as: for waterproof coatings in the range of 0.6−0.8, for soil surfaces - 0.2, for lawns - 0.1, and for melt runoff, regardless of the type of coating - in the range of 0.5-0.7. According to research L.I. Vovk and Yu.A. Trofimchuk, it is recommended the use of the normative document "Rules for the use of centralized municipal water supply and sewerage systems in settlements of Ukraine", according to which the runoff coefficient for rainwater must be taken as 0.7 (for waterproof coatings), and for melt water regardless of the type of coverage - 0.6 (Vovk, Trofimchuk, 2018).

It is also worth noting that the environmental technologies of the German company Wilo have the best reputation in the world in the field of rainwater. This company has developed a reference guide for the use of rainwater. This guide provides examples of calculating rainwater inflows, determining water needs, calculating the volume of a rainwater storage tank and selecting a water supply system. In addition, it is interesting and valuable for our study to introduce the coefficient of runoff (c) for different types of roof surfaces, including extensive green roofs (Wilo, 2016; Ferrans, Rey, Pérez, Rodríguez, Díaz-Granados, 2018). In the Ukrainian DBN 2.6-14-97 and DBN B.2.6-220: 2017 such a technique is absent.

Sites of agricultural machinery, in addition to the general patterns in the formation of quantitative characteristics of surface wastewater, have differences, which are mainly due to the different proportion of permeable surfaces in the total catchment area (for sites of main production, compared with sites of ancillary production administrative buildings).

The results of calculations of the volume of surface wastewater discharged in the city sewerage network from the site of the main and auxiliary productions of PJSC "Lvivsilmash Plant" and their projected values in the arrangement of green roofs are given in table. 1.

Thus, the arrangement of green roofs on the production buildings of industrial enterprises in Lviv will provide:

1. Reduction of surface wastewater discharged in the city storm sewer network by almost 2.5 times (by 60%), reducing the load on them during heavy rainfall.
2. Reducing the level of harmful substances in the air due to the absorption of carbon dioxide and the release of oxygen in the industrial zone.
3. Increasing the durability of the roof structure by 2.5-3.5 times, as the green roof performs a protective function against exposure to UV rays and overheating.
4. Reducing energy costs for heating and cooling, as a green roof serves as a natural insulator.
5. In the event of a fire, such a roof will prevent its spread.

Table 1. Determination of the volume of surface wastewater from the territory of PJSC "Lvivsilmash Plant"

Name	The site of the main production	Additional production site
Total area, hectares	49.9	72.29
Area of waterproof surfaces, ha	16	28.9
With a roof		
Rainwater runoff ratio	0.7	0.7
Melt water runoff coefficient	0.6	0.6
Volume of surface wastewater during the warm period, m^3	53.2	96.09
Volume of surface wastewater during the cold period, m^3	21.6	39.02
Annual volume of surface wastewater, m^3	74.8	135.11
When installing a green roof		
Rainwater runoff ratio	0.3	0.3
Melt water runoff coefficient	0.6	0.6
Volume of surface wastewater during the warm period, m^3	22.8	41.2
Volume of surface wastewater during the cold period, m^3	21.6	39.02
Annual volume of surface wastewater, m^3	44.4	80.22
Decrease in annual quantity of surface sewage of waters discharged in the city storm sewer network, m^3/%	30.4 / 60.0	54.89 / 60.0

Therefore, among other advantages of application of extensive "green" roofs the scientist A.V. Bezkorovaina distinguishes the following: increasing sound insulation, using them as a recreational area and obtaining economic benefits from it (Beskorovainaya, 2015). A.I. Yevtushenko, V.E. Nuriev, V.V. Zotov and V.I. Vinogradov (Evtushenko, Nuriev, Zotov & Vinogradov, 2018) note similar advantages: green roofs do not overheat in summer and provide additional insulation in winter, provide sound insulation and have a longer service life. That is, in addition to an attractive appearance, green roofs solve problems of both environmental and economic nature. Numerous scientific investigations and practical experience confirm the positive impact of green roofs on climate, vegetation diversity and the overall landscape of the city (Berto, Stival, Rosato, 2018; Shafique, Kim & Rafiq, 2018; Teotónio, Silva, Cruz, 2018).

In general, the study of the impact of industrial enterprises roofs extensive landscaping on the state of the ecological and economic system of Lviv revealed the positive impact of greenery on the main parameters that characterize the quality of the environment and is expressed in the following:

1. Extension of a life cycle of a roof without repair, thanks to protection against the aggressive environment and mechanical influences. Saving money, the roof covered with tar is replaced on average in 20 years, but its service life increases by 2-3 times;

2. Water conservation, rainwater absorption occurs. Such water can be reused in production.

3. Reduction of rainwater. Can hold water by 60%. Reducing the load on the city sewage by rainwater runoff - reducing the money spent on sewage.

4. Acoustic comfort. Reduce sound reflection on the roof surface and improve sound insulation to 8 dBs. The soil layer absorbs low frequencies, and plants - high. Protection against electromagnetic radiation.

5. Reduction of carbon dioxide emissions generated by electricity generation at power plants for air conditioning and heating. Absorption of 0.5 kg of harmful particles per square meter. Dust neutralization (University of Duisburg (Germany): 1,000 m2 of extensive roof landscaping absorbs 8 kg of dust per year; Singapore: the air near the green roof contains 37% less sulfur dioxin and 21% less carbon monoxide; Michigan, Detroit (USA): 20% of the roofs of these cities, which are green, neutralize 889 tons of nitric oxide per year, University of Michigan (USA): environmental impact of landscaping 20% of the surface of all roofs of the city (17,000 planted street trees) (Dadiverina & Komishnya, 2018).

6. Production of additional oxygen. German scientists R. Schubert and M. Meisterhaus proved that a grassy lawn on a roof of only 150 m^2 produces oxygen that can breathe 100 people, and a green roof of 48 m^2 produces as much oxygen as a tree with a crown about 10 m in diameter (Seroshtan, 2015). As a result, landscaping the roofs of the city helps to reduce air pollution and enrich it with oxygen, which increases the comfort of life and reduces the number of diseases, especially asthmatic.

7. Reducing the cost of cooling the building by 15-19% due to the natural evaporation of moisture. Studies show that in summer a high concentration of green roofs can significantly reduce the average temperature of the whole city by 2-5 ° C.

8. The green roof becomes a new living space for flora and fauna. Dozens of species of plants, including rare ones, dozens of species of insects, birds and other small animals can survive on green roofs (Solonenko & Vatamanyuk, 2017).

9. Reducing the cost of repair and maintenance of the roof.

10. Additional income from the lease of land on the roof.

11. Increasing the value of real estate.

12. Good aesthetic appearance of buildings.

13. Reducing the cost of heating of the upper floors of the building in winter and cooling of rooms in summer.

The value of alternative forms of roof landscaping is not only in the renewal of the ecosystem, but also in energy efficiency. This area became especially relevant in Europe in the 60's during the energy crisis. Currently, energy efficient technologies are very relevant for Lviv. Extensive green roofs in residential areas are a kind of temperature buffer that improves energy consumption for heating in winter and cooling in summer. Green roofs contribute to the thermal insulation of the house. The savings directly depend on the climate, composition and amount of substrate, the height of the roof structure and the selection of the range of plants, so the economic effect will be individual for each roof.

For example, in winter, the effect of thermal insulation with extensive landscaping and a substrate height of only 10 cm can be improved by 10%. The difference in temperature on the surface of the waterproofing without landscaping can reach 100º C during the year. Especially in summer, a green roof helps to reduce the heat load to about 60%.

Numerous studies in this area converge in one; green roofs help to smooth out effectively temperature jumps. The greatest thermal insulation is achieved in summer, by cooling the upper floors of the building. For example, the temperature of the roof structure under the green roof system, at an ambient temperature of 30 °C, is 17.5 degrees. The thickness of the substrate is only 16 cm in January at -14 °C; the temperature under the plant environment is 0 degrees. The economic effect is to reduce the cost of heating and air conditioning of buildings by an average of 20-30%.

It is important that in Ukraine landscape and recreational planning of settlements is regulated by DBN 360-92 "Planning and development of urban and rural settlements" (Order of the State Commission for Urban Development, 1992), as well as the State sanitary rules of planning and development of settlements (Order of the Ministry of Health, 1996).

Standards for "green" construction in Ukraine are voluntary (Zinchenko, 2015). In many ways, the activities of the Ukrainian Council contribute to the implementation of these standards. The priority areas of its work are:

- implementation of international standards of "green" construction in the country;
- certification of real estate for compliance with the standards of "green" construction;
- organization of conferences, seminars and "round tables" on "green" construction for construction and energy professionals, environmentalists and lawyers;
- popularization of ideas of "green" construction.

The existing document DBN-360 (Order of the State Commission for Urban Development, 1992) states that in the conditions of compacted construction, the use of vertical landscaping is allowed, as well as the arrangement of gardens on the roofs of buildings. However, there are no rules for the design and creation of landscaping roofs. Thus, all landscape design companies engaged in landscaping roofs in Lviv today have no idea about the correctness of their design, which leads to a gross violation of technology, safety and reduced service life of facilities. Exceptions may be international companies (e.g., ZinCO, FlorDepot), operating in the Ukrainian market according to European standards and technologies.

Also, the main problems of extensive landscaping of roofs - the destructive force of the crustal system and wind loads, so the design is quite complex. It usually has several insulating layers, additional windbreaks and a special irrigation system. The soil layer for plants should be 30-40 cm, to create a lawn - 15 cm. Permissible loads in the case of extensive landscaping when saturating the soil with water should not exceed 70 kg/m^2 of surface. New technologies of arrangement of "green roofs" include the whole complex of construction works. This is a solution to waterproofing,

the device of the drainage layer with the necessary filtration. Depending on the specific conditions of the composition and the number of layers of green roofing can vary within the widest range, each time meeting a specific task.

Among other ecological and economic problems of landscaping of roofs, it is possible to allocate the following: before installation it is necessary to carry out examination of the building and a roof; engineering and technical complexity of design; the emergence of a high level of humidity, so before planting covered with special materials that provide waterproofing of the roof; high cost of installing a green roof (from 100 to 200 euros per 1 m^2); plants are found in unnatural conditions (temperature difference, negative effects of wind, increased evaporation of moisture, negatively affects their growth and development); in the event of a roof leak, repairs will cost much more, and the cause of the problem is much more difficult to establish; application of a heating drainage system so that at a negative air temperature the soil layer does not freeze.

Another reason for abandoning green roofs in Lviv is, unfortunately, the low quality of construction and installation work. Installation of such a roofing system requires special knowledge and experience. Additional difficulties and financial costs are borne by the service system, because the plants need constant care. Opinions "against" are due to time and lack of knowledge and information, little experience in this field of domestic architects, design engineers, contractors, operating organizations, and sometimes the customers themselves.

As it was mentioned above, in order to increase the effectiveness of care for the roof and the plants that are planted on it, we have proposed the following recommendations: monitoring the flow 2 times a year (autumn and spring after heavy rains and snowmelt); monitoring of the flow 2 times a year (autumn and spring period after heavy rains and snowmelt); conducting regular monitoring of the condition of green plants (at the slightest signs of freezing, various diseases, it is necessary to provide quality treatment and care); in the presence of system of auto-irrigation and lighting of carrying out maintenance before the beginning of operation and at the end of operation; in case of weeding, its immediate removal is required; in the dry season in the absence of an auto-irrigation system additional watering of a green roof is necessary; in especially snowy period it is necessary to remove excess snow to reduce the load on the building; when the substrate layer subsides, its backfilling is required; with a large slope of the roof it is necessary to use a geogrid to avoid washing away the substrate and the layer of green plants during heavy rains and snowmelt.

In addition, one of the significant factors in increasing the environmental and economic value of the urban area is the regulatory system that ensures the preservation and development of landscaping and contribute to the normalization of the environmental situation, as well as improving living standards.

The strategy of improving the existing system of landscaping roofs should be implemented based on budget self-sufficiency of the "green" municipal sector through the development of a transparent scheme of financial flows, targeted use of accumulated funds from the operation of green spaces, widespread use of tools that increase economic responsibility, operation of green areas, including compensation

payments, consideration of landscaping in the calculation of rent, financial guarantees of contractors for the volume and quality of work performed. Along with this, the necessary components of effective management of landscaping roofs are forecasting the need for greenery for different areas of the city of Lviv based on an inventory of green roofs and the use of incentives (Fig. 3).

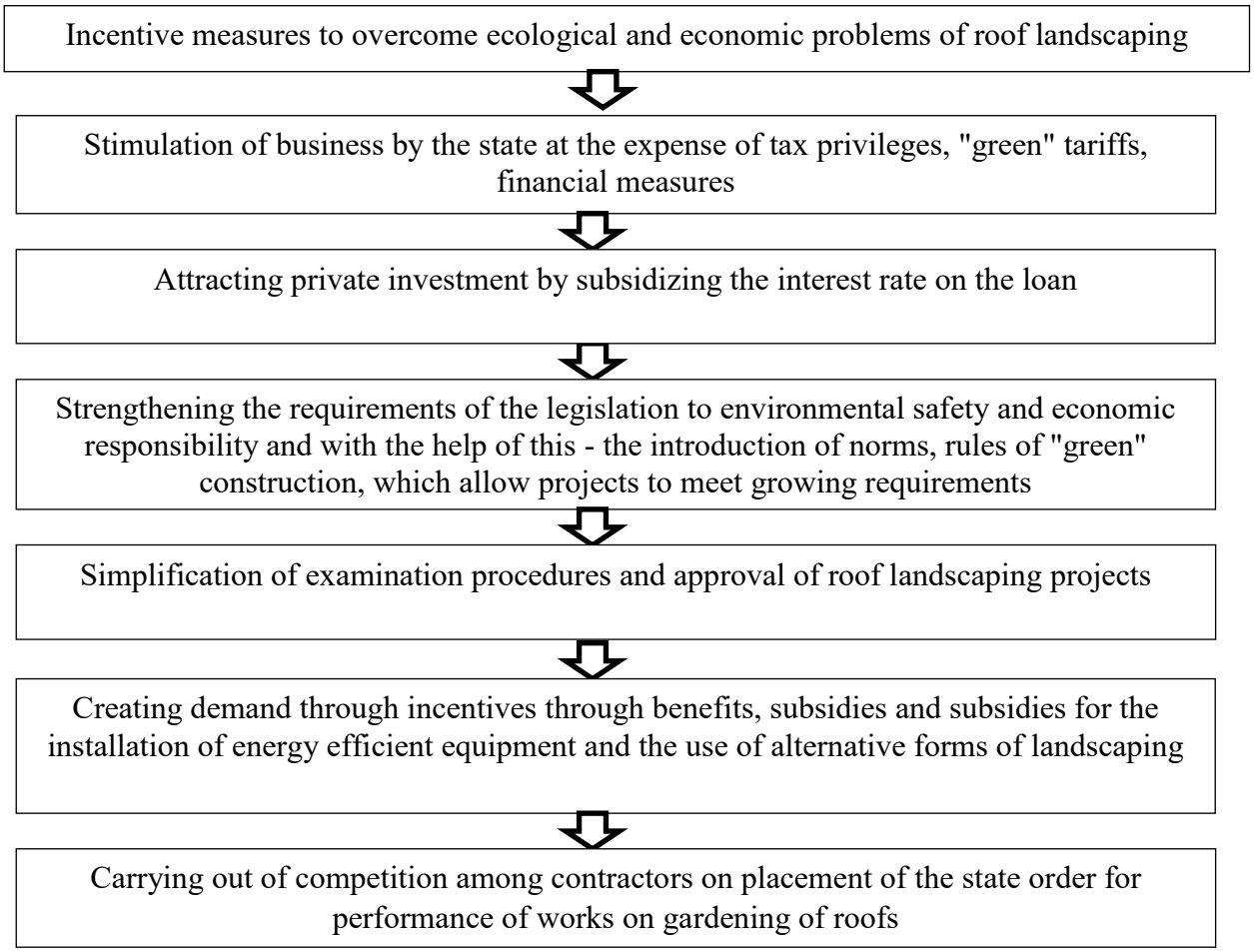

Figure 3. Incentive measures to overcome ecological and economic problems of roof landscaping in Lviv

Source: author's development

Discussion. The domestic and foreign literature highlights a number of proposals for improving the environmental and economic policy of cities and the state as a whole. From our point of view, urban farming can be an important step in this direction. As a result of "panic purchases" during the COVID-19 pandemic, the demand for food exceeded the possibilities of prompt deliveries. Store shelves emptied.

This situation gives an important signal: in the future, it is necessary to create more self-sufficient cities and districts, which, if necessary, will be able to provide citizens with food and necessities. Using urban spaces to grow vegetables, fruits, legumes, poultry, small livestock and even fish can be a solution. Urban farms and greenhouses can be set up on the roofs of buildings - a huge unused area in cities - and provide homeowners with direct access to fresh food, which will help avoid panic in global crises.

Urban farming can be a powerful economic stimulus for the urban economy of Lviv - a new economic sector is emerging, which means new jobs for people who could take care of plants. Farms can be used both by locals for personal needs and by business - restaurants, cafes will be able to grow their own products on their roof.

Conclusions. Thus, the use of landscaping roofs in both industrial areas and residential areas makes it possible to create a comfortable environment close to natural conditions, increases the recreational and aesthetic appeal of the urban environment and improves its economic performance. In addition to the architectural-planning and aesthetic role, green roofs solve a number of problems: clean the air from emissions from transport and industrial enterprises; reduce noise, improve microclimatic conditions; increase humidity; reduce wind force, air temperature in summer and increase it in winter; perform a sanitary-protective role, thus supporting the livelihood of the city population; reduce the cost of repair and maintenance of the roof; contribute to the formation of additional income from the lease of land on the roof; increase the value of real estate. In addition, the quality of landscaping affects the well-being and health of city residents.

In the modern city in a densely built-up and cold climate, the problem of compensation of greenery using green roofs helps to increase the comfort of living in the home, as well as improving the environmental and aesthetic characteristics of both individual apartments and the house as a whole. Also, should be optimized the architectural and landscape organization of the urban environment, functional, microclimatic and sanitary parameters of entire cities. The use of green roofs in modern Ukrainian construction and design requires certain adapted developments of methods and approaches based on the experience of foreign countries. Thus, the issue of landscaping roofs, which is a promising component of "green" construction, remains open today. This is due to the lack of regulatory documentation, difficult economic and political situation, mentality. In this regard, the need to develop management decisions that help mobilize the ecological potential of green spaces and economic resources, aimed at developing a complex of green areas of cities (as the issue of improving the mechanism to stimulate greening of roofs), is an important condition for improving the implementation of environmental and economic politics of cities and the state in general.

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INNOVATIVE FACTORS OF NETWORK COMPANIES ECONOMIC INTEGRATION

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Abstract. *The article proves the importance of innovative development for the successful economic integration of network companies. The innovative development of network companies is determined by increasing the level of competitiveness through the use of their capabilities for rapid updating of products, coordination of efforts to develop new products and technologies, active dissemination of innovations and their implementation. Factors of innovative development have a specific effect on each network. The most effective ones are the joint acquisition of the latest technologies for the production and sale of innovative products (including in international markets), joint efforts in the field of staff training and improving the efficiency of resource and organizational interaction. The combined effect of these factors leads to an increase in knowledge-intensity of products and sales of innovative products (services). The combination of competitive advantages related to network integration benefits and innovation opportunities creates new sources of efficient network operation and development. To activate the factors of innovative development, it has been proposed to form effective models of network interaction in the field of joint acquisition of new technologies, materials, related services; to increase the level of technological support, which affects the intellectualization of network companies; to optimize human resources management, which will determine the ability of staff to promote the creation and implementation of the latest innovative developments.*

Keywords: *innovations, economic integration, network companies, intellectual capital, science intensity of products, training, development and stimulation of personnel.*

JEL Classification: J01, J30, J50.

Formulas: 0; fig.: 2; tabl.: 1; bibl.: 18.

Introduction. The level of innovative development of network companies operating in the domestic and international markets testifies to their ability to create high-performance and high-tech products that ensure their competitive position in domestic and foreign markets. Compliance of technological, market, consumer characteristics of products (services) with quality and price parameters plays an important role. If the demand for such products (services) shows growth trends, it indicates the effective impact of innovative development on network integration. In contrast, when the network under the conditions of production of the latest products does not take into account the quality and price requirements, sales opportunities are limited due to high prices or poor quality. In this case, it can be stated that the network has not yielded results, and the impact of innovation factors has not been effective. Ensuring the innovative development of network structures in domestic and international markets largely depends on their flexibility to market requirements and coordinated links between their participants.

Literature review. Problems of formation and evaluation of the innovative component of network companies activities were studied by: M. Perederii (approach to estimating the share of innovatively active production systems in the overall

structure of the organization, the indicators of innovative development) [11, p. 191]; O. Nikulina (use of the indicator of the share of innovative products in the total output of network companies within the analysis of innovation management) [9]; O. Hadzevych, I. Matviichuk (methods of assessment of innovative development) [1, p. 102-103]; Zen A.S., Fracasso E.M. (impact of resources and opportunities on innovations of network companies) [17]; Guan J., Ma N. (impact of innovation opportunities on the market and economic characteristics of the network) [2]; McPhillips M. (impact of open innovation on the state of innovation and economic development) [8]; Zimmer B., Cardinal J.S., Yannou B., Piette F. (building network connections in a cluster) [18]; P. Marešová, P., Jašíková, V., Bureš (efficiency of implementation of cluster initiatives of innovation development) [7], Utami Handayani, N., Cacravatia, A., Diawati, L., & Nur Bahagia, S. (phases of the life cycle of an innovative company) [14] ; Hittmar, S., Varmus, M. and Lendel V. (effectiveness of the innovative strategy of business structure development) [4].

Aims. The purpose of the study is to substantiate the impact of innovative factors on improving the efficiency of network companies.

Methods. The method of a systematic approach – to systematize all innovative factors influencing the economic integration of companies, the method of statistical analysis – to assess statistics on the development of network business structures, data series analysis (to determine dynamic changes) are the methodological basis of the research. The measuring is based mainly on the use of parametric indicators, which allow to reliably and objectively assess the nature of innovation activities of network companies.

Results. The innovative activity of network companies has a certain specificity owing to the ability to use complementary resources to create value that meets market needs, the ability to reduce all costs by increasing the scale of activity, increasing production by expanding the distribution network, risk-sharing among participants and reducing uncertainty, joint efforts for staff training, which may be carried out through the improvement of information exchange of knowledge and experience. In addition, due to the orientation of network structures on the strategy of open innovation, the involvement of a wide range of participants, which contribute to the development and implementation of effective innovation solutions, is ensured.

The concept of «network companies» is widely represented in the references [15; 16; 5, p. 194; 6, p. 376-377; 10, p. 39; 13]. The generalization of these approaches has provided us with the possibility to determine the main essential features of network companies: partnership, «soft integration», common values of participants, common resource base of participants, synergy effect of a network company, readiness for external challenges, existence of a single management centre, network specialization, transparency of relations and interdependence among participants and openness to change, high level of commitment of network participants, mobility of network interaction and functioning, speed of transactions, innovation. The key functions of network structures are coordination of network participants, cooperation and interaction among participants, creation and maintenance of stable, long-term partnerships, joint management, ensuring

competitive positions of participants and business network as a whole, joint management of resource base, risks, financial efficiency, optimization of management through the use of innovative measures, unity of legal support for a network company within the selected type. Based on the identification of the main essential features and the establishment of the functions of these business entities, we have made an attempt to formulate the essence of the concept under research. In particular, a network company is a business structure of participants (commercial, non-commercial companies, natural persons-entrepreneurs), which operates on the principles of innovation, openness, mobility, use of horizontal and vertical links of formal (informal) cooperation (partnership) among the parties, which cooperate within the framework of their own specialization, commitment, interdependence to achieve common goals. Their specific advantages are related to a single resource base, the ability to ensure a synergistic scale effect, adaptability to environmental conditions.

Let us describe the main advantages and disadvantages of network companies. It has been established based on the study of scientific sources [3; 6; 12] that their main advantages include the following. Increasing trust reduces transaction costs and uncertainty, increases predictability in the form of expectations; intensive information flow increases the emergence of new business opportunities, access to new technologies, expansion of markets; voluntary and long-term cooperation provides companies with flexibility, strengthens their receptivity to innovation and focus on the end-consumer; mutual free access to resources owned by network participants; possible reduction of production and sales costs.

Strategic partnerships can replace mergers and acquisitions, which are a more costly and risky development model. On the other hand, the disadvantages of network interaction are the growth of monopoly and reduced competition in the market; reducing the efficiency of activities in the absence of a firm consolidation of the goals of network participants and slowing down decision-making procedures under its significant expansion; growth of dependence, restriction of actions of separate subjects and loss of independence by a company; reduction of management flexibility; blurring the boundaries among organizations due to the complicated links among network participants; increase in transaction costs as a result of increased investment in support and development of inter-firm relations, which may be ineffective [3; 6; 12]. Therefore, the main conditions for the effective formation of inter-firm relationships are defining and agreeing on partners' goals, developing an innovative strategy for formation and development within the process of interactive interaction, organization of control and monitoring of relationships.

Thus, the advantage of network companies is their unique and additional opportunities for innovation. The orientation of network structures on innovative development, which is reflected in the production of new products (services), development of new markets, development of new competencies of companies and their staff, allows to master new markets, create new technologies and become direct participants in industry development at national and international levels. The combination of the advantages of innovative development and network interaction

contributes to the strengthening of market share, the growth of financial, economic and technological indicators. If a network company is not innovation-oriented, the interaction of participants in such a partnership can become burdensome for more powerful entities, and all structural units will lose market position.

Problems of innovative development of network interaction will be considered in this article on an example of various branches. Three network companies have been selected, in order to analyse the peculiarities of innovative development. Using the chosen methods of analysis, indicators of evaluation of innovative development of network companies taking into account their integration into international markets have been selected. All indicators have been grouped into four subsystems:

- financial indicators that characterize the innovative development potential, which include the level of knowledge-intensity of products (services) of a network company, the level of intellectual capital, the level of company's integration into international markets, the level of savings in total expenses related to the cost of sold products (works, services) due to scale effect;
- indicators of the personnel system, which characterize the innovative potential of development, cover the share of costs for material incentives for staff in the total payroll (carried out on the basis of innovative performance indicators), the correlation of costs for staff motivation and sales of innovative products, and net revenue from sales of innovative products, the share of costs for training, education, retraining of staff of network structure participants in the total expenses, the correlation of changes in knowledge-intensity of products on the introduction of training, education, retraining of staff for each participant in the network structure;
- indicators of the logistics system that characterize the innovative development potential (including in the international market), measured by the share of equipment used for innovation in the total equipment;
- indicators of evaluation of the strategy of innovation process management within network companies, which include the compliance of the declared strategy of innovation process management with the actual one and the nature of the integration of a network company into international markets (open, closed).

The business networks studied in the article have produced competitive products (services), which are characterized by a high level of innovation that allows them to ensure integration into international markets.

Let us analyse the innovative development of these network companies, taking into account their functioning in international markets during 2016-2018. The initial data of financial statements, internal documents have been obtained from data sources of network companies. For the purposes of comparative analysis, we present the results of measuring the main indicators of innovative development of the networks under research.

Evaluation of the innovative activity of PJSC «DATAGROUP» for the period 2016-2018 (Table 1) has shown that the main advantages of the network include effective cooperation in the joint formation of the logistics system. In particular, during the period under research, the share of equipment used for innovation in the total equipment has increased, which is associated with the acquisition by participants

of certain technical means necessary to work on joint programmes (expansion of the Internet, customer service). The main obstacles to the innovative development of PJSC «DATAGROUP» (including integration into international markets) were the deterioration of financial and human resource indicators for basic components. The reasons for the deterioration of financial indicators of innovative development are the reduction of the volume of services of an innovative nature due to the predominance of the focus on the provision of traditional services (without the innovation component).

Table 1. Dynamics of the basic indicators of innovation activity of PJSC «DATAGROUP» for the period 2016-2018

№	Stage / Indicator	Value		
		2016	2017	2018
1	*1st stage of evaluation – financial indicators that characterize the innovative development potential (including in the international market)*			
1.1	Level of knowledge-intensity of products (services) of a network, %	30,84	31,83	30,46
1.2	Level of intellectual capital, %	28,73	27,55	24,8
1.3	Level of savings in total expenses related to the cost of sold products (works, services) due to scale effect, %	20	21	19
2	*2nd stage of evaluation – Assessment of the impact of innovative development potential on the level of international business development*			
2.1	Share of sold products (works, services) of an innovative nature in the total sales of products (works, services) in international markets, %	52	41	44
3	*3rd stage of evaluation – indicators of the personnel system, which characterize the innovative potential of development (including in the international market)*			
3.1	Share of employees engaged in innovation activities in the company, %	52	40	44
3.2	Share of costs related to material incentives for staff in the total payroll %	3	6	8
3.3	Correlation of the level of changes in the costs for staff motivation (Cm) and the level of changes in sales of innovative products (services), %	Cm (-9,6), CD (18,2), No correlation	Cm (354,9), CD (-8,94), No correlation	Cm (160,8), CD (19,69), Direct correlation between the growth
3.4	Share of costs for training, education, retraining of staff of network structure participants in the total expenses, %	2,5	3	4
3.5	Impact of the correlation of changes in knowledge-intensity of products (services) and the introduction of targeted training, education, retraining of staff for each participant in the network structure, %	Ineffective. Upscinn1 - Upscinn0) = -2,94, (Uckin 1 – Uckin0) = 0,5.	Effective. Upscinn1 - Upscinn0) = 0,99, (Uckin 1 – Uckin0) = 0,5.	Ineffective. Upscinn1 - Upscinn0) = -1,37 (Uckin 1 – Uckin0) = 1.
4	*4th stage of evaluation – indicators of the logistics system that characterize the innovative development potential (including in the international market)*			
4.1	Share of equipment used for innovative activity in the total equipment, %	71	76	78
4.2	Impact of change in the share of equipment used for innovative activity in the total equipment on change of volumes of sold products (works, services) of innovative character of a network	Not subject to evaluation	There is no positive impact	Positive impact on the growth

Source: compiled according to internal data of the firm

For three years, this trend has occurred due to an insufficiently effective approach to the sale of innovative services. The reason for the decrease in the indicator of savings in total expenses related to the cost of services of an innovative nature due to the scale effect of a network company was the inefficient approach to management in the field of procurement of materials and related services. The inefficiency of targeted training, education, retraining for each participant of the network structure has been revealed. Factors that slowed down the innovative development of this network were: network organization of supply of materials and services necessary for the provision of services (due to lack of a common approach to finding profitable offers, the network could not increase the production and sale of innovative services); market factor associated with the predominant focus of the network structure on consumers of traditional services (products), which have been positioned in the market for a long time. As a result, despite the fact that the network participants were able to provide the joint acquisition of the necessary technological support, it did not cause an increase in financial, economic and human resource indicators of innovation potential.

Another situation has developed in PJSC «Research Institute of Radiation Protection of the Academy of Technological Sciences of Ukraine». Similarly, through the evaluation of four groups of indicators of innovative development, data for the network under research has been obtained. The analysis has revealed the following trends:

- financial indicators that characterize the innovative development potential (including in the international market) for 2016-2018 have been marked by a reduction. The level of knowledge-intensity of products (services) decreased from 45.59% to 32.72%. At the same time, in 2018, due to certain efforts of the participants to combine scientific and technical functions, the volume of sales of innovative products had increased, which affected the growth of knowledge-intensity. The level of intellectual capital decreased from 0.83% to 0.34%, which indicates a reduction in the provision of a network with software, technology that affects the specificity. The level of savings in total expenses related to the cost of sold products (works, services) of an innovative nature due to the scale effect decreased from 32% to 16% which is a negative trend that indicates an increase in material consumption. In general, this is due to the inconsistency of participants' actions regarding the assessment of the quality of materials (large share of defective products affects costs) and marginal prices for materials;

- the share of sold products (services) of an innovative nature in the total sales of products (services) in international markets showed fluctuations from 76% in 2016, 75% in 2017 to 78% in 2018.

- indicators of the personnel system, which characterize the innovative potential of development (including in the international market) had the following values. The share of employees engaged in innovation activities in the company fluctuated for three years in direct proportion to the fluctuation of the share of sold products (services) of an innovative nature in the total sales of products (services) in international markets. It amounted to 78% in 2016, 76% in 2017, 81% in 2018.

Similar directly proportional changes have been seen in relation to the share of costs related to material incentives for staff in the total payroll (4.5% in 2016, 7% in 2017, 6% in 2018). The direct correlation of the level of changes in the cost for staff motivation (Cm) and the level of changes in sales of innovative products (services) over three years has been observed;

- the share of equipment used for innovation in the total equipment was characterized by growth in 2016-2018 (72% in 2016, 73% in 2017, 75% in 2018). The positive impact of the change of the share of the equipment used for innovative activity in the total equipment on change of volumes of sold products (services) of an innovative character in the international markets has been revealed.

The analysis has shown that the main advantages of innovative development of this network are joint participation in the costs of material incentives, training, education and retraining of staff through network interaction, which has led to increased production and sales of innovative products (services) and increased knowledge-intensity of products (services) of the network in 2018; network cooperation in relation to the creation of a material and technical system that has had a positive impact on the increase of innovative products (services).

Based on the analysis, the main obstacles to innovative development of PJSC «Research Institute of Radiation Protection of the Academy of Technological Sciences of Ukraine» (including integration into international markets) include a decrease in the level of intellectual capital, the level of savings in total expenses related to the cost of sold innovative products due to the scale effect of the network company. The reason for this situation is the reduction of innovative services due to the expansion of traditional services. This is due to the growth of imported consumables for the production of innovative services (highly accurate evaluation of the level of radioactive effect, environmental pollution). The main factors that contributed to the innovative development of the network were the factor of human resources potential of participants in the network interaction, which provided the growth of the production, promotion and sale of products (services) of an innovative nature and increase of knowledge-intensity; technological factor, which made it possible to increase the competitiveness of the network company by increasing productivity and creating new products.

Another research object was PJSC «PHARMSTANDART-BIOLIK». Guided by the selected methodological support used for the two previous networks, an analysis of the state of indicators of innovative development in relation to PJSC «PHARMSTANDART-BIOLIK» has been carried out. The evaluation has provided the possibility to determine the following:

- in terms of financial indicators, the following facts have been identified. The level of knowledge-intensity of the network's products in 2016 was 15.09%, in 2017 – 14.76%, in 2018 – 14.59%. It has been established that, owing to the general reduction of the volume of innovative products (mainly in the domestic market), the knowledge-intensity decreased. This is due to the lack of successful cooperation of participants to create new innovative products. The level of intellectual capital decreased from 0.66% in 2016, 0.12% in 2017 to 0% in 2018;

- with regard to the share of sold products of an innovative nature in the total sales of products in international markets, its growth from 28% in 2016, 30% in 2017, 36% in 2018 has been determined. Despite the overall reduction of innovative products, there was an increase in its share in international markets while declining in domestic ones. This is due to the impact of the price factor, namely, foreign consumers had a greater demand for innovative products of the network compared to domestic ones;

- regarding the indicators of the personnel system, which characterize the innovative potential of development (including in the international market), the following has been revealed. With the growth of the share of employees engaged in innovation activities in the company (31% in 2016, 32% in 2017, 37% in 2018), there was an increase in the share of costs related to material incentives for staff in the total payroll (4.5%) in 2016, 5% in 2017, 7.5% in 2018), an increase in the share of costs for training, education, retraining of staff of network participants in the total expenses (0.5% in 2016, 1, 6% in 2017, 2.3% in 2018). The direct correlation of the level of changes in the costs for staff motivation and the level of changes in sales of innovative products for three years, the negative correlation of changes in knowledge-intensity of products and the introduction of targeted training, education, retraining of staff for each network participant in 2017, 2018, has been revealed;

- regarding the indicators of the logistics system, the following has been proved. The share of equipment used for innovation in the total equipment was characterized by the growth (from 72% in 2016, 74% in 2017, 76% in 2018). There is a positive impact of this indicator on the growth of sales of innovative products.

The problem that narrowed the innovative capabilities of the network is the inefficiency of targeted training, education and retraining of staff for each of its participants. Each of the participants independently approved expenses and the programme of training and development, but due to the lack of coordination of activities, this programme did not provide the expected effect.

Comparative analysis shows that the highest level of knowledge-intensity of products (services) had those network structures that were involved in providing services, in particular, PJSC «Research Institute of Radiation Protection of the Academy of Technological Sciences of Ukraine» (change from 45.59% to 32, 72%), PJSC «DATAGROUP» (change from 30.84% to 30.46%). PJSC «PHARMSTANDART-BIOLIK» (change from 15.09% to 14.59%) (Fig. 1) has been ranked the third in terms of this indicator due to the unpredictable increase in procurement costs, which causes high prices for products, and, accordingly, reduction in demand.

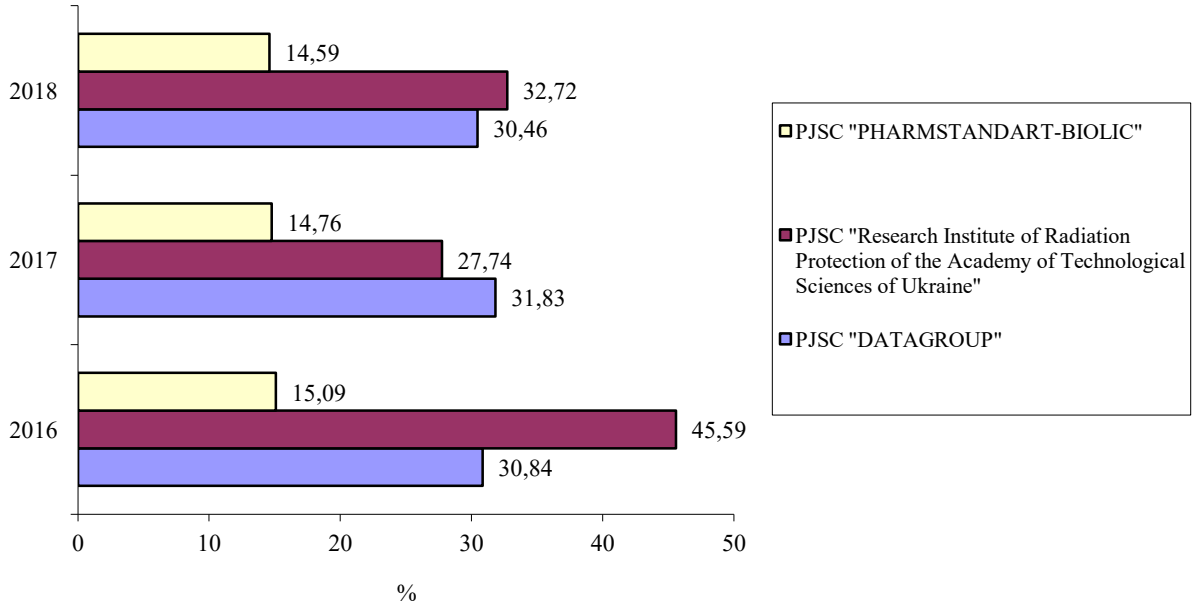

Figure 1. The level of knowledge-intensity of products (services) of network companies for 2016-2018.

Source: compiled according to internal data of the firm

The authors found a general trend of reducing the level of intellectual capital (Fig. 2).

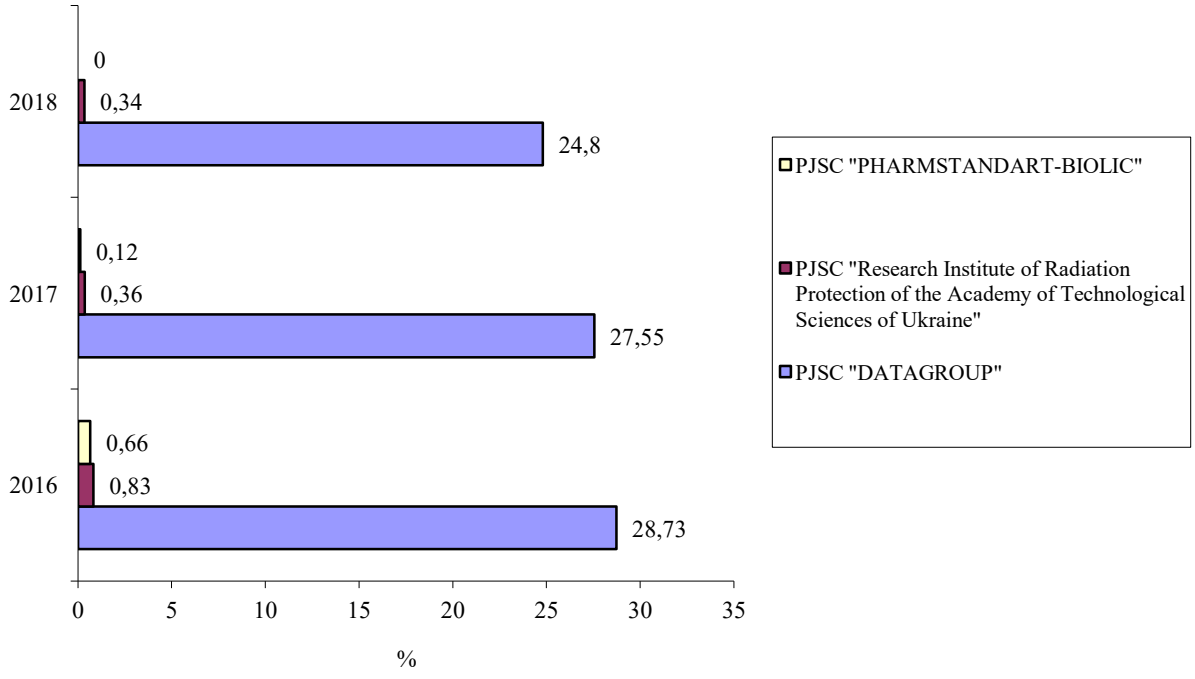

Figure 2. The level of intellectual capital of network companies, 2016-2018

Source: compiled according to internal data of the firm

The highest value of this indicator had PJSC «DATAGROUP» (change from 28.73% to 24.8%), the other networks had at less than 1, which is due to the low level of technology upgrades.

The analysis has shown that the growth of innovation activity of network structures depended on the share of equipment used for innovation in the total equipment (from 65% to 80%).

The innovative development of network structures was also influenced by the agreement of their participants on joint motivation programmes for staff, which was observed especially in 2018, that, in turn, led to increased productivity.

Discussion. Based on the research, the suggestions have been made, in particular**,** the creation of effective models of interaction to ensure the effect of joint efforts in the field of procurement of materials, raw materials (services); increasing the intellectualization of network companies through the formation of intangible assets (acquisition of high-tech assets); achieving harmonized actions of network companies through creating joint education programmes, staff training, increasing the readiness of staff to perform innovative functions.

Conclusion. The importance of innovative development for the successful economic integration of the network companies under research has been substantiated. The authors have proved that the innovative development of network companies is determined by increasing the level of competitiveness through the use of their capabilities for rapid product upgrades, coordination of efforts to develop new products and technologies, active dissemination of innovations and their implementation. In turn, it has been shown that the factors of innovative development have a specific effect on each network. We can state that the combination of the advantages of economic and technological integration with the possibilities of innovative development provides the possibility to strengthen the competitiveness of network companies. To enhance the factors of innovative development, the following has been proposed: formation of models of network interaction for joint procurement of materials, related services; increasing the level of technological support, which will increase the intellectualization of network companies; improving the skills and readiness of staff to develop and implement innovative solutions.

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CHAPTER 2
DEVELOPMENT OF FINANCE, ACCOUNTING AND AUDITING

IMPACT OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT ON THE ACCOUNTING PARADIGM

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Abstract. *The article is devoted to the justification of the modern paradigm of accounting, based on the principles of concepts of sustainable development and social responsibility of business. The purpose of the research is to clarify organizational and methodological aspects of the functioning of the existing accounting system in Ukraine and determine the directions for further improvement of information support of socially responsible business from the positions of: 1) expansion of accounting objects, taking into account the impact on the accounting system of complications of management processesI, increasing the uncertainty of the external environment, increasing the role of digitization of society; 2) increasing the requirements for the components of social reporting (taking into account the needs of users) with the obligatory observance of common principles of preparation of accounting information; 3) continuity of professional education of accountants to increase their qualifications and prestige of the profession; 4) activation of professional organizations of accountants and auditors when justifying proposals for the creation of information infrastructure adequate to the requirements of the market economy in the interests of all members of society. To achieve this goal, the need to improve the methodology of accounting and reporting of domestic enterprises in three interdependence areas: risk-orientedness is scientifically substantiated; social focus; digital-oriented. At the level of practical developments in terms of improving the accounting policy of domestic enterprises, the results of scientific research aimed at solving specific problems in the field of socially oriented accounting are presented.*

Keywords: *social responsibility of business; accounting paradigm; risk-oriented accounting; social reporting; digitalization of accounting; risk; professional judgment.*

JEL Classification: G32, M10, M40.

Formulas: 0; fig.: 0; tabl.:1; bibl.: 11.

Introduction. The European vector of development, enshrined in the Constitution of Ukraine [10], determines the gradual implementation of the norms of legislation of the European Union in the field of socio-economic relations, which causes the need to transform the provisions of national economic science in the direction of ensuring the sustainable development of economic systems at all levels.the course is aimed at harmonization of economic, social and environmental components of social development, which allows solving the problems of preserving the environment, improving social development of society and overcoming the consequences of financial and economic crises. The concept of sustainable development is based on the idea of social responsibility of business, which provides for the achievement of a balance between corporate, state and public interests in achieving the goals of sustainable development.

An important role in solving the problems of social responsibility of business is played by useful information formed on the basis of accounting technologies, which actualizes the need to substantiate the socio-oriented paradigm of accounting. The *paradigm of accounting is understood* as a designthat includes methodological principles for the formation of accounting information and the results of scientific research aimed at solving specific problems in the field of accounting.

Literature review. The idea of socially oriented accounting was launched in the 60s of the twentieth century and belongs to scientists such as R. Lieckert and R. Hermanson [4, p. 132]. Domestic scientists have also repeatedly raised this issue in their publications [1; 2; 4; 5; 8; 9], which gave impetus to the justification of the modern accounting paradigm in Ukraine.

Aims. The main purpose of the article is to clarify the organizational and methodological aspects of the functioning of the existing accounting system in Ukraine and determine the directions for further improvement of information support of socially responsible business from the following positions:

- revision of the theoretical bases of accounting, taking into account the impact on the accounting system of complications of management processes, increasing the uncertainty of the external environment, increasing the role of digitization of society;
- differentiation of requirements for the components of financial statements (taking into account the needs of users) subject to mandatory observance of common principles of preparation of accounting information;
- refusal (partial refusal) from the strict format of reporting when reflecting the results of social responsibility of business;
- continuity of professional education of accountants to increase their qualifications and prestige of the profession, as well as harmonize the Ukrainian system of professional training of accountants with international standards;
- intensification of professional organizations of accountants and auditors when justifying proposals for the creation of information infrastructure adequate to the requirements of the market economy in the interests of all members of society.

Methods. The methodological basis of the modern accounting paradigm is the principles of sustainable development, the observance of which requires the modernization of the classical accounting system in three interdependent areas: risk-orientedness; social focus; digital focus.

Despite the fact that modern world trends confirm the need to reform the accounting system in the direction of its risk-orientedness, national accounting standards do not recognize the risk as an object of accounting. 3) selection of accounting tools for managing entrepreneurial risk.

Results. When recognizing the risk in the accounting system, it is necessary to deigroup it by the nature of the formation into two groups: the risk cause and the risk consequence. This will establish the relationship of the risk-cause with the conditional fact of economic activity, and the risk consequence with the actual (real) fact of economic activity.

Therefore, the task is updated to reflect in the accounting policy the methodology for assessing the degree of probability of loss of economic benefits by individual accounting objects under the influence of risk-cause.

Table 1. Scale for assessing the likelihood of risk when justifying accounting policies on certain facts of economic activity

Probability of risk	The nature of the consequences	Quantitative estimation (%)
High bracket	The consequences of the upcoming event can be affirmed with sufficient confidence for enterprises of any type of activity or organizational and legal form	90-100
High	The consequences of the upcoming event depend on the specific characteristics of individual enterprises, but are highly likely to	50-89
Average	The probability that an upcoming event will be carried out is higher than the minimum	10-49
Small	The probability that the upcoming event will be carried out is very small and is solitary	0-9

Source: based on [3, p. 126]

According to the scale, the object of accounting, followed by its reflection in the system of balance sheet accounts and in the financial statements of the enterprise, should recognize the risk cause (conditional fact of economic activity), which has a significant degree of probability of occurrence (50-100%).

Unforeseen liabilities with a slight degree of probability of manifestation (10-49%) out of balance to further control their occurrence. If the percentage of probability of their manifestation increases, under such obligations it is necessary to form reserves of subsequent payments (forecast reserves) and reflect them in the balance sheet. Unforeseen liabilities characterized by a minimum probability of their occurrence (0-9%) consider true uncertainty not reflected in the balance sheet.

Based on the fact that under the influence of risk, the historical value of a significant part of assets (fixed assets, intangible assets, reserves, receivables, financial investments) changes, there is a need for further assessment of these objects at fair value or the creation of reserves for adjusting the initial value.

In the context of risk management of entrepreneurial activity, reserves are divided into appraisers and predictable ones. Creation of valuation reserves is possible in case of established probability of short of expected economic benefits or possible losses, such as in the formation of a reserve of doubtful debts.

Projected reserves (reserves for future expenses and payments, reserve capital) do not have a direct connection with the cost assessment of assets and liabilities and is a kind of guarantee to minimize the risk associated with the possible loss of economic benefits in certain areas of the enterprise: guarantee payments to certain categories of employees in case of termination of the company's activities, repayment of tax liabilities, fulfillment of declared guarantees to buyers or other counterparties, repayment of the consequences of force majeure, covering losses, etc.

Therefore,from the standalents of risk management, not only the economic validity of the provision (as a source of coverage of the consequences of the risk manifestation) becomesimportant, but also the actual provision of established reserves

with the relevant assets, which requires reservation of funds, and therefore changes in methodological approaches in the formation of reserves in the accounting system .

Another, but no less important, direction of modernization of accounting is associated with its social focus. Socially oriented accounting is the process of identifying, measuring, registering, accumulating, generalizing, storing and transmitting to users reliable and unbiased information about the state and results of financing social programs (measures).

The central place in the objects of socially oriented accounting belongs to the costs caused by the social activity of the enterprise. These include costs associated with the personnel of the enterprise, as well as other costs caused by economic operations that in one way or another affect society and the environment.

Based on the main components of corporate social responsibility, it is advisable to distinguish the following areas of generalization of social costs of the enterprise:

1) costs associated with the formation of a social package regulated by law;
2) costs for the development and motivation of personnel;
3) costs for social measures;
4) labor and safety expenses;
5) costs for the maintenance of social facilities;
6) environmental costs aimed at minimizing or eliminating harmful effects on the external environment.

This classification will form the basis for justifying the accounting policy for the display of social expenses in the accounting system using analytic accounts to accounts 949 "Other operating expenses", 663 "Settlements on other payments", 23 "Production", 91 "General Production Expenses", 92 "Administrative Expenses", 93 "Sales Expenses".

It is quite clear that the vast majority of social costs lead to economic and social benefits by the enterprise, but such benefits are usually quite difficult to measure (reliably assess), and therefore impossible to reflect in the accounting system. Therefore, the main task of a methodological nature should be to substantiate algorithms that would enable Ukrainian enterprises to generate reliable accounting information on social and environmental programs in order to publish it in social reporting.

In Ukraine, social reporting (managementreport) is legally recommended to consist only of large enterprises (with more than 500 employees) for the disclosure of financial and non-financial information on their activities in the context of environmental impact (environment), implementation of social programs, in particular, regarding social protection of employees, observance of human rights, fight against corruption and bribery [11]. In addition, in certain circumstances, Ukrainian companies independently initiate the need to form indicators of social reporting, namely: when entering the foreign market, especially in Europe and the United States; when attracting investors through the public placement of their securities on the exchange;o (monopolist companies, companies whose activities are related to the defense, chemical, pharmaceutical industry).

At the same time, as the practice of social reporting in Ukraine shows, most Ukrainian companies use social reports as a kind of platform for presenting themselves in a more attractive way for investors, society and the state, indicating inflated goals that are often virtually impossible. The problem is also reinforced by the fact that at the state level the methodology of drawing up social reports has not been worked out, and therefore the reports of different companies are characterized by a high degree of subjectivism, which significantly reduces the level of trust in the information presented in them.

However, despite these practical difficulties, the consolidation at the legislative level of the mandatory use of social reports is a significant step towards the practical implementation of the socially oriented paradigm of accounting.

In the era of the digital economy, in the formation of the accounting system, it is impossible not to take into account radical changes in the receipt and use of information, the essence of which is to expand the space for working with information, to increase the convenience and mobility of business processes at no additional cost, "cloud" access to any data and documents, quick document flow, the introduction of technologies related to the individualization of the production system. At the same time, large data requiring the use of structured and unstructured processes are "given to the processing" of artificial intelligence (solving problems by automated data processing using special algorithms), which leads to the adoption of creative decisions that were previously a human function.

A set of trends and factors of accounting development in the digital economy radically change the classical accounting methodology, principles, procedures, meaningful orientation and characteristics of the information product. At the same time, there is no doubt that enterprises seeking to increase transparency and availability of information will show the greatest interest in digitization of accounting.

The main advantage of digitization of accounting is the possibility of introducing a "triple record", in which the display of data for each transaction occurs not only on debit and credit accounts, but also by the third record – in the "world" register [7, p. 129]. With this methodological approach to the accounting procedure, the financial statements of the enterprise become available at any time for the regulatory authorities and other stakeholders of the enterprise, which will ensure full financial transparency, avoid distortion of information, constant monitoring, reduction of the cost of obtaining documentation and its verification, etc.

Discussion. Despite the fact that the accounting system is in dire need of the introduction of digital technologies, in practice, the issues of digitization of accounting remain open. First of all, this is due to:

- absence of general rules and norms of control of digital accounting processes at the state level;
- low competence of accounting specialists in the field of digital technologies;
- non-compliance of the directions of educational training of specialists in the field of accounting with modern requests of the information society;

- opportunistic behavior of accountants who perceive the transition to digital accounting as a prerequisite for the disappearance of the accountant's profession.

Meanwhile, the number of enterprises interested in the introduction of digital technologies as an obvious competitive advantage in creating conditions for digital accounting and auditing and secure cloud storage of credentials is constantly growing. At the same time, experts in the field of audit and consulting are convinced that the digitization of accounting can turn accounting into a continuously functioning process and an effective tool for business social responsibility.

Conclusions. Based on the hypothesis that the methodological basis of the modern accounting paradigm is the principles of sustainable development and social responsibility of business, aimed at harmonizing the economic and social components of social development, as well as reducing the influence of information risk in assessing the investment attractiveness of the enterprise, the need to modernize the traditional accounting system in threevector terms: risk-orientedness; social focus;

The article provided a number of methodological recommendations on the recognition of risk in the accounting system and its relationship with the real and conditional facts of economic activity.

It is motivated that the introduction of socially oriented accounting requires a revision of classical approaches to the recognition of social costs. At the same time, the introduction of the practice of social reporting for Ukrainian enterprises strengthens the level of trust of investors and society in their activities, contributes to the formation of a positive image, which positively affects their competitiveness and increases the possibility of entering foreign capital markets.

It was established that the modern accounting system is in dire need of the introduction of digital technologies. However, in practice, enterprises face the following problems: the lack of general rules and norms for controlling digital accounting processes at the state level; low competence of accounting specialists in the field of digital technologies; non-compliance of the directions of educational training of specialists in the field of accounting with modern requirements of digitization, which requires state regulation in the near future.

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CHAPTER 3
MODERN MANAGEMENT TECHNOLOGIES

ADAPTATION OF THE STRATEGY OF INTERNET PROMOTION OF ADVERTISING SERVICES FOR MANAGEMENT OF AN APARTMENT BUILDING

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Abstract. *The article considers methodical approaches to the adaptation of the strategy of Internet promotion of advertising services for apartment building management with the help of Internet marketing tools. The purpose of the article is to substantiate the choice of effective Internet marketing tools for advertising apartment building management services. The article considers the main tools of Internet marketing to promote advertising services for the management of an apartment building through social networks. Changes in the legal acts of Ukraine on preventing the monopolization of apartment building management services and on promoting the increase in the number of private companies in this area of activity are analyzed. It was found that the field of apartment building management services for private companies is quite new, citizens are poorly informed about the activities of these businesses, which necessitates significant investment in advertising. In order for advertising to have an effect, it is necessary to develop a clear strategy for promoting advertising and find effective tools for Internet marketing. It is noted that modern Internet marketing tools include the promotion of advertising through search engines of web browsers and social networks. The dynamics of the number of users of social networks in Ukraine is studied. It was revealed that as of January 1, 2020, there were 27.46 million Internet users in Ukraine. The number of social network users in Ukraine is as follows: Facebook has 13 million users, Instagram has 11 million users, LinkedIn has 2.9 million users. It is noted that the advertising of apartment building management services is for collective and individual consumers. When creating advertising, it is advisable to distinguish between the following hierarchical levels: houses that belong to the elite housing, houses that can be classified as "business", houses of "comfort" and "smart (economy)" class. It was found that the most effective social network for the promotion of apartment building management services for collective consumers is search query advertising, and for individual consumers - the social network Facebook. The essence of tools and methods is revealed and the expediency of promoting an advertising campaign for the provision of utilities on the social network Facebook is substantiated. A step-by-step plan for the formation and promotion of the advertising campaign of enterprises that provide apartment building management services has been drawn up. The following is proposed for collective and individual consumers of communal services allocated within the legislation: for collective consumers to configure advertisements of services through a search query, for individual consumers it is recommended to configure targeted advertising through the social network Facebook.*

Keywords: *apartment building, services, consumers, advertising, promotion, internet marketing tools, social network, Instagram.*

JEL Classification: O 18; M 31

Formulas: 0; fig.: 0; tabl.: 0; bibl.: 17

Introduction. The increasing competition among enterprises that provide public services to residents of apartment buildings are new for both residents and service providers. Residents of apartment buildings are accustomed to being serviced by JEC or MDM and until now have not been able to choose the service company. With changes in Ukrainian legislation, residents of apartment buildings were able to choose among a certain number of companies that provide public services. Since this sector of the market is new to both consumers and producers, there are no established methods and effective tools to effectively promote the management of multi-family housing.

Literature review. A small number of Ukrainian scientists dedicate their research to the development of housing and communal infrastructure. Their work formed the basis for further research, the results of which are reflected in this article. The work of A.V. Dymchenko are devoted to the development of housing and communal infrastructure in the context of reform [1]. The model of economic security management of consumers of housing and communal services is presented in the work of K.S. Savenko [2]. Problems of attracting investments in housing and communal services and ways to overcome them are considered in the article by O.V. Tverdy [3]. Peculiarities of administrative and legal regulation in the sphere of housing and communal services management of Ukraine are investigated in the article by O.Ye. Kushch [4]. The problem of formation of the mechanism of state regulation of the sphere of housing and communal services at the regional level is investigated in the article by V.M. Filatov [5]. The new direction of economic research “development of methodological and practical aspects of the application of Internet marketing tools” are devoted to the work of the following scientists. The works of the following scientists are devoted to the new direction of economic research "development of methodical and practical aspects of application of Internet marketing tools". The effectiveness of the use of social networks for advertising campaigns and as tools for brand promotion is considered in the works of A.A. Azoyan and I.L. Petrova, G.P. Lyashenko, R.V. Motkalyuk, A.V.Kudina [6-9]. Features of Internet marketing and specific differences between digital marketing and Internet marketing are considered in research O.Yu. Krasovskaya, M.A. Oklander, O.O. Romanenko [10, 11]. Peculiarities of Internet marketing and the future of marketing communications are considered in the articles O.O. Tertychny, D.V. Yatsyuk [12, 13]. Given the specifics of the advertising campaign for management services for an apartment building and the lack of practical experience of companies in this area, it is advisable to conduct research on the selection of effective Internet marketing tools for the implementation of just such an advertising campaign. It should be noted that the tools for promoting advertising through different social networks will be different. The experience of applying advertising promotion tools in other countries cannot be used mechanically for Ukrainian consumers due to differences in consumer behavior and content differences in social networks. The use of effective Internet marketing tools to promote the advertising campaign for multi-family home management services remains a challenge.

Aims. The purpose of the article is to justify the choice of efficient Internet marketing tools for advertising the management of a multi-family house.

Methods. Conducting theoretical and empirical research, the authors used such research methods as: analysis and synthesis, induction and deduction, abstraction and concretization, and systematic, statistical analysis, which allowed to achieve the goal of the study.

Results. Since the independence of Ukraine, citizens have become accustomed to the fact that most houses are serviced by public utilities or State enterprises, for which they pay for housing and communal services. Traditionally, such utilities were for a long time subsidized and received considerable budgetary support, which allowed them to be set well below existing market tariffs.

In 2015, the Verkhovna Rada of Ukraine adopted the Law of Ukraine «On Housing and Communal Services», which determined that all decisions on the management of apartment houses are made by co-owners [14] It is the co-owners who have the right and duty to determine the manager of the house, the list and the amount of the costs of running their house, To decide on the conduct of ongoing and major repairs and the choice of a model for the organization of contractual relations with the utility operator. With the passage of this Act, all utilities are required to write off their homes and, as long as they are serviced by a predetermined tariff, as co-owners at the meeting decide who they decide to the managers or establish the MDM and hold the house on their own. If the utility company (WEC) wants to raise the tariff or to continue serving the house as a manager to provide certain services at home, the decision must be made by the co-owners.

In 2017, the Law of Ukraine «On Housing and Communal Services» in a new version entered into force, which assumed that housing and communal services included housing and communal services [14] Housing services included cleaning, maintenance, sanitation, electricity for the operation of common property, and maintenance of the home. Utilities included the supply and distribution of gas, electricity, heat, hot and cold water, and household waste. The relevant law stipulates that consumers, managers, and performers are involved in legal relations concerning the provision of housing and communal services.

Since 2014, the Law of Ukraine «On State Aid to Economic Entities» has been in force in Ukraine, which has determined that State aid is inadmissible for competition [15]. The forms of such assistance include subsidies, grants, grants, tax exemptions, debt relief, guarantees, and the like. By State aid, the legislator means any form of support for local or State resources, which may distort competition. Public utilities will, therefore, for the time being, have to compete with private companies, offer a reasonable market rate to the consumer and compete for the customer.

This state of affairs is also consistent with European legislation. According to paragraph 187 Communication from the European Commission concerning the concept of State aid under article 107 of the Treaty on the Functioning of the European Union, measures of support provided by the State, are considered to distort competition or threaten to distort competition when they improve the competitive

position of the recipient compared to other competitors [16]. If a State assisted a certain actor in a sector where competition might exist, such action was a distortion of competition.

These changes in domestic legislation made it impossible for public utilities to monopolize the management of apartment buildings. The changes have had a positive impact on the development of private companies providing services for the management of multi-family houses. Because of competition in the sector, managers compete for the consumer, who can choose the best service for the best value.

Discussion. More and more service companies are on the market every day, and the consumer finds it difficult to choose from dozens of names and offers. However, the scope of such services for private companies is quite new, citizens are not well informed about the activities of these entities, which leads to the need for significant investment in advertising. For advertising to have an impact, it is necessary to develop a clear strategy for advertising promotion and to find efficient internet marketing tools.

Modern Internet marketing tools include the promotion of advertising through search engines of web browsers and social networks. An analysis of the number of internets and social media users is needed to determine how to promote advertising more effectively - through search engines or social networks. The following conclusions are drawn from the studies conducted on the number of users of social networks in Ukraine. As of 01.01.2020, there were 27,460,000 in Ukraine. Internet users [17]. The most popular social network in Ukraine is the Facebook network, which has 13 million users. The Facebook network is the most popular. Social network Instagram has the second largest number of users. 11million Ukrainians use this network. The Linkedin social network is less popular among Ukrainian users, its audience is only 2900000. Man. Among female users, the most popular are Facebook social networks (the proportion of female users was 60.4 percent in 2020) and Instagram (the proportion of female users was 60.2 percent in 2020). Among male users of social networks, the Linkedin social network is more popular (the proportion of male users was 52.4 percent in 2020).

At the beginning of the creation of advertising, it is necessary to decide which consumer will be targeted by advertising. The promotion of the management of apartment buildings is made for collective and individual consumers. The Law of Ukraine «On Housing and Communal Services» defines the concepts of collective and individual consumers in the following way «collective consumer - legal person unites consumers in the building and their interests conclude a contract on the provision of communal service», an individual consumer - a natural or legal person who is the owner (co-owner) of the immovable property or, with the consent of the owner, another person, uses the immovable property and receives the housing communal service for one's own needs and for which or on whose behalf a relevant agreement on the provision of a housing and communal service has been concluded» [14].

When creating advertising it is advisable to distinguish the following hierarchical levels: houses that belong to elite housing, houses, can be classified as

«business», houses of «comfort» level, and «smart (economy)» class. Depending on the target audience, different Internet marketing tools are selected for advertising the management of apartment buildings.

The firm that develops the advertising campaign for the management of the apartment building should have its site. The order of forming the advertising campaign is tied to the actions on the company's site [6]. The first step in creating advertising is the formation of a unique trade offer (TSP) [7]. Producer TSP is one or more characteristics of a service that is qualitative to the firm among competitors and is directed to a specific consumer. For individual customers, it is advisable to pay attention to the following advantages: the cost of connection to the service for quality service in the provision of the service, rapid response in case of a non-standard or emergency situation. For collective consumers, the TSS focuses on the following points: loyalty programs for the collective consumer (discounts), equipment leasing when concluding a service agreement, additional services. Depending on the hierarchical level of the housing stock, the CBP should emphasize the level of quality of services that the firm plans to provide, taking into account the requirements of the consumers in these services. For example, for luxury housing, it can be emphasized in the TSS that garbage removal is carried out by machines of a certain class, satisfies the high level of comfort of residents, and at convenient times (for example, early morning). For smart (economy) homes, it is advisable to emphasize in the TSS the reasonable level of service prices. The TSS consists of several keywords that reflect the nature of the service that is provided and the level of its quality or certain features. According to these keywords, the consumer, when searching a certain service via the Internet, can see the firm-manufacturer. Therefore, considerable attention has been paid to the development of TSS.

After the formation of the TSS, the most effective ways of promoting the management services of the firm through Internet marketing tools are determined. The range of Internet marketing tools is defined according to the purpose of the advertising campaign of the firm that provides the services. At this stage, promotional campaigns will vary for a collective or an individual consumer.

The advertising process takes place in an advertising cabinet from Google. This service is free of charge. For a collective consumer, it is advisable to use an advertisement of a search request, which is formed in the following stages.

Step 1. Create a set of keywords. For example: Garbage removal company; The company that picks up the garbage; A garbage company, that sort of thing. For an effective advertising campaign, the more keywords you choose, the better. The Google Advertising Office, the «keywords» tab, can help in the selection of keywords.

Step 2. Create an advertisement. Its creation begins with the selection of actions to be taken by the potential client, namely: increase the number of calls, increase the number of subscriptions or purchases on the site, increase the store's attendance. For the collective consumer, it will be advisable to choose the increase in the number of calls. A customer who calls the firm to clarify the information about the service provider is more likely to become a customer of your service.

Step 3. Election of the place to be advertised (country, city, region). In the case of advertising the provision of services for the management of a multi-family house, it is advisable to choose not the whole of Ukraine, but the specific city or locality in which the firm operates. Otherwise, the entire advertising budget will be shown for the entire country.

Step 4. Make an announcement. The advertisement adds the keywords that were selected in the first stage of advertising formation. Keyword selection is a very time-consuming and time-consuming process, so it should be done beforehand. Leaving the keywords in the ad placement will delay the process for a few days. For moderation (approval for display) search engines advertisement takes three days.

Step 5. Creates the text of the advertisement that will be displayed when you search. Before starting to compile the text better check the information presented in its advertisements competitors by searching the search engine according to certain keywords. It is not necessary to copy the text of competitors exactly, otherwise, the firm will not differ by the text of the advertisement among dozens of other firms. On the contrary, an advertisement should be designed to reflect a firm's unique trade offer, exactly how it might differ

Step 6. Customize an advertising budget. Advertising is displayed according to the principle of the auction: whose offer is more expensive and more relevant (more accurately corresponds to the search query) and is shown above. According to the observations of the practitioners, consumers who are looking for a service or a good always «click» the first links that the search engine gives out. The price of the «click» of the consumer depends on the number of competitors, according to the keywords that the search system reflects at the moment. Usually when creating ads a prompt of the actual price for «click» on the given keywords at the moment pops up.

For individual users of services for the management of apartment buildings, it is better to choose the promotion of advertising through social networks. To promote advertising through social networks, you need to have a business account in the relevant social network. For individual consumers, it is best to target advertising through social networks, for example through Facebook. Social network Facebook offers that this network is the most popular among users in Ukraine. The process of promoting advertising through the Facebook social network (targeted advertising) involves the following steps.

Step 1. Shaping the purpose of the advertising campaign. Usually, the purpose of targeted advertising is to increase the number of potential customers (increasing the audience). For this purpose, the tool «Traffic» is selected.

Step 2. Once the purpose of the advertising campaign has been chosen, the budget is streamlined. A certain amount of budget can be allocated for the duration of the advertising campaign. In this case, the total cost of the advertising campaign will not exceed the given value. You can choose a certain amount of daily budget. In this case, advertising costs may vary from day to day, but the average daily budget will be constant. As the experience of Internet marketing agencies shows, in the first weeks of the advertising company, most of the budget that is planned for the whole duration of the advertising company is spent. If this fact is not taken into account, the

advertising campaign will have to increase the budget, as it will not be sufficient for the second half of the advertising period.

Step 3. Determine the name of the company and the destination of the traffic. The name of the company is only seen by the marketing firm, which adjusts the advertising company. The name of the company producing the services is necessary to distinguish it from the tuned advertising campaigns of other enterprises. The selection of the target audience depends on the choice of the position «where to go traffic». In case of setting up an advertising campaign for the management of an apartment building, it is a site, namely, a page on the site where people can join the developed computer.

Step 4. Setting budget lines for the advertising campaign. If you select daily budget costs when you configure your advertisement and optimize it, then the budget frame for your advertising campaign needs to be set manually. In order to avoid unnecessary expenses during the advertising company period, it is necessary to make a preliminary decision with the company-producer of services, which orders the settings of the advertising campaign according to the limit of daily expenses for the advertising campaign.

Step 5. Setting up the audience. This is the most important stage of the entire advertising campaign. The effectiveness of the entire advertising campaign depends on the correct setting of the audience.

Step 5.1. Select the region in which the advertisement will be displayed. It can be the whole city or town or whole or separate district of the city.

Step 5.2. Choosing age, sex, and detailed targeting. The purpose of this step is to attract as many audiences as possible to the site. In order to achieve the objective of the advertising campaign of the multi-family house management service, it is advisable to select people between the ages of 18 and 65+ women and men.

The detailed targeting includes three categories, such as demographic interests, interests, and behavior. In the interests of demographics, it is possible to customize advertising according to such indicators of potential consumers as education, finance, life events, parents, family status, work. Since the purpose of the company's advertising campaign is to attract as many audiences as possible, it is advisable not to select specific demographic interests. Interest and behavior are where the narrowing of the advertising circle begins. Taking into account the services of the enterprise, advertised, and this - utilities, then in the interests of choosing the position «housing-communal services». It is advisable to select the segment «movement for environmental protection». In behavior you can choose «attracted buyers». Attracted buyers are people who regularly make purchases over the Internet.

Step 6. Final advertising for potential consumers. At this stage, it is advisable to select platforms and design the final type of advertising. Facebook automatically installs a variety of playthings, such as Audience Network, and recommends advertising in all possible locations. But the automatic settings are designed to pump money out. That's why it's best to always edit the play station.

Conclusions. The study recommended the following effective Internet marketing tools to form the advertising campaign of the multi-family home

management company. For the collective and individual consumers of public services designated by law, it has been proposed that: for collective consumers, customize service advertisements through a search request. For individual users, it is recommended to configure targeted advertising via the Facebook social network.

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PROFESSIONAL COMPETENCIES OF MILITARY REGISTRATION SPECIALISTS AS A FACTOR FOR ENSURING BUSINESS SECURITY

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Abstract. *The article explores the problem of implementing the competency-based approach and the formation of certain competencies. The purpose of the article is to develop a list of professional competencies of specialists in military accounting of enterprises. In order to achieve this goal, the article used general methods of cognition: analysis and synthesis, induction and deduction. The study provided an opportunity to determine the list of professional competencies of specialists in military accounting of enterprises that can be used in the development of standards for their training and retraining.*

Keywords: *competencies, professional competences, military registration specialists, military registration.*

JEL classification: F52, H56, I26

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Introduction. Stable operation, development and economic security of enterprises depend on their ability to comprehensively counter all existing and possible threats to the external and internal environment [1-2].

Modern Ukrainian enterprises operate in difficult conditions. In their external environment, there are constantly new threats to their economic security. A feature of the processes that occur in the external environment is the high level of their uncertainty, which significantly complicates the modern preparation and implementation of measures to adequately respond to challenges and threats.

One of the important factors of economic security of enterprises is the ability to achieve a balance in resolving conflicts of interest between the state and the enterprise that arise during military service [3] in the relationship between enterprise, employee and territorial recruitment centers (military units).

In these circumstances, the most important task of the enterprise security system is to actively conduct information and analytical work to study existing and identify (predict) other challenges and threats that may arise in the future. This will allow effective management of the enterprise security system, respond quickly to all negative changes that occur in the external environment of the enterprise, and those that are just beginning to take shape, and fully in the short and long term will negatively affect economic security.

Given the fact that currently as a result of the aggressive policy of the Russian Federation, the annexation of Crimea and parts of Donetsk and Luhansk, in terms of a special period in Ukraine one of the most important areas in the security system of all domestic enterprises is mobilization training, including military accounting of conscripts, which is part of the content of mobilization training. The current state of the military-political situation and the level of socio-economic development of the country requires enterprises to adapt their activities and security system, taking into

account the personal accounting of conscripts in the interests of national security and defense.

The most important component of the mobilization training system is its personnel component, in particular the selection and appointment of personnel to the positions of specialists in mobilization work and military accounting, as well as the formation of their professional competence and professional development. Thus formation of professional competence of these workers should be carried out in the course of their preparation (advanced training) and practical performance of tasks on mobilization work, in particular conducting military accounting. To date, the national economy has a significant need for training of mobilization workers in the public and private sectors of the economy, but the system of certified training (training) of these workers has not yet been formed.

Thus, today there are contradictions between the needs of theory and practice, in particular the lack of a single list of competencies for the training of specialists in mobilization and military accounting and as a consequence of the standards of their training.

Literature review. The works of V. Baidenko, Y. Vardanyan, I. Zymna, L. Karpova, L. Koval, N. Kuzmina, A. Markova, O. Mytnyk, O. Pometun, S. Rakov, V. Slastyonin, L. Khoruzha, A. Khutorsky, who laid the foundations of the theory of competence approach, are devoted to the problems of realization of the competence approach and formation of certain competences. Thanks to the research of these scientists, the essence, content and structure of professional competence are determined, the conditions are identified, the technological bases of its formation are developed.

The issue of professional competence has been studied by domestic and foreign scholars mainly in relation to teachers. Thus, scientists V. Adolf, S. Budak, S. Vershlovsky, O. Dobudko, M. Kabardov, V. Krychevsky, V. Maslov, V. Strelnikov, N. Kharitonova, O. Shiyan emphasize the need to develop the problem of professional and professional competence of the teacher in the conditions of multilevel professional education. Other researchers V. Bespalko, A. Verbytsky, M. Clarin, J. Kolomynsky, G. Selevko connect the solution of the problem of development of professional competence of teachers with the technological organization of training.

In foreign literature, the works of D. Britel, E. Jimez, R. Kwasnitsa, W. Landscheer, M. Lennon, P. Mercer, M. Robinson are devoted to the development of professional competence.

In domestic publications, professional competencies in the field of military accounting were studied in the work of O. Pravdyvets, V. Kholin [4], which concerned the administrators of the Unified State Reserves Register.

In addition, the issues of formation of professional competencies of employees of military accounting of enterprises were partially covered in the report of O. Pravdyvets [5].

Thus, a review of scientific works of domestic and foreign scientists shows that the issues of professional competence of specialists in personal accounting have not

been studied. Perhaps this is due to the fact that military accounting is a specific task that has become relevant during the partial mobilization in Ukraine (2014-2015) and the action of a special period that holds to the present time, so the question of forming the professional competence of specialists of question of military accounting enterprises need further research.

Aims. The purpose of the article is to develop a list of professional competencies of specialists in military accounting of enterprises.

Methods. In order to achieve this goal, the article used general methods of cognition: analysis and synthesis, induction and deduction.

Results. According to [2], the protection of the sovereignty and territorial integrity of Ukraine, ensuring its economic and information security are the most important functions of the state, the business of the entire Ukrainian people.

Based on [6-8] enterprises are important elements of the system of military accounting of conscripts, who keep personal accounting of conscripts, which is the content of mobilization training of the state and is conducted to ensure full and quality staffing of the Armed Forces and other military formations formed in accordance with the laws, personnel in peacetime and special periods.

According to [8], the tasks of military accounting are:

- formation of a military reserve of human resources to ensure the implementation of measures for the transfer of the Armed Forces and other military formations formed in accordance with the law to the organization and staff of wartime, as well as to replenish their personnel in peacetime and in special periods;
- analysis of the quantitative composition and qualitative condition of conscripts for their effective use in the interests of defense and national security;
- documentation of military accounting documents of conscripts;
- reservation of conscripts for the period of mobilization and wartime;
- conducting control over the observance by conscripts, officials of state bodies, enterprises, institutions and organizations of the established rules of military accounting.

Military accounting personnel are appointed to keep military accounting at enterprises, and the maintenance and provision of advanced training of these persons is carried out at the expense of the state and relevant local budgets, enterprises, institutions and organizations.

According to [9], the name of the profession is defined - military accounting inspector (3439).

Given that the level of competence of the employee does not remain constant for a long time there is a need for periodic training, and one of the most important factors influencing the level of competence of professionals is the dynamic change of regulations on personnel management, labor law and regulations, the study of which takes some time to raise their professional level depending on the new tasks and changes in the regulatory support of this activity.

This task should be solved by the system of advanced training of military accounting specialists, but the standards for their training have not yet been developed.

Therefore, we have a priority task - to determine the professional competencies of these specialists for further development of the appropriate standard of their training.

To determine the competence of specialists, we use the method of developing professional standards [10].

According to [10], competence is a dynamic combination of knowledge, skills, abilities, ways of thinking, views, values, and other personal qualities, which determines a person's ability to successfully socialize, conduct professional and / or further educational activities consisting of general and professional competencies.

Professional competencies are a set of knowledge, skills and abilities, professionally significant personality traits that provide the ability to perform at a certain level of labor functions, defined by the relevant professional standard.

Based on the analysis of the tasks assigned to enterprises in the conduct of military accounting, it is possible to determine the list of professional competencies of specialists in military accounting of enterprises, which are given in table 1.

Table 1. List of professional competencies required to perform labor functions

№	Labor functions	Professional competencies (by labor action or group of labor actions)
1	Checking the availability of military accounting documents for citizens during employment (training)	Knowledge of the types of military accounting documents issued to conscripts
		Ability to identify a person by his military records in relation to his military service
2	Sending within seven days to the relevant district TRC notices of changes in the credentials of conscripts hired (trained) or dismissed (expelled from the educational institution)	Ability to fill in the Notification on change of accounting data of the employee and timely sending of this notification to the district TRC at the place of his military accounting
3	Ensuring the completeness and accuracy of the accounting data of conscripts in accordance with the requirements in accordance with the law	Knowledge of military accounting of conscripts
		Ability to fill in personal cards of P-2 employees and build a card index from them
4	Notification of conscripts and conscripts about their call to the district TRC and ensuring their timely arrival	Ability to develop timely orders of the head to ensure notification of employees in accordance with the instructions of the district TRC on the call of employees and ensure its implementation
5	Interaction with district TRCs on terms and methods of verification of identity card data, lists of conscripts, registration data, making appropriate changes to them, as well as on notification of conscripts	Ability to interact with district TRC officials
6	Organization of periodic verification of identity cards of conscripts with entries in military tickets and certificates of registration in conscription stations.	Ability to organize the verification of identity cards of conscripts with entries in military tickets and certificates of affiliation to conscription stations with registration cards P2 and accounting documents of district TRC
7	Within five days from the date of submission of the relevant documents, making changes to the identity cards of conscripts regarding their marital status, place of residence (stay), education, place of work and position and	Ability to timely make changes to the identity cards of employees, fill in and send to the district TRC notifications of changes in credentials

№	Labor functions	Professional competencies (by labor action or group of labor actions)
	sending (if any) to the district TRC notifies about the change of credentials	
8	Compilation and submission by December 1 of each year to the district TRC of lists of citizens to be assigned to conscription stations (if any)	Ability to compile lists of citizens to be assigned to conscription stations
9	Acceptance on receipt from conscripts of their military accounting documents for submission to the district TRC for verification of accounting data and registration of conscripts for the period of mobilization and wartime	Ability to ensure the collection of records and return of military accounting of employees
		Ability to draw up documents for the reservation of conscripts at the enterprise for the period of mobilization and wartime
10	Timely execution of documents for booking conscripts for the enterprise for the period of mobilization and wartime	Ability to timely make changes to the identity cards of employees, fill in and send to the district TRC notifications of changes in credentials
11	Constant control over the observance by conscripts of the established rules of military accounting and the conduct of appropriate explanatory work	Knowledge of the Rules of Military Accounting of Conscripts
		Ability to monitor their implementation and outreach
12	Constant informing of district TRCs about citizens who violate the rules of military accounting, to bring them to justice in accordance with the law	Ability to detect violators of military accounting rules and timely inform district TRCs about employees who violate them
13	Maintaining and storing a log of the results of inspections of the state of military accounting of conscripts and comparing their credentials with the data of district TRC	Ability to maintain and store a log of the results of inspections of military accounting of conscripts and verification of their credentials with the data of district TRC

Discussion. The introduction of a system of certified training of military accounting specialists in the country will provide an opportunity to increase the effectiveness of economic security of enterprises and national security of Ukraine as a whole.

To implement this task it is necessary to solve a set of legal, scientific, pedagogical and organizational measures, in particular:

- make changes to regulations;
- develop standards for the training of specialists in mobilization work and military accounting;
- to organize work on determining the need for training and planning of this training in the areas of economic activity on a sectoral basis;
- organize the educational process and other activities.

Conclusions. The study provided an opportunity to determine the list of professional competencies of specialists in military accounting of enterprises that can be used in the development of standards for their training and retraining.

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EXPERIENCE OF LEADING COUNTRIES OF THE WORLD REGARDING THE ORGANIZATION OF EDUCATION INSTITUTIONS SECURITY

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Abstract. *Recently, in all countries of the world there is a question of ensuring the safety of all participants in the educational process of relations between educational institutions. That is why the aim of the article was to study the experience of leading countries in the field of security in educational institutions. The research methodology included a comparative analysis of the world's efforts to ensure security in educational institutions and the search for new ways to improve. The main threats to the security of educational institutions have been identified, namely: terrorist acts; the impact on students of persons who use psychoactive substances; inadequate actions of people with mental disorders; criminal actions of criminal elements; interpersonal conflicts in study groups; man-made disasters, fires, etc. It is established that the system of identification of their employees - teachers, students and other members of the educational staff is of great importance for ensuring the security of educational institutions. It was found that trainings and other types of training are conducted for all participants of the educational process to ensure the safety of educational institutions. Educational institutions of the world's leading countries have formed their security policy in internal documents, which define the main directions, principles, tasks and technologies of activities to combat external and internal threats.*

Keywords: *educational institutions; security; participants in the educational process; threats; opposition.*

JEL classification: F52, H56, I26

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Introduction. A comparative analysis of higher education systems in the UK, Italy, Germany, France, Finland and the United States identified major differences in the education systems of these countries at the higher education level, and common features - to enter higher education institutions with classical or vocational programs, you must first obtain secondary education. .

An important direction in the activities of educational institutions in foreign countries is to ensure their safety. The security of educational institutions in developed countries is considered to be the creation of such conditions under which reliable protection of life and health of students and teachers, as well as respect for their rights, freedoms and personal dignity.

Literature review. Ensuring the safety of educational institutions abroad is becoming an increasingly important task today. This is due to the fact that recently foreign educational institutions are often the object of various criminal encroachments. Including such dangerous as hostage-taking by criminals, terrorist acts, shooting of students with automatic firearms, theft and damage to property [1-8].

Given the real and potential threats to the activities of educational institutions, ensuring their safety has always been and remains an important direction in the work

of governments and law enforcement agencies in almost all countries. However, despite all the measures taken to ensure the security of educational institutions, they still remain the object of various criminal encroachments. The peculiarity of crimes committed against educational institutions is that criminals can come from both external and internal environments. Criminals from the external environment include terrorists, organized criminal groups and individuals who, due to some criminal interests or due to mental disorders, commit illegal acts against educational institutions, individual teachers and students. Criminals from among teachers or students may also appear in the domestic environment. In this category, the motives for committing illegal acts may be different. They can be based on mental disorder, revenge for the insults, self-affirmation and others.

Aims. The aim of the article is to compare the experience of European countries in ensuring the security of educational institutions.

Methods. To achieve this goal, methods of analysis and synthesis, methods of comparison and generalization of results were used.

Results. Security experts believe that educational institutions are always of interest to terrorists and other criminals due to a number of circumstances that are due to the specifics of their activities. First of all, it should be borne in mind that there are children in educational institutions and therefore everything that happens in them is always of special interest to society. And if a crime is committed within the walls of an educational institution, which is directed against the health and life of students, it causes a wide public response and is always in the field of view of public authorities, the media and the general public. This is exactly what terrorists are counting on whose goal is to assert themselves, intimidate society and force the authorities to make some concessions to them. Educational institutions are just as attractive for criminals who are going to take hostages. This is due to the fact that in educational institutions in a relatively small area there is always a high concentration of people - students and teachers [2].

The security of an educational institution is an important component of its overall security. Moreover, it largely depends on the level of protection of the educational institution from external threats, as well as on how safe its internal environment. The security of the educational institution also influences the choice of entrants, as well as education and what knowledge will be acquired during training in it. And this already has a very serious impact on the competitiveness of the educational institution in the market of educational services. Educational institutions are chosen for education, which, due to a combination of factors, make them better for education than others. And so it is clear that parents will never allow their children to study in those schools where there is a threat to their health and life [1-3].

Given that currently ensuring security in education is a difficult task, for its successful solution in foreign countries only high-level professionals are involved who are well aware of the nature and mechanisms of modern security threats to educational institutions. This primarily applies to terrorist acts, hostage-taking and the criminal use of firearms and explosives. As well as other illegal actions that are

possible in educational institutions. Figure 1 presents the main types of threats to the stable operation and security of foreign educational institutions.

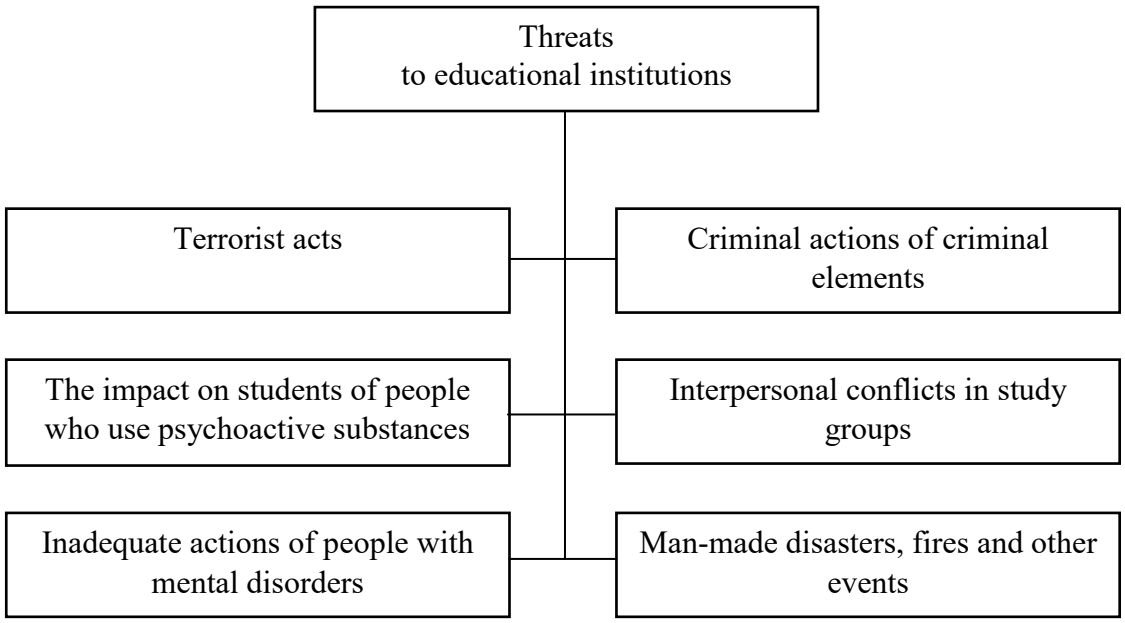

Figure 1. The main threats to the security of educational institutions
Source: developed by the author

Monitoring, analysis and evaluation of the processes currently taking place in the external and internal environment of educational institutions in foreign countries shows the existence of real and potential threats to their security. Therefore, the creation of effective security systems capable of timely detecting criminal intentions against educational institutions and actively counteracting criminals to prevent crimes, especially regarding the lives and health of students - is a priority for public authorities, law enforcement and educational institutions themselves [2].

The most dangerous type of threats are threats directed directly against the staff of educational institutions. This type of threat can be implemented in the form of hostage-taking from students and teachers, the use of firearms and explosives by criminals, attacks on students and teachers for moral humiliation and physical abuse, organizing the abduction of students and teachers to obtain ransom and other dangerous crimes against the person [2-3].

Foreign security experts note that one of the areas in which new threats to the security of both organizations and individuals are actively formed are social networks. As an innovative product of the information economy, social networks have recently become very popular. They are actively used by various categories of the population of especially developed countries for virtual communication and operative exchange of important information. Such communication contributes to the involvement of various categories of the population in active social - political, cultural - educational, scientific and technical and other spheres of life and activity of society and the state. Young people use social networks especially actively. This is

confirmed by studies that show that recently more than half of their contacts with their peers are made by young people on social networks [1-8].

Recently, social networks are actively used for active hybrid information wars. For this purpose, various technologies are used, including the so-called "trolling". The basis of this technology is deception, slander, provocation. All that contributes to the emergence of quarrels, conflicts, the formation of a negative attitude of others to a particular person. A particular danger of trolling is that this form of online provocation or bullying can be used by anonymous users who are virtually impossible to identify. The use of trolling against students and teachers can have a serious negative impact on their personal lives as well as their position in society. And the most dangerous thing is that the constant negative impact over a long period of time on a particular person can form a suicidal mood. This is especially true for young people with a weak psyche.

Of particular concern is the fact that studies in educational institutions in the United States show that more than 57% of students have been exposed to aggression in cyberspace to varying degrees. The same problem exists in Canada, where 34% of students have been exposed to cyberspace. In EU countries, a similar problem is also encountered in educational institutions, but less often, as in Europe, students are less likely than Americans to communicate on social networks [1].

However, despite the fact that threats on social networks pose a serious danger to educational institutions, it is very difficult to counter them. This is due to the fact that in democracies there is free access to all information resources. And the technical equipment and literacy of the population and, first of all, of the youth, allows to use effectively all available information resources on the Internet. As a result, there are currently no effective technologies to combat criminals on social media.

This is due to the fact that currently there is no technical capacity for timely and effective response to these threats. Thus, the technologies used on the Internet not only provide opportunities for the development of society and man, but also pose very serious threats, especially to young people. When taking measures to protect educational institutions from existing and possible threats to their activities, special attention is always paid to ensuring the protection of people - students and teachers.

An important feature of the organization of protection of educational institutions from modern threats to their security is that they usually occupy a large area, which houses many buildings for various purposes, which house expensive scientific and educational equipment. All this creates serious problems in the organization of protection of the territory and all objects that are on it. In order to provide reliable protection and protection, a multilevel system of protection is created in educational institutions. But in the author's view, a significant drawback is that despite the presence of real terrorist and other threats to the safe operation of educational institutions, they traditionally and strictly adhere to the rules of free access to students' places of residence and to all educational and sports facilities and cultural facilities. entertainment activities. This significantly complicates the activities of the security system to prevent the commission of terrorist acts and other crimes on the territory and educational facilities of educational institutions [1, 3].

Despite the fact that almost all countries take active measures to ensure the safety of their educational institutions, there are some differences in their actions.

In order to prepare educational institutions for competent actions in the event of a real threat to their activities, and especially the lives and health of students and teachers, the American Association of Higher Education has developed special recommendations for security and crime prevention, including terrorist acts [1].

These recommendations draw attention to the need for regular inspections of the territory and educational buildings, especially in the event of a terrorist threat or other danger. It is proposed to pay special attention to the timely organization in each guarded educational building of single checkpoints equipped with the necessary equipment to identify students, teachers and all visitors.

The recommendations pay special attention to the timely notification of students and teachers about events that have occurred on the territory, educational and other facilities of educational institutions. To this end, it is proposed to equip reliable and effective notification systems in educational institutions, which allow to maintain communication with each student and employee of the educational institution [1-6].

In order to increase the level of protection of educational institutions in the United States, security technologies are constantly being improved. Given that threats to the security of educational institutions can arise in the external and internal environment and manifest themselves in various forms, security professionals are constantly improving protection technologies. Innovative solutions are actively used in the development of technical means, which allow to increase the level of security of educational institutions.

Special attention in American educational institutions is paid to the observance of security measures during various mass events with the participation of students, teachers and invited guests. This is due to the fact that a large crowd always attracts terrorists and other criminals, as it allows you to commit a high-profile crime with a large number of victims. In order to prevent crimes during mass events, security services pay special attention to the organization of effective access control. To do this, security officers are actively using modern metal detectors, which eliminate the passage to mass events of criminals armed with firearms and melee weapons. Including modern portable arched metal detectors that are easy to assemble and run on batteries. Due to the fact that crimes are often committed with the use of firearms, the security services of educational institutions use a system of X-ray control. This system, installed at the entrance to the training building, allows you to detect weapons that are carried in bags or backpacks.

Security experts believe that conventional locks cannot provide reliable protection for buildings and individual rooms of higher education institutions. This is because the keys to these locks can be forged, stolen or lost. Therefore, in order to increase the reliability of protection of higher education institutions, it is proposed to use more widely without key locks. They are of different types, but in schools it is better to use PIN-code locks. These locks have many digital combinations, so they should be used where they are used by many people: teachers and students [1-4].

The study of the process of emergence and development of emergencies that have taken place in foreign educational institutions shows that it is very important to limit the scope of criminals. To this end, it is proposed to use lock controllers used in access control systems. These technical devices allow security specialists to lock the doors of all guarded premises at the same time in the event of a threat, which will limit the scope of criminals on the territory and facilities of the educational institution. Such a restriction of possible access of criminals to other premises of the educational institution will objectively contribute to the preservation of life and health of teachers and students who are in them. This confirms the analysis of emergencies that occurred in educational institutions. During which the human casualties would be much less if the criminals had a restricted area of free movement on the territory and facilities of educational institutions.

Of great importance for the security of educational institutions is the system of identification of their employees - teachers, students and other members of the teaching staff. In American schools, this area of security is given much attention. To solve this difficult task, an identification system is used, which includes the use of identification badges, and for visitors they can have a color code that changes daily. In addition, visitors must register in a special log of visitors.

In order to prevent the intrusion of unwanted persons into educational institutions, a flow management system is also used, which scans the identity documents of visitors and verifies the obtained data with a database in which information about criminals is stored. In the event that this system determines that the visitor is in the database of criminals, the security service of the educational institution shall be notified immediately.

Given that criminals use explosives to commit terrorist acts, the security services of educational institutions should always pay special attention to their timely detection. It is taken into account that criminals can send explosives by mail, they can be brought in a bag, a school backpack. It is difficult to fight this type of crime. Success can only be if all students and staff are attentive and notice all the items left unattended. For this purpose, educational institutions train staff in the rules of handling suspicious objects. And security services use detectors and specially trained dogs to investigate suspicious objects for explosive devices.

In order to ensure the security of American educational institutions, various modern video surveillance systems are most widely used, which are integrated into a multi-node network that allows video cameras located at different educational institutions to simultaneously transmit video images to emergency services directly in patrol cars [1].

In American schools, school buses are used to move students. In order to prevent crimes, buses are equipped with a video camera, radio station, digital video recorder and location control system. This equipment allows you to record and transmit in real time the location of the bus, its stops and speed, and in case of threat, this equipment allows you to quickly contact the school.

Given the growing number of armed attacks on students and teachers, security officers began to issue firearms. Such an exceptional measure makes it possible to

adequately counter criminals armed with firearms and protect the lives of students and teachers of colleges and universities.

In order to increase the level of professional knowledge and practical skills of employees of the security system of educational institutions, special trainings are constantly conducted with them on timely detection and objective assessment of emerging threats to life and health of students and teachers, as well as educational material and technical base of educational institutions.

It should be noted that to obtain a synergistic effect requires a comprehensive application of all the above technical means. Only in this case it is possible to build a multilevel protection system capable of counteracting modern security threats to educational institutions. For educational institutions, it is also recommended to conduct special security classes for security staff, teachers and students. The purpose of these classes to give knowledge, as well as to form skills and psychological readiness to act properly in a real threat [3].

Given the real terrorist and other threats in the field of government education, law enforcement agencies and educational institutions themselves in the EU are paying constant attention to the security of educational institutions. This activity was especially intensified after the tragic incident that occurred on March 9, 2012 in France. On that day, an Islamic extremist committed a crime by carrying out an armed attack on a school in the city of Toulouse. As a result of the use of automatic firearms by schoolchildren, the criminal killed four and wounded one person.

In order to prevent crimes that may be based on religious and national contradictions, the French authorities have separated religious institutions from secular ones. According to the current rules, it is forbidden to demonstrate affiliation to any religion in educational institutions. In the case of extremism or religious fundamentalism, students and their parents are held administratively liable. It should be noted that, despite active opposition from the Muslim community, the country has passed a law banning the wearing of the hijab in schools. Security experts believe that the introduction of a secular approach to the educational activities of public schools has prevented a significant number of incidents based on national or religious hostility among students.

Given that ISIS militants have repeatedly called for the killing of teachers because, according to radical Islamists, they instill in students the values of secular society and are therefore "enemies of Allah," the authorities are responding by tightening control over the radicalization of youth [4].

Threats to the security of educational institutions can arise not only from extremist elements and terrorists. Accidents and man-made catastrophes pose no less serious danger to the life and health of students and teachers, as well as to the educational material and technical base of educational institutions.

They concern the determination of the safe distance of educational institutions from industrial enterprises, gas stations, parking lots and other facilities where man-made accidents and catastrophes can potentially occur. Recommendations are given on how to inspect the location of educational institutions. Much attention is paid to

ensuring the organized evacuation of students from the premises of the educational institution in the event of a threat to their lives and health [5].

In order to strengthen the security of educational institutions in France, additional measures are taken to ensure the safety not only on their territory, but also on the streets adjacent to schools, colleges and universities. For this purpose, mobile patrols are used, which carry out their activities to prevent crime throughout the school year. And with the heads of educational institutions, special training sessions are held to prepare them for the right actions in extreme situations. Students are also prepared for possible attacks by terrorists or other criminals, which includes training in the correct actions in the event of an attack by armed criminals and the rules of first aid for victims.

Much attention is paid to creating safe conditions in the field of education in England. The country's authorities and law enforcement agencies have become particularly active in ensuring the security of educational institutions, following the execution by an Islamic extremist of students at a Jewish school in the French city of Toulouse. The tragedy was covered by the British media and caused a wide public response.

It can be assumed that the combination of these two factors discussed above in the absence of religious and national tolerance can lead to conflicts in educational institutions, which will be based on religious and national hostility.

Such conflicts, as shown by the tragedies that have occurred in a number of educational institutions in the EU, can have serious consequences, including deaths. With this in mind, public authorities, principals and teachers of English schools pay special attention to educating students in tolerance towards people of other nationalities and religions. inspections of educational institutions [3-6].

The British OFSTED has the right to inspect the activities of educational institutions, to decide on changes to existing curricula, and if necessary, even to close their activities. However, work to prevent extremism in Britain is under way, with the emphasis shifting from school to preschool. An important area in the activities of OFSTED is the development of various recommendations for the improvement of educational institutions, certification and the provision of various intermediary services, including in the field of security.

Nowadays, young people are often subjected to psychological influence by various extremist organizations, which try to attract them to their side and actively use them for illegal purposes, including for committing terrorist acts. In order to teach young people to recognize these criminal intentions in England, much attention is paid to the formation of students' knowledge and skills that allow them to recognize and respond to the suggestions of extremists and be resistant to the propaganda of multiculturalism [8].

We believe that this approach is creative and should be implemented in the security systems of Ukrainian educational institutions. In the context of increasing the level of threats in the field of education, constant attention is paid to ensuring the security of educational institutions by the German authorities. Ensuring reliable physical protection of students from possible criminal acts, including terrorist attacks,

is considered to be a priority in solving this complex task. German law enforcement agencies have developed a set of measures to prevent crimes in educational institutions. Particular attention is paid to the creation of modern security systems in educational institutions, which exclude the entry of outsiders into the territory and into educational buildings. Police and psychologists are involved in conducting classes on safe behavior and correct actions in extreme situations. In foreign countries, much attention is paid to the development of mechanisms to combat crimes in the field of education. To this end, special recommendations are developed for educational institutions to ensure safety in modern conditions [6-8].

Discussion. First of all, it is proposed that educational institutions formulate their security policy as an important fundamental document that defines the main directions, principles, tasks and technologies of activities to combat external and internal threats.

Western security experts believe that every educational institution should develop a special security regulation. This document should specify the goals and objectives of security activities, identify the forces and means involved in their solution, material and technical resources, as well as mechanisms for cooperation with law enforcement agencies. Schools are also encouraged to set up their own security services. And in that case, if for some reason the educational institution cannot have its own security service, then as an alternative it is offered to conclude a contract with a specialized security company for the provision of security services.

Much attention is paid by Western security experts to improving countering existing threats to educational institutions. To this end, developing special recommendations on how to effectively ensure the physical protection of educational institutions from possible attacks by terrorists and other criminals. Specific suggestions are given on how to place physical security posts to protect the most important objects of the educational institution. In this regard, the recommendations pay special attention to the introduction of modern access management and control systems, which integrate electronic student tickets [9].

Specialists in the field of security pay special attention to equipping educational institutions with video surveillance and registration systems, with the possibility of video analytics, as well as equipping educational institutions with modern security and fire alarm systems. From all the above we can conclude that the protection of educational institutions in foreign countries is a complex set of organizational and engineering measures aimed at ensuring the safety, especially of students and teachers, as well as preserving the training facilities from terrorist attacks and other criminal encroachments.

We believe that such an approach to ensuring the security of educational institutions in foreign countries does not fully meet the existing threats to their activities. By providing only basic physical protection, it is impossible to effectively counter extremism and radicalism of religious movements in educational institutions. To solve such complex tasks, it is necessary to have such systems that are able not only to perform the function of protection, but also to solve such complex tasks as monitoring, analysis and evaluation of processes occurring in the internal and

external environment of educational institutions. Without this activity, it is extremely difficult to identify all threat factors in a timely manner, including signs of preparation for a terrorist act or other crime, which in turn will not allow to take timely and adequate measures to prevent them. Therefore, when organizing the security system of an educational institution, it is necessary to pay attention not only to the organization of security and physical protection, but also, it is very important for the purpose of timely detection of threats, to constantly conduct information and analytical work.

Conclusions. Based on the results of the study, the following conclusions can be drawn. The article examines the experience of the world's leading countries in ensuring security in educational institutions. The main threats that affect the security of educational institutions are identified, namely: terrorist acts; the impact on students of persons who use psychoactive substances; inadequate actions of people with mental disorders; criminal actions of criminal elements; interpersonal conflicts in study groups; man-made disasters, fires, etc. It is established that the system of identification of their employees - teachers, students and other members of the educational staff is of great importance for ensuring the security of educational institutions. It was found that trainings and other types of training are conducted for all participants of the educational process to ensure the safety of educational institutions. Educational institutions of the world's leading countries have formed their security policy in internal documents, which define the main directions, principles, tasks and technologies of activities to combat external and internal threats.

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ORGANIZATIONAL AND LEGAL ASPECTS OF OMBUDSMAN'S ACTIVITY IN INSURANCE

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Abstract. *Every year, more and more countries around the world involve the public and independent experts in regulating the activities of institutions, including the insurance market. The purpose of the article is to study the legal and organizational aspects of the ombudsman in insurance. To solve this goal, the method of systematization of criteria was used; historical method for the chronology of the creation of ombudsmen in the financial market; identification of models for organizing the activities of ombudsmen in the insurance market. In the European Union, there are two models of organizing the work of the ombudsman in the financial market, including the insurance market: the British and the German. Based on the study of nominative acts of the European Union, the main criteria that must be met by the institution that provides alternative dispute resolution (ombudsman), namely: accessibility; professionalism, independence, impartiality; transparency; efficiency; justice (impartiality); freedom. It is established that the competent authorities of individual states must compile lists of ABC institutions that meet the requirements set out in the Directive and make this information publicly available.*

Keywords: *financial market, insurance market, pre-trial dispute resolution, consumer, ombudsman.*

JEL classification: G22, G52.

Formulas: 0; fig.: 0; tabl.: 1; bibl.: 2.

Introduction. A significant role in protecting the rights of consumers of insurance services in most countries is played by the state in the form of bodies regulating insurance markets, or specialized government agencies and agencies, which have a wide range of regulatory, control and law enforcement powers to protect consumer interests. In addition to these powers, such state institutions also perform the functions of reviewing appeals and complaints from consumers.

The world's leading countries are actively involving not only government agencies in the regulation of these issues, but also strengthening the role of institutions that deal with alternative dispute resolution between consumers and insurance companies.

Literature review. On 21 May 2013, the European Parliament and the Council adopted the Directive on Alternative Dispute Resolution with Consumer Involvement and amending Regulation (EC) №2006 / 2004 and Directive 2009/22 / EC (hereinafter - the Alternative Dispute Resolution Directive) [1-2].

Among the reasons for its adoption are**:** consumers and sellers do not know about the mechanism of out-of-court compensation for damages with a fairly low percentage of citizens who know how to file a complaint to the institution of alternative dispute resolution (ABC); the level of quality of complaints handling by ABC institutions differs significantly; cross-border disputes are often considered unsatisfactory. Inequality in the scope of alternative dispute resolution, its quality and awareness of Member States creates a barrier to the internal market.

The aim of the Directive is to achieve a high level of consumer protection in order to contribute to the proper functioning of the internal market by enabling consumers to submit complaints against sellers on a voluntary basis to institutions offering independent, impartial, transparent, efficient, fast and fair alternative dispute resolution procedures.

This Directive is an indication to EU Member States of how a system of consumer protection should be built on the basis of an alternative dispute resolution mechanism. It approves harmonized requirements for both ADR institutions and ADR procedures so that, once implemented, consumers have access to high-quality, transparent out-of-court redress mechanisms, regardless of where they live in the EU. At the same time, Member States are allowed to deviate from the approved requirements if they provide a higher level of consumer protection [2].

Some of the requirements laid down in the Directive are those which Member States must comply with, while others are subject to national rules at their discretion. The Directive does not define a specific model of an alternative dispute resolution mechanism according to the criteria of the subject of creation, methods of financing, territorial or sectoral affiliation.

The Directive applies to out-of-court settlement procedures for domestic and cross-border disputes concerning sales contracts, the provision of services between an EU seller and an EU consumer, in all sectors of the economy, with some exceptions. For example, this Directive does not apply to health services, higher education, non-economic services.

Aims. The purpose of the article is to study the legal and organizational aspects of the ombudsman in insurance.

Methods. To solve this goal, the method of systematization of criteria was used; historical method for the chronology of the creation of ombudsmen in the financial market; identification of models for organizing the activities of ombudsmen in the insurance market.

Results. The history of the ombudsman as an alternative dispute resolution is more than 200 years old. The ombudsman's mechanism or office provides an independent, impartial, fair, timely, efficient and informal external dispute resolution process between the consumer and the seller of the goods (service provider, contractor, etc.), which is free of charge for consumers.

This form of alternative dispute resolution is also widely known as external dispute resolution (ADR). It does not depend on the companies they complain about and does not depend on them [1-2].

One of the first in the field of financial services was the Insurance Ombudsman of Great Britain (1981), the purpose of which was to protect the rights of policyholders. Today, the UK Financial Ombudsman Service is an independent public out-of-court settlement of financial services disputes established by Parliament under the Financial Services and Markets Act (2000). The UK Financial Ombudsman Service's competence extends to consumer relations. banks, including mortgage, mortgage intermediaries, investment intermediaries, pension funds, insurance companies, credit unions, securities intermediaries.

In the world, dispute resolution organizations in the field of financial services are created as:

- universal institutions operating in the financial market as a whole (the scope applies to all financial services, including insurance);
- separate institutions operating in parallel on its separate segments.

Universal organizations also include the National Council for Consumer Complaints in Sweden, the Committee for Complaints on Transactions with Financial Firms in Iceland, the Joint Conciliation Council in the Austrian banking sector, the Czech Financial Arbitration Service, and the Office of the Financial Ombudsman of Poland [2].

In contrast, in Belgium, in addition to the organization of the Financial Ombudsman, which is responsible for resolving disputes related to the provision of most financial services, there is also an Insurance Ombudsman, designed to protect the rights of consumers in the field of insurance and pensions.

In Denmark, there are five bodies - the Danish Securities and Brokerage Complaints Board, the Insurance Complaints Board, the Danish Investment Fund Complaints Board, the Danish Banking Complaints Board, and the Danish Mortgage Complaints Board. which intersects in some cases.

In Germany, in addition to delimiting the competence of organizations that ensure the rights of clients in the field of financial services in the areas of banking services, insurance and investment support, there is also a parallel operation of individual organizations within the banking sector.

Lithuania The law defines the institutions that have the right to consider and resolve pre-trial disputes between consumers and service providers, in particular, the Lithuanian Insurance Supervision Commission considers complaints of consumers of insurance services.

In Poland, the Institute of the Financial Ombudsman was established in 2015 on the basis of the Insurance Ombudsman, which has been operating since 1995.

As we can see, there are different options for the formation and operation of organizations that care about consumer protection in the field of insurance. There are also a variety of mechanisms for dealing with customer complaints, which have become widespread in the world. However, the activities of these organizations in the field of consumer protection in the field of insurance, regardless of the country in which they are established, comply with the principles set out in the Recommendation of the European Commission of 30 March 1998 № 98/257/EC.

The main advantages of using the alternative dispute resolution mechanism are:

- availability of legal protection,
- speed of problem solving,
- small costs,
- efficiency from the standpoint of loading ships,
- the possibility of reaching a compromise solution.

In world practice, there are usually two main models of financial ombudsmen: British and German (table 1) [2].

Table 1. The main models of financial ombudsmen: British and German

British model	German model
1) in 1981, the institute of financial ombudsman was established in Great Britain at the initiative of private business; 2) since 2000, the status of the institution of financial ombudsman has been enshrined in law in the United Kingdom; 3) not only an individual but also an organization or charitable foundation with an annual turnover of less than £ 1 million can lodge a complaint; 4) Prior to applying to the Financial Ombudsman Service, the client must try to resolve the dispute with the financial institution on his / her own, for which purpose he / she should send a complaint there. After receiving a final response from the financial institution or after 8 weeks, the dissatisfied consumer may contact the Financial Ombudsman Service; 5) disputes are resolved by conciliation of the parties, only every tenth case is referred to the ombudsman for a final decision; 6) term of consideration of the case - from 6 to 9 months; 7) the cost of services for the applicant is free; 8) the decision of the ombudsman taken at the end of the investigation is binding on the financial institution if the consumer agrees with the decision of the ombudsman. 9) the maximum amount of the binding decision of the ombudsman is £ 100,000, but in some cases the ombudsman may recommend that the organization pay the consumer an amount greater than this amount; 10) the service of the financial ombudsman is financed by membership fees of private companies. English banks pay in proportion to the number of accounts opened, and also pay for each complaint sent.	1) the scope of out-of-court procedure extends to all subjects of the financial market; 2) the ombudsman works at branch business associations; 3) only complaints of individuals are considered; 4) financial institutions enter into an agreement on the recognition of regulatory acts of the financial ombudsman; 5) the complaint is accepted for consideration if: - the dispute is not considered or has not been considered in court or an amicable agreement has not been concluded; - the case is or has been the subject of extrajudicial proceedings by another body; - the statute of limitations for the transfer of the case to the ombudsman has not expired; 6) the decision of the ombudsman is binding if the amount of the dispute does not exceed 5 thousand euros, and if more than this amount, then the decision of the ombudsman is not binding on both parties; 7) after the decision is made, the parties must agree with him; 8) term of consideration of the case - 2-3 months; 9) Complaints are borne by financial institutions.

Source: developed by the author

Based on the study of nominative acts of the European Union, the main criteria were systematized. The **basic criteria** to be met by the institution and the alternative dispute resolution procedure include [1]:

- accessibility;
- professionalism, independence, impartiality;
- transparency;

- efficiency;
- justice (impartiality);
- freedom.

Let's focus on the requirements for achieving each of the criteria:

Accessibility. Among the requirements for ABC institutions, it is determined that such an institution must:

- have a site with updated information that gives the parties easy access to information about the ABC procedure and the ability to file a complaint;
- provide, if available, the possibility for the consumer to file a complaint offline;
- to take into account both domestic and cross-border disputes (disputes arising from a contract between a consumer and a seller located in different EU Member States).

ABC institutions may agree to maintain or introduce procedural rules that allow them to refuse to consider a complaint on the following grounds:

- the consumer has not previously contacted the seller to resolve the dispute;
- the absence of a dispute or dispute is minor;
- the dispute is or has been considered by another ABC institution or court;
- the size of the requirements exceeds a certain financial threshold. However, these thresholds may not be of such a level that significantly complicates the rapid access of consumers to the complaint by ABC institutions;
- the consumer has filed a complaint for violation of the deadline for its submission, which may not be less than one year from the date of submission of the complaint by the consumer to the seller;
- the dispute cannot be resolved by the ABC.

Professionalism, independence and impartiality. Individuals responsible for ABC must meet the criteria of professionalism, independence and impartiality, and this is guaranteed to ensure that they:

- have the necessary knowledge and skills in the field of alternative or judicial dispute resolution, as well as a general understanding of law;
- appointed for a sufficiently long period to ensure the independence of their actions, and may not be relieved of their duties early without good reason;
- do not receive any instructions from any of the parties or their representatives;
- receive a monetary reward that does not depend on the results of the procedure;
- immediately inform the ABC institution of circumstances that may affect (or may be considered as such) their independence or impartiality, or cause a conflict of interest of one of the parties.

Transparency. ABC institutions on their websites, and in other convenient ways, should place in a clear and understandable form:

- information on contact details of the institution; individuals responsible for ABC; types of disputes under consideration, including thresholds; procedural rules, etc.;
- annual reports of its activities, which should cover information on internal and cross-border disputes:

- number of disputes accepted and types of complaints;
- systematic or significant problems that often lead to a dispute;
- the number of disputes that were denied and the percentage by type of grounds for refusal;
- the percentage of proposed or adopted decisions in favor of the seller, consumer or disputes resolved under amicable agreements;
- percentage of terminated ABC procedures;
- the average duration of dispute resolution;
- the level of compliance / execution of decisions made by ABC institutions in the dispute resolution procedure;
- interaction of ABC institutions in resolving cross-border disputes.

Efficiency. The effectiveness of the ABC procedure must be ensured by compliance with the following requirements:

- ABC procedure is available online and offline for both parties, regardless of their location;
- the parties may participate in the procedure both independently and with the involvement of representatives;
- ABC procedure is free or has a token fee;
- the ABC institution that received the complaint notifies the parties to the dispute when it receives all the necessary documents;
- the decision in the ABC procedure is made within 90 calendar days from the date of receipt of all documents on the complaint. In difficult cases, this period may be extended, as notified by the parties.

Impartiality. To achieve impartiality during the ABC procedure, the parties must be provided with:

- be able to express their point of view, receive from the ABC arguments, documents, facts provided by the other party, conclusions and statements of experts, comment on them;
- be informed about the optional involvement of a lawyer, about the possibility of involving a third party at any stage of the procedure, the ability to contact consultants;
- to receive notifications on the results of the ABC procedure with arguments of the grounds for its adoption.

In procedures where an ABC decision is taken to resolve a dispute (unless the proposed decision is binding on the seller if the consumer has agreed to such a decision), it must be ensured that:

1) the parties had the opportunity to withdraw from the procedure at any time if they were not satisfied with the procedure; in cases where, according to national rules, the seller's participation in the procedure is mandatory, the right to refuse the procedure belongs only to the consumer;
2) before the parties have to give their consent / refusal with the proposed decision of the ABC body, they are informed that:

- the parties have the choice to agree with the decision or not, to abide by it or not;

- participation in the procedure does not limit the right to go to court to resolve the dispute;
- the proposed decision may differ from the court decision;

3) the parties were notified of the legal consequences of agreeing to the proposed decision and its compliance;
4) the parties had a reasonable period of time to respond to the proposed solution or settlement agreement.

Freedom. The principle of freedom must be ensured by the following:

- the agreement between the consumer and the seller to file a complaint to the ABC was not binding on the consumer if his right to go to court is restricted;
- the decision proposed by the ABC institution aimed at resolving the dispute may be binding on the parties, if they knew about it in advance and agreed to it. National law may provide that the decision proposed by the ABC is binding on the seller and therefore the seller's consent to the decision is not required.

The Directive also regulates the issues of **informing and interacting with** ABC institutions so that consumers have the opportunity to quickly determine the competence of which ADR entity to resolve the dispute or whether the seller participates in the ABC procedure.

Thus, there is an obligation according to which sellers must inform consumers in an understandable and accessible form (on the website or at the time of concluding the agreement) about the ABC institutions that should be involved in resolving disputes with the consumer.

The EU Commission and the Member States have committed themselves to: disseminating information on how consumers can access ABC procedures; take the necessary measures to encourage consumer and professional organizations to raise awareness of ABC institutions and procedures and to promote the choice of ABC by sellers and consumers.

The competent national authorities must draw up lists of ABC establishments which comply with the requirements laid down in the Directive and make this information publicly available.

The office of the conciliator and the procedure for settling disputes between insurers and consumers of their services shall be established in accordance with the basic requirements laid down in this Directive.

Discussion. A less common model is when the ombudsman works for a state institution that regulates the financial market (Bosnia and Herzegovina - banking institutions, Azerbaijan - the Central Bank, Serbia - the National Bank).

The German model is widespread in the world, as the review procedure allows customers to obtain solutions quickly and free of charge. Out-of-court settlement of a dispute is particularly attractive when the value of the dispute is so low that recourse to the court makes no economic sense. Namely, such disputes are usually more.

The practice of different countries shows that the ombudsman makes a decision in favor of the financial institution and customers in an approximate proportion of 50/50. That is why the financial ombudsman is recognized in many countries as an instrument of objective out-of-court dispute resolution.

The principles of the Insurance Conciliator's Office, as a prototype of the Financial Ombudsman, take into account the elements of these global models of this institution.

Conclusion. In the article we have studied the legal and organizational aspects of the ombudsman in insurance. To solve this goal, the method of systematization of criteria was used; historical method for the chronology of the creation of ombudsmen in the financial market; identification of models for organizing the activities of ombudsmen in the insurance market. In the European Union, there are two models of organizing the work of the ombudsman in the financial market, including the insurance market: the British and the German. Based on the study of nominative acts of the European Union, the main criteria that must be met by the institution that provides alternative dispute resolution (ombudsman), namely: accessibility; professionalism, independence, impartiality; transparency; efficiency; justice (impartiality); freedom. It is established that the competent authorities of individual states must compile lists of ABC institutions that meet the requirements set out in the Directive and make this information publicly available.

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DEVELOPMENT OF REGIONAL INFRASTRUCTURE: PUBLIC AND MANAGEMENT ASPECT

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Abstract. *The academic paper is devoted to the study of theoretical and methodological aspects of public infrastructure management at the regional level. It has been determined that the regional infrastructure is an organizational and economic system; it includes a territorial and sectoral complex of facilities and areas of activity that meet the needs of the region in resources, products and services necessary for functioning, reproduction and development of economic entities. It has been substantiated that the foundation of economic growth and sustainable development lies in effective state management of regional development. It should be noted that the important role of ensuring competitiveness is set on the public management, which in turn depends on the level of infrastructure development, market, financial and other levers of influence. According to data of the European Commission in 2019, it has been established that the first place in Europe in terms of regional infrastructure is occupied by London, which indicates the effectiveness of state measures for infrastructure management. A conceptual model of the public management system of regional infrastructure has been developed. As a result of the research, it has been found that the long-term development of the regional infrastructure is determined by the balanced functioning of all its elements, as well as the formation of a favorable environment for generating and maintaining the potential of the territory needed to find new factors of production on the basis of innovative approaches, increasing the rate of economic growth of the regional economy, and ultimately, improving living standards.*

Keywords: *regional infrastructure, public management, management system model, management assessment methodology.*

JEL Classification: O18, R10

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Introduction. Under the conditions of innovative development of the world economy, the attention to the issues of regional infrastructure is explained by the fact that it, firstly, occupies a larger part of the reproduction process; it absorbs a significant part of capital investments and labor resources. Secondly, further division of labor resources and strengthening of integration processes increases the burden on the economy. In theoretical terms, the development of regional infrastructure is an understudied area of economies. Due to the global crisis caused by the Covid-19 pandemic, public infrastructure management at the regional level is of key importance towards supporting economic growth, facilitating trade and increasing resilience to climate change.

The efficiency of production and the social-political situation depend on the level of development of regional infrastructure. The higher the level of infrastructure development is, the faster the region receives investment, labor force flows into the region, economic development accelerates, and the life and health of the population improves. Conversely, the lower the level of infrastructure development is, the slower the production and the lower the standard of living is. The level of infrastructure

development in the region also plays an important role in creating the image of the territory. And this in turn affects the investment attractiveness of the region.

The presence of a direct link between the development of the regional economy and the degree of infrastructural development of a particular region is a common norm for modern economists. Nowadays there is a clear understanding of the need to implement infrastructure development for the successful operation of various areas of activity. Infrastructure is an essential part of any economic system. Infrastructure facilities are locally connected to each other, but most of them function in order to meet the needs of a specific area, business and population. Consequently, the problem of effective management of regional infrastructure by the state acquires special significance and relevance.

The purpose of the academic paper is to study approaches to the development of regional infrastructure, based on theoretical and methodological provisions relating to its public and management aspect.

Literature Review. The development of regional infrastructure is of great importance for the sustainable development of the economy and is of interest to many scholars who have considered various aspects of this problem. Since 1990, an active study of the issues of the influence of regional infrastructure on economic growth and living standards of the population has begun. The researcher Aschauer D. in his research linked the decrease in economic growth in the United States with reduced infrastructure costs [2]. Scientists Karras G. and Evans P. continued to study this issue, defining satisfactory conditions for economic development as an analysis of the interrelationship of microeconomic infrastructure with the nature of the production process. Subsequently, scientists discovered a link between increasing the efficiency of regional development, financing infrastructure and public management of this process [6].

Husin A. notes that infrastructure plays an important role in supporting sustainable development; the scholar proposes to use the System Dynamics simulation model in demand forecasting, which will provide an assessment and generate scenarios for comparing the feasibility of a regional infrastructure project [8].

Estache A. adheres to the position that the importance of the influence of infrastructure on economic growth is easy to underestimate. In order to avoid underestimating its impact, infrastructure and public capital should be separated, as well as national payments and regional infrastructure investments [4].

Morgenroth E. considers infrastructure as an important driver of regional development. State regional institutions attract centralized investments for the development of regional infrastructure facilities, which will increase employment, economic growth and improve social integration [13].

In our viewpoint, the development of individual infrastructure facilities will not provide sufficient economic development; only systemic development and high quality services of the entire regional infrastructure will ensure the competitiveness of the region and business; and for this it is necessary to build an effective system of governance and regulation.

There are numerous examples of regional infrastructure development. In particular, Chile has a national SNI system, which includes a harmonized structure for the identification, coordination, evaluation and implementation of infrastructure projects. This system provides standardization and methodological guidance for the assessment of regional infrastructure facilities by allocating institutions that manage these projects and their budget funding [3]. A 2016 CBI / AECOM infrastructure survey has found that a lack of strategic regional governance and permanent decision-making are considered as major obstacles towards improving local infrastructure.

Kaufmann D., Kraay A. and Mastruzzi M. Have developed 6 indicators of regional infrastructure management efficiency, namely: indicator of responsibility, political stability, efficiency of public management, quality regulation, rule of law, and control over corruption [10]. The OECD has also developed the "Proper Infrastructure Development" Program, which includes an infrastructure vision strategy, risk management principles, regulatory support, and coordination of infrastructure policies between levels of government [14].

In 2016, the McKinsey Global Institute provided information on the development of a new methodology for assessing the quality of public infrastructure management in the analytical review "Bridging the gaps in global infrastructure" [11]. The outlined diagnostics includes such elements as "infrastructure quality" and "public management in the construction and logistics of infrastructure projects".

From this brief review of the literature on infrastructure development, it can be understood that most scientists and organizations have studied the impact of infrastructure on the overall economic situation. Herewith, insufficient attention is paid to the management aspects of regional infrastructure development. In the present academic paper, we consider public and management aspects of regional infrastructure development as one of the most important factors of long-term economic growth and competitiveness of the region.

Methodology. The methodological basis of this study is a set of methods of scientific knowledge, general and special research methods. Scientific investigations in the field of methodology for assessing the development of regional infrastructure have been analyzed and systematized in order to develop a model of an infrastructure management system at the regional level.

Results. At present, the world, having entered the third millennium, is faced with the global economic problem of building a competitive economy. Regions are understood not only as a spatial, infrastructural, natural-resource and economic category, but also as a social space that has an ecological, historical and social-cultural component forming the attractiveness of the territory. In our viewpoint, the development of the region's infrastructure should be understood as a system of actions aimed at solving the problems of social-economic development of the state, taking into account the rational contribution of the regions to their development.

Covid-19 pandemic crisis has worsened regional infrastructure development prospects for Central, Eastern and Southeastern Europe. Due to the unforeseen costs of national budgets in the coming years, it is important to invest in infrastructure as efficiently as possible, as well as accelerate the transition to digital innovative

technologies. Expanding investment scales in infrastructure development can be an important tool to support recovery activities [1].

The methodology for assessing the effectiveness of regional infrastructure management is developed and applied by the IMF and the World Bank, as well as large consulting companies, in particular, the McKinsey Institute. The present assessment allows identifying weaknesses in public management of infrastructure investments and developing reforms in order to overcome them.

The effectiveness of public management in this area can be assessed in different ways, namely: as the effectiveness of the implementation of the infrastructure facility; as the effectiveness of public investment management in infrastructure based on the project life cycle; as the effectiveness of public management in the field of infrastructure created by public or private investment.

The latter type of assessment is the most comprehensive. Each of them is characterized by its own system of criteria and indicators, and it can be applied independently. The stages of development of the international methodology for assessing infrastructure management are presented in Figure 1.

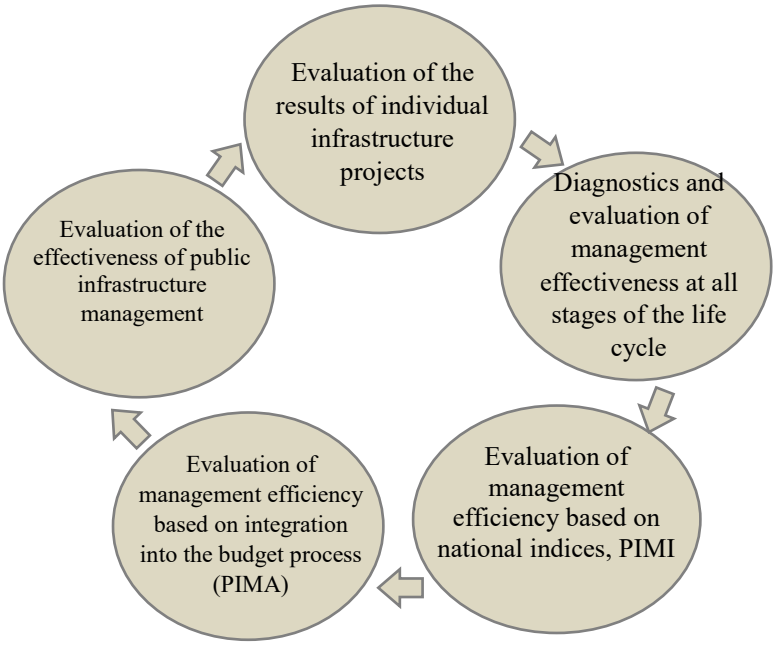

Figure 1. Stages of development of methodology for assessing regional infrastructure management

Source: compiled based on [3; 9].

Experts of McKinsey company in their study "Infrastructure Efficiency: How to Save 1 Trillion USD per a Year" have concluded that reducing costs by 40% with this amount of infrastructure or increasing infrastructure efficiency by 60% is possible through widespread use of leading experience in the field of selection and implementation of new infrastructure projects and getting more benefit from existing infrastructure [12].

The main problems of infrastructure development are the problems related to the purely economic approach to the development of the region and the issues connected

with poor coordination of management and operation of infrastructure facilities due to the multi-sectoral composition of the infrastructure.

In 2018, the European Commission has proposed to create the InvestEU program within the multi-year MFF programs for 2021-2027. It combines 13 financial instruments and is aimed at mobilizing investments of at least 650 billion EUR (about 4,5% of EU GDP in 2019) in four basic sectors, namely: sustainable regional infrastructure, research, innovation and digitalization, small and medium business, social investment [5].

According to the Regional Competitiveness Index (RCI) Methodology (Figure 2), which defines more than 70 indicators, including: the level of governance in the region, infrastructure, digital, healthcare, human capital, labor market and innovation, in 2019, the five leaders in the European Union in terms of regional infrastructure development were as follows: London (the UK), Ile-de-France (France), Kent (the UK), Utrecht (the Netherlands), Surrey (the South-East UK). These regions have a developed transport infrastructure, communications, housing and communal services, education, medicine, social security, culture and recreation.

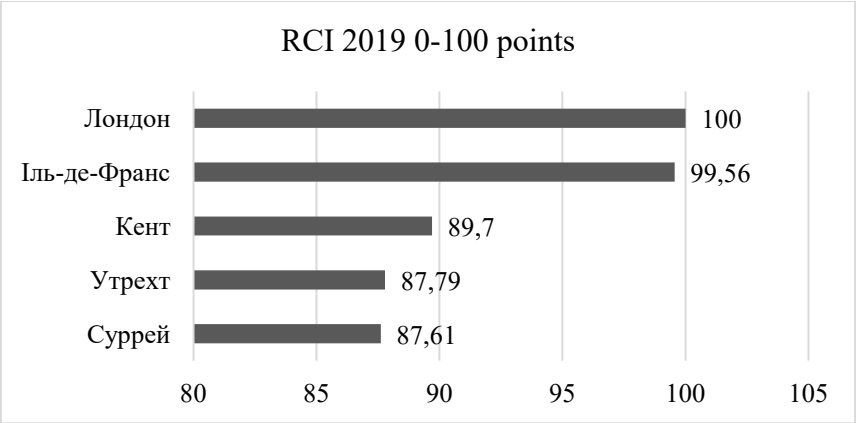

Figure 2. Ranking of regions according to the level of infrastructure development in 2019

Source: compiled according to data of the European Commission.

In Figure 2, it can be observed that London is in the 1st place; consequently, we can conclude that the methods of public management of regional infrastructure development used by the UK government are quite effective. The London National Infrastructure Commission (NIC) has conducted a study on infrastructure sustainability in 2020, which defines how government, regulators and relevant sectors can provide sustainable and reliable infrastructure that is able to meet the future needs of the state. The role of the UK government is not limited to funding; first of all government institutions direct investments in profitable infrastructure projects and support private investment through various management mechanisms.

Three forms of regional infrastructure funding are used in the United Kingdom, namely: public funding; private funding; mixed form of public-private funding. During the period 2008–2018, most of the funds for the development of regional infrastructure came from the central government (Figure 3).

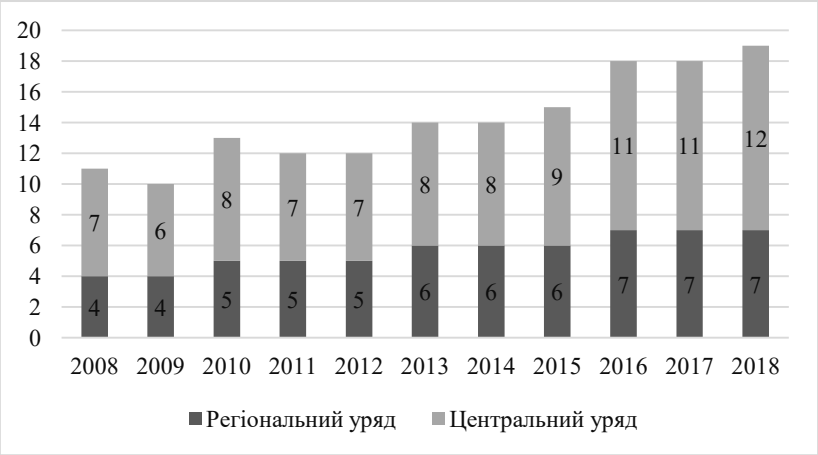

Figure 3. Public investment in infrastructure in 2008–2018, GBP billion in current prices

Source: compiled based on [15].

The key measures for public management of regional infrastructure conducted by the UK government are listed in Table 1.

Table 1. Measures on public management for development infrastructure at the regional level

Sector of regional infrastructure	Measures
Automobile	Maintenance and development of strategic highways is funded directly by the state through the Road Agency. Local authorities are responsible for the management and maintenance of local roads; capital modernization and repair of local roads is financed by the central government.
Railway	Passenger transportation services are provided to carriers through government-approved deductibles. It maintains the Network Rail infrastructure network, which is partly funded by government subsidies and funds of freight and railway companies.
Aviation-related	The state promotes competition and ensures a level playing field and high security standards in a predominantly privately owned sector. The development of the aviation-related sector is considered a priority area of industrial policy.
Electric-power related	Investments come from the private sector, the state energy program lies in minimizing energy costs for consumers in the long run perspective.
Telecommunication	The government provides an effective regulatory framework for the management of the sector and seeks to ensure wider coverage and accessibility of the broadband network for consumers and business entities.
Water supply	The role of the state lies in ensuring a safe and acceptable standard of water supply and prices.
Science and innovations	The state considers this sector as the main vector of economic growth. Public funds are invested in research through bodies that fund higher education (Technology Strategy Board).

Source: compiled based on [1].

The basic recommendations concerning the management aspect of regional infrastructure development are as follows:

- as a result of constant climate change and digitalization processes, greater pressure is created on the infrastructure system and necessary long-term investments in the field of water supply, energy and telecommunications. In order to do this, it is necessary to define long-term priorities for these areas and provide regulators with

new functions, including allowing companies to invest in infrastructure while protecting the interests of consumers;

- in order to protect the interests of the private sector investing in infrastructure, the regulatory system should fairly balance risk and reward between consumers and investors, as well as increase competition in the design and construction of regional infrastructure networks and facilities;
- the government will set clear standards of sustainability and stress test regional energy, water and transport infrastructure in order to address vulnerabilities and prevent potential threats.

Infrastructure is of great importance for the livelihood of the population and production facilities, forasmuch as it provides the necessary level of services, starting from water supply and energy supply and ending with social sphere facilities. Public management and regulation supports the entire life cycle of these structural elements of regional infrastructure.

We believe that infrastructure management should be understood as the processes, methods and tools of interaction, decision-making and monitoring used by the authorities in order to implement available infrastructure services to the society. Regional infrastructure management and improvement at all stages of the infrastructure cycle is extremely important towards ensuring sustainable economic growth. However, this requires a careful assessment of the capabilities and strengths of public institutions and depends on numerous institutional and social-economic aspects, strategic planning, and the creation of environmentally sustainable infrastructure throughout the life cycle and at all levels of government.

The conceptual model of the state management system of regional infrastructure can be presented in Figure 4.

In our viewpoint, the management system of regional infrastructure should be understood as a complex set of elements, including as follows: public authorities, strategic directions of development, objectives, functions, technologies and methods, tools, structures that create a mechanism for influencing the infrastructural and regenerative potential of the region, determining the social-economic processes in order to improve the economy of the region.

Public management of regional infrastructure is necessary for planning, selection and provision of timely necessary infrastructure within the budget. The development of regional infrastructure should meet the requirements of modern development principles by introducing new technologies that allow improving the technical level and quality of products and resource-saving technologies that ensure a high level of competitiveness of products.

Discussion. The present research correlates with the results of Kumari A. (2017), namely: “studies on the development of regional infrastructure are empirical in nature; most of them are devoted to financing infrastructure, public-private partnership is considered as a priority source of funding of regional infrastructure”. Public management of regional infrastructure is necessary for planning, selection and provision of timely necessary infrastructure within the budget, as well as on the basis of private funding and public-private partnership.

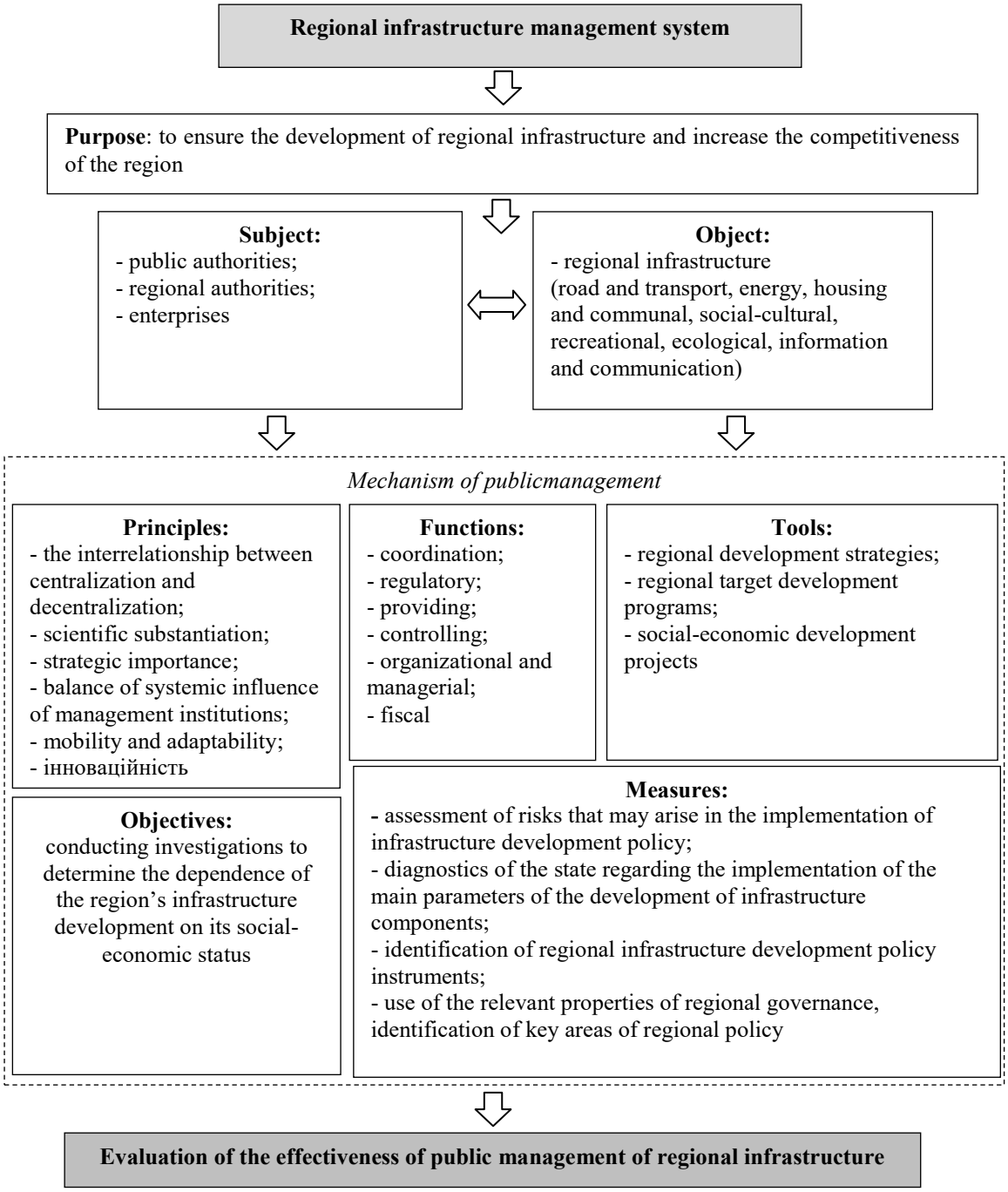

Figure 4. Model of state management of regional infrastructure

Source: compiled by the author.

The development of regional infrastructure should meet the requirements of modern development through the introduction of new technologies; they allow improving the technical level and quality of products and resource-saving technologies ensuring a high level of products' competitiveness.

Extended regional infrastructure includes various elements of systems, namely: economy, politics, government and science. These subsystems are independent; thus, the key task is to coordinate such subsystems, as: the formation and configuration of

structural communication (Kuch B., 2016). This means that public management and regulation should support the potential and the entire life cycle of these structural subsystems of regional infrastructure.

Currently, the management of regional infrastructure faces numerous challenges towards ensuring its sustainable development. Lack of effective management strategy leads to complete destruction of infrastructure facilities and high costs for infrastructure (Olufemi, 2015). Therefore, regional infrastructure management and improvement at all stages of the infrastructure cycle is extremely important in order to ensure sustainable economic growth. This definitely requires a careful assessment of the capabilities and strengths of public institutions and depends on many institutional and social-economic aspects, strategic planning, and the creation of environmentally sustainable infrastructure throughout the life cycle and at all levels of state governance.

Conclusions. Management of regional infrastructure's development is a set of specially organized systemic actions aimed at ensuring sustainable and balanced reproduction of social, economic and natural potential of the region with a positive dynamics of the parameters of the level and the population's life quality. Competitive and dynamic development of the region is possible only due to the full implementation of the existing specific regional potential, the main element of which is the infrastructure of the region. State regional policy should focus on improving the spatial development of the national economy by identifying and disclosing the benefits of each region, the formation and promotion of new agglomerations of dynamic economic growth throughout the country. We are talking about the multipolar development of the state's territory and the creation of effective regional facilities for innovation-oriented social-economic progress. Methodological approaches to managing the development of infrastructural support in the region should always have an idea of the infrastructure's own potential, opportunities, conditions and ways to implement it. Modern regional policy should be a clear, well-coordinated system of development and implementation of priority areas of regional infrastructure, including a set of flexible provisions of organizational, legal, methodological and informational nature. The policy of the central government should be aimed exclusively at joint development and coordination of strategic and program documents for development of regional infrastructure, as well as coordination of their implementation.

The objectives of regional governance are as follows: intensifying and updating the use of all types of available resources, creating stimulating conditions, opening new markets and social opportunities, and creating favorable conditions for efficient management and improvement of living standards. There is a certain dependence between the full implementation of the accumulated potential and the quality of regional management. It is manifested as follows: the higher the professional level of regional management is, the better the existing infrastructural potential of the region is used and multiplied. Thus, the degree of implementation of the region's own infrastructural potential is determined by the level of use of modern management

methods. This dependence constitutes an important regularity of the modern management of regions.

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